FREE! CENTERFOLD PLAN

CORDLESS CHOP SAWS: SWEET! Page 60

WOODWORKER'S JOURNAL

June 2003, Volume 27, Number 3

04/23/03

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See page 90

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1½ HP SHAPER

- MOTOR: HEAVY-DUTY 1½ HP, 110/220V
- 2 INTERCHANGEABLE SPINDLES: ½" AND ¾"
- TWO SPINDLE SPEEDS: 7,000 AND 10,000 RPM

- SPINDLE TRAVEL: 3"
- SPINDLE OPENINGS: 1¼", 3½", AND 5"
- TABLE SIZE: 20¼" x 18"
- FLOOR-TO-TABLE HEIGHT: 33½"
- MAX. CUTTER DIAMETER: 5"
- APPROX. SHIPPING WEIGHT: 220 LBS.

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3 HP SHAPER

- HEAVY-DUTY 3 HP, SINGLE-PHASE, 220V MOTOR W/REVERSING SWITCH
- 3 INTERCHANGEABLE SPINDLES: ½", ¾" AND 1"
- TWO SPINDLE SPEEDS: 7,000 AND 10,000 RPM

- 3" SPINDLE TRAVEL
- SPINDLE OPENINGS: 1⅜", 2¼", 4", AND 5½"
- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE WITH STANDARD WING ATTACHED: 30½" x 28¼"
- FLOOR-TO-TABLE HEIGHT: 34"
- APPROX. SHIPPING WEIGHT: 353 LBS.

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12 SPEED 17" FLOOR DRILL PRESS

- MOTOR: 1 HP, SINGLE-PHASE, 110V/220V
- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE: 13⅜" SQUARE
- TABLE TILTS 90° IN BOTH DIRECTIONS
- SPINDLE TAPER: MT#3
- SPINDLE TRAVEL: 4¾"
- SWING: 17"
- DRILL CHUCK: ⅝"
- 12 SPEEDS: 210 - 3300 RPM
- DRILLING CAPACITY: 1" STEEL
- INCLUDES BUILT-IN LIGHT
- OVERALL HEIGHT: 64½"
- APPROX. SHIPPING WEIGHT: 275 LBS.

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10" HEAVY-DUTY TABLE SAW

- 1½ HP, SINGLE-PHASE, 110/220V MOTOR
- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE (W/ WINGS ATTACHED): 27⅛" x 40⅝"
- CUTTING CAPACITY : 3⅛" @ 90°, 2⅛" @ 45°
- ⅝" x 1¼" ARBOR ACCEPTS DADO BLADES
- FRONT & REAR QUICK-LOCK FENCE IS MICRO-ADJUSTABLE
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- APPROXIMATE SHIPPING WEIGHT: 220 LBS.

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10" LEFT-TILTING SUPER HEAVY-DUTY TABLE SAW

- MOTOR: 3 HP, SINGLE-PHASE, 220V
- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE (W/ WINGS ATTACHED): 40⅛" x 27"
- EXTRA-LARGE HANDWHEELS
- CUTTING CAPACITY: 8" L & 26" R OF BLADE
- MAXIMUM DEPTH OF CUT @ 90°: 3"
- MAXIMUM DEPTH OF CUT @ 45°: 2⅛"
- ⅝" DIAMETER ARBOR ACCEPTS DADO BLADES UP TO 13/16"
- APPROX. SHIPPING WEIGHT: 467 LBS.

MOTOR COVER & DUST HOOD INCLUDED

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THE ULTIMATE 14" BANDSAW

New!

- MOTOR: 1 HP, TEFC, 110V / 220V SINGLE-PHASE
- PRECISION GROUND CAST IRON TABLE: 14" x 14"
- 2 SPEEDS: 1500 & 3200 FPM

- CUTTING CAPACITY/THROAT: 13½"
- MAXIMUM CUTTING HEIGHT: 6"
- QUICK CHANGE BLADE RELEASE/TENSIONING
- TABLE TILT: 45° RIGHT, 10° LEFT
- FENCE: DELUXE EXTRUDED ALUMINUM
- FULLY BALANCED CAST ALUMINUM WHEELS WITH RUBBER TIRES
- BLADE SIZE: 92½" (¼" TO ¾" WIDE)
- BALL BEARING BLADE GUIDES
- 4" DUST PORT
- INCLUDES ONE ⅜" BLADE
- APPROX. SHIPPING WEIGHT: 210 LBS.

G0555 INTRODUCTORY PRICE

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17" HEAVY-DUTY BANDSAW

New!

- MOTOR: 2 HP, SINGLE-PHASE, 110V/220V, TEFC
- PRECISION GROUND CAST IRON TABLE: 17" SQUARE

- CUTTING HEIGHT: 12"
- CUTTING CAPACITY LEFT OF BLADE: 16¼"
- FULLY-BALANCED CAST ALUMINUM WHEELS WITH RUBBER TIRES
- DELUXE EXTRUDED ALUMINUM RIP FENCE
- BLADE SIZE: 132" x ⅛" - 1" (STANDARD ½")
- 2 SPEEDS: 1600, 3300 FPM
- 4" DUST PORT x 2
- TABLE TILT 10° LEFT, 45° RIGHT
- QUICK CHANGE BLADE RELEASE/TENSIONING
- HEIGHT FROM FLOOR TO TABLE: 37½"
- APPROX. SHIPPING WEIGHT: 321 LBS.

G0513 INTRODUCTORY PRICE

ONLY $750.00

19" HEAVY-DUTY BANDSAW

- MOTOR: 2 HP, SINGLE-PHASE, 60 Hz, 110V/220V, TEFC

- PRECISION GROUND CAST IRON TABLE: 19" x 19" x 1½" THICK
- CUTTING CAPACITY LEFT OF BLADE: 18½
- CUTTING CAPACITY HEIGHT: 12"
- 2 SPEEDS: 1700, 3600 FPM
- BLADE SIZE: 143" x ⅛" - 1¼"
- QUICK CHANGE BLADE RELEASE/TENSIONIN
- WHEELS ARE FULLY-BALANCED CAST ALUMINUM WITH POLYURETHANE TIRES
- DELUXE EXTRUDED ALUMINUM RIP FENC
- BLADE GUIDES: ROLLER DISC
- BLADE TENSION INDICATOR
- MICRO ADJUSTING GEAR TABLE
- 4" DUST PORT x 2
- TABLE TILT 10° LEFT, 45° RIGHT
- APPROX. SHIPPING WEIGHT: 383 LBS.

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- 1 HP, 110/220V, SINGLE-PHASE MOTOR
- 6" x 47" PRECISION GROUND CAST IRON TABLE
- RABBETING CAPACITY: ½"
- MAX. DEPTH OF CUT: ½"
- 3-KNIFE BALL BEARING CUTTERHEAD
- SUPER HEAVY-DUTY, CENTER MOUNTED FENCE IS 4" x 29¼"
- INFEED & OUTFEED TABLES HAVE HANDWHEELS FOR CONVENIENT TABLE HEIGHT ADJUSTMENT
- POWDER COATED PAINT
- STEEL STAND HAS BUILT-IN CHIP CHUTE
- APPROX. SHIPPING WEIGHT: 215 LBS.

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8" X 65" SUPER HEAVY-DUTY JOINTER WITH HANDWHEELS

- 1½ HP, 220V, SINGLE-PHASE MOTOR
- SUPER HEAVY-DUTY PRECISION GROUND CAST IRON BED
- 3-KNIFE CUTTERHEAD IS 3" IN DIA. AND RUNS IN SHIELDED, PRE-LUBRICATED BALL BEARINGS
- MAX. DEPTH OF CUT: ½"
- INFEED TABLE HAS RABBETING LEDGE
- HEAVY-DUTY CENTER-MOUNTED FENCE
- APPROX. SHIPPING WEIGHT: 450 LBS.

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8" X 75" JOINTER WITH 4 BLADE CUTTERHEAD

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- 2 HP, 110V/220V, SINGLE-PHASE MOTOR
- 8" x 75" PRECISION GROUND CAST IRON TABLE
- 3" DIAMETER CUTTERHEAD RUNS IN SHIELDED, PRE-LUBRICATED BALL BEARINGS
- MAGNETIC SWITCH WITH THERMAL OVERLOAD PROTECTOR
- 4-HSS CUTTERHEAD KNIVES ARE 8" x ⅛" x 1"
- MAX. DEPTH OF CUT: ½"
- CUTTERHEAD SPEED: 5500 RPM
- CUTS PER MINUTE: 22,000
- APPROX. SHIPPING WEIGHT: 461 LBS.

G0500

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12½" PORTABLE PLANER

- 2 HP, SINGLE-PHASE, 110V MOTOR
- MAX. CUTTING WIDTH: 12½"
- MAX. CUTTING DEPTH: 1/16"
- 2 HSS KNIVES
- FEED RATE: 25 FPM
- ON/OFF TOGGLE SWITCH
- MAX. CUTTING HEIGHT: 6"
- MIN. BOARD THICKNESS: 3/16"
- CUTTERHEAD SPEED: 8,540 RPM
- 57 CUTS PER INCH
- APPROX. SHIPPING WEIGHT: 85 LBS.

G8794

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15" PLANER

- 2 HP, 220V, SINGLE-PHASE MOTOR
- PRECISION GROUND CAST IRON BED
- CUTTERHEAD SPEED: 5000 RPM
- RATE OF FEED: 16 FPM & 20 FPM
- MAX. CUTTING WIDTH: 14½"
- MAX. CUTTING HEIGHT: 6⅛"
- MAX. CUTTING DEPTH: ⅛"
- NUMBER OF KNIVES: 3 HSS
- ALL BALL BEARING CONSTRUCTION
- APPROX. SHIPPING WEIGHT: 440 LBS.

INCLUDES STAND!

G1021

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20" PLANER

- 3 HP, 220V, SINGLE-PHASE MOTOR
- 25¾" x 20" PRECISION GROUND CAST IRON TABLE
- CUTTERHEAD SPEED: 4833 RPM
- RATE OF FEED: 16 FPM & 20 FPM
- MAX. CUTTING WIDTH: 20"
- MAX. CUTTING HEIGHT: 8⅝"
- MAX. CUTTING DEPTH: ⅛"
- NUMBER OF KNIVES: 4 HSS
- DUST EXHAUST HOOD HAS 5" DUST PORT
- APPROX. SHIPPING WEIGHT: 785 LBS.

4 BLADE CUTTERHEAD!

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OSCILLATING SPINDLE SANDER

- 1 HP, SINGLE-PHASE, 110/220V, TEFC MOTOR
- PRECISION GROUND CAST IRON 25" x 25" TABLE TILTS TO 45°
- STROKE LENGTH: 1½"
- FLOOR-TO-TABLE HEIGHT: 35½"
- SPINDLE SPEED: 1725 RPM
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- PERMANENTLY LUBRICATED BALL BEARINGS
- BUILT-IN 4" DUST PORT
- APPROX. SHIPPING WEIGHT: 300 LBS.

G1071

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24" DRUM SANDER WITH VARIABLE SPEED

- 5 HP, 220V DRUM MOTOR DRIVES 2 ALUMINUM SANDING DRUMS
- ¼ HP VARIABLE SPEED CONVEYOR MOTOR
- CONTROL PANEL WITH AMP LOAD METER
- HANDLES STOCK UP TO 23½" WIDE AND 4¼" THICK
- HOOK AND LOOP SANDPAPER INSTALLS EASILY ONTO THE DRUMS
- INDUSTRIAL RUBBER CONVEYOR BELT
- 2 - 4" DIA. DUST PORTS
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15" WIDE-BELT SANDER (OPEN END)

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- REQUIRES SINGLE-PHASE, 220V ELECTRICAL AND 50-70 PSI AIR.
- CONVEYOR SPEED 13 & 16.4 FPM
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- OVERALL DIMENSIONS: 61¼"H x 32½"D x 35"W
- APPROX. SHIPPING WEIGHT: 922 LBS.

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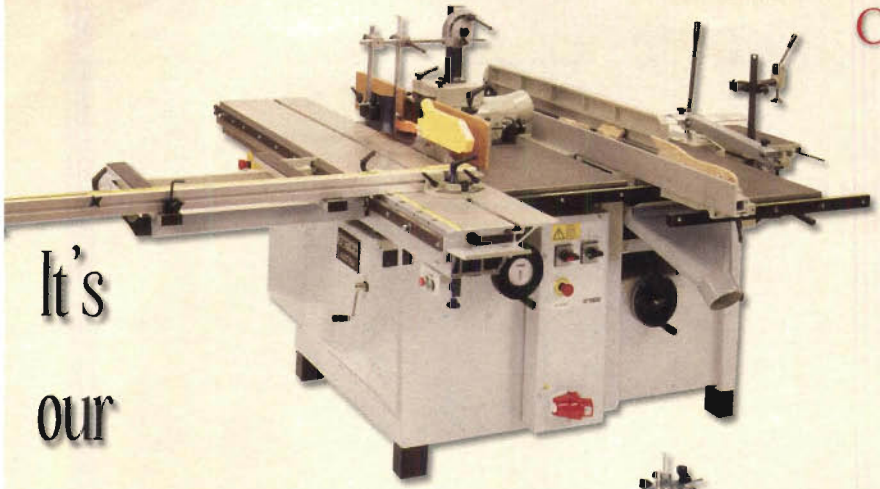

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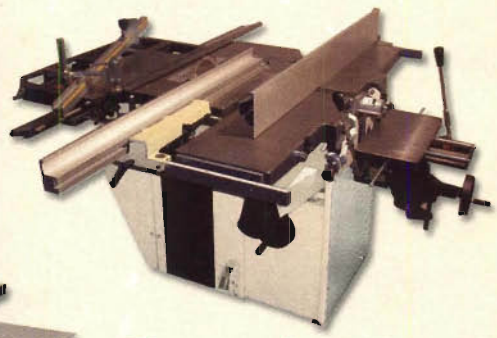

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The revolutionary X31 set new performance standards when we introduced it 14 years ago. Packed with features and powered by 3 separate 3 HP motors, home woodworkers can achieve results comparable with the best, fully equipped professional shops.

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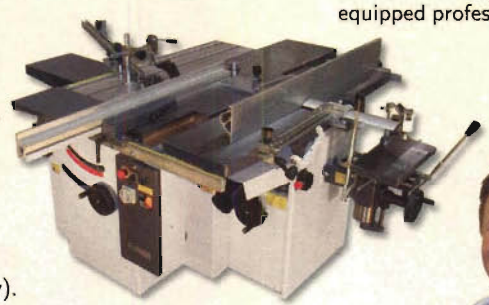

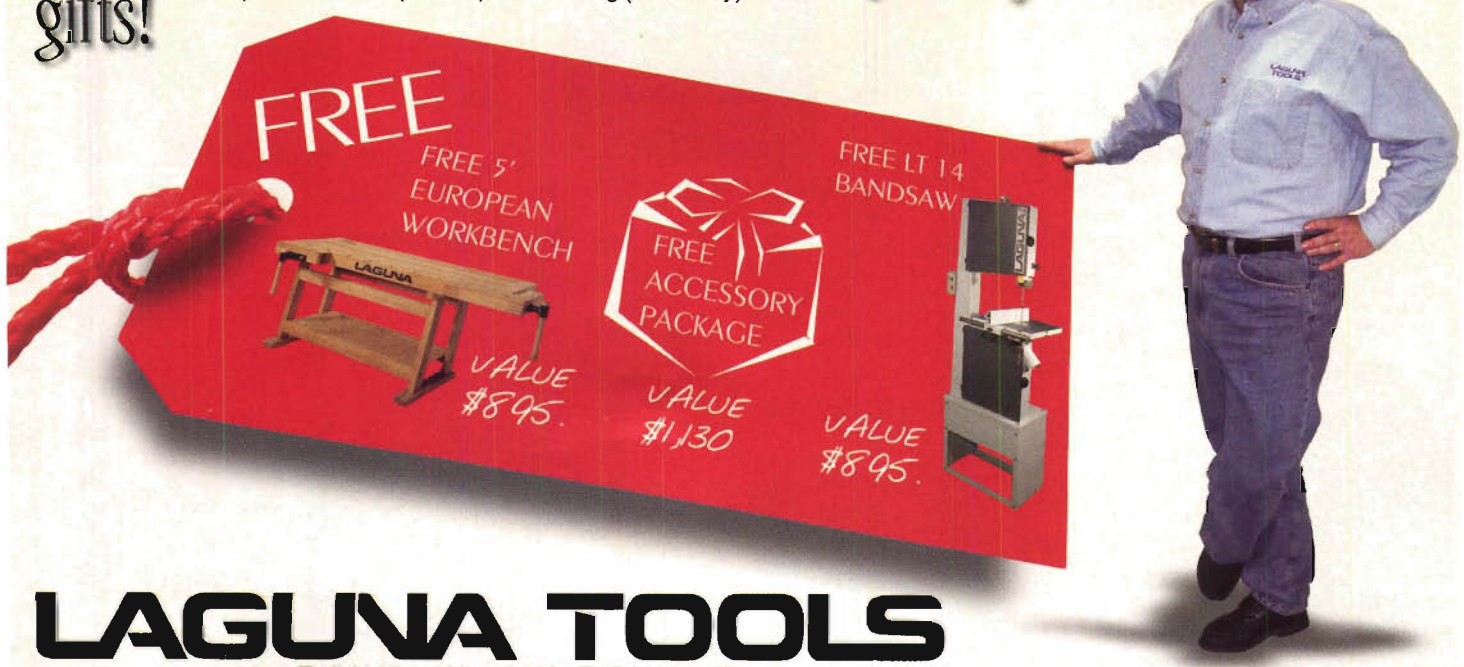

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Woodworker's Journal

Features

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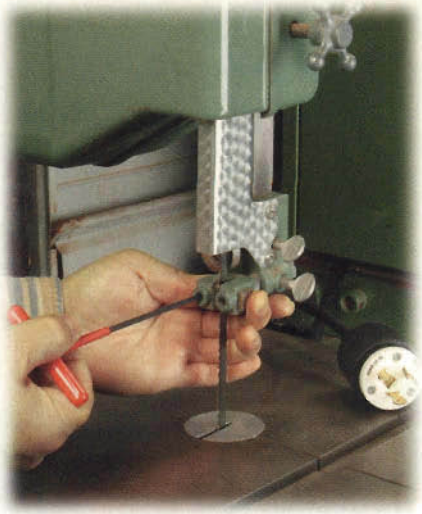

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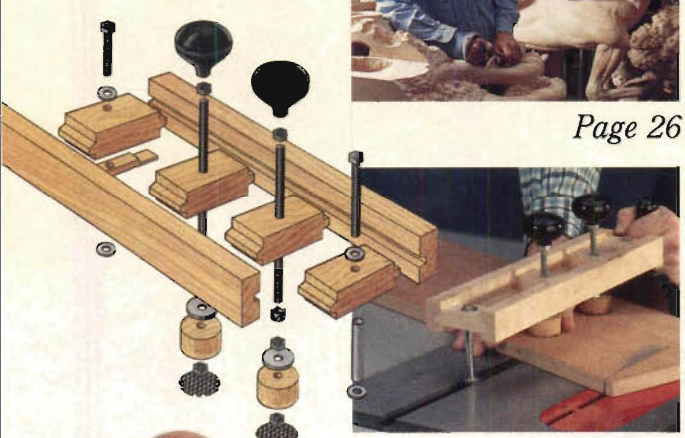

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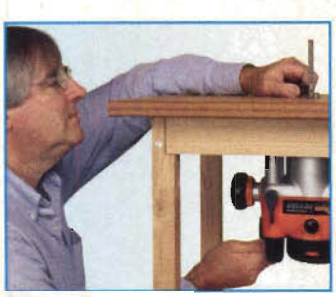

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Woodworkers

Techniques

Tools

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ONE CUTS THE PRICE OF PERFORMANCE.

Under $60
12amp Circular Saw
CSB121

Under $80
13amp Circular Saw
CSB131

THE OTHER CUTS AND CUTS AND CUTS.

THE HOME DEPOT

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CSB131 13amp
SKU# 312-053

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A Case of Drawer Envy

I've read the study drawer with case article in this issue *(see page 52)* about six times. And I learned something new each time. During a good portion of it, master woodworker Ian Kirby is explaining the single-lap dovetail or, as we Americans are more likely to call it, the half-blind dovetail. Asked about the nomenclature distinction, Ian told me, "you wouldn't call a double-lap dovetail joint a double-blind dovetail, now would you?"

This is where it got a little embarrassing. See, I've been editing this magazine for about 15 years (and have worked with wood longer than that). In all honesty, I've never really had an opportunity to call a double-lap dovetail a double-blind dovetail because ... well, because I've just never really come across either one.

And that, readers, is no small part of the joy of working with Ian.

"This study drawer is the classic method of making a solid wood handmade drawer," Ian points out, "and it represents the furniture maker's craft at its best. More than 30 steps are involved: no other furniture assembly poses more technical and methodological challenges."

That's important, but it's really Ian's infectious passion for the craft that makes me insist that all of you, long in the tooth pros and wet behind the ears apprentices alike, read Ian's article this time around. (And while you're at it, why not try building the study drawer and case?)

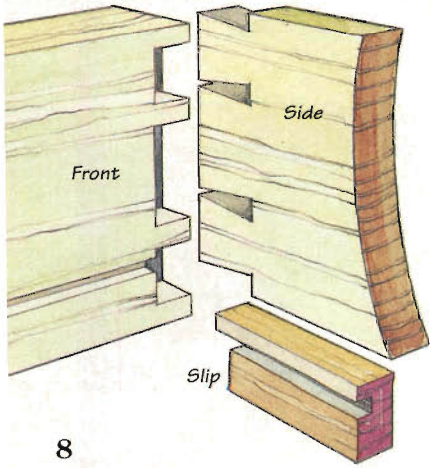
Who else writing about woodworking today says; "This drawer parades quality and elegance, starting with its feel and sound in use, especially as it is closed. Pushed by fingertip pressure, it slows down as air is forced from the case, and it makes a muffled clunk as it comes to rest." I don't know about you, but I'll be happy with my woodworking when my drawers start making muffled clunks as they come to a rest!

"Pushed by fingertip pressure, it slows down as air is forced from the case, and it makes a muffled clunk as it comes to rest."

You know, as good a woodworker as Ian is, he's an even better teacher.

Either way, he's a treasure, and I'm honored that he has chosen *Woodworker's Journal* as a primary channel through which to share a lifetime of woodworking knowledge.

Read this article — at least twice. Then drop me a line and try to convince me you didn't learn something new and important about our craft.



Larry N. Stoiaken

MAY/JUNE 2003
Volume 27, Number 3

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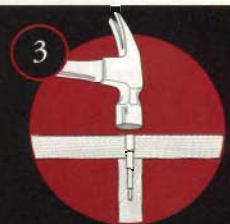
(2) Add glue & insert



(3) Tap down

U.S. Patent No. US 6,267,527, U.S. Patent No. D456,700

Available at: Woodworkers Supply®, Inc., Rockler Woodworking & Hardware, Hartville Tool®, Eagle America, PriceCutter.com Woodcraft, Acme Electric/Tool Crib, Amazon.com®, right-tool.com, Mathew Hall Lumber and Wood World.

(Circle No. 57 on PRODUCT INFORMATION form)

LETTERS

For His Next Miracle ...

Michael Dresdner: Good at finishing or "finishing god?"

Mail Call! Contact us by writing to "Letters", Woodworker's Journal, 4365 Willow Drive, Medina, Minnesota 55340, by fax at (763) 478-8396 or by e-mail: letters@woodworkersjournal.com We ask that all letters, including e-mails, include a mailing address and phone number. We reserve the right to edit for length and clarity.

Divine Finishes

Thank you, Michael Dresdner — you are a finishing god. I had been experimenting with spraying polyurethane, and had some pretty crappy results. I was almost ready to buy some lacquer and retarder when I read *Finishing Thoughts* in the December 2002 issue.

I bought some acetone Saturday and shot the finish on two jewelry boxes yesterday and today. I got some great results.

George "Bobby" Campbell
Pooler, Georgia

WJ Responds: You can be sure that Michael's advice has been the answer to other readers' prayers, too!

Two Bits on Drill Presses

Just wanted to put my two bits in on the road test of the various drill presses (*Tool Review*, February 2003).

As much as I hate to admit it, Craftsman has a very good machine in that model (22920N). It closely matches the very best industrial machinery available. I have always rejected Craftsman due to their nonstandardization of manufacture. However, in this machine, they did exceed my requirements. It surpasses the other machines in the article, especially for the amount of cash outlay.

Merv Denman
Keller, Texas

I have no problem with any of Mr. Marshall's choices or critiquing in his review of current drill presses on the market. I love 'em all.

I have in my shop an ages-old Walker-Turner that I traded for in the early 50s. It was my good fortune to have worked in a diversified machine shop as a combination person. In this capacity, I had access to the boneyard and came by a phased-out 3/4 HP D.C. motor with the controller. I modified the motor mounts and used the motor with the controller on my drill press for many years.

Gerald Thomsen
Junction City, Oregon

Rating Tool Reviews

Sorry — I disagree with Larry Stoiaken on the merits of tool charts (*On the Level*, February 2003). Sure the information is out there, but having it all in one place makes comparisons easier. If I'm looking for a specific feature, I can find the "best" tool. I bought my Porter-Cable 7518 that way. Ain't much good for anything but a router table, but d**n, it's the best router table router out there.

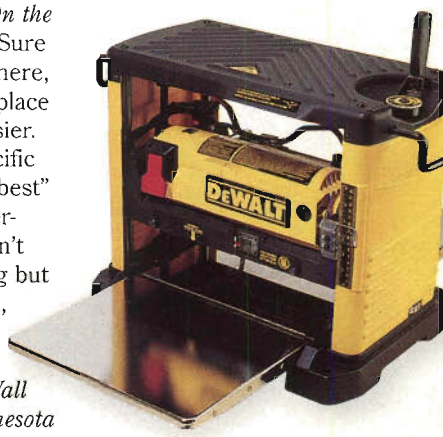
Jim Wall
Roseville, Minnesota

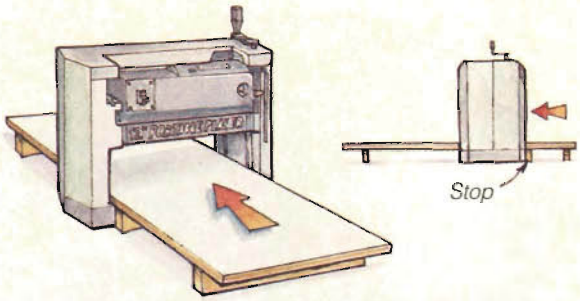
WJ Responds: Our choice continues to be getting the benefit of our reviewer's experience and research. We put a higher value on that information than on a collection of manufacturer-supplied specs.

Snippets on Snipe

I just purchased a new DeWalt DW733 planer just like the one in *Questions & Answers* (February 2003). If you lock the cutterhead each time you run a board through you should NOT have a problem with snipe.

It really is necessary only to do so for the final one or two cuts, from my experience. It is important, however, to check the table extension alignments. The





This solution for snipe shown in the February 2003 Questions & Answers should accommodate outfeed tables.

instruction manual gives the proper alignment for the infeed and outfeed tables.

Gerald L. Steele
Starbuck, Minnesota

I own a DeWalt model DW733 planer myself and have figured out how to eliminate [snipe] almost completely, and it requires no additional construction of infeed and outfeed tables.

Make sure the machine is set up properly in accordance with the manual and then try feeding your stock through the machine at as much of an angle as it can take. The infeed and outfeed rollers and cutterhead all accept the board gradually, starting with the corner, and leave the board gradually, ending with the corner.

Obviously this is not possible with a 12½" board or anything super long, but most of the time it is possible. A lot of the time, I will send a piece of wood through the machine and and let it hit either side guide and straighten itself out as it is pulled through. It works like a champ.

If you can get some angle on the infeed, the snipe will practically disappear. I guarantee you will be delighted and amazed.

Martin Carlson
Houston, Texas

Lift the board slightly as it enters and leaves the machine. If you miss, a woodscraper will clean up the ridges and eliminate cutting your board.

Robert Gutchess
Canon City, Colorado

I found that waxing the bed of the planer with automobile wax fixes the problem. As soon as I notice sniping, I wax. Believe me, it works!

Dave Ross
Apple Creek, Ohio

Barry's "Real America"

My comments are directed to the story about "The Perfect Vacation: A Week at

Michael McCrary (above) had a good vacation, but Barry Nelson isn't happy about it.

Anderson Ranch" in the February issue (*Shop Talk*). Why didn't you just edge the article with lace and cute little animals to make us have an even more warm and fuzzy feeling? It's just so

continues on page 12 ...

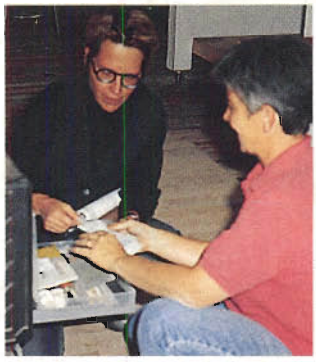
sweet that Michael had a wonderful time with Teri and Susie.

Cr*p!!!!!!!

I'm getting so sick and tired of seeing so-called experts in sewing, ceramics, painting, drawing, arts and and crafts — oh, and also woodworking — lending their expertise in woodworking. I'm sure that they have hammered a few nails in a block of wood. If they want their views known, then go start their own women's woodworking magazine and stay out of my workshop.

If you're running out of veteran woodworkers to staff this magazine, then you better get out of the city and into real America. I know quite a few men that are more than fit to staff a real woodworking magazine.

Barry C. Nelson
Kalamazoo, Michigan



Susan Working (back) is director of the woodworking program at Anderson Ranch. Teri Masaschi (front) is a finisher, conservator and restoration expert.

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

If you spray your power tool with a non-silicone product, you won't have to worry about any evil, lingering silicone nodules.

Lingering Silicone

In the December 2002 *Woodworker's Journal,* I ran across a "Trick of the Trade" by Walter France advising people to spray silicone lubricant on the gears of their table saws. Silicone sprays are excellent lubricants, but they are also finish contaminants. Most lacquers and paints will "fish-eye" horribly from the presence of even trace amounts of silicone. Unfortunately, once the aerosol is released in the shop, it may take years for the contamination to dissipate.

John Kriegshauser
Chicago, Illinois

WJ Responds: Silicone spray might not be my first choice for lubricating a table saw, but it does provide a convenient way of applying lubrication to hard-to-reach trunnions and gears. To prevent finish contamination, though, the professional woodworkers I know lubricate their machinery with non-silicone based spray products, such as Boeshield T-9® or Bostik TopCote®. Most of these sprays dry after application, so they don't attract dust as readily as "wet" lubricants.

However, it's ultimately better to clean and lubricate your table saw at least once a year than to worry about the specific kind of lubricant you use. Lubrication reduces friction and wear on mechanical parts and also prevents rust and corrosion from forming, a real problem in shops located in damp climates.

— *Sandor Nagyszalanczy is the author of* Power Tools *and our shop maintenance expert*

As Sandor points out, other lubricants may be better, but don't be too worried about silicone. Spraying silicone on the gears and trunnion is not likely to cause it to land on much else, and since your wood does not come in contact with the gears, the likelihood of contamination is fairly low. In the event that you do get a light mist of airborne silicone on a piece you are about to finish, there is an easy fix. Use Zinsser SealCoat™ as your first coat of clear finish (after the stain) and it will seal in the silicone. After that, proceed with whatever top coat you desire, since all of them are compatible over SealCoat.

— *Michael Dresdner is the author of* The New Wood Finishing Book *and our finishing expert*

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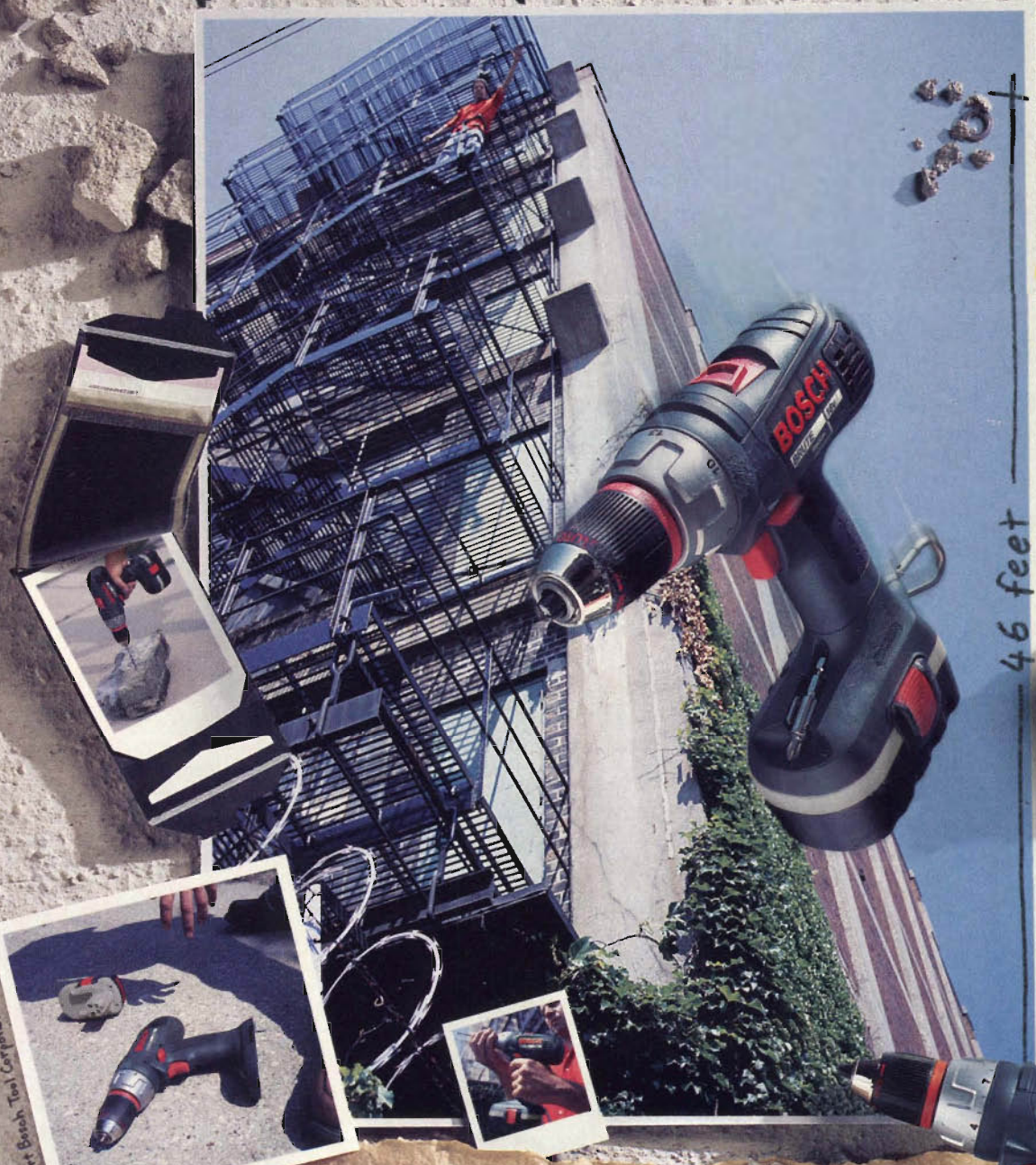
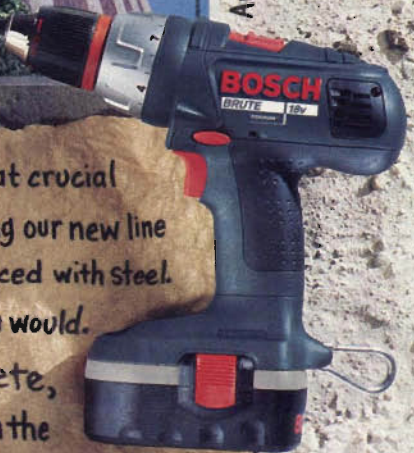
People Drop Things.





Amazing, But True.

Plates of food, overfilled grocery bags, footballs at crucial moments, and power tools at work. We kept that in mind while designing our new line of cordless power tools. The collar of our Brute Tough™ drill is reinforced with steel. Its Body Armor™ is so durable, you could drop it forty-six feet. Not that you would. But we did. And despite taking a mean bounce off unforgiving concrete, it came up working. We dropped it again. Another forty-six feet, put in the drill bit, and bore a good two inches into concrete as payback. Downtime? Not hardly.

See it at boschtools.com Attorney Alert: Do not try this test at home. Or at work.

(Circle No. 86 on PRODUCT INFORMATION form)

How to Avoid Dangerous Spinout

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

Q A photo in "Drill Press Showdown," (February 2003) exhibits a situation that nearly cost me the end of my left ring finger. I was using a 2¼" Forstner bit and holding the workpiece with my left hand against a fence, without clamps. The bit engaged the wood and its rotation pulled the wood to the right, with my hand following.

Dr. Alan E. Tasoff
Northfield, New Jersey

A If you were plunging the bit into the wood, a fence should have counteracted the bit's clockwise rotation on the left-hand side. Maybe your fence slipped loose, but more likely the mishap occurred when you raised the bit and it lifted the workpiece up and over the fence. Sometimes hand pressure alone isn't enough when this sort of jamming happens.

The best insurance against Forstner bit calamities like this is to clamp workpieces against the table and fence. A clamp or two wrapped around the fence should hold smaller workpieces steady; or you can clamp them in a drill press vise. When drilling holes into the faces of broader boards, clamp a couple of scraps to the fence on either side of the bit and down against the workpiece face. To drill into the ends or edges of a large or long workpiece, tip the drill press table vertically and clamp the board against the table.

Also, be sure to select the correct speed for the bit size you're using. Clean accumulated crud off your bits to minimize friction, and keep them sharp. Toss any bits that don't spin in a straight axis. Finally, go easy on the quill handle and let the bit do the work. This way bits will cut smaller chips and clear them efficiently.

— Chris Marshall

Most drill presses have a bit speed chart inside the top pulley cover — just one way you can increase safety.

Q What is the best way to support a drawer when not using hardware? Approaches I have seen include: supports at the lower corners, a single bottom center support, sometimes dovetailed, and supports on the two sides. Which is best, and why?

Gary Hordemann
Spokane, Washington

RECALL NOTICE!

Recalls are in effect involving Ryobi drills, Makita circular saws and Northern Tool air compressors.

The on/off trigger can stick or the lock-on button can jam on model number HD501 Ryobi hammer drills.

The lower blade guard can become jammed on the Makita model 5740NB 7¼" circular saws.

The capacitors can overheat on model 191000 and model 192000 2½ HP Northern Tool air compressors.

For more information, visit: www.cpsc.gov or contact the manufacturers at their recall hotlines, shown below:

Ryobi:
800-867-9624
www.ryobitools.com

Makita:
800-462-5482
www.makitausa.com

Northern Tool:
800-222-5381
www.northerntool.com

A There is no single best way to do any woodworking task. The task you expect the drawer to perform determines what slide method is best suited.

If the load is light and the drawer is not exceedingly tall, then a single, bottom-center support is fine. It is easy to install and mounts easily to both web frames and solid bottoms. If the drawer is taller or the load heavier, wooden slides which run in matching grooves (attached either to the drawer or the carcass) are a better idea.

Ian Kirby demonstrates the Arts & Crafts philosophy of drawer building in an article starting on page 52.

Another option is simply sliding the drawer on the bottom edge of its sides. Each option serves a specific need best. Over the course of time, the Arts & Crafts movement has striven for years to determine the "best" design, material and methods for all aspects of woodworking, and Ian Kirby shares the results of the drawer philosophy in this issue.

— Rob Johnstone

Q I purchased a 2 HP air compressor/finish nailer kit and figured it was all I would ever need for my woodworking hobby. When my son-in-law wanted help framing his basement, I thought this compressor

continues on page 16 ...

THIS ISSUE'S EXPERTS

Jorge Silveira *is the product line manager, pneumatic and benchtop, for Porter-Cable tools.*

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

Rob Johnstone *is the editor of* Woodworker's Journal.

Sandor Nagyszalanczy *is a power tool expert and author of* Power Tools *from Taunton Press.*

While a 2 HP compressor is fine for a 2½" finish nailer, a larger tool will use more air — and will likely need a larger compressor.

would be adequate to run the Porter-Cable FR350 framing nailer. I didn't think we were taxing the compressor at all, when it broke its belt. I was then told by the people who helped me repair the compressor that the small pancake compressor doesn't like the big framing nailer. Do I have to buy a larger compressor to run both nailers?

Richard Monroe
Williamston, Michigan

A Larger nailers have greater air consumption than smaller nailers. The larger nailers have larger cylinders to meet the power requirements needed to drive larger fasteners. So, the larger tools use more air per shoot and thus require larger compressors. Examples of different air requirements are listed in the chart below.

Porter-Cable provides a chart in our catalog that shows each compressor's capability in different applications. An additional guide I use is to recommend a pancake compressor for finish and smaller nailers. I recommend a side stack compressor or a larger compressor for framing and roofing nailers.

— *Jorge Silveira*

Nailer type	Air Consumed per Shoot (Approximated at 90 PSI)
Brad Nailers	.03 to .04 CFM
Finish Nailers	.04 to .05 CFM
Framers	.08 to .09 CFM

Q I have just had to replace the motor on my three-year-old 10" table saw. The repairman said I could have prevented this by periodically removing the brushes and blowing out sawdust that accumulates in the brush holes. Is this true?

Bob Carona
Jacksonville, Florida

A It's impossible to say, without knowing all the variables, whether cleaning your table saw's motor would have prevented its demise. Both portable power tools and machines with vented universal-style motors, such as the one on your contractor's saw, are always susceptible to damage from dust and chips. In the very dusty environment inside a running table saw, sawdust is sure to enter the motor and cause wear, especially if the saw is used without dust collection. It's even possible that a specific event, such as a single chip falling into the motor, could ruin the brushes and/or commutator bars. That's one reason that more expensive machines use totally enclosed, fan cooled motors — they keep sawdust from getting in and wrecking havoc.

You can remove the brushes and blow the motor clean with compressed air, but the force of the air can actually propel chips farther into the works where they can cause problems.

— *Sandor Nagyszalanczy*

WINNER! *For simply sending in his question on drawer supports, Gary Hordemann of Spokane, Washington wins the* **Bosch 1613AEVS router** *shown above. Each issue we toss new questions into a hat and draw a winner.*

Keeping your table saw clean will keep your motor running — and make blade height and tilt adjustments easier.

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Roll Crimper Fools No One

What's This?

David Luettgerodt from Bruce, Wisconsin sent in the tool above. It says "Stanley" and "Pat. Jan. 31-88," and it adjusts from 3" to 5" under the wing nut. Know what it is? Send in your answer for a chance to win a prize!

If you have your own woodworking mystery tool (or the answer to this issue's entry), send it to Stumpers, *c/o Woodworker's Journal, P.O. Box 261, Medina, Minnesota 55340. Or send us an e-mail:* jtakes@woodworkersjournal.com

Slow But Sure

The gizmo with the handle and crank, shown in the February issue of *Stumpers*, took nearly two minutes of recollection (golden years slowdown), but then I realized that I was staring at a vintage shot-shell crimper.

James A. Rohrich
Williamsburg,Ohio

Load 'Em Up:

Golden years or not, James, your shot hit the mark. Over 300 other readers agreed with you about the tool sent in by Texans **Douglas Tiller** and **Nadine Rogers**.

The name of the tool? A "roll crimper," says **Thomas "Possum" Whatley** of Swansboro, North Carolina. "Crimping the shell is the last step of the loading process of a shotgun shell," notes **David Harris** of Richmond, Texas.

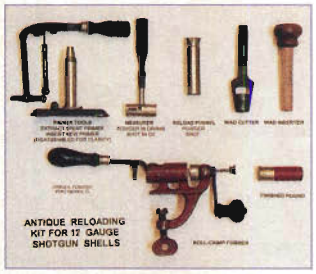
"The primer was first installed in the brass end of the shell, then the powder charge dumped into the open end," says **James** of Ohio, whose letter is above. "After the gunpowder, a wad (or wads), usually discs of felt or hard cardboard, is inserted over the powder. The loading is finished by pouring in a pre-weighed charge of shot (pellets of lead)."

"An overshot wad (a thin cardboard wad) kept the shot from falling out," said **David R. Schmidt** of San Jose, California.

Over 300 replies from as far away as Beijing, China to this mystery tool's use may have crimped our mail carrier's style ... and step.

"The screw on the bottom of the tool was intended to fasten to a table or other workplace," said **Keith Sacane** of Clovis, New Mexico. "The filled shell would be inserted into the tubular guide," said **Roy Dean** of Beijing, China. "Then you would push the levered arm against the brass base of the shell while turning the crank handle, which rolled the paper part of the case down tight against the front wad," said **Gregory R. Berg** of Hammond, Indiana.

"The diameter of the [cylinder] ring determines the gauge of the shell" to be loaded, said **Arnold O. Kohn** of Chaska, Minnesota. "You need a separate tool for each gauge."



Carle A. Forster of Port Richey, Florida, inherited this reloading kit — with all the pieces — from his grandfather (1870 - 1958), "who used it to put meat on his family's table."

"Modern shot shells are made of stiff plastic," said **Ernie Peck** of Manhattan, Kansas. "They use a six- or eight-fold crimp that also acts as the 'top wad' that holds the shot."

Tools like the Texans', however, "were very popular from the late 1800s until the 1960s," said Master Sergeant **Karl E. Brugman** of Fort Bragg, North Carolina. "The average hunter could reload his shotgun shells extremely cheap. Also, it was usually a long way to the local store. (Wal-Mart wasn't open 24/7 then.)"

In fact, noted **Donald M. Lowe** of Silverton, Oregon, "My grandfather was a market hunter in the Mississippi flyway in the 1890s. They would shoot ducks all day and reload the empty casings at night for the next day."

— Joanna Werch Takes

WINNER! *Chris Marks of Metairie, Louisiana, wins a Fein MultiMaster Starter Kit. We toss all the Stumpers letters into a hat to select a winner.*

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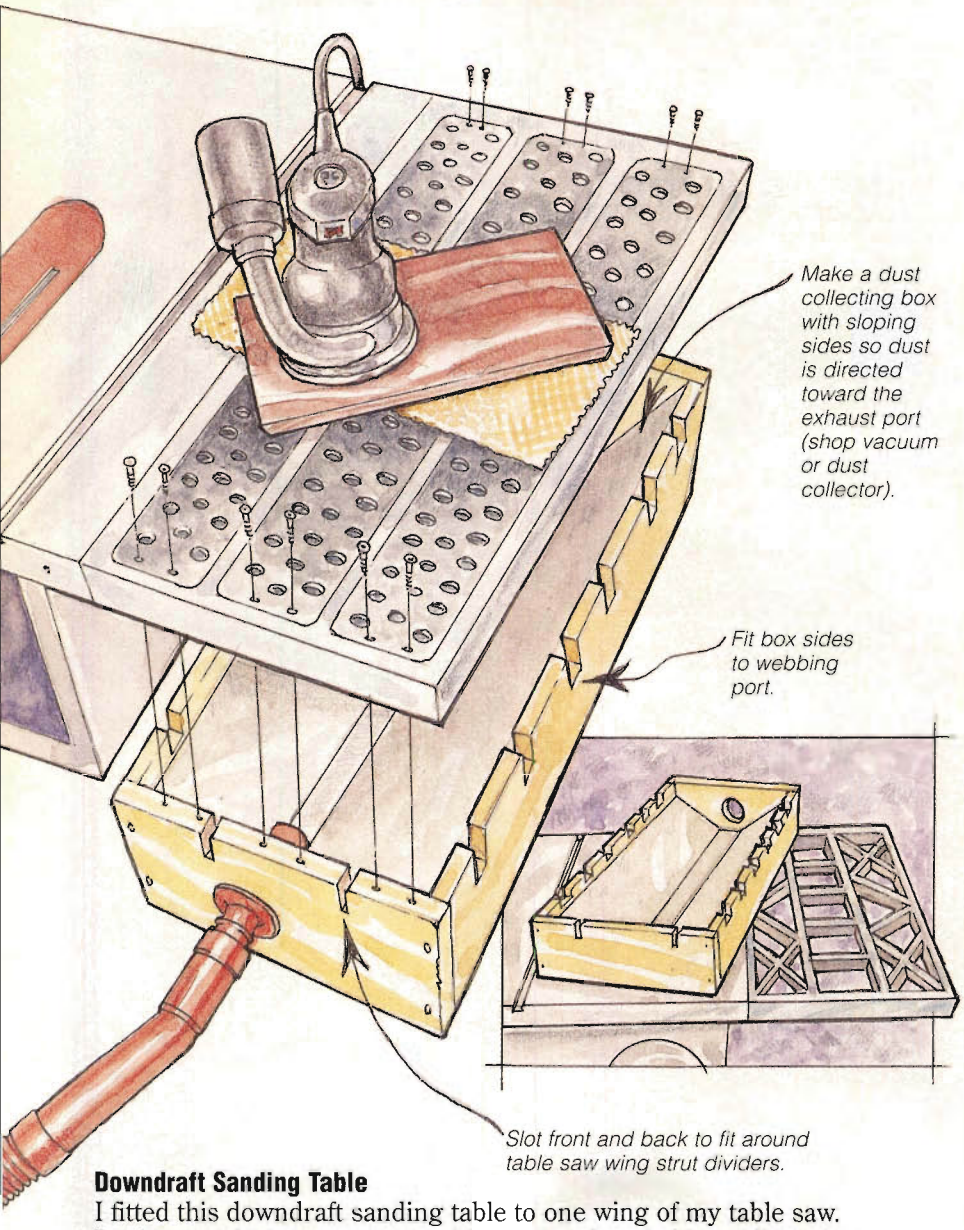
(Circle No. 98 on PRODUCT INFORMATION form)

Making the Most of What's in Your Shop



Downdraft Sanding Table

I fitted this downdraft sanding table to one wing of my table saw. It takes up almost no space and has no enclosed sides to limit the size of the workpiece being sanded. The top surface has 1/2" dust collection holes drilled on 1" centers. I use a narrow piece of kitchen shelf liner to hold the workpiece while sanding.

Barb Siddiqui
Wenatchee, Washington

Compressor Alert

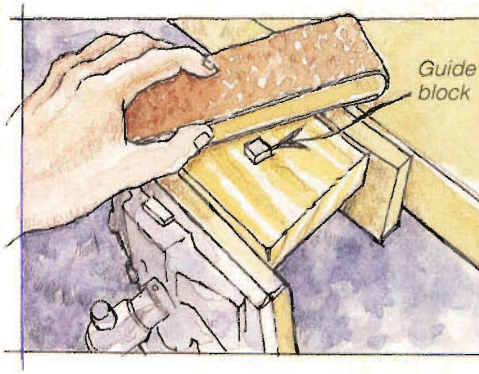
An unattended air compressor is nearly as dangerous as a boiler. I recently had the pressure switch stick on my unit, and it got up to 400 psi before I realized what was happening.

As a reminder to turn it off when leaving the shop, I wired the hot side of the pressure switch to a lightbulb. Now, when I turn off the lights and one remains on, I know exactly what I have to do. Using a red bulb would be an even more forceful reminder.

Damon McGaha
Russell Springs, Kentucky

New Life For Guide Blocks

When the steel guide blocks used in most band saws become grooved and worn, they can easily be resurfaced. Drill a hole in a piece of hardwood so the guide block fits snugly. Place the wood on a flat surface and force the guide into the hole until it is flush with the bottom. Now dress both wood and metal down on a belt



sander until you have a clean, smooth surface. Do the other side in the same way. If you don't have a belt sander, clamp block and guide in a vise and dress it down as shown above.

Dwayne Glanton
North Little Rock, Arkansas

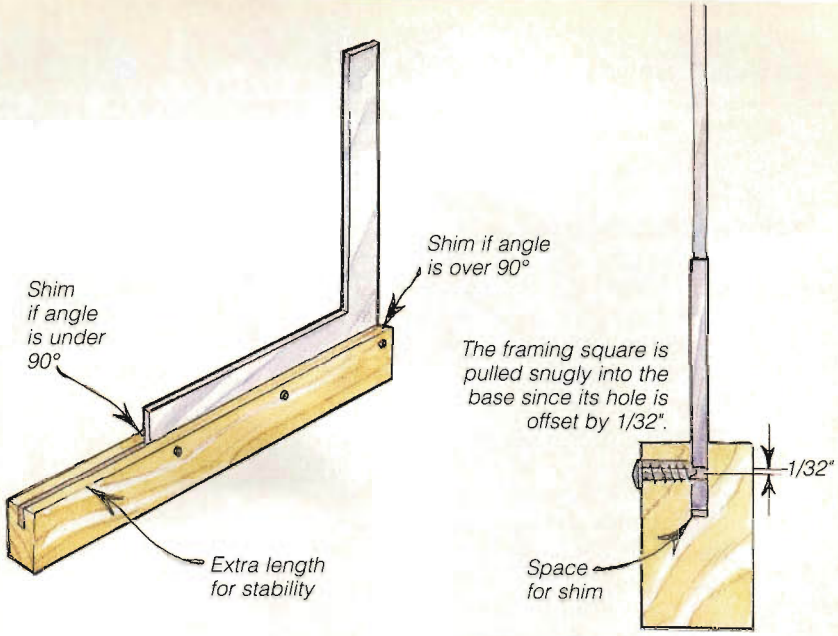
Refined Framing Square

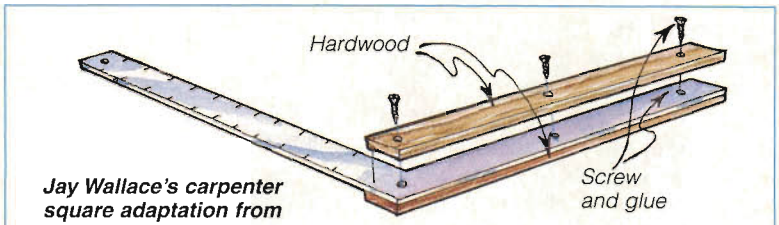
Here's a refinement to Jay Wallace's Trick of the Trade that appeared in the *April 2002* issue. My approach allows the right angle to be slightly corrected if necessary.

Cut a strip of stable hardwood about 1½" by 7/8" and slot it with a thin-kerf blade. Drill three 1/8" holes, insert the framing square and lightly mark the metal with the drill bit. Now center punch 1/32" closer to the reference edge and drill through.

The screw tips pressing against the holes will provide constant, inward pressure. Additionally, you can now adjust the square to an exact right angle by inserting a thin shim at whichever end needs it.

Robert England
Eugene, Oregon





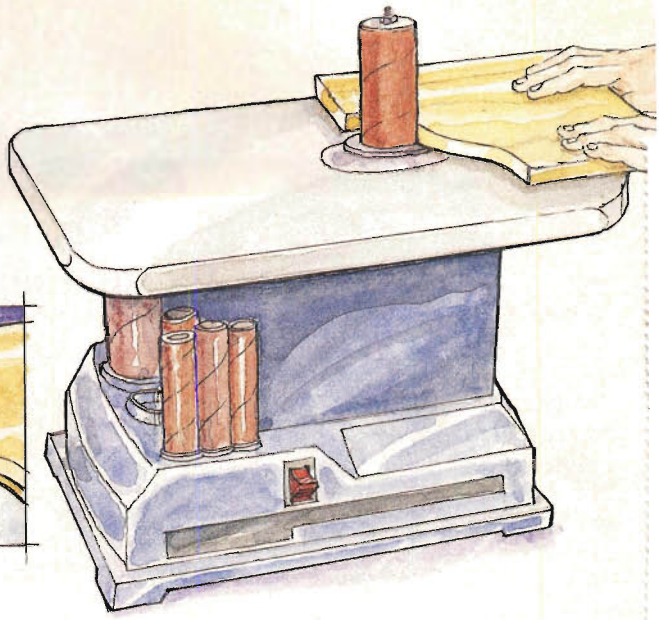
Jay Wallace's carpenter square adaptation from our April 2002 issue.

Tricks continues on page 22 ...

Spindle to Pattern Sander

I recently bought a spindle sander and soon realized that with a minor modification it would work pretty well as a pattern sander. I had the local machine shop make a new insert from aluminum, as shown in the drawing. Now I create a template with a 3/8" offset for each piece I have to sand. It works like a charm, eliminating "hard spots" in the finished work.

Jim Slosson
Olympia, Washington



Jewelry Boxes

For lining round and odd-shaped jewelry boxes, I came up with this easy transfer technique. I apply a thin layer of carpenter's glue to a oversized sheet of posterboard, lay the velvet or felt over it, then weight it down with a few telephone directories or other readily available heavy weights.

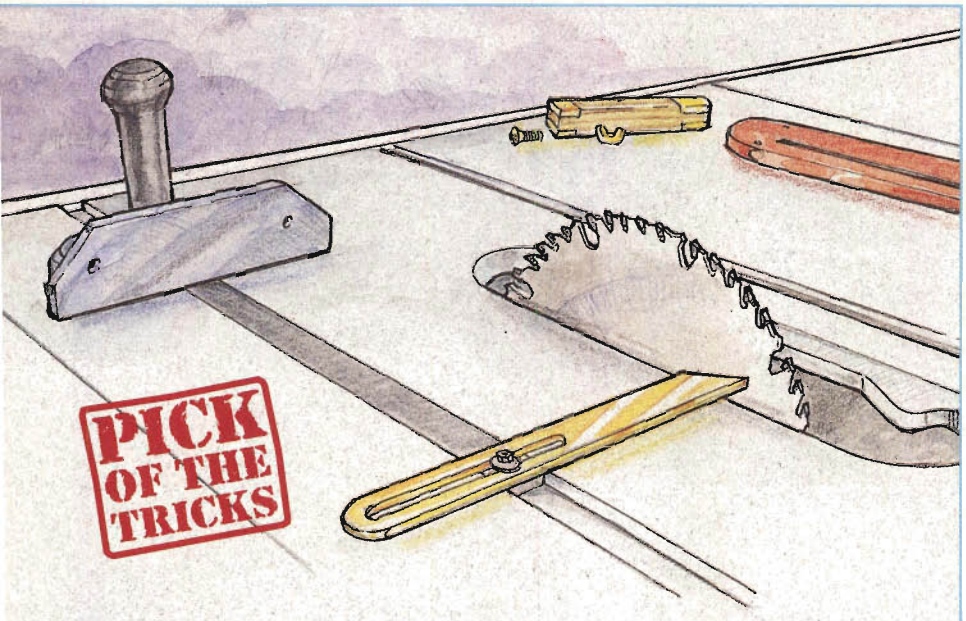
After the glue has cured, I turn it over, trace the outline of the box or drawer on the posterboard and simply cut the shape out with some sharp scissors.

Gary MacKay
Myrtle Beach, South Carolina

Guide for Drawing Curved Lines

As an aid in drawing smooth curves, you can't do much better than a freehand effort using a piece of #12 two- or three-wire Romex such as that used in house wiring. Just bend it to the desired shape and run a pencil along one side of it. Use pushpins if you need them to hold the wire in position. It may not be as satisfactory as a flexible rule, but I find that it smoothes out the ripples as compared to drawing curves by hand.

Ralph Wilkes
Penn Yan, New York



Aligning Table Saw Blades

I recently knocked my table saw blade's alignment out of kilter and had to readjust it. After some false starts, I found a low-cost and easy answer. I took the blade out of my bevel gauge and the washer off the bottom of my miter gauge, and used the screw to mount the bevel gauge blade on top of the bar. This gave me a pointed tip that I could slide back and forth to check alignment. It was flush with the table saw surface, easy to adjust — and didn't cost me a dime.

Ray Vojtash
North Plainfield, New Jersey

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In addition to our standard payment (below) Ray Vojtash of North Plainfield, New Jersey, 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. Or send us an e-mail:* **tricks@woodworkersjournal.com**

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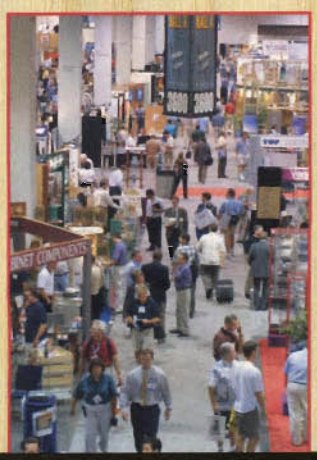

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Boats to Bouts: Our Editors Widen Their Horizons

Mike McGlynn: Luthier

Class Hits the Right Note

Today, it seems, just about everyone feels like they can build a guitar. Much of the blame for this can be laid directly at the feet of Charles Fox. Hardly a guitar maker alive today hasn't been touched by Charles' hand, either through his teaching, his innovative construction methods, or his countless tool and jig designs.

In summer 2000, I attended a one-week seminar about guitar building at Charles' American School of Lutherie. The class was rewarding and inspiring enough that I returned this past fall to attend an intensive, hands-on, course that would see me build, from beginning to end, a steel string acoustic guitar in two weeks!

Each of the six students in the class — ranging in age from 18 to 62 and in woodworking experience from none to my 20-plus years — would build a guitar, minus the finish, in two weeks. Of the six, four had either built or attempted to build a guitar before.

We could choose to build one of six different models of guitars: two classical and four steel string. The class split right down the middle with three choosing to build classical models and three, myself included, choosing to build steel string models. I decided to build an OM model, which is a medium size

guitar. Charles and his wife Denise had said that all tools would be supplied but, being pretty attached to my own hand tools, I did take along a handful of chisels and my block plane.

On the first day we did all of the following: select body style, make 1/2 pattern of body, select wood for the sides and back, match sides for figure and cut to shape, bend the sides, cut out back oversize, glue on and profile back strip, fit and glue on the back braces, select top wood, joint and glue up top. The following days brought more of this same intensity and, though the days were long, they just flew by!

Some of our tasks included: shaping the rim edge, carving the back braces, and gluing the rim to the back to form the "boat." On day four, "soundboard day," we inlaid the sound hole binding, braced the top, cut out the sound hole, and glued the top to the "boat." In the end, we worked, on average, nine hours per day and took one day off.

In a true testament to Charles and his assistant Cameron Carr's teaching skills, everyone in the class left with an accomplished-looking and -sounding guitar. This was in spite of some of the inevitable mistakes that come about when inexperienced, or even experienced (ahem), people take on a new and difficult challenge.

When I returned home I finished the guitar, per Cameron's detailed instruction, with an innovative Super Glue fill and several coats of water-based lacquer.

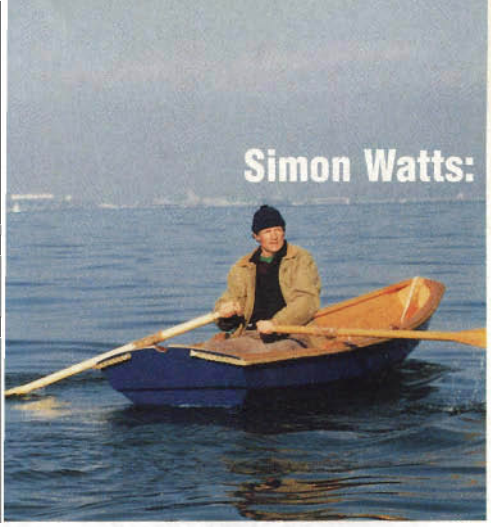
Charles Fox, above, is the inventor of the sidebender machine, now used to form the bouts of nearly every guitar manufactured.

My class was in California, but Charles has since moved his school to Portland, Oregon, a hotbed of lutherie. He can be reached at *www.americanschooloflutherie.com*; 707-431-9530.

— *Mike McGlynn*

Mike and his classmates challenged their woodworking skills and built "something with an intangible quality of mystique" in class with Charles Fox (left) and Cameron Carr (white shirt).

WJ contributing editor Mike McGlynn's guitar class was "the most personally rewarding experience of my professional career."



Simon Watts: Messing About With Boats ...

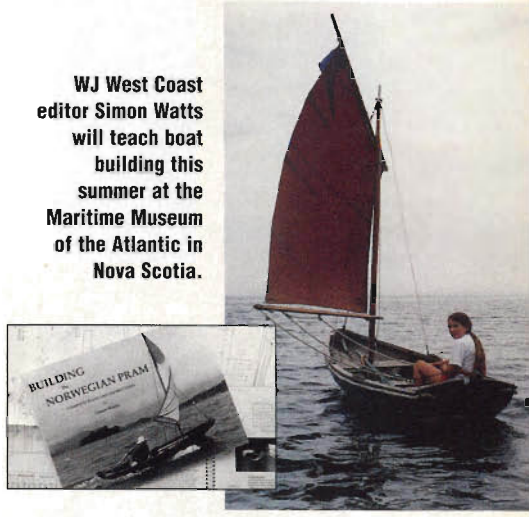
... And Making Plans

Simon Watts had always been interested in boats, but the first one he tried to build did not turn out well. "I got so disgusted I cut it up and put it in the stove." Five years later, he ordered a boat from a traditional builder in Nova Scotia and jokingly asked if he could help make it. The answer: sure. "It was one of those happy accidents," Simon says of his Canadian apprenticeship. The Nova Scotians were "completely nonromantic and starry-eyed about boats, but they were fast," he said. They built about a boat a week.

That worked out well for Simon, who ended up teaching six-day courses in which students learned all the steps in building a traditional boat. Simon compiled manuals on each of the designs built in the classes: the 11½' Norwegian pram, a 10' Nova Scotian skiff and the Petaluma, a 19½' rowing shell. Now, he's offering a revised edition of the manuals, to woodworkers of moderate skill who want to build a boat.

Machinery needs are few — just a band saw and access to a thickness planer — as it's mostly hand tool work. "Almost every part of a boat is curved in some way," Simon commented. The most useful aspect of the manuals, Simon says, are plans showing important items — molds, transom, stem, knees and other vital parts — at full-size. No need for lofting or to enlarge the drawings. Each manual costs $45 and is available by fax at 415-885-5613 or through *simonawatts@earthlink.net.*

— Joanna Werch Takes



WJ West Coast editor Simon Watts will teach boat building this summer at the Maritime Museum of the Atlantic in Nova Scotia.

continues on page 26 ...

A Carving Joyride ...

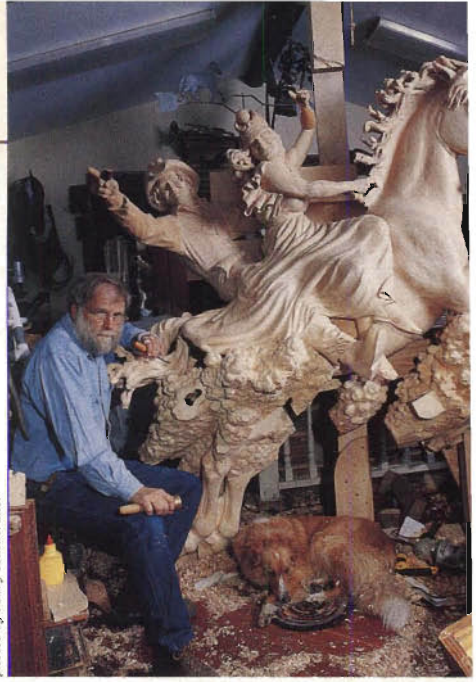
Cogelow Rides High

Fred Cogelow's last name is pronounced like two of the stereotypical staples of a Minnesota diet — "cod-Jell-o®" — but his carvings are certainly not provincial.

The 53-year-old is widely known for works he fashions out of his signature butternut. He's also done three commissioned pieces in basswood — one of which is "Joyride," done for the school district in his town of Willmar, Minnesota.

"Joyride" is allegorical, Fred says, relating to the exploration of space. In particular, it's meant to resonate

with the space exploration of George "Pinky" Nelson, Willmar's homegrown astronaut. That's the sort of thing he explores in his commissions, which also include "Soliloquy" at the Willmar theater and "Ad Hoc Petra," a recently completed religious theme work. All three are large, public works: the only type of commission Fred will do. It's the type of project that lets him attempt things he would never try in the work he sells



photos by Mary Hinderaker

directly to the public — larger sizes, different themes and construction techniques like "Joyride's" hollow body construction.

His interest in carving, Fred said, came from a father who was an aspiring woodworker and from an old Norwegian immigrant neighbor's "enchanted" wooden craftwork. Fred himself first tried carving at age 17 "for about six hours with a dull carpenter's chisel and a torch and an old piece of pine or fir that I should have just burned."

Now, he's a full-time carver. "Of course my dog, Ola (a collie mix) has all the ideas," Fred comments.

— Joanna Werch Takes

continues on page 28 ...

National Woodworking Contest Winners

Projects from Eddie Canono (above) and Scott Reitman (below) took home first place in Rockler's sixth annual Woodworking contest.

Buckeyes Sweep Contest

Woodworkers from the Buckeye State dominated several categories in the sixth annual National Woodworker's Contest, an event sponsored by Rockler Woodworking and Hardware.

Taking first place in the carving category, with his Venetian-style high carved table, was Eddie Canono of Parma. Made of mahogany lumber finished in blond shellac flakes and then waxed, the table has a top patterned after a François Boucher painting and apron and leg carvings of Canono's own design.

In furniture, another Ohioan, Scott Reitman of Cleveland, headed up the category with his French style walnut armoire, which sports soft maple drawers.

Another Ohioan, Lowell Converse, took second place in the turning category.

Also pictured here is the second place entry in the turning category, a Southwestern inspired "Plywood Pot" from Lowell Converse of Beaver Creek. The pot is made of 336 separate segments of Baltic birch plywood.

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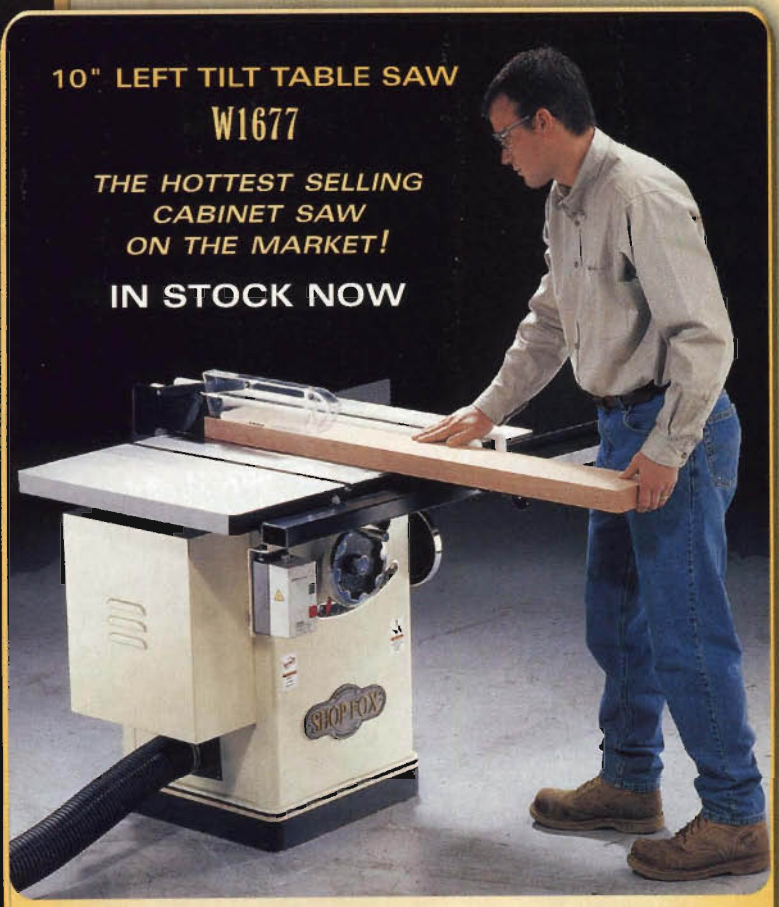

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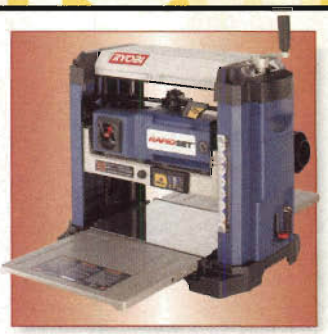

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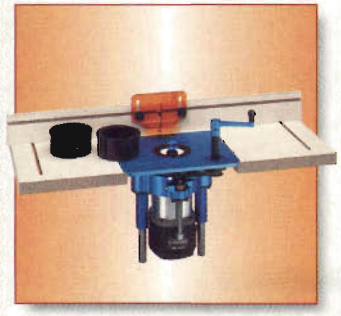

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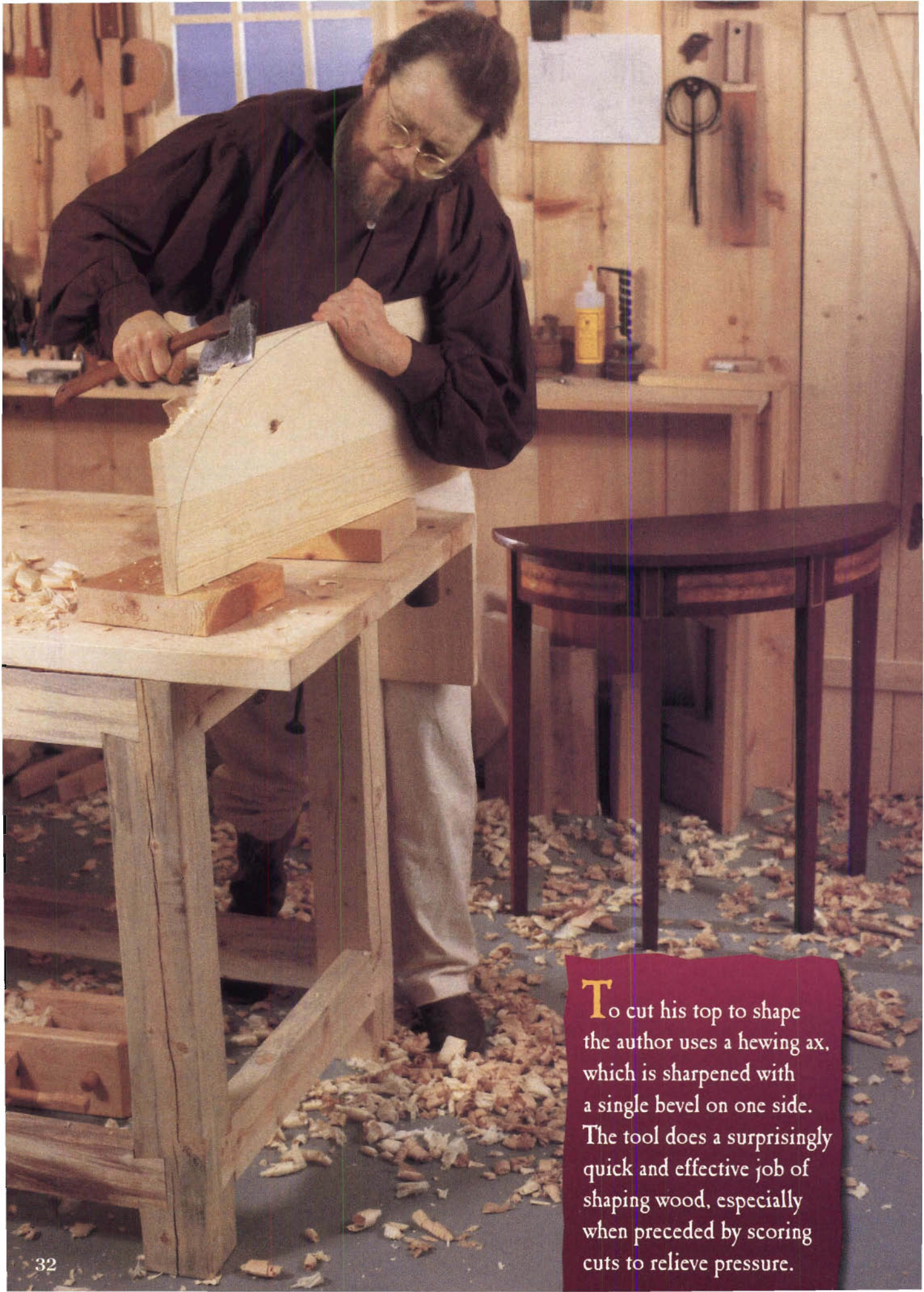


To cut his top to shape the author uses a hewing ax, which is sharpened with a single bevel on one side. The tool does a surprisingly quick and effective job of shaping wood, especially when preceded by scoring cuts to relieve pressure.

The Demi-Lune Sofa Table

By Stephen Shepherd

A demi-lune table is a classical furniture form which takes its name from the half-moon shape of its top. This top may be either semi-circular or elliptical. The continuous curve on the front of the table makes it a good choice for narrow spaces, while its straight back edge is ideally suited for placement where it will not be seen.

A demi-lune table typically has two legs at the back corners and two legs spaced roughly equally across the curved front. Traditionally, these legs have been turned or square-tapered. The legs are connected by four apron rails, including a straight rail at the back and three curved rails across the front. For aesthetic reasons, many cabinetmakers prefer to make the front center rail longer than the other two curved rails.

Some demi-lune tables are extravagantly made, with expensive hardwoods, parquetry and inlays. This one is more provincial. It is painted and grained to imitate mahogany (see detail photo, page 35). I also painted gold stripes on the upper parts of the tapered legs. Because I relied on paint for my "look," I was able to employ inexpensive, widely available materials: standard 3/4" thick lumberyard pine for the top and the back rail and 2" thick spruce for the legs and front apron.

Overall, the table shown here is 30" tall by 30" wide by only 11¼" deep, but feel free to vary the dimensions to suit your purpose. I made my table entirely by hand with simple hand tools, but you can easily use power tools to shortcut some of the steps.

The old "two-nails-and-a-string" method is a time-honored way to lay out a perfect ellipse. Shorten the string and move the nails to draw the apron locations.

On traditional pieces like this table, I prefer to use hide glue — either hot hide glue or the liquid variety — for all the joinery. Once the blank for the top is dry, you can move on to laying out its elliptical shape. As you can see in the photos above, this is a fairly straightforward process if you use the traditional "two-nails-and-a-string" method. (You'll find more details at the top of the next page.)

My curve was not quite half of an ellipse, so I had to make a temporary add-on strip to place alongside the straightedge of the top to hold my nails, which are always located on the major axis of the ellipse. For this layout, I used a 3/4" x 1" x 30" strip of wood. I squared a centerline across one face and gauged a line 3/4" from one edge. Then I drove two nails into the strip, on the gauged line, equidistant from the center mark (see *Drawing*).

Next, I placed my glued-up blank upside down and squared a centerline across it, perpendicular to the back

Making the Tabletop

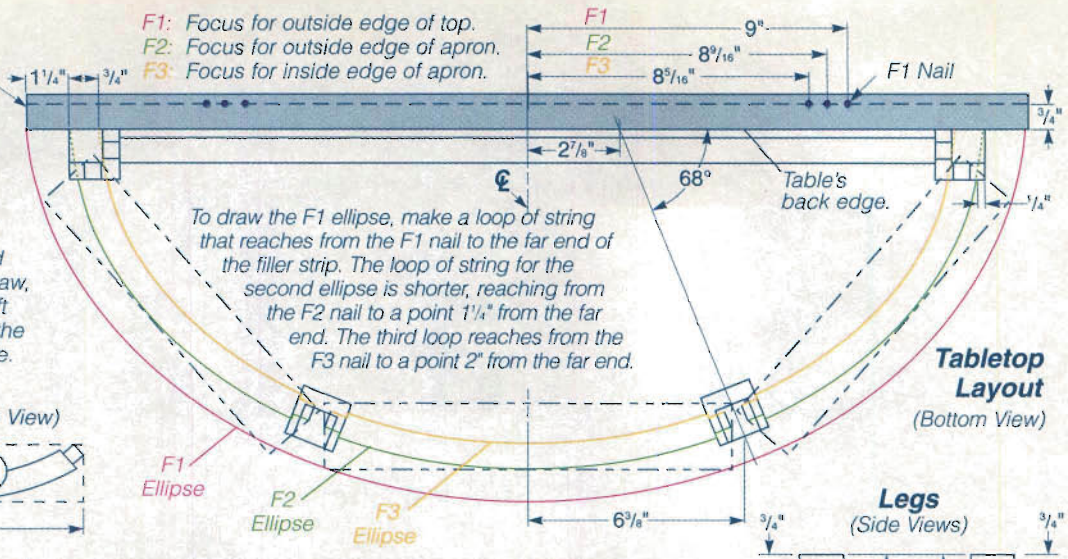
Demi-lune tabletops are sections of either circles or ellipses. Whichever you choose, make the tabletop (piece 1) first so it's available to use as a full-size pattern for laying out the legs and apron pieces.

To reduce the risk of warping, I glue up several narrow boards for the top instead of using a single wide board. Since it will not be under stress, simple edge joints are adequate for the glue-up. Roughen the edges of your boards to create more surface area for good adhesion.

Filler Strip: 3/4" x 1" x 30" (required to draw ellipses)

Striking an Ellipse: To form the ellipses, a loop of string is laid in place, encircling two nails (eg., F1 and F1). Your pencil tip draws the loop of string tight against itself and the two nails and, as you draw, the shape of an ellipse is left on your stock, as shown in the photos on the previous page.

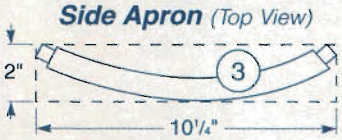
F1: Focus for outside edge of top.
F2: Focus for outside edge of apron.
F3: Focus for inside edge of apron.



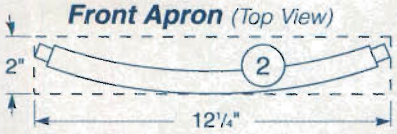
To draw the F1 ellipse, make a loop of string that reaches from the F1 nail to the far end of the filler strip. The loop of string for the second ellipse is shorter, reaching from the F2 nail to a point 1 1/4" from the far end. The third loop reaches from the F3 nail to a point 2" from the far end.

Tabletop Layout (Bottom View)

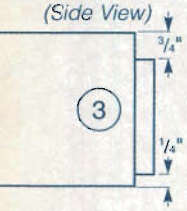
Side Apron (Top View)



Front Apron (Top View)



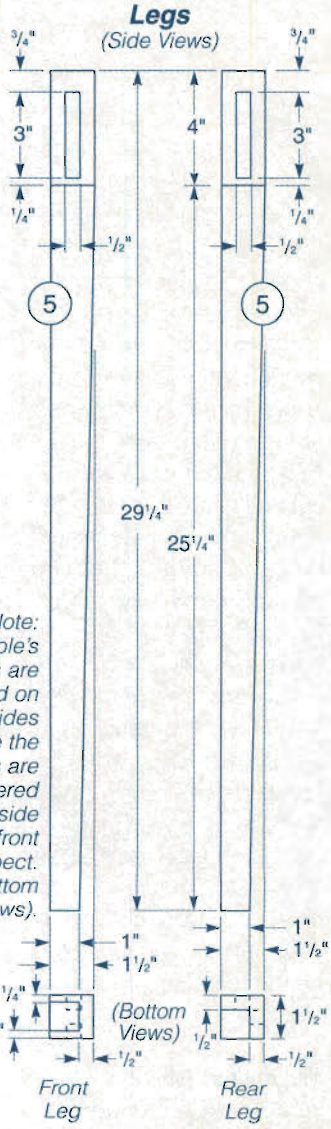
Tenon (Side View)



Exploded View

The curved aprons are cut from a thick piece of wood, so the grain on their tenons will be "short." Take care as you bring the aprons and legs together that you don't break off the tenons.

Legs (Side Views)



Note: The table's front legs are tapered on three sides while the rear legs are only tapered on the inside and front aspect. (see Bottom Views).

NOTE: While this table is constructed from inexpensive softwood stock (available at most local home centers), it is painted to mimic more expensive hardwood. The goal is not to create a photographic recreation of hardwood, but to simply give the impression and let the viewer's mind "fill in the blanks."

Material List

		T x W x L
1	Tabletop (1)	3/4" x 11 1/4" x 30"
2	Front Apron (1)	2" x 4" x 12 1/4"
3	Side Aprons (2)	2" x 4" x 10 1/4"
4	Back Apron (1)	3/4" x 4" x 25 1/2"
5	Legs (4)	1 1/2" x 1 1/2" x 29 1/4"

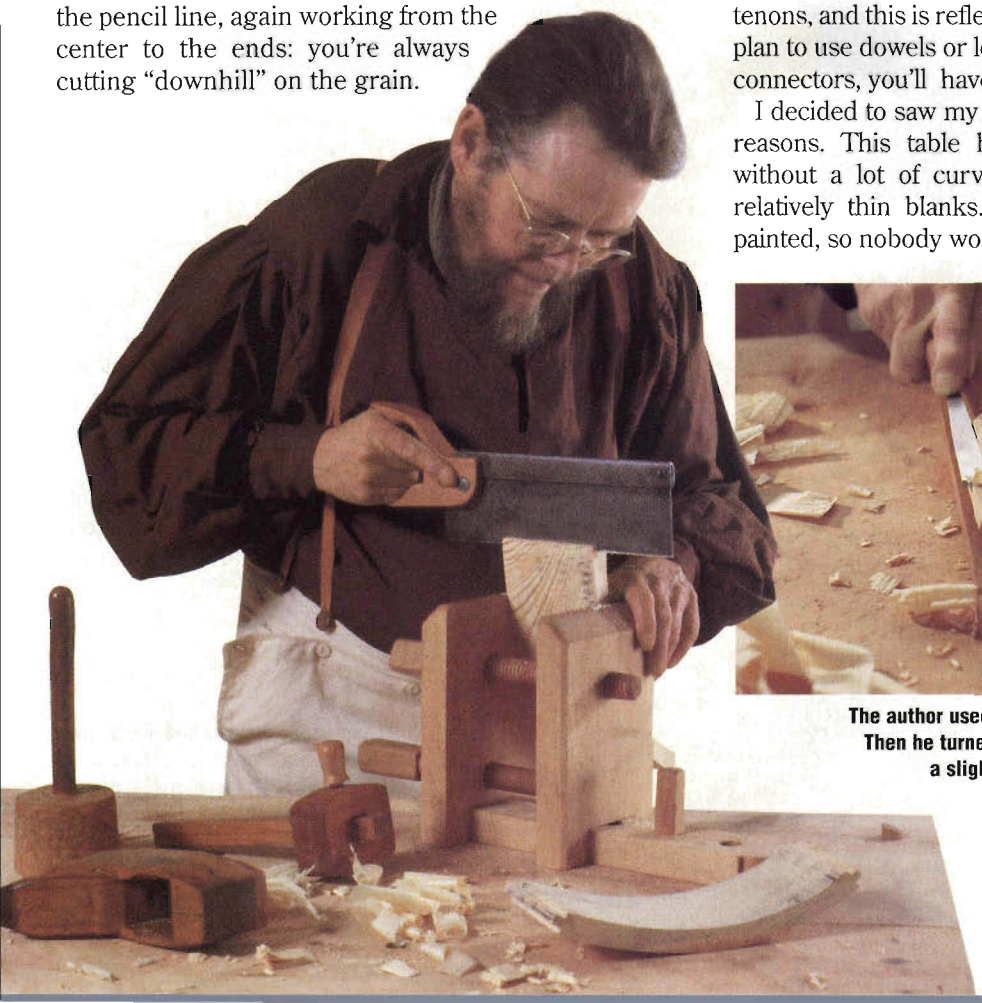
edge. I aligned the centerlines of the strip and the blank and clamped them together. Then I ran a pencil around the inside of the loop to mark out the elliptical shape of the top.

To accurately place the curved apron sections, you'll want to plot their locations on the underside of the top. Either draw the apron lines now by shortening your string loop and moving the nails as shown in the *Drawing*, or mark them after you've shaped the tabletop, using a marking gauge that has two bumps on its face for following curved surfaces.

To cut the tabletop to shape, I used a hewing ax, as shown in the photo on page 32. A regular ax or hatchet will also do the job. Chopping is actually quicker than sawing out the shape, but don't hesitate to use a hand saw or band saw if the ax is a bit intimidating.

If you do use an ax, hold the top blank upright on a chopping block and begin chopping at the center of the curve, working in each direction toward the ends. Make scoring chops into the wood to relieve pressure, then hew close to the final shape.

Use a hand plane or spokeshave for final shaping to the pencil line, again working from the center to the ends: you're always cutting "downhill" on the grain.



The author's table was painted and grained to look like more exotic wood, such as this "crotch birch" detail. If you examine old furniture carefully, you'll notice corners and inside edges are darker than surrounding areas. Try to imitate those effects with your grain painting.

Making the Aprons and Legs

To begin making the aprons (pieces 2 through 4), lay out an accurate, full-size plan of the legs and apron sections on the underside of the top so you can work out the exact sizes and shapes. As described here, the apron pieces have tenons, and this is reflected in the *Material List* sizes. If you plan to use dowels or loose tenons as the main mechanical connectors, you'll have to subtract the tenon lengths.

I decided to saw my aprons from solid stock, for several reasons. This table has relatively short apron pieces, without a lot of curvature, so I could saw them from relatively thin blanks. Also, the table was going to be painted, so nobody would see the unusual grain pattern.

The author used a backsaw to cut the tenons for this table. Then he turned to his chisels to pare the tenons, creating a slight angle to accommodate the curved aprons.

"Despite its curves, this demi-lune table is easier to make than it looks, with either hand or power tools. The half-moon shape makes it the perfect choice as a hall table or sofa table."

Some older tables along these lines had aprons curved only on the outside faces; the inside faces were left flat. On this small table, however, I felt the added thickness inside the aprons might make the table a little too top-heavy, so I decided to saw the inside curves, too.

Select material thick enough to accommodate the curve of individual apron pieces. I got these curves from 2" thick blanks. For a little added strength, select wood with a slight curve to the grain to follow the curve of the apron.

Use your full-size layout on the underside of the top to determine the exact size and shape of your apron blanks. Transfer the curved shapes from your layout to the blanks with tracing-paper templates cut out and stuck to the blanks' edges with spray adhesive or thinned hide glue.

Saw the curves with a bow saw, band saw or bench ax. Fair them to final shape with a block plane and spokeshave. Cut the tenons on the ends of the apron pieces, taking care not to break the short, angled grain. Note that all of the tenon shoulders (except those on the back apron rail) will be slightly angled to meet the faces of the legs. Your paper template will show you the shoulders' exact locations. Mark them out with a try square and a bevel gauge, then cut the shoulders and cheeks of the tenons with a tenon saw or band saw and pare them square and true with a chisel. I slightly undercut the tenon's front cheek to ensure a tight fit between the apron and the leg.

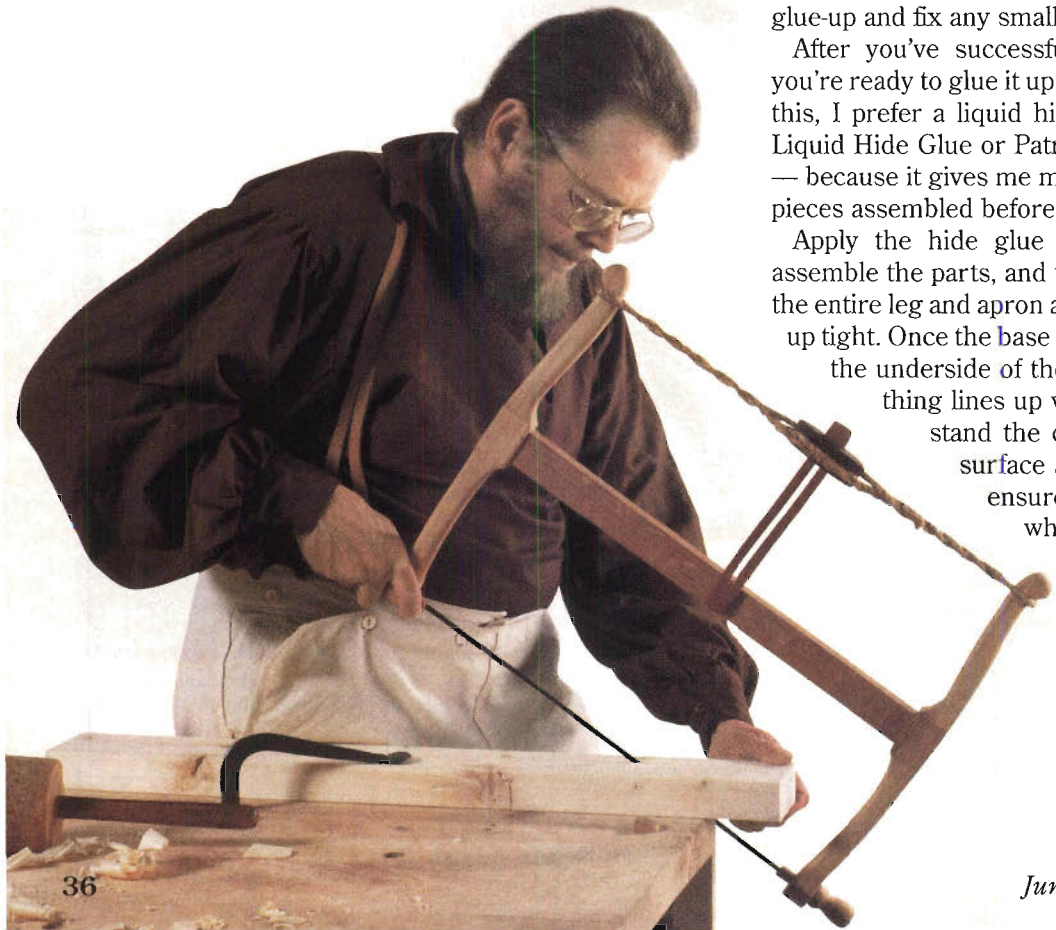
The legs (pieces 5) on most demi-lune tables have straight, square top sections to simplify the apron joinery, and are either turned or tapered from there to the floor. For this table, I tapered the front legs on three sides, leaving the inside faces straight. I tapered the back legs on the front and inside faces only (see *Elevation Drawing*). I sawed the tapers with a bow saw and faired them with a plane, but you could use a simple tapering jig on the table saw, instead.

Assembling the Table

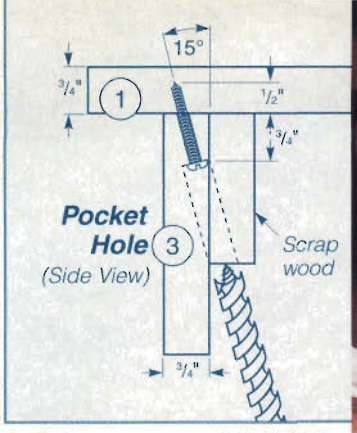
Apron assembly can be a bit tricky on this type of table because of the curved surfaces. As such, a band clamp is practically a necessity. If you don't have a band clamp, you can make a simple tourniquet from a rope or a strap to accomplish the same task. As with all complex assemblies, a dry run will give you a chance to rehearse the glue-up and fix any small joinery problems.

After you've successfully dry-assembled the table, you're ready to glue it up. For a complicated glue-up like this, I prefer a liquid hide glue — such as Franklin's Liquid Hide Glue or Patrick Edward's Old Brown Glue — because it gives me more working time to get all the pieces assembled before the glue sets.

Apply the hide glue to the mortises and tenons, assemble the parts, and tighten the band clamp around the entire leg and apron assembly to draw the shoulders up tight. Once the base unit is under clamp, invert it on the underside of the tabletop to make sure everything lines up with your full-size layout. Then stand the clamped unit upright on a flat surface and weigh or clamp it down to ensure the finished table will sit flat when the glue has dried.



An old-fashioned bow saw and a sharp eye are the traditional tools required for forming tapers on square legs. Today, the job would be done on a table saw with a low cost tapering jig in place to ensure accuracy.



An auger bit makes fast work of excavating the "pocket" of a pocket hole. A block of scrap wood, clamped to the back of the apron, is essential give it some "meat" to bite into as the hole is started.

Attaching the Tabletop

After you've glued the base and cleaned up any excess squeeze-out, you're ready to attach the tabletop. I opted to use pocket screws. To create a pocket screw hole, make an angled excavation on the inside of the apron and drill a clearance hole for the screw, as shown at right. You can cut the pocket with a gouge or drill it with an auger as I'm doing in the photo.

If you do drill a pocket, be sure to clamp a scrap block of wood to the back side of the apron to support the tip of the auger bit. Stop drilling at a point that will allow about 1/2" of the screw to protrude through the top edge of the apron. Then, drill a clearance hole through the center of the pocket to the top edge of the apron. Elongate the hole in a direction perpendicular to the grain of the top to allow for seasonal wood movement.

A Painted Finish

My table is painted and grained to imitate fancier woods — mahogany and crotch white birch. To prepare for painting and graining, fill any holes or voids with putty. Work the putty into the voids with a putty knife or spatula, allow it to dry, then sand the surface to 150 grit.

To imitate mahogany, I use either a bright red or dull orange color for the base coat; for white birch, a white or cream-colored paint. Oil-based paint is the traditional choice. Brush it in the "grain" direction you are trying to imitate.

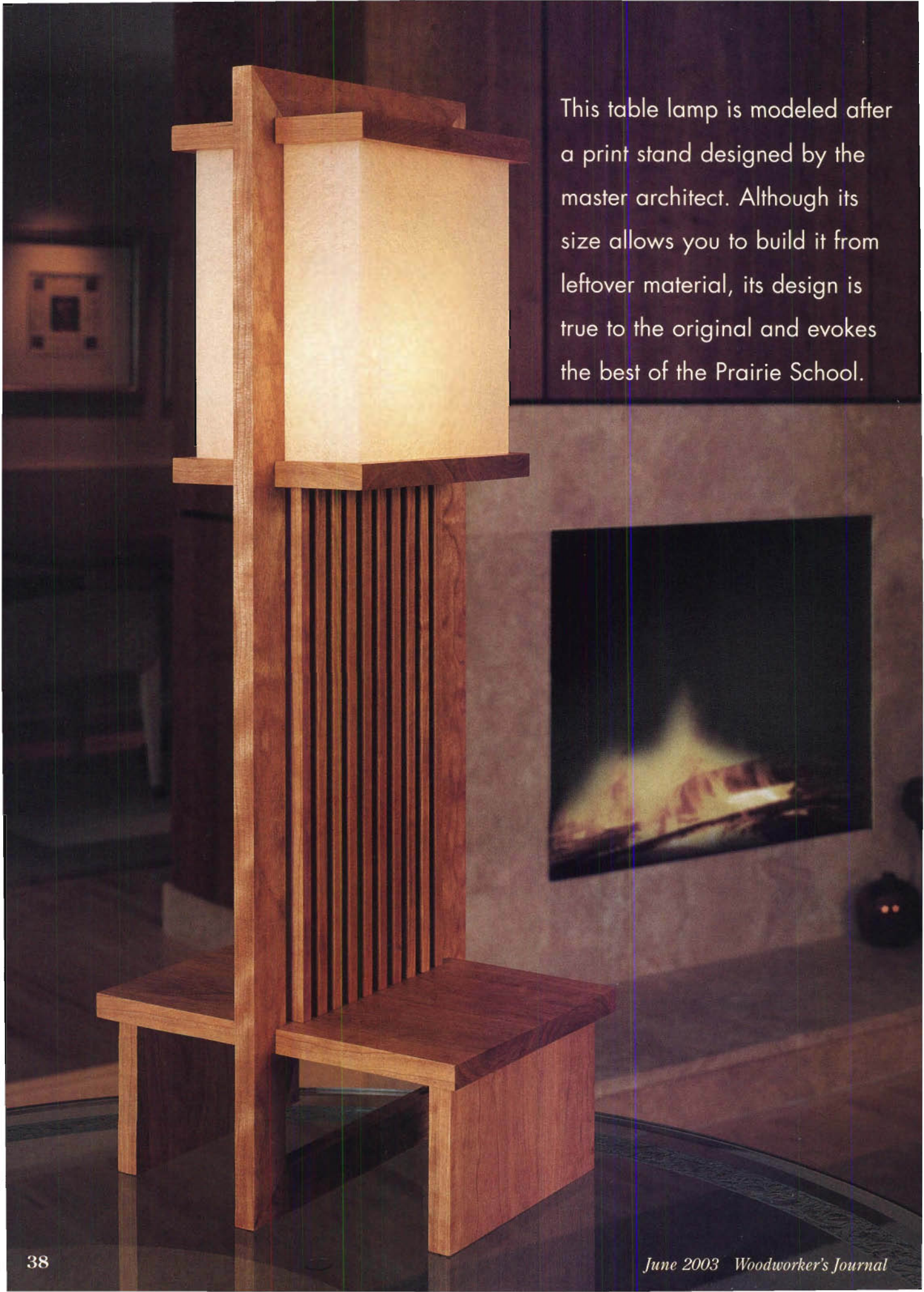
When the base coat is dry, I mix up some "graining shellac," a mixture of shellac and burnt umber pigment, sometimes with a little black iron oxide added. I partially load my brush with this mixture, then brush it almost dry on a newspaper or paper bag. Using this "dry" brush, I apply the graining shellac in the direction of the intended grain. If there are any areas I don't want to grain, such as joints, I use a thin piece of metal or cardboard, or a broad putty knife, to mask them. I slowly build up layers of graining shellac, sometimes with intervening layers of regular unpigmented shellac, to help create the illusion of depth in the finish.

Details like cross banding, miters, stringing, stripes and different colored "wood inlays" contribute to the overall effect and help to fool the eye.

When you're all finished painting and graining, apply a top coat or two of satin spar varnish to protect the paint and give the surface a more uniform sheen.

The completed table features details that lead a casual observer to imagine gold inlay and fine veneers.

Stephen Shepherd is a furniture maker and woodworking historian based in Utah.



This table lamp is modeled after a print stand designed by the master architect. Although its size allows you to build it from leftover material, its design is true to the original and evokes the best of the Prairie School.

FRANK LLOYD WRIGHT LAMP

By Mike McGlynn

With any artistic or architectural movement, pieces of furniture come to evoke its essence. The Stickley Morris chair representing the Arts and Crafts period, or just about any piece by Rulhmann representing the Art Deco movement, are examples. Within the Prairie School, a number of pieces, mostly by Frank Lloyd Wright, would qualify as hallmarks of the movement. This lamp is based on one such classic: Wright's Japanese print stand.

Wright was a major collector and dealer of Japanese prints, and he designed his original print stand to display some of them. Variations of his print stand show up many times throughout his career: there is even a floor lamp version.

I built this table lamp for a client who has a long-standing affection for Wright and his furniture style. The hardest part of this design for me was figuring out the lamp part and what to use for a shade. In the end, I used leftover Lumacite™ material that I had from an interior shoji style door I built a couple of years ago. Lumacite is an acrylic material that comes in a number of different patterns; it's also quite expensive. As an alternative, I'd recommend Plexiglas™ with rice paper glued to the outside.

One nice thing about this lamp is that it is made out of a lot of small pieces. I managed to make the entire thing out of small cutouts that I've had lying around my shop for years.

A down side to being constructed with pieces this small is they will want to warp every which way (especially the slats). Any warping of the slats will throw off the symmetry of the lamp. To help prevent warping, and for a pleasing grain pattern, choose pieces of wood that are as close to rift sawn as possible.

"From the cradle to the grave his true being craves this reality to assure the continuation of his life as Light thereafter."

Frank Lloyd Wright
1869 - 1959

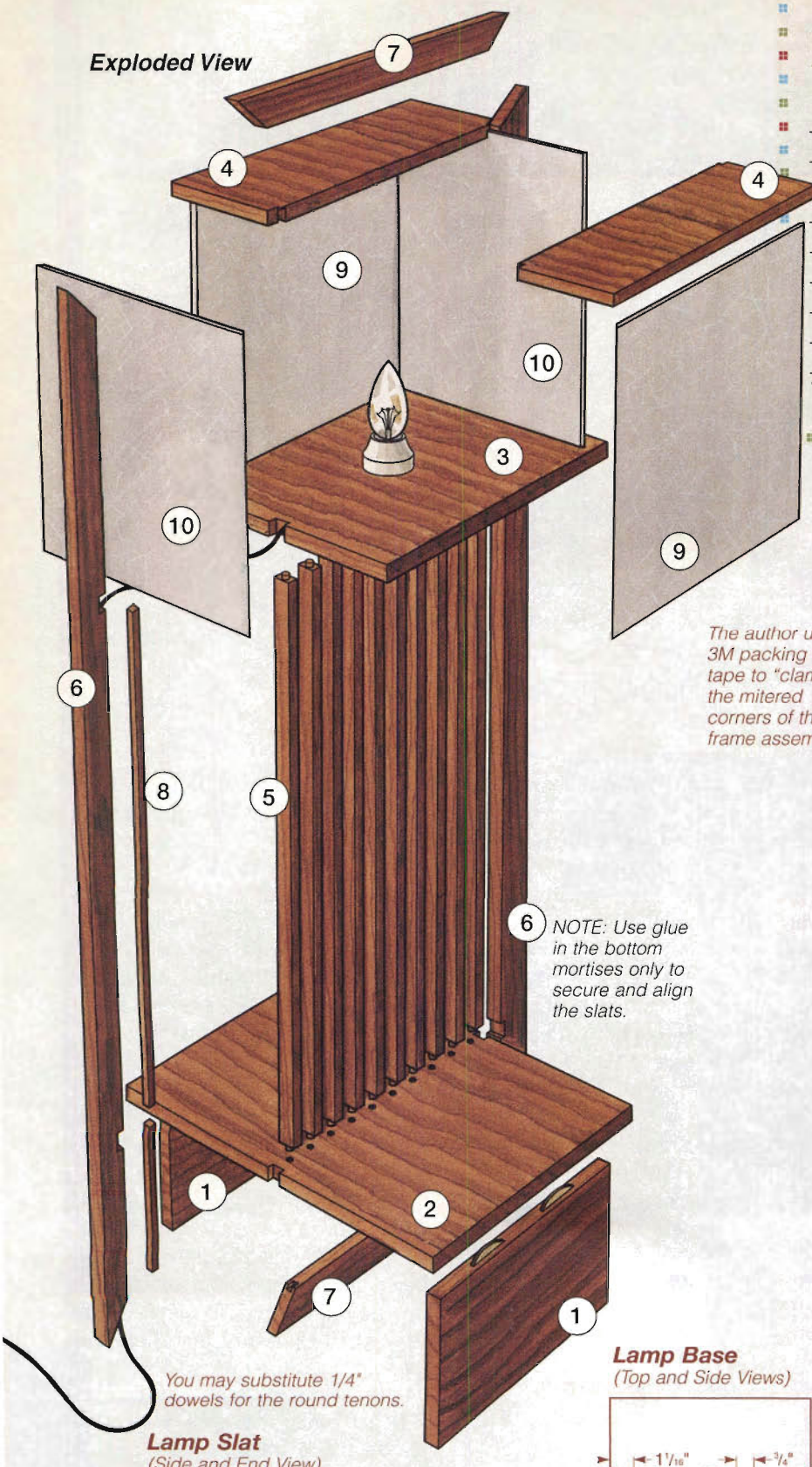
Getting Started

When I finished selecting my wood, I went through my usual process of milling the pieces oversize, letting them acclimatize in my shop, then milling them to final dimension. With the spindles, I was extra careful and used three steps, with two adjustment and flattening sessions. I started with several more spindles than I would need, knowing there were sure to be at least a couple that would not work.

Due to my "use-of-scrap methodology" the legs, platform, lamp base, and lamp caps (pieces 1 through 4) are all made of glued-up stock. I found that it was easiest to glue up one length of material that would be planed down, face sanded, and cut into the six respective pieces. This also helped to assure that the grain and color would be well matched on all of these pieces.

After I had them milled to size, I used water to raise the grain on all of the pieces and sanded them to 220 grit. When breaking their edges, it is important to keep in mind that some edges, such as the top of the legs, are not rounded over in any way.

Exploded View



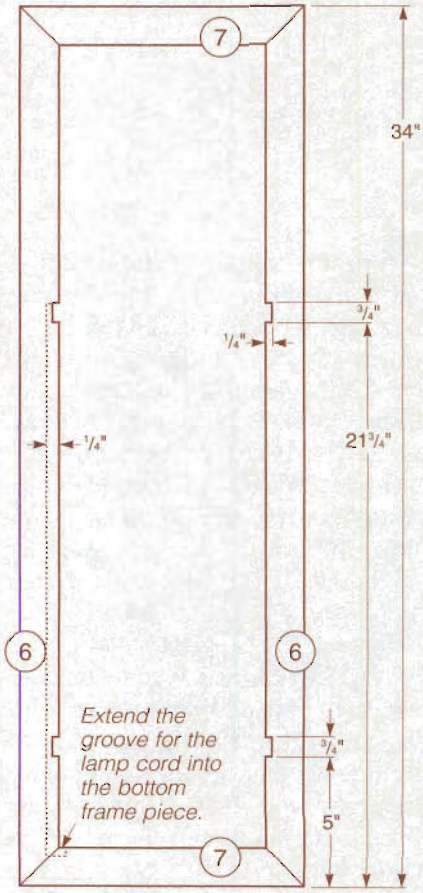
MATERIAL LIST

		T x W x L
1	Legs (2)	3/4" x 5" x 7 7/8"
2	Platform (1)	3/4" x 8 7/8" x 13 5/8"
3	Lamp Base (1)	3/4" x 7 1/8" x 8 7/8"
4	Lamp Caps (2)	3/4" x 8 7/8" x 3 5/16"
5	Slats (10)	3/8" x 1 1/2" x 16 1/2"
6	Frame Sides (2)	5/8" x 1 1/2" x 34"
7	Frame Top & Bottom (2)	5/8" x 1 1/2" x 10 7/8"
8	Wire Cover Strip* (1)	1/4" x 1/4" x 24"
9	Shade Front & Back (2)	3/16" x 7 7/8" x 9 7/8"
10	Shade Sides (2)	3/16" x 6 1/8" x 9 7/8"

*Trim to fit.

The author uses 3M packing tape to "clamp" the mitered corners of the frame assembly.

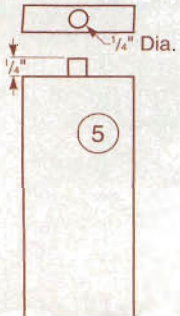
Frame Assembly
(Front View)

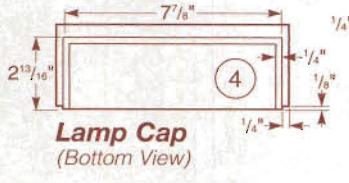


NOTE: Use glue in the bottom mortises only to secure and align the slats.

You may substitute 1/4" dowels for the round tenons.

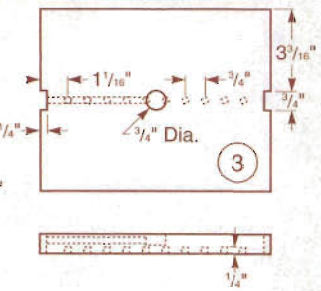
Lamp Slat
(Side and End View)



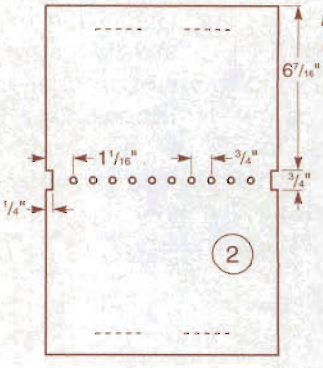


Lamp Cap
(Bottom View)

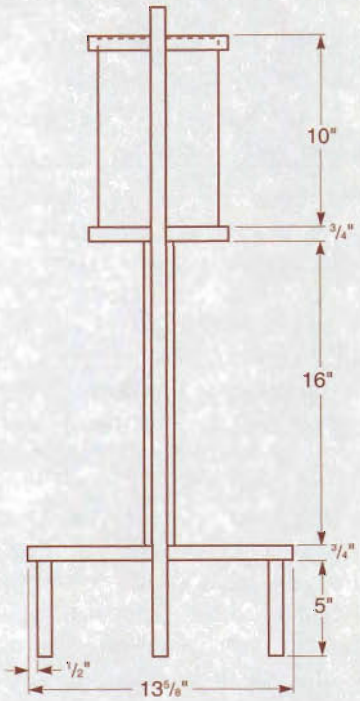
Lamp Base
(Top and Side Views)



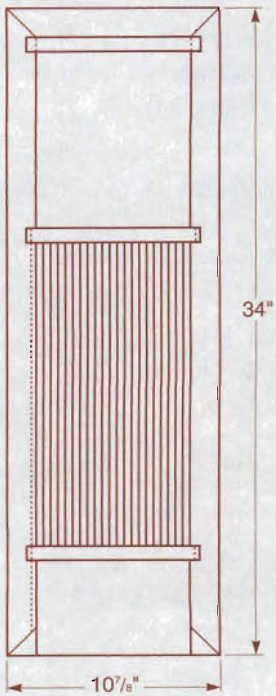
Platform
(Top View)



Lamp Elevation
(Front View)



Lamp Elevation
(Side View)



The Center Section

This lamp is a bit of a puzzle in that it has to be assembled in a particular order for everything to come together right. The first step is to assemble the center section.

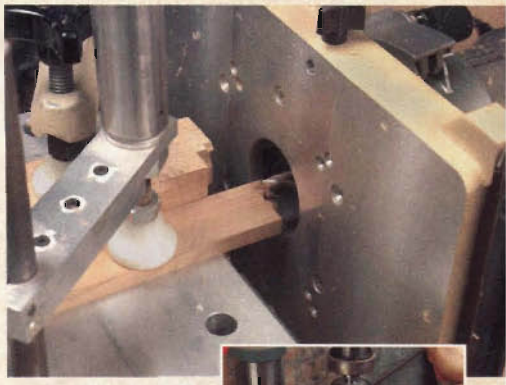
Before you start the assembly, several joints need to be cut — the slat's tenons, the mortises (and a lamp mounting hole) in the platform and lamp base, and the half- lap joints on the platform and lamp base. In addition, the lamp base needs to be drilled for the cord. See the *Elevation Drawings* at left for all the construction details.

With regards to the slats (pieces 5) and their tenons, I chose to machine 1/4" long round tenons on the ends of the slats with my multi-router. A round tenon works well because its corresponding mortise is simply a drilled hole. The alternative to this is floating tenons made from 1/4" dowels.

After cutting my tenons, I laid out and carefully drilled the platform and lamp base for their corresponding mortises. For appearance's sake keep this in mind: on the platform the holes go in the good side, and on the lamp base they go in the lesser side.

Cutting the half-lap joints is the next step. These joints are exposed, so it is important to take your time in their layout and cutting. I found that it was imperative to have a piece of the frame material handy when doing this step. To prevent blowout I taped the joint area with masking tape. I marked out the joint on the tape using a sharp pencil. Starting in the center of the joint, I took multiple passes on a table saw, using my miter gauge with a fresh fence to further avoid grain tearout. As I got close to my edge markings, I started to check the joint with the frame material. By taking fine passes, I got a tight, sliding fit.

One of the cool design details of this lamp is how the cord is hidden. Drilling a long hole like this through the long dimension of a board is not for the faint of heart. As can be seen from the *Drawings*, this hole is slightly offset from the center to avoid the tenon holes. I used a 1/4" x 10" auger bit while holding the piece on edge in a vise. Take your time: drilling through the face at this point may make you say things that require a trip to the confessional.



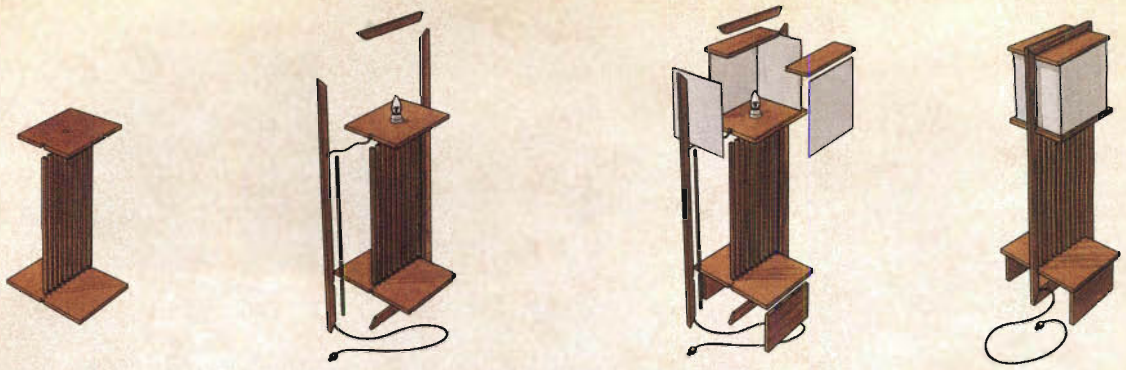
The author used a multi-router to create round tenons on the slats. These fit the holes drilled into the platform and base.

Assembling the center section is an exercise in patience. To ease their insertion, bevel the ends of all the tenons with sandpaper. I put a drop of glue in each of the platform mortises and inserted the slat tenons into the mortises. I squared up each slat before going on to the next one.

Don't glue the top end tenons; the glued bottom joints provide all the alignment necessary. Installing the lamp base onto the tenons is quite difficult; you have to line up all the tenons almost simultaneously. I started at one end and slowly worked to the other, until all the tenons were engaged in their holes. Then I simply tapped the base home. Once I completed the center section, I attached the legs to the platform with biscuit joints.

Building the Frame

To begin the frame (pieces 6 and 7), I cut all four miters on the upright frame pieces. Laying out and cutting the half-lap joints in the uprights is the next step. and this is where having the legs already attached comes in handy. I set the lamp on a flat surface (table saw), inserted



This lamp is a bit like a puzzle. It has to be assembled in a particular order for all the pieces to come together correctly.

the uprights into the half-laps and, with the bottom miter touching the surface, carefully scribed the half-laps onto the uprights. Then I formed the joints carefully on the table saw.

The second half of the hidden wire process requires routing a groove down the middle of an upright. This groove extends from the bottom mitered end to the top edge of the top lap joint (see *Drawings*). A piece of cherry (piece 8) is milled to hide the wire in the groove.

Before the uprights can be installed to the center section, the cord must be installed and hidden. I used 10' of standard 16 gauge lamp cord. Lay the wire in the groove (make sure 12" stick out of the top) and use Super Glue to secure the covering strips. (I cut it into two pieces to avoid impinging on the lap joints.) When the glue had cured, I sanded the filler strip flush.

Threading the wire through the lamp base (piece 3) is the only tricky part to attaching the uprights. I used a dab of Titebond® on each lap joint and glued the uprights in place with a couple of bar clamps. Take your time and carefully fit the frame's top and bottom miters. Prior to gluing in place, cut a groove in the end of the bottom frame member that meets the cord so it can exit easily.

After years of trying all sorts of miter clamps, I still find 3M packing tape the simplest. I put glue on the miters and, with two to four strips of tape, I get the tightest joint possible. When the glue has dried I remove the tape, eliminate excess glue, and then do my touch-up sanding.

Construction of the shade (pieces 9 and 10) is quite time-consuming. I wanted the shade to look uniform all the way around so I mitered and glued the pieces together, as described in the *sidebar* below.

The last step is to machine the retainer grooves in the shade caps, as shown in the *Elevation Drawings*. I routed them in several passes on the router table. The caps should be fitted carefully so that when they are in place the shade can't move.

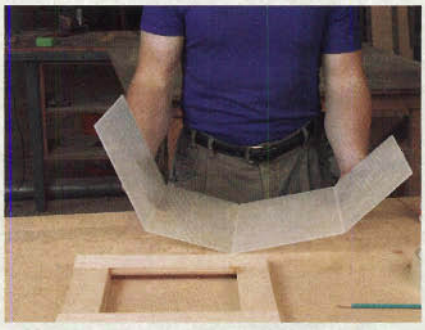
Prior to finishing I went over the lamp in a meticulous fashion, easing edges and looking for any missed glue squeeze-out. Because I was going to use an oil finish, I sanded everything up to 220.

The last order of business is to install the socket, switch and plug. I used a very basic, compact, screw-on porcelain socket. The switch is a standard inline rocker suction switch and the plug is a standard two-prong plug. This lamp is a great introduction to the elements of Prairie school style and at the same time requires a pretty high level of attention to detail to get it to turn out right. Have fun!

Contributing editor Mike McGlynn builds furniture for a living in Minneapolis, Minnesota.

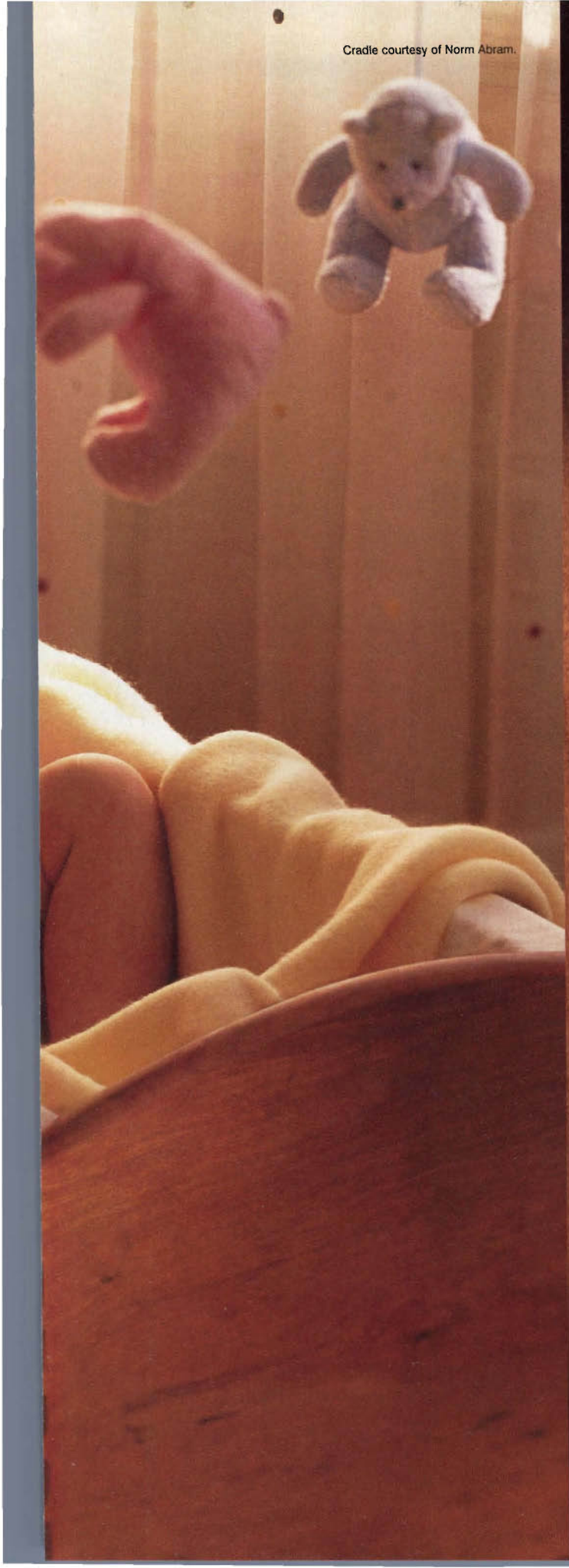
A LUMACITE SHADE

Cut the shade pieces to size on the table saw and miter their edges on the router table.



Miter-roll the shade pieces into a cube using 3M packing tape as your hinge. Super glue is used to cement the miter joints, and a final piece of tape is applied to the open corner.

Cut the shade pieces to size and miter the joining edges using a chamfer bit on your router table. Use 3M packing tape to miter-fold the shade together. Align the pieces, apply Super Glue accelerator to the joints and roll the shade into a cube. Apply a last bit of tape at the open corner. Place two wooden frames (to hold the lamp shade square as the glue cures) on the ends of the cube. Now apply Super Glue to each corner joint from the inside (with that joint pointing down). Allow the glue to cure for one minute and move on to the next joint.



Cradle courtesy of Norm Abram.

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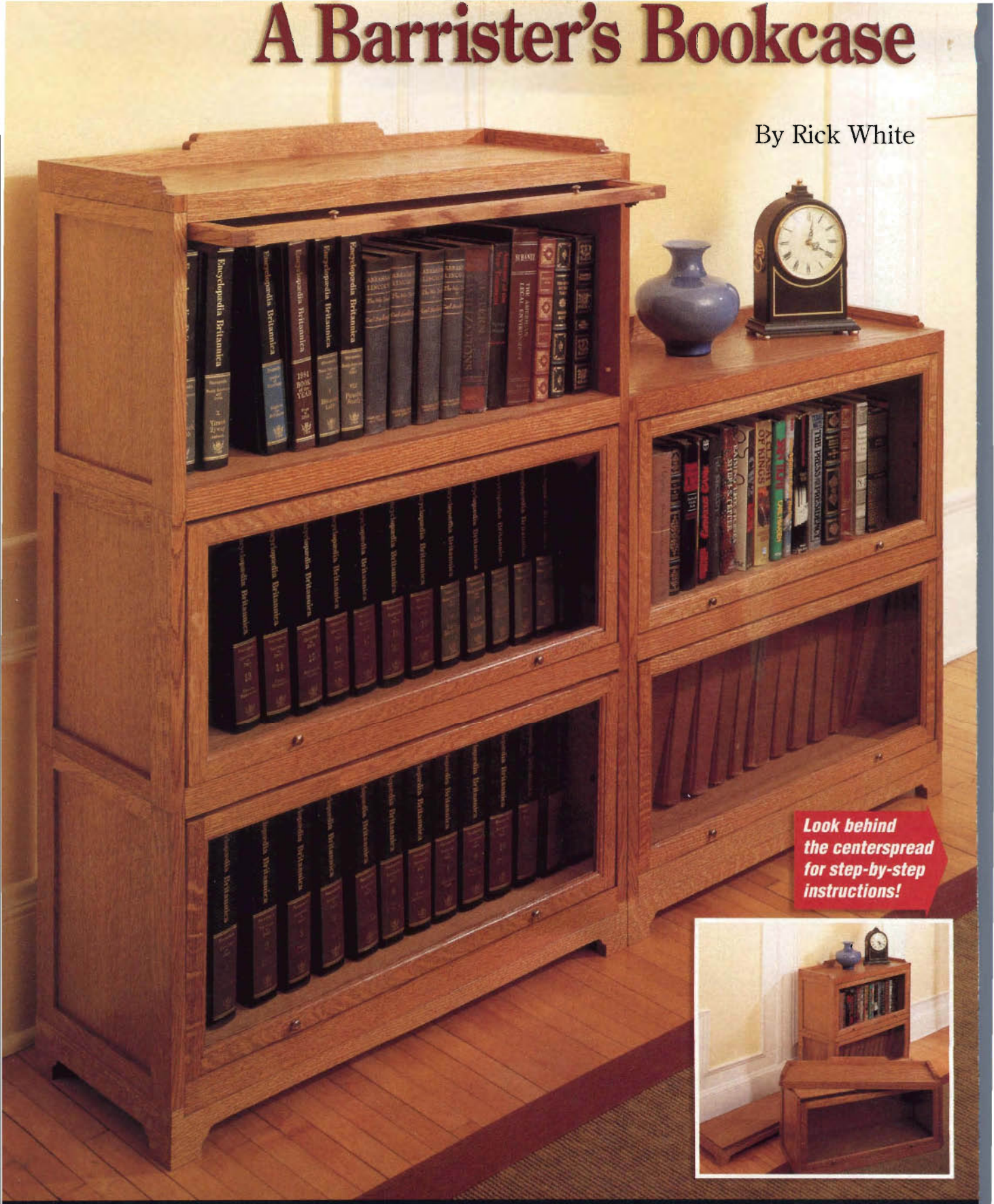
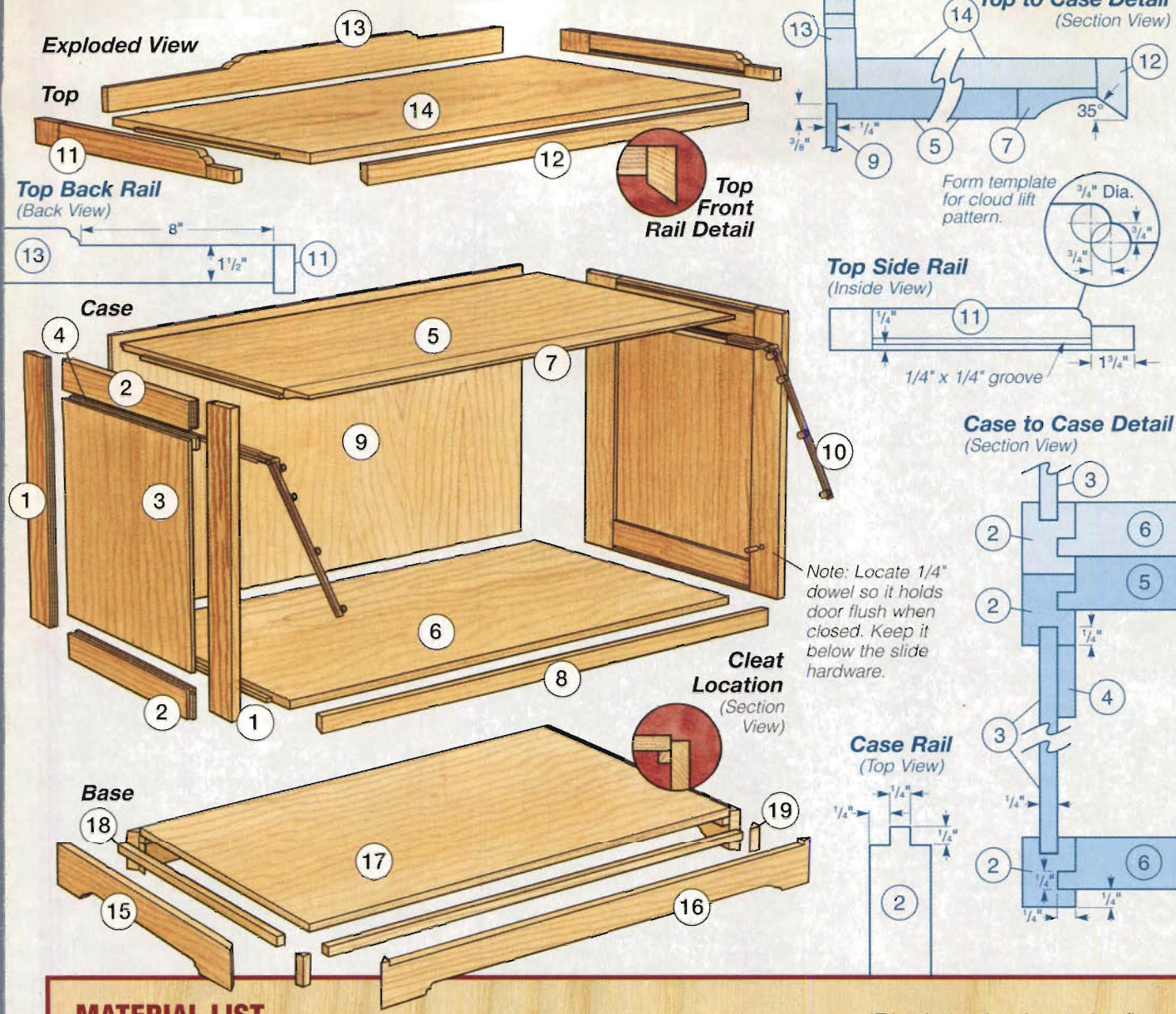
A Barrister's Bookcase

By Rick White



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

Modular furniture used to mean "compromise" furniture. Not so with the author's classic set of expandable barrister's bookcases. They're as beautiful as they are functional.



MATERIAL LIST

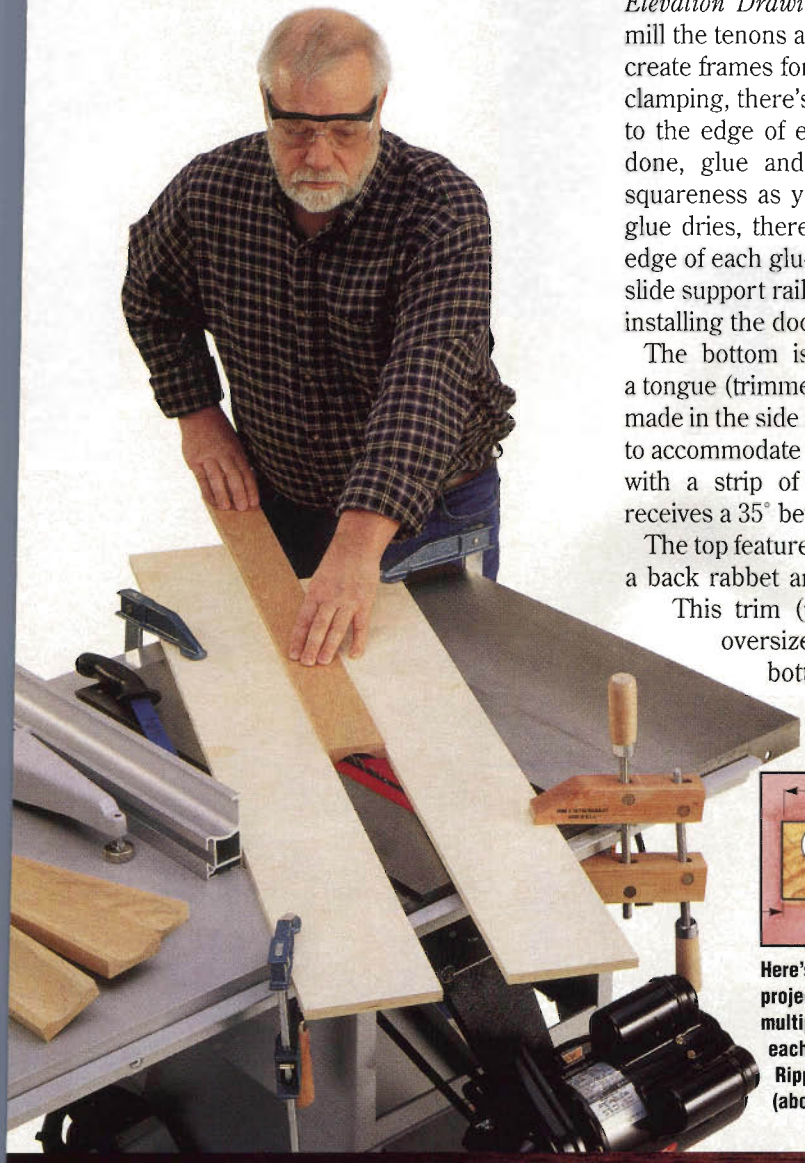
*Trim cleat and retainer stock to fit.

		T x W x L
1	Case Stiles (4)	3/4" x 1¾" x 14½"
2	Case Rails (4)	3/4" x 1" x 9⅝"
3	Case Panels (2)	1/4" x 9⅝" x 12⅞"
4	Slide Support Rails (2)	1/4" x 1" x 9⅛"
5	Case Top (1)	3/4" x 9⅞" x 30½"
6	Case Bottom (1)	3/4" x 11⅞" x 30½"
7	Case Top Edging (1)	3/4" x 2" x 30"
8	Case Bottom Edging (1)	3/4" x 1½" x 30"
9	Case Back (1)	1/4" x 30¾" x 13¾"
10	Door Slides (2)	Nylon
11	Top Side Rails (2)	3/4" x 1¾" x 12⅝"
12	Top Front Rail (1)	3/4" x 1½" x 30"
13	Top Back Rail (1)	3/4" x 2¼" x 30"
14	Top Platform (1)	3/4" x 11⅛" x 30½"
15	Base Side Rails (2)	3/4" x 2¾" x 12⅝"
16	Base Front & Back Rails (2)	3/4" x 2¾" x 31½"
17	Base Platform (1)	3/4" x 11⅛" x 30"
18	Base Cleats* (1)	1/2" x 1/2" x 85"
19	Base Glue Blocks (4)	3/4" x 3/4" x 1¾"
20	Door Rails (2)	3/4" x 1¼" x 27⅞"
21	Door Stiles (2)	3/4" x 1¼" x 12¹³⁄₁₆"
22	Glass (1)	1/8" Measure opening
23	Retainer Strips* (4)	3/8" x 3/8" x 90"
24	Sash Knobs (2)	3/8" Dia. brass

Modular Barrister's Bookcases

By Rick White

We all have special books we'd like to hand down to the next generation. You may start out with a home library consisting mostly of paperbacks, but over the years you will accumulate a hardback collection that deserves a more protective environment than standard bookshelves can provide. And if you're like me, that collection will continue to grow a little with each passing year. That's why I designed a barrister bookcase system that will grow right along with it.

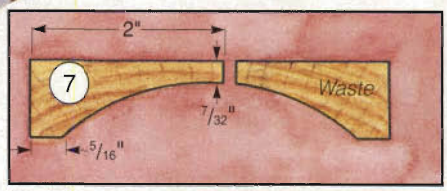


Starting With the Case Subassembly

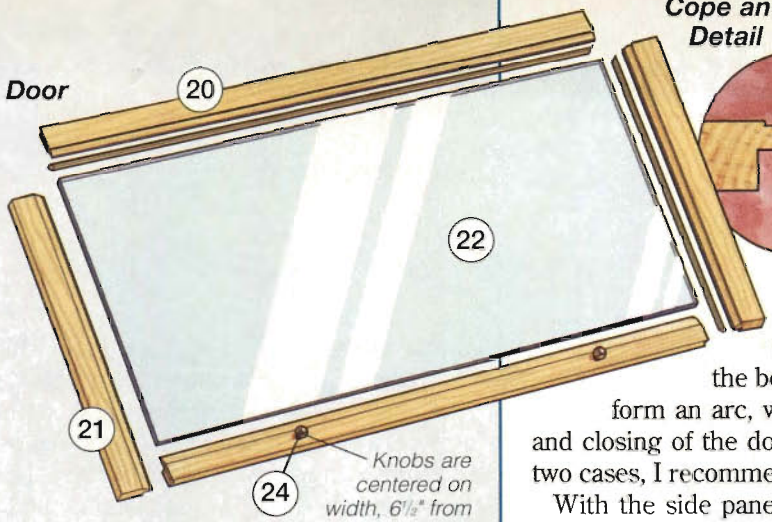
The *Material List* provides the items you'll need to create one unit — a case, a top and a base. Machine accordingly — I suggest starting with two or three cases, a top and a base. Get started by milling the case parts (pieces 1 through 9) to overall size. One exception is the top edging (piece 7), which is cut extra wide now and trimmed after some fancy machining (see photo below). Following the *Elevation Drawings* at right, use your table saw to mill the tenons and grooves on the rails and stiles to create frames for the side panels. Before gluing and clamping, there's one more groove to machine close to the edge of each rail (see *Drawings*). With that done, glue and clamp the panels, checking for squareness as you tighten your clamps. When the glue dries, there is a rabbet to cut along the back edge of each glued-up panel (for the back). Glue the slide support rails (pieces 4) in place, but hold off on installing the door support hardware (pieces 10).

The bottom is made next. Its sides each have a tongue (trimmed to fit the stopped grooves you just made in the side rails), and its back edge has a rabbet to accommodate the back. The front edge is trimmed with a strip of hardwood edging (piece 8) that receives a 35° bevel along its inside bottom edge.

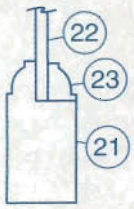
The top features two trimmed tongues on its sides, a back rabbet and some trim along its front edge. This trim (pieces 7), shown below, is milled oversized and a cove is formed on its bottom. After the cove is shaped, the edging is ripped to width, exposing a portion of the cove.



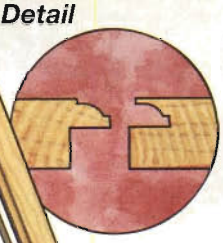
Here's an old trick used to form wide coves. For this project, the fences are set at 30° to the blade. Take multiple passes, raising the blade slightly after each cut to "sneak up" to the proper measurement. Ripping the stock after the cove is the right depth (above) leaves you with the trim for the case top.



Door Rail/Stile
(Section View)



Cope and Stick Detail



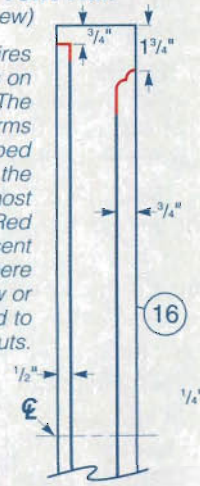
In addition to creating instant glass retainer strips, this cope and stick bit set also creates perfect corners on your door frame.

After the unit is assembled, the cove on the top edging and the bevel on the bottom edging meet to form an arc, which accommodates the opening and closing of the door. (Note: if you stack more than two cases, I recommend screwing them together.)

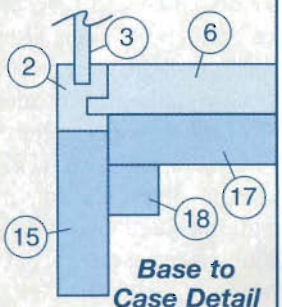
With the side panels assembled and milled and the edging added to the top and bottom, bring the cases together with clamps and glue. You can test fit the back, but don't install it yet — that has to be done later.

Base Front Rail
(Front View)

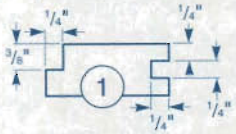
This piece requires two drop cuts on the table saw. The bottom cut forms most of the shaped cutout, while the top cut forms most of the notch. Red lines represent areas where a hand saw or drill is used to complete the cuts.



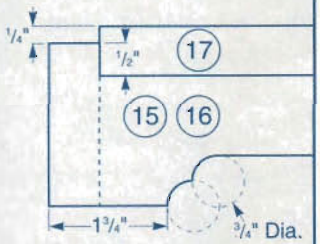
Base to Case Detail
(Front View)



Case Stile
(Top View)



Note: Rabbet for back cut on back stiles only.

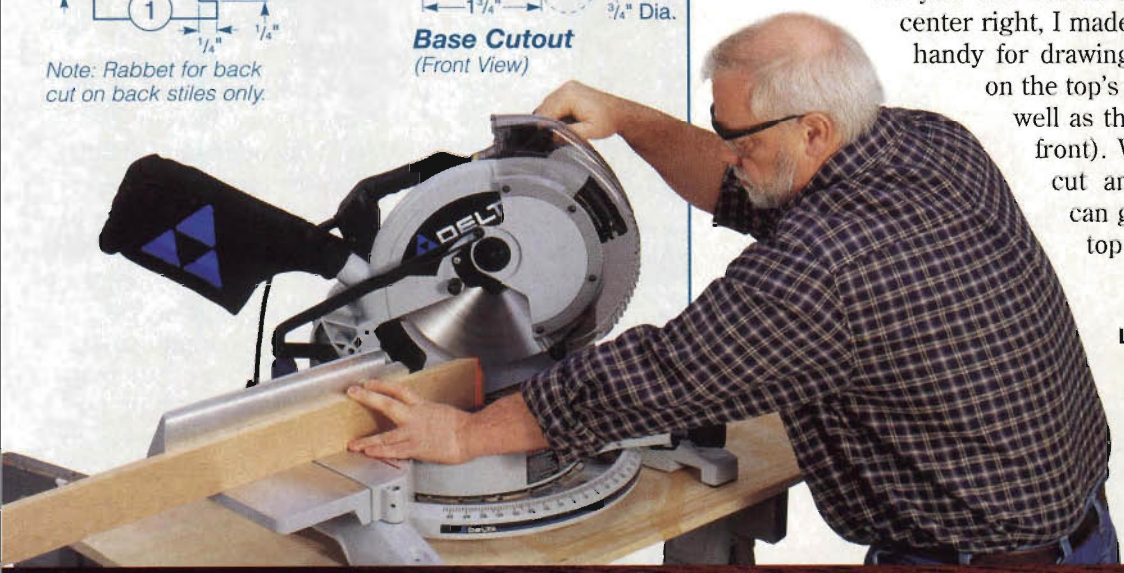


Base Cutout
(Front View)

Making The Top Subassembly

As with the case, start on the top by cutting your parts (pieces 11 through 14) to size. Once again, however, there's an exception. The top's side rails (pieces 11) are a glued-up subassembly designed to carry the appearance of stiles and rails all the way to the top. To make these side rails, I glued up a blank of horizontal pieces, trimmed and jointed its edges and added two vertical "stiles," one along each edge. When the glue dried, I ripped off each top side rail (with "stile-ized" ends). These pieces receive a stopped groove (see *Drawings*) for the top platform, which has a trimmed-off tongue along each edge, just like the case top. Move on to making the top's front and back rails, which also require a little shaping (see *Drawings*).

As you can see in the inset photo at center right, I made a template that is handy for drawing cloud lift shapes on the top's sides and back (as well as the base's sides and front). With all the pieces cut and machined, you can glue and clamp the top together.



Laser beams on miter saws! They only seem silly until you've completed your first cut. Then you wonder where they've been all your life!

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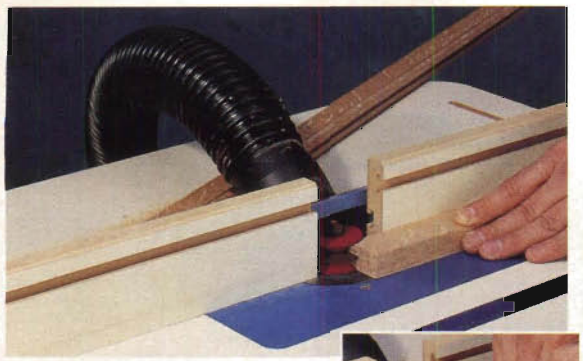


A cope and stick router bit set made fast work of the door frames. After sticking the rails and stiles (above), the ends of the rails are coped, as shown at right. Then you turn to the table saw to free the retainer strips.

Making The Base Subassembly

The base subassembly (pieces 15 through 19) is different from the case and top in that it has no rabbets or tongues. After I used my miter saw to miter the corners, I turned to my table saw to make two drop cuts on the front rail and one each on the other three rails. The upper drop cut on the front rail helps form the notch (see *Drawings*). The other three help form the shaped cutout on each piece. (Be sure to use a start and stop line on your fence for these cuts.) Use the template to draw the cloud lift shape, but this time you can turn to your drill press to *actually* mill their shape. As for the top notch, I recommend gluing up the base pieces (including the cleats and glue blocks) before you use your hand saw to finish cutting out the notch (see *Drawings*). It's a delicate part of the project, so take your time here. You'll notice that the base platform sits a little proud of its rails (just like the case top sits proud of its rails). This is how the pieces interlock.

Making The Door Subassembly

The doors were so easy to make it was a little scary. That's because editor Rob Johnstone asked me to test out a cool new cope and stick router bit set. With these two bits, I could make doors all day long! Get started by milling the rails and stiles (pieces 20 and 21) to overall size. (This would seem to be the right time to order your glass (piece 22), but to tell you the truth, I never order glass until my frames are completed.) Now simply insert your "stick" bit and mill the inside edges of the frame pieces from end to end. Switch to the "cope" bit and mill the ends of the rails. Now comes the cool part. Turn back to the table saw and remove the retainer strips, which have magically appeared on the inside edge of each piece you've machined. The bits account for the kerf you're about to make, and the pieces you trim off become your perfectly sized glass retainer strips (pieces 23) — just miter them to length! The laser beam guide on my new chop saw took all the fear out of that move as well.

Now things move quickly. Measure for your glass, install it with the retainer strips and brads and, with the case on its front, position your slides for installation. I cut 2" off the back of these nylon slides so they'd fit the boxes. Doing so did not present any problems for installation.

A handy template provides solid repeatability for the cloud lift shapes jig sawn on various pieces.

Once the doors are working in concert with the case, lay out and drill a 1/4" hole on the inside of the case (see *Drawings*). This hole is for a short length of dowel which serves as a doorstop. With the hardware and stop in place, install the back with small brads. Sand through 220 grit, add the sash knobs (pieces 24) and select your finish. I went with a coat of Watco® Medium Walnut Oil followed by a coat of wipe-on polyurethane for my white oak cabinets.

Rick White is an expert woodworker and long-time contributing editor and project builder for Woodworker's Journal.

Shop Maintenance: Part II

By Sandor Nagyszalanczy

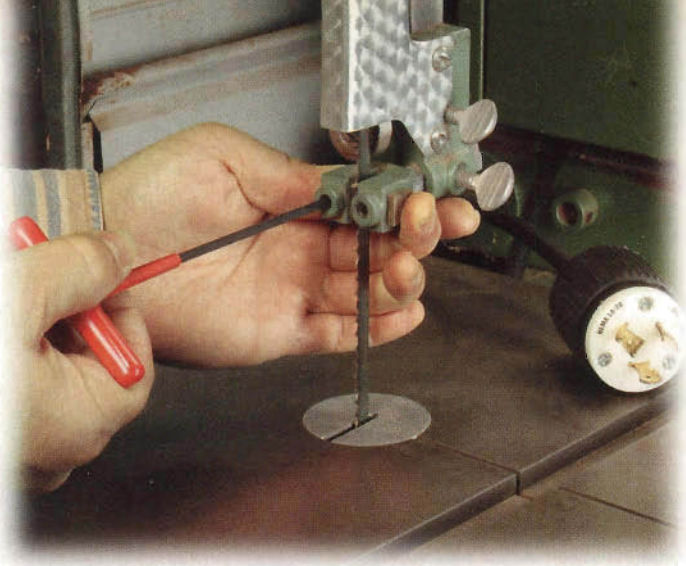
Last issue, Sandor established a maintenance calendar and extolled the virtues and benefits of proper maintenance. In the second of his two-part series, our expert presents specific tasks for a variety of tools.

The author's tools are aging gracefully because of his active maintenance program.

Among the various woodshops I've visited over the years, the best shops are always run by woodworkers serious about taking care of their tools. Rather than just fixing tools and machines when they break, they service and adjust them at regular intervals. Regularly performing some or all of the cleaning and adjustment tasks described here will keep your machines at peak performance and help prevent unexpected problems or accidents due to misaligned or worn parts. Because the exact procedure for certain adjustments depends on the specific make and model of the machine, only general information is given here; consult your tool's manual or contact the manufacturer for more detailed instructions.

Table Saw: Clean and dry lubricate the saw's trunnions and blade height adjustment mechanism. If adjustable, set the throat plate flat with the table. Check the saw's bevel tilt at 90° and 45° and readjust the stops. Check to make sure the miter slots are parallel to the saw blade, and realign the saw table if necessary. Check to make sure the rip fence is parallel to the blade and set the miter gauge stops. Check and align the blade guard and splitter.

Crosscut Saw: Alignment differs by type and style. Radial- arm saws will require the most attention and fuss, as the head and arm must be aligned and set in a specific order to assure parallelism of the blade to the travel of the arm (consult your tool's manual). Newer compound- and sliding-compound miter saws are usually much easier to adjust. Take a few test cuts to check for square cuts and regularly used miter and bevel angles. Readjust the stops as necessary. You should also confirm the accuracy of the saw's detents (click stops), which may or may not be adjustable. If a detent is off and you can't readjust it, mark it clearly on the saw, so you'll know you must set that angle manually in the future. Also check the squareness of the fence to the table with a try square. Clean the arm(s) on sliding-compound miter saws and radial-arm saws and dry lubricate them.



Adjust the guide blocks on your band saw to make light contact with the blade, and set the rear thrust bearing just shy of touching the back edge of the blade.

Band Saw: Check the saw's rubber tires and, if they are encrusted, clean them with a brush or by lightly scraping them. Replace them if they are cracked or torn. If the saw blade is difficult to track, check the alignment of wheels to assure they are coplanar (both — or all three — discs are in the same flat plane) using a straightedge and shimming the wheels in or out on their axles as necessary. Check both upper and lower sets of blade guide blocks for wear, and redress by sanding or filing them or replace them if they're worn out. Adjust the guide blocks to make light contact with the blade, and set the rear thrust bearing just shy of touching the back edge of the blade. Set the table stop so that the saw table is square to the blade, and finish up by setting the miter gauge stops.

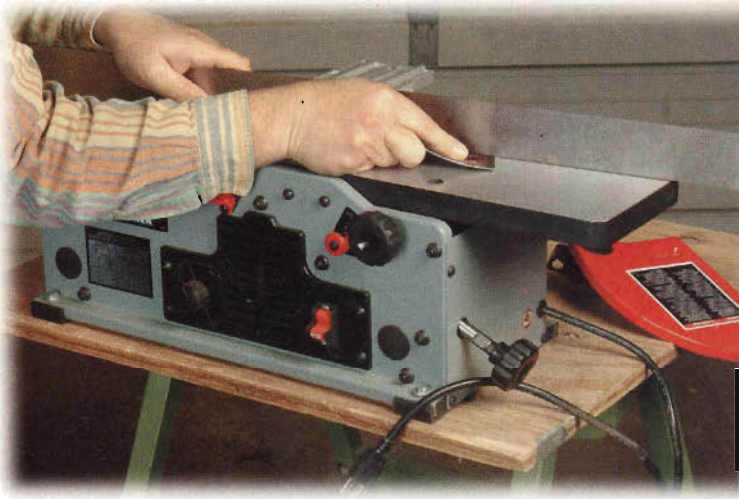
Jointer: Check the machine's belts and pulleys. Clean and lubricate the tables and their ways. Confirm that the infeed and outfeed tables are straight and parallel (see photo at right). Check the fence for square and 45 degrees and readjust the stops as needed. Check the knives for sharpness and confirm that they're all set to the same cutting circle, using a dial indicator or knife gauge (made specifically for adjusting jointer knives). Make sure the knife-locking screws are all tight. Set the outfeed table flush to the cutting circle.

Planer: On small portable planers, check knives for nicks and sharpness. Also check to make sure knives are parallel to the bed and all set to the same cutting circle. Clean rubber infeed and/or outfeed rollers. Check and align the infeed and outfeed tables. Also, check the accuracy of the depth gauge and depth stops.) On larger stationary planers, adjust the pressure of the infeed and outfeed rollers, chip breaker and pressure bar. Check and adjust the height of bed rollers. Check and adjust the power feed drive belt or chain; drain and refill gear case if your planer has one.

Drill Press: Lubricate the quill assembly and check and adjust quill retraction spring tension if necessary. Check squareness of table relative to the chuck and reset stops, if fitted. Check the chuck for concentricity with a dial indicator. Clean, lubricate and adjust the table raising and lowering mechanism.

Stationary Sanders: Clean discs and belts with a rubber cleaning stick; remove and replace the abrasives if they're heavily worn. On belt sanders, examine the drive and idler rollers and carefully scrape off sawdust and debris. Check the alignment of support tables for square; set miter gauges and stops as necessary.

Router Table: Check flatness of the router insert, and adjust its height flush with the tabletop. Clean and lubricate the router lifter mechanism, if fitted. Check the squareness of the router fence relative to the table.



Confirm that the infeed and outfeed tables on your jointer are straight and parallel with a true straightedge. You can use a feeler gauge (the corner of a credit card works well, too) to check the gap between the straightedge and infeed table. If the gap varies along the table, you'll need to adjust or shim the ways to restore parallel.

Routers: Thoroughly vacuum air vents on motor housing. Examine collets for damage; clean with wire brush as necessary. Clean and dry lubricate height adjustment assembly. Discard and replace any router bits with bent shafts and replace or resharpen carbide bits with chipped cutting edges. Lubricate pilot bearings with special high-speed bearing lubricant.

Cordless Tools: Check battery packs for cracks or damage. If the tool's charger has the feature, run all batteries through a "conditioning cycle." Clean electrical contacts on both batteries and tools with a spray contact cleaner (rubbing with a clean pencil eraser also works).

Sandor Nagyszalanczy is a writer and photographer. His seven books include Power Tools: An Electrifying Celebration and Grounded Guide *from Taunton Press.*

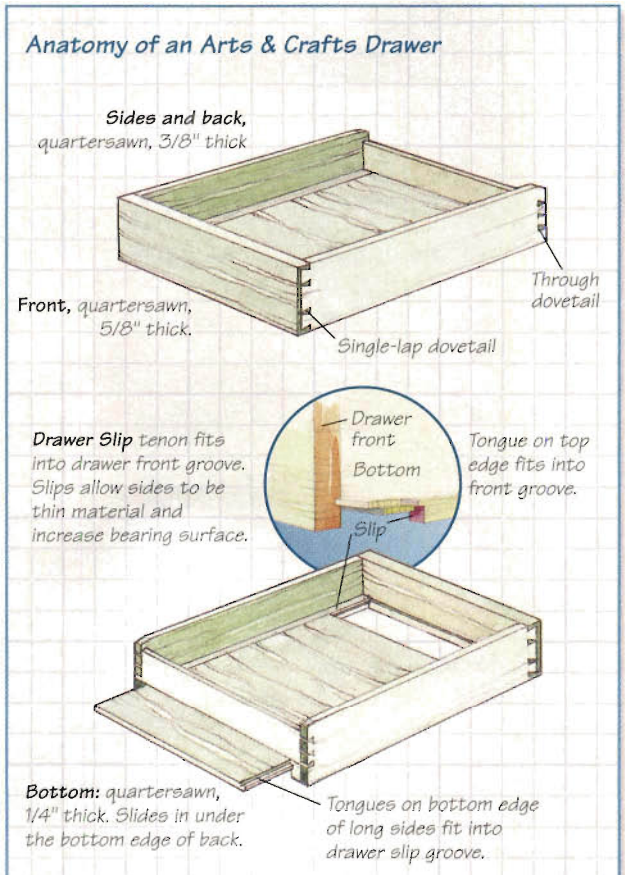
Making a Single-lap Dovetail

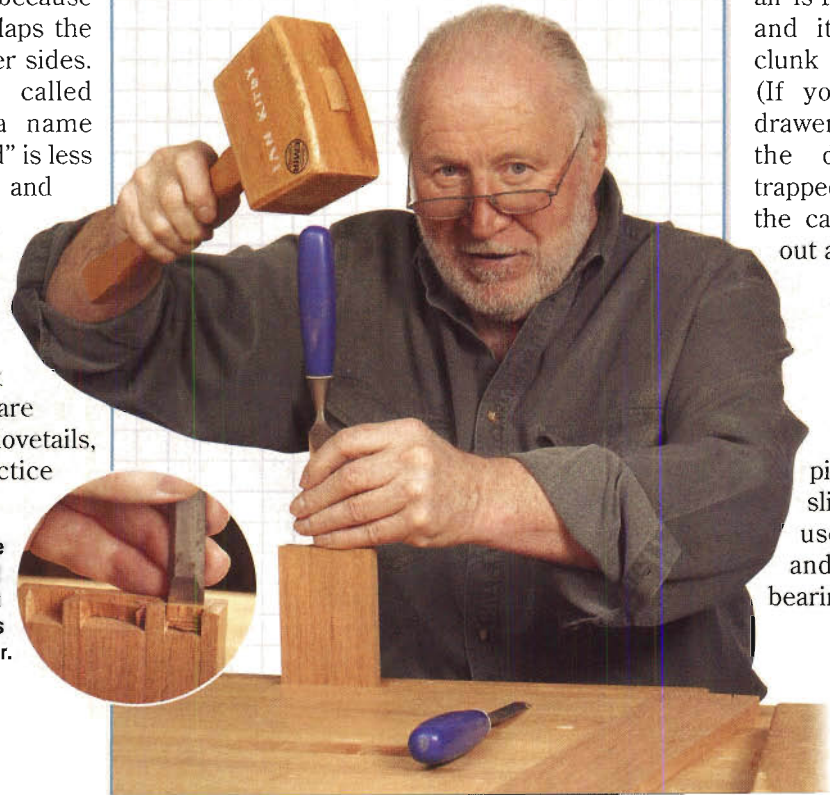
The single-lap dovetail is one of over 30 steps in making a classic handmade solid wood drawer.

By Ian Kirby

In a previous article about making through dovetails (*Woodworker's Journal*, April 2003), I argued the case that learning to make the joint is challenging enough without the added complexity of making it part of a project. Now that you've mastered the through dovetail, the next logical step is to master the single-lap dovetail. This time, however, you will work on a project. It's a study project rather than one destined for sale or display, but you can use it for storing valuable papers or knickknacks, as a reference for solving drawer-making problems, or to impress your friends with the intricacies of a handmade drawer.

The single-lap dovetail is the joint at the front of any drawer put together using dovetail joinery. It's so-called because the drawer front overlaps the tail ends on the drawer sides. The joint is often called a "blind dovetail," a name I dislike because "blind" is less descriptive than "lap," and potentially confusing. How would one describe a double-lap dovetail, for example — a "double-blind dovetail"? The back corners of a drawer are joined by through dovetails, so you get to practice making both joints.





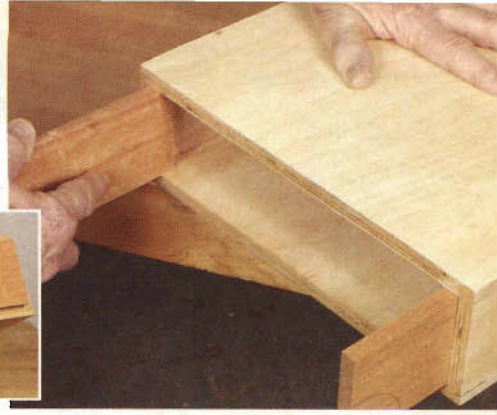
Paring the sockets of the single-lap dovetails is just one of over 30 steps that Ian explains in making this Arts & Crafts drawer.

This study drawer is the classic method of making a solid wood handmade drawer, and it represents the furniture maker's craft at its best. More than 30 steps are involved: no other furniture assembly poses more technical and methodological challenges.

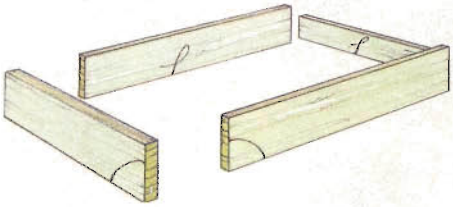
Be under no illusion: this is not a quick and easy project. Nor is it to be compared to a machine-made dovetailed drawer with a plywood bottom on metal slides, which does an excellent job in the right setting. This drawer parades quality and elegance, starting with its feel and sound in use, especially as it is closed. Pushed by fingertip pressure, it slows down as air is forced from the case, and it makes a muffled clunk as it comes to rest. (If you don't make the drawer back narrower than the drawer sides, the trapped, compressed air in the case pops the drawer out an inch or so.)

Ordinary drawer bottoms are grooved into relatively thick sides. The bottom of this drawer fits into a supplementary piece called a drawer slip, which allows the use of thinner sides and increases their bearing surface.

To begin the process, fit the individual pieces of the drawer to your drawer case. Accuracy is essential. A one shaving taper on the inside edge of the drawer front allows it to snug into the opening. The sides and the drawer back are then sized, as described in steps 2 and 3 in the article below.



Finally, all the parts, including the bottom, are made of selected quartersawn material. Honduras mahogany is the best choice. Avoid softwood because it's not hard enough and flatsawn material because it's unstable. Quartersawn wood is also easier to work, a major consideration when so much handwork is required. Although machine tools handle the initial preparation of the stock, the skilled use of a hand plane is essential throughout this study project.



Orientation marks record what goes where: face sides in; face edges down; left and right shown by quadrants.

Making and Fitting the Parts

Even with only four parts, keeping track of what goes where is impossible without a marking system. The simple system shown here is directly descended from British Arts and Crafts furniture makers. It uses fewer marks than any other system I've seen. Face sides go inside, face edges go down. Left, right, front, and back on the drawer sides are indicated by a quadrant mark on the front bottom. Left and right on the drawer front and back are indicated by a quadrant mark on the bottom edge, either end.

Use a soft pencil to mark a face side, a face edge, and a quadrant on all four parts. One secret of success to precisely fitted drawers is taking the time to fit all four parts to the case opening before you join them. With that said, let's move on to the first of the steps.

1. Fit the front

Plane one end of the front to fit the case. Check the fit by offering the front at an angle: the goal is an exact reflection of the opening.

Crosscut the other end as close as you can and plane it to fit the opening. Go too far and the front will be too short. A prudent approach is to take a shaving off the inside edges, so the wood has a minute taper toward the inside — that is, the face side. Assuming the case has straight sides, the front now fits on three sides. Leave the top edge proud by 1/16".

2. Fit the back

Fit the ends of the back in the opening, just like the front. To do this, the bottom edge should sit on the bottom of the case with about a 7/8" gap at the top. Make sure the face side is looking at you as you fit the back because that's how it goes in the case.

3. Fit the sides

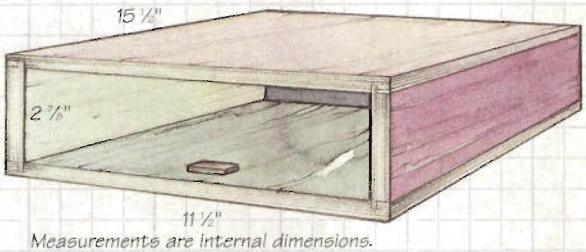
Square the ends and cut to length. Plane the top edge until the side is a push-fit that enters halfway or better. To check that you are planing parallel, turn the side around and enter the front end first: it should slide with the same push-fit.

4. Clean up the inside faces

Plane mill marks from the inside faces before you lay out the dovetails. Mill marks must be removed in preparation for polishing later; the outside faces don't get polished.

Although all steps are critical, this one may not be obviously so. If you plane the inside of the pin pieces — that is, the drawer front and back — after you've cut the joints, they become smaller and therefore loose.

Case for Study Drawer



Measurements are internal dimensions.

Make the study drawer case of 1/2" Baltic birch plywood. Join the corners with tongue and groove joints cut on a table saw. See the detail at right.

Make the case parts dead accurate on the table saw. Before you cut the joints, sand the inside of the sides and the areas where the drawer edges run on the top and bottom pieces. Sanding helps the drawer glide better.

Cut the tongue and groove joint on the table saw. Clamp the case square using correctly designed clamping blocks. Remove all traces of glue from the inside corners before it dries. Ignored and hardened glue will prevent the smooth running of the drawer.

When gluing up the case, make specially designed clamping blocks to direct pressure to the right place.

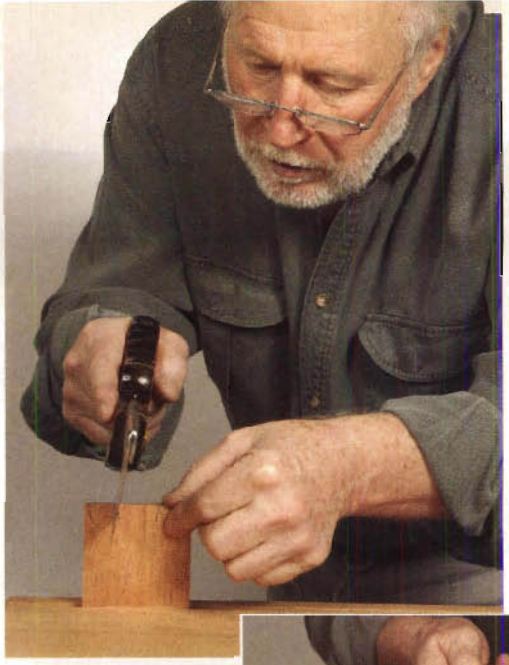
Detail of tongue and groove joint.

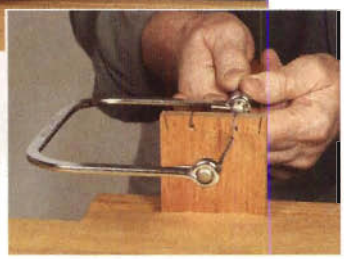
Jointing the Parts

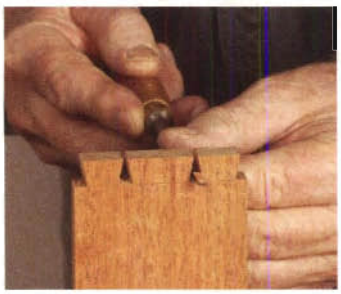
A handmade drawer forcefully demonstrates the logic of initially making the joints with the end grain of the front and back left below the long grain surface of the sides. You make the front and back of the drawer to fit the drawer opening, then you make the sides so they're proud of the end grain. In other words, the drawer is too big for the opening. But once you plane the sides down to the end grain of the front and back — which act as precise signposts — the drawer fits perfectly!

5. Mark out and cut the single-lap dovetail front joints

Setting 1. Set your cutting gauge less than the thickness of the side by about 1/32". This is the amount by which the tails will sit proud of the pins. Knife this setting on the face side of the drawer front. Setting 2. The second gauge setting determines the length of the tails and, at the same time, the thickness of the end wall. Knife down the end grain of the drawer front and knife around the end of the drawer sides.







Cutting the tails for a single-lap dovetail is the same as cutting the tails for a through dovetail. After cutting the tail slopes with a dovetail saw, remove the bulk of the waste with a coping saw. Your next step is to clean up to the lines by vertical and horizontal paring.

Lay out the tail piece as per the drawing. Cut the tails as if you were making a through dovetail.

Mark the pins from the tails by clamping the pin piece in the vise so that it protrudes about 1/8". See the photo at lower right on page 55. Position the tail piece to the lap gauge line and align the bottom edges flush. Mark the tails as for a through joint.

Sawing the pins introduces a new technique. Start the cut on the corner nearest you. Saw across the end grain to establish the correct line, then saw down the vertical line. Avoid wandering in the first line to prevent ragging out the kerf. Next, chop out the waste with a chisel and mallet. This is one of the rare woodworking procedures best done sitting down. I use a sawhorse. Lay the drawer front on the bench and, using the widest chisel that will fit between the saw kerfs, begin to chop by positioning the chisel about halfway down the joint. The first piece will come flying out. Make two or three more chops towards the knife line, but keep off the line by about 1/16".

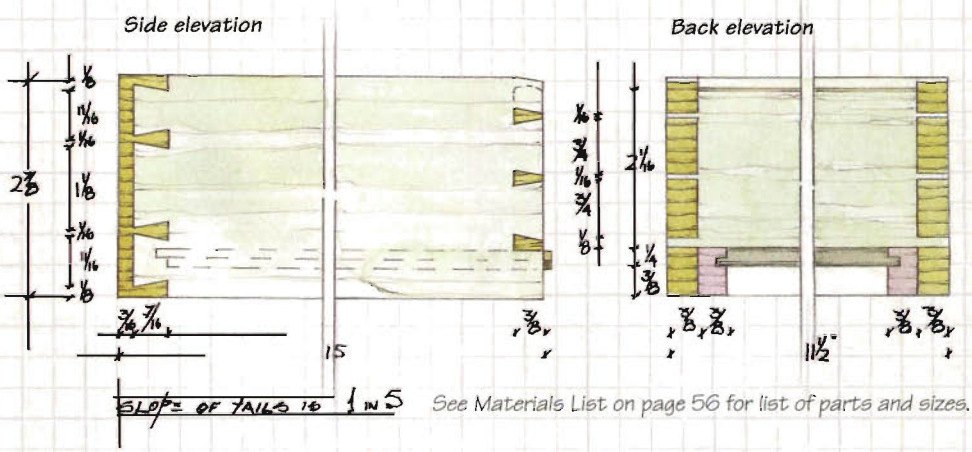
Next, clamp the drawer front upright in the vise and, slice by slice, cut down vertically with gentle mallet blows. With the bulk of the waste removed, pare to the knife lines by hand.

You can't remove the waste from the corners until the end grain fibers have been severed. Do this on each side with a skew chisel — 1/4" chisels ground and sharpened to the angle of the tail. Now, by judicious paring, you can clean out the corner waste.

Assemble the two parts with a hammer as for the through joint. The surface which is sitting above the end grain is what will later be planed off to make the drawer fit.

Study Drawer Details

These dimensions make for elegant looking and refined front and back joints. The hidden detail (the shape described with dotted lines) shows the groove — in the drawer front that accepts the tongue on the bottom — going through a tail socket. It also shows the line of the bottom pin on the back joint.



See Materials List on page 56 for list of parts and sizes.

6. Cut the groove in the front for the drawer bottom

The groove is easiest cut on a table saw using a 1/8" kerf blade. It goes through a tail socket so it's not visible on the side of the drawer. Leave 3/8" below the 1/8" groove.

7. Locate the back joints

The top edge of the groove is the line of the bottom edge of the back. Set a marking gauge to the top edge of the groove and gauge the back end of the sides to indicate the first pin in laying out the back joint.

8. Mark out and cut the through dovetail back joints

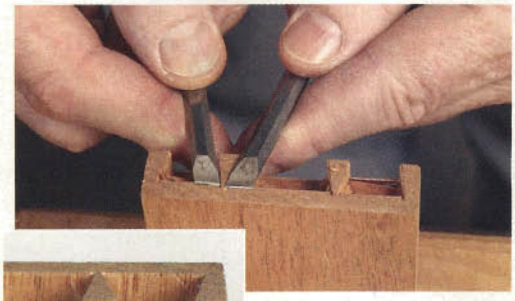
The bottom pin socket on the back is dovetailed on one edge only. This avoids unnecessary fussing with measurements to position the back so that the bottom can slide past it. Take your measurements from the drawing and cut the through dovetail joints.

9. Radius top edge of the back

Use a plane to gently curve the edge of the back. You may wish to finger gauge pencil lines down each side 1/16" from the edge as a guide and another down the center of the edge — this line comes off last. Getting a symmetrical curve in this manner is a nice exercise in planecraft.

After cutting with a dovetail saw, lay the front on your bench and begin chopping out the waste across the grain

Next, clamp the drawer front in the vise and continue chopping out the waste down the grain.



The corner waste is removed by first severing the end grain with a pair of purpose-made 1/4" skew chisels. The goal is pins and sockets that are clean as a whistle.

Polishing and Gluing the Parts

For me "polish" means apply shellac and wax — the traditional Arts and Crafts finish.

10. Polish the inside faces

Be careful not to get any wax on the joints or the lower surfaces where the drawer slip gets glued.

11. Glue up the joints

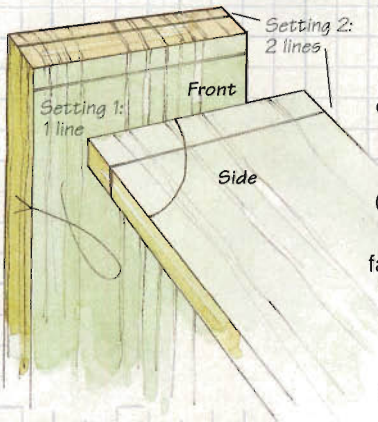
Using a shaped wooden paddle, wet all the mating surfaces with glue, but do so sparingly to minimize squeeze-out. Assemble the parts, tap the tails down with a hammer, then close each set of tails one by one by nipping with a bar clamp. Clamping blocks are unnecessary because the faces of the sides stand proud of the ends of the pins. If the joints are as tight as they should be, there's no need to leave the work in clamps.

12. Check for accuracy

Measure the diagonals to check for square. Sight across the sides to check for twist. Correct any inaccuracies by pushing or twisting the four parts.

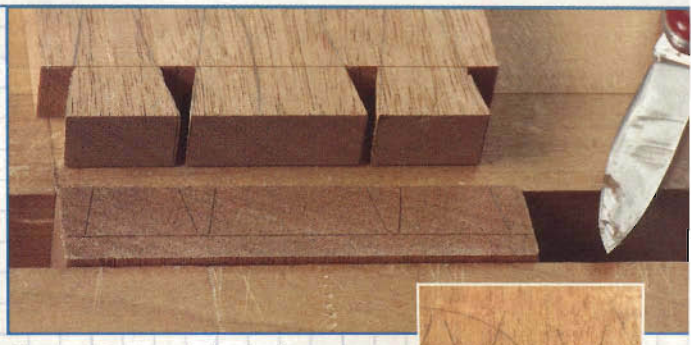
13. Edge clamp the front joint

Because the two outer lines on the front joint are not trapped like the inner glue lines, the glue tends to push the joint open at these interfaces. Close the joint tight with light pressure from a small clamp.



Marking Out and Jointing

The single-lap joint on the drawer front is marked out by two gauge settings and three gauge lines. The first setting (1/32" less than the thickness of the side) determines how far the tails stand proud of the pins. The second setting determines the length of the tails and, at the same time, the thickness of the end wall.



Use the tails to mark the pins by positioning their ends up to the lap gauge line. After you've completed step 5 (above) trial fit the joint. Note the drawer side stands proud of the ends of the pins (inset).

Making and Gluing the Drawer Slip

Drawer slips add an elegantly functional detail to a handmade drawer. Other designs exist, but only this one leaves a square corner.

14. Make the drawer slips

Cut the slips from the same quartersawn material as the drawer sides. Saw the groove in each slip on the table saw before sawing the slip to width — about 1/16" wider than need be. Make an extra piece to check the fit of the tongues which you will make on the drawer bottom.

15. Clean up the slips

Plane off the mill marks on the grooved face and the top edge that will be visible from inside the finished drawer.

16. Make the front joint

The slip is held in the groove in the drawer front by a tongue, which amounts to a bare-faced mortise and tenon. Mark the shoulder with knife and try square, cut it with a dovetail saw, and clean up with a chisel.

17. Polish the slip

Shellac and wax the top edge of the slip.

18. Glue the slips into place

Light spring clamps hold the drawer slips firmly to the sides. Check that the shoulder of the tongue is tight to the drawer front, and clamp the top edge of the slip tight to the bottom edge of the drawer back.

Making and Fitting the Drawer Bottom

The long grain of the solid wood bottom runs from side to side. This allows for shrinkage and expansion front to back. If the grain were made to run front to back, expansion of the bottom would either jam the the drawer shut tight or bust the case open. The bottom has tongues on three sides to fit the grooves in the slips and the drawer front. The tongue on the front is on the top face of the drawer bottom. The tongues on the sides are on the bottom face of the drawer bottom.

19. Prepare the bottom

Glue up boards to make the bottom and plane to 1/4" thick.

20. Size the bottom

Plane the end grain of one edge square to the front edge.

21. Make the first tongue

Mark the tongue with a cutting gauge and cut it with a shoulder plane. Check it for a sliding fit using the spare slip.

22. Mark the second tongue

Fit the shoulder of the first tongue tight to the bottom of its drawer slip and knife the shoulder line of the second tongue, using the drawer slip as a guide.

23. Cut to length

Leave 3/16" for the tongue beyond the shoulder line you just knifed and saw off the excess material.

24. Make the second tongue

Cut the tongue with a shoulder plane and check it for a sliding fit with the spare slip.

25. Flush the slip and the bottom

Using the spare drawer slip as a guide, plane any excess from the top face of the drawer bottom to make the two parts flush.

26. Insert the bottom and square the front edge

Slide the bottom into place. If it doesn't fit square to the front, remove and adjust accordingly. The bottom should slide in and out with little effort so it can shrink and expand easily.

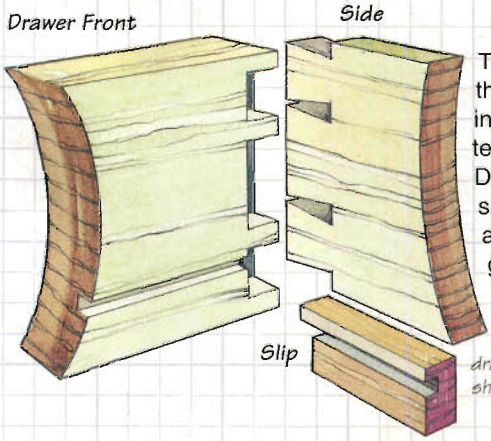
To create the second tongue on the drawer bottom, establish the shoulder with a knife line. Cut all tongues with a shoulder plane.

MATERIAL LIST

	T x W x L
Case (Baltic birch ply)	
Top/Bottom (2)	1/2" x 12½" x 16"
Sides (2)	1/2" x 3¼" x 16"
Back (1)	1/2" x 3¼" x 11⅞"
Drawer* (Selected quartersawn hardwood)	
Front (1)	5/8" x 3¼" x 12"
Sides (2)	3/8" x 3¼" x 15½"
Back (1)	3/8" x 2¼" x 12"
Bottom (1)	9/32" x 15½" x 11"
Slips** (2)	3/8" x 7/8" x 15½"

*All dimensions before final fitting.
**Cut from wide board. Make one spare.

Drawer Slip and Bottom Assembly



This inside corner view shows the relationship of the groove in the drawer front and the tenon on the drawer slip. Drawer slips are cut from the same quartersawn material as the drawer sides. Cut the groove on a table saw.

A short tenon on the front of the slip fits into the groove on the drawer front. The shoulder of the slip should fit tight to the drawer front.

27. Make the front tongue

The tongue on the front is on top of the drawer bottom. This means that if there is a little shrinkage in the drawer, any gap will be out of sight on the bottom. Even a dressmaker's pin can't fall into a crack.

28. Cut to length at the back

Leave the back projecting 1/4" or less.

Shooting the Drawer

In woodworking parlance, shoot means to "make straight," hence the expressions "shoot the edge" and "shoot the drawer." This also explains why an 07 is known as a "shooting plane."

29. Plane off excess drawer slip

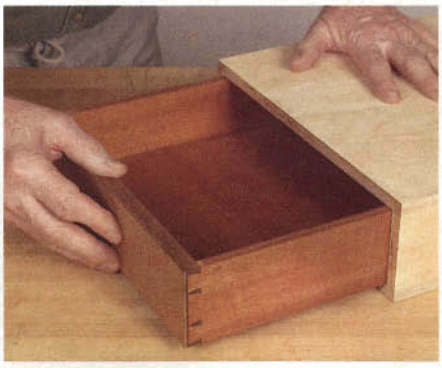
The drawer slips were made wider than needed so they project below the sides after being glued in place. Now is the time to plane them flush with the bottom edges of the drawer sides. Check that they are aligned by laying a straightedge across both slips.

30. Shoot the drawer

Hold the drawer front in the vise and support the side on a board as wide as the drawer is long, clamped across the benchtop. Plane the side from end to end, checking for straightness as you go. When you've planed both sides down to the end grain of the pins, the entire drawer should enter the case, though the fit may be very tight.

Ease the fit a shaving at a time. Working the drawer in and out will burnish any high spots, identifying exactly where a shaving must be removed.

Plane both drawer sides down to match the end grain of the dovetail pins.



The final test: closing your handmade drawer with fingertip pressure.

Contact surfaces may be lightly rubbed with candle wax, then buffed with a tight wad pad until you buff it all off. Don't sand the surfaces and don't wax them with beeswax — it will cause the drawer to stick.

Finishing the Drawer Front

The three remaining steps will take you to the end of the drawer making process, and to a new level of woodworking.

31. Planing the top edge of the drawer to fit the case opening

If, when you made the single-lap joints at the front corners, you didn't align the bottom edges spot-on, you can make them flush now and still have some drawer front material to plane to fit. Either way, you now finally fit the front to the opening.

32. Flush the front

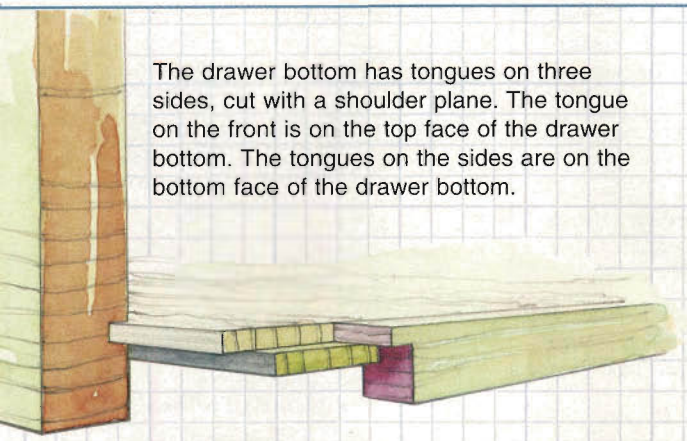
Once the drawer enters the case fully and easily, hold the drawer tight in the opening by clamping it in the vise and plane the front so that it's flush with the case edges.

33. Make and glue the stop in place

The drawer stop brings the drawer to rest where you want it — flush, inset or proud; it's your choice. The stop is a small piece of material, sized about 3/16" thick to allow clearance for the drawer bottom. I position it by setting an adjustable square as a guide, then glue and clamp it in place.

"The goal is a drawer that slides as easily as a skate blade on ice and closes with fingertip pressure."

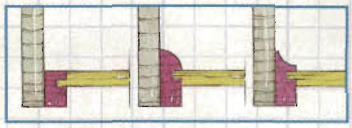
Ian Kirby is a master woodworker and regular contributor to the Woodworker's Journal. *His book,* The Complete Dovetail, *is available from Linden Publishing.*



The drawer bottom has tongues on three sides, cut with a shoulder plane. The tongue on the front is on the top face of the drawer bottom. The tongues on the sides are on the bottom face of the drawer bottom.

Detail showing how tongues on drawer bottom fit into grooves on the drawer front and sides. Slip is pulled back.

The flush slip with its long shoulder lines presents the most demanding work, although it has the simplest look when finished. A less demanding alternative is to make slips that stand proud of the bottom, thus eliminating the visible shoulder line.



Drawer slip variations, left to right: flush, rounded over and coved.

The proper position of the drawer slip is tight to the side, engaged in the drawer front's groove and snug to the bottom edge of the back.

SHOWCASE

has never been so easy!

Charged-up Miter Saws

By Chris Marshall

The expanding world of cordless tools has a new category, and manufacturers are slowly, but surely, joining in. Next time you buy yourself a miter saw, you might find yourself telling the clerk to "hold the cord."

Right now there are only four different models to choose from, and these saws aren't getting the same press as today's hot new battery-powered drills, trim saws or routers. Admittedly, a cordless chop saw seems more fitting for a contractor than a woodworker, but it could be a sensible option if your electric tools compete for precious few shop outlets. Or, if you don't have the space for a permanent miter saw station, these saws are small enough to tuck under a bench or on a shelf, and you can tote them easily with one arm for those occasional trim or framing projects.

Recently I gathered up these saws to see how they'd fare in a battery of tough and exacting cutting tasks. I'll admit straight away that I was skeptical going into this tool test. I love my trusty miter saw with its three-pronged

THIN-KERF BLADES

The test saws for this article came fitted with thin-kerf carbide blades that cut a track about half as wide as conventional crosscut blades. I asked Russell Kohl, vice president of sales and marketing at Freud, why thin-kerf blades are the best choice for these machines. His answer was simple: Thin blades require less energy to cut through a workpiece, so they boost the cutting performance of lower powered cordless and corded saws. The tradeoff is higher vibration, which can lead to more tearout and swirl marks. When shopping for a thin-kerf blade, look for high-strength steel that's laser cut (with expansion slots) and tensioned flat in the manufacturing process.

tail. But after a couple of hundred test cuts, I can honestly say these cordless machines are worth their salt. They can't top the cutting capacity of a 12" slider with a plug, but they do pack plenty of muscle for their size and are just as accurate as comparably priced corded saws. Here's how each one measured up.

Ryobi MS180 18-volt

Last fall, Ryobi entered the cordless miter saw arena with this 8¼" dia., 18-volt compound miter saw. At a tad under $200, it comes well appointed for an astonishingly low price. Ryobi makes the tool more appealing by pairing it with a 1/2" drill/driver that shares the same batteries.

As far as capacities go, the saw will cut through 8/4 stock when the blade is square to the saw table or 2x material when tipped to a 45° bevel. The blade has enough reach to crosscut a 2 x 6 at 90° or lumber up to 3¾" wide at a 45° miter. I tested the saw's mettle by slicing through some 8/4 oak and dense, 2x Southern yellow pine. The motor labored a bit but didn't stall or seem underpowered for the challenge. In fact, its thin-kerf 40-tooth blade crosscut the oak as cleanly as any saw in this group. It performed less swimmingly on the pine, however. The blade deflected along the cross-grain growth rings instead of slicing a flat plane, which left a wavy cut.

This machine has a unique miter table lock. Instead of the usual twist knob in front, you lock the miter setting by pushing down a lever behind the saw fence. The lever lock offered plenty of holding power, but I missed the twist knob for swinging the blade right or left. For cutting bevels, the saw adjusts with a more conventional knob in back of the tool.

Most miter saws have a wedge-and-slot system for locking common miter detent settings. Ryobi opted instead for a spring-loaded ball bearing that catches on stop notches inside the saw base. While you can feel the detents at 0°, 22.5°, 30° and 45°, it was easy to overshoot them by a half degree or so unless I lined up the cursor carefully. I like the wedge-and-slot style better; it provides a reassuring "click" that leaves no room for doubt about the cutting angle.

Accuracy really rules the day with miter saws, and the Ryobi suffered some on my polygon cutting test (see page 68). It could be that my test saw had a slightly looser pivot mechanism or possibly more arbor or blade runout than the other saws. Whatever the case, a bit more cumulative cutting error seems a fair tradeoff for such a modestly priced saw.

As for its other features, the Ryobi comes with a dust bag, dust guide, one-hour charger and hold-down clamp. Will this machine satisfy a machinist's taste for precision or the cutting demands of a deck builder? Not necessarily, but all in all, it delivers decent performance, especially if you check the angle settings carefully and touch up those critical cuts

Shop Test continues on page 62 ...

Ryobi includes a screw-style clamp that holds workpieces firmly against the saw fence and keeps your left hand out of harm's way.

Ryobi MS180

Street price: $199
Weight: 21½ lbs
Battery: two 18-volt (NiCD)
Arbor: 5/8"
Blade diameter: 8¼"
Maximum cut miter/bevel:
2 1/16" x 5½": 0°/0° square cut
2 1/16" x 3¾": 45°/0° vertical miter
1½" x 5½": 0°/45° horizontal miter
1½" x 3¾": 45°/45° compound miter
No load rpm: 2,000
Phone: 800-525-2579
www.ryobitools.com

Locking a miter setting on Ryobi's cordless saw involves pushing down a lever behind the fence. There's no twist knob on the front of this machine.

with a block plane or sandpaper. You can find this miter saw and drill/driver combo at your nearest Home Depot™.

Makita BLS820SFK 24-volt

If you're a dyed-in-the-wool Makita fan, this mid-sized cordless miter saw won't disappoint you. It may even tempt your allegiance if you wear a tool cap of a different color.

The BLS820 spins an 8½" blade, so it can crosscut stock up to 2⅜" thick and 4 13/16" wide at 90° or 3⅜"-wide lumber at 45°. Tilt the blade to its maximum bevel, and the saw slices 2x material with some tooth to spare. These cutting capacities won't frame a house, but the saw is amply sized for cutting a woodworker's fare of furniture parts and moldings.

Setting miter and bevel angles was a breeze on this tool. Up front, the silver-on-black miter scale was easy to read, and it has an arrowhead-style cursor that makes the angle setting visible from any vantage point. No parallax problems here. Another arrowhead on the bevel tilt scale helped when aligning the tool to the scale's tiny hash marks, especially when the scale was coated with sawdust. The table swiveled smoothly, and nine wedge-and-slot detents locked it crisply in place. Or you can set up miter cuts off the detents all the way to 52° left and right. When I tightened the handle to lock in a non-detent miter, the table stayed put, just like it should.

Both Makita saws in this test group have an adjustable throat piece on the table for snugging up the kerf opening to help reduce tearout. I made some cross-grain test cuts on birch plywood to see how well the feature worked. While the saw's standard 40-tooth blade did a fine job cutting the birch on its own, splintering on the bottom face reduced to almost nil when I closed the kerf around the blade. What a simple and sensible feature.

The Makita sports a compact motor with an electric brake and externally accessible brushes for easier maintenance — but don't let the power plant's small proportions fool you. This motor sliced through 8/4 oak and 2x Southern yellow pine with equal verve and at pleasantly low decibels. The motor head's pivoting action was smooth, and a rubber overmold on the handle kept my grip secure.

Makita has invested significant R&D energy into the MakStar™ nickel-metal hydride battery system that comes with this saw and seven other 24-volt tools. The battery has 20 cells inside with a memory chip that records their individual charging histories. A computer in the charger uses this information to determine the optimal charging cycle for each cell. The charger also has a cooling fan that blows air through the battery to help extend its life.

The folks at Makita tell me that the sophisticated battery and charger help explain why this miter saw will take a bigger chomp out of your pocketbook than competitor saws. While a second battery

Shop Test continues on page 64 ...

would help ease the sticker shock, still the BLS820 performed admirably for me on all accounts. It's a safe bet that the extra investment here on the front end will buy you performance you can count on over the long term.

Makita BLS712SFK 24-volt

For about $20 more than Makita's other cordless miter saw, you can buy this dual-rail slider with some of the same features as its larger brother, plus a few more. The BLS712 also gives you a few extra inches of crosscutting capacity.

This machine spins a 7½" blade, which is pretty modest for a sliding miter saw these days. Even so, the blade still crosscuts 8/4 stock up to 7⅛" wide in the sliding mode. Twist the table to 45°, and cutting width decreases to 5". The saw won't quite clear 2x stock when set for a deep bevel cut.

The heart of this tool is the same scrappy motor used in the BLS820. It drove the blade through 8/4 oak and some tough Southern yellow pine without complaint. Makita boasts that the saw will chop 316 2 x 4s before the battery needs a recharge. At that point, you'll have to wait — the tool comes with just one battery. Regardless of what you're cutting, this saw needs to be clamped or bolted to a work surface. The narrow saw base and a shifting center of gravity make it tippier than the other test saws.

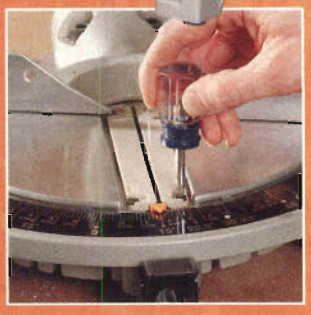
Both the saw table and the sliding rails offer silky smooth action.

Shop Test continues on page 66 ...

Makita's saws are powered by MakStar™ nickel-metal hydride batteries. The charger monitors each of the 20 internal cells and charges them independently.

Makita BLS820SF

Street price: $730
Weight: 22⅓ lbs
Battery: one 24-volt (NMH)
Arbor: 5/8"
Blade diameter: 8½"
Maximum cut miter/bevel:
2⅜" x 4 13/16" 0°/0° square cut
2⅜" x 3⅜" 45°/0° vertical miter
1¾" x 4 13/16" 0°/45° horizontal miter
1¾" x 3⅜" 45°/45° compound miter
No load rpm: 2,300
Phone: 800-462-5482
www.makitatools.com



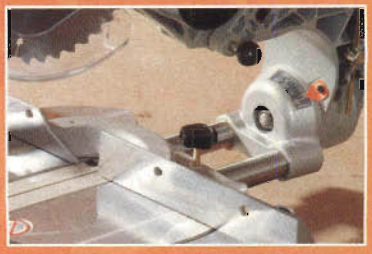
Adjustable kerf boards on the Makita saws help keep splintering to a minimum.

Makita BLS712SF

Street price: $750
Weight: 24⅓ lbs
Battery: one 24-volt (NMH)
Arbor: 5/8"
Blade diameter: 7½"
Maximum cut miter/bevel:
2" x 7⅛" 0°/0° square cut
2" x 5" 45°/0° vertical miter
1⅜" x 7⅛" 0°/45° horizontal miter
1⅜" x 5" 45°/45° compound miter
No load rpm: 2,300
Phone: 800-462-5482
www.makitatools.com

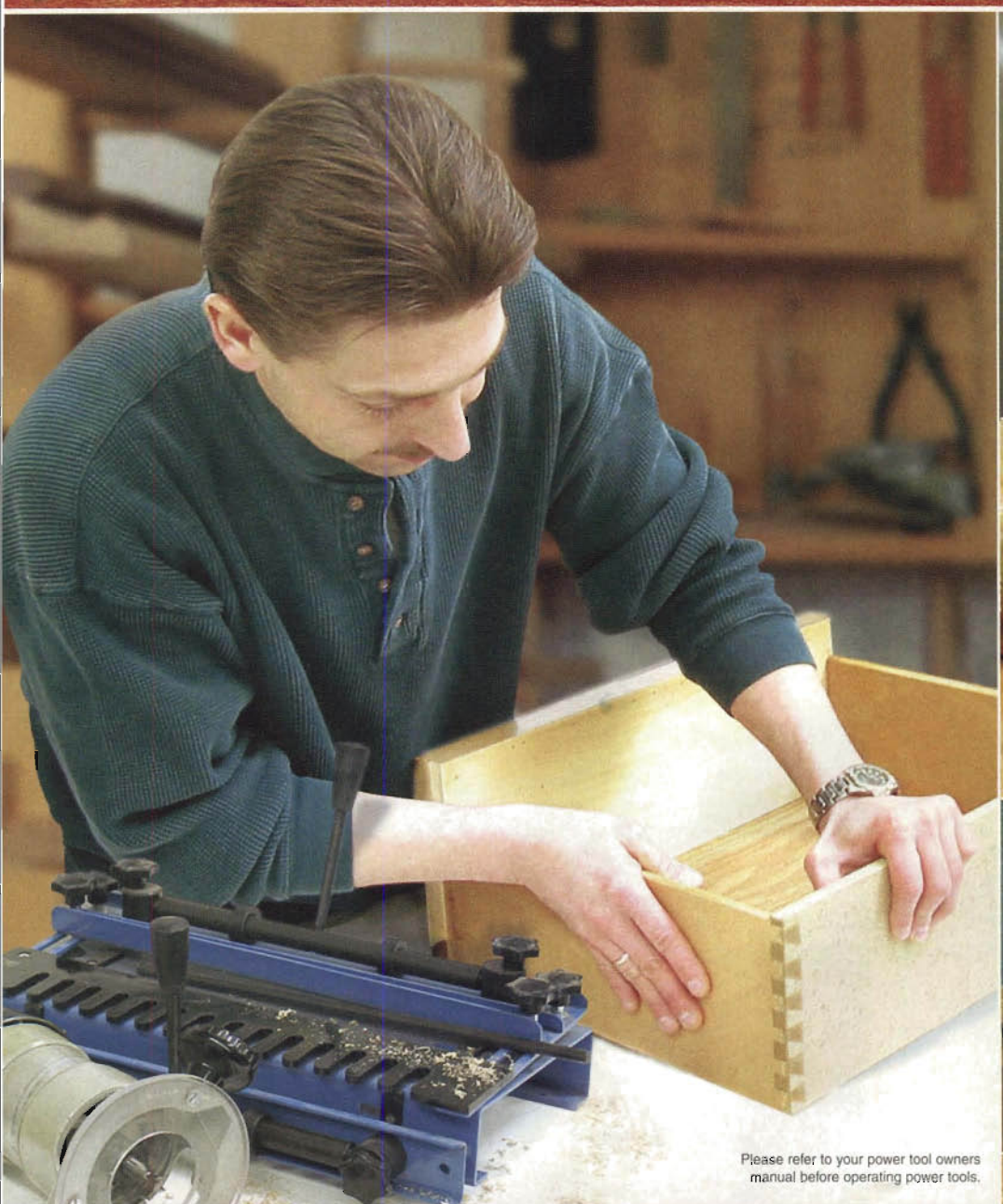
Through-cuts aren't the only option with Makita. Just flip a lever and twist a screw on the motor carriage to cut stopped kerfs for dadoes and lap joints.

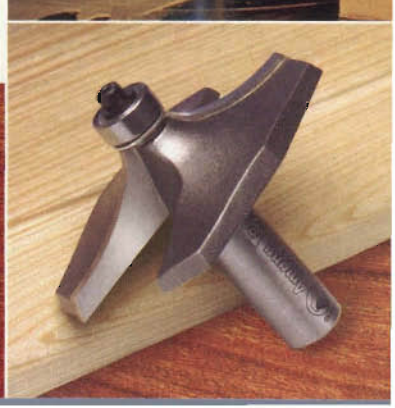
An outboard brace bolted behind the BLS820 provides sure footing for the tool when it's not fastened or clamped to a benchtop.



The BLS712 carriage rides on a pair of ball-bearing rails. You can also lock the rails in their extended position and use the tool like a plunge-style miter saw.

No Matter What Your Project, We Have The Cutting Tool for You





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I couldn't detect any side-to-side play in the motor carriage that would lead to sloppy cuts. In fact, this slider cut the second tightest polygon shape of the test group (see page 68) on the very first try. Not only was there miniscule cumulative error, but the joints were so flat they all but disappeared when I butted the pieces tight.

The 712 comes with silver-on-black miter and bevel scales similar to the 820, with arrowhead pointers to mark the cutting angles accurately. You can park the table at nine wedge-and-slot detents or swing it a full 47° left and 57° right for more extreme miter cuts.

One feature unique to this machine is a blade depth stop for making dado cuts. Swing a lever into position on the saw carriage, and you can limit the downward travel of the blade. With the lever engaged, a stop screw dials in the exact depth of cut. I liked the dadoing feature, but the small blade reduces the travel of a stopped cut to workpieces just a few inches wide. A clever jig builder could easily boost the cutting range by outfitting the saw with an auxiliary table and fence to raise workpieces closer to the blade and out from the saw fence.

Other goodies that come packed with the saw include a 40-tooth carbide blade, one-hour MakStar™ charger, dust bag, hold-down clamp and a giant carrying case. All in all, you certainly could spend a lot less and buy a corded sliding miter saw with more capacity, but not if you want one with a battery. Looking past the price tag, this Makita will give you pinpoint accuracy and plenty of cutting muscle in a compact, lightweight package.

Bosch 3924K 24-volt

If you're looking for a battery-powered miter saw sized like its corded cousins, look no further than the Bosch 3924. It's equipped with the largest saw table and fence in this test group and spins a 10" blade. With 24-volts driving the motor, this saw's size and performance may make you look twice for the power cord.

Bosch surely set its sights on framers and trim carpenters when designing the 3924. The blade will crosscut a 4 x 4 or 2 x 6 at 90°, and it can still slice through 8/4 stock at a 45° bevel. If your projects involve wide trim work, this saw can handle compound miter cuts on 4¼" wide crown molding, even when the molding is placed in the "sprung" position against fence and saw table.

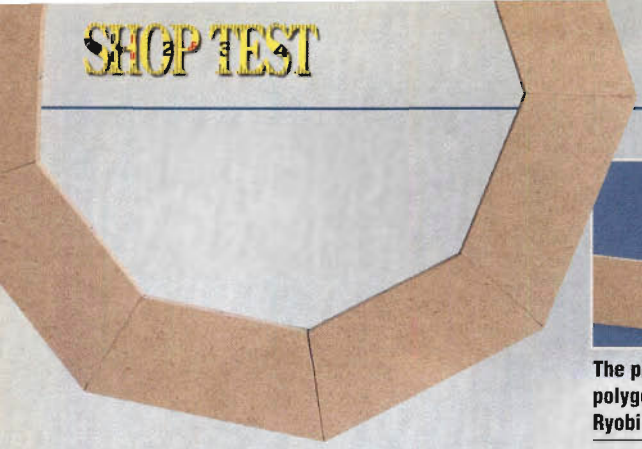
A pairing of thin-kerf blade and gutsy motor made easy work of my test cuts on thick oak and yellow pine. Its motor was noisier than other saws, but it didn't make me

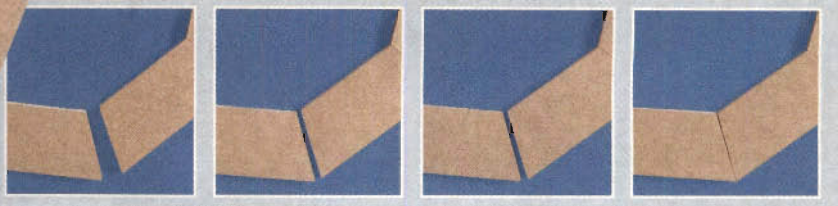
Shop Test continues on page 68 ...

Bosch 3924K

Street price: $459
Weight: 30 lbs
Battery: two 24-volt (NiCD)
Arbor: 5/8"
Blade diameter: 10"
Maximum cut miter/bevel:
3½" x 5½" 0°/0° square cut
3½" x 3⁹⁄₁₆" 45°/0° vertical miter
2" x 5½" 0°/45° horizontal miter
2" x 3⁹⁄₁₆" 45°/45° compound miter
No load rpm: 3,600
Phone: 877-267-2499
www.boschtools.com

Bosch designed the blade guard on this saw to stay up and out of the way for hassle-free blade changes (above left). Extensions on both the fence and table slide out to create a larger platform for workpiece support (center). Plus, Bosch's heavy-duty hold-down clamp slips into a pair of holes on each end of the saw and levers down for a vise-like grip (above right). Knurling on the post keeps the clamp anchored in the holes.





The photos above depict the gap between the first and last pieces of the nine-sided test polygon cut by each saw. From left, the joints were created by the following saws: Ryobi MS180, Makita BLS820, Makita BLS712, Bosch 3924.

POLYGON CUTTING TEST

If you've ever cut a picture frame with mismatched miter joints, you know it doesn't take much deviation from 45° to throw the last corner off. Even a quarter degree of error at each miter makes a noticeable difference. Increase the number of sides on a shape and this cumulative cutting error becomes a bigger problem.

To test the accuracy of these cordless miter saws, I tuned up the blade, fence and table according to their manuals. Then I set each saw to a 20° miter and cut nine-sided polygons from MDF strips. Granted, no one cuts nine-sided figures regularly, but I was curious to see how the last joints would turn out. When the dust settled, Bosch ruled the day with a ninth joint that closed almost perfectly. Makita's BLS712 sliding miter saw earned a strong second place. The last joint was about 3/32" open — darn respectable on the first try. The other Makita saw fared well, but the ninth joint was about 1/2" open on round one. I cut a second polygon using one of the Bosch pieces to set the blade angle, and the BLS820 left the final joint open about 1/8". The Ryobi saw (a consumer tool priced at less than a third of the Makita offerings) finished fourth. After I cut three polygons and reset the blade with one of the Bosch test pieces, the last joint was still about 5/8" open.

Shop Test continues on page 70 ...

reach for earplugs when sawing for extended spells. The motor brushes are externally accessible, so they'd be easy to change later.

There were no surprises when I swiveled and locked the saw table to nine wedge-and-slot detents or tightened the handles for other miter and bevel cuts. The table pivoted and locked down just as you'd expect from a pro-series saw. It certainly helped the tool cut the most accurate polygon when I tested it for mitering precision. I wasn't as pleased with the scale cursors, however. On the miter table, the cursor is a red hairline mark on clear plastic, located inside a recess on the handle, which made it harder to see than arrow-style pointers. The bevel scale pointer was a flat piece of metal. Unless I sighted my bevel angles straight on from table level, I wasn't sure of the angle setting.

Kudos go to Bosch on this saw's fence design, simply leagues better than the rest. The fence is 2½" tall on the right and rises to 3½" on the left — almost double the height of Makita's 8½" saw. Bosch includes a fence extension that slides out to add another 7" of workpiece support. I also appreciated the milled pattern on the fence faces that lends just enough "bite" to help hold workpieces in place. The other saw fences were all polished smooth and slippery.

Bosch provides ample workpiece support on the saw table, too. The table is more than 20" long, but an integral extension piece slides out to add another 3¼" of length. You'll get a quick-action hold-down clamp that engages like a locking pliers for an effective grip, and it comes off the tool just as easily when not needed.

Of all four saws, I'll admit that the Bosch impressed me most. It's appointed with sensible features and cuts accurately without extra fuss. The tool includes two batteries, a dust bag and one charger, for a price that rivals many of today's better corded saws. If you're already using other Bosch 24-volt tools, you can even buy this saw without the batteries for around $300. The Bosch 3924 wins my vote for your best buy.

Contributing editor Chris Marshall writes project stories and tool reviews for Woodworker's Journal.

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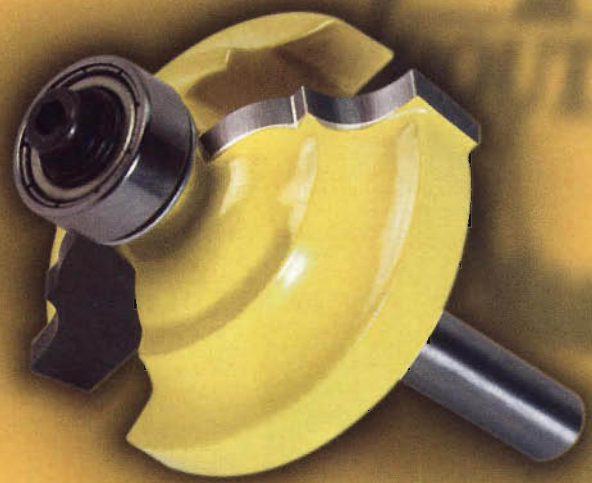

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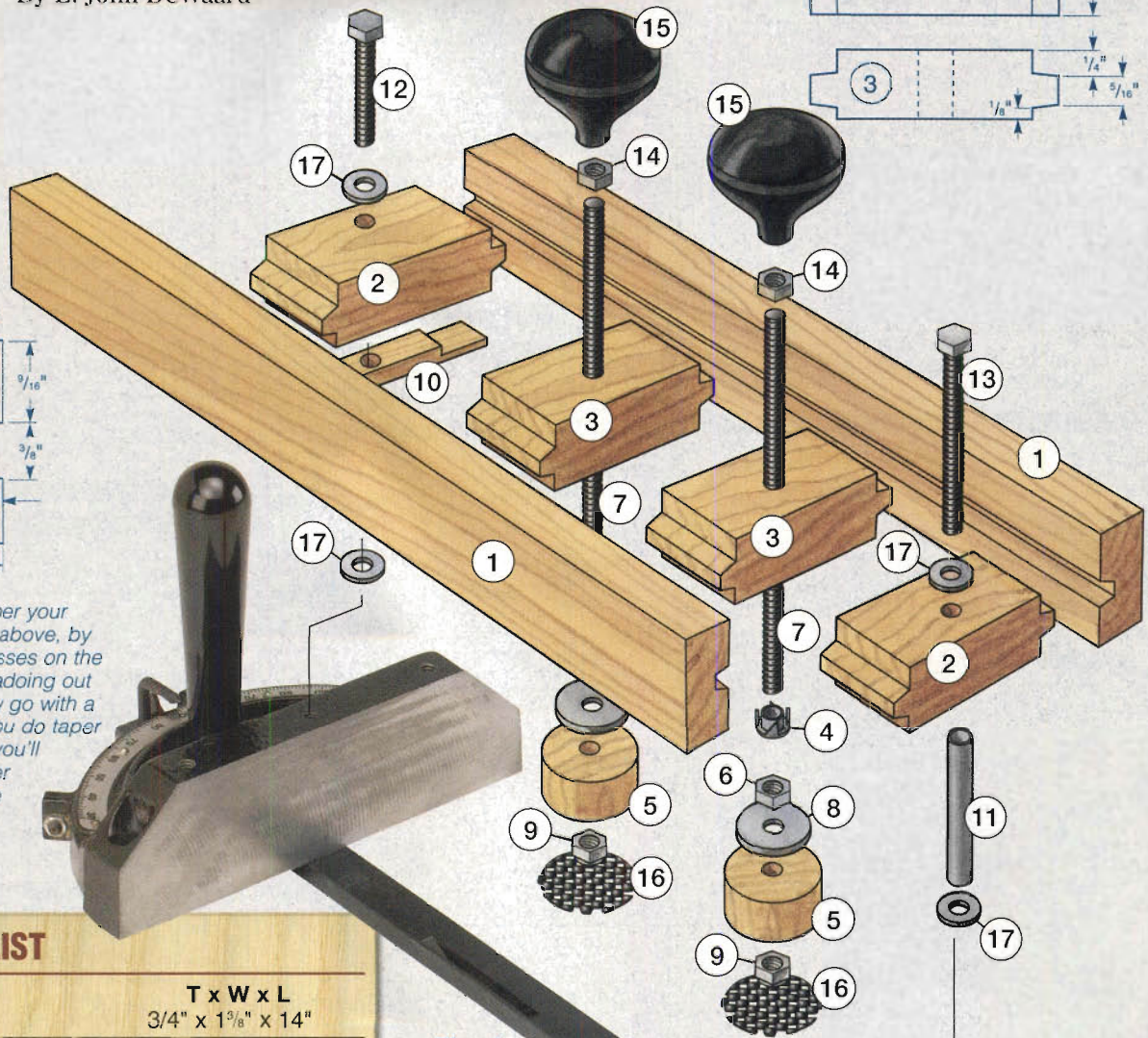
Marketplace ... continued

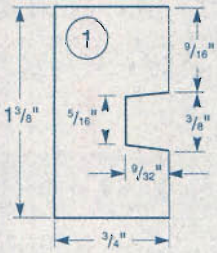
The Miter Clamp Jig

By E. John DeWaard



Sliding Stile
(Top and Side Views)

Rail
(Side View)

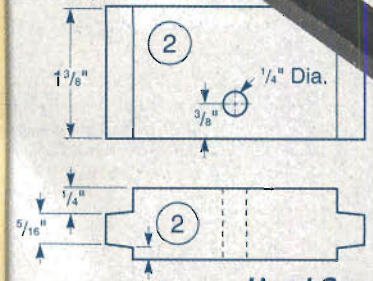


Note: *You can taper your grooves, as shown above, by taking two extra passes on the table saw before dadoing out the waste, or simply go with a square groove. If you do taper your groove walls, you'll want to slightly taper the shoulders of the stile tenons as well.*

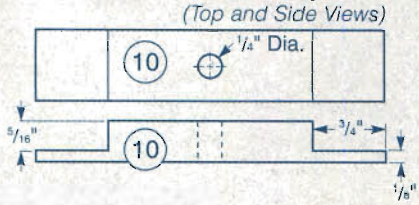
MATERIAL LIST

		T x W x L
1	Rails (2)	3/4" x 1 3/8" x 14"
2	Fixed Stiles (2)	3/4" x 1 3/8" x 2 3/4"
3	Sliding Stiles (2)	3/4" x 1 1/2" x 2 11/16"
4	T-nuts (2)	5/16" - 18
5	Clamp Pads (2)	3/4" x 1 3/4" Dia.
6	Upper Pad Nuts (2)	5/16" - #18
7	Clamp Bolts (2)	5/16" - #18 x 5"
8	Pad Fender Washers (2)	5/16" I.D. x 1 1/4" O.D.
9	Lower Pad Locknuts (2)	5/16" - 18
10	Head Spacer (1)	3/4" x 7/16" x 3 5/8"
11	Toe Spacer (1)	3/8" x 2 6/8"
12	Head Bolt (1)	1/4" - 20 x 1 1/2"
13	Toe Bolt (1)	1/4" - 20 x 3 1/2"
14	Knob Stop Nuts (2)	5/16" - 18
15	Knobs (2)	5/16" - 18 x 2" Dia.
16	Pad Liners (2)	1 3/4" Dia.
17	Washers (4)	1/4" I.D.

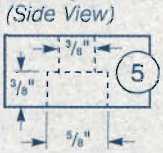
Fixed Stile
(Top/Side Views)



Head Spacer
(Top and Side Views)



Clamp Pad
(Side View)



Attach this jig to your miter gauge and you can clamp workpieces in place for extremely accurate and safe milling.

Start building this jig by ripping a 30" length of hardwood for the rails (pieces 1) to the dimensions shown. Plow a groove with slightly angled walls in one of the wider faces (it takes three passes on the table saw) and then crosscut the rails to length.

Make the fixed stiles (pieces 2) and sliding stiles (pieces 3) from a single 1 x 8 board crosscut to 2¾" long. Mill a tongue on each end to the dimensions shown in the Drawing: a tenoning jig on the table saw works well for this. (I slightly tapered my tenon sides so they'd slide easier.) Rip the board to produce two fixed and two sliding stiles (check the Materials List for the dimensions), then trim a hair off each end of the sliding stiles. This will allow them to move in the rail grooves. If they still bind, trim their shoulders slightly with a block plane or sanding block. Be sure to label all four parts to avoid confusion.

Using diagonal lines, find the center of each sliding stile and bore a 3/8" through hole, using your drill press. Slip a 5/16", #18 T-nut (pieces 4) into the bottom of each hole and hammer it flush.

Assemble the jig body by gluing one fixed stile between the rails and clamping it, then add the sliding stiles and glue and clamp the second fixed stile in place at the other end. Set the assembly aside to cure while you make the clamp pads (pieces 5).

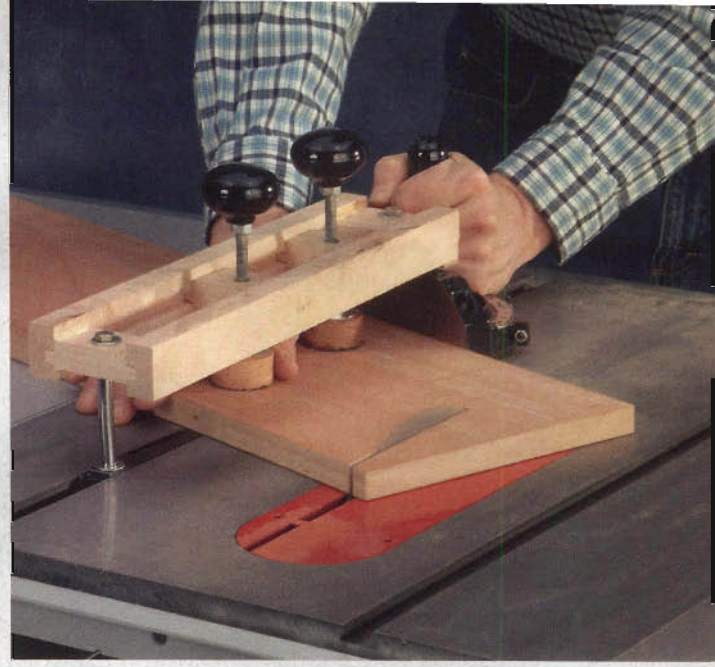
Using a Hole Saw to Form the Clamp Pads

With a 1¾" hole saw chucked in the drill press, select the slowest speed and drill halfway into a piece of 1 x 3. Make sure the saw's 3/8" guide bit slightly penetrates the bottom face. Replace the saw with a 5/8" Forstner bit, increase the speed and drill 3/8" deep to counterbore the earlier hole. Now flip the 1 x 3 and rechuck the hole saw. Free the clamp pad by drilling through, using the hole produced by your first cut as a guide. Follow the same sequence for the second pad.

Drilling a Hole in Your Miter Gauge

Disassemble your miter gauge and turn the head over to locate the pivot hole. Transfer the center of this hole to the top of the head and chuck a #7 drill in your press. Tape one of the fender washers you'll use later over the hole to form a dam: this holds thread-cutting oil close to the hole as you drill. Tap the hole with a 1/4 by #20 tap and clean the threads with a pipe cleaner.

Complete the clamping pad subassemblies next. Begin by running an upper pad nut (pieces 6) up each clamp bolt (pieces 7). Add a fender washer (pieces 8), the clamp pad and the lower pad Nyloc® nut (pieces 9). This is a locking nut with a nylon washer built in. Tighten it until the rod is flush with the opening, then tighten the top nut until the washer is tightly trapped.



The author's miter clamp jig in action. It eliminates creep and adds another level of safety, especially on cuts like the one shown above.

Joining the Bar

Bore a 1/4" hole in the fixed stile nearest to the head of the miter gauge, at the location shown in the *Drawings* at left. Then, using the bar from the miter gauge as a pattern, mark and drill a 1/4" hole for the toe bolt in the other fixed stile. Notch the head spacer (piece 10) as shown in the *Drawings* and glue and clamp it to the bottom of the fixed stile, flush with the end. When the glue has set, drill down through the fixed stile to produce a through 1/4" hole. Next, chuck a 3/8" drill in your press and counterbore the bottom of the other fixed stile 1/4" deep. This will accommodate the toe spacer.

Reassemble your miter gauge, then cut the toe spacer (piece 11) to length (this will depend on your miter gauge). Fit the spacer into the counterbore on the fixed stile. Thread the clamp bolts into the T-nuts in the sliding stiles, and you're ready to attach the bridge to the miter gauge with the head and toe bolts (pieces 12 and 13). Run the knob stop nuts (pieces 14) down each clamp bolt, followed by the knobs (pieces 15). Tighten the knobs, then tighten the nuts back up against the knobs to lock them in place.

Apply epoxy to the bottom of each fender washer on your clamp pads and screw the pads down. The jig acts as a clamp here.

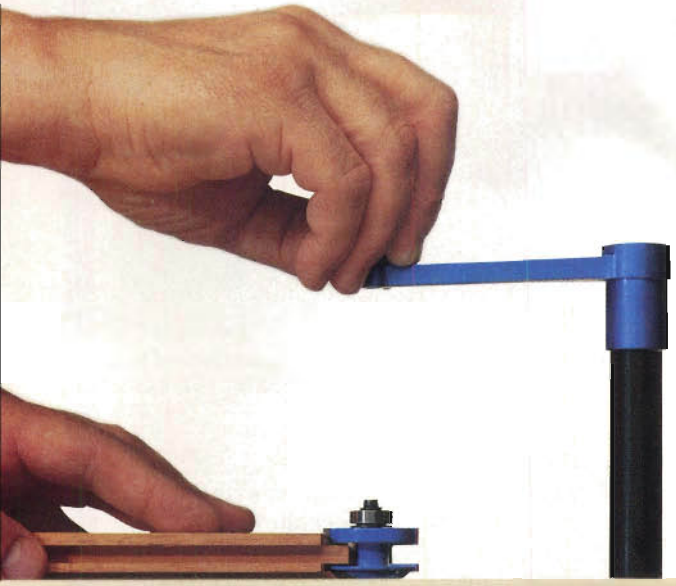
When the epoxy has set, apply Loctite® to the three threads above the nuts over the clamp pads and back the nuts off three turns and then down two and a half turns. You're doing this because the buried nut must be able to turn, plus you want the pads to compensate for irregularities.

Use rubber cement to attach pieces of router pad (pieces 16) to the bottom of the pads, trimming them with a razor blade, and you're ready to go to work.

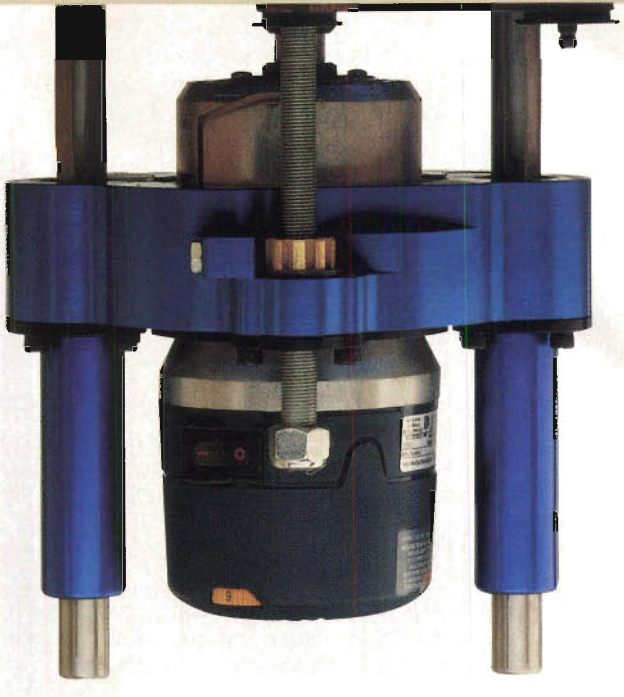
E. John DeWaard is a woodworker from Marshall, Michigan. This jig has become a daily staple in his shop.

Router Adjustments: View from the Top

By Bill Hylton



A table mounting has long been a staple setup for router users. If there are any gripes about this common setup, they have to do with changing bits and adjusting the height of the bit for any cut.



Each individual woodworker must ask the question: how many scraped knuckles and sore lower backs will it take before you spring for your first router lift? It won't be cheap, but that hasn't stopped an awful lot of woodworkers.

Not surprisingly, some of the hottest accessories and newest product developments address the two vexations mentioned above.

To get a handle on the state of this art, I tried all the router table height-adjustment products and accessories I could get my hands on (you're jealous, aren't you?). I've sorted them into three categories: routers, plunge adjusters, and router lifts. Since the capabilities of the top-end lifts are the benchmarks, let's look at them first.

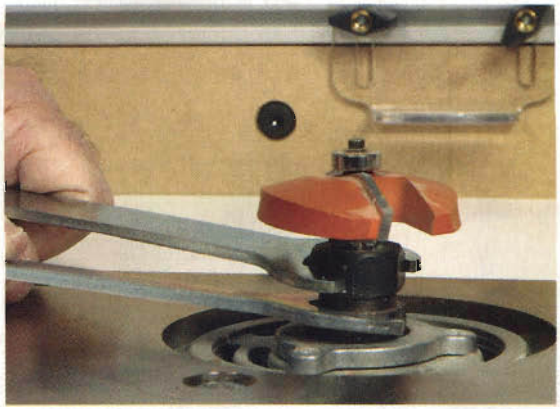
Router Lifts

With the best of the router lifts, you can achieve two things: You can adjust the bit up and down from the top of the table (using a removable crank while monitoring the adjustment on an indicator) and you can raise the collet above the tabletop for bit changes.

Based on their popularity, for a lot of woodworkers, these are must-have capabilities. They want nothing less, and they'll pay the price to get them.

Bear in mind that not all lifts have these capabilities. Bear in mind, too, that you can't use just any router in one of these top-end lifts. And, oh, yeah! Expect to pay at least $260 just for the lift.

The top-end lifts are JessEm's Mast-R-Lift®, Bench Dog's ProLift™ Ni (PL1002) and Woodpeckers' Precision Router Lift, (Jointech's Router Lift Pro and Rockler's Mast-R-Lift are both made by JessEm). A half-step below is the Bench Dog ProLift Al (PL1001). A full step down are the JessEm Rout-R-Lift and Woodpeckers' Unilift, which is just coming on the market.



Why all the excitement? When it comes right down to it, it's about being able to change (and then adjust), your bits from above the router table's top.

All consist of a metal plate (comparable to a regular insert plate) that drops into an opening in the tabletop. Attached to its underside are a pair of precision ground steel posts on which a router mount rides. The mount is driven up and down the posts by a screw operated from above the plate, usually with a removable crank. As the crank is turned, an indicator dial spins, seemingly giving you a readout on the bit's elevation.

I say seemingly, because none of the dials will give you a cumulative readout. You must tally fractions in your head as the dial revolves. The upshot: the dials can be helpful in making fine adjustments, but they are practically useless for establishing a coarse setting.

Two basic mount designs are used in the lifts. With the top of the line lifts, you remove the router motor from its base and clamp it in the lift's mounting block. This arrangement provides the best vertical adjustment range and enables you to raise the router so its collet projects above the table. Bit changing is a snap.

The three top lifts are designed specifically for the Porter-Cable 7518 motor, long the king of the router hill. All will also accept a modest selection of mid-power (1½ to 2¼ HP) router motors, including Bosch's 1617 and 1618, Porter-Cable's 690, Makita's RF1100 and RF1101 and DeWalt's 616 and 618, as well as its 610.

The ProLift Al model, though its design duplicates the big boys, won't take the big PC. It's designed for the lighter weight, lower power routers.

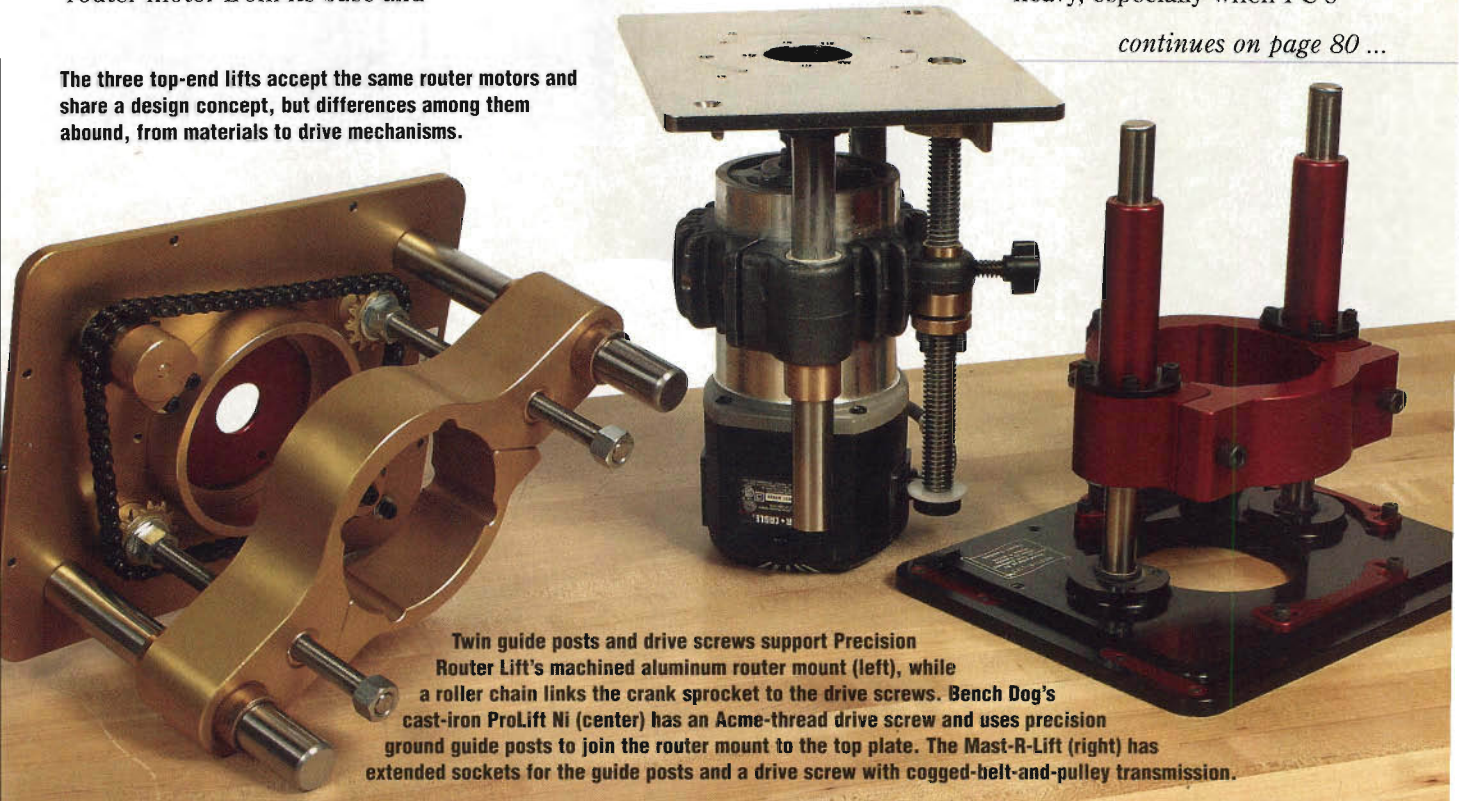
The two low-end lifts have a mount for a router and its base. You can use virtually any router with these two lifts, including plunge models. The combination of router base and mount, however, restricts the elevation that's possible. You get above-the-table bit height adjustment, but not above-the-tabletop bit changing. (In fact, depending upon the router you use, bit changes with this lift may actually be more difficult than with a conventional insert plate mounting.)

Line up the top three lifts side by side, and the similarities and differences are evident.

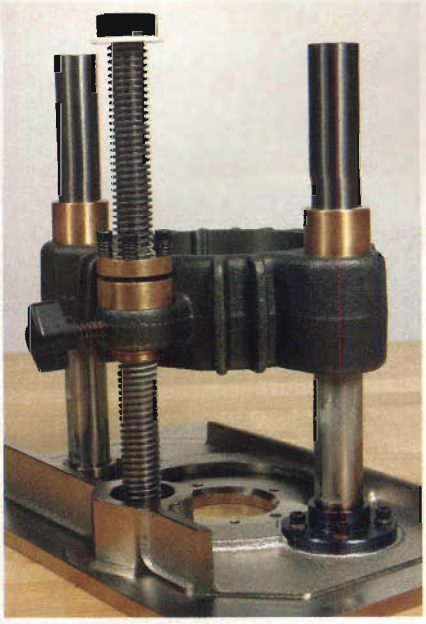
The Bench Dog lift is mostly cast iron, and it weighs a ton! It is so heavy, especially when PC's

continues on page 80 ...

The three top-end lifts accept the same router motors and share a design concept, but differences among them abound, from materials to drive mechanisms.



Twin guide posts and drive screws support Precision Router Lift's machined aluminum router mount (left), while a roller chain links the crank sprocket to the drive screws. Bench Dog's cast-iron ProLift Ni (center) has an Acme-thread drive screw and uses precision ground guide posts to join the router mount to the top plate. The Mast-R-Lift (right) has extended sockets for the guide posts and a drive screw with cogged-belt-and-pulley transmission.



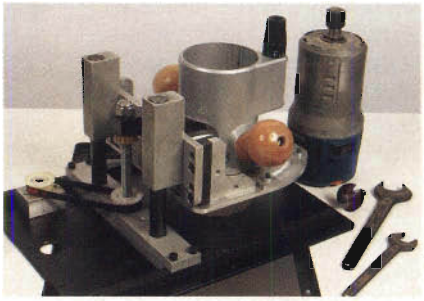
Bench Dog's top-of-the-line lift is mostly cast iron and is so heavy (with router installed) that you may want to add bracing to your tabletop. The plate is nickel-chrome-plated and has an opening for the largest bits available.

roughly 16-pound motor is installed, that you must shore up your router table's top with braces to prevent sagging. The shiny plate is nickel-chrome-plated and has an opening for the largest bits available. Polished steel reducers for the opening are provided. Beneath the plate are the guide posts that carry the router mount and a single 8-pitch Acme-thread screw that raises and lowers it.

Adjustments are made with a socket wrench — Bench Dog provides the socket, you provide the wrench — that turns a nut on the screw itself. A dial press fits on the socket, and it can be zeroed by twisting the dial on the socket. Unfortunately, there's a lot of slop in the fit of the socket on the nut. Using a ratchet handle on the socket adds extra fussiness; use a T-handle instead.

Both the Mast-R-Lift and the Precision Router Lift are primarily aluminum. Both are sturdy without

Woodpeckers' PlungeLift package provides an integrated mounting plate and above-the-table adjustment system for many plunge routers.



JessEm's original model, the Rout-R-Lift, will accommodate almost any router, including plunge models. It has above-the-table adjustability, but because the router's base mounts to the lift's carriage, bit elevation is limited.

being excessively heavy. Both come with bit opening reducers: JessEm uses phenolic for these; Woodpeckers, aluminum. Both lifts have a machined aluminum router mount riding on the guide posts.

The Mast-R-Lift uses a single 20-pitch drive screw. The screw is turned through a cogged belt and pulley setup, which gives you 1/16" of movement per crank revolution. Its dial is divided in 0.002" increments. It cannot be zeroed.

The Precision Router Lift uses a pair of 32-pitch drive screws, located inboard of the guide posts. The lift has a roller chain system to turn the screws in unison. A brake feature locks the chain to prevent router vibration from causing height changes. When you insert the crank, the brake is automatically disengaged.

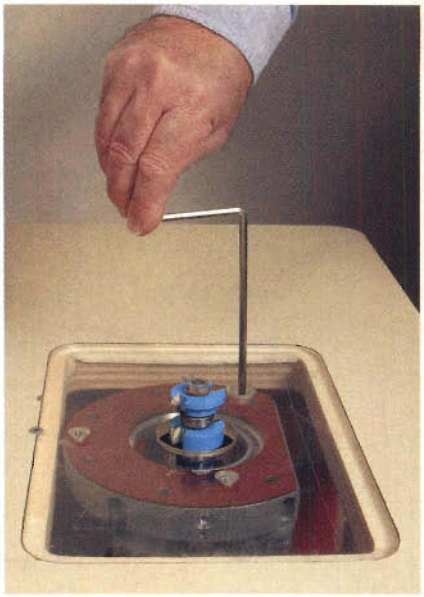
Each screw has an indicator graduated in thousands on top. A single rotation moves the router 1/32", so moving the router a full inch requires 32 rotations. This is swell for fine adjustments, but not so fine for coarse ones. Each indicator can be zeroed by loosening a screw.

All three lifts are excellent products: well designed and well manufactured. The key features are worthwhile, saving you a little time and improving the precision of your router table cuts.

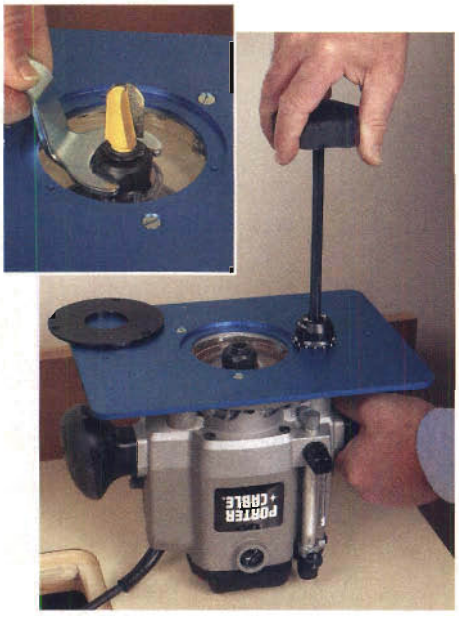
Here's the "but." Are the features worth more than $260 to you? Can you match — or at least *approximate* — the features for less money? Absolutely.

Plunge Router Adjusters

Before the woodworking world had router lifts, it had plunge routers. A lot of us have viewed the plunger as a natural choice for a table, simply because fine, accurate bit height adjustments are easy to make with it.



The Router Raizer for plunge routers is simple but flexible. The removable crank can be used on either end of the adjuster, whether the router is in the table or out.



Porter-Cable's 8529 plunge router is designed to be adjusted in or out of the table. The optional adjuster drops through a hole you drill in the mounting plate and mates with the router's height adjustment screw. The bent wrench Porter-Cable supplies (see inset) easily changes bits from above the table. It can access the collet, even when it's slightly below the table surface.

Many plunge routers, in fact, are factory equipped with a simple depth-of-cut adjuster for router table use. Turn a big knob and the router motor moves up and down the plunge posts. Reach the bit setting you want and stop turning.

Such adjusters are widely available for most plunge routers and cost about $25. To make adjustments even easier, get an adjuster with a crank in place of the knob. The cranks cost more, about $35.

The simplicity and effectiveness of this system, surprisingly, haven't kept other plunge router adjusters off the market.

An excellent add-on is the $90 Router Raizer, which can be mounted on virtually any plunge router. Remarkably flexible, it allows you to adjust the bit height manually from either the top or the bottom of the router. And it doesn't prevent the router from being used for regular plunge operations.

The patented device replaces the router's threaded height-stop rod. Typically, you must drill a 3/4" hole in the router's baseplate. The Router Raizer's hex shaft passes through the hole and the router's base, extending up through a hollow lead screw you mount on the motor. When it is completely assembled, the shaft has a socket on each end for the separate crank.

With the router hung in a table, you insert the crank into the socket in the router's base and wind the bit up or down. Each full rotation changes the bit elevation 1/16", so a quarter turn equals 1/64" (or 0.015"). Pop the router out of the table, and you can use that free-floating plunge action just by pushing down on the handles. You can also insert the crank into the upper-end socket and wind the motor down to the base.

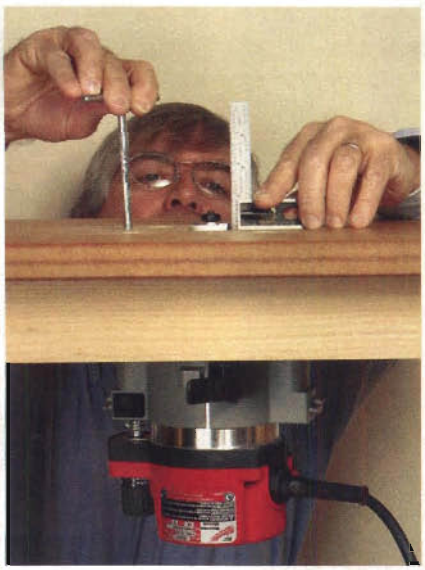
A relatively new adjuster from Woodpeckers integrates a manual adjuster for a plunge router with a very solid aluminum mounting (or insert) plate. Its manufacturer calls it the PlungeLift and charges about $150 for it.

The device has the same 32-pitch drive screw used on the PRL. You change the elevation with a crank that plugs into a socket on the top of the plate. The dial surrounding the socket can't be zeroed, but it does allow you to track adjustments as fine as 0.001". As with the PRL, this is ideal for fine adjustments, but not for coarse ones.

Here's an interesting comparison. Buy the PlungeLift and, in addition to a micro-fine adjuster that's operable from the table surface, you get a dandy mounting plate. But you wouldn't really use the router and lift as a handheld tool (as you might a router and plastic mounting plate). You can't plunge the router while it's in the lift, and it isn't a simple matter to free the router from the lift.

For $60 less, you can get the Router Raizer but no plate. So buy a plate with the savings. The adjustment isn't as fine, and there's no readout, but coarse movements are faster, and the plunge is still operable. You can crank adjust bit height from above the table, but also with the router upright.

What none of these plunge router adjustment systems are able to do, however, is elevate the collet through the base and above the tabletop. The construction of the routers simply won't allow it.



Milwaukee's new 3½ HP router can be adjusted from above the table using a T-handle wrench to turn the height adjustment screw. The wrench comes with the router. You provide the access hole in the tabletop (or insert plate).

The New Breed of Routers

It has taken a long time, but router manufacturers are awakening to the market potential of a router designed for router table use.

Leading the way is Triton, an Australian newcomer. Its 3+ HP plunge router has two design features that compare well with the top-end router lifts.

First, the router has two adjustment modes: winder and plunge. When the winder mode is engaged, you adjust the bit by squeezing a lock ring and twisting the hand grip. This moves the router motor on the posts. When you release the lock ring, the motor position is frozen. There's a separate fine adjuster.

The Triton's bit adjustment capabilities don't perfectly match those of a lift. You can't make adjustments from above the table. The fine adjuster has some backlash. There's no zero-able gauge. But, on the other hand, the capabilities are integrated into the router and its price tag.

Second, the Triton's bit change mode advances the collet through the router's base, activates the spindle lock, and locks out the power switch. Above-the-table bit changes are S.O.P. Sweet!

Two American manufacturers also have recently introduced new table-friendly routers.

Milwaukee has two fixed-base models that allow above-the-table changes in bit height. One is the 1¾ HP BodyGrip router, the other a 3½ HP fixed-based router with EVS.

An Acme-thread screw linking the motor and the base makes adjustments as fine as 1/64". When the router is upright, you turn the screw using its top-mounted knob. When you hang it under a table, you drill a hole in the tabletop (or insert plate) so you can access the bottom end of the screw with a T-handle wrench (it's in the carton).

Porter-Cable's contribution to the realm is its new 8529, a 2 HP

continues on page 86 ...

With a Triton in the table, you hold a small square beside the bit and turn the fine adjuster to establish the bit height.

Changing bits in a table-mounted Triton router is an above-the-table, one-handed operation. When it's wound into bit-changing position, the collet is above the table, the spindle is locked, and the power switch is locked out.

plunge router. (This is a replacement for the troubled model 7529.) The table-mounting enhancements include a bent wrench for above-the-table bit changes and an optional height adjustment handle.

The bent wrench is familiar as an aftermarket item. It can dip into a 3+ inch hole in a router tabletop to work a collet nut that's about an inch below the surface. What's notable here is that it's delivered with the router. And it's the only wrench you get.

The accessory handle works much like Milwaukee's T-handle. You drill an access hole in the tabletop or insert. Drop the adjuster's shaft through the hole to engage and turn the router's height adjustment screw. PC's handle does have a "dial," but you can't convince me it is either fine or accurate.

With the best of the router lifts you can do two things: adjust the bit up and down from the top of the table and raise the collet above the tabletop for bit changes.

My Conclusions

Router lifts are pretty seductive. All three top-end models are thoughtfully designed and well constructed. All are easy and convenient to use, although all have quirks. Being able to raise and lower a bit with a conveniently located crank, and being able to bring the collet up above the table surface to change bits ... well, these are definite attractions.

But when the price tag gets turned over so I can see it, that really tends to get my attention. The tags on the Mast-R-Lift and the PRL are $260 each, while the one on the ProLift Ni is $380. That's not exactly chump change in my neck of the woods, but as they say, "you get what you pay for," and these are quality products. Whether the convenience and efficiency gained with them are worth the cost is really your call. But as I look around and see the offerings in this category expanding rapidly, I think it is clear that many woodworkers have already answered the question.

Bill Hylton is a regular contributor to Woodworker's Journal *and the author of* Woodworking with the Router *from Reader's Digest.*

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Flexibility, Control and Power

Flexibility, control and power to cut thick stock are found in Metabo's new STE105 Plus variable speed jigsaw. Flexibility — and the versatility for a wide range of cutting tasks — comes from a beveling sole plate with positive stops at 15, 30 and 45 degrees. Control comes from a barrel grip design that keeps your hand close to the work surface. And power comes from a 6 amp motor with 62 inch-pounds of torque — enough to cut up to 4⅛" in wood (1$^{3}/_{16}$" in metal and 3/8" in sheet steel).

The STE105 Plus, with five-stage orbital blade motion, also has variable speed settings which range from 1,000 to 3,000 no-load strokes per minute. Cutting accuracy comes from grooved needle bearing roller guides, while clear visibility at the cutting line comes from a blower which continuously removes sawdust.

Other features of the 5.7 pounds STE105, which sells for around $209, include the Metabo "Quick" tool-free blade changing system, a carrying case, anti-splintering insert, jigsaw blade and Allen wrench. *For more information, 800-638-2264 or visit* www.metabousa.com.

Man-made Material: A Blade That Can Cut It

Until now, says Russell Kohl, Freud's vice president of marketing and sales, saw blades for double-sided materials like laminate or melamine just couldn't cut it.

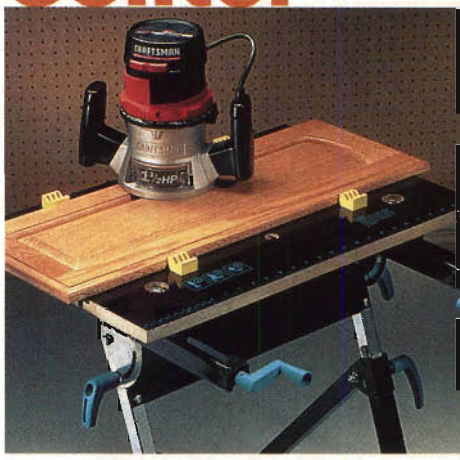
"What we have found is that standard blades generate a lot of chatter and vibration, which produces chipping in melamines and laminates," Russell says. To offset chatter, Freud has designed a blade with laser-cut antivibration slots. The new offering is the 10" LU97R Perma-SHIELD™ Coated Double-Sided Laminate/Melamine Saw Blade.

Woodworker's Journal shop master Rick White has been trying out the LU97R in the shop and affirms that it works well for its designated purpose. "I've found nothing better for melamine," he said. The Perma-SHIELD coating reduces friction to increase blade life, while laser cut slots allow the blade to expand with heat during use to keep the cut straight and true. Pre-tensioning secures the blade flat for years of operation.

The LU97R blades have 80 carbide teeth in a triple chip grind (TCG) tooth design. Each tooth has a negative hook angle for easy feeding and fast cutting. The Sub MicroGrain Titanium Carbide Blend tips are an exclusive formula manufactured by Freud specifically for this industrial blade for ultra long life. The LU97R is available for $100.

For more information, call 800-334-4107 or visit www.Freudtools.com.

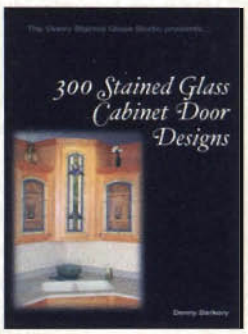
Clamping Center



The Quick Jaw® Work Center, model 6136, from Wolfcraft is a workbench and clamping table in one. Product manager Matthew Van cites its versatility and flexibility: the jaw adjusts up to 14° for irregularly shaped pieces, and variable height adjustment lets you use the bench in any position, at a range of 30¼" to 40¾" high. Four swivel pegs can be used to grip workpieces or extend the clamping range. Its suggested retail price is $59. *For more info, call 630-773-4777 or visit* **www.wolfcraft.com.**

Frame Something New

If you've mastered building frame and panel doors and want to take on a new challenge, Delphi Glass has some projects for you. They're offering a project book and tip sheet that tell you how to add stained glass inserts: the frame of your door becomes the frame for the image. The Cabinet Customization Tip and Project Sheet for woodworkers includes detailed directions to create stained glass cabinetry, and also lists kits and tool recommendations for getting started. The book, *300 Stained Glass Cabinet Door Designs*, costs $18.95 and shows you how to add textured or colored glass designs, as well as "bevels" — which refers to pre-made shapes in stained glass designs, as opposed to joinery reference that woodworkers are used to. *For more information, call Delphi at 800-248-2048 or visit* www.delphiglass.com/diy.



Steaming Dents and Filling Gouges

By Michael Dresdner

When you sand a project prior to finishing, the goal is to get the surface smooth and level. But, like potholes on the freeway, our projects are often plagued with depressions and divots that show up during final sanding. These fall into two categories: dents and gouges. Dents are depressions in the wood where the fibers have been crushed, but not broken. Gouges are voids where wood fibers have been cut and where wood is missing. A significantly different repair technique is used for each one.

Steaming Dents

Wood fiber is like a bundle of straws, and dented wood is like an area of collapsed straws. Steaming swells them back into shape, usually making them completely disappear. If you are not sure whether the depression is a dent or a gouge, try steaming first. If it does not come out completely, treat it like a gouge and fill it.

To steam a dent, put a drop or two of distilled water into the depression, and let it soak in for a few seconds. Add at least enough water to fill the dent. Meanwhile, wet a clean, cotton cloth and wring it out. Lay the damp cloth over the water-filled dent and press a hot iron onto the cloth. The damp cloth will prevent the iron from scorching the wood. The heat will convert the water, which will have absorbed into the wood, into steam. The expanding steam will remove the dent. Remove the iron as soon as the cloth gets dry. If the dent comes only partway out,

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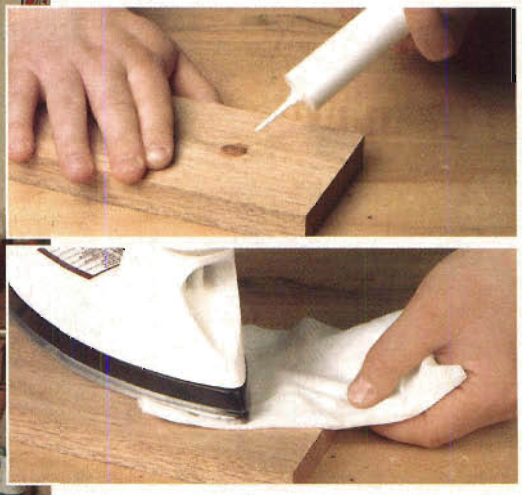


Removing a dent using steam is a simple, two-step process that requires distilled water, an iron and a damp cotton cloth.

"Finding a putty that will take stain exactly the same as the wood," says the author, "is the Holy Grail of finishing."

repeat the process a second time. When the wood is dry, resand the area before you stain or finish, using the same grit paper as you used for your final sanding.

Filling Gouges

Because wood is actually missing in a gouge, the only solution is to replace it with something, and that something is putty. Wood putty comes in powdered form that's designed to be mixed with water, and in both waterbased and solvent-based ready-to-use formulations. You'll find it in a wide range of colors at home improvement stores and woodworking outlets. The various brands and types of putty are more alike than different, but they're cheap enough that you can experiment with a few.

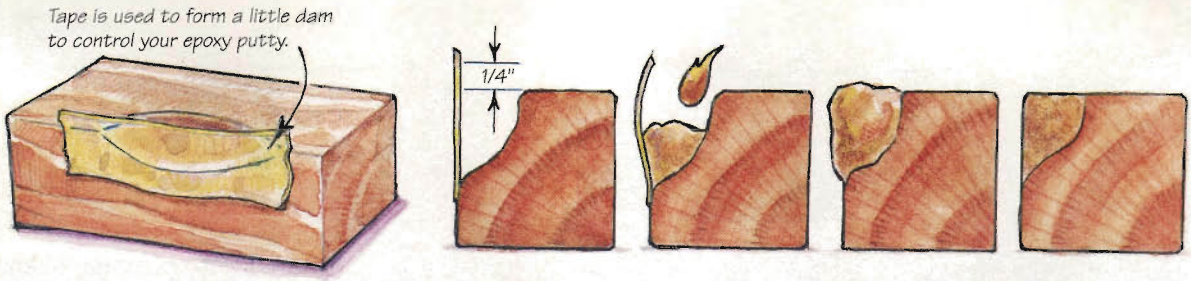
Because putty must be sanded, it is applied to raw wood prior to staining. Take a small amount out of the container and use a putty knife to press it into the gouge, knothole, or chip that needs filling. Leave it slightly proud of the surface, because it will shrink a bit as it dries. Make sure it is dry, then sand the putty flush to the surrounding area. Sand until the putty is exactly the shape of the original gouge. That way, you know you have gotten all the putty off the surrounding area. If you are not sure if the putty is hard enough to sand, test it by pressing your thumbnail into the center of the putty spot. If it gives or indents, let it dry further.

Match the putty to the lightest background color of your wood.

Put a dollop of putty and a few spots of artist's colors on a piece of glass or laminate to create a mixing palette for making your own custom-colored putty.

Matching Colors

Even fairly uniform wood is actually a variety of colors, due to grain and figure patterns. As a result, a fairly large putty spot often shows up as a dark or light "pond." For this reason, I find it is best to match the putty to the lightest background color of the wood. After the wood has been sealed, you can go back and add grain lines and figure colors with a fine touch-up brush and some artist's colors. The combination of the appropriate light background and some adroit touch-up can yield an almost invisible repair.



To properly fill a gouge along an edge, first build a little dam with masking tape. Keep the tape about 1/4" higher than the wood surface. Add drops of filler into the void until it is slightly proud and bulges the tape dam slightly. When the epoxy is cured, remove the tape and file or sand it flush.

Of course, it is not always easy to find exactly the right color of putty to match the background of every piece of wood. Fortunately, you can make putty either lighter or darker by mixing artist's colors into it. Use waterbased artist's acrylic colors with waterbased putty, and artist's oil colors with solvent-based putty. You'll find both at any craft or art store.

Put a small amount of putty onto a piece of glass or a scrap of plastic laminate, add a few dollops of the colors you think you'll need, and mix them in with a putty knife a little at a time until you get just the right tint.

Putty Under Stain

Finding a putty that will take stain exactly the same as the wood it is on is the Holy Grail of finishing. Some putties absorb more stain than others, but some woods absorb more stain than others, too. Matching up the two is difficult at best, and sometimes impossible. If you are planning to stain your project, take a scrap of the same wood, make a gouge in it, and fill it with the putty you plan to use. Sand it when it is dry, then stain it. The putty will either be darker or lighter than the surrounding wood or, if you are living in a state of grace, it will be exactly right.

Adjust the color of the putty as needed so that it is correct after the stain goes on. This may take several tries, so be patient.

Epoxy and Polyester Putties

Any putty will work for voids in flat surfaces, but you'll need something stronger to rebuild damage on an exposed edge or corner. For that, you can mix liquid epoxy, use a polyester body filler, such as Bondo®, or buy a special epoxy-based wood putty. Both epoxy and polyester fillers tend to be fairly runny, so you'll need to make a "dam" out of masking tape to hold them in place until they harden.

(Circle No. 4 on PRODUCT INFORMATION form)

(Circle No. 66 on PRODUCT INFORMATION form)

FINISHING HOTLINE

Help! I built an outdoor glider out of white oak, and the oil finish I used did little to protect it from the intense sun out on the deck. I tried some other products on scrap and left them out there and they didn't do much better. What am I doing wrong, and what do I use to save my glider?

Rene Brousseau
Fossil, Oregon

My favorite clear finish for patio furniture is plain, old-fashioned spar varnish. It has become scarce at most home stores (Varathane still offers a true spar varnish), but you'll find a wealth of high quality brands of it at marine and boat supply stores.

True spar varnish is made from tung oil and phenolic resin: two materials that have a natural immunity to sun degeneration. That means it holds up better outdoors than alkyds or polyurethanes, which tend to break down at the line where the wood meets the finish. This causes the finish to delaminate and peel over time, but spar varnish doesn't do that. Instead, it wears from the top down. It will turn chalky on the surface after time, but it still holds on firmly to the wood below. This allows you to periodically sand the surface of an old finish to remove the chalk, then rejuvenate with additional coats of spar varnish as needed.

Clear coatings, spar varnish included, do not block the sun's rays. As a result, the sun will still cause wood to fade, but other than changing its color, it will not harm the wood. Some better (and more expensive) brands of spar varnish contain UV blockers or absorbers that mitigate the effect of the sun on the wood below, but ultimately, the sun always wins. If fading is a concern to you, look for cans that announce "contains UV inhibitors" or similar claims on the label.

— Michael Dresdner

Winner! *For simply sending in his question on outdoor finishes, Rene Brousseau of Fossil, Oregon, wins* **a complete ZAR® Wood Finishing Kit** *shown at left. Each issue we toss new questions into a hat and draw a winner.*

FINISHING THOUGHTS

... *continued from page 93*

Epoxy wood putty, like the SculpWood® in the photo below, starts as two soft clays. Mix the same size ball of each together with the other by kneading them in your gloved hands. Once mixed, press the soft clay into the void and shape it to match the missing profile. It will cure hard, and can be filed, carved, sanded, and finished. When I have to rebuild a corner, I add a tack or two to anchor the putty so that it won't break off after it sets. You can even use epoxy or polyester fill to "cast" small replacement parts, such as broken pieces of carvings. These alternative putties are more difficult to color, and are best reserved for pieces that will be stained dark or painted, unless your touch-up skills are finely honed.

A moldable epoxy putty results from mixing two clay-like components together. Form the epoxy clay to the shape of the missing part, using anchor tacks to make sure the putty stays put.

Michael Dresdner is a nationally known finishing expert, woodworker and contributing editor for Woodworker's Journal. *His latest book,* The New Wood Finishing Book, *is available from Taunton Press.*

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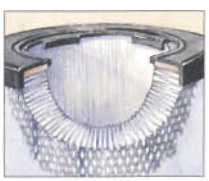
(Circle No. 17 on PRODUCT INFORMATION form)

COLLECT DUST HERE.

OR HERE.

Dust is no friend to the serious woodworker. So let's clear the air and set the record straight. New canister dust collectors from JET feature exclusive V-Weave technology and filter dust that's 15 times as small as standard filters. Not only that, JET's new dust collectors have over six times the filtering capacity of standard units. The innovative canister design makes disposal easy. (No more messing with cloth bags.)

And because there is less air resistance with a canister filter, no matter which of the four models you choose – from 650 to 1,900 CFM – you'll get more suction than with a standard dust collector. Which means you'll collect more dust in the collector. And less in your lungs. To find out more, visit your JET distributor, jettools.com or call 800-274-6848.



Unlike standard filters, V-Weave technology traps particles as small as 2 microns. But what else would you expect from JET?

(Circle No. 45 on PRODUCT INFORMATION form)

DUST DOG V-WEAVE FILTER TECHNOLOGY

JET®

Powermatic, Performax and JET. A Family of Brands.