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WOODWORKER'S JOURNAL

August 2002
Volume 26
Number 4



9 Great trim routers

Which of these mighty mites is best for you?

Learn the truth about high-tech adhesives

4 Proven cabinetry techniques

AT LAST!

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See page 51



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- MAX. CUTTING WIDTH: 16 1/2"
- MAX. CUTTING HEIGHT: 7 1/4"
- PRECISION GROUND CAST IRON TABLE
- TABLE TILTS: 10° LEFT AND 45° RIGHT
- TABLE SIZE: 17" x 17"
- BLADE LENGTH: 113"
- BLADE WIDTH: 1/4" TO 1"
- OVERALL HEIGHT: 72"
- INCLUDES 1/2" BLADE, FENCE AND MITER GAUGE
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- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE (WITH 2 SOLID EXTENSION WINGS ATTACHED): 40 1/4" x 27"
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- CUTTERHEAD SPEED: 5000 RPM
- RATE OF FEED: 16 FPM & 20 FPM
- MAX. CUTTING WIDTH: 14 1/4"
- MAX. CUTTING HEIGHT: 6 1/4"
- MAX. CUTTING DEPTH: 1/8"
- NUMBER OF KNIVES: 3
- ALL BALL BEARING CONSTRUCTION
- APPROX. SHIPPING WEIGHT 540 LBS.

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20" PLANER

- 3 HP, 220V, SINGLE-PHASE MOTOR
- TABLE IS PRECISION-GROUND TO A MIRROR-LIKE FINISH
- CUTTERHEAD SPEED: 4833 RPM
- RATE OF FEED: 16 FPM & 20 FPM
- MAX. CUTTING WIDTH: 20"
- MAX. CUTTING HEIGHT: 8 1/2"
- MAX. CUTTING DEPTH: 1/8"
- NUMBER OF KNIVES: 4 HSS

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- MOULDING FEED RATE: 12 FPM
- MAX. CUTTING WIDTH: 13"
- MAX. CUTTING DEPTH: 6"
- MAX. CUTTING DEPTH: 1/8" (PLANING)
- MAX. PROFILE DEPTH: 3/4" (MOULDING)
- NUMBER OF KNIVES: 3
- 4" DUST PORT
- MOTOR: 1 1/2 HP, 110V/220V
- SINGLE-PHASE
- APPROX. SHIPPING WEIGHT 240 LBS.

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REG. \$695⁰⁰
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1 1/2 H.P. SHAPER

- 2 INTERCHANGEABLE SPINDLES: 1/2" AND 3/4"
- MOTOR: HEAVY-DUTY 1 1/2 HP, 110/220V
- TWO SPINDLE SPEEDS: 7,000 AND 10,000 RPM
- TABLE SIZE: 20 1/4" x 18"
- SPINDLE TRAVEL: 3"
- SPINDLE OPENINGS: 1 1/4", 3 1/2", AND 5"
- FLOOR-TO-TABLE HEIGHT: 33 1/2"
- MAXIMUM CUTTER DIAMETER: 5"
- APPROX. SHIPPING WEIGHT: 220 LBS.

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- MOTOR AMP DRAW: 12 AMPS (220V ONLY)
- APPROX. SHIPPING WEIGHT: 130 LBS.

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3 H.P. SHAPER

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- TWO SPINDLE SPEEDS: 7,000 AND 10,000 RPM
- HEAVY-DUTY 3 HP, SINGLE-PHASE, 220V MOTOR w/REVERSING SWITCH
- 3" SPINDLE TRAVEL
- SPINDLE OPENINGS: 1 1/4", 2 1/4", 4", AND 5 1/2"
- PRECISION-GROUND CAST IRON TABLE
- TABLE SIZE WITH STANDARD WING ATTACHED: 30 1/2" x 28 1/4"
- FLOOR-TO-TABLE HEIGHT: 34"
- APPROX. SHIPPING WEIGHT: 353 LBS.

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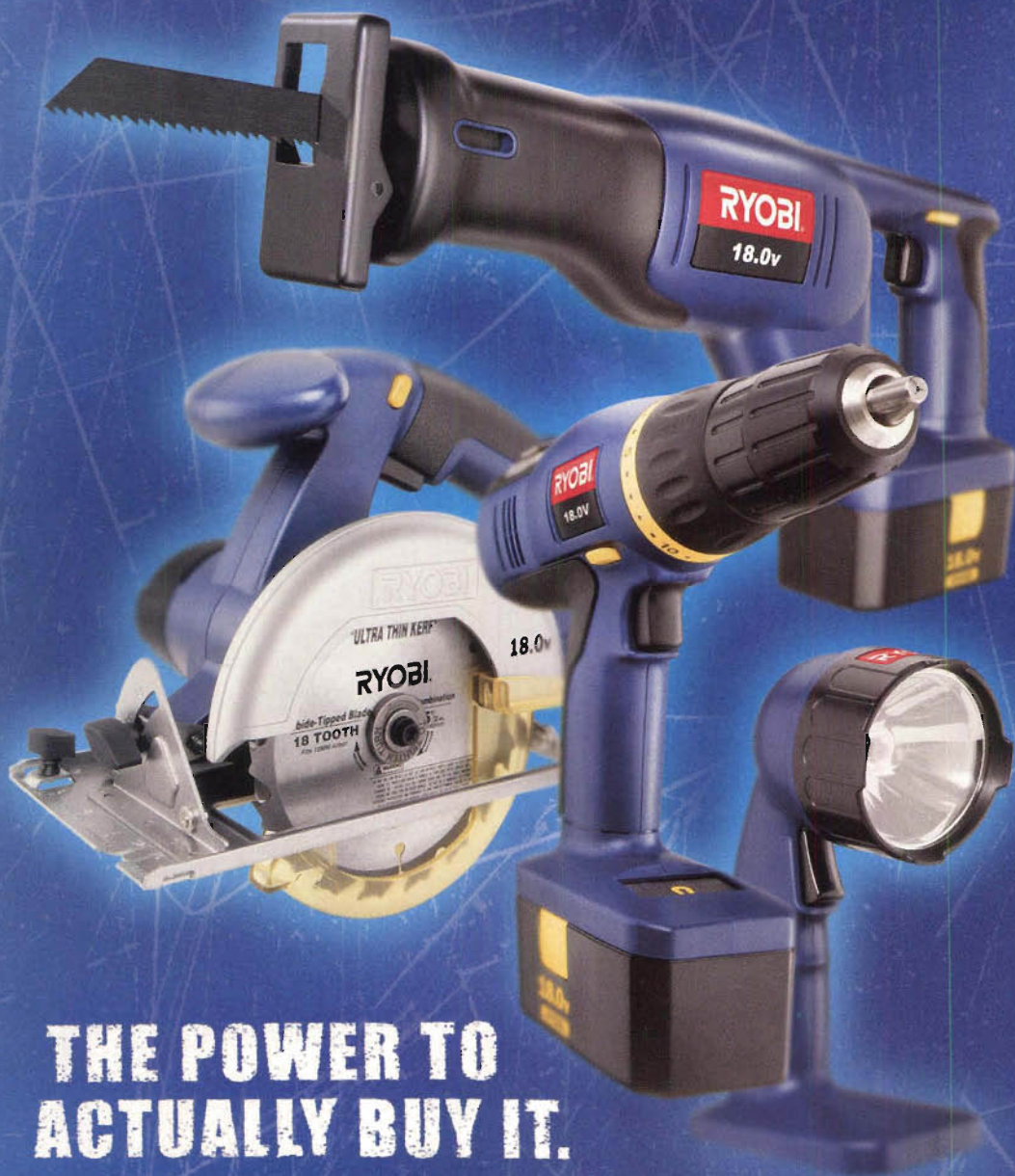
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Woodworker's Journal

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July/August 2002 

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34 Four Methods of Casework Joinery

By Lonnie Bird

Revisiting the fundamentals of casework joinery with master woodworker Lonnie Bird will help you design your own masterpieces.



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51 Basic Melamine Storage Cabinets

By Linda Haus

It's cabinetmaking 101, as you learn to make a basic set of all-purpose cabinets.



59 Scroll Sawn Nightlights

By John Nelson

What should kids do on their summer vacation? Learn a little woodworking with a simple scroll saw project.

42 Bat House Bungalow

By Chris Marshall

Improve the environment — for you and the bats — by building a home for these mosquito munchers.



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46 Woodworking's Crumbling Gender Barrier

By Joanna Werch Takes

Woodworking's fastest growing new demographic has arrived. So how was the journey?



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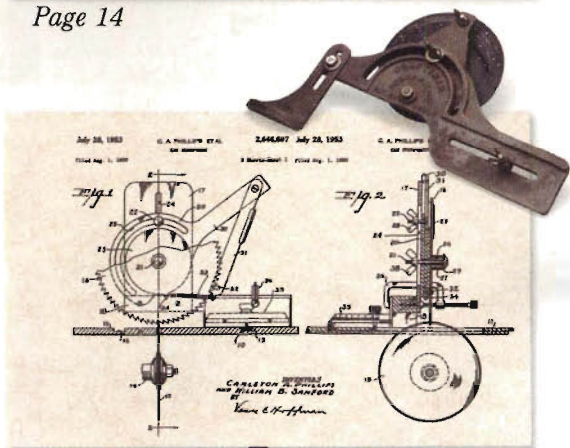
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A little payback and the secret formula for bit rpm.

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A simple rolling table saw base takes the "pick."

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The woodcarvings of Rupert Kreider and "The Magnificent Mesquite."

16 Questions & Answers

Replacing batteries; tilting table saws and Japan color.

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The top woodworking books from the last year.

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You never know what you'll find in the garage.

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Michael Dresdner takes you on a quest for stick-to-itiveness: Visit the world of high-tech adhesives.

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66 Today's Shop

Which clamp for what application? Charles Self fills in all the critical details.

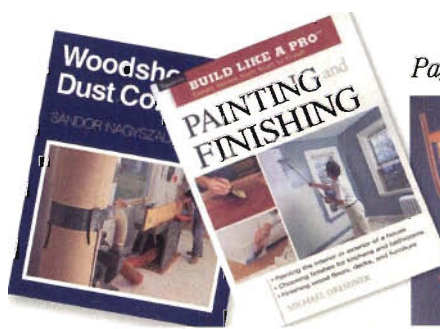
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74 Tool Review

A one-trick pony? Not anymore. Bill Hylton examines nine trim routers and shares his notes.

80 What's In Store

More innovations: Cruise control, a dual doweling system and a new hammer that uses two heads.



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Got Clamps?

"You can never have too many clamps."

Some woodworkers say that's a great slogan for a T-shirt — or even a tombstone. It's certainly not the sexiest aspect of woodworking, but having the right clamps and proper adhesive for the job sure makes the middle steps of a project go a lot smoother. For this issue, I asked two of our award-winning regulars, Charles Self and Michael Dresdner, to cover the latest in clamping options (Today's Shop, *page 66*) and adhesive technology (Finishing Thoughts, *page 24*).

To help keep your shop and shop supplies organized and efficient, I also called on Linda Haus, one of Rick White's long-time shop assistants, to come up with a multi-purpose

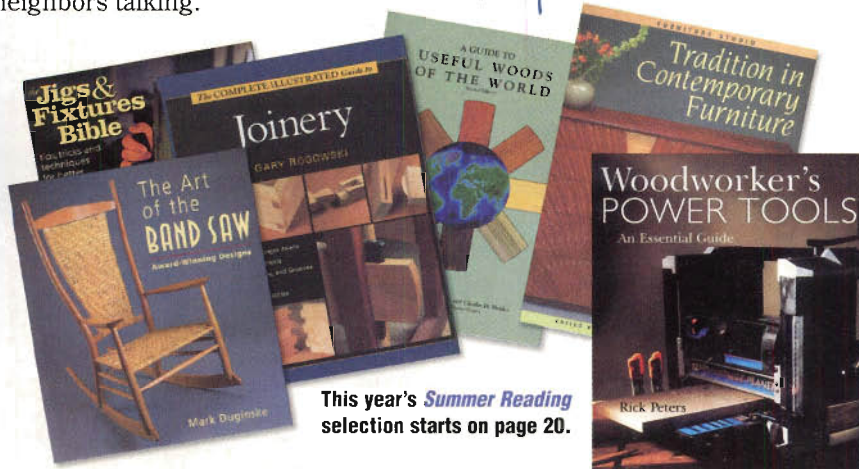
"starter set" of melamine storage cabinets. Check out this issue's *centerspread* for Linda's cabinetmaking 101 course.

**Charles Self's
clamping suggestions
start on page 66.**

And while Linda's a return project builder, I'm very happy to welcome well-known author Lonnie Bird to our pages for the first time ... his article on four basic woodworking methods starts on page 34. Bill Hylton, another well-known author (and a *Woodworker's Journal* regular) is back again this issue; look for his review of those handy little trim routers on page 74.

Of course, it is summertime, so if you're in the mood for a more relaxed read, fear not: our annual *Summer Reading* section is back with a quick look at some of the best books to hit the stands this last year (*see page 20*). And finally, if you can't get any reading done because the mosquitoes are buzzing you, check out Chris Marshall's project on *page 42*. It's a simple little weekend affair that will take care of that problem and get your neighbors talking.

Larry N. Storken



**This year's Summer Reading
selection starts on page 20.**

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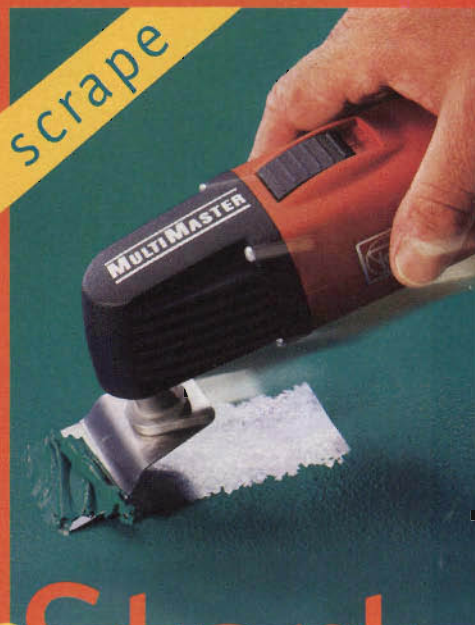
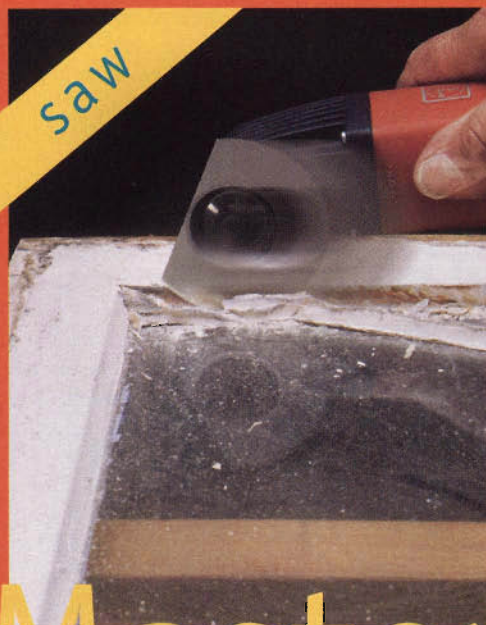
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Two Dovetail Jigs Become One



Chip Winnett has been using jigs from *Woodworker's Journal* for many years — and he has a great improvement for this one.

It's Payback Time

Just a little payback ...

I have been a reader of your wonderful publication for much of the last 25 years. In fact, many of the jigs and fixtures I use in my shop are from back issues of your magazine.

I just finished reading the fine article by Jack Gray, "Sliding Dovetail System," from your *April 2002* issue.

I have used a similar setup to make sliding dovetails for several years. The difference in my setup is that I sized my "groove jig" to fit the base plate from my router table. The setup for using this jig is the same as noted in Mr. Gray's article. Once I have routed my grooves, I return the base plate and router to my router table, move my fence in as required, and cut the tails. There's no need for the second jig.

Chip Winnett
Corrales, New Mexico

Reader Bob Fowler chose blind mortises over through mortises for his version of our Side Table.

Renewal Sweeps Winner

Thank you for choosing my name at random for the 10" Ryobi table saw. I will really enjoy my saw, and I enjoy your magazine, too!

Johnnie Holloway
Sherman, Texas

WJ Responds:

Johnnie won first prize in one of our renewal sweepstakes. Subscribers should be sure to watch their mailboxes for renewal notices and the chance to win great tools from our advertisers.



When Johnnie Holloway renewed his subscription to the *Journal*, he got more than he bargained for ... he won a 10" Ryobi table saw.

Table Talk

I have just completed my version of the "Arts and Crafts Side Table" (*February 2002*). My wife is not fond of through mortises, so this version is built with blind mortises. I went with quartersawn white oak.

Bob Fowler
Easley, South Carolina

Two Corrections:

Bob, your table looks great. For other readers who are building this project, the top of the lower drawer support mortise is 5 $\frac{1}{16}$ " from the top of the leg (we failed to mention this). Also, the correct length of the back apron is 17", not 17 $\frac{1}{4}$ ", as shown in the *Material List*.



Threats to Pine

I would like to respond to the answer given to Martin Johnson in the *April 2002* issue (*Questions & Answers*) on the availability of Ponderosa pine for use in making Colonial style furniture.

Forests in which Ponderosa pine is present extend from southern Canada into Mexico, and from the Pacific coast as far east as western Nebraska. Throughout the western United States, Ponderosa pine is the fourth most plentiful species, accounting for 18 billion cubic feet of growing stock.

In general, the northern spotted owl lives in mixed conifer (Douglas and true firs) forests in western Washington, western Oregon, and northern California and occupies little of the 30-plus million acres of Ponderosa pine forests.

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The reductions in their harvest are more likely related to old growth concerns, product size and quality, engineered wood product substitutions, and market trends.

In addition, sugar, Western white and Eastern white pine are very susceptible to blister rust, an introduced disease. In the northern Rocky Mountains, blister rust has resulted in a 90 percent reduction in the extent of Western white pine. I totally agree that white pines are ideal for fine furniture, but it's important to note that their availability is also threatened.

*Russell T. Graham
Research Forester
USDA Forest Service
Moscow, Idaho*

Weekend Woodworking

I love your magazine, especially the projects. I am a weekend woodworker, though my husband and I hope to have more time to devote to our projects in the coming months. I made a fleet of Grasshopper Toys (*Woodworker's Journal*, February 1990) for my small friends this year — they made great holiday gifts. The model, at right, is my niece Madeleine.

*Rachel Tilney
Westtown, Pennsylvania*



The Formula for Bit RPM

I have long wondered what the safe maximum rpm for a given bit diameter is. With the potential danger so great, it amazes me that this info is so hard to come by. Your maximum tip speed of 130 mph (*Tool Preview*, February 2002) is very useful and worth the yearly subscription price alone!

Here's a simple formula fellow readers can use to see if they are within the safety zone for the bit they're using. First, know that 130 mph equals 11,440 feet per minute. Now take the bit diameter times .262 ($\pi/12$) and divide that into 11,440. That's the maximum safe rpm. If you have a 2 1/2" bit, multiply 2.5 by .262 and divide that into 11,440. You get 17,466 rpm.

*Tom Stoffregen
Milton, West Virginia*

Safety First: Learning how to properly 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.

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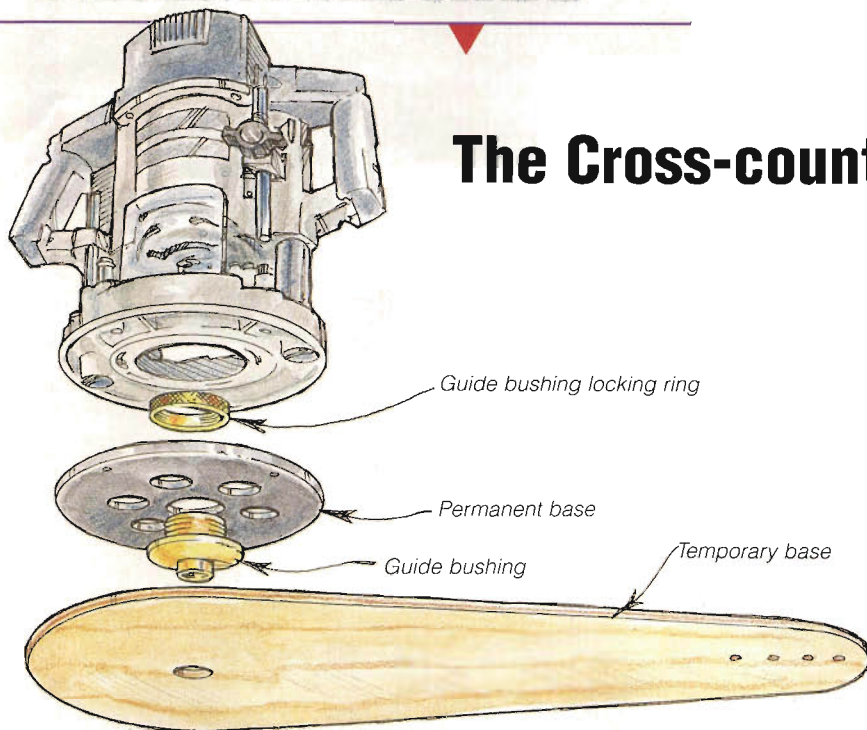
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The Cross-country Table Saw

Switching Bases in a Hurry

Here's a drawing of a quick way to attach a plunge router to an auxiliary base: Just drill a hole in the temporary plywood base which exactly fits a large guide bushing. Install the guide bushing in the permanent base, drop the router onto the temporary base and you're in business.

*William Adsit
Milford, Illinois*

Troublesome Biscuits

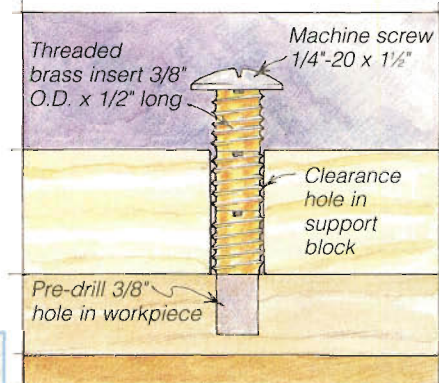
Every now and then you get a "fat" biscuit that won't fit in the slot. Instead of sanding, I put it in a metal vice, one end at a time, and give it a good squeeze. To extract a tight biscuit after a dry fit I grip it with a pair of upholstery pliers and give a good pull. The pliers impress another groove in the biscuit — making an even tighter joint after swelling.

*Edgar Feathers
Rochester, New York*

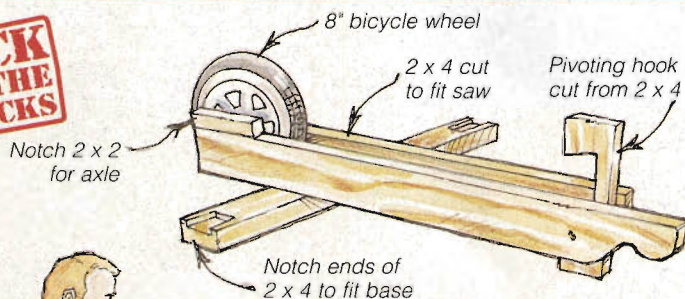
Installing Threaded Brass Inserts.

Brass inserts are easily damaged — or cross-threaded — especially if you don't have a screwdriver large enough to fit the slot. My solution is to thread three inserts on a round-head, slotted machine screw as shown in the sketch. I then drill a clearance hole through a piece of scrap twice as thick as one insert. I screw the entire assembly into the hole and stop when the screw head reaches the block. Finally, I back out the machine screw together with the two remaining inserts. The third one remains embedded in the work.

*A. M. Benson
Houston, Texas*



**PICK
OF THE
TRICKS**



Mobile Saw Base

With this mobile base I can easily move my contractor's table saw around — even down steps or over door thresholds.

I use the table saw fence rails wheelbarrow-style so I don't have to bend down. The wheel and axle are from a child's bicycle and the remainder shop scrap. Be sure to engage the wooden "hook" before moving the saw.

*Paul McKibben
Norcross, Georgia*



WINNER!

In addition to our standard payment, Paul McKibben of Norcross, Georgia, will also receive a Delta 22-580 portable

two-speed finishing planer for being selected as the "Pick of the Tricks" winner. We pay from \$100 to \$200 for all tricks used. To join in the fun, send us your original, unpublished trick. Please include a photo or drawing if necessary. Submit your Tricks of the Trade to Woodworker's Journal, Dept. T/T, P.O. Box 261, Medina, MN 55340. E-mail: tricks@woodworkersjournal.com

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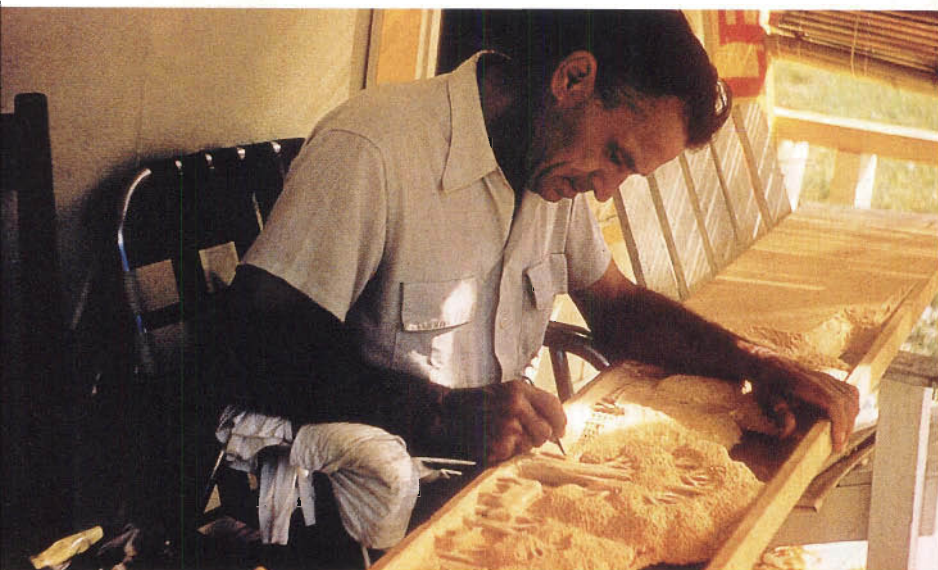


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Perspective: A Hobo, A Carver, An Artist



In this photo from 1958, Rupert Kreider is shown working on one of his relief carving rural landscapes. The Arkansas itinerant supported himself with sales of carvings, plus odd jobs.

Arkansas Traveler

Work of an Itinerant Carver

During his lifetime, Rupert Kreider was known as a “free spirit.” The Arkansas itinerant supported himself through sales of his scenic woodcarvings, with the Squirrel Trading Post becoming his de facto gallery. Nearly 10 years after his death, a major museum is staging a retrospective of his work: the exhibit “Life in Perspective: the Woodcarvings of Rupert Kreider” will be at the Abby Aldrich Rockefeller Folk Art Museum in

Colonial Williamsburg until February 17, 2003.

Born in Lancaster, Pennsylvania in 1897, Kreider told a friend that he left home at the age of 14 because he didn’t like farm life and that he set off “just walking and carving.”

Kreider’s carvings incorporated intricate detail. The largest and most complex scenes also reveal his knack for creating the illusion of spatial depth through the use of distant “vanishing points” and repetitive motifs that diminish in size and seem to disappear in the distance. Artists have used such

techniques for centuries to create perspective, but more often in paintings and drawings than in relief carvings.

By the 1950s, Kreider was leading a modified hobo existence, drifting from one place to another and sustaining

himself through odd jobs and the sale of his carvings. About 1955, he arrived at the Squirrel

Trading Post in St. Joe, Arkansas, a souvenir and curio shop that sold his smaller, simpler carvings. The proprietor’s family bought his larger pieces for themselves.

It’s these pieces that make up the Colonial Williamsburg exhibit. They include eight elaborate farmscapes and other rural scenes carved in relief and a lamp base made from a cypress knee carved in the round.

Kreider made sporadic visits to the Squirrel Trading Post from the 1950s to the early 1970s. He died in 1983 and, because he had served in the U.S. Army Air Corps, was given a veteran’s burial in the National Cemetery in Little Rock, Arkansas.

“People who knew Kreider have remarked on his ability to live according to his own terms, characterizing him as a ‘free spirit’ who honored personal inclinations, disdained material wealth and focused on the present moment,” said Barbara Luck, Colonial Williamsburg curator of paintings and sculpture. “Perhaps the artist’s knack for creating the illusion of spatial depth in his carvings extended to his personal philosophy, enabling him to prioritize his needs, to take life’s twists and turns in stride, and to ‘put things in perspective.’”

For more information on the exhibit, call 757-220-7698 or visit www.colonialwilliamsburg.com.

Photos by Camera Work, Inc. and Ron Thomas



The Squirrel Trading Post in St. Joe, Arkansas acted as Kreider’s gallery; the proprietor’s family also bought much of his work.



“Church” is a Kreider carving from around 1960. The windows are carved all the way through, with more wood removed from around the openings on the reverse side to enhance the illusion of spatial depth.



Charlie Boren is a Texas wood sculptor who works with Ken E. Rogers' favorite wood: mesquite.

Not Just for Barbecue

The Many Faces of Mesquite

You can probably guess the most popular use of mesquite wood: cooking. Ken E. Rogers, a former wood technologist with Texas A&M University, is so familiar with the wood and its other uses — number two, flooring; three, furniture; four, wood turning and sculpture — that he's written a book on it.

A highly dense hardwood with a very dark color and four times the stability of oak, "Mesquite is real, real pretty," Ken said. "It competes in wood turning and sculpture with all the rainforest hardwoods we're trying to get away from."

It also has another pleasing characteristic: if you cut a circle out of mesquite, it will stay a circle during the drying process, rather than contracting. Because of this low shrinkage rate, Ken said, a lot of turners put green mesquite on a lathe, and it doesn't distort.

Personally, Ken says he's made about 500 mesquite vases, along with "a couple hundred cutting

boards." He particularly appreciates the variety of appearance he gets out of the species. "Every tree is different," Ken explained. "It's basically the same color, but the grain is different; there's worm holes, ring shake, separation of grain around the growth rings, swirling grain. It just looks different. That's the beauty of mesquite."

Other woodworkers have been picking up on this beauty. A 1972 meeting on the wood at Texas A&M drew 15 people, Ken said. The most recent meeting drew more than 600 from Texas alone.

Although the wood's traditional range is considered to be South and Central America and the southwestern United States, it has now been transplanted all over the world. It won't grow, however, in areas with high rainfall, acid soils or freezing conditions. Which is why British woodturners, for example, are having it shipped in.

It was this increased interest, and daily inquiries about mesquite, that led Ken to write *The Magnificent Mesquite* (University of Texas Press, ISBN 0-292-77105-3).

"I've worked with mesquite for 23 years," Ken said. "I decided I needed to pull all the information together."

Photo © Charlie Boren

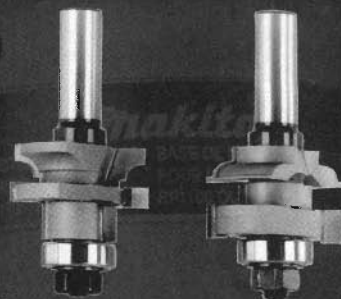


Many of Charlie's mesquite pieces incorporate images of Native Americans and the American bald eagle.

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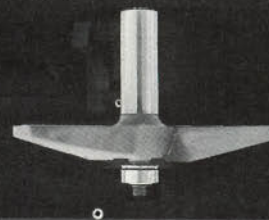
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Tilt: Does It Matter Which Direction?

THIS ISSUE'S EXPERTS

Ian Kirby is the author of *The Accurate Table Saw* from Cambium Press and a regular contributor to the *Woodworker's Journal*.

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

Sandor Nagyszalanczy is a furniture designer/craftsman and author of seven woodworking books, including *Woodshop Dust Control* from Taunton Press.



Q I have cordless drills and screwdrivers with expired batteries. Most stores tell me to throw them away and buy new ... they don't sell batteries. This I cannot believe.

*Ed Huck
Franklinville, New Jersey*

A I assume you're referring to light-duty cordless power tools that have rechargeable batteries inside. These are recharged by plugging the cord from a small charger into the tool itself. More powerful cordless tools have removable battery packs, which are recharged by removing the pack from the tool and slipping it into a battery charger. Removable battery packs are readily available from tool dealers, well-stocked hardware stores and online at: www.ecordlesstool.com or www.batterybarn.com.

Unfortunately, non-removable cordless tool batteries aren't designed to be replaced; like ballpoint pens, these tools are designed to be disposable. But that doesn't mean you should simply throw them away!

The nickel-cadmium (NiCad) batteries used in virtually all inexpensive

rechargeable tools are toxic and **MUST** be properly disposed of. **NEVER** discard them in the trash, incinerate or compost them. The Rechargeable Battery Recycling Corporation makes it easy to recycle properly. Call 800-544-6986 or visit www.rbrc.org.

— Sandor Nagyszalanczy

Q What are the pros and cons of right- and left-tilting table saws? Why are the right-tilt so much more prevalent?

*Nick Wiese
Minnetonka, MN*



Watch for Ian Kirby's table saw series for tips on getting the most accurate cuts — whether your saw tilts left or right.

A A left- or right-tilting blade cuts as efficiently as one another. So it's a matter of personal preference — the pros and cons about balance out.

A common response is that a right-tilting blade is liable to squeeze the workpiece between fence and blade, setting up the conditions for a kickback. This is only so if you haven't aligned the fence with the blade or if you are not using a splitter.

— Ian Kirby

continues on page 18 ...

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Recalls are in effect involving some portable air compressors from Ingersoll-Rand, which can unexpectedly rupture due to inner corrosion; for some hand-held saws from Roto-Zip Tool Corporation, because the handle can separate from the body; and for some circular saws from DeWalt: the spindle may slip and allow the blade to contact the lower guard.

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QUESTIONS & ANSWERS

Q I am a Japanese woodworker, but I don't know what "Japan drier" and "Japan color" are. A few years ago I read that someone went to Denmark, but couldn't find Danish oil. Do the French know what French fries are? Please explain.

*Suminosuke Kawase
Tamon Cho Nara Shi, Japan*

A In the late 1800s, rather than import the urushi and other resins at the root of Japanese lacquer work, Americans adapted a varnish to mimic the look. "Japan" originally meant what we would now call enameled coatings — fairly thick, lustrous, glossy paint in a variety of colors.



The French, says Michael Dresdner, now know French fries — thanks to McDonald's. Originally, the term "French" (as in French braids, French vanilla, and yes, French fries) meant "sophisticated."

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driers" means a linseed oil based liquid concoction heavily laced with driers. Japan driers are meant to be added to oil paints, artist's oils, or oil varnishes to speed up drying time. "Japan colors" are simply artist's oil colors with Japan driers already added.

Danish oil is a material used to mimic the look of the almost nonexistent finishes typical on Danish Modern furniture. It generally contains a small amount of drying oil (usually linseed or tung), a small amount of oil modified resin (typically alkyd resin) and a good bit of solvent.

— Michael Dresdner



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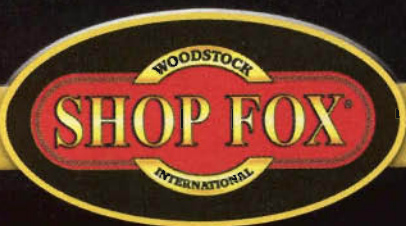
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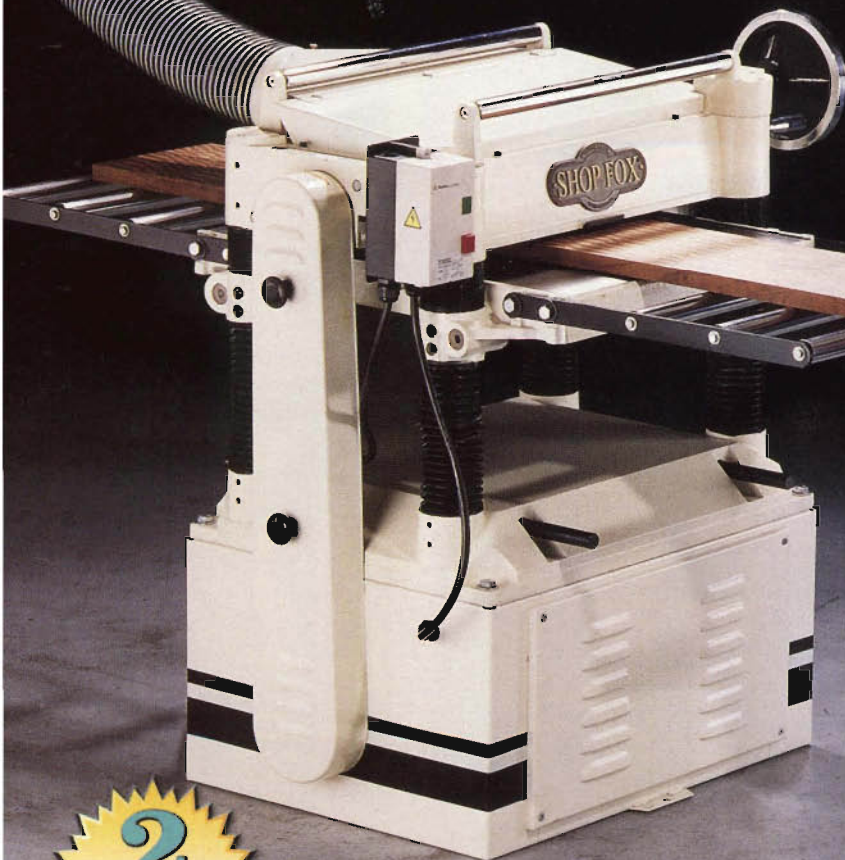
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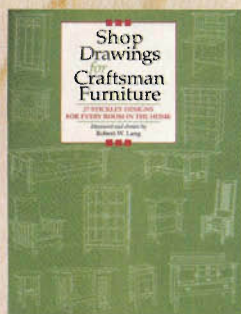
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By John English

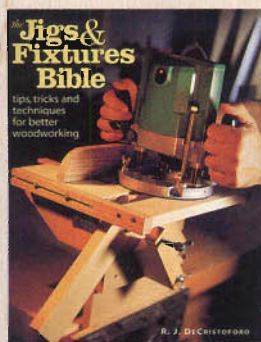


Shop Drawings for Craftsman Furniture

By Robert W. Lang

Cambium Press; ISBN-1-892836-12-2

At first glance, this book looks like just another survey of Arts & Crafts furniture. But it doesn't take long to realize that what Lang has given us is a very detailed shop manual, designed for intermediate to advanced skill levels, and written by a craftsman who understands the subtleties and nuances of Stickley's groundbreaking designs. The book includes 27 measured, annotated drawings.



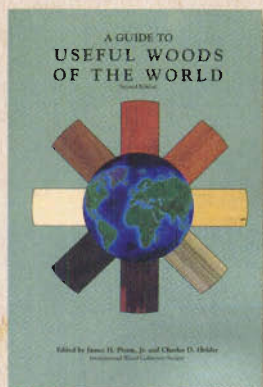
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By R.J. DeCristoforo

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ISBN-1-55870-563-5

"Bible" may be a little strong, but this book certainly does have all the hallmarks of a Cris classic. In his inimitable style, he shows us how to get more out of virtually every tool in the shop. His 50 years experience is complemented by hundreds of great photos.



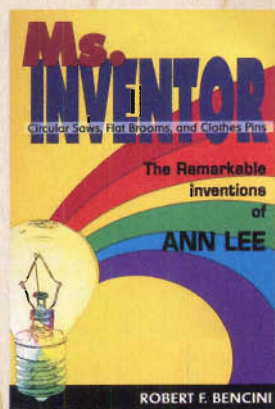
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Forest Products Society;

ISBN-1-892529-15-7

Featuring 279 species of workable wood, this reference is the ultimate resource for any serious woodworker. It includes a color photograph of each species, along with copious scientific information and summaries of its uses, workability and more.



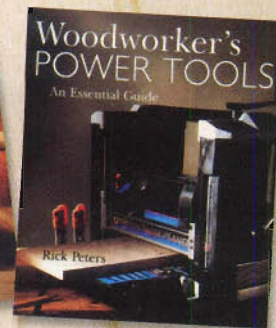
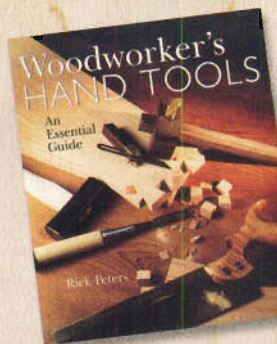
Ms. Inventor

By Robert F. Bencini

Robert D. Reed Publishers;

ISBN-1-885003-69-2

Profiling one of the most remarkable women of the 18th century, this book brings to life Ann Lee, mother of the American Shaker movement. While it concentrates on the sect's inventions, the author has an eclectic agenda that includes its share of history and politics.

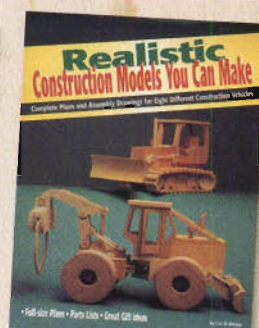
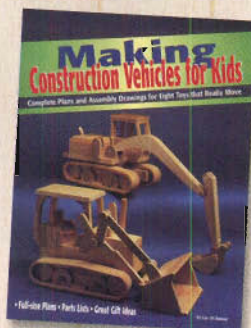


Woodworker's Hand Tools, Woodworker's Power Tools

By Rick Peters

Sterling Publishing Co., Inc.; ISBN 0-8069-6661-0 and ISBN 0-8069-6659-9

The subtitles on these books call them essential guides, and that in a nutshell is what they are. Beautifully illustrated and well written by a competent, experienced craftsman, they are more than reference works: these books are a joy to read. Even the most experienced among us can learn from these comprehensive, handsome manuals.

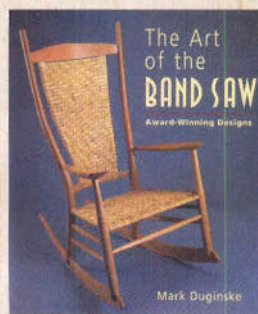


Making Construction Vehicles for Kids, Realistic Construction Models You Can Make

By Luc St-Amour

Fox Chapel Publishing Co. Inc.; ISBN 1-56523-151-1 and ISBN 1-56523-152-X

Our thirteen-year-old, the ultimate athlete, spent the better part of a sunny afternoon poring over these books. We didn't even know he could read! The books' appeal is universal: with St-Amour's detailed full-size plans, assembly sequence drawings, comprehensive materials lists and no-nonsense instructions, anyone can get into the heavy equipment business!

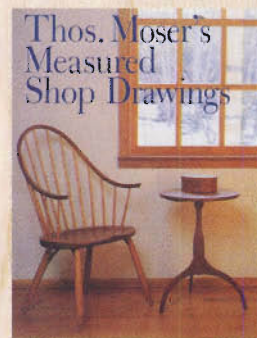


The Art of the Band Saw

By Mark Duginske

Sterling Publishing; ISBN-0-8069-3891-9

Here we have two marvelous books in one — an illustrated primer on the band saw by a renowned and knowledgeable writer, and an exquisitely photographed gallery of pieces built on the band saw by some of the country's foremost artisans.



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By Thos. Moser Cabinetmakers

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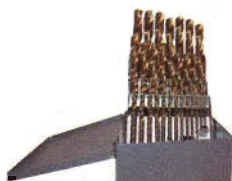
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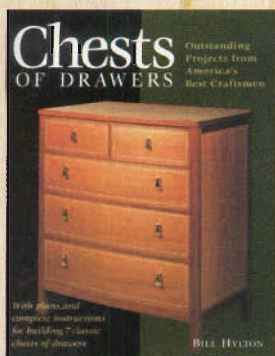


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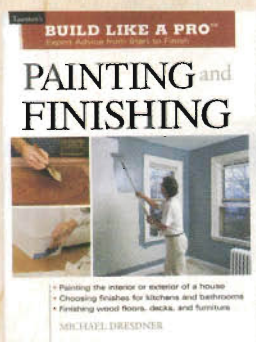


Chests of Drawers

By Bill Hylton

Taunton Press; ISBN-1-56158-422-3

With primers on case and drawer construction, superb photography and incredibly detailed instructions, veteran shop writer Bill Hylton walks us through the mysteries of chest building. Did I mention the wonderful photography? The book profiles seven different chests, ranging from a painted Pennsylvania Dutch recreation to a thoroughly modern cherry contemporary. Isometric and plan drawings hold your hand as you work. And the photos, well ...



Painting and Finishing

By Michael Dresdner

Taunton Press; ISBN-1-56158-480-0

Ever wonder whether you should use oil or latex? How about adding dye to a stain? And what really is the difference between an acrylic and a polyurethane finish? One of America's best known finishing experts answers these and thousands of other questions as he explains in wonderful detail how to do the job right. When it comes to prepping and applying stains, paints or finishes, nobody explains things as well as Dresdner.

The Complete Illustrated Guides to ... Joinery

By Gary Rogowski

Taunton Press;

ISBN-1-56158-401-0

... Shaping Wood

By Lonnie Bird

Taunton Press;

ISBN-1-56158-400-2

... Furniture

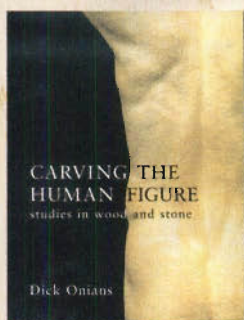
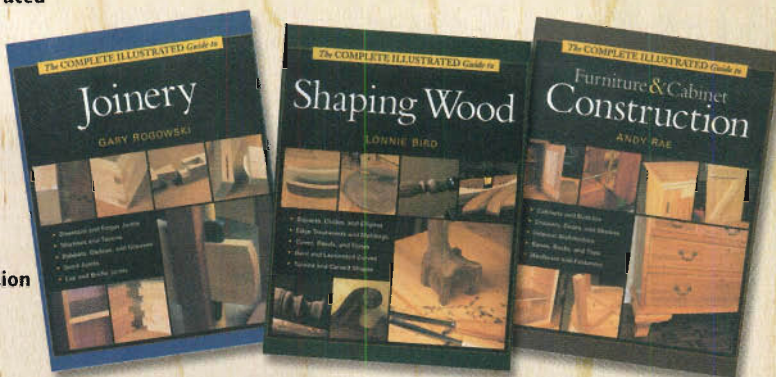
& Cabinet Construction

By Andy Rae

Taunton Press;

ISBN-1-56158-402-9

Indispensable! No other work quite captures the dramatic essence of this set. Three master woodworkers show and tell in spellbinding detail, and their talents are showcased in beautiful hardcover volumes — each complete with gorgeous photography and line drawings by Mario Ferro. This reference set belongs on every serious woodworker's shelf.



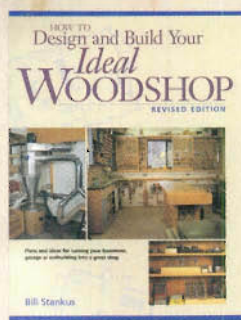
Carving the Human Figure

By Dick Onians

Guild of Master Craftsman Publications;

ISBN-1-86108-179-0

Here's a thorough grounding in the skills required to carve the most important subject in sculpture — the human form. With separate chapters on the head, torso, knees, feet, hand and arm, the book addresses every aspect of this most challenging art form.



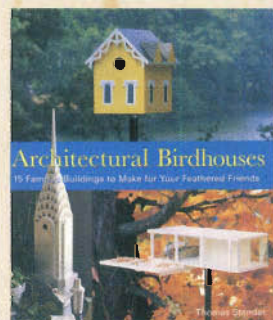
How to Design and Build Your Ideal Woodshop

By Bill Stankus

F&W Publications, Inc.;

ISBN-1-55870-587-2

The title says it all: this is a pretty comprehensive manual for anyone who wants to convert their basement or garage into a woodworking shop. Stankus thinks of everything, from storage to lighting, power and noise.



Architectural Birdhouses

By Thomas Stender

Lark Books; ISBN-1-57990-236-7

Based on major architectural styles and world-famous buildings, these fanciful birdhouse designs are suitable for woodworkers of all skill levels. The 1-2-3 style of instruction, erudite yet quirky introductions and some decent illustrations all combine to make this book a fun read.

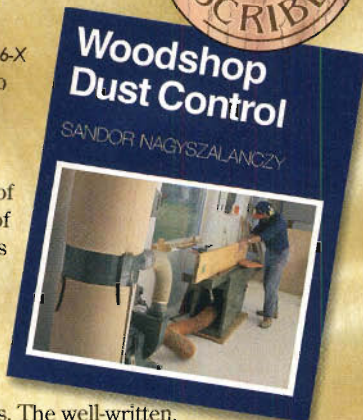
Second Annual WoodScribe Award

Woodshop Dust Control

By Sandor Nagyszalanczy

Taunton Press; ISBN-1-56158-116-X

This book has proven so valuable in helping woodworkers clear the dust that it's being reissued. Explanations of the respiratory effects of dust, the various options for control, and how to select and install the abatement options that your shop needs have proven invaluable to numerous woodworkers. The well-written, well-illustrated new edition — including the latest technology — promises to keep even more woodworkers breathing easy. It's both a new book and a proven classic ... truly a proper selection for the *Woodworker's Journal* 2nd Annual "WoodScribe Award."



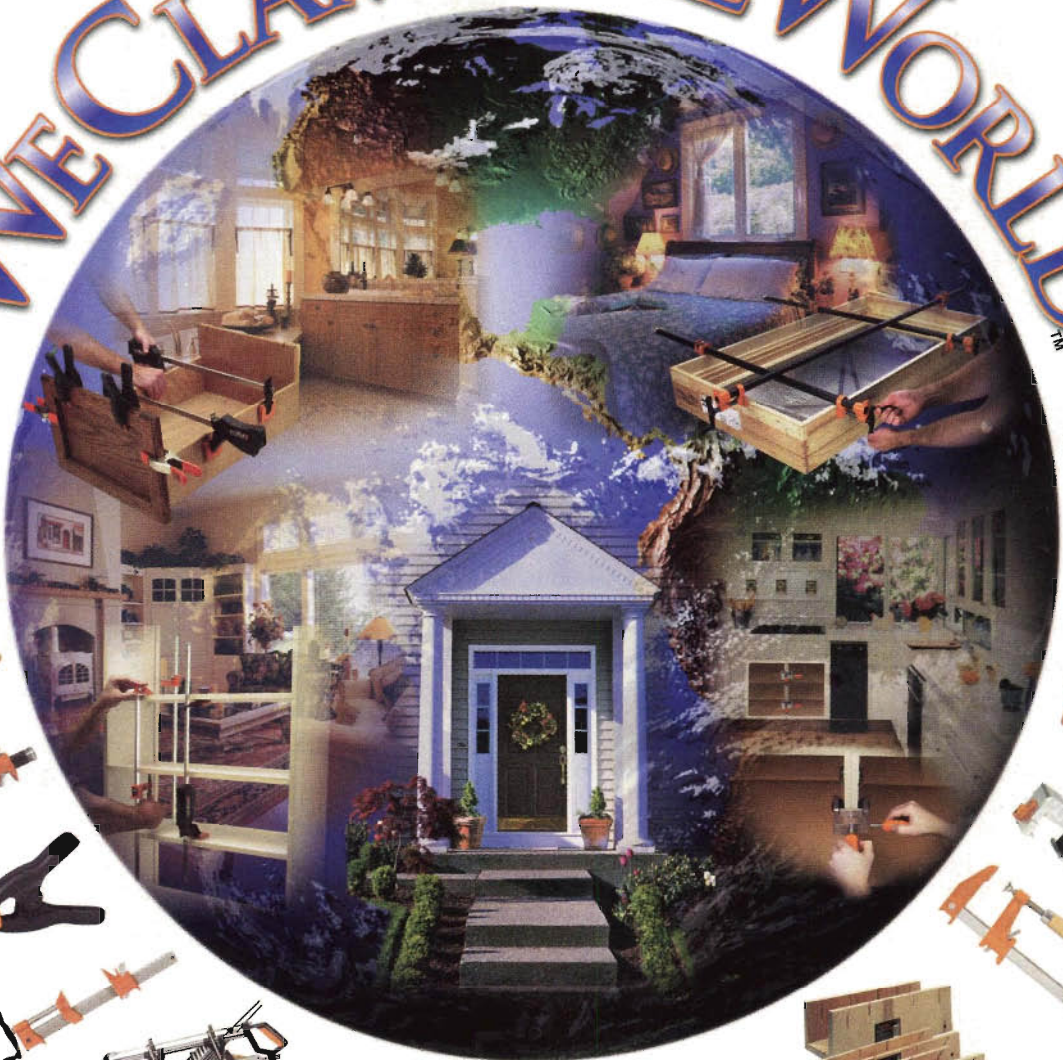
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By Rick Mastelli and John Kelsey

Furniture Society; ISBN-0-9671004-1-0

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High-tech adhesives are becoming available in an ever-expanding range of delivery systems.

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Working With High-tech Adhesives

For most woodworking we stick to our favorite tried and true adhesives, usually a PVA (polyvinylacetate) or "yellow glue" such as Titebond®, or a hide glue in either hot or liquid form. Most of the time they are ideal, but some jobs have special requirements, and that's when we need high-tech adhesives.

By Michael Dresdner

We might choose them for their exterior waterproof qualities, fast setup times, long open times, gap filling abilities, clamp-free assembly, ability to bond oily or troublesome woods, or because they are able to bond wood to metal, plastic, or other materials. Fortunately, these days there is an ideal adhesive for virtually every task you can come up with.

In this article we'll look at the most common varieties — cyanoacrylate, polyurethane, epoxy, and a fairly new moisture-cured hot melt adhesive — and talk about how to make this collection of high-tech adhesives work for you.

Caution: Always Test First

Before we dive into the various materials, let me remind you that it is always important to test new materials first on scrap before you use them on a project. This is especially important with these adhesives. Make sure they will work with the materials and clamping methods you've chosen. They might be temperature or humidity sensitive, have short open times, expand (and push pieces apart) when curing, or get very slippery when wet. A sample glue-up under your intended conditions can save you from a world of problems later on.

A Few Common Traits

There are a few characteristics common to all of the adhesives in this article, and the most notable is how they cure. Most wood glues cure by simply drying. The water and/or solvent in them evaporates, leaving behind a solid film that sticks to both sides of the wood joint. By contrast, the adhesives in this article cure by a chemical reaction. All of these adhesives create a glue line that is stronger than wood.

Furthermore, all of them are considered permanent, though some, like cyanoacrylate, epoxy, and HiPurformer can be reversed with high heat or special solvents. These glues are all more rigid than common PVA adhesives and are not prone to "glue creep."

They are all temperature stable, which means they can tolerate storage in both freezing and warm temperatures without being harmed.

Because they all cure by chemical reaction, they're quite temperature sensitive. For example, in a cold room, the required clamp time can be as much as 10 times what is recommended for ideal conditions. Conversely, in a hot room, the open time may drop to a fraction of what you'd normally get. Here's a good rule of thumb to remember: For every 10°C the temperature rises, a chemical reaction doubles in speed. (Note: in case you don't want to look it up, 10°C is equal to 18°F.)

Some of these adhesives will bond to finished wood and some will not, but even those that do not won't clean up easily off finish. If you are prefinishing, it is a good idea to mask the surfaces you want to keep clean. Remove the masking tape after assembly, but before the glue cures.

"In a cold room, clamp time for these high-tech adhesives can be as much as 10 times what is recommended for ideal conditions.

Here's a good rule of thumb to remember:

For every 10°C the temperature rises, a chemical reaction doubles in speed."



All polyurethane glues will foam when applied. The adhesive has an extended open time and is extremely water-resistant.

Cyanoacrylate (*Sigh-an-no-ack-rill-ate*)

When cyanoacrylates (or CA in shorthand) first burst onto the scene with distinctive trade names like Crazy Glue, Super Glue and Hot Stuff, they brought unimagined speed to the field of adhesives. A variety of formulations exist, from ultra-thin to thick gels, with setting times that vary from one or two seconds to over a minute. They are all clear, waterproof, and require no clamping, so you can simply hold parts in place until the glue sets. CA is triggered by either moisture or alkalines, but once it starts to cure it continues on its own.

Characteristics: Cyanoacrylate is an instant adhesive, so you have little or no time to align parts. Manufacturers offer very watery versions, which are too thin to be gap filling and only work on perfectly mated parts, and gap filling thick versions which usually dry slower and work better on wood. CA will bond a variety of materials including glass, ceramics, plastic, abalone, etc., and special versions are offered to deal with oily woods and to bond metals to wood. It can be used at almost any temperature, both indoors and out. In all cases, CA forms a permanent waterproof bond, but you can reverse it with high heat (above 350° F) or with a special debonder solvent.

Generally, it can be used for:

- Fast setting or where clamping is impossible
- Repairs (it will stick to old glue)
- Glue size to seal end grain before staining
- Crack or gouge filler when added to sawdust
- Mounting green or dry blocks for turning
- Finish or sealer on green or dry wood
- Repairing chips in high-tech finishes
- Solidifying cracked or crumbly wood
- Gluing live bait onto fish hooks. On the other hand, you should avoid using it on:
- Complicated assemblies requiring long open time
- Jobs where glue cost is an issue (it's expensive).

Warnings: It's a good idea to wear disposable gloves and goggles to keep the glue off your hands and out of your eyes. CA is a bit like cutting onions in that the fumes are irritating to your eyes and lungs, but not particularly harmful. Contrary to Internet rumor, CA is not carcinogenic and does not contain

Head to head: high-tech adhesives

Characteristics	Cyanoacrylate	Epoxy	Polyurethane	HIPURformer
Suitable for oily woods	yes	some yes, some no	yes	yes
Suitable for mixed materials	yes	some yes, some no	yes	yes
Good gap filler	yes	yes	no	yes
Clamping required	no	no	yes	no
Open time	30 sec.	varies	20 min.	30 sec.
Cure time	24 hrs	varies	4 hrs	24 hrs
Waterproof	yes	yes	yes	yes
Submersible	no	yes	no	no
Apply to one side or two	one side	both sides	one side	one side
Expands/contracts during cure time	neither	neither	expands	neither
Dangerous vapors	no	no	almost none	no

cyanide. However, it is flammable. It will stick to skin, so be careful not to glue yourself to objects or you might end up as the topic of the next *American Pie* movie.

Storage and shelf life: How long CA lasts is affected by the size of the container. Smaller amounts have a shorter shelf life than larger ones. A 2 ounce bottle will last at least a year at room temperature. Do not refrigerate opened containers as that can clog the tip and make the glue harden in the container. You can double the shelf life by freezing, but only unopened bottles. Let them warm to room temperature before you open them, and don't refreeze.

Epoxy

Epoxy is made in a wide range of formats and curing speeds to be used as adhesives, coatings, and molding materials. All epoxies consist of two parts that are mixed together to form a self-curing plastic. They are waterproof; gap filling; can be clear or opaque; and will bond most materials, including wood, with no clamping needed.

The one drawback for woodworkers is that even clear epoxy leaves a visible glue line because it needs some thickness to bond effectively.

Characteristics: Epoxies that mix at a one-to-one ratio are fairly thick and are offered at a variety of cure times, from five minutes to 24 hours. These are great for rough surfaces, sloppy fits and outdoor furniture. Thinner epoxies have mixing ratios from two-to-one up to five-to-one, again with a range of cure times. These are thin enough to be rolled or brushed on, and work great for laminating veneers, as casting or decoupage resin, or for durable bar top finishes as well as for simple gluing. Epoxy makers also offer a variety of fillers and colorants that you can mix in to make them thicker, colored or opaque, or simply expand their volume. With enough filler, you can create spreadable non-sag pastes and putties for casting or filling voids. You'll also find epoxy putty in sticks that get kneaded to form a clay-like moldable putty.

In general, epoxies can be used for the following applications:

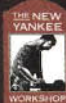
- Decoupage, bar top finish or casting resin
 - Patio furniture or other exterior uses
 - Boats — even below the waterline
 - Rough surfaces or poorly fit joints
 - Filling gaps or as a gouge putty
 - Repairs.
- Avoid using them for:
- Seams that show (glue line is visible)
 - Very tight fitting joints (not enough space for the epoxy).

Warnings: Since it is usually solvent free, epoxy is fairly safe, but some people find their skin is sensitive to it. For that reason, it's a good idea to wear disposable gloves.

Storage and shelf life: Epoxy will last at least two years under most any storage conditions. If it freezes, it gets cloudy and thick, but can be restored by setting the container in warm water. Over time, the hardener portion often turns yellow, but that does not mean the epoxy has gone bad — only slightly discolored.

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Polyurethane

Sold under a variety of names such as Gorilla Glue, Excel, and Polyurethane glue, this adhesive is a moisture-cured urethane. It cures by taking small amounts of moisture from the surrounding wood or air and combining with it to form a permanent bond. Not surprisingly, it sets faster in moist air or on wetter wood, and slower in dry air on very dry wood. Its chief claim to fame is that it can do all the same jobs as any PVA adhesive while giving the woodworker more time to assemble parts, and end up with a more rigid, waterproof bond to boot.

Characteristics: Polyurethane forms a bond that is rigid and waterproof, but not submersible. It is non-reversible and highly heat- and solvent-resistant. Polyurethane easily bonds oily and hard-to-glue woods, and will glue wood to non-wood materials such as metal, some plastics, stone, etc. Because it expands and foams while it cures, firm clamping pressure is a must.

It is generally used for:

- Difficult glue-ups where you need a long open time
- Oily or resinous woods
- Gluing wood to other materials
- Exterior applications like cupolas, doors, outdoor furniture
- Bent laminations and veneers
- End grain joints such as miters
- Repair work where some old glue still remains
- Green, wet, or pressure treated wood.

On the other hand, avoid:

- Situations where clamping is impossible
- Rough or poorly fitted surfaces.

Warnings: Wear disposable gloves. The adhesive is not particularly harmful, but it is almost impossible to remove from your skin once it dries. You can scrub it off before it cures with soap and water, but after it cures it will be with you for a long time.

Storage and shelf life: Shelf life varies with storage conditions and brand. Shelf life may last up to



Franklin's HiPURformer is a moisture-cured urethane which forms a final bond like polyurethanes, but it's a hot melt.

three years, though one year is more common. Save unused adhesive by squeezing out all the excess air from the container, capping it firmly, and storing the container upside down.

HiPURformer™ (High performer)

This unique adhesive comes from Franklin, the people who make Titebond. Technically, it is a moisture-cured urethane which forms a final bond much like the polyurethane adhesives discussed above. Instead of being in liquid form, however, it is a hot melt that is dispensed through a special heat gun. Like all hot melt adhesives, it tacks very quickly — from 30 seconds to 75 seconds. Over the next 24 hours, it uses moisture in the air and wood to convert to a permanent, waterproof, gap filling, heat- and chemical-resistant bond. It does not foam or expand, so you don't need clamps.

Characteristics: This high-tech hybrid handles exactly like the hot melt adhesives so popular with the arts and crafts folks, but then cures to very durable bond. Full

cure takes 24 hours, but you can handle or machine parts in an hour or two. There's no clamping and no spreading glue; just squeeze out a bead of adhesive to one side of a clean surface and press the parts together immediately. There is no need to wet the joint, and it will not foam or push the parts apart. Within the first few minutes as it cools, any squeeze-out will clean off raw or finished wood like wax, but after it cures it is permanent.

HiPURformer will bond most materials and will adhere green or wet wood as well as dry wood. The cured bond is immune to solvents and is heat-resistant, but it will come apart at very high temperatures. It does leave a visible glue line and has some thickness, so it may not be the ticket for fine joinery applications. It works best on raw wood, but will stick to lacquer, though not to oil finishes.

Generally, it is used for:

- Frame work and quick assemblies — fast, no clamp
 - Hard to clamp glue-ups
 - Applied carvings or moldings
 - Mount wood for turning
 - Patio furniture, decks, or fences
 - Furniture repairs
 - Tool handle repairs.
- On the other hand, avoid:
- Using below the water line
 - Creating seams that will show (the glue line is visible).

Warnings

The barrel of the applicator gets up to 280°F, so wear heat resistant gloves. Try not to get it on your skin, as it does not come off easily. There are no vapors or solvents, so it is otherwise quite benign.

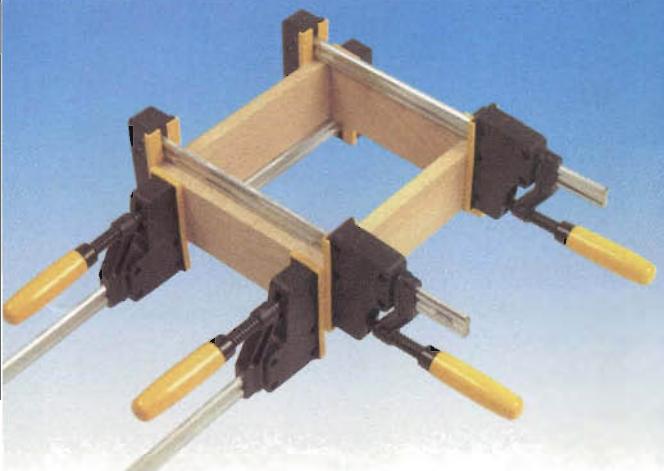
Storage and shelf life: You need no special storage conditions, as neither cold nor heat will affect it. HiPURformer will last at least a year unopened, but open capped cartridges will only last a month.

Michael Dresdner is a nationally known finishing expert. His book, Painting and Finishing, is available from Taunton Press.

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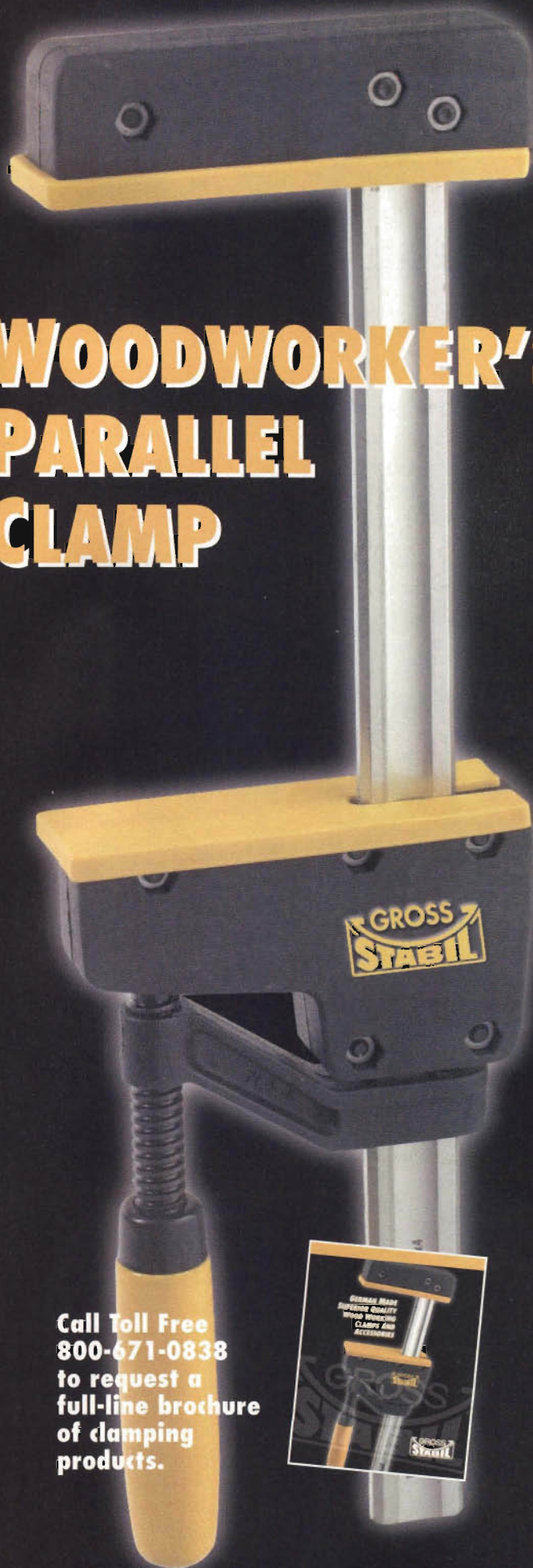
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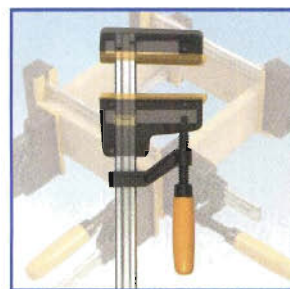
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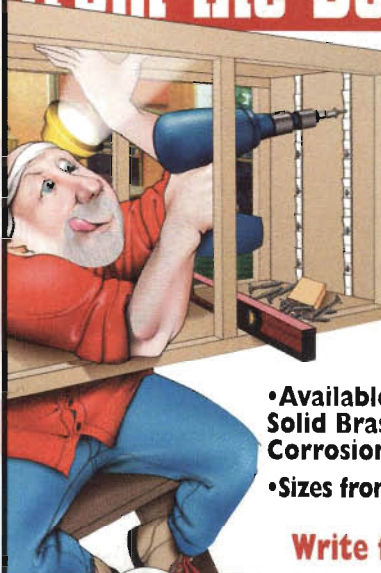


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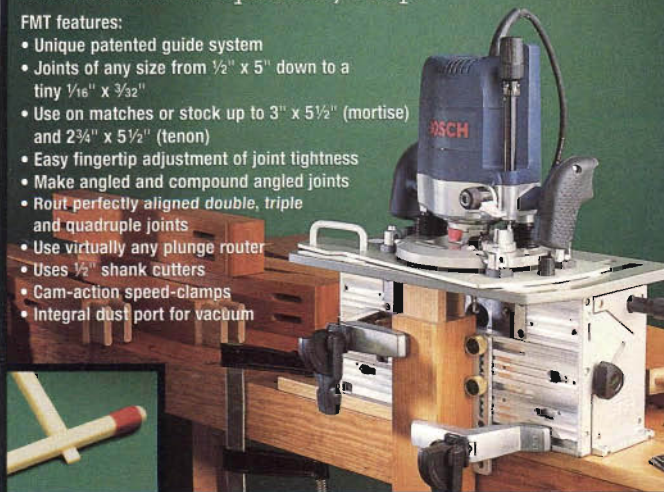
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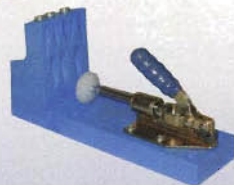
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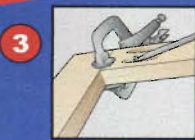
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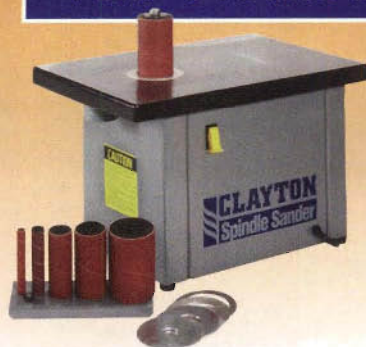


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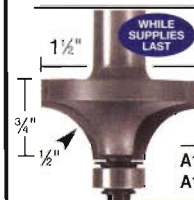
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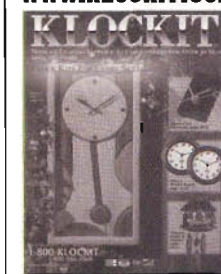
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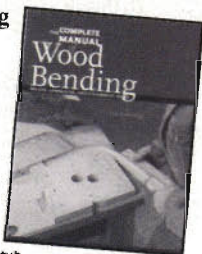
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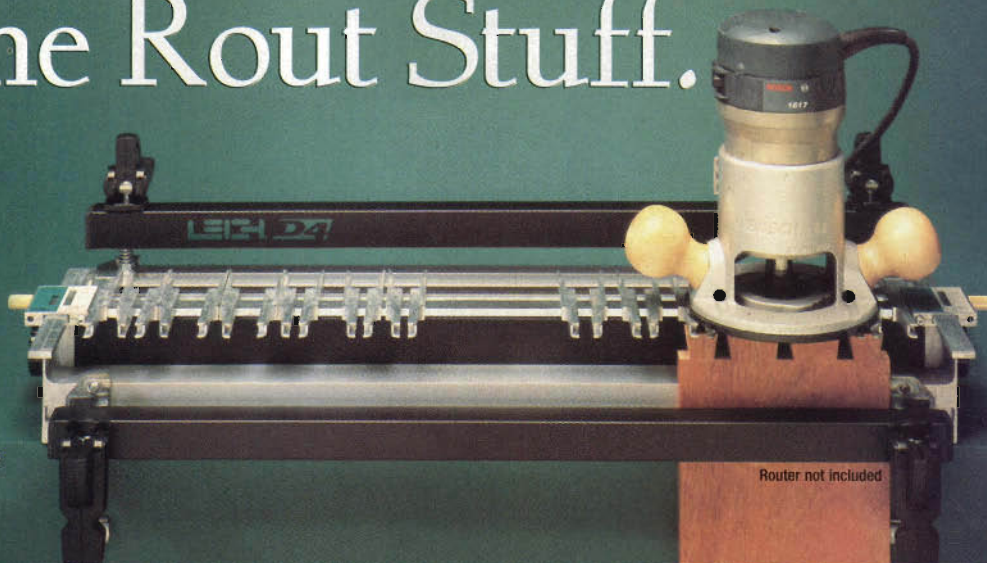
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Four Methods of Casework Joinery

By Lonnie Bird

Once you eliminate the frills from a complicated casework project, building it becomes a simple matter of constructing a series of boxes.

Have you ever wanted to build a chest of drawers or dressing table but just weren't sure how to begin? Perhaps you saw a photo of a china cabinet in a magazine and you wanted to reproduce it, but felt it was beyond your reach. Although large-scale casework projects can seem somewhat intimidating, building them is really nothing more than constructing boxes. Once you gain an understanding of the methods involved, construction becomes much easier.

Drawers, which are also boxes, are fit within the casework and slide on wooden rails or runners. Doors are often added as well to keep the contents of the chest hidden from view, although sometimes doors have glass panes, or "lights" specifically for displaying the contents of the case.

The challenge when constructing any casework is to keep it square. As I'm sure you can imagine, it's much easier to fit doors, drawers, and molding to a box with 90° corners than to a trapezoid or a parallelogram. But that becomes easy, too, once you realize that parallel sides of the box must be exactly the same length.

Over the centuries, cabinetmakers have developed a number of ways to construct casework, and each method has its own advantages. By understanding the various methods of construction, you can design your own casework to suit your needs. Once you've constructed the case or box, you can add feet, moldings, doors, and other details to give your design distinction.

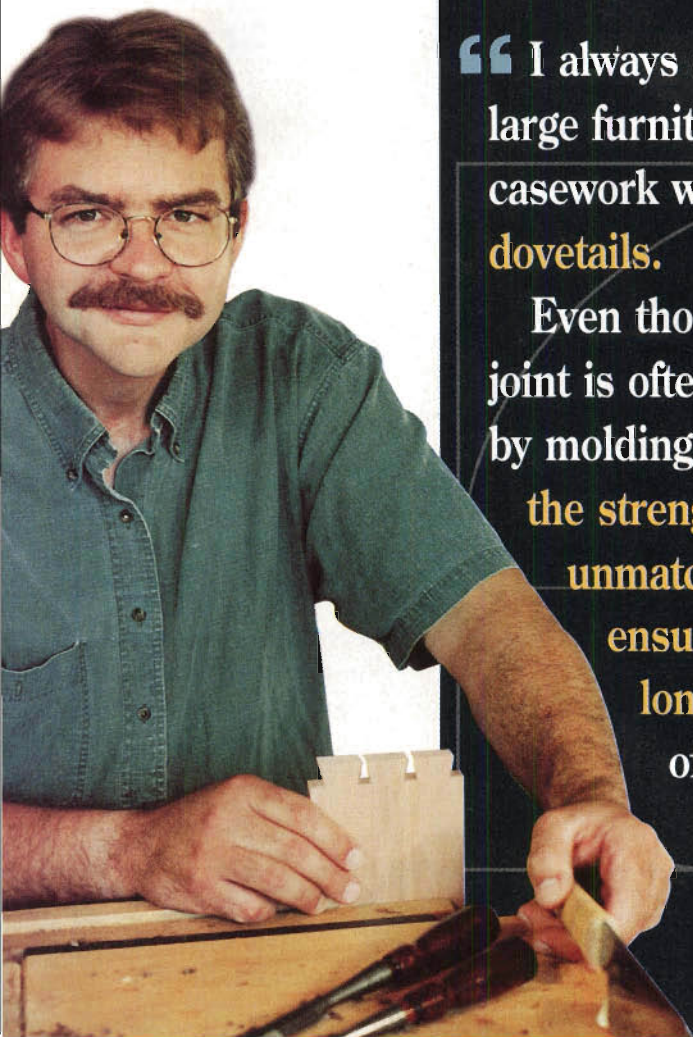
For the purpose of discussion, I've divided casework into four separate categories: frame-and-panel, post-and-rail, box construction and face frame. Although these categories work well for getting a grasp on case construction, cabinetmaking is too diverse to always fit neatly into categories. Sometimes you'll find it necessary to combine construction techniques from two or more types.

Frame-and-panel

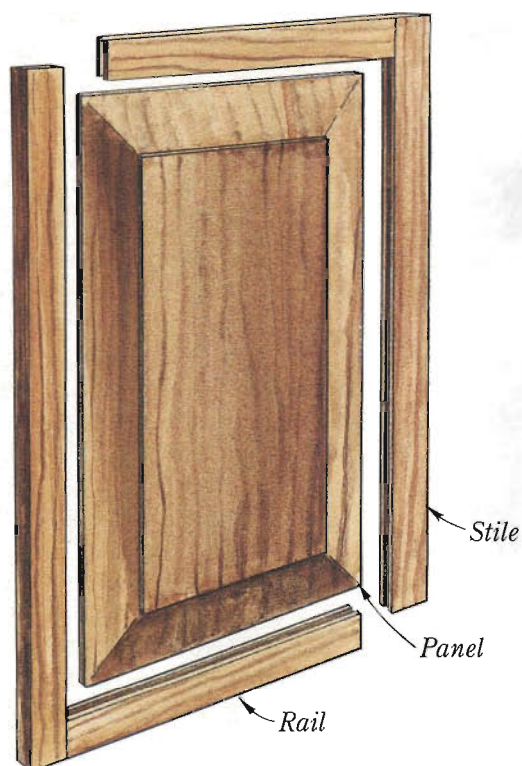
Frame-and-panel casework is simply a series of wood panels surrounded by a stile and rail framework. The paneled framework is joined at the corners to create a box. Probably the most familiar example of this timeless design is the rolltop desk. Mass-produced in large numbers around 100 years ago, the rolltop desk was once a common sight in America's offices. These massive oak desks featured a large, spacious writing surface supported by a pair of chest of drawers. The space between the chests provided a knee-hole. A frame-and-panel assembly covered the knee hole at the back of the desk to provide a finished appearance.

“ I always construct large furniture casework with dovetails.

Even though the joint is often hidden by molding, the strength is unmatched and ensures the longevity of the piece. ”



Frame-and-panel



Stiles and rails joined at their corners form a frame, which is filled with a flat or raised panel.

Positioned on top of the writing surface was another paneled framework, which housed a series of small drawers, pigeonholes, and other storage areas. The inside edges of the framework were grooved to provide a track for the canvas-backed tambour, which rolled down to secure and hide the contents. Although the rolltop desk is an elaborate example of casework, not all frame-and-panel casework is that complex. In fact, it can be as simple as a storage chest with a hinged lid.

Construction: Successful frame-and-panel casework begins with well proportioned panels. Rectangular panels look best; panels that are square (or close to square) tend to look boxy and somewhat clumsy. To proportion panels for a pleasing effect, I use simple mathematical systems. Ratios of whole numbers derived from the Fibonacci series have universal appeal. The series of numbers begins by adding 1 plus 1; then the sum is then added to the previous number to derive the next number in the series.

The proportion reflected in this sequence is akin to the Golden Rectangle. First discovered by the Ancient Greeks, the Golden Rectangle

Frame-and-panel doors, even complicated ones with tombstone panels (as shown at right), are still just wood panels surrounded by stiles and rails.



has been used to develop proportions for everything from architecture to credit cards. The ratio, 1 to 1.618, is also a foolproof method for sizing panels in frame-and-panel casework.

The framework surrounding the panels is typically assembled with mortise and tenon joints. The inside edges of the frame members can be left square or “stuck” with a simple molding profile which is mitered or coped at the corners. The panels can be raised or beveled along the edges or simply left flat.

Once assembled, four sub-assemblies of framework are joined at the corners to create a box. Although a simple butt joint has sufficient strength, adding a tongue and groove joint at the corners helps with alignment during assembly and glue-up. The assembled box is usually supported by bracket feet or some other type of short base to lift the box off of the floor. After assembly of the casework, doors, drawers, and lids are added.

Post-and-rail

Another time-tested method of case construction is known as post-and-rail — sometimes referred to as leg-and-rail. Post-and-rail construction is a good choice when the case is positioned high off of the floor.



Dressing tables, tall chests and sideboards are just a few examples of furniture that use this type of construction. The posts are used as legs to elevate the case and are usually embellished to eliminate the plain, square look; a tapered leg is a simple, yet elegant option. Other versions include turning or compound curves such as cabriole legs.

Construction: Typically with post-and-rail, a set of matching posts are joined with wide boards to create a box. This construction method is very similar to the methods used to join tables and beds. The posts are mortised to accept tenons, which are cut on the ends of the case sides. Often, four posts are used, but if the case is very wide, as with a sideboard, additional pairs of legs may be added for more support. At the case front, a framework of rectangular openings is created to allow the fitting and installation of doors and drawers. The top rail of the framework is usually turned on edge to create a broad surface for dovetail joinery. A single, wide dovetail is sawn on the end of the top rail. This fits into a corresponding dovetailed socket on the top of the leg post. Lower rails are joined to the legs with double tenons. Doubling the tenons creates twice the surface area for glue and significantly adds to the strength and rigidity of the case. Vertical frame members, stiles, are either dovetailed or tenoned into the horizontal rails. The

back of a typical case is also a thick, wide board, or several boards glued together with several tenons cut on the ends that fit within mortises in the legs. Dividing the wide joint into a series of smaller ones strengthens the leg mortises and helps avoid splitting of the case sides during seasonal changes in humidity.

The Box Method

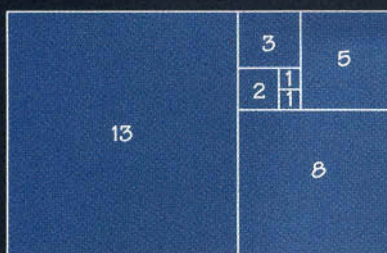
The box method is the technique that you probably used the first time you built a small cabinet, tool chest

Post-and-rail is the best case construction method when your case is going to be elevated off the floor. The posts serve as legs and are typically tapered, turned or carved, as in the example at left, to embellish the overall appearance.

Right Sized Rectangles

The **Fibonacci Series** is figured by adding the successive number to the number which precedes it.

The rate of successive terms goes 1, 1, 2, 3, 5, 8, 13, 21 and so on.



or jewelry box. As the name implies, four planks are simply joined at the corners to create a box. It's undoubtedly the least complicated method—and one of the most widely used. Because of its flexibility, the box method can be used for a variety of designs and furniture styles. The completed case could rest low to the floor on bracket feet or be positioned at eye level on a post-and-rail base.

Although the basic design of this construction method is quite simple, it functions well within complex furniture designs. The slant front desk, for example, has an upper corner cut at an angle which supports a hinged lid. The lid folds down to form a writing surface and expose an elaborate arrangement of pigeonholes, drawers, doors, and hidden compartments. The entire assembly rests on bracket feet which lift it a few inches off of the floor and raise the writing surface to a comfortable height for working.

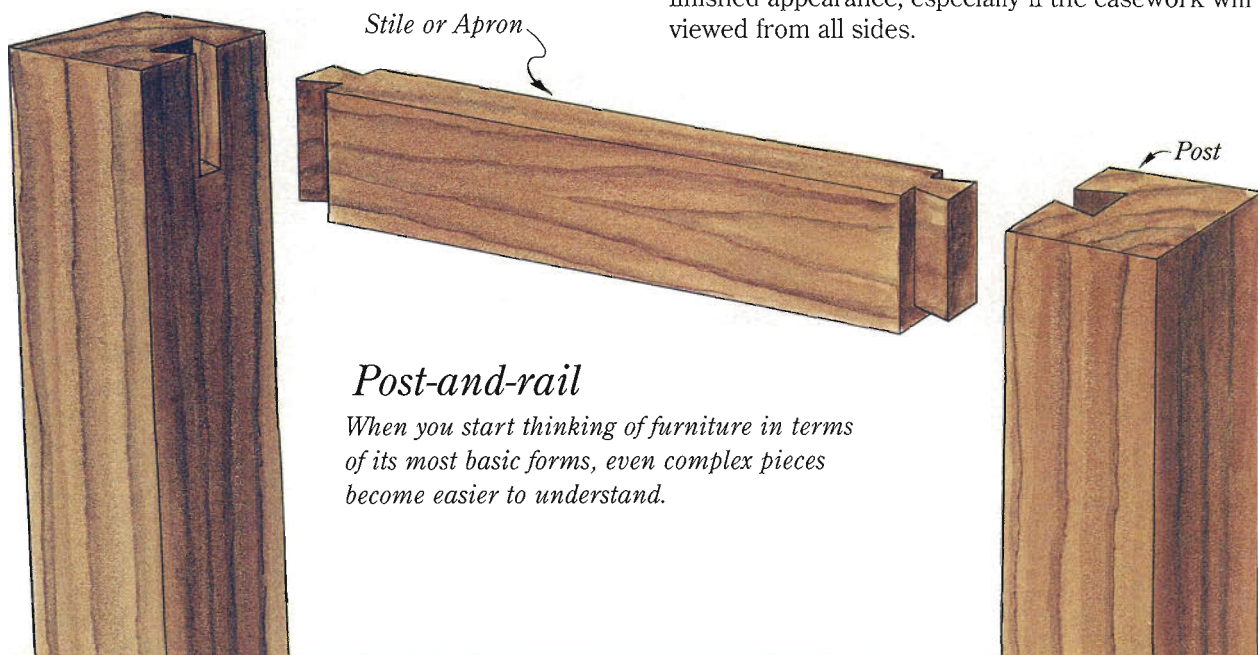
Construction: Construction of the box method can be as simple as butt joints and nails—or as complex as half-blind dovetails. When deciding which joint to use at the corners, I consider the material, the overall size of the box and how it will be used. I'll often fasten the corners of diminutive boxes with glue and nails. Afterward, I'll cover the entire box with a figured

veneer to decorate the box and hide the simple construction.

I always construct large furniture casework with dovetails. Even though the joint is often hidden by molding, the strength is unmatched and ensures the longevity of the piece. Splined miters are also a good choice for small, decorative boxes which won't be subjected to a great deal of stress. An added advantage with miters is they allow the wood grain to flow in a continuous pattern around all four sides of the box.

If the case is to have drawers, the dividers and partitions can easily be joined with a sliding dovetail which fits snugly within a mating socket in the case side. Drawer runners are typically joined with mortises and tenons to the front and back dividers, creating a strong, rigid framework for drawer support.

Backs on these cases are "let in" to a rabbet which is cut along the back, inside edges of the box. The back is usually made up of a series of random width boards which are nailed to the rabbet in the case. The edges of the backboards are also rabbeted to allow each board to overlap the next. A quirk bead may also be shaped along the edges to dress up the backboards and hide the seasonal wood movement that occurs between them. The finest casework of this type sometimes has a frame-and-panel back. Although considerably more work, the rigid framework adds both strength and stiffness to the case and the frame-and-panel design provides a more finished appearance, especially if the casework will be viewed from all sides.



Post-and-rail

When you start thinking of furniture in terms of its most basic forms, even complex pieces become easier to understand.



Adding a face frame to a box stiffens it and creates resistance to racking. It's a good option for casework with doors, as it frames the doors visually and the stiles provide a place to mount the hinges.

Adding a Face Frame

Still another method of casework construction is to attach a face frame to the box in the previous example. Our old friends, stiles and rails, return to create the face frame. The assembled frame is then glued (and occasionally nailed as well) to the front edges of the box.

Adding a face frame to a box gives the box greater stiffness and resistance to racking. It's also a good option for casework with doors. The face frame "frames" the doors visually, and the stiles provide a place to mount hinges. The top rail of the face frame often is sized wider than the stiles and bottom rail to provide an area for application of a crown molding.

A Few Embellishments

Once you've settled on a method of case construction, you can choose to "dress it up" or "dress it down." Plain furniture styles, such as Shaker and Arts & Crafts, use simple lines, such as straight or tapered legs, subtle

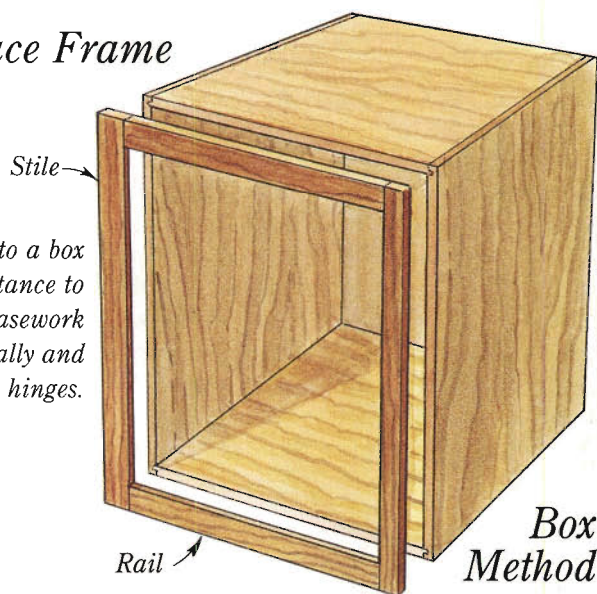
curves and sparse moldings. In contrast, period furniture styles use compound curves, elaborate gooseneck moldings, and perhaps some carving.

Other Casework Variations

Some forms of casework don't seem to fit into any particular category. For example, corner cabinets don't really have sides; they're simply a face frame with canted corners. The back edges of the corner are rabbeted to accept the backboards.

Most examples of tall furniture casework are built in two or more sections. For example, a period tall chest has a post-and-rail lower case which supports a dovetailed box upper case. This design combines the best of both casework methods: the lower case is visually lifted from the floor and supported by cabriole legs and the strong, yet simple, box construction of the upper case is straightforward in construction and is easily fitted with partitions, dividers, and drawers.

Face Frame



Still another unusual example is the tall case clock, sometimes referred to as a grandfather clock. Its tall, elongated case is really three separate boxes stacked upon one another. The base and middle section, or waist, are simple face frame boxes. In contrast the hood, which frames the dial and houses the works, is an elaborate mix of construction methods.

Lonnie Bird builds beautiful period furniture and teaches seminars in Dandridge, Tennessee. You can contact him at lonniebird@earthlink.net.

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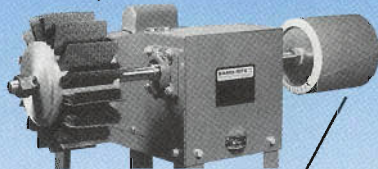
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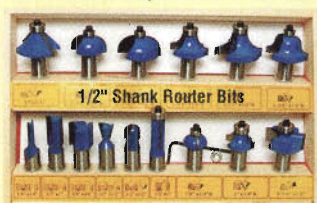
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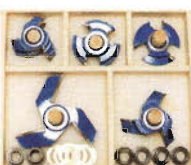
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The Bat House Bungalow

By Chris Marshall

You can kiss your insect repellent goodbye when bats move into this cozy dwelling.



**A single
brown bat
can eat
as many as
1,200
bugs every
night.**



Attracting bats seems a little counterintuitive, doesn't it? But no other winged creatures can beat a colony of bats for ridding your yard of mosquitoes and other insect pests. In fact, a single brown bat can eat as many as 1,200 bugs every night. (Talk about a midsummer night's dream!) Building a suitable home for bats also keeps these helpful critters out of your attic and chimney — not to mention your living spaces — by improving their habitat.

This three-chambered house (which can house up to 300 bats!) is modeled after a design developed and tested by the Organization for Bat Conservation (OBC). It's a simple project that can be tackled easily in an afternoon, and you probably have all the wood you need in your scrap bin already. Use cedar for the exterior parts — it naturally resists decay and contains no chemicals that could harm the bats. BC plywood works well for the interior components. You'll also need a length of plastic mesh with an 1/8" grid pattern to line the inside surfaces of the house for landing and roosting. If your local home center doesn't stock this mesh, order it directly from the OBC at their web site at the URL www.batconservation.org, or you can call them at 517-339-5200.

Holy Kick-off, Batman

Start this project by gluing up the cedar panels for the back (piece 1) and top front (piece 2). I tried out Franklin's new high-tech hot melt polyurethane (it's waterproof), but any water-resistant adhesive should do the trick. Cut the bottom front panel (piece 3) and roof (piece 4)

from more cedar. Rip lumber to width for two sides (pieces 5), and before you cut them to length, plow 3/8" dadoes as shown in the *Elevation Drawings* on the following page. These dadoes form tracks for the plywood partitions and ceiling. Put your combination blade back in your table saw and tilt it 30° to bevel the back edge of the roof and the top edge of the top front panel. Next, miter cut the top and bottom ends of the sides at 30° (as shown in the photo at right). These bevels and miters create the roof pitch.

Plow a wide dado across the face of the back panel, as shown in the *Elevation Drawings* on the next page. This groove provides a recess for housing the beveled edge of the roof and helps form a watertight joint. Cut the partitions and ceiling to size (pieces 6, 7 and 8).

With all the parts milled, it's time for assembly. Fasten the sides to the back with glue and 1 5/8" galvanized deck screws. Cut and staple a piece of mesh to the back panel so it fits between the sides and stops at the ceiling dadoes. Use 1/4" or 5/16" staples, and staple liberally.

Cover both faces of the partitions with mesh as well as the inside face

of the ceiling. You just want to make sure the mesh does not interfere with the edges and ends that must fit into the dadoes.

Once the mesh is securely stapled in place, slip the ceiling into its dadoes so the mesh is inside the bat chamber. Spread a thin coating of glue along the partition dadoes, and slide the partitions into place. A couple of brad nails will help secure them, too. Wipe off any excess glue that squeezes out.

The roof and front panels go on next. Cover the back face of the top front panel with mesh, staple it on and attach the panel to the sides with glue and finish nails. Align the beveled edge with the top angled ends of the sides before driving the nails (see the photo sequence on page 45). After stapling the mesh to the bottom front panel, position it on the sides, leaving a 1/4" ventilation gap between it and the top panel. Secure it to the sides with more glue and finish nails.



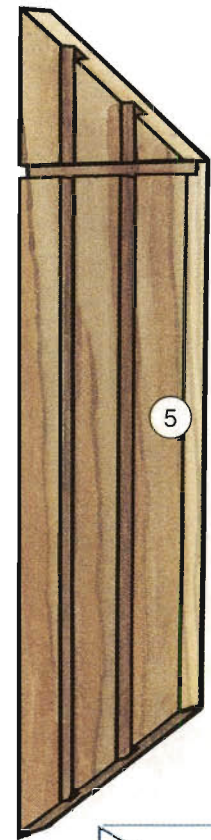
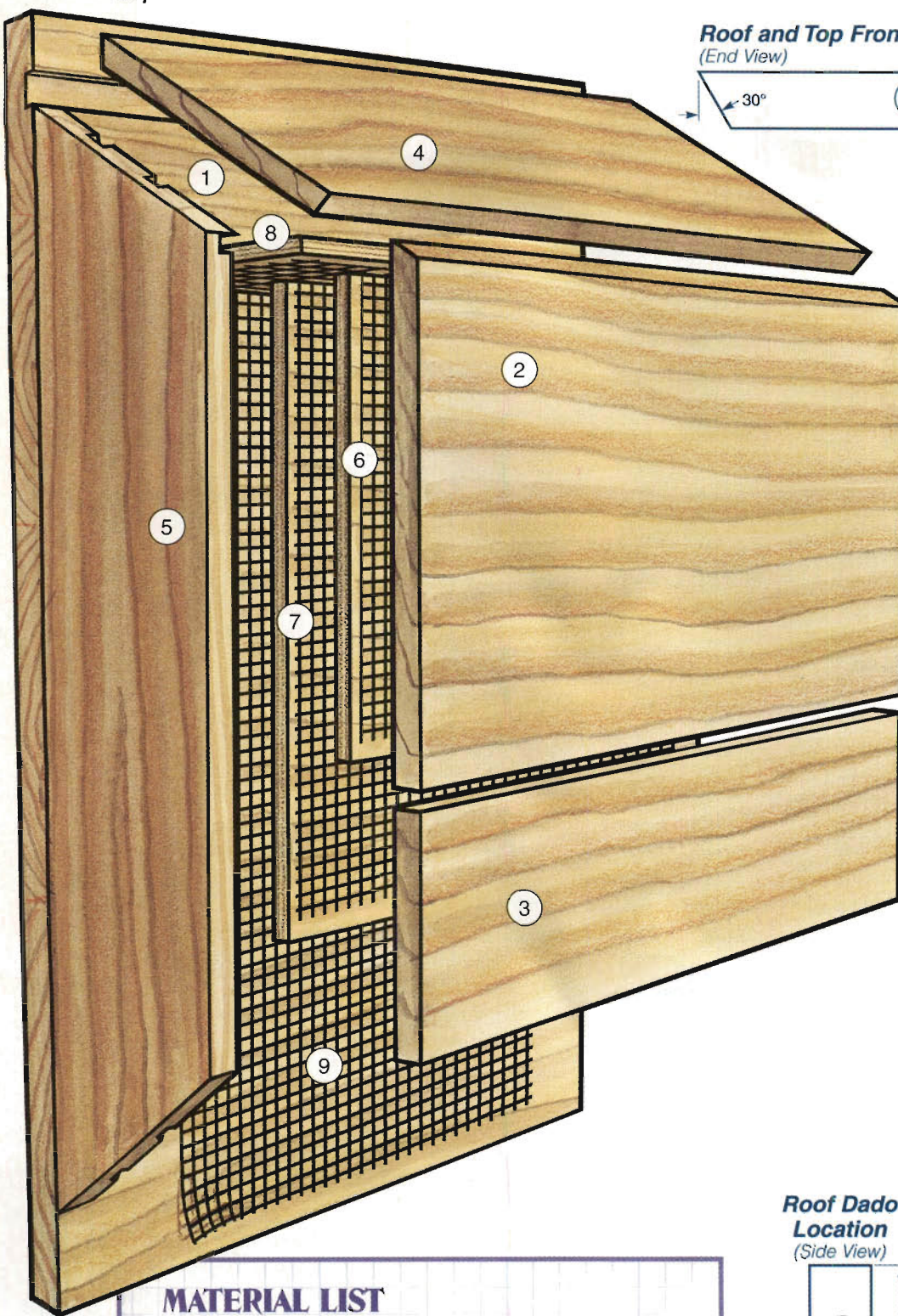
Form the dadoes on the sides before you cut them to final length. Use a power miter box saw to chop their 30° ends, as shown above.

Roof and Top Front Panel
(End View)

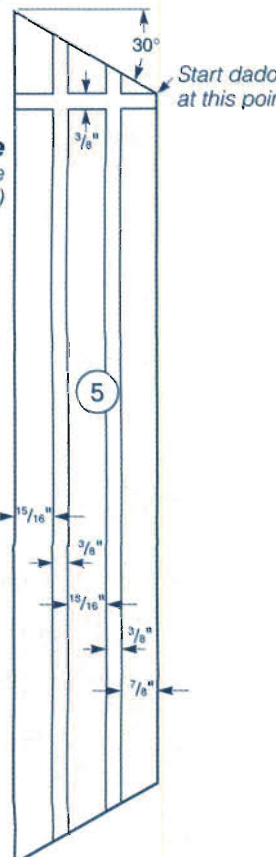
30°

2 4

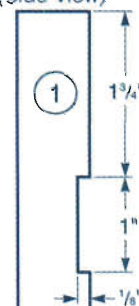
Bevel back edge of roof and top edge of top front panel at 30°.



Side
(Inside View)



Roof Dado Location
(Side View)

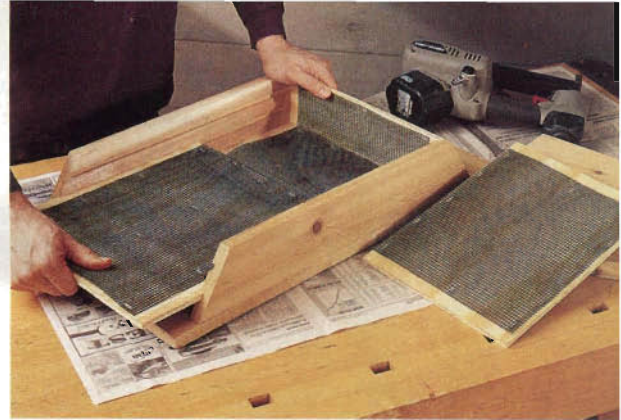


MATERIAL LIST

	T x W x L
1 Back Panel (1)	3/4" x 14" x 25 1/2"
2 Top Front Panel (1)	3/4" x 11" x 14"
3 Bottom Front Panel (1)	3/4" x 5 1/2" x 14"
4 Roof (1)	3/4" x 6 3/4" x 16"
5 Sides (2)	3/4" x 3 1/2" x 21"
6 Short Partition (1)	3/8" x 12 7/8" x 10"
7 Long Partition (1)	3/8" x 12 7/8" x 14"
8 Ceiling (1)	3/8" x 3 1/2" x 12 7/8"
9 Plastic Mesh	11" x 82 1/2"



The author used Franklin's new waterproof hot melt polyurethane for his bat house, but any water-resistant glue should work fine.



The mesh covered partitions create an ideal bat roosting habitat. Glue and nail the partitions in place.

To install the roof, first apply a bead of silicone caulk along the shallow roof dado on the back panel, and spread glue onto the rest of the contact surfaces. Adjust for an even overhang all around and nail the roof to the sides.

The assembly process is complete, but the bat house exterior should now be finished with stain or waterbased primer and paint. The goal of the finish is to absorb as much sunlight as possible to warm the house. Choose a black finish if the average temperature in your area is less than 85°F in July, a medium color like brown or gray for temperatures closer to 100°, and white paint or stain for houses in southern regions where temperatures exceed 100° regularly.



Finish nails secure the front of the bat house. All the internal surfaces have mesh stapled firmly in place.

Chris Marshall is a writer and woodworker based in Ohio. His last project was the Router Table Fence (May/June, 2002).

Locating a bat house

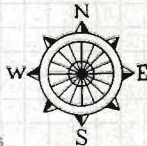
Good bat house design is only part of the formula for attracting bats. Location, location, location is crucial, too. The Organization for Bat Conservation

recommends attaching the house to a building or mounting it on a pole. Trees will work, but a leaf canopy may make the house harder for bats to find. Choose an open location free of obstructions like branches or power lines.

Erect the house so it's at least 12 to 15 feet off the ground and, when possible, face it so it receives at least six hours of direct sunlight.

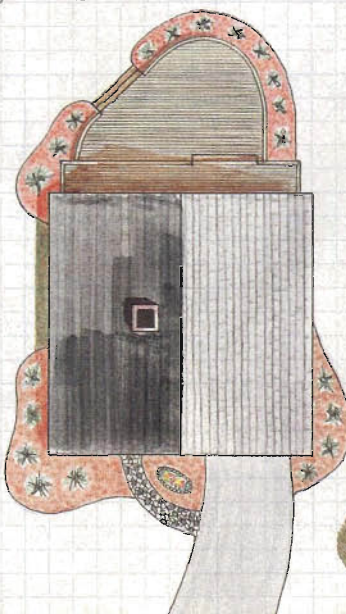
Typically, southern or southeastern exposures are best. Bat houses hung in the early spring have the best chances of being occupied in the first season. If your house remains vacant the first year, experts say to wait at least two more years before relocating it.

Water is a key ingredient for a successful bat colony.



A pole or post is a safer location than a tree.

- Mount your house 12 to 15 feet off the ground.
- For warmth, try to offer a southern exposure.
- Pick a spot with an obstacle-free approach zone.
- Set up your bat house in early spring.



Woodworking's Crumbling Gender Barrier

Women are woodworking's fastest growing new demographic — and tool manufacturers and retailers are finally starting to notice.

By Joanna Werch Takes

It's clear to Roseanne Somerson, head of the furniture design department at the Rhode Island School of Design (RISDI), that women woodworkers have arrived. "Only a real idiot would even question a woman's role [in woodworking] at this time," she said.

female woodworkers, compared to three million in 1995 — more than a 30% increase in just three years.

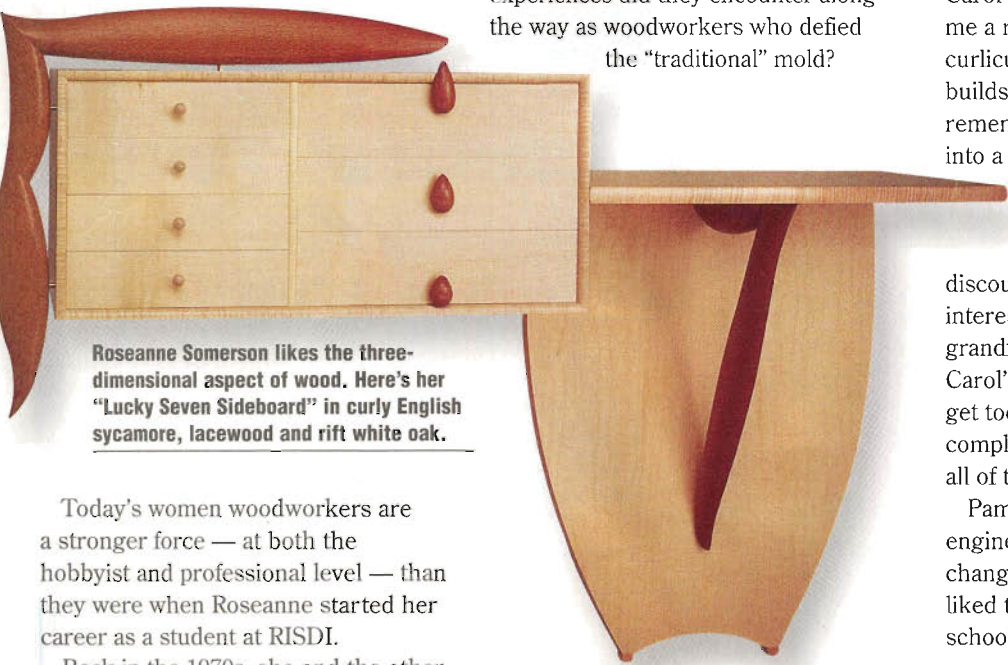
The statistics do leave a few questions unanswered. For instance, how do women woodworkers feel about their newfound status? How did they get started in woodworking, and what experiences did they encounter along the way as woodworkers who defied the "traditional" mold?

In the Beginnings

Some of these woodworkers, including nationally known woodworking instructor Carol Reed, did have what many would consider a traditional start, involving a grandfather who puttered in a shop and passed on his love for woodworking. At age seven, Carol said, "My grandfather handed me a rusty old plane to make pine curlicues." Becky Gessner, who now builds cradles for her grandchildren, remembers pounding her father's nails into a 2 x 4 "until it shone" at age five.

Many women, however, are just as likely to recall indifference to — or even active discouragement from — a childhood interest in woodworking. Despite her grandfather's encouragement, it was Carol's brothers, not her, who would get tools for birthdays — and then complain that she was the one using all of them.

Pam Niedermayer, a software engineer who has considered a career change to woodworking, would have liked to take shop classes in high school, but women weren't allowed.



Roseanne Somerson likes the three-dimensional aspect of wood. Here's her "Lucky Seven Sideboard" in curly English sycamore, lacewood and rift white oak.

Today's women woodworkers are a stronger force — at both the hobbyist and professional level — than they were when Roseanne started her career as a student at RISDI.

Back in the 1970s, she and the other female woodworking students were considered an oddity. Today, Roseanne reports, at least half of the undergraduates in the furniture program she oversees — and almost that many at the graduate level — are female. Other woodworking schools, and a variety of retailers, are also offering women-only classes as hobbyist interest rises. A 1998 "Woodworking in America" survey (commissioned by Rodale Press) tracked the growth: about four million



Despite pieces like her "Personal Writing Desk," some people are still surprised that Roseanne can make furniture.



"The women I know," Roseanne says, "are working with the same equipment and on the same scale as men." Here's her 80" "High-heeled Trestle Table."



Roseanne's two piece "Love Letter Stash"
is made from wenge and white oak.

"A girl in the class ahead of me had pursued it, but she was turned down flat," Pam said. Even as an adult, there was a time when Pam "didn't consider woodworking a viable option for a woman. 'The woodworkers who were famous,' she noted, 'were all men.'"

"Home Improvement"

Perhaps as a result of such childhood experiences, many of today's women woodworkers came into the field as adults. Some choose it as a second career. Many studio furniture makers — including Roseanne Somerson and Wendy Maruyama (head of the furniture design and woodworking program at San Diego State University) learned woodworking as undergraduate art students. And, as with men, many women find that home improvement is an important motivator.

That's borne out in the recent "America's To-Do List" study commissioned by Ace Hardware. Out of 1,000 American homeowners surveyed, 62 percent said the woman of the house is at least partially responsible for physically tackling home repairs and improvement projects.

When she was first married, Becky said, she and her husband agreed they needed storage shelves. "He was talking about hiring somebody, and I told [him] 'I know how to do that.' It took a long time before he gave in and said let's go get some 2 x 4s."

For Barbara Gill, getting into woodworking was a natural outgrowth of building a house and running a sawmill, while Pam got started by building a darkroom for her photography hobby. Both Pam and Barbara have since taken classes on subjects ranging from cabinetmaking to turning to using hand tools.

Cure for the Empty Nest

Of course, men do home improvement, too — and frequently become active woodworkers in retirement. For women, though, it's often not just a career that's taking up the time they could use for woodworking: as Arlie Hochschild notes in *The Second Shift*, most of them are still taking on the majority of housework and child care tasks. Perhaps that's why a number of women said they didn't become woodworkers until their children were adults.



Carol Johnston, below, creates furniture in her Indiana shop like the sideboard shown above. The appeal of making both a dining room and a bedroom suite, Carol said, was "that I can design a piece to be exactly what I want." She also cross-stitched the bird pictures above the sideboard. "That's my evening hobby," she said.



Sixty-two percent of American homeowners say the woman of the house is responsible for physically tackling home repair and improvement.

— Ace Hardware Corporation Survey



Bonnie Bishoff builds and designs furniture (like the "Trout Sextet," above) with husband J.M. Syron. They met when both were working as carpenters and now frequently hire female apprentices for their shop.

Carol Johnston, for instance, who has taken up woodworking as a hobby after years of working as a nurse, said, "I think the time of my life when I started woodworking made all the difference in pursuing it. My kids were leaving home, and we could live on my husband's income. Woodworking helped fill the void: a perfect answer to the 'empty nest syndrome.'"

Other woodworkers agree with her sentiments. Barbara started her sawmill to work around her children's schedules, but waited until they were grown to get into woodworking. Becky builds cradles for her grandchildren and vanities for her daughters-in-law — but didn't have time when her own kids were young.

Even at RISDI, Roseanne says, it's unusual for the furniture program's graduate students to be on the lower end of the age spectrum: most are closer to 50 and above.

Class Act

No matter what age they are, though, women woodworkers seem to be drawn to classes — but they have differing opinions about the current trend for women-only woodworking courses.

Carol Reed first started taking woodworking classes at Palomar Community College in San Marcos, California in the mid-1980s. For the most part, she was the only female in the classroom.

She later began teaching at her alma mater, and has watched female enrollment in woodworking courses climb to between 20 and 30 percent. She would never teach a women-only class, though, because "I don't want woodworking to be gender specific," she said.

In her four years of woodworking study at an Indiana community college, Carol Johnston said, the number of women enrolled got larger every year. She has no interest in taking a women-only class. "I learned things from the men in my classes," she said, "and I think that they, too, learned from the women."

So what's the appeal of women-only woodworking classes? The answer, Roseanne said, may be that they allow some women a sense of freedom. Most of her students, though, "have been through the issues of gender at a younger stage of their lives, and now they're just here to make furniture," she said. Wendy thinks having a female teacher — not just classmates — may have been an inspiration for her.

What classes with both genders offer, though, is a chance to observe different approaches to woodworking. "My instructor once commented that he thinks that women make better woodworkers because they are more patient," Carol Johnston said.

In her classes, Carol Reed said, "The guys are more mechanically minded; the ladies are more interested in design." Whether their drill is 14.4 volts or 18 volts, Carol went on, "men think they just want something bigger and more powerful because ... that's the way guys are."



Bonnie thinks nontraditional upbringings may have influenced the Bishoff/Syron partnership and pieces like the blanket chest, top, and java credenza, above. She "always defined myself as the opposite of what a lot of other young girls were doing." J.M., on the other hand, grew up in a family with weavers and seamstresses.

At this point in her woodworking, Bonnie says, "I do a lot of carving." At right: "Sea Otters Chair" by Bonnie Bishoff and J.M. Syron.



to push two buttons at the same time, Delta and P-C have gone to removable packs, Todd said. "We have a team of industrial designers, two of whom are female," he noted. "That's no accident. We've done a great deal of 'degenderment' to make our tools appealing to women."

Jane Van Bergen, creative services manager of Ryobi Tools, notes that her company has incorporated feedback from focus groups, including women, into tool designs. Again, this has translated into tools better balanced for smaller hands, as well as lighter weights. Ryobi's BTS10 table saw, for instance, weighs only 40 pounds.

Despite such efforts at the manufacturing level, though, when it comes to buying tools, women still get frequent verbal reminders that they are not the traditional market. Her regular suppliers excepted, Roseanne said, "Tool stores are still some of the worst places. It's, 'Lady, what are you trying to do?'" It's ironic, because she says both men and women are actually coming into her furniture program today "at an equal loss. It used to be that, in schools, men had shop and women had home economics. Now

Tools: Grips, Gripes ...

Her comment leads to what, for many, is the crux of woodworking: the tools. What is women's take on them?

First of all, some contend that many tools are too big — either in weight or in actual size. After being provided with a larger drill in a class, Carol Reed said, she went out and bought a 9.6-volt Black & Decker. "I love it. I don't think it weighs two pounds."

"One of my biggest gripes," said Bonnie Bishoff, "is the grip on a lot of tools." Bonnie is a furniture maker who got into woodworking through building theater sets and now works together with her husband, using a lot of grinders and sanders. Some, she said, have such a broad grip that it doesn't seem possible anyone was thinking about small to medium size hands.

Such comments are not falling on deaf ears. Porter-Cable/Delta spokesman Todd Langston says they are one reason tool companies are constantly assessing their products, including the sustaining line that has been around forever. They've changed tool handles to make them easier to grab, and they've altered the style of battery packs. Instead of the old pack that required getting a hand around it



Carol Reed (aka "The Router Lady™") specializes in ecclesiastical furniture, like this baptismal font, when she's not traveling the country as a woodworking instructor.

nobody has anything. The average person has very little experience with either hand tools or machinery."

Bonnie said that when she goes to buy tools or supplies, "I'm usually approached somewhat skeptically, like 'What did he tell you you're supposed to get?' That's a fairly common thing."

Carol Johnston added that she's been on the receiving end of sexist remarks at woodworking stores. She went on to say, however, "as the number of women woodworkers grow, these attitudes will hopefully fall by the wayside" — and, in some areas, they apparently have. Becky says she's asked several retailers if women come in and buy tools. "The response every place is that they get more and more women every year, and they're buying good tools, so they know they're going to be doing serious stuff."

... And Growth

That's a theory that is again borne out by the experiences of the tool manufacturers. DeWalt's woodworking tools brand manager, Mike Gorman,

**"It used to be that,
in schools, men
had shop and
women had
home economics.
Now nobody has
anything."**

— Roseanne Somerson

says he and his staff give up to three dozen presentations a year and, in many of those cases, he would estimate the audience at 40 percent female. At JET Tools, marketing services manager Debi Schmid says the warranty cards indicate that numerous women are buying the company's mini-lathe. And at Ryobi, Jane says that women now make up about 50 percent of the responders on their warranty cards, up from about 10 percent a few years ago. Ryobi has an exclusive sales agreement with Home Depot, where 60 percent of the shoppers are women, according to a recent study. HD's women's nights out, the increase in women among woodworking guilds and single-parent and two-career households, where women take on or share responsibility for home renovations, may be behind the increasing number of women tool purchasers, Jane says. In any case, Ryobi is responding to this increase not only in their tool design, but in their packaging: a woman will be pictured on the box for a miter saw to be released this year. Last year, women were on the boxes for Ryobi drills and belt sanders.

At DeWalt, Mike Gorman thinks women's involvement with tools and with woodworking may be "because woodworking is a hobby and an active lifestyle." He sees women involved in woodworking at all levels — from the professional trades, to furniture making, to crafts — and has for the 10 years he's worked for DeWalt. "We never saw it as extraordinary," he said.

Women's Designs

After women woodworkers buy their tools, are the projects they build any different from men's? Again, that's open for debate.

Women, Wendy said, have traditionally had closer ties to a home's interior: "Why men have always been the ones who made furniture is beyond me," she adds. Carol Reed contends women are better with their hands, and "pay more attention to little details."

On the other hand, both Barbara and Becky say it's their husbands who take on some of the roles stereotypically

associated with a male woodworker's wife. Barbara's husband is the creative one who comes up with the designs; she builds them. Becky's husband "doesn't know how to use the tools at all, but he's good at painting and staining."

Bonnie, who works in collaboration with her husband on both designing and building furniture, says that people who see their work at shows are always trying to figure out who does what.

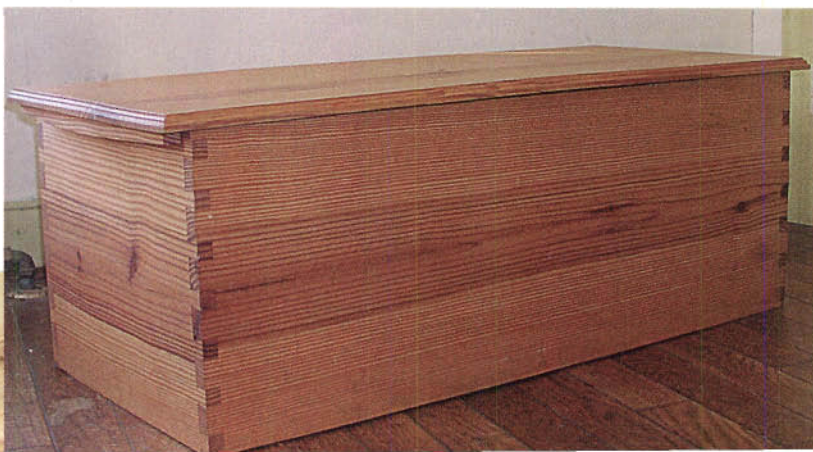
Personally, she thinks the pieces reflect both of them. "People consistently look at our work, and they tell us it's both male and female: kind of sexy, kind of curvy. In some way, it's because both of us work on it."

In essence, Roseanne said, women woodworkers are doing things that are just as technically difficult as the projects that men build. She cited a Furniture Society conference where Wendy had displayed several slides of furniture, and had the audience guess whether each piece was made by a man or a woman. People were wrong as often as they were right.

"I would love," Roseanne said, "to see all furniture just valued as furniture, and not dealing with whether a woman made it or a man made it."

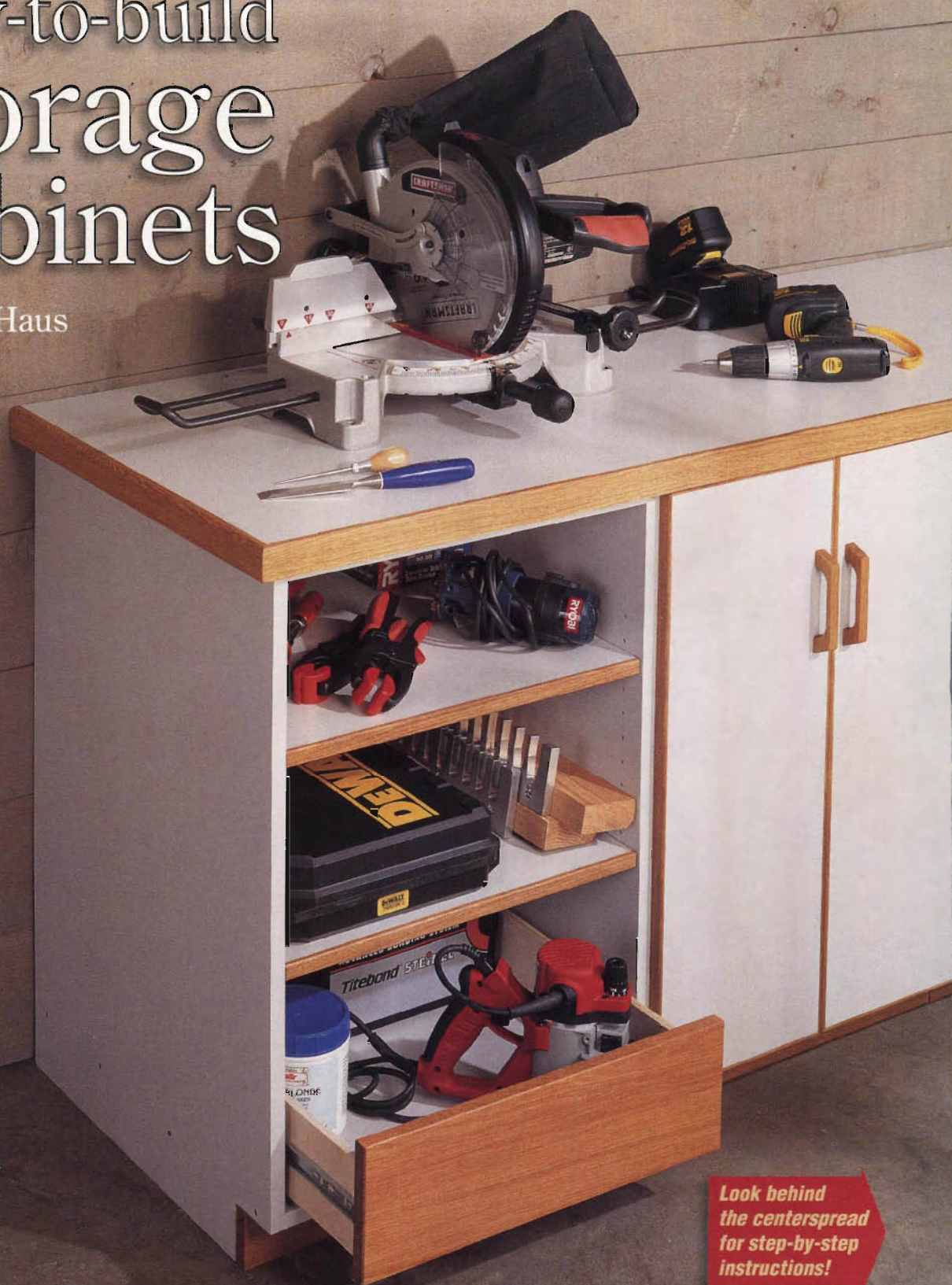


Barbara Gill prefers the Virginia woods she saws at her mill for her work, which includes a walnut Shaker clock, above, and a Southern yellow pine blanket/toy chest, right. For the past two years, she has concentrated on turning. "Turning, in my opinion, is the ultimate use of beautiful wood," she says. "It is almost instant gratification." Barbara, along with several other women in this story, often discusses her hobby on www.womeninwoodworking.com.



Easy-to-build Storage Cabinets

By Linda Haus



Look behind
the centerspread
for step-by-step
instructions!

Solve your garage, laundry room or workshop storage problems with these easy-to-build modular melamine cabinets that can be customized to handle whatever you happen to hoard!

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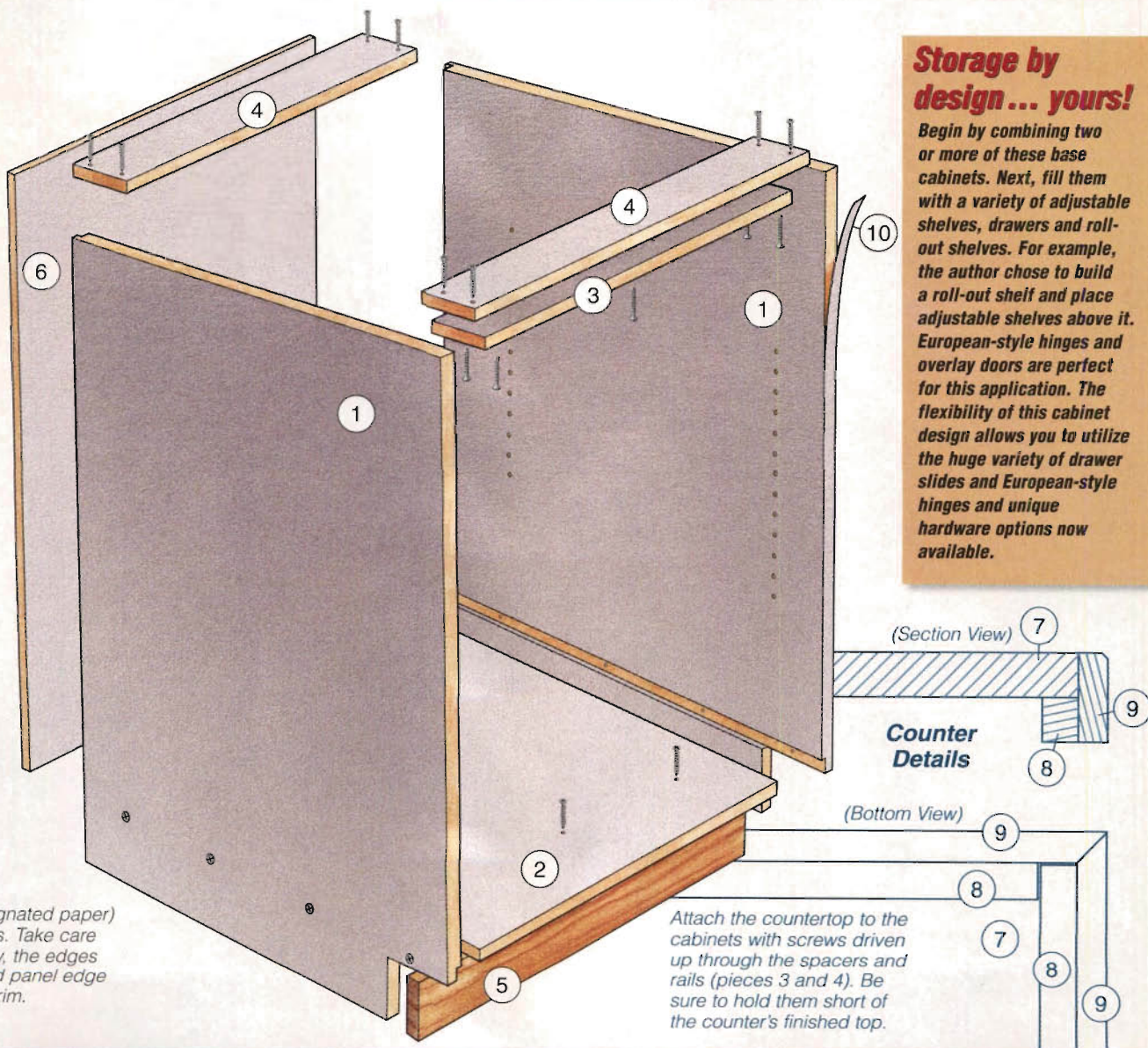
MATERIAL LIST (For one 22½" wide cabinet)

	T x W x L
1 Sides (2)	¾" x 23¼" x 34½"
2 Bottom (1)	¾" x 23" x 21½"
3 Spacer (1)	¾" x 3" x 21"
4 Rails (2)	¾" x 3" x 22½"
5 Toe Kick (1)	¾" x 3" x 22½"
6 Cabinet Back (1)	1/4" x 22" x 32¼"
7 Countertop (1)	¾" x 24" x *
8 Countertop Build-up (1)	¾" x 5/8" x *
9 Hardwood Edging (1)	1/2" x 1½" x *
10 Melamine Hot-melt Tape (1)	1/32", Trim to fit

* Length is determined by number of storage cabinets desired.

Storage by design... yours!

Begin by combining two or more of these base cabinets. Next, fill them with a variety of adjustable shelves, drawers and roll-out shelves. For example, the author chose to build a roll-out shelf and place adjustable shelves above it. European-style hinges and overlay doors are perfect for this application. The flexibility of this cabinet design allows you to utilize the huge variety of drawer slides and European-style hinges and unique hardware options now available.



lastic impregnated paper)
arp edges. Take care
Curiously, the edges
y exposed panel edge
ardwood trim.

Storage Cabinets

By Linda Haus

My woodworking mentor, Rick White, preaches the old maxim "A place for everything and everything in its place." And while I agree with him in principle, in practice I've always had a bit of a problem with this old saw. Like most folks, whether it was the garage, family room, basement or even the woodshop, I just never seem to have enough space for storage.

A few weeks ago, I decided to do something about the dearth of storage space in my life. I got together with designer Jeff Jacobson from the *Woodworker's Journal* (that's him at right) and we came up with a dead-easy cabinet design that's remarkably flexible.

I started with a modular system for building basic melamine cabinets that can be adapted to suit just about any storage need. The melamine panels come finished on both sides with a plastic laminate, so they're stable, sturdy and easy to clean. Depending on what the cabinets are to be used for, you can build drawers or shelves to fit, and cover the opening with doors as required. Use a bit of imagination and you'll have storage even Rick will envy.

Building the Basic Box

The basic unit in this modular system is a small cabinet that can be outfitted as needed. For me, the key was to keep it simple and keep it versatile.

Handling large sheet goods on a table saw is a lot safer if you enlist a helper. Otherwise, cut the parts a little oversize with a circular saw and use the table saw's built-in accuracy to clean up the cuts.

Why Melamine?

Melamine is a slightly less durable version of the standard plastic used in countertop laminates. It is made by impregnating paper with resins, hence there is a wide variety of colors and patterns available. The paper is thermally fused to a core (called a substrate), such as industrial grade particleboard or medium density fiberboard (MDF).

What makes melamine board such a great choice for utility cabinets is that the panels come with plastic finished faces on both sides. Aside from the obvious aesthetic benefits, this also makes for a very stable product. Melamine panels come in a variety of sizes and substrates. You can order panels from 1/4" to 1 3/8" thick, in widths of 49" and 61". They also come in lengths from 73" to 145". Of course, your local lumberyard will probably only stock the standard 49" x 97" panels in 3/4" thickness, which is exactly what you'll need for this project. A cabinet shop can order other dimensions and colors, if you decide to get creative.



NOTE: Melamine (thermally fused plastic) panels, freshly machined, have very sharp edges. Do not cut yourself when handling them. They are also a bit fragile. Always protect them with either matching hot-melt tape or h

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The author added 1/2" thick hardwood trim to accent her countertop, mitering it on a laser-guided saw for extremely accurate joints. Apply the trim with glue and finish nails.

Attach the toe kick and the cabinet back, using glue and finishing nails to secure them. A few more countersunk screws driven down through the cabinet bottom into the top of the toe kick will add stability and strength.

The Countertop

The countertop (piece 7) is essentially just a sheet of melamine cut to size. The actual size of your countertop will depend on how many base cabinets you choose to build and join together. Traditionally, countertops sport a 1 1/2" thick front edge: this can be achieved by screwing a thin cleat called a build-up (piece 8) to the front and side edges of the counter (see the *Detail* at left). Be sure the faces are flush before screwing the build-up in place from below. Add a piece of hardwood (piece 9) to protect and accent the edge. Miter the corners as shown in the photo, above right. You can use glue and finish nails to secure the hardwood in place. I used a trim router to flush-up the hardwood after the glue had cured. Cover the rest of the exposed edges throughout the cabinet with hot-melt melamine tape (piece 10). I used an old clothes iron for this job and it worked great.

Customizing Your Cabinet

The best aspect of these modular cabinets is that you can customize the interiors by adding adjustable open shelves, doors, roll-out shelves or drawers to accommodate whatever you need to store.

Doors and adjustable shelves are perhaps the easiest options to build. Simply cut them to size, apply edging (either hardwood or melamine) and install them. Standard European-style hinges work well for the doors: they're designed for cabinets without face frames, and most models come with detailed installation instructions. Shelves can be installed with adjustable brass pins that fit into predrilled holes in the sides of the cabinet. Templates for drilling these holes are widely available.



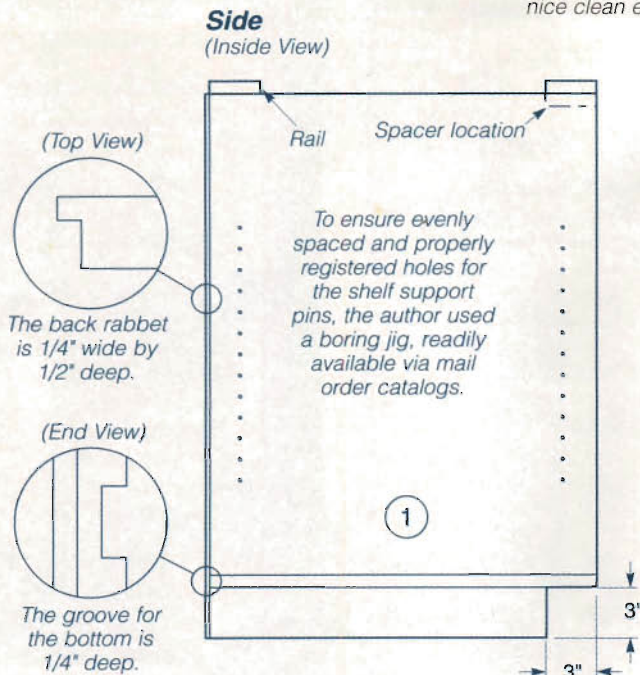
Both drawers and roll-out shelves will require drawer slides that are simply screwed into the cabinet sides. As these are utility cabinets, the drawer bodies can be as simple as two sides butt-jointed and screwed to the front and back, with a bottom either set in a groove or screwed in place. The key is to keep things simple: after all, you don't want to have to find even more storage space for a whole bunch of fresh jigs, now do you?



Join the cabinets to each other by clamping them together and using a drill/driver to drive screws into pre-drilled, countersunk holes every 8" or so down the front and back edges. It's important that the bank of cabinets be dead level and aligned as you screw it together.

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NOTE: When you begin cutting your melamine material, be sure to trim off any damaged factory edges so you get nice clean edges on your cabinet parts.



First, measure your available space and determine how many units you need to build. The cabinet that is described here (about 22½" wide) is a perfect compromise: it's narrow enough so that shelves won't sag, yet wide enough to offer plenty of storage.

Start construction by cutting the sides (pieces 1) to size. The factory edge may not be perfectly straight, square or clean: it's a good idea to trim about a blade width off of it, so you're sure to start with a crisp edge.

Handling large sheet goods on the table saw is easy if you have help. When I'm alone, I like to set a sheet on a pair of saw horses and use my circular saw to cut parts slightly oversize. Then I can safely trim them to finished dimensions on the table saw.

Use a saber saw to remove the toe kick cutout from each side (see the *Elevation Drawings* above), then clamp a straightedge in place and use a straight bit in your router to plow the dado in each side for the cabinet's bottom panel (piece 2). Note that some melamine sheet stock is not exactly 3/4" thick. You can get around this by making two cuts with a smaller diameter bit (and moving your guide to adjust between cuts), or purchasing a special router bit designed to cut panel-sized grooves.

Stay with the router and your clamped-on straightedge to mill a rabbet (check the *Elevation Drawings* for details) down the inside back edge of each side (to accept the back), then return to the table saw to cut the bottom and the spacer (pieces 2 and 3) to size. The spacer is a handy little piece designed to keep the tops of the cabinet sides parallel. It also provides a solid edge for doors or drawers to close against.

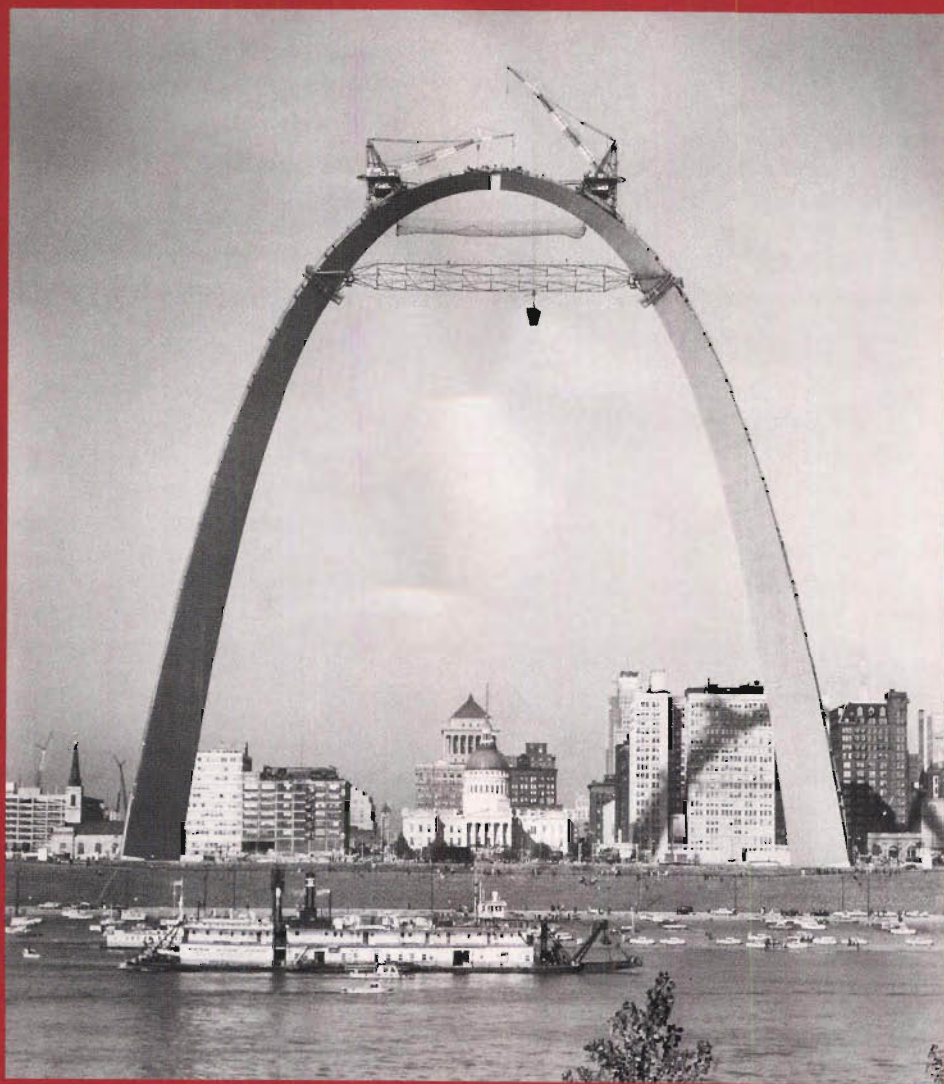
Assemble the sides to the bottom with glue in the dados, and screws. As this is a utility cabinet, I used three standard black phosphate-coated screws driven through each dado into countersunk, pre-drilled holes. However, there are screws available with plastic caps that dress up the heads, in case your cabinet ends up in a more "finished" area than the workshop.

Clamp the spacer in place while the glue dries, to help keep everything square. While you're waiting, you can cut the two rails (pieces 4), the hardwood toe kick (piece 5), and the cabinet back (piece 6) to size. The back can be made from standard 1/4" white paneling; it doesn't have to be melamine.

Screw the rails in place next. Drive the screws down from the top through countersunk, pre-drilled holes into both the top edges of the cabinet sides and the top face of the spacer.

One option with this modular system is to attach doors to the utility cabinets, using European style hinges. They require no face frame, and are installed in 35mm pockets that can be bored on the drill press.





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Scroll Sawn Nightlights

By John Nelson

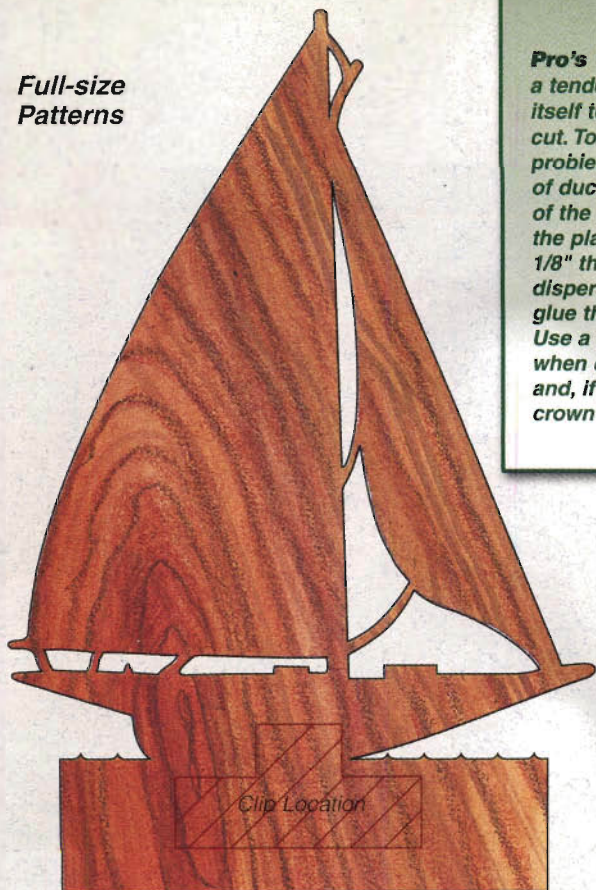


Looking for something to interest the kids (or grandchildren) this summer? How about introducing them to the basics of woodworking with these simple scroll sawn nightlights.

These nightlight projects are a lot of fun and simple to complete, and they make great gifts. You can make yours from scrap wood or even metal, and use a stack cutting technique to really speed up the process. If you are introducing kids to the shop, I recommend starting out with 1/8" plywood. As you might guess, kids love this sort of project,

particularly since they get to actually operate a power tool! (Scroll saws, if approached properly, are one of the safest power tools around.) Even if a child does not do the actual cutting, they can paint or decorate the cutouts as they choose: from a single color (like the flocked frog) or painted with a lot of detail, or simply left natural to show off the wood grain.

Full-size Patterns



Pro's Tip: Plastic has a tendency to burn itself together as you cut. To eliminate this problem, apply a layer of duct tape on the top of the plastic. Sandwich the plastic between 1/8" thick wood to disperse the heat, and glue the pattern on top. Use a slower speed when cutting plastic and, if possible, use a crown tooth blade.



NOTE: If you want to make your nightlight out of a thin metal such as aluminum, simply sandwich three to four sheets between two pieces of 1/8" thick plywood and cut out as usual.

Starting Out

Using one or more of the *Full-size Patterns* that I've provided above, get started on your nightlights by making copies at a local library or copy center. (Permission is hereby granted for your personal use.) Select your material and cut the 1/8" thick plywood, metal or plastic to overall size. If you are going to stack cut (as shown in the photo at right), stack three or four pieces and carefully tape them together along the edges. Do not try to cut stacked pieces that add up to more than 1/2" thick as a group.

Take your paper pattern and attach it to the top piece of wood with a spray adhesive from a local office supply store. (Take care to apply adhesive to the paper pattern, not the wood.) If the pattern has interior cutouts, drill a 1/16" diameter starter hole for the blade at each interior cut. Make all your interior cuts first. Then, starting on one edge, form the piece's outside shape by following the pattern. If you're cutting stacked pieces, it's very important that you keep everything together as you cut. Don't hesitate to stop and re-tape if necessary to keep everything properly aligned. Once your piece is cut, use a block of wood with sandpaper wrapped around it, lightly sand the front and back surfaces of the cutout to remove any burrs.

Finishing Up

If you are going to leave the wood looking natural, simply apply or spray on a topcoat of a clear satin or gloss finish. If you are going to paint your nightlight one color (such as black), using a can of spray paint is an easy application method. If you want a fancy, detailed nightlight, apply a light primer coat and hand paint to suit. Finish up by adding a light, clear topcoat finish of your choice.

Attach the plastic clip to the back surface of the project (I recommend epoxy — the five-minute type is fine) where indicated on each of the patterns above. Snap the clip onto the nightlight, add a bulb, and you're done! One final tip: On the cat, horse, and boat patterns, you might want to hide the lightbulb by gluing a piece of non-stick baking liner paper (parchment paper) across the back surface. (Refer to the photo at right.) You can get this liner in a grocery store or a kitchen supply store. This hides the bulb and gives a nice "glowing" effect. Do not use regular paper, as it could overheat.

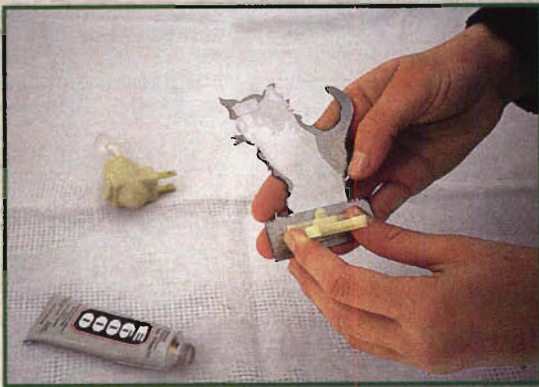
John Nelson is a well-known author of over 40 woodworking books. Since the 1980s he has concentrated on his mission to "bring scrolling to a higher level."

Tip: A quick and unique finish is flocking. Flocking gives a cloth-like feel and look to a project. Simply apply a special coat of flock paint to the project, and apply flocking material per instructions. You can get a flocking kit from any craft store.



Needed for this project:

- Pinless blade scroll saw
- No. 2 or 5 skiptooth blade (optional)
- Epoxy glue
- 3/4" Wide masking tape
- 1/8" Thick plywood
- Aluminum roof flashing (optional)
- Nightlight kit (National Artcraft Co., part #393-256-03; telephone 888-937-2723 for catalog or www.nationalartcraft.com)

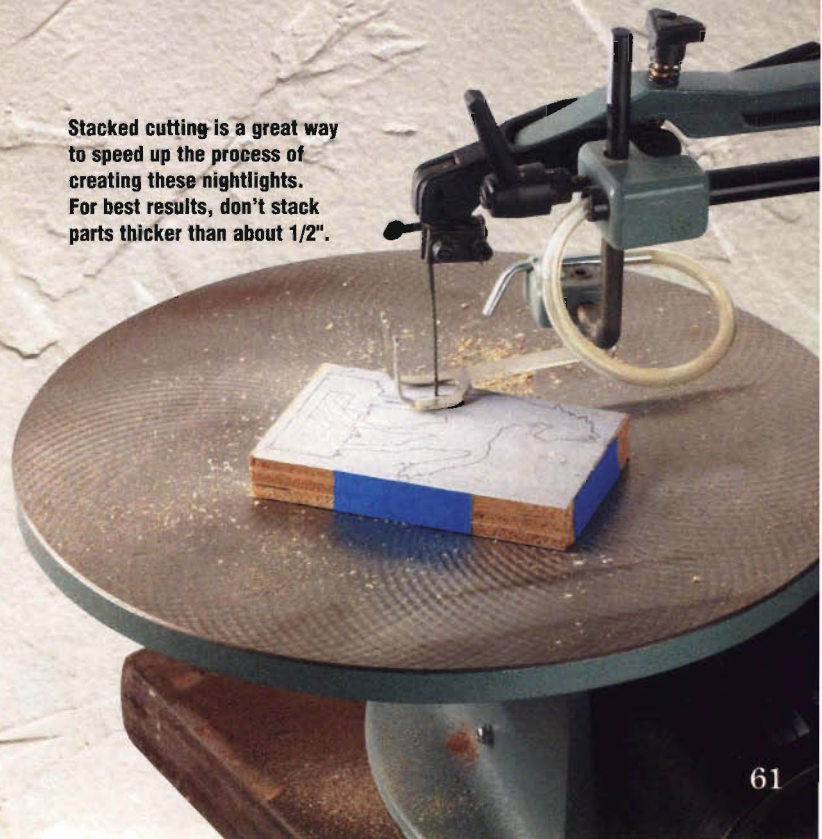


Use epoxy to attach the nightlight's clip to the scroll sawn project. Five-minute epoxy will do fine.



Use parchment paper to line the back of see-through lights.

Stacked cutting is a great way to speed up the process of creating these nightlights. For best results, don't stack parts thicker than about 1/2".



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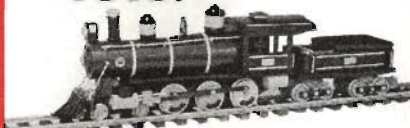
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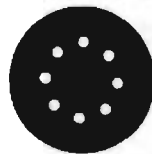
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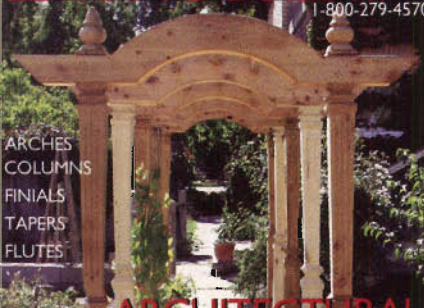
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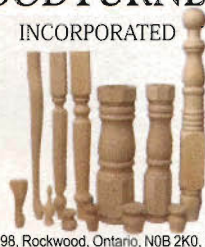
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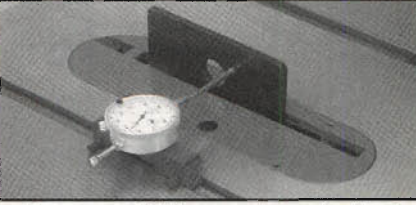
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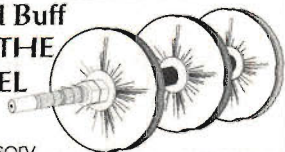
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(Circle No. 67)

Selecting the Right Clamps for Your Shop

By Charles Self

Having enough clamps isn't always the issue: sometimes it's a question of having the appropriate ones to tackle the project you're building.

If a woodworker goes a day without hearing "you can't have too many clamps," he's just not hanging out with the right people (other woodworkers, of course!). But trying to follow that advice can leave you broke. Even though your shop gradually fills up with clamps, it may well be devoid of the right type for a specific job. This, of course, leads to making more purchases ...

Sure, we can avoid going broke by buying only what we need when we need it. The problem here is determining exactly what that is, when the array of choices is enough to stun the senses. Perhaps it's time to pose a few soul-searching questions.

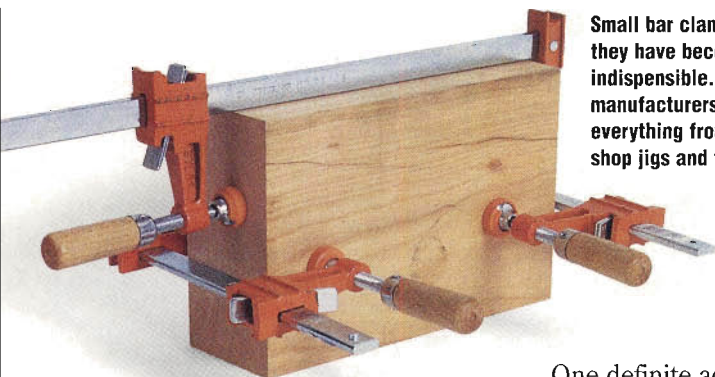
Does your particular brand of woodworking involve lots of flat spans, glued-up panels, edged plywood and similar things?

Or do you tackle a lot of uneven surfaces and shapes, up to and including curves? Perhaps you build for outdoor use? And are your projects large, small, or medium sized? Do you need to add more pipe or bar clamps, or will you be better off with versions that work well on non-parallel surfaces? Are you going into a barrel-making stage where band clamps are the only choice? Are you clamping mainly right angles, or are you mostly a frame maker?

Whew!

The first job anyone has when getting ready to add more clamps to a collection, especially if the clamps aren't needed immediately, is to figure out how, where, and how often they'll be used. Once that's determined, selection of a clamp type just about falls in your lap, becoming nearly (but not quite) automatic.





Small bar clamps are so handy that they have become nearly indispensable. Available from many manufacturers, they are used for everything from glue-up to securing shop jigs and fixtures.

Let's begin with the how.

Perhaps the most obvious use of clamps in the woodshop is creating panels. Now, flat panel clamping and glue-up is a real challenge, and a fast way to go nuts. But it's also the foundation of good woodworking. Therefore, the ability to rapidly and accurately glue up and clamp flat panels is one definitive sign of a good woodworker.

Panel clamping is the province of pipe and bar clamps, and that's an awfully large province. Let's take a quick tour.

Pipe Clamps

The basic panel clamp is the pipe version, available for 1/2" and 3/4" black iron pipe that has been threaded on at least one end. The Pony™ brand is probably the best known, and often makes up the core of a shop's collection. In addition to standard clamps, they are also available in a model which holds the panel in the center, and another with deep reach jaws. Other accessories include slip-on pads to protect projects from the evils of metal jaws, and saddles which hold the pipes off the benchtop to make clamping somewhat easier.

One definite advantage to pipe clamps is the ease with which one can change their lengths. If you have your clamp fixtures mounted on five foot pipe and discover that you need a nine foot long clamp, you can simply buy a nine foot section of pipe and transfer the heads to it. Or, you can join two five foot sections with a collar. Length is essentially unlimited, though the flexibility of 1/2" pipe can limit real-life use (unless some form of intermediate support is found).

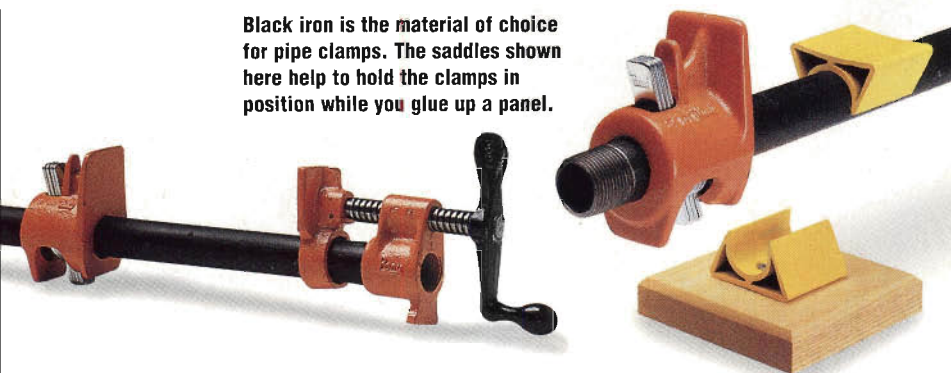
Black iron is preferred over galvanized (silver) pipe because the surface is rougher and less likely to slip. It also costs a little less. When used consistently, however, it does tend to wear, rust and pick up grime. For that reason, I like to use kitchen waxed paper between the pipe and the wood being clamped, to reduce the possibility of stains.

Aluminum and Steel Bar Clamps

Many woodworkers prefer bar clamps over pipe clamps. In some instances, they definitely have their uses. Jorgensen® and Shop Fox® aluminum versions are considerably lighter than pipe clamps, and are generally easier to use. This is because they have positive stops every few inches along the bar, reducing slippage.

continues on page 68 ...

Black iron is the material of choice for pipe clamps. The saddles shown here help to hold the clamps in position while you glue up a panel.



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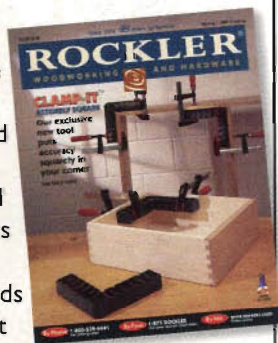
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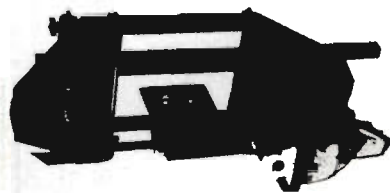


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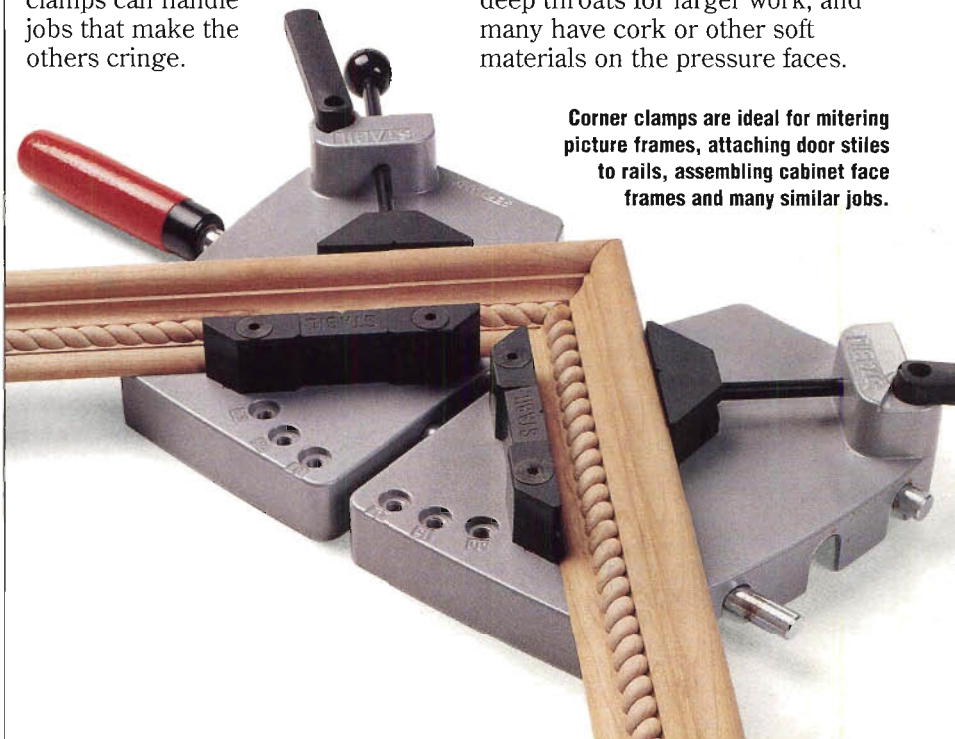
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Generally, you can't apply as much pressure with an aluminum clamp. But most of us over-crank anyway, so perhaps that's not an issue. (Few glues demand high clamping pressure. And a properly fitted joint is a great defense against the need for extreme cranking. If the joint doesn't fit well, you're probably better off re-making it than forcing it closed with a clamp.)

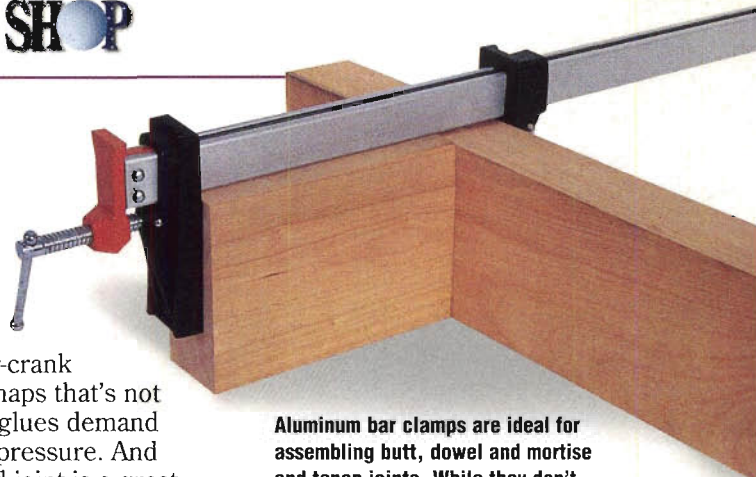
Steel bar (Wilton is a prime manufacturer) clamps allow as much pressure as, and possibly even more than, pipe clamps. They also have that positive clamping action provided by the aluminum models. And there's a larger basic selection, including jaws with a deeper reach than their aluminum counterparts.

Corner Clamps

Available in a variety of styles and sizes, these specialty clamps make short work of miters. Lightweight picture framing clamps are all most of us generally need, but on occasion a heavy-duty model such as the Bessey™ corner unit or the Gross Stabil (shown below) is invaluable. These heavy-duty clamps can handle jobs that make the others cringe.



Corner clamps are ideal for mitering picture frames, attaching door stiles to rails, assembling cabinet face frames and many similar jobs.



Aluminum bar clamps are ideal for assembling butt, dowel and mortise and tenon joints. While they don't exert a whole lot of pressure, most of us tend to squeeze too hard anyway!

Picture framing clamps also provide another benefit, for they leave a gap for you to trim the miter to an exact 90.

Corner clamps are useful for cabinet face framing, carcass panels, assembling cabinet door stiles to rails and attaching bookcase verticals to horizontals, among other jobs.

Cam Clamps

Cam clamps are quick action, light duty, light pressure bar clamps that are close to ideal for instrument making. I've seen guitar makers use these in profusion, and for light box making there is little else that is as easy to use. The lever that activates the cam provides only light pressure. Available in sizes past 30" long, some come with deep throats for larger work, and many have cork or other soft materials on the pressure faces.

C-clamps

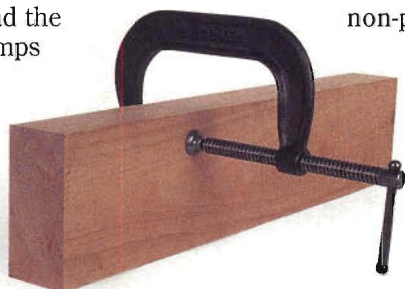
For years, I felt the best uses for C-clamps were in welding. But there are also a number of woodworking jobs they do well. For the most part, they need some kind of protection, such as a piece of scrap, between the work and the clamping surface. This also helps to spread the pressure, as C-clamps provide a lot of tension in a very small footprint. Possibly the best of the edge clamp designs is an adaptation of the C-clamp: it comes with a center post that screws into place after the clamp is tightened down to the panel surface.

The edging is thus tightly clamped in place, and quite easily, too. These clamps also provide enough pressure to apply edging on gently curved panel edges.

C-clamps are inexpensive, so having plenty on hand is not a hardship. There are some round protective pads available which can be hot-melt glued onto the jaws, to avoid small depressions in wood.

Hand Screws

Hand screws (see photos on following page) are one of the most versatile, and one of the most under-used, woodworker's clamps. The wooden jaws and steel threads allow work at different angles, so these clamps are wonderful for tackling non-parallel surfaces



C-clamps provide a terrific amount of pressure over a very small footprint, so most woodworking applications will require protective pads between the clamp face and the workpiece.

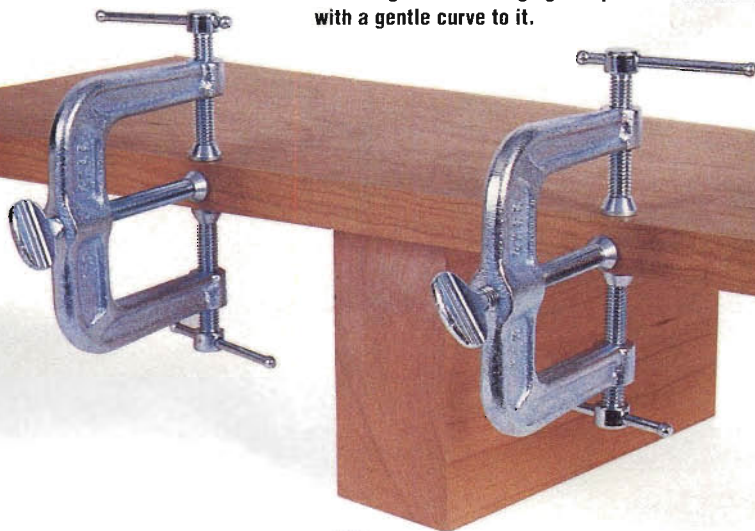
and objects. Sizes vary: most common today are versions in the 4" to 14" range, but larger models are available up to 24".

Rotating the handles adjusts the jaws. Using the front screw for initial sizing works quickly,

while final pressure is applied with the rear screw. Jaws must be kept clean and free of glue drippings, as hardened glue will indent a workpiece and fresh glue may even attach the wooden jaws to your project! A slip of masking tape over each jaw is a big help when the glue-up seems likely to be messy. Some people prefer to tape a piece of rubber or plastic

continues on page 70 ...

Some models of the inexpensive C-clamp come with a center screw which makes them ideal for attaching hardwood edging to a panel — even one with a gentle curve to it.



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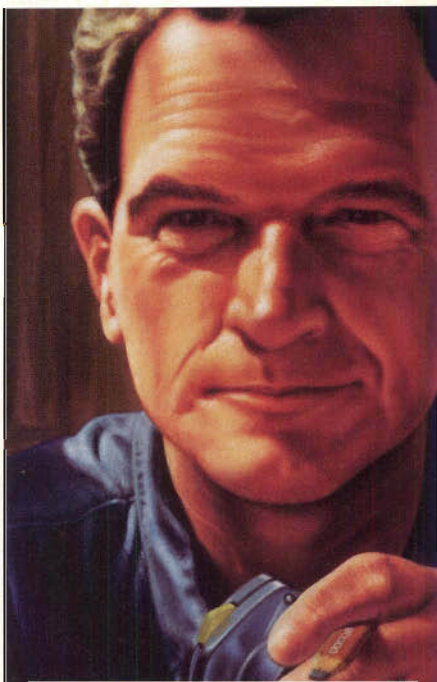
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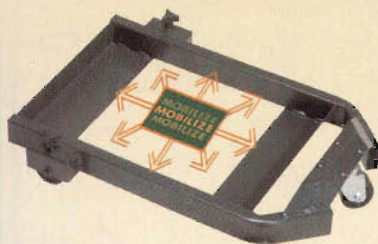
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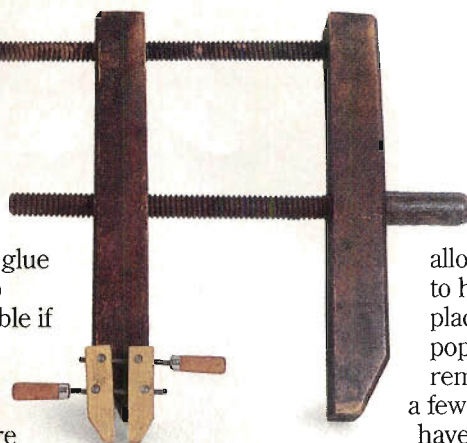


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(Circle No. 53 on PRODUCT INFORMATION form)

in place over the tips, in order to prevent glue buildup. Such tip covers are reusable if cleaned and stored properly.

Making hand screws even more interesting to woodworkers are kits now available that contain all the metal parts, along with plans that allow us to build our own custom models.



While most modern hand screws are in the 14" or under category, many antique versions had huge jaws designed for large scale projects. Some of these treasures are still out there, hiding in dilapidated cardboard boxes at flea market and estate sales.

down with one hand. This

allows the other hand to hold the parts in place. The clamp's popularity has remained high, and a few new developments have popped up over the years. These include tiny clamps (just 6" long) for light duty work, and spreader clamps for doing repair jobs such as removing and replacing chair rungs and splats.

Now, American Tool

Company is not the only maker. Wolfcraft® and others are pursuing them heavily. One-handed clamps are possibly the most useful clamp development to come along in the past couple of years, though some very innovative fixtures from De-Sta-Co® and others also have appeared. Together, they make jig builders' jobs a great deal easier.

Spring Clamps

Small, one-hand spring clamps are useful for so many light clamping duties, it's hard to find a place to begin. Look for either resin bodied models like the Craftsman® types from Sears®, or steel bodied types. (Stanley® used to make a steel bodied spring clamp that lasted exceptionally well, and probably still does.)

Adjustable Clamp Company makes steel bodied Pony models with openings from 1" to 4". This latter is one big clamp, as it is about a foot long to provide enough leverage to open that monster spring.

One-handed Clamps

When Quick-Clamps™ arrived on the scene a few years ago, they were very quickly accepted in hobby shops of all kinds. The reason is simple: the clamp's design allows the user to slip it closed and clamp it



So called "one-handed" clamps were instant shop favorites due to their ease of operation. More versions and varieties are being developed all the time.

Outfitting A Woodworking Shop with Clamps

Getting the clamps you need is not quite as easy as checking out the catalogs or looking over the shops of your pals in the local woodworking club. Almost, but not quite.

First, think about the jobs you'll be doing. If your primary interest is in building lutes and violins, you can pass on pipe clamps, longer bar clamps and heavy C-clamps. Just move on down the list to those lighter duty one-hand clamps. Mix and match with smaller bar clamps, usually of the aluminum persuasion, and go from there.

By the same token, if you never build anything smaller than a 22" wide kitchen cabinet, there's not a lot of sense in spending your money on a dozen hand screws under 12" and a slew of cam clamps.

For the rest of us, a mixed bag of clamps seems to work well enough to get things rolling and keep us ready for most jobs. Super-specialty clamps should be bought if and as needed, but the following list strikes me as a good basic package.

C-clamps: Start with half a dozen 3" and go up or down from there as projects demand. (And **don't** forget to pick up several that feature the center edge clamping option.)

Spring clamps and their variants. Varying in size and construction, they are alike in use and appearance.



Band clamps come in many guises, from exceptionally light duty ones rigged with nothing more than a piece of string, to more robust models like the strap-fitted one shown here. They are indispensable when it comes to mitered frames, octagonal forms and round projects.

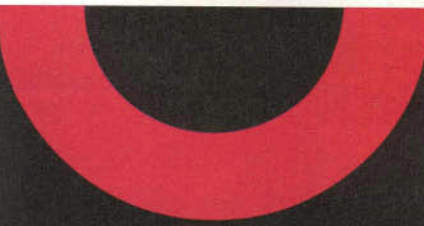
Bar clamps: A minimum of one 24" pair and another at 36" or longer. (I set up my present shop with two 36" and two 48" aluminum bar clamps.) For heavy-duty work, both Adjustable Clamp Company and American Clamping Company offer really great bar clamps meant for cabinet shop work: these are the Bessey K bodies from American Clamping and Adjustable Clamp

Company's new Cabinet Master™. They're both superb. I suggest buying them in models that are at least 24" long: 30" and 48" may be the handiest. They're not cheap, but nothing worthwhile ever is.

Pipe clamps: It might be a good idea to set up four 48" sets. You don't have to buy extra clamps to get longer ones (or shorter). Simply buy some six and eight foot bars, and have them threaded.

continues on page 72 ...





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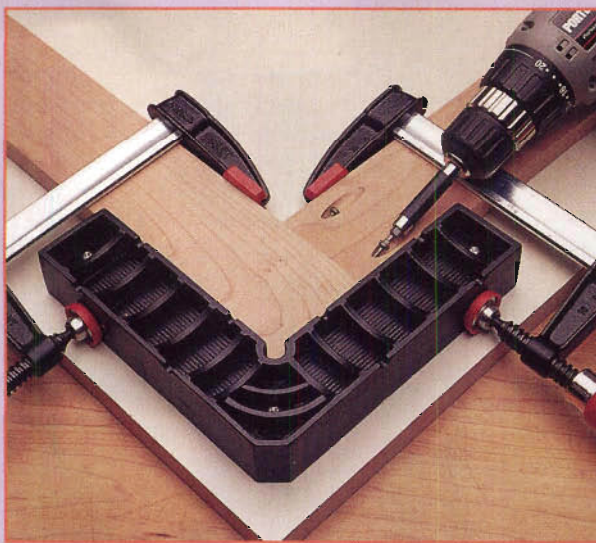
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"Clamp-it": Seriously Square

An elegantly simple new product is helping woodworkers get perfectly square corners. In shops all over the country, Rockler's new Clamp-it™ is proving to be surprisingly popular. Developed to aid woodworkers in various stages of construction,



the injection molded corner jig is extremely accurate. Shown here mounted on a bench to aid in 90° pocket joinery, the little square corner is equally helpful in European cabinetry operations and standard casework tasks. Small (8" x 8" x 1½") and sturdy, its polycarbonate material will not mar sanded surfaces even when clamped tightly to them.

These can replace bar clamps, leaving you free to be a bit more specific when you do buy bar clamps. You could actually make a fairly inexpensive investment if you go with four 24" lengths of pipe, four more at 48", and four 72" pipes to complete the set. These offer you a huge array of options when combined with either four or eight pipe clamp sets. (I recommend going for 3/4" instead of 1/2" pipe, unless all your work is very light.) A set of collars that join your various pipes together (to make two pipes into a single longer pipe clamp) can be a lifesaver.

Band clamps: You'll find one pair of at least 14 foot with an easy to use ratchet mechanism almost indispensable. Check out the mechanism before finalizing the deal — some are really easy to use, and others can add half an hour to assembly and glue-up times. Make sure the band is woven nylon or canvas, unless you really want to deal with the problems and restrictions created by the super heavy-duty steel band types: they rust as they age, and you'll need to protect the work surface.

Corner clamps: I'd start with four light duty models. I particularly like the light duty Pony models from Adjustable Clamp Company,

but there are other good ones out there, too. For work with cabinets, consider the Bessey types.

Spring clamps: My suggestion here is that you begin with at least two with 2" openings, and two more at 3". These are going to end up holding lights in place and many other jobs unrelated to normal clamping duties, so you'll end up buying more fairly soon.

One hand (Quick Grip™) clamps: In my shop, I use the one-foot long, heavy-duty models most, but that's followed quickly by the 6" light duty clamps. The two- and three-foot long models also see intensive use. So, I'll recommend starting with two one-foot long and two three-foot long clamps, and progressing from there. The shorter ones are great for clamping portable tools (planers, etc.) to benches.

As I said at the beginning, no woodworker has ever had too many clamps. But it's possible to get along with a limited number of each kind as long as you apply a little thought to the types of projects you do, and the ones you plan to do. And how you plan to do them.

Charles Self is an award-winning writer and woodworker. He regularly reviews tools and related items for Woodworker's Journal.

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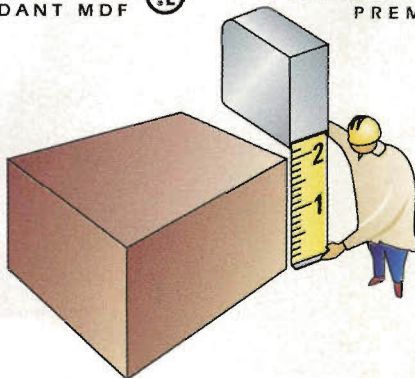
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Pony Up to Trim Routers

By Bill Hylton

DeWalt
DW670



As the preeminent workhorse of the woodshop, routers are widely regarded as the most versatile beast in the barnyard. But one router cannot do it all.

Your stable needs a hardworking quarter horse (or two or three) for routine joinery cuts and decorative profiling, and a Clydesdale for your router table.

But don't overlook a pony. A laminate trimmer (aka, a trim router) can be held in one hand and fits into tight spots that won't accommodate a full-size machine. It can't spin BIG bits, but you don't need a draft horse to plow an inlay groove or rout a hinge mortise.

Originally, these routers were designed to trim plastic laminate after it has been cemented to a substrate, hence the name. But woodworkers promptly used the pint-sized routers for all sorts of woodworking chores.

Freud FT1000E



Trimmers are great for:

- ♦ Rounding over, chamfering, and profiling edges
- ♦ Inlay work
- ♦ Mortising for hinges
- ♦ Pattern routing
- ♦ Trimming plugs, through tenons, and edge bands
- ♦ Sign-making

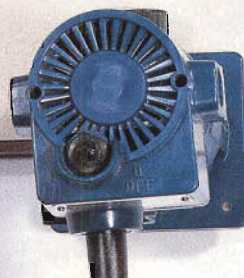
Small though they are, don't think of them as wimpy. Because laminate is so thin, it's easy to underestimate how difficult it is to cut. Just listen to your router as it cuts the stuff; it is working. Today's trim routers pack as much power as the full-size routers of 30 years ago. But use discretion. Too heavy a load will overtax a trimmer's bearings and motor, causing it to overheat.

Two Fundamental Styles

Two base styles dominate: sleeve-type and two-piece. The sleeve-type base is common to regular-size fixed-base routers. The sleeve is split, but it has an adjustment bolt that spans the split.

The two-piece base design is used on DeWalt, Freud, and Bosch trimmers. One section is a split-ring clamp with a post. The clamp holds the motor. The other piece is the base itself, and it has a post rising from it. The posts overlap and are bolted together. To adjust how much the bit extends from the base, you loosen the bolt, allowing the parts to move. A jackscrew controls the movement, making it a micro-adjustment from one end of the range to the other. Hybrid designs are used on the Hitachi and the Porter-Cable 7310.

Makita 3700B





Ryobi TR31

The 7310 shares the adjustment concept of the two-piece base, but Porter-Cable (PC) bolts the base directly to the motor, rather than to a clamp. A coil spring around the bolt keeps the base pressed against the motor when the bolt is loosened, so the jackscrew's threads remain engaged with those on the motor case. Pulling slightly on the base compresses the spring, disengages the threads, and allows a fast, coarse adjustment. Neat!

Hitachi, too, attaches a single-piece base directly to the side of the motor. The base's post is secured with a studded knob. A jackscrew raises and lowers the base in a controlled way, but you can loosen the knob enough to cock the post and disengage it from the threads, allowing quick, coarse adjusts.

A problem common to all but the sleeve-type bases is vertical alignment. You want the bit axis perpendicular to the baseplate. But the two-piece base configuration (and its hybrids) doesn't guarantee it. The motor can be slightly cocked in the clamp, the assembly bolt can be

insufficiently tightened, or wear can introduce a misalignment between the base parts (or base and motor). In my experience (as an owner of two such trimmers), they aren't reliably accurate for some common operations. Twist the tool as you round over edges, for example, and you can introduce a hairline fillet to the shape. But only here and there. Just enough to make you nuts. And it is because the base surface isn't square to the bit axis.

With all of that said, let's take a look at a roundup of some of the best offerings on the market.

Bosch 1609A

The Bosch 1609A is designed for trimming laminate, first and foremost. A herd of bases is available. The vertical adjustment range is very short, which is OK for laminate work, but a limitation for general woodworking.

The motor is compact, and to me, it seemed smaller than it really is. Still, it is one of the most powerful trimmers, drawing 5.6 amps. The collet is small, as are all the trimmer collets, but it is somewhat elongated, so it grips a fraction more of the bit shank.

The tool uses Bosch's template guides, making it suitable for inlay work and some pattern work. But you have to remove and reattach the baseplate to mount them.

Tool Review continues on page 76 ...

**Bosch
1609A**



**Craftsman
27512**



**Hitachi
TR6**



Porter-Cable 310

DeWalt DW670

The DeWalt trimmer is also focused on laminate work. It has the same assortment of bases as the Bosch, mounted to the motor in the same way, with the same limited adjustment range.

Vertical adjustments, made via a jackscrew, seem unnecessarily difficult to make. The screw's wheel doesn't protrude much, and it is frustratingly hard to turn. And to complicate things, there is no provision for a fast, coarse adjustment.

The DeWalt has, however, a lot of positives. It is powerful at 5.6 amps, has a long collet (for a trimmer) and a deep socket for the bit's shank, has a spindle lock for one-wrench bit changes, and it's configured for PC-style template guides.

Freud FT1000E

The Freud trimmer is the maxi-mini. It is the heaviest (by nearly a half-pound) and the tallest (by a good 2"), neither of which is good. Perch this motor atop a diminutive trimmer base, and you have a tippy tool. It is the most powerful, at 7.6 amps, and it is the only variable speed trimmer. But the rpm range — 20,000 to 30,000 — is limited, and the slowest speed is really a regular router's top speed.

Freud FT1000E

Freud FT1000E

Street price: \$159.99
7.5 amps
No-load speed: 20 - 30,000 rpm
Weight: 4.4 lbs.
Footprint: 2 13/16" x 3 7/8"
Height: 10 3/16" to 10 11/16"
Phone: 800-334-4107
www.freudtools.com

The plunge base available with the Freud is unique in the trimmer realm, but its size — it's adapted from a huge 3 HP router — conflicts with the small-scale nature of the trimmer.

DeWalt DW670

Street price: \$99.99
5.6 amps
No-load speed: 30,000 rpm
Weight: 3.65 lbs.
Footprint: 3 1/8" x 3 3/8"
Height: 8 3/8" to 9"
Phone: 800-433-9258
www.dewalt.com

Freud's standard base is the spitting image of the Bosch's; the motor clamp, the adjustment scheme and the range are the same. It takes Bosch guides. Differences? The Freud base is 1/8" longer, and has a Phillips screw on the motor clamp.

Hitachi TR6

This design is the maverick, and I really want to like the Hitachi. But every positive is offset by a negative, and in the end, it's just a big guy whose feet are too small.

The Hitachi's base tilts. Its vertical adjustment has ample range, and it allows fast, coarse adjustments while providing for precise fine adjustments. The open design gives good access to the collet for two-wrench bit changes. The motor barrel, roughly oval in section, is comfortable to grip.

But this trimmer is second only to the Freud in weight. Bulkiest at the very top, smallest at the very bottom, it even looks poorly balanced. The U-shaped bit opening, essential because of the tilt feature, almost guarantees you'll bobble at corners. And the open design seems to put you at risk if you try to grip the tool down low.



Bosch 1609A

Bosch 1609A

Street price: \$99.95
5.6 amps
No-load speed: 30,000 rpm
Weight: 3 1/8 lbs.
Footprint: 2 13/16" x 3 3/8"
Height: 7 7/8" to 7 11/16"
Phone: 877-267-2499
www.boschtools.com

Inserting a wrench handle into a slot in the Bosch motor locks its armature. You can hold the motor in one hand and work the second wrench with the other: easy bit changes!

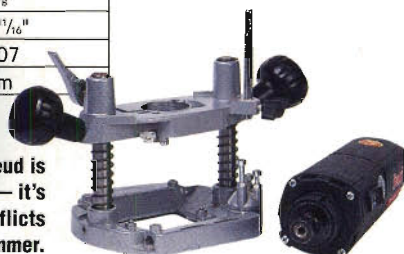
The limitations? Low power, perhaps. Lack of fine vertical adjustment, definitely. For template work and inlay, it is marginal, I'd say, since only one guide is available from Makita (it gets sandwiched between the base and the baseplate; screwdriver required for installation). The bit opening is too large for Porter-Cable guides.

A "pull-and-rotate" style adjustable handle on the DeWalt's two-piece base allows you to separate the motor and base without tools.

DeWalt DW670

Makita 3700B

While the Makita has the lowest amp rating, it is average in weight and footprint. The sleeve-type base is plastic, with an easy-on-the-fingers plastic wingnut to tighten it around the motor. The vertical adjustment is strictly freehand, but the range is an almost phenomenal 2" plus. Oh, there's a scale stuck on the motor barrel and an index mark on the base, but there's no mechanical indexing of the motor and base. The accuracy of micro-adjustments depends on the deftness of your touch.





Hitachi TR6

Hitachi TR6

Street price: \$99.95
4 amps
No-load speed: 30,000 rpm
Weight: 3.9 lbs.
Footprint: 2 1/4" x 2 3/4"
Height: 7 1/16" to 8 3/4"
Phone: 800-706-7337
www.hitachi.com

Hitachi's standard base tilts. Socket screws lock the setting securely, but a lack of detents leaves the precision of the baseline setting up to you.

plastic here. Naturally, it is configured to take PC template guides.

The sleeve-type base holds the motor securely at a right angle to the baseplate, and it

provides precise vertical adjustment and ample range. The motor barrel is threaded and girded by a hard plastic ring, to which the base clips. Turn the ring and it inches up and down the motor, dragging the base with it. The ring is indexed, so you can readily make those 1/128" adjustments. To expedite the two-wrench bit changes, the motor and base separate easily: loosen the lock knob and tug the parts in opposite directions.

Makita 3700B

Makita 3700B

Street price: \$129.99
3.3 amps
No-load speed: 28,000 rpm
Weight: 3.6 lbs.
Footprint: 3 1/4" x 3 1/2"
Height: 7 1/16" to 9 3/8"
Phone: 800-462-5482
www.makitatools.com



Trim guides provide a pilot bearing so you can use a straight bit. Makita's guide has both vertical and lateral adjustability, allowing its use with bits of various lengths and diameter.



Porter-Cable 310

With its squat proportions, the 310 looks like a regular router that's been miniaturized. It works like one, too. It is an old design, carrying back to the days when Rockwell was in the woodworking tool business.

The 4 amp rating is modest, but the 310's girth and heft bespeak a stolid, tireless worker. The 4"-diameter baseplate is thick, fabric-based phenolic — no chintzy

Tool Review continues on page 78 ...

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Porter-Cable 7310

The 7310 is Porter-Cable's entry in the multiple-base set sweepstakes. It's the newest, lowest priced, and most widely available of the PC trimmers. Will you be surprised when I say, when it comes to woodworking, I don't much like it?

It does have admirable features. The base-to-motor mounting is simple and effective. Its adjustment range is wide, and it allows coarse as well as fine adjustments. It is no more inaccurate (nor more accurate) than the other two-piece base trimmers. It takes PC guides, of course. It has a spindle lock for single-wrench bit changes. But of the Porter-Cable trimmers, I rank this one last.

Ryobi TR31/Craftsman 27512

The Ryobi trimmer has a couple of unique (and worthwhile) features. Notable is the transparent yellow plastic baseplate. You can actually see layout marks! But its bit



Ryobi TR31	
Street price:	\$101.98
3.8 amps	
No-load speed:	23,000 rpm
Weight:	3 lbs.
Footprint:	3 1/2" square
Height:	6 1/2" to 7 1/16"
Phone:	800-525-2579
	www.ryobitools.com

Separating the Craftsman's (or Ryobi's) motor from its base is possible only if you completely remove the studded wingnut that tightens the sleeve-type base on the motor.



Coupling the 310's motor and base is simple. Align the black clips on the base with the vertical slots on the motor and push until the clips snap onto the adjusting ring.

Porter-Cable 310

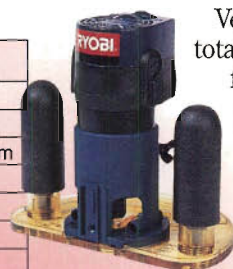
Street price:	\$144.95
4 amps	
No-load speed:	27,500 rpm
Weight:	3 3/4 lbs.
Footprint:	4" diameter
Height:	5 3/4" to 7" plus
Phone:	800-487-8665
	www.porter-cable.com

Porter Cable 310

opening is too big for PC-style template guides, and no alternative guides seem to be available. (The Craftsman is the same tool, clad in black plastic and shod with a round, opaque baseplate.)

Like the Makita, both the motor case and the base on the Ryobi are plastic. Though I didn't test drop it onto concrete, the plastic lent an insubstantial feel to the tool. Equally disconcerting is the Ryobi collet, which is integral to the motor's armature. If the collet is damaged or worn, you might as well toss the tool. Replacing the collet means replacing the armature.

Vertical adjustment is totally freehand, with no fine adjustment control provided. The motor slides easily inside the base's sleeve — even wiggling from



Ryobi TR31 & Craftsman 27512

Craftsman 27512

Street price:	\$99.99
3.8 amps	
No-load speed:	23,000 rpm
Weight:	3 lbs.
Footprint:	3 1/2" square
Height:	6 1/2" to 7 1/16"
Phone:	800-349-4358
	www.sears.com

Porter-Cable 7310

Street price:	\$99.95
5.6 amps	
No-load speed:	30,000 rpm
Weight:	3 3/4 lbs.
Footprint:	3 1/8" to 3 13/16"
Height:	7 3/8" to 8 1/16"
Phone:	800-487-8665
	www.porter-cable.com

Porter Cable 7310



A studded knob attaches the 7310's base to the motor. The jackscrew engages threads in the motor case and raises and lowers the motor as far as the mounting bolt slot will allow.

side-to-side. A nipple-like protrusion on the motor keeps the base from coming completely off, unless you remove the clamp thumbscrew.

Choosing a Trimmer

Base your selection on what do you plan to do with the trimmer. Several makers — PC, DeWalt, Bosch, Freud — have sets with a motor and three or four different bases. It is so seductive! All those accessories! Typically twice the price of the trimmer alone, a set makes good sense if you are in the counter biz, trimming odd angles and around backsplashes and scribing laminate edges to fit a wall. If you are doing general woodworking, the extra bases will see little, if any, use.

If you'll be using your trim router for edge detailing or operations that demand that the bit axis be absolutely perpendicular to the trimmer's base, get one with a sleeve-type base. The other designs aren't accurate in this regard.

PC's 310 has no "features" to list (no edge guide, no set with extra bases, no chip guards, no handy carrying case), but it is the ideal mini-router. The motor is perpendicular to base, the adjustment range is good, and the adjustment is micro, precise, and simple. Yes, it's the most expensive. It's worth it.



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Innovations Inside Your Tools

First Jigsaw with "Cruise Control"

Consistency and performance are the hallmarks of Freud's new jigsaw, the FJ85 Heavy-duty Variable Speed. It's the first jigsaw in the U.S. market to incorporate the new design feature of Electronic Cruise Control. "Think of it in terms of your car," says Russell Kohl, vice president of marketing and sales for Freud, Inc. "To maximize fuel and energy, you want your car to maintain a constant speed, even when going up or down hills. It's the same with a jigsaw. When you encounter flaws or knots in wood, you want the cutting speed to remain consistent without vibration or opposition. The FJ85 jigsaw regulates the speed for you."

With the constant speed, the FJ85 can provide a faster, finer cut and, since the blade doesn't bog down, the 6 amp, 650 watt jigsaw requires less force. Weighing in at 5.4 pounds, the variable speed FJ85 has four orbital settings. It comes with a tool-free blade changing system and a dust collection port. Street price is \$109. *For more information, call Freud at 800-334-4107 or visit www.FreudInc.com.*



Fastest Tightener

A rare-earth magnet motor gives Hitachi's new 12-volt impact driver, the WH12DM, the fastest tightening speed in its class: the WH12DM

can tighten a 5.3 mm x 120 mm screw in hemlock spruce in 6.5 seconds, averaging 30 percent faster than



other 12-volt drivers, according to the company. Maximum tightening torque is 885 inch-pounds. Protecting this high-speed driver from burnout is a heat-resistant motor with 1.4 times thicker winding and computer-analyzed air ducts for superior cooling.

Pushing a button switches the driver from forward to reverse operation, while a stepless variable speed trigger switch ensures smooth operation. Its no-load rotation speed is 0 - 2,300 rpm, with an impact rate of 0 - 3,000 rpm.

The 3.7 pound WH12DM sports a Nickel-Cadmium battery, and is available for about \$250. *For more information, call 800-829-4752 or visit them on the web at the site: www.hitachi.com/powertools.*

Mafell's New Duo-Dowel System



"An entirely new power tool" is what Mafell calls their DD40 Duo-Dowel System. The offering from the German company uses a powerful 600-watt electric motor to drive two special drills through a gearbox in order to bore holes for two

wooden dowels with one operation. The hand held DD40 offers numerous joint angles and adjustment options, with a practical range of 0 - 90° and drilling depth of up to 1 7/16". Dowel joints can be easily taken apart at any time before gluing — allowing you to assemble a piece in your shop, then dismantle it for transporting to its final destination.

The standard version of the 6.2 pound tool comes equipped with 5/16" drill bits, but a variety of sizes is available, from 3/16" up to a maximum of 1/4". A dust collection hose is standard.

The DD40 comes in a carrying case along with wooden dowels, special drill bits, anti-slip mats and a glue bottle with special nozzle. Price is \$789. *For more information, call 888-736-3812 or visit www.mafell.com.*

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Inlace is a liquid inlay material for woodworkers, with decorative applications for turning, scroll sawing, carving and furniture projects. It comes as a two-part polyester resin — one part the Inlace and the other the catalyst or hardener. After mixing the Inlace and the catalyst, it is applied to your project and allowed to cure. After this, it can be worked in the same way you would normally continue with the project: planing, turning, carving, etc. You have about 20 minutes of working time before the Inlace starts to set up and about eight hours before it can be carved or sanded.



Inlace comes in nine colors, and during the working time, you can enhance it with add-ins like metal dust, nuggets and granules, also available in several additional colors. Finish does not adhere to Inlace. Clear Inlace and dyes to mix for nearly unlimited custom shades are available. An 8-ounce kit costs \$29.95; prices for dyes and nuggets average \$9.95. *More info: call 888-895-7779 or visit www.choicewoods.com.*



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continues on page 84 ...

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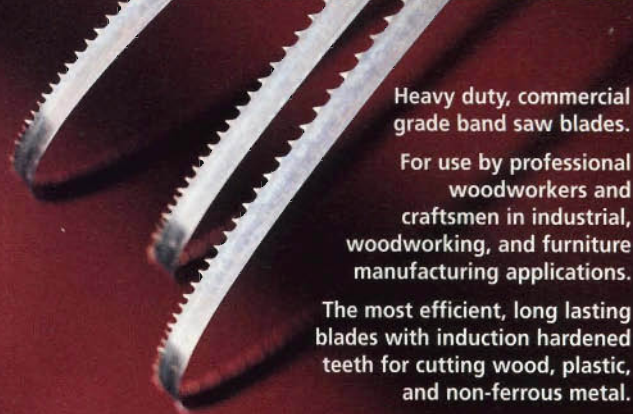


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A Bag Full of Milwaukee

Ever climb all the way into the attic and forget to bring one of the tools you need? The folks at Milwaukee must have heard from a few of us, because they've introduced a kit (model 6310-27) that comes with a circular saw, Sawzall, driver-drill, worklight, two 2.4 amp-hour batteries and a one-hour universal charger all packed in a really tough contractor bag.

According to their literature, the 6310 circular saw "cuts more 2 x 4s on one charge than ANY other cordless circular saw (up to 145)." The 6.5" blade allows for a deep 2 1/2" depth of cut at 90° and easily cuts a 2 x 4 at 45°. The 6515 Sawzall has a 1" stroke length and



0-2,000 strokes per minute, with up to 72, 2 x 4 cuts on one charge.

Milwaukee's model 0522 driver/drill boasts a whopping 400 inch-

pounds of maximum torque to drive large bits with authority, and an all-metal 1/2" chuck. The driver-drill has a reversible battery for working in tight spaces, while the Worklight's Xenon bulb can be pivoted 90° to illuminate those same tight spots for up to three hours. The kit carries a respectable price tag (list is \$1,080), but you get a lot for the money. All Milwaukee products have a limited warranty. *For more information, call 877-729-3878 or www.mil-electric-tool.com.*

New Butane-powered Glue Gun

The new cordless, butane gas-powered glue guns from Weller®, a CooperTools® brand, offer an alternative to searching for an open electric socket or getting cords in the way during glue-up: standard butane lighter fuel. A patented, automatic magnetic thermostat regulates the gas flow so the guns are "on" only when the heat to the glue melt chamber drops below the working temperature.

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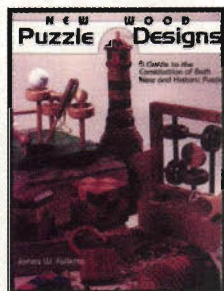
A Hammer That Uses Two Heads

The new Ti-Tech hammer from Vaughan & Bushnell offers freedom from framing hammer pain. The ergonomically designed Ti-Tech has been engineered to combine the lightness of titanium with the toughness of steel and comes with two interchangeable steel striking caps which fit onto the titanium head. The forged steel caps provide the option of a milled or smooth-finished striking face and attach with a free-floating pin that minimizes shock at impact. According to Vaughan, the 16-ounce Ti-Tech, with the natural shock absorption qualities of titanium, produces "a faster, more powerful swing with less recoil." In addition to the free-floating pin, an anti-vibration pad within the steel caps and a high density handle further reduce handle sting.

Although the Ti-Tech is the same 17" size as a regular framing hammer, it's almost half a pound lighter. And the extra cap gives it the ability to switch instantly from rough framing to finish carpentry. It comes in six different models with fiberglass or hickory handles, curved or straight wood handles and a choice of milled or smooth striking face caps. Street price is about \$90.00. *For more information, call 815-648-2446 or visit them on the Internet at www.hammernet.com.*

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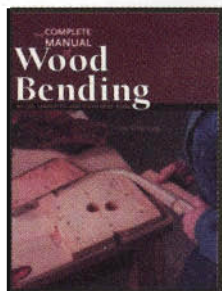
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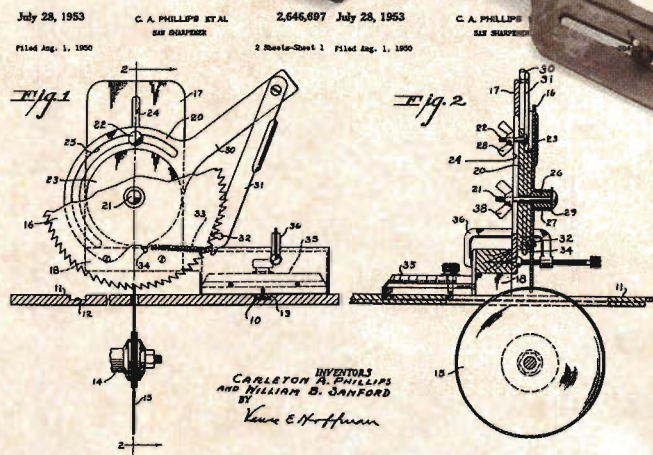
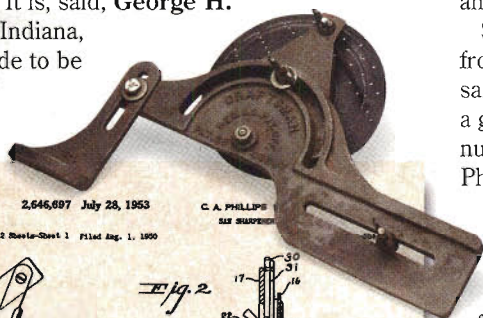
Sharp-witted Readers

By Joanna Werch Takes

Remember how, as a kid, you felt that urge to poke around in attics and basements? **Arif Ulku** of Grosse Pointe Woods, Michigan, does — and he hasn't outgrown it. He came across the mystery tool, pictured at right, in his uncle's garage. The crank, says Arif, turns clockwise. Stamped on the tool is "E. Cunningham, Worcester, Mass."

Now that he's unearthed it, both Arif and his uncle, **Pat Stanley** of Harbor Springs, Michigan, are wondering what the tool is for. "Any ideas?" Arif inquires. As if he has to ask: I know *Woodworker's Journal* readers have ideas. If they're about this tool, send them in.

Your ideas are sure to reflect your sharp wits: they certainly did in your answers to the mystery tool from our April 2002 issue. **G.F. "Fin" Lackey Sr.** of Boaz, Alabama, had asked about an attachment. It is, said, **George H. Rolf** of Indianapolis, Indiana, "a saw sharpener made to be used on a table saw."

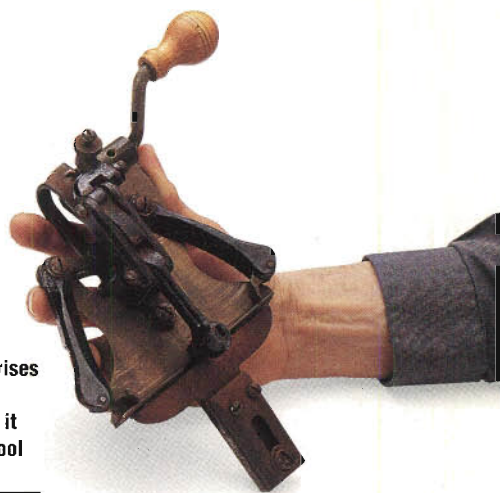


Patent drawings like this one helped Joseph M. Prodor of White Rock, British Columbia — and many others — figure out the saw sharpener.

"From the picture," added **David Sophusson** of Custer, Washington, "it looks like you're only missing two parts: the second indexing disc and the special grinding wheel that you mount on the saw."

"The gist of it was that the blade of the table saw was replaced with a grinding disk, and the tool was attached to the table saw via the miter groove," said **Lester Clark** of St. Louis, Missouri. "The blade to be sharpened was clamped into the device," continued **Glenn MacRill** of Houston, Texas. **Jim McGovern** of Bella Vista, Arkansas, explained,

When you crank the handle, the "hammer" rises and the two arms come toward the middle until it drops. That's how the tool works. Now what is it?



"There is an arbor on the back side of the round [index] disk where the saw blade went, and you matched up the number of teeth on the blade with the number of holes in the disk."

Noah Alkinburgh of Lancaster, Pennsylvania, supplied the info that, while sharpening, you could pivot the blade, "allowing for a flat grind or a beveled grind to your saw teeth." By attaching to the miter gauge, said **James Van Assche** of Fayette, Ohio, you could "duplicate the precise angle of the original tooth."

Several readers got help figuring out how the tool works from patent drawings. As **Jay Eckles** of Exton, Pennsylvania, said, "The United States Patent and Trademark Office has a great web site [www.uspto.gov]. Searching for patent number 2646697, I was able to discover that Carleton A. Phillips and William B. Sanford invented this device and filed for its patent in 1950; the patent was granted in 1953."

After that, "the tool was manufactured by Quick-Way Saw Company of Cortland, New York," said **George May** of Olalla, Washington — who still has his grandfather's — and, by 1966, was being sold through Craftsman tools. That's the date on the Sears catalog where **Joe Schwarz** of Alta Loma, California, found it selling for \$16.88.

Back then, noted **Dudley Greeson** of Kokomo, Indiana, the tool was designed to sharpen 6" to 12" blades. One reason it's now obsolete, said **Chester Rivard** of Imlay City, Michigan, is because almost all of today's table saws are 10" or 12". Also, noted **Bill Shaffer** of Huntingdon, Pennsylvania, the sharpener dates to "the BC era (before carbide)."

"In its day," said **Steve Gutman** of Yorktown Heights, New York, the tool "worked quite well." Once carbide came along, however, "its days were numbered."

WINNER! For taking the time to respond to *Stumpers*, **William Orr** of El Dorado, Kansas wins a **Makita sanding package with a 6" random orbit sander, model B06030**

and a 5" finishing sander, model B05010. 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.

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