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ENTERTAINMENT CENTER

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WOODWORKER'S JOURNAL

October 2003
Volume 27
Number 5

8/28/03

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1 1/2 HP SHAPER

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

G1035
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OPTIONAL WING)

3 HP SHAPER

- HEAVY-DUTY 3 HP, SINGLE-PHASE, 220V MOTOR W/REVERSING SWITCH
- 3 INTERCHANGEABLE SPINDLES: 1/2", 3/4" AND 1"
- TWO SPINDLE SPEEDS: 7,000 AND 10,000 RPM

- 3" SPINDLE TRAVEL
- SPINDLE OPENINGS: 1 1/4", 2 1/4", 4", AND 5 1/2"
- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE WITH STANDARD WING ATTACHED: 30 1/2" x 28 1/4"
- FLOOR-TO-TABLE HEIGHT: 34"
- APPROX. SHIPPING WEIGHT: 353 LBS.

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12 SPEED 17" FLOOR DRILL PRESS

- MOTOR: 1 HP, SINGLE-PHASE, 110V/220V
- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE: 13 3/4" SQUARE
- TABLE TILTS 90° IN BOTH DIRECTIONS
- SPINDLE TAPER: MT#3
- SPINDLE TRAVEL: 4 3/4"
- SWING: 17"
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- 12 SPEEDS: 210 - 3300 RPM
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- INCLUDES BUILT-IN LIGHT
- OVERALL HEIGHT: 64 1/2"
- APPROX. SHIPPING WEIGHT: 275 LBS.

G7947
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10" HEAVY-DUTY TABLE SAW

- 1 1/2 HP, SINGLE-PHASE, 110/220V MOTOR
- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE (W/ WINGS ATTACHED): 27 1/2" x 40 1/2"
- CUTTING CAPACITY: 3 1/4" @ 90°, 2 1/4" @ 45°
- 3/4" x 1 1/4" ARBOR ACCEPTS DADO BLADES
- FRONT & REAR QUICK-LOCK FENCE IS MICRO-ADJUSTABLE
- MAXIMUM RIPPING CAPACITY: 24"
- APPROXIMATE SHIPPING WEIGHT: 220 LBS.

G1022SM
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SALE \$310⁰⁰

10" LEFT-TILTING SUPER HEAVY-DUTY TABLE SAW

- MOTOR: 3 HP, SINGLE-PHASE, 220V
- PRECISION GROUND CAST IRON TABLE
- TABLE SIZE (W/ WINGS ATTACHED): 40 1/2" x 27"
- EXTRA-LARGE HANDWHEELS
- CUTTING CAPACITY: 8" L & 26" R OF BLADE
- MAXIMUM DEPTH OF CUT @ 90°: 3"
- MAXIMUM DEPTH OF CUT @ 45°: 2 1/4"
- 1/2" DIAMETER ARBOR

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

- CUTTING CAPACITY/THROAT: 13 1/2"
- 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: 92 1/4" (1/4" TO 3/4" WIDE)
- BALL BEARING BLADE GUIDES
- 4" DUST PORT
- INCLUDES ONE 3/8" BLADE
- APPROX. SHIPPING WEIGHT: 210 LBS.

G0555 INTRODUCTORY PRICE
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17" HEAVY-DUTY BANDSAW

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

- CUTTING HEIGHT: 12"
- CUTTING CAPACITY LEFT OF BLADE: 16 1/4"
- FULLY-BALANCED CAST ALUMINUM WHEELS WITH RUBBER TIRES
- DELUXE EXTRUDED ALUMINUM RIP FENCE
- BLADE SIZE: 132" x 1/4" - 1" (STANDARD 5/8")
- 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: 37 1/4"
- APPROX. SHIPPING WEIGHT: 321 LBS.

G0513 INTRODUCTORY PRICE
ONLY \$750⁰⁰

19" HEAVY-DUTY BANDSAW

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

- PRECISION GROUND CAST IRON TABLE: 19" x 19" x 1 1/2" THICK
- CUTTING CAPACITY LEFT OF BLADE: 18 1/2"
- CUTTING CAPACITY HEIGHT: 12"
- 2 SPEEDS: 1700, 3600 FPM
- BLADE SIZE: 143" x 1/4" - 1 1/4"
- QUICK CHANGE BLADE RELEASE/TENSIONING
- WHEELS ARE FULLY-BALANCED CAST ALUMINUM WITH POLYURETHANE TIRES
- DELUXE EXTRUDED ALUMINUM RIP FENCE
- 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.

G0514 REG. \$950⁰⁰
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- 1 HP, 110/220V, SINGLE-PHASE MOTOR
- 6" X 47" PRECISION GROUND CAST IRON TABLE
- RABBETING CAPACITY: 1/2"
- MAX. DEPTH OF CUT: 1/2"
- 3-KNIFE BALL BEARING CUTTERHEAD
- SUPER HEAVY-DUTY, CENTER MOUNTED FENCE IS 4" X 29 1/4"
- INFED & 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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G1182HW

REG. \$329⁰⁰

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

- 1 1/2 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: 1/2"
- INFED TABLE HAS RABBETING LEDGE

- HEAVY-DUTY CENTER-MOUNTED FENCE
- APPROX. SHIPPING WEIGHT: 450 LBS.

**FREE PAIR OF SAFETY
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G1018HW

REG. \$695⁰⁰

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8" X 75" JOINTER WITH 4 BLADE CUTTERHEAD



- 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 1/4" X 1"
- MAX. DEPTH OF CUT: 1/2"

- CUTTERHEAD SPEED: 5500 RPM
- CUTS PER MINUTE: 22,000

- APPROX. SHIPPING WEIGHT: 461 LBS.

G0500

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ONLY

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12 1/2" PORTABLE PLANER

- 2 HP, SINGLE-PHASE, 110V MOTOR
- MAX. CUTTING WIDTH: 12 1/2"
- 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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WITH
PURCHASE
OF G8794
PLANER**

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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: 14 1/2"
- MAX. CUTTING HEIGHT: 6 1/4"
- MAX. CUTTING DEPTH: 1/8"
- NUMBER OF KNIVES: 3 HSS
- ALL BALL BEARING CONSTRUCTION
- APPROX. SHIPPING WEIGHT: 440 LBS.

G1021

REG. \$795⁰⁰

SALE \$725⁰⁰



**INCLUDES
STAND!**

20" PLANER

- 3 HP, 220V, SINGLE-PHASE MOTOR
- 25 1/2" 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: 8 3/4"
- MAX. CUTTING DEPTH: 1/8"
- NUMBER OF KNIVES: 4 HSS
- DUST EXHAUST HOOD
- HAS 5" DUST PORT
- APPROX. SHIPPING WEIGHT: 785 LBS.

G1033

REG. \$1295⁰⁰

SALE \$1195⁰⁰



**4 BLADE
CUTTERHEAD!**

OSCILLATING SPINDLE SANDER

- 1 HP, SINGLE-PHASE, 110/220V, TEFC MOTOR
- PRECISION GROUND CAST IRON 25" X 25" TABLE TILTS TO 45°
- STROKE LENGTH: 1 1/2"
- FLOOR-TO-TABLE HEIGHT: 35 1/2"
- SPINDLE SPEED: 1725 RPM
- SPINDLE OSCILLATES AT 72 SPM

- INCLUDES 100 GRIT SLEEVE FOR EACH SPINDLE & GROUND STEEL TABLE INSERTS
- 10 TAPERED & THREADED SPINDLE SIZES
- PERMANENTLY LUBRICATED BALL BEARINGS
- BUILT-IN 4" DUST PORT
- APPROX. SHIPPING WEIGHT: 300 LBS.

G1071

REG. \$525⁰⁰

SALE \$495⁰⁰



24" DRUM SANDER WITH VARIABLE SPEED

- 5 HP, 220V DRUM MOTOR DRIVES 2 ALUMINUM SANDING DRUMS
- 1/4 HP VARIABLE SPEED CONVEYOR MOTOR
- CONTROL PANEL WITH AMP LOAD METER
- HANDLES STOCK UP TO 23 1/2" WIDE AND 4 1/4" THICK
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- INDUSTRIAL RUBBER CONVEYOR BELT
- 2 - 4" DIA. DUST PORTS
- APPROX. SHIPPING WEIGHT: 495 LBS.



G1066Z

REG. \$1595⁰⁰

SALE \$1550⁰⁰



15" WIDE-BELT SANDER (OPEN END)

- SANDING BELT MOTOR: 5 HP
- BELT FEED MOTOR: 1/4 HP
- REQUIRES SINGLE-PHASE, 220V ELECTRICAL AND 50-70 PSI AIR.
- CONVEYOR SPEED 13 & 16.4 FPM
- INCLUDES EXTENDED SUPPORT BAR FOR WIDE BOARDS.
- OVERALL DIMENSIONS: 61 3/4" H X 32 1/2" D X 35" W
- APPROX. SHIPPING WEIGHT: 922 LBS.



G9983

REG. \$2795⁰⁰

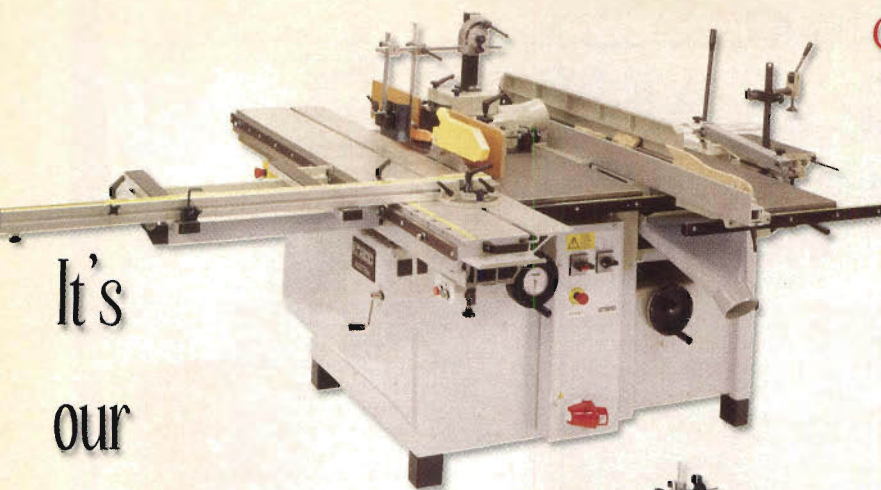
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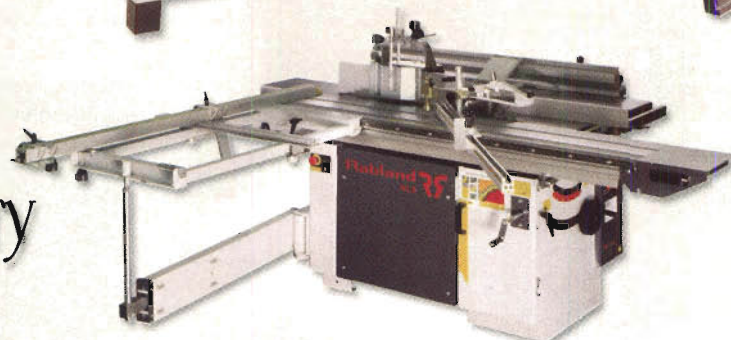
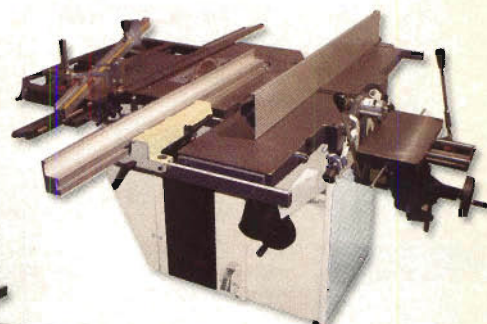




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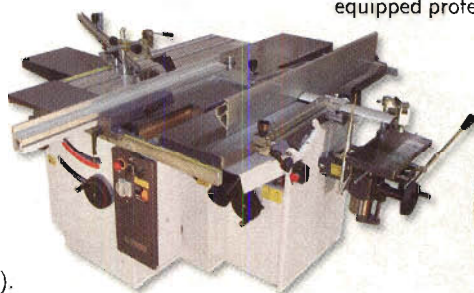


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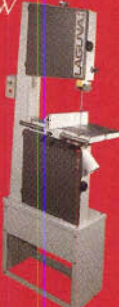
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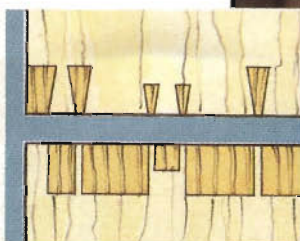
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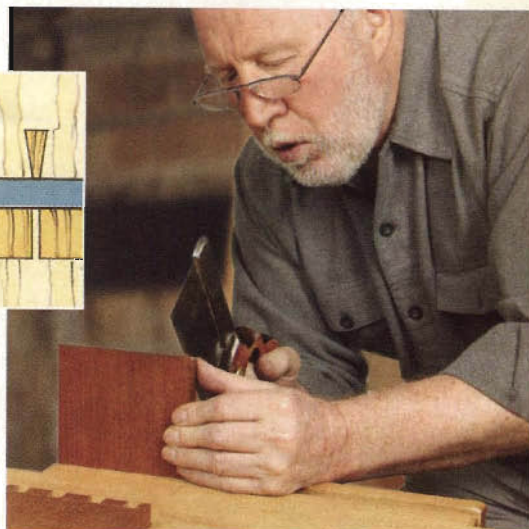
How to design a stunning dovetail — or hide one in a secret miter.



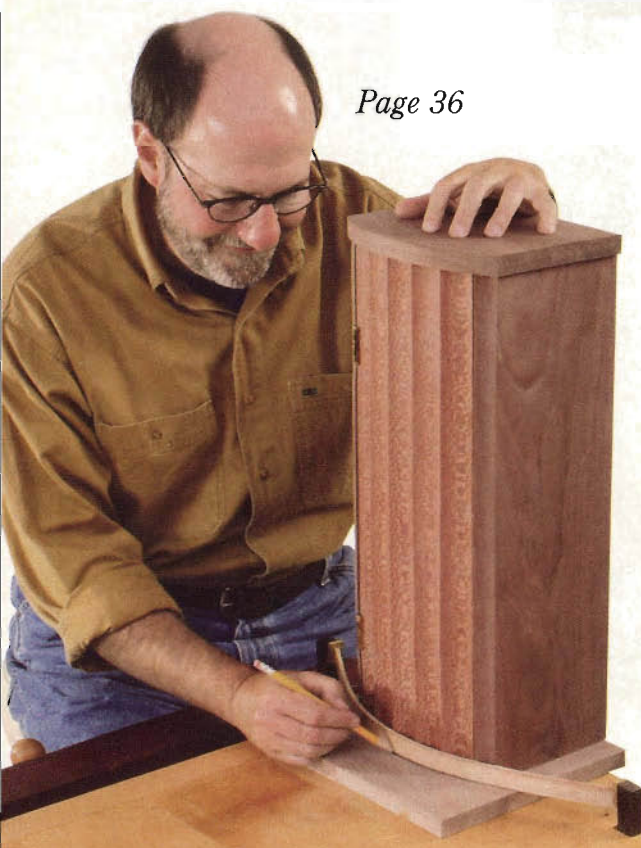
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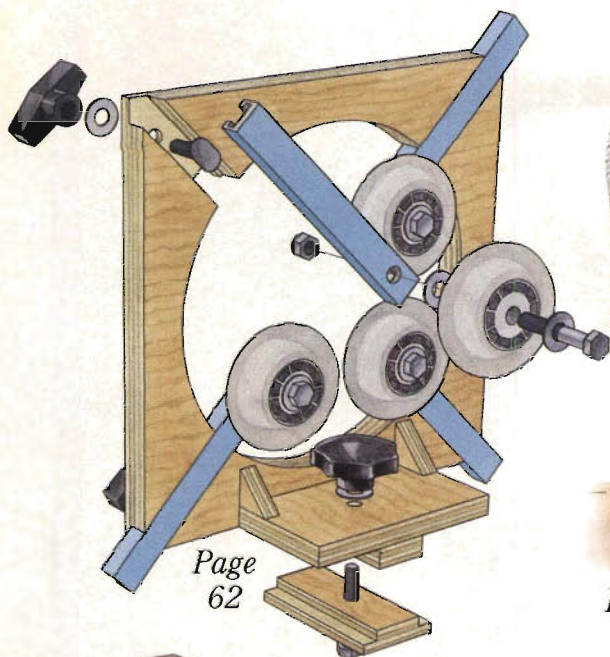
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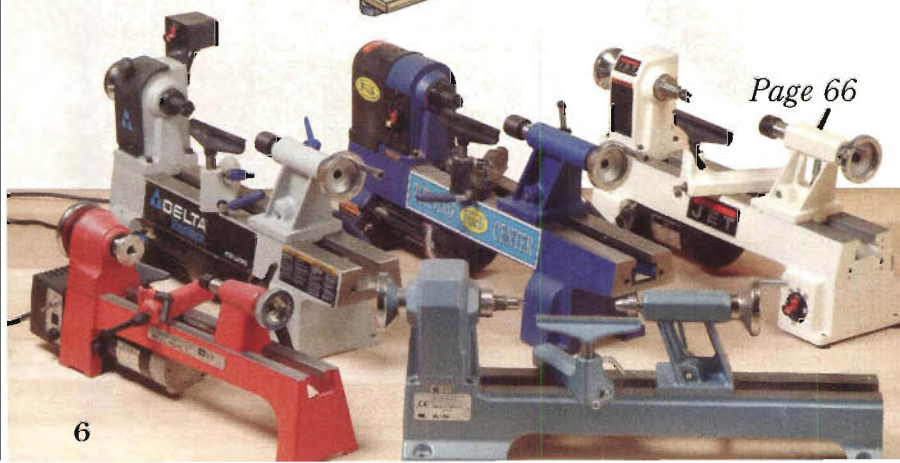
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White's Magic

Looking back over the years of *Woodworker's Journal*, few constants in my magazine life are more pervasive than our master woodworker, **Rick White** (that's him, below). Rick has been with us since the very beginning: building projects, testing tools and, in general, helping to keep us on the straight and narrow — at least on all things woodworking. He's a no-nonsense woodworker prone to occasional bouts of what we have come to refer to as "White Magic."

"How'd you do that?" an editor or artist will ask.

"I don't know ... I just did it," Rick will answer.

And so it goes.

Sadly, Rick is laid up. And while he would not want me to share the intimate details of his illness, I will tell you that he's been in the hospital and he's in a battle. Not for his life, but certainly for his woodworking life.

I went and visited him the other day, and all he wanted to talk about was woodworking. In fact, he was thumbing through a woodworking catalog when I got there. Good woodworker that he is, he has a side calculation going, figuring how much he's saving in daily gas and lunch money, and converting the savings into major tool purchases for when he wraps up his stay. (Sound familiar?)

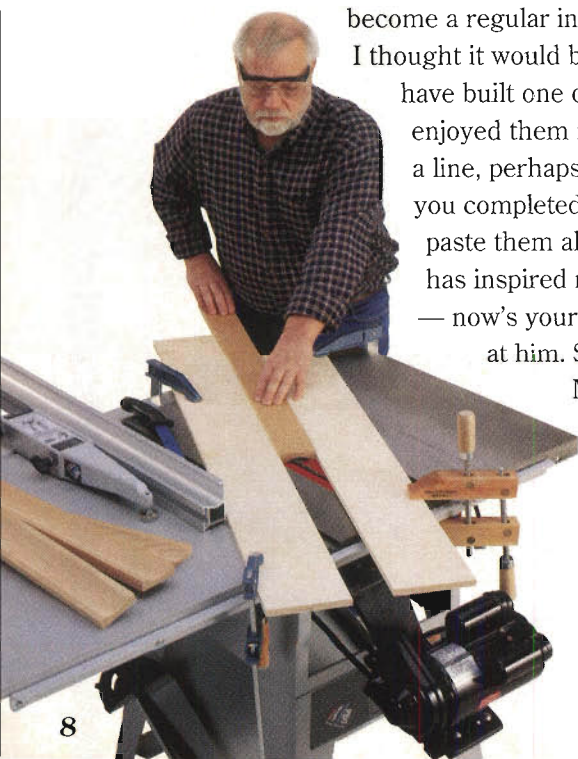
But he's concerned. Concerned that he won't be able to put those tools to use: "That's the biggest thing that worries me," he told me, "and the thing that drives me the most to work hard and get better: I need to get back in my shop."

Well, I'm not a betting man, but I can tell you, if I was, I'd bet big money that Rick will indeed get back in the shop, and will once again

become a regular in our pages. In the meantime,

I thought it would be fun to ask readers who have built one of Rick's projects (or just enjoyed them in the magazine) to drop him a line, perhaps with a picture of the project you completed. We'll sneak in his room and paste them all over the walls. I know Rick has inspired many of you over the years — now's your chance to send a little back at him. Send your letters to "White

Magic" c/o *Woodworker's Journal*, 4365 Willow Drive, Medina, MN 55340.



Larry N. Storker

SEPTEMBER/OCTOBER 2003

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Women Woodworkers Call Out Barry



We've received no letters concurring with Barry Nelson's critique of women woodworkers.

Mail Call! Contact us by writing to "Letters",

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Minnesota 55340, by fax at

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

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We ask that all letters,

including e-mails, include

a mailing address and phone

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to edit for length and clarity.

You Get What You Pay For

I think Bill Hylton's article on router lifters ("Router Adjustments: View From the Top," *June 2003*) pretty much covered the subject except for one aspect: the cost of material vs. the cost of good tools. I suspect that many garage woodworkers like myself have a hard time justifying a nice lifter or other special tools.

I don't know about the other WJ readers, but my wood isn't free. Good wood costs! Decent tools are relatively cheap. Our colleagues should consider what they pay for wood and contrast that with the cost of the tools they use.

I've trashed a lot of expensive wood over the years using inferior equipment. It finally dawned on me that the cost of material was exceeding the cost of good gear. That's why I bought

a Porter-Cable 7518 router, some good bits, a very nice Rockler router table with a Mast-R-Lift™. I'm so happy that I did. Any mistakes now are mental, not metal. Good stuff works!

One other thing: battery powered miter saws ("Charged-up Miter Saws," *June 2003*)? Come on! Any time you consider a portable tool, consider the cost of battery replacement. They don't last very long, and they aren't cheap! I have a number of small battery powered tools for convenience, but my 3HP table saw isn't battery powered.

Jim Hinkson

El Sobrante, California

Barry, You Ignorant ...

As a long-time subscriber of your magazine and a woman, I was appalled when I read the *June 2003* issue with Barry Nelson's letter to the editor ("Barry's 'Real America'").

I know and have had to deal with many men like Mr. Nelson since I took up the hobbies of woodworking and home improvement. His assumptions that Susan Working and Teri Masaschi

are not woodworking experts, and that they should go "start their own women's woodworking magazine and stay out of my workshop" is the typical ignorance and stupidity that unfortunately prevails in this industry.

There wasn't even a single line of response to Mr. Nelson refuting his issues, discussing your choice of running the article, or defending the quality of Ms. Working or Ms. Masaschi's work, or your female subscribers and readers.

Traci M. Remmo
Indianapolis, Indiana

I would just like to know if Barry is intimidated by women in general or specifically by talented women in the woodworking industry? No doubt his insecurities are the result of his need to compensate. I bet he has a really big truck!

Catherine Morris
Rohnert Park, California

WJ Responds: Hear, hear, Catherine and Traci. As you have stated so well, this is not the only misguided male woodworker on the planet. When we talked about

putting this letter in our magazine, fellow editors Larry Stoiaken and Rob Johnstone asked me if I'd like to pen a response. I could've written a couple of dandies, but decided I would be robbing fellow female woodworkers of the opportunity to have at Barry. I reintroduced readers to Susan and Terri and counted on you to respond.

I was not disappointed.

— Joanna Werch Takes
Associate Editor

Divine Dovetails

Thank you for Ian Kirby's article on dovetails ("Diligent Practice Makes Perfect Dovetails," *April 2003*). For a long time, I had been limited to butt joints, miter joints and unimpressive box joints. I've always seen dovetails and wanted to try them, but after a few failed attempts, I gave up. Ian's article takes you through step-by-step instructions, from tools required to finished, beautiful joints.

After a few practice joints in pine (which doesn't work as well), I switched to mahogany and found I could make nearly perfect joints. Last night, I made three different patterns in oak, and after a little fudging and paring, they came out snug, with no gaps. I'm making a cradle for my new daughter and know that the joints will all be dovetails — she's worth the effort. Thank you again for the fine article and I'm looking forward to seeing many more.

Rick Smith
Colona, Illinois

Talkin' Tools

I enjoy your publication very much; however, a couple of items are bothering me. The first:

The handheld saber saw [featured in *Stumpers*, *April 2003* and *August 2003*] is just that, and it is not a jigsaw. The modern day saber saw was also referred to as a bayonet saw frequently in its early days. The modern electric jigsaw, also called a scroll saw, was not put on the market until about 1947. Foot-powered jigsaws had been around for many years. The modern design came about from a designer who patterned it after the treadle sewing machine. It was a rather heavy cast-iron saw that was either

continues on
page 12 ...

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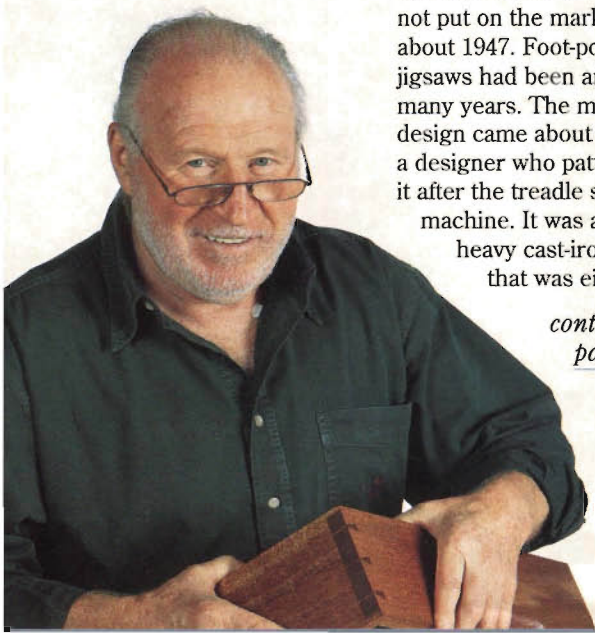
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Safety First: Learning how to operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary guards have been removed from equipment shown in our magazine. We in no way recommend using this equipment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

mounted upon a workbench or its own stand and had a tilting table.

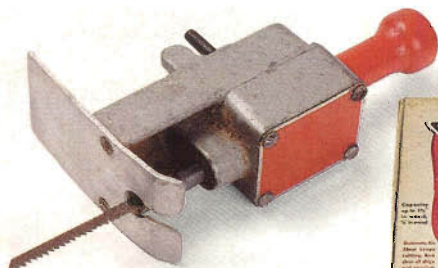
The next item is the "table saw." Although all fixed blade circular saws appear to have a table, I was taught, while studying to be an industrial arts teacher, that the first water-powered arbor saws were really arbor saws. Those saws had a fixed arbor and the table tilted on trunnions.

The modern day arbor saw has a fixed table, the arbor tilts on the trunnions, and the entire mechanism may be set very accurately with precision. One may purchase either a left-tilting or a right-tilting arbor saw. Thus, you have two distinct types of saws that both have tables on them. That fact, however, does not make them both table saws. You actually have the arbor saw with a fixed table, and then there is the modern day tilting arbor saw.

*Robert W. Summers
Grosse Ile, Michigan*

Maybe I'm just cranky in my old age, but you've really embarrassed me in front of my family and friends.

For years, I have emphasized precision in their speech. A woodworker calling a power miter box a "chop saw" ["Charged-up Miter Saws," June 2003] is



like a sailor who cannot distinguish between a ship and a boat.

A power miter box is for making smooth, precise cuts at a variety of simple and/or compound angles in wood. A chop saw is for making coarse 90° (and only 90°) cuts — hence, "chopping," usually in material such as steel rebar, metal rods and the like.

*Joe Klocek
Overland Park, Kansas*



Reader's Bed

When I saw Rick White's plan for the Reader's Bed (February 2001), I knew I had to build it. I modified the plan for my king-size mattress and used maple and mahogany. I had been looking for the right project to use some curly maple that I had. There was just enough of it for the doors and drawer fronts. I also made some ship's wheels and mounted lights in the center using wood to match the bed.

*Robert Nienhuis
Zeeland, Michigan*



Clamp Cart

My interest in woodworking started with your magazine's first issue, and I have developed a real hunger for my amateur craft ever since. I attempt to make something from each issue as an on-going learning program and for the enjoyment.

As every woodworker will tell you: clamps, clamps and more clamps. Every project requires clamps. What to do with all of the different types and style of clamps that are accumulated from project to project. My answer, from very early on, was to make a holder/storage spot for the clamps. As you can see from the two photos, a simple holder has evolved into a modular unit with every new clamp style.

I did not start out with a master design for my clamp holder/storage stand. It just ended up this way. My only request: stop putting projects in your issue that require a new type of clamp.

*David DiRanna
Fountain Valley, California*

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Putting the Squeeze on Squeeze-out

Q Whenever I use glue, I am never sure whether to let it dry and then try to scrape it off or to use a wet rag and wipe all seams before the glue dries. I have not had much luck with the former, as after I stain I almost always seem to find a spot I missed. Is there a preferred method by the pros, and if I do find a glue spot after staining, what is the best way to fix it?

*Larry Waters
Virginia Beach, Virginia*

A Why, there is always some glue squeeze-out to clean up. You can't avoid this, but can at least minimize the time and trouble.

First, the choice of glue: the water-soluble glues such as poly-vinyl emulsions (Titebond® or the equivalent) and plastic resin glue (Weldwood) are much easier to clean up than epoxy and other glues of its type. When

edge joining boards, try to leave them a fraction oversize and then clean up the glue lines in a thickness planer. If too wide for your planer, join them up in sections and then replane. However, replaning by hand or machine is not always feasible — a mortise and tenon joint, for example.

You have a choice of cleaning up before or after the glue has cured, and I think it much better to tackle the job at once. I've found that a small, stiff-bristle brush (called a "flux brush") is ideal for getting into awkward places. Use plenty of water, and be sure to rinse the brush from time to time.

An alternative is to apply finish to the parts before assembly, leaving the contact surfaces of the joint bare, of course. Use a good sealer so the glue does not penetrate and can easily be wiped off.

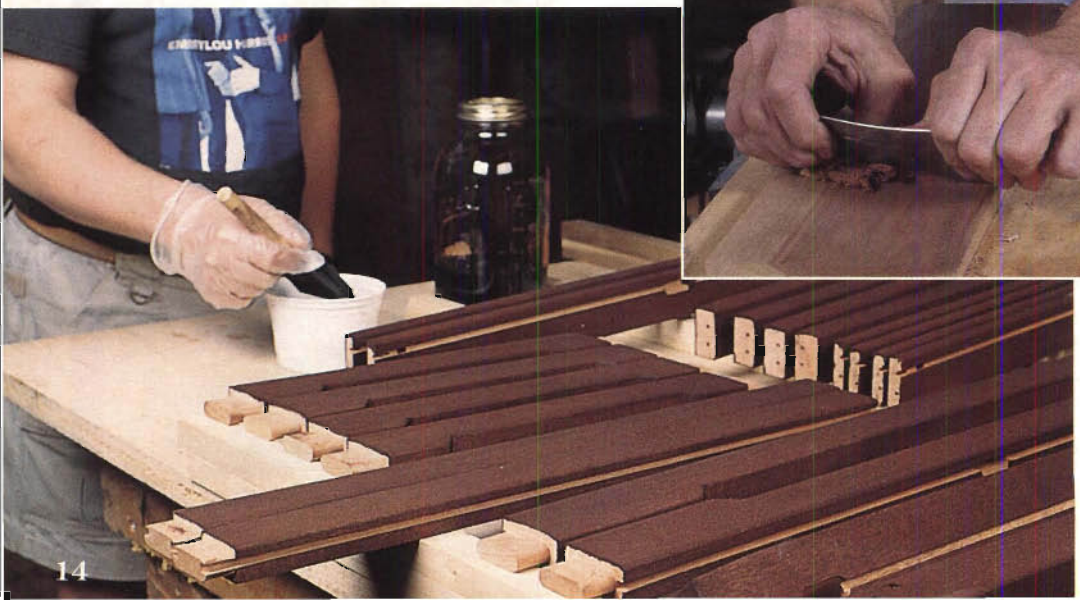
If, when you come to apply the final finish, you still find smears of glue, remove them with a cabinet scraper. If you don't own one, scraps of window glass (careful!) work pretty well.

— Simon Watts

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: QandA@woodworkersjournal.com

Please include your home address, phone number and e-mail address (if you have one) with your question.

Prefinishing is one way to reduce glue squeeze-out problems; another is using a cabinet scraper to clean up your workpiece.



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

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— WJ Editors

A chuck's three jaws seat on the flat part of DeWalt's Pilot Point bits, so the bit can't slip.



Q No matter what effort I use or what kind of portable drill I use, so long as it has a keyless chuck, the drill bit slips inside the chuck whenever it meets a certain amount of resistance. Is there some secret to securing the drill bit inside the keyless chuck? Some sort of temporary adhesive or slip-resistant coating that should be used? Looking forward to any solutions you might have.

*Alexander Bove
Chestnut Hill, Massachusetts*

A Although I know of no "miracle coatings" that prevent bit slippage, I can think of several things to minimize the problem. Since keyless chucks with smooth plastic outer shells are difficult to grasp and tighten, you can improve your grip and increase bit-tightening torque by wearing gloves with anti-slip coated palms. To improve your chuck's hold on larger diameter twist bits, try using flat-ground shank bits.

It's also important to consider your technique: It's

possible that you're applying too much pressure as you drill, causing the bit to slip. Try a little less downward force, especially when the bit's just about to break through the underside of the material. This is most important when boring through thin sheet metal. When drilling thick materials, such as wood or plastic, make sure to pull the bit out occasionally, to clear chips which can create enough resistance to hang the bit up.

— Sandor Nagyszalanczy

THIS ISSUE'S EXPERTS

Simon Watts is the West Coast editor of *Woodworker's Journal*.

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

Steve Blenk is a full-time woodturner and writer living in the Pacific Northwest.

continues on page 16 ...

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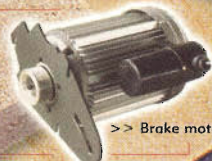
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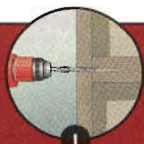
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QUESTIONS & ANSWERS

Q

I recently attended a bowl turning demo at a woodworking show, and the speaker commented that his bowl gouge had an Irish grind. Exactly what is an Irish grind, and how is it done?

*Charles Lustig
Sumter, South Carolina*

A The surest way to start a small war is to tell another turner how to grind his chisels. That said, there are several accepted profiles that seem to be most effective for removing the interior portion of a bowl.

One such is the Irish or Celtic grind. Put simply, the business edge of the gouge is ground around and further up along the sides of the gouge's flutes, thereby creating a larger bevel area for the now longer cutting edge of the tool to ride. This also gives the turner more options on the angle at which he/she may hold the chisel in relation to the work to achieve a controlled cut. A skilled turner can even back cut or sweep the bowl's bottom.

I usually grind a Celtic or Irish type bevel with an included angle of about 60° between bevel and edge. This may seem a bit obtuse(!), but it gives me better bevel control at an easier angle to the work.

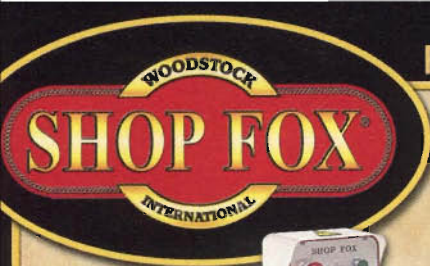
— Steve Blenk



The two illustrations above represent the difference between an Irish, or Celtic, grind (top) and a conventional bowl gouge grind (bottom).



WINNER! For simply sending in his question on keyless chucks, Alexander Bove of Chestnut Hill, Massachusetts wins a **Bosch 1594 hand-held planer**. Each issue we toss new questions into a hat and draw a winner.



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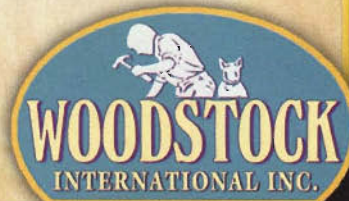
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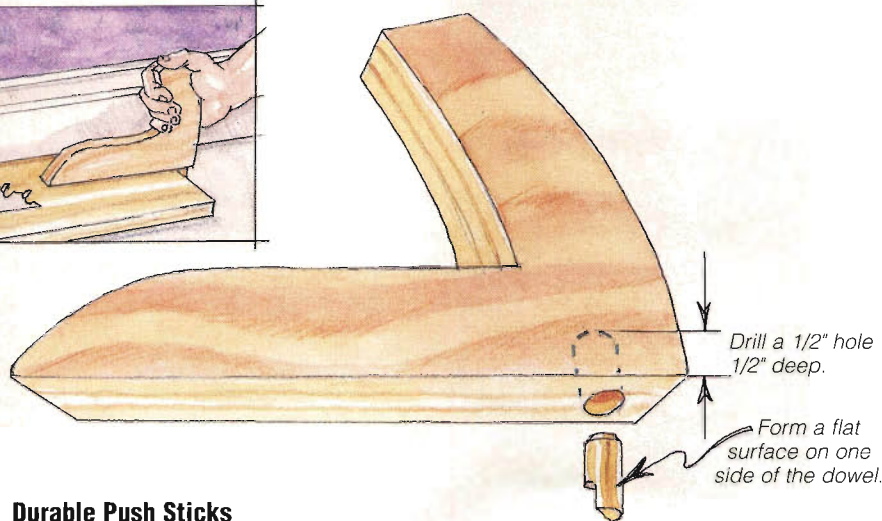
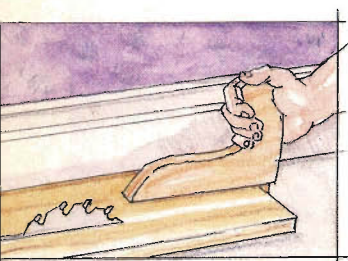
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Quick Tricks Save Time, Space and Money



Durable Push Sticks

I like to make push sticks that not only do their job but also feel comfortable to the hand. This takes a little time and then, sooner or later, you cut the step or notch away and have to make a new one. My new model push stick has a short piece of hardwood dowel with a flattened aspect on its forward surface, as shown above. When it wears down, I just drill out the old dowel and replace it with a new one — a couple of minutes' work.

*Ken Collier
Spring Valley, California*

Sawing Thin Metal

A sheet of thin metal can easily be sawn by clamping it in a vise between two pieces of plywood or Masonite™. You can then saw through the wood and metal sandwich with a hacksaw. If you need a wider slot, use two or even three blades in your hacksaw frame.

*Dennis Deselle
Bunkie, Louisiana*

Ultimate Glue Bottle

To keep costs down, I buy my wood glue by the gallon and then decant it into smaller bottles. Of all the containers I've tried, I found a used plastic mustard bottle to be by far the best. The cap keeps the nozzle clear of glue when closed, and the large opening makes refilling easy.

*Jeffrey Farlow
San Antonio, Texas*

Clamping Deep Panels

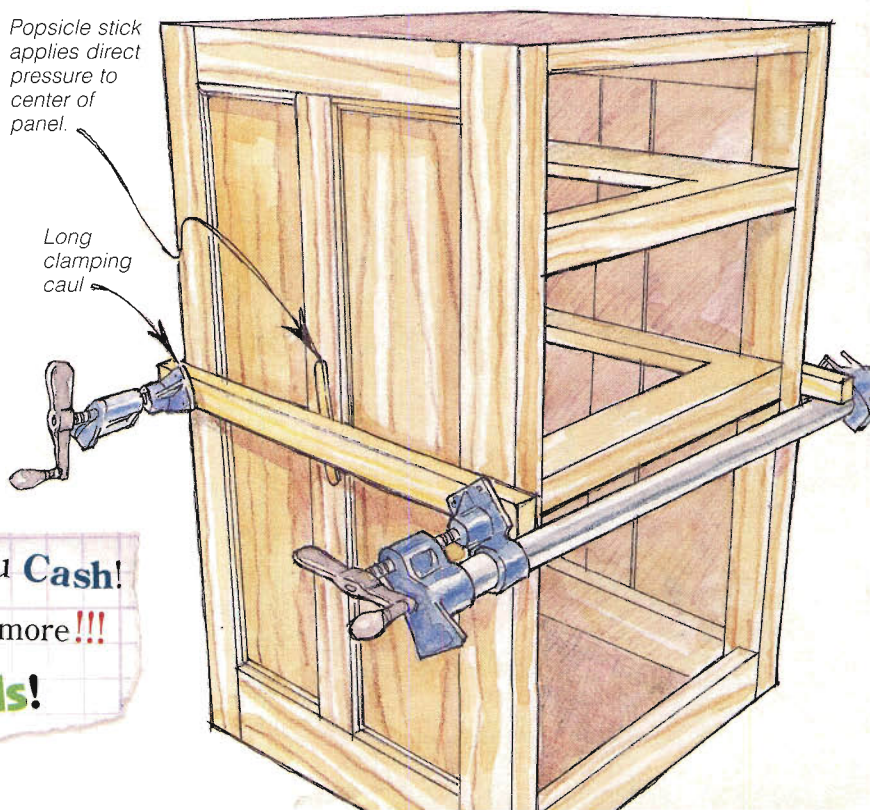
I have used this trick many times when gluing up a cabinet with a web frame towards the center of the piece. It's difficult to apply pressure directly to the center frame because a typical clamp will not reach.

However, by placing a thin strip of scrap inside of a long caul (I use a Popsicle® stick) as shown, and clamping the ends with bar clamps, direct pressure is applied to the center. Another way, of course, is to use a softwood caul with a slight crown.

*Joel Gaertner
Menomonie, Wisconsin*

*Popsicle stick
applies direct
pressure to
center of
panel.*

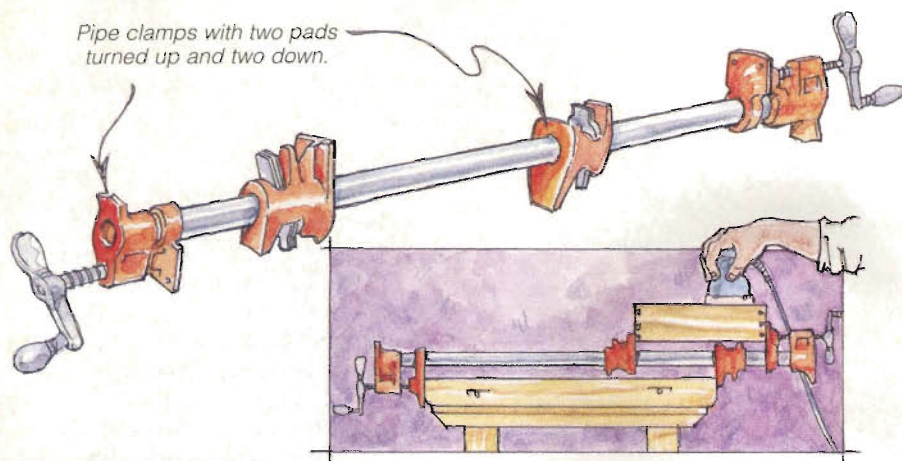
*Long
clamping
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See page 19 for the **details!**



Double-duty Bench Clamps

I find this a handy way to hold large assemblies while sanding or finishing on a workbench. Assemble and place pipe clamps with two pads turned up and two down, as shown in the drawing. If your clamps are too short for the width of bench, put two together with a threaded coupling.

Tighten the lower clamps to a work surface, rest the assembly on the pipes, and tighten the upper ones. If necessary, block the work up with wooden wedges to make an uninterrupted surface for sanding. If the work is wider than the bench, let the pipe clamps overhang one side — but watch out for a capsized!

D.A. Clements
Seattle, Washington



WINNER!

In addition to our standard payment (below) Harry Gewertz of Santa Monica,

California, will also receive a **Drill Doctor 400PK 200** 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:

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continues on page 20 ...

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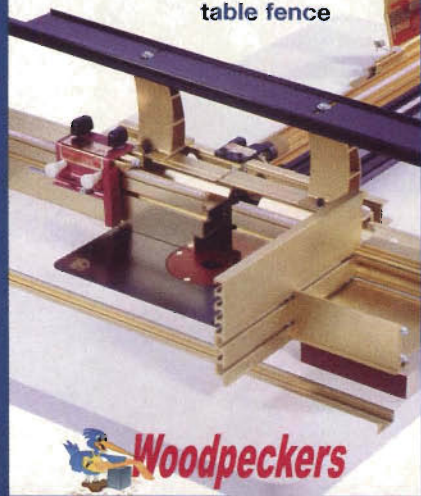
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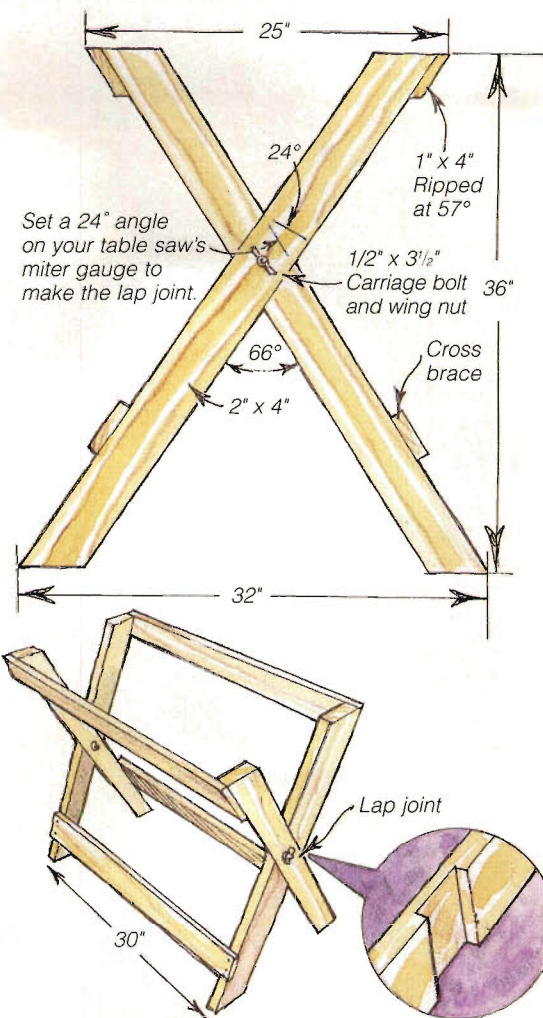
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Handy Horses

With very limited bench space in my small shop, I needed to come up with an auxiliary table that could be folded and stored when not in use. My solution was a pair of sawhorses which fold (like scissors) by slacking two wingnuts, as shown in the drawings at right.

The horses are perfectly rigid because of the dado cut in each leg. I made mine with a 66° angle and a spread of 25" at one end and 32" at the other. This arrangement works well because you can turn the horses either way up, according to need. I chose to make the distance between the X-frames either 24" or 30".

*Dischmond Spurrier
Wellsburg, West Virginia*



Versatile Egg Crate

"Egg crate" is a white, plastic light diffuser made for recessed ceiling lights. This product typically comes in 2' x 4' sections and can be found in the ceiling tile department of your local building supply store. Cut it by reaching into a cell and breaking off the divider with a needle-nose pliers. (Be sure to use eye protection for this process.)

The most obvious use for egg crate is in a downdraft sanding table. However, I also have found it useful for lightweight shelving, racks for drying recently finished parts and as a separator when sticking lumber.

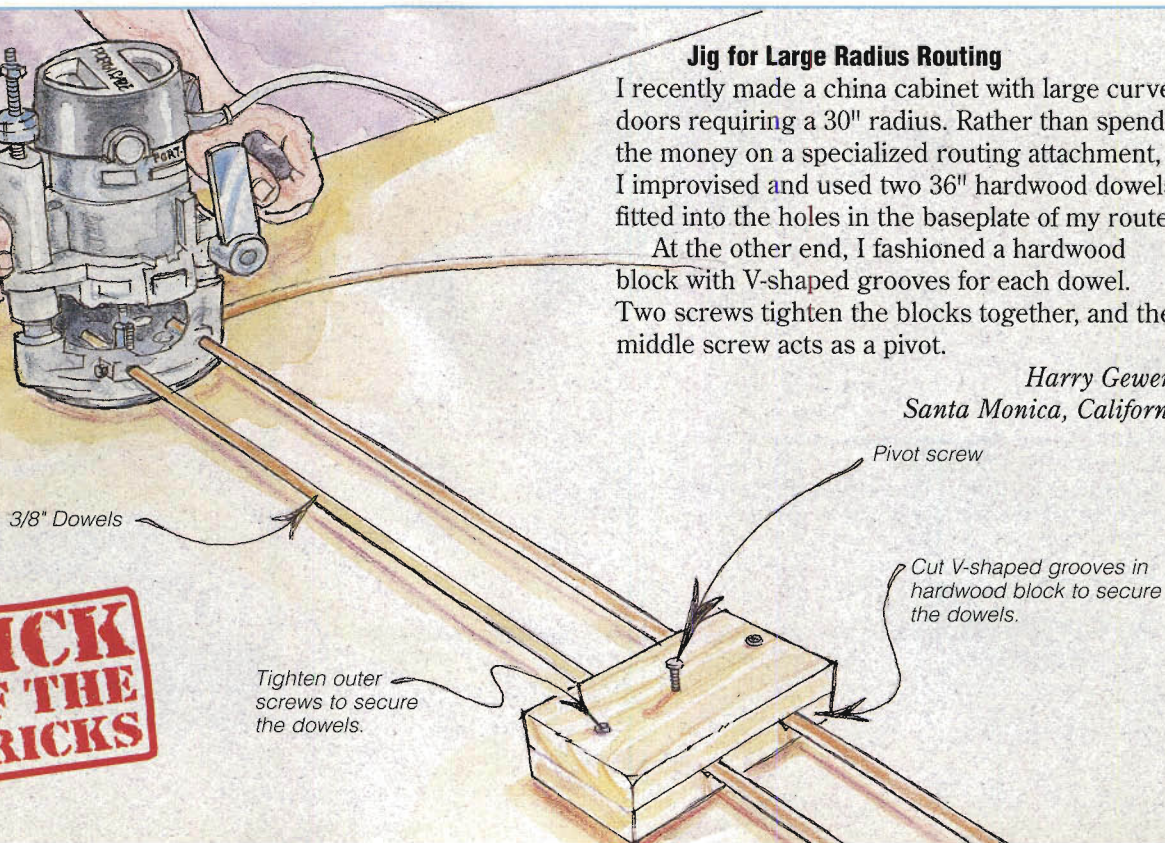
*Dana Craig
Norwood, Massachusetts*

Jig for Large Radius Routing

I recently made a china cabinet with large curved doors requiring a 30" radius. Rather than spend the money on a specialized routing attachment, I improvised and used two 36" hardwood dowels fitted into the holes in the baseplate of my router.

At the other end, I fashioned a hardwood block with V-shaped grooves for each dowel. Two screws tighten the blocks together, and the middle screw acts as a pivot.

*Harry Gewertz
Santa Monica, California*



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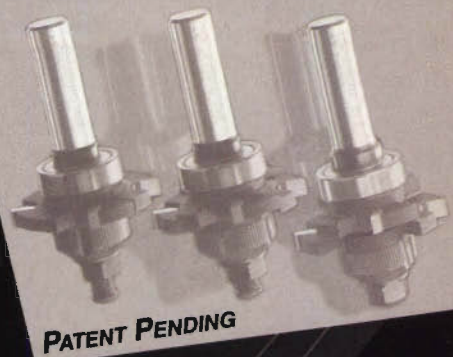
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Clap on to Clapboard

What's This?

WJ editor Rob Johnstone contributed the tool set below for the Stumpers mystery. Marks? "Made in Germany," and "TA" enclosed in a diamond. Know what these things are? 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

Time on His Hands

There is more than one way to identify this clapboard bracket [the mystery tool from the June 2003 *Stumpers*]. One is to have the experience or the item in hand; the other is to shift into "research mode." Did you know there are about 360 patents dated 31 Jan. 1888?

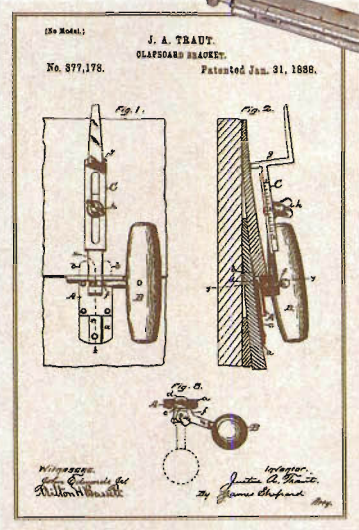
*Allen Wheeler
Federal Way, Washington*

Gauging a Preacher

Yes, Allen, and we appreciate your dedication in slogging through all of them to identify the tool belonging to **David Luetgerodt** of Bruce, Wisconsin. As **Keith Rucker** of Tifton, Georgia, points out, "there were two patents issued on this same day, for similar devices, from two different inventors!"

The one in our discussion, though, "is Justus Traut's design and construction," noted **Ron Hubay** of Northwood, Ohio. "Mr. Traut was a well-known and successful contractor for the Stanley Rule and Level Co. He started work at Stanley at age 18 and had over 145 patents in his name," said **Darrel Nyman** of Litchfield, Minnesota.

As for his clapboard bracket, said **Greg Wease** of San Diego, California, "Stanley manufactured these between 1888 and 1935." **Mike Mattox** of Council Bluffs, Iowa, noted that "the tool is shown in the 1909 catalog," where "the specifications are listed as:



No. 89, Length 8 $\frac{3}{4}$ ", Width 2 $\frac{1}{2}$ ", Material Spec. Iron, Finish Nickel, Handle hardwood, Special gauge graduated 8ths, Packed in box 3 wt. lbs. 1 $\frac{3}{4}$, Code staclairer, Price doz. \$6.00." He adds: "the 1926 catalog shows the price at \$1.20 each."

Sometimes, said **Charles Reisert** of Cambridge City, Indiana, "the stumper is called a preacher." More specifically, though, "it's a Stanley #89 Clapboard or Siding Gauge, used to set the exposure or 'to the weather' of siding," said **Ashley Kennedy** of Evanston, Illinois.

"The tool comes in pairs, one for each end of the board," said **Patricia A.**

Otto Gumprecht of Overton, Nevada, tells us this tool was for putting on drop siding — while **Allen Wheeler's** research tells us who patented it.

Patton of Johnsburg, New York. "The gauge is adjustable for the exposure you want your siding to show."

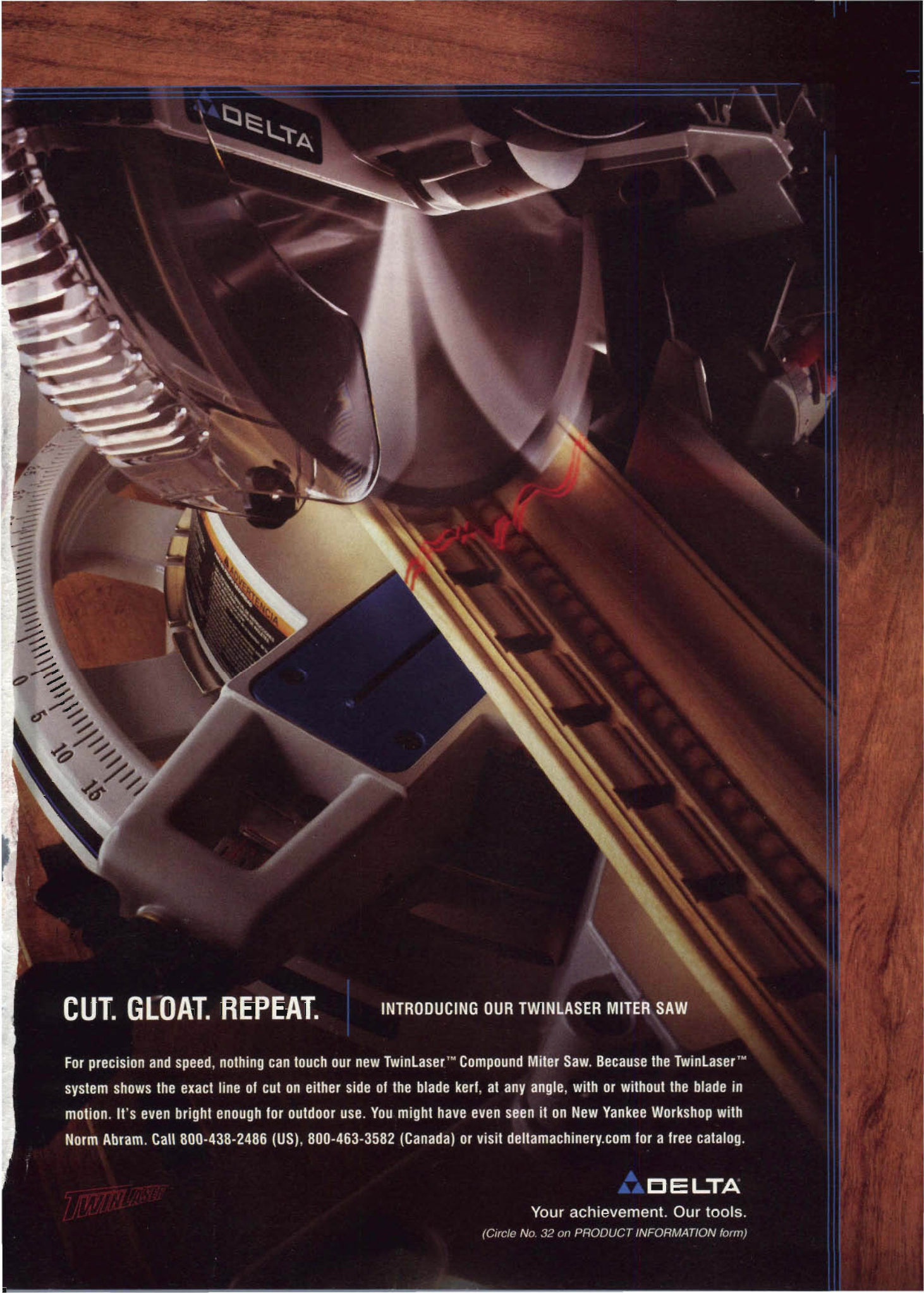
"You place the points under the last piece of siding nailed in place [and] adjust the wing nut slide to the spacing of the siding," said **Robert Casement** of Poughkeepsie, New York. "When the handle is tilted, a spur is forced into the lower clapboard and holds the tool in place," said **Don Kendall** of Bloomfield, New York. "The clapboard to be installed is placed in the upper part of the gauge and nailed in place," said **Richard O. Thomas** of Stafford, Virginia.

Depending on board length, noted **Rich Guzman** of Houston, Texas, a worker might even use three of the gauges at a time.

— *Joanna Werch Takes*



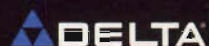
WINNER! Tom Konsler of Chapel Hill, North Carolina wins a **Delta 36-255L 12" compound miter saw with laser**. We toss all the *Stumpers* letters into a hat to select a winner.



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The Plane Truth



Knight's Shining Irons

A Prolific Plane Maker

Hidden in the middle of a Portland, Oregon, neighborhood, behind a bike shop, in space not much bigger than a one-car garage, is the workshop of Steve Knight. But don't let appearances fool you; in the past three years, this tiny one-man shop has produced more than 1,600 planes, and Steve has no intention of slowing down.

Steve's plane profession started out innocently enough. A carpenter and furnituremaker, Knight wanted "some nice tools for myself, but since I couldn't afford to buy 'em. I thought I'd try making a few." Two years and more than 40 prototypes later, Steve finally succeeded in making a tool that he enjoyed using. Soon he started making a few planes for friends and, as he says, to "pay for his habit."

Through word of mouth, Knight Toolworks has developed enough of a loyal following to allow Steve to put down his hammer and become a full-time plane maker. "Plane making gives me the opportunity to make what I like," says Steve, "The kicker is that people are happy to pay me for it."

Fiddling with Planes

A natural tinkerer, Steve isn't a slave to tradition. In the last three years, he has fiddled with every element of the basic plane. "The good thing about not learning from others is that you don't take anything for granted."

To understand why plane irons are set at a 45° angle, Steve tried steeper bed angles on identical bodied planes. Explains Steve, "higher bed angle reduces tearout in wild-grained hardwood; the downside is that the plane is harder to push through the wood." Consequently, he now offers planes with five different bed angles.

Another interesting detail of Steve's planes is that they don't use

chip breakers. An adjustable throat plate ensures that the mouth is open only a few thousandths of an inch, just enough for the shaving to come through. Having played around with a variety of plane body shapes, "some of which looked great, but were impossible to hold onto," Steve now offers traditional tote-handled jacks and jointers, and tote-less coffin planes.

"Who Needs Tools?"

To understand metallurgy, Steve started making his own blades. After experimenting with both A2 and O1 tool steel (Steve prefers O1... "O1 doesn't hold an edge quite as long as A2, but it can be sharpened keener"), he is now dabbling with Japanese laminated irons. Steve still sharpens each iron — and tests each plane — before it leaves his shop.

The most surprising thing about Steve's shop is that, with the exception of a stroke sander and four sharpening wheels, it's equipped about as well as most hobby shops. Steve maintains a 10-plus planes per week average with little more than a contractor grade table saw, drill press and router. He doesn't own a planer or jointer.

"Who needs those tools when I've got all these planes?" he says. "It gives me a chance to practice what I preach."

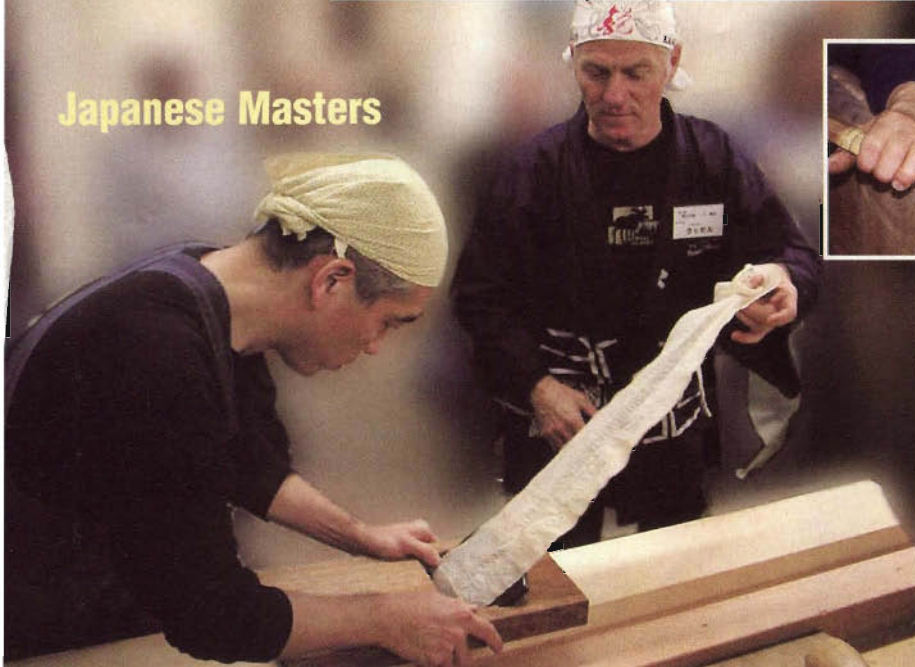
— Joe Hurst-Wajczuk



Steve's four sharpening wheels are the most specialized equipment his shop holds for his plane making pursuit.



Japanese Masters



Mitsuo Naoi (right) and Masuro Kamiyo (far left) are two of the Japanese woodworkers who showed American students techniques and tools — including the “lethal-looking” spearplane, inset.



“National Living Treasure” Visits U.S.

Woodworking students at Palomar College in San Marcos, California, had a rare and inspiring treat this past school year. A two-day workshop by Kojiro Sugimura and his Kezurou-kai fulfilled this group of woodworkers' purpose: to educate people around the globe

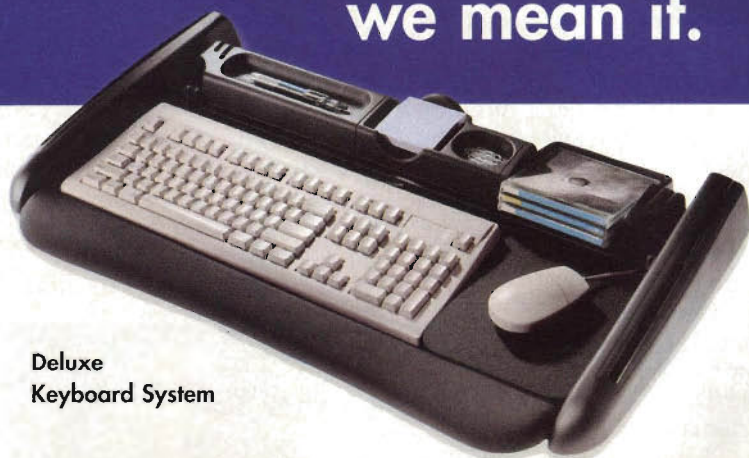
about Japanese woodworking.

The educators who traveled to Palomar College — in an event sponsored by Hida Tool & Hardware Inc. — included Mitsuo Naoi, a master temple builder who has been declared a “national living treasure” in Japan.

The morning began with lessons in sharpening from Kiyoshi Kimura, a stone maker from Kyoto, followed by setting and planing with Masaru Kamiyo, a woodworking teacher who specializes in wide plane techniques. Although translators were on hand, these men were so animated in their presentations that

continues on page 26 ...

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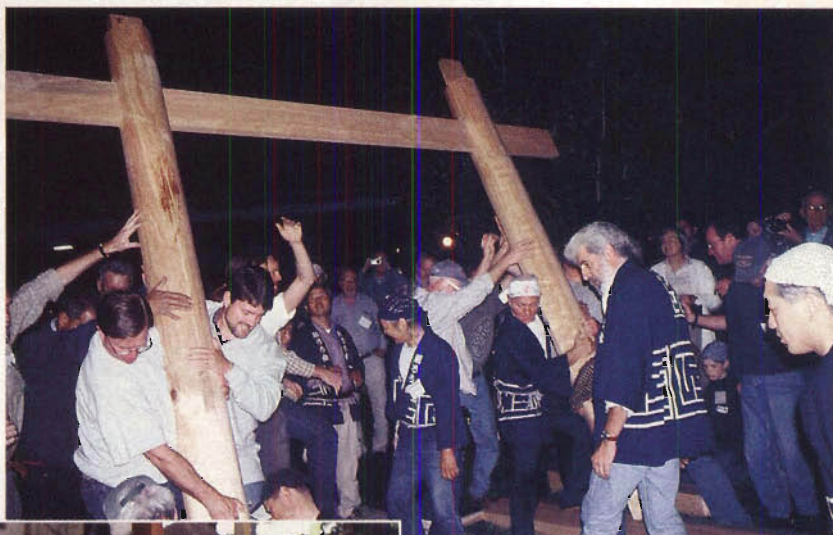
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Kezurou-kai founder Kojiro Sugimara, left, wants to provide an education in Japanese woodworking to people around the globe — like the Palomar College students above.



language was not a barrier. Most impressive was Yuji Funatsu, a third generation chisel maker whose "Funahiro" tools are highly prized. His demonstration of the lethal-looking spearplane was remarkable both for the crisp ribbons and smooth surface of the wood, and for Funatsu-san's elegant and graceful body control.

The day also featured a "planing competition" that tested participant's skills in both Western (push) and Japanese (pull) techniques.

Meeting of the Masters

The main activity was the construction of the torii gate. It seemed appropriate to use a 150-year-old Torrey pine tree that Palomar students harvested and processed the week prior to the event. (Palomar has an urban forestry project in

effect, harvesting and processing local trees for lumber that is then sold to students at reduced rates). With Naoi-san guiding the participants, work continued deep into the evening and well after sunset before the torii was raised.

While in California, the Kezurou-kai woodworkers also visited American Sam Maloof. The great mutual respect among the masters led to Sam's participation in having his hands, as well as Mitsuo Naoi's and Kojiro Sugimura's, cast in bronze. Retiring Palomar instructor Steve Kirby will deliver the castings to Japan this year when Palomar's students travel to help the Kezurou-kai in rebuilding the flood-damaged Kintai Bridge in the Yamaguchi prefecture.

— Paul Henry



A torii gate — constructed from Torrey pine — now stands at the entrance to Palomar's woodworking facility.

continues on page 28 ...

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Woodworking "B&B"

Travels With LiLi

Besides learning everything she can about woodworking in Rick White's shop, *Woodworker's Journal* apprentice LiLi Jackson is taking things a step further and seeking out ways to gain more woodworking knowledge. To that end, she's visited the North House Folk School in Grand Marais, Minnesota; Peters Valley Craft Center in Layton, New Jersey; and the Furniture Society 2003 conference in Philadelphia.



Dennis Maddox, far left above, is one of the instructors at Mike and Dana VanPelt's American Sycamore Retreat.

She also recently spent a week at the American Sycamore Retreat in Cloverdale, Indiana, for a pencil post bed class. That's just one of the many classes offered this year at Mike and Dana VanPelt's school; several others focus on women



LiLi Jackson used the band saw in her pencil post bed class. After rough shaping, she used a hand plane to do most of the shaping on the pencil posts.

woodworkers. American Sycamore, LiLi said, "is like a bed and breakfast — with woodworking. You can do woodworking and you don't have to leave."

In keeping with the retreat theme, woodworkers stay on the grounds, eating Dana's cooking and working in the shop until late in the evenings — except on Thursdays, when they break for barbeque. American Sycamore is a training facility for workers from Delta and Porter-Cable tool companies, which means they have a very well-equipped shop, plus a lathe room. "Regular woodworkers" from all over, including many repeat customers, also come there. The cabinets in the kitchen, for example, bear plaques stating "this cabinet was built by so-and-so, a lawyer from Texas,

and the next one says built by so-and-so, and she's a teacher from wherever," LiLi said.

Instructors include Frank Klausz, Betty Scarpino and Paul Anthony, among others. One course offering is a women's basics class; Dana refunded the tuition for the members of last year's class, LiLi reports, provided they completed their assignment of finding another woodworker to mentor. As for LiLi, she completed her bed, except for finish sanding, before shipping it home — when she would decide how to accommodate the mattress support. That decision, though, could wait: it wasn't woodworking.

This year's American Sycamore classes are on the web at www.americansycamoreretreat.com.

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A Simple Cherry Entertainment Center



Pleasing proportions and wraparound doors are key features in an entertainment center that won't dominate your room.

By John English

Our old house had a built-in TV center, so it had to stay behind when we moved to Wyoming last year. Its replacement is a basic casework project which required a fair amount of time, but doesn't call for a huge arsenal of tools. If you're wondering whether you can handle it, then it's probably well within the scope of your skills.

Beginning with the Sides

The first step is to rip and crosscut the side stiles and rails (pieces 1 through 5) to size, following the *Material List* on page 32).

After cutting, sand the side stiles and rails and lay out the curve on each lower rail (see the *Elevation Drawings* on the next page). A piece of bendable 1/4" stock works well to lay out a pencil line on the stock. Band saw the rail, then clean up the cut with a drum sander chucked in your drill press, as shown at right.

A stopped groove (see *Drawings*) in each stile holds the plywood panels (pieces 6 and 7) in place. This groove also holds the tongues and tenons on the ends of the rails, when the panels are assembled. The easiest way to plow these grooves is with a bearing-guided rabbeting bit (above right).

Center a groove in the appropriate edge or edges of each rail as shown in the *Drawings*. Then mill the matching tongues or tenons on their ends. Start the process with a large bearing-guided rabbeting bit chucked in a table-mounted router. Notch for the lower rail tenons with your band saw.

Now use the miter gauge on your table saw to help trim about 1/32" off the end of each tongue and tenon. This ensures they sit tight in the grooves and allows air and excess glue to escape.

Assembling the Sides

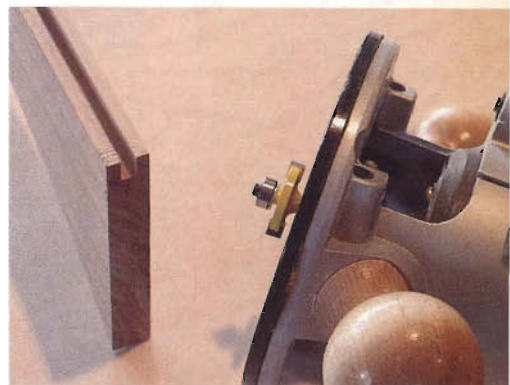
The four 1/4" cherry plywood side panels (pieces 6 and 7) complete the parts required to assemble the two sides of the entertainment center. Keep in mind that with a project like this, it looks best if you keep the grain pattern running continuously through both panels.

Begin your glue-up by creating a sufficiently large area (2 x 4 studs on sawhorses will work) to assemble the sides. Test all the parts and, when they fit, apply glue only where the rail tongues enter the grooves — the plywood panels need to float freely — and clamp up the subassemblies.

The Back and Fixed Shelves

When your carcass sides are dry, remove the clamps and sand the two subassemblies down to 220 grit. Then clamp a straightedge in place to plow the two grooves in each for the fixed shelves (pieces 8). The rabbet in each side subassembly for the cabinet back (piece 9) is a job for a 1/2" dado head in the table saw. Cut the back and the fixed shelves to size, then glue and clamp the fixed shelves in place. Note that they stop at the edge of the rabbets which you just cut for the back.

While the glue dries, apply a coat of primer and two coats of matte black paint to the inside face of the back. Then use a template to drill the shelf holes in the stiles for the adjustable shelves. Fit the back in its rabbets and nail it into place.

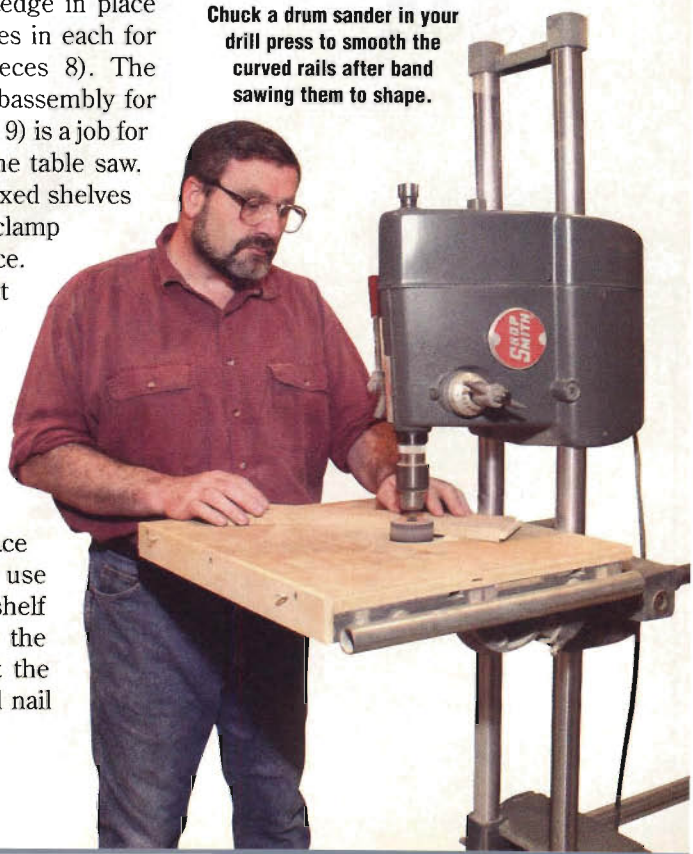


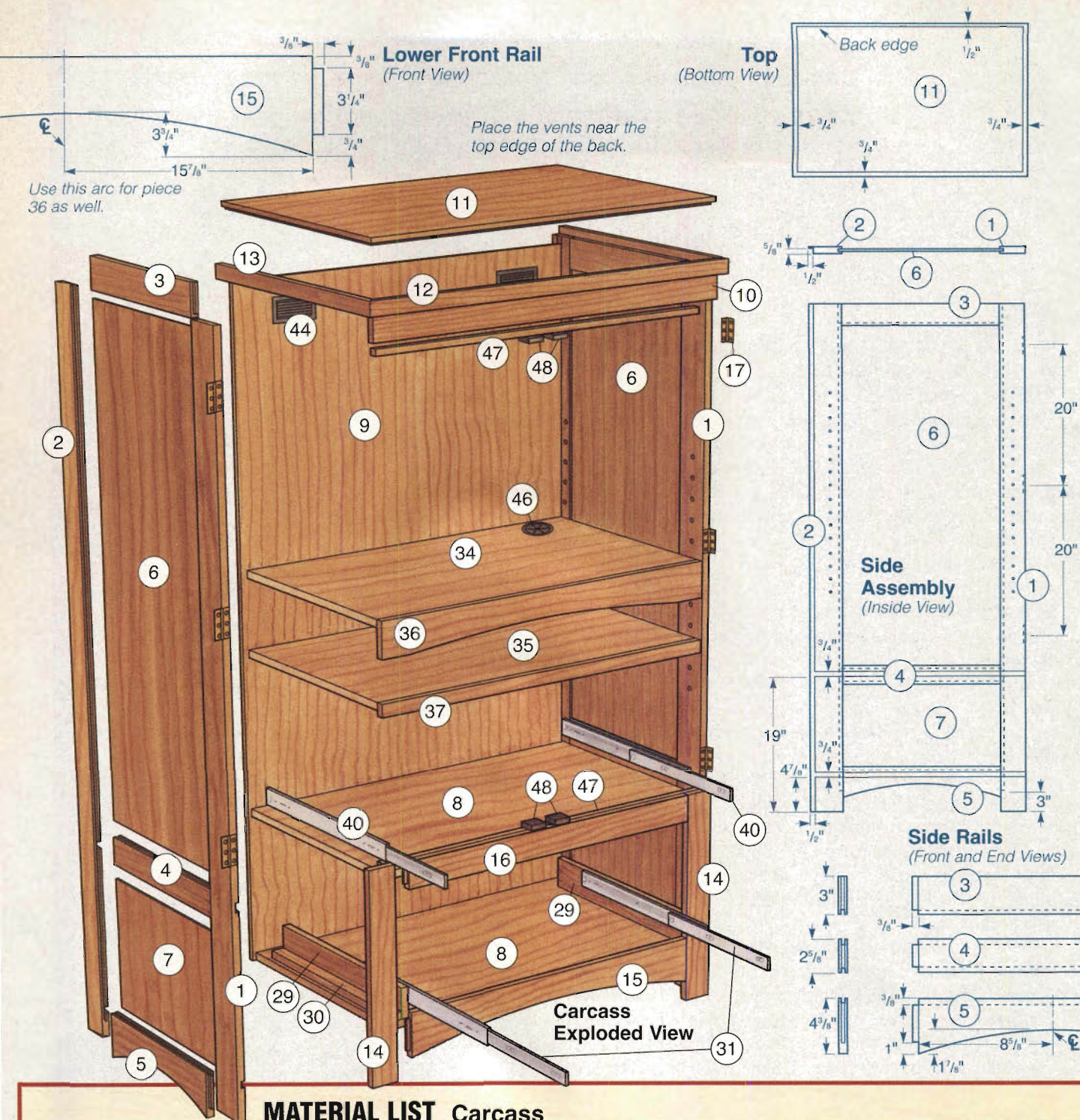
Mill the 1/4" wide by 3/8" deep stopped grooves for the side panels using a bearing-guided rabbeting bit.

Moving on to The Top

The front top rail (piece 10) can be tacked in place next. I used 3d finish nails, and set the heads. Cut the top (piece 11) to size next, then lay it in place and mark the locations of the back, sides and front rail. The edges of the top are rabbeted so that the top

Chuck a drum sander in your drill press to smooth the curved rails after band sawing them to shape.





MATERIAL LIST Carcass

	T x W x L		T x W x L
1 Front Side Stiles (2)	3/4" x 2 3/4" x 70 3/4"	12 Front Top Edge Cap (1)	3/4" x 1 3/8" x 38 3/4"
2 Rear Side Stiles (2)	3/4" x 3 1/2" x 70 3/4"	13 Side Top Edge Caps (2)	3/4" x 1 3/8" x 25"
3 Upper Side Rails (2)	3/4" x 3" x 18"	14 Front Stiles (2)	3/4" x 2 3/4" x 68"
4 Middle Side Rails (2)	3/4" x 2 5/8" x 18"	15 Lower Front Rail (1)	3/4" x 4 3/8" x 32 1/2"
5 Lower Side Rails (2)	3/4" x 4 3/8" x 18"	16 Center Front Rail (1)	3/4" x 2 5/8" x 32 1/2"
6 Upper Side Panels (2)	1/4" x 17 7/8" x 47 7/8"	17 Brass Butt Hinges (3 pair)	1 1/2" x 2 1/2"
7 Lower Side Panels (2)	1/4" x 17 7/8" x 12 5/8"	18 Door Top Rails (2)	3/4" x 4" x 11 3/8"
8 Fixed Shelves (2)	3/4" x 22 1/8" x 36 1/4"	19 Door Stiles (4)	3/4" x 2 5/8" x 47 1/4"
9 Back (1)	1/2" x 37" x 65 1/8"	20 Door Bottom Rails (2)	3/4" x 4" x 11 3/8"
10 Front Top Rail (1)	3/4" x 3" x 37 1/4"	21 Door Panels (2)	1/4" x 11 3/8" x 42"
11 Top (1)	3/4" x 24 1/4" x 37 1/4"	22 Soss Invisible Hinges (3 pair)	Brass

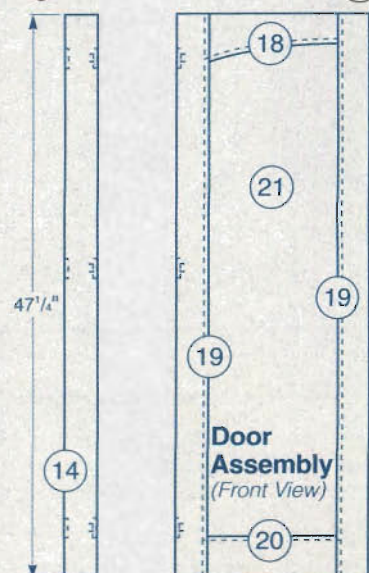
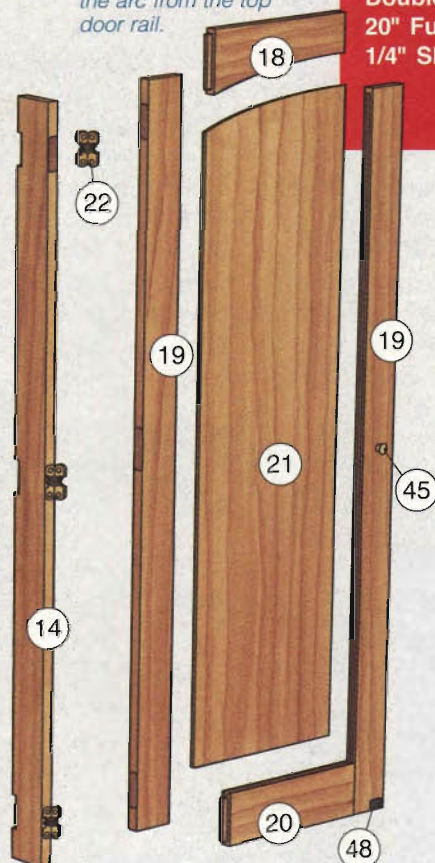
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Double Media Tray #34631	\$12.99	Magnetic Catches** #26559	\$1.49
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1/4" Shelf Pins (Pack) #81844	\$3.99		

To order, please call 800-610-0883 and mention code W3105.

Form the curve on the top edge of the door panels after transferring the arc from the top door rail.



Piece 14 is cut from one piece so the grain of the front stiles will run the full height of the cabinet.

Door Top Rail (Front View)



Front Stile (Front View)

fits cleanly: this ensures that no gaps are visible. When you are satisfied with the fit, glue and nail the top in place.

Run a router equipped with a flush-trimming bit around the top, to clean the edges before installing the mitered edge caps (pieces 12 and 13): these are just cut to length, then glued and nailed in place. Set the nails in the cap and the top before moving on to the front frame.



A shop-built jig and a stop on the drill bit control the location, frequency and depth of the shelf support holes.

The Front Frame

One of the best features of this entertainment center is that the doors fold all the way back against the sides when they're open, giving the piece a clean look. To accomplish this, the doors are hinged to the front stiles (pieces 14), which in turn are hinged to the sides of the cabinet.

The front frame is made up of the two stiles plus three rails, of which the top rail has already been made and installed. Before trimming the stiles to length, take a look at the *Drawing* at left: this shows where the hinged portions of the stiles will be cut from the fixed parts. The object

here (again) is to have continuous grain patterns flowing all the way up the stiles, despite the fact that they have been cut in two. Go ahead and crosscut the stiles before building the frame.

Band saw the lower front rail (piece 15) to shape and clean the cut with a drum sander. Mill tongues on the ends of both this piece and the center rail (piece 16), using the same rabbeting bit you used earlier on the cabinet sides. Transform these tongues into tenons by trimming the shoulders on your band saw.

Chop the mortises in the stiles with a Forstner bit chucked in your drill press, then clean up with a sharp chisel. Dry fit the front lower frame together and, when you're satisfied with the fit, apply glue and clamps. When it's dry, sand the frame and install it with glue and nails.

Hinged Stiles

The two hinged stiles are attached to the cabinet sides with three pairs of solid brass butt hinges (pieces 17). These are set in mortises which can be milled freehand with a router, then cleaned up with a sharp chisel.

It's important to note that the screws for the hinges will have to be 1/2" long or less for the front stiles, or they'll blow right through.

The Arch-top Doors

The arched doors are actually easier to build than the front frame. Begin by cutting the parts to size, then band saw the top rails (pieces 18) to shape. Clean the curved cut with a drum sander and plow a groove along the inside edge of each stile (pieces 19), using a bearing-guided rabbeting bit. Make a similar groove on the inside edges of the top and bottom (pieces 20) door rails.

Mill the tongues on the ends of the rails using the same table-mounted rabbeting bit you used earlier, holding each part against a miter gauge with a piece of scrap between the part and the gauge: this will prevent tearout at the end of each cut.

Use the top rails to scribe the arch on each of your plywood panels (pieces 21), then trim these on the band saw. Dry fit the doors to check their fit, then assemble them with glue and clamps.

The doors are installed using invisible Soss™ hinges (pieces 22). They come with templates and instructions, and require patience to



After installation, trim the edges of the top with a bearing-guided flush trim bit, then

use 1/4" scrap (temporary) guide blocks (inset) to establish the height of the mitered molding.

install. Chop their two-step mortises (see photos at right) in the door stiles and hinged cabinet stiles, then predrill for the screws and secure the hinges in place.

Constructing the Large Drawer Box

The large bottom drawer in this cabinet is essentially a large finger-jointed box, with a tongue and groove drawer face. I used 12" poplar for the drawer sides, front and back (pieces 23 and 24): it was less than half the cost of cherry, came in wide boards, and tends to be a bit more stable in this dimension.

Mill the finger joints and plow grooves for the drawer bottom (piece 25). These grooves are through in the front and back. After dry fitting, assemble the drawer with glue and clamps.

Drawer Side
(Inside View)

Drawer Front Assembly
(Front View)

Drawer Front Assembly
(Section View)

Media Tray
Exploded View

Tray Detail

Tray Sides
(Front View)

Tray Front/Back
(Front View)

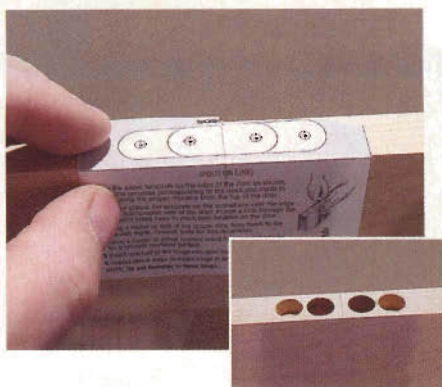
Typical Tenon and Groove

Drawer and Media Tray

MATERIAL LIST

	T x W x L
23 Drawer Sides (2)	3/4" x 9 3/4" x 20"
24 Drawer Front & Back (2)	3/4" x 9 3/4" x 31 1/4"
25 Drawer Bottom (1)	1/2" x 19" x 30 1/4"
26 Drawer Face Stiles (2)	3/4" x 2 5/8" x 11 3/4"
27 Drawer Face Rails (2)	3/4" x 2 5/8" x 27 1/4"
28 Drawer Panel (1)	1/4" x 7 1/4" x 27 1/4"
29 Vertical Drawer Cleats (2)	3/4" x 3" x 20"
30 Horizontal Drawer Cleats (2)	3/4" x 1 1/4" x 20"
31 Drawer Slides (2)	20", Full extension
32 Drawer Face Spacer (1)	1/4" x 6 1/2" x 26 1/2"
33 Drawer Pull (1)	Brass
34 Upper Adjustable Shelf (1)	3/4" x 21 3/8" x 35 5/8"
35 Lower Adjustable Shelf (1)	3/4" x 21 3/8" x 35 5/8"

	T x W x L
36 Upper Shelf Front (1)	3/4" x 3 1/2" x 35 5/8"
37 Lower Shelf Front (1)	3/4" x 1 1/4" x 35 5/8"
38 Shelf Supports (8)	Brass
39 Media Tray Sides (2)	3/4" x 3" x 18"
40 Media Tray Drawer Slides (2)	Full extension
41 Media Tray Bottom (1)	1/4" x 17" x 34 1/4"
42 Media Tray Front & Back (2)	3/4" x 3" x 35 1/4"
43 Media Tray CD/Tape Holders (2)	Plastic
44 Vent Grommets (2)	Metal
45 Pulls (3)	Brass
46 Wiring Grommets (3)	Flexible style
47 Catch Cleats (2)	3/4" x 3/4" x 35 1/2"
48 Magnetic Catches (4)	Low profile



The Soss brand hinges, which attach the doors to the operable stiles, come complete with templates (above). After marking several hole locations, drill out most of the two-step mortises with a 1/2" Forstner bit (inset). Then clean up the mortises with a chisel, or use a rotary tool equipped with a 1/2" coarse grit drum sander to get the final mortise (right).

The Drawer Face and Installation

By now, you're familiar with tongue and groove construction, so the drawer face should be easy to build. Cut the stiles and rails (pieces 26 and 27) to size, then use the rabbeting bit to plow a groove along the inside edge of each part. Move to the table-mounted router to mill the tongues, cut the panel (piece 28) to size, and glue and clamp this subassembly together, after a dry fit.

Make up a pair of L-shaped cleats (pieces 29 and 30) and attach the drawer slides (pieces 31) to these cleats, following the manufacturer's instructions. Clamp the cleats to your bench, exactly the same distance apart as they will be in the cabinet. You can now easily attach the slides to the drawer. Just be sure to mount the drawer high enough to clear the lip at the bottom of its opening.

Screw and glue the cleat/slide subassemblies in place so that the closed drawer slides are absolutely flush with the back face of the cabinet frame. Then slide the drawer in place.

Cut a scrap piece of 1/4" plywood (piece 32) a hair smaller than the viewable area of the panel in the drawer face. Use this as a spacer between the drawer front and face: without it, when you tighten the drawer pull (piece 33), the panel will bow inward. Now you're ready to attach the drawer face. Stick some two-sided tape to the drawer front, place a couple of 4d finish nails in the bottom of the opening (as spacers),

and center the drawer face in the opening. This will let you line it up square in the opening, and the tape will hold it in place while you open the drawer and screw the face to the front. Attach the pull (you may have to counterbore for the screw), and you're ready to make some shelves.

Making the Adjustable Shelves

There are two large adjustable shelves (pieces 34 and 35) in the cabinet, one for the TV and one for the components. Weight is an issue here, especially over time. With that in mind, the front edges of the shelves (pieces 36 and 37) are more substantial than a standard 3/4" piece of trim. After cutting them to size and shape, drum sand the curve and attach them to their relevant shelves with glue and clamps. The shelf supports (pieces 38) are brass with a plastic, no-slip cushion coating. They simply pop into the 1/4" diameter holes you drilled earlier.

A Media Tray

The last subassembly to build is the media tray. Its sides (pieces 39) are a simple molding milled on the table saw. Cut the large rabbets for the drawer slides (pieces 40) first, then switch to a dado head to plow the groove for the bottom (piece 41).

The front and back of the tray (pieces 42) are the same molding

without the rabbet, as shown in the *Drawings* at left. Cut the tray bottom to size, then miter the molding to length and dry fit everything.

Glue up the tray and, after the clamps have been removed, install the slides. Assemble the black plastic media holders (pieces 43), then simply lay them in place.

Wrapping Up

I applied three coats of a professional grade matte polyurethane-based finish, sanding with 400 grit paper between coats.

Reinstall the hardware after the finish is dry, then install the back vents, door pulls and the wiring grommets (pieces 44, 45 and 46).

To keep the doors closed properly, I installed a couple of 3/4" square cherry cleats (pieces 47), gluing them to the back of the cabinet frame at the top and bottom of the opening. Mounting the magnetic catches (pieces 48) is the final step.



John English, a former Today's Woodworker editor, is also a long-term contributing editor.

“ It might have been safer to use wider strips yielding wide edges and narrow them down with the bevel cuts, but I didn’t want to waste any of this precious wood, and I wanted to preserve as much continuity of figure as possible. ”



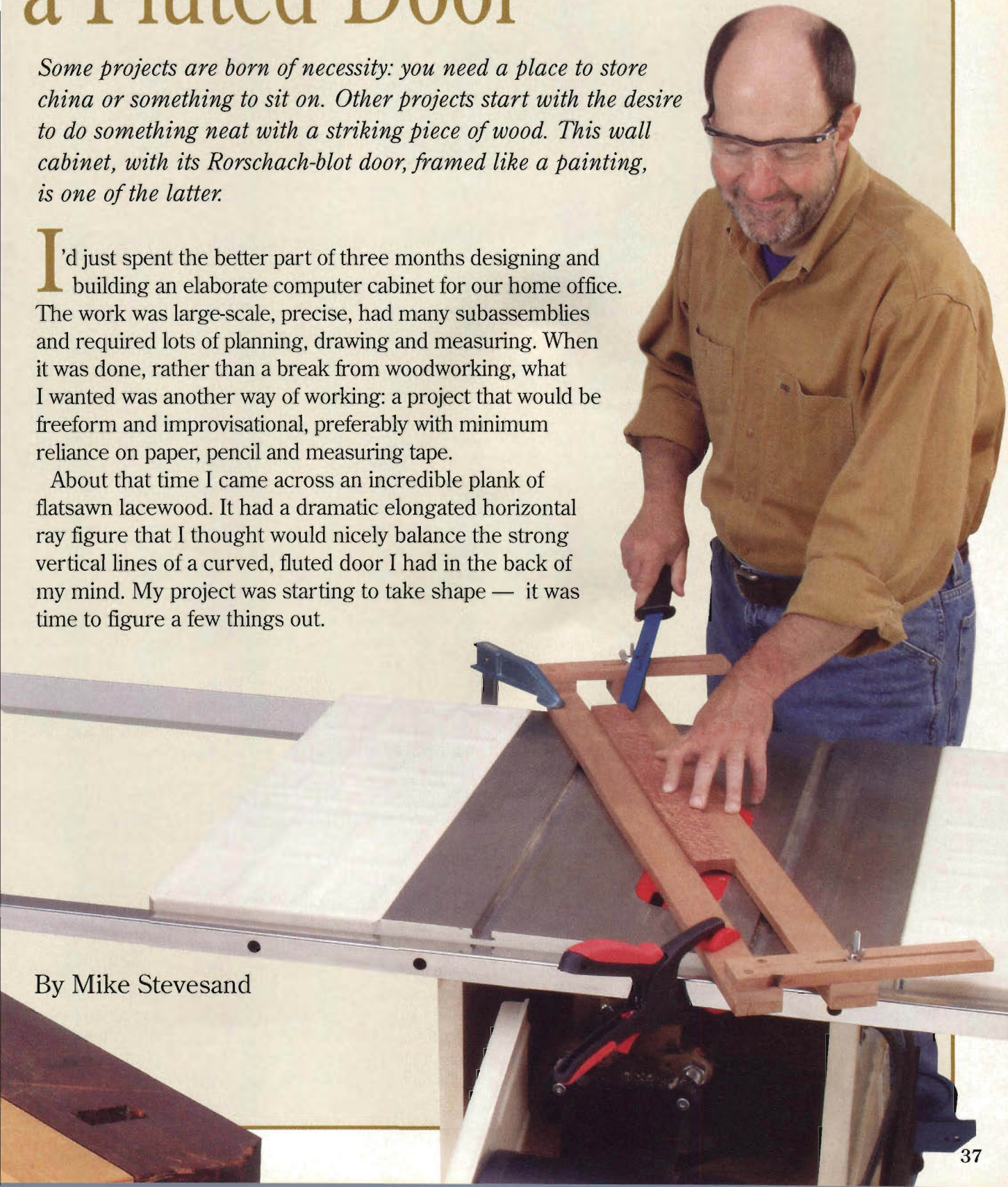
Wall Cabinet with a Fluted Door

Some projects are born of necessity: you need a place to store china or something to sit on. Other projects start with the desire to do something neat with a striking piece of wood. This wall cabinet, with its Rorschach-blot door, framed like a painting, is one of the latter.

I'd just spent the better part of three months designing and building an elaborate computer cabinet for our home office. The work was large-scale, precise, had many subassemblies and required lots of planning, drawing and measuring. When it was done, rather than a break from woodworking, what I wanted was another way of working: a project that would be freeform and improvisational, preferably with minimum reliance on paper, pencil and measuring tape.

About that time I came across an incredible plank of flatsawn lacewood. It had a dramatic elongated horizontal ray figure that I thought would nicely balance the strong vertical lines of a curved, fluted door I had in the back of my mind. My project was starting to take shape — it was time to figure a few things out.

By Mike Stevesand





After many test cuts on pine, the author used his shop-made jig to form the coves in the lacewood staves. The adjustable jig accommodated both widths of door staves.

The basic technique was clear enough: I would cut a plank into strips, cove each one, and bevel the edges so when they were edge-glued back together they would form a curve (this process is called “coopering,” named for the barrelmakers who invented it).

The challenges were, one, getting a tight joint between each strip without the strips slipping against each other and, two, smoothing the coves (rough from the saw blade) while keeping the arrises (the “spines”) between them sharp and clear, which is half of the visual rhythm flutes establish. I knew that the door had to be perfect before making the rest of the cabinet, because the sizes and proportions of the other pieces would be determined by the door. With the width of the door absolutely fixed by the high points of the outer arrises, there would be no adjusting once it was made.

A Cove Conundrum or Two

The first order of business was to figure out how to cut the coves. I knew the trick of clamping an angled fence across the table saw and running a board over the blade, raising the blade slightly with each pass so that the skewed angle of presentation forms a radius. I had made a few pieces of crown molding that way, but this was a bit different. The door I had in mind needed narrow pieces coved out to almost their full width, leaving edges just wide enough to support the strips on their trip over the

blade and to bevel later to establish the curve. But the edges had to be narrow enough so they could be worked to sharpness once the door was glued up. It might have been safer to use wider strips yielding wide edges and narrow them down with the bevel cuts, but I didn’t want to waste any of this precious wood, and I wanted to preserve as much continuity of figure as possible. In addition, the coves had to be deep enough to create the shadow lines which are the other half of the fluted rhythm, but shallow enough to leave enough thickness for the biscuits I’d use to join the strips, and for the screws for the hinges I planned to use to hang the door.

The solution I hit upon was a jig with two long pieces forming a “chute” to guide the strips over the blade without exposing my fingers to it. Because I wasn’t yet sure how wide the strips should be to get the effect I was after, I made the width adjustable. And because the strips were to be at least 18" long, and therefore had to travel at least 36" from front to back, I built up the ends so the strips could pass underneath them. And I made the “legs” from 1/2" stock so the 3/4" strips would project above the jig, allowing me to push from the side rather than the top and keep the push stick above the blade so it was not in danger of contacting it at the end of the cut.

Now I had the means, but there were other questions. How wide should the coves be? How deep? How many? And how was I to get the arrises sharp after glue-up? (See the box at right for that one.)

There are tables that give angles and equivalent radii for cove cutting. My solution was to cut 20 or so strips of scrap pine into various widths and begin experimenting. I clamped the jig to the table front and back at an arbitrary angle and began cutting. The first thing I learned was that the larger the angle of the jig relative to the blade, the wider (and larger radius) the cove is in relation to its depth. Some trial and error here yielded the conclusion that 1 3/4" wide strips would be right for this door. I adjusted the jig to that width, raised the



After planing the coves on each door stave, the author formed a 5° angle on both long edges (with the exception of the outside staves). To align the staves during glue-up, biscuit joints were put to good use.



blade to a little less than half the thickness of the strips and clamped the jig to the table so that the blade emerged from the throat plate about 1/16" from the inside edges of the jig front and back, reasoning that this would result in a cove of the proper depth with 1/16" edges. I then lowered the blade to just above the table for the first cuts. Another sacrificial strip showed that I was pretty close, but the radius of the cove was a little too large. I fiddled with the angle until my sanding block (with coarse paper attached) bore against the edges of the cove with about 1/16" clearance to the bottom (see box at right).

Ripping and Coving Lacewood Strips

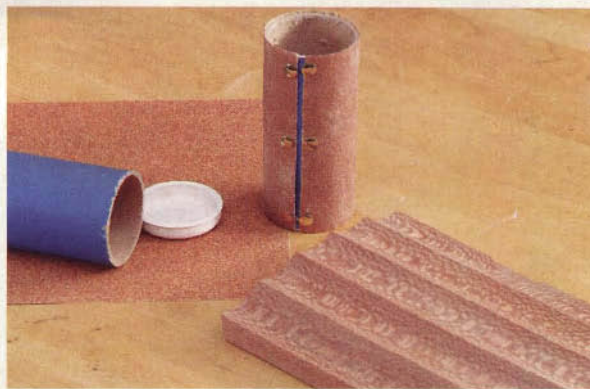
Now I was ready to cove the real thing. But first, I marked the jig angle right on the saw table and took the setup apart to cut my lacewood into 1 3/4" strips. (It would have been easier to have the strips ready, but I didn't know they should be that width until I had experimented.) Some further experimentation with my pine scrap strips had shown me that a 5° bevel on the edges resulted in a nice, mild curve. Luckily, I remembered that the outside strips (i.e., the edges of the door), once glued up, would need to be trimmed after the door was assembled. This necessitated extra



Raising a Sharp Point

The challenge was how to get the coves' arrises sharp after glue-up. I knew I would need a cylindrical sanding block because the coves coming off the saw would be rough and need lots of smoothing. What I figured out was that if I had a sanding block with a radius just slightly larger than the coves', it would bear against the edges first, before bottoming out in the coves. If I could cut the coves to the proper radius and keep the edges narrow enough, the sanding process would essentially abrade from the top down, sharpening the arrises before smoothing the coves.

That was the theory, anyway. A friend gave me a stout cardboard mailing tube with removable plastic flush cap ends that I thought might work. The walls were almost 3/16" thick, and I found that I could cut it down to a suitable length and attach sandpaper with thumbtacks. The end caps kept it quite stiff. A perfect and simple solution to a challenging sanding problem.



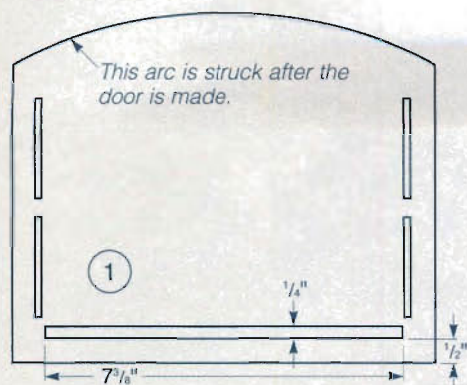
The radius of a mailing tube was a key to the author's success in creating his dramatic door with knife-edge arrises.

A slightly oversized tubular sanding block creates sharp arrises.

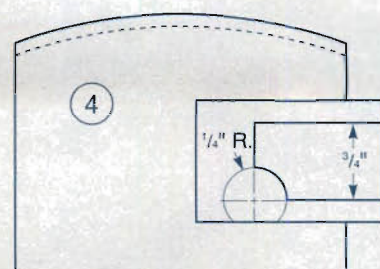
The outside staves are wider, and their outside edges are trimmed after the door is glued up.

Biscuits are used to align the staves.

Top and Bottom (Inside View)

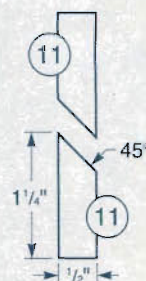


Shelf and Door Stop (Top View)



NOTE: The cove is only found on the forward edge of the shelf; omit it for the door stop.

French Cleats (End Views)



width on the ends, so I cut two lacewood strips to 2" and four to 1 3/4". I arranged and rearranged the strips into a pleasing pattern (always with the wider strips to the outsides) and marked them in sequence with the cabinetmaker's pyramid on the backs.

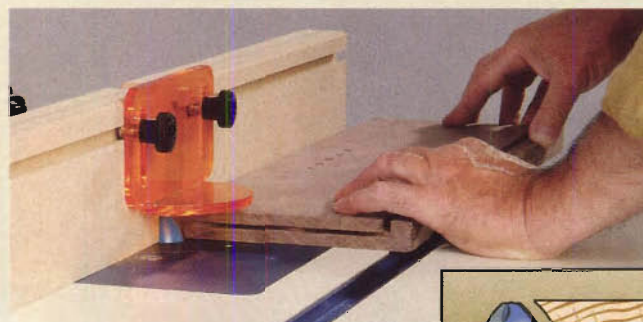
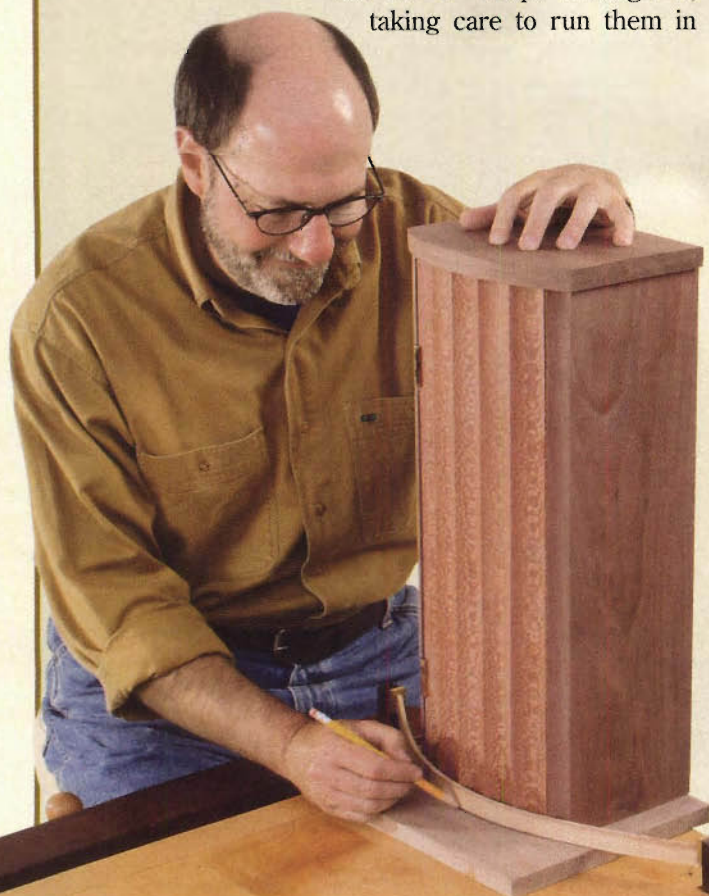
Returning the jig setup to the angle marked on the saw table, I ran one more pine strip through it for a final check with the sanding block. It came out right, so I lowered the blade, ran all four 1 3/4" lacewood strips through, raised the blade a bit, and repeated the process until the cove was the right depth and the edges were about 1/16" wide. I then readjusted the outer leg of the jig so the "chute" was 2" wide (keeping the inner leg fixed relative to the blade), again lowered the blade and ran the 2" strips through it, taking care to run them in

the same orientation with each successive raising of the blade, until the coves matched the other pieces and one edge was the same 1/16" wide as the narrower strips, but the other edge was about 1/4" wide.

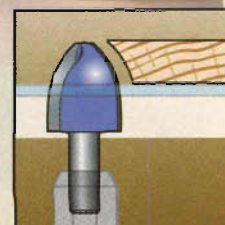
Beveling and Joining a Cooped Door

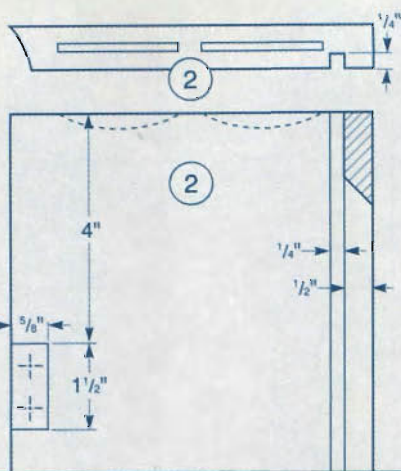
I took the setup apart, set the blade to 5° and set the fence to cut one edge of each 1 3/4" strip, eyeballing the line of cut so it just skimmed the outer point of the edge of the cove. This is a chance to narrow the edges if they've come out a bit fat. I then reset the fence to cut the opposite edges, and reset yet again to cut the bevel on the thin-edged side of the 2" wide strips, leaving the wide edge alone. These wouldn't be cut until the door was almost finished. Experimenting with the finished strips, and keeping in mind the final composition would be 1 1/2" wider with the side pieces, I decided I liked the door best with five flutes, rather than the six I had cut.

The biscuit joiner made easy work of joining the strips into a curve. I simply struck four lines across the backs of the strips, set the joiner's fence to the 5° angle, registered it to the back faces, and cut the slots on all the strips (except for the wide-edged sides of the 2" strips, which would be the outer edges of the door). I glued up the outer and next inner strips in pairs and clamped them with handscrews. When they were dry,



The author scalloped the front edge of the sides on his router table (above). A 1/8" strip of hardwood, flexed on his workbench, provided a perfect offset for the top and bottom and made it easy to transfer the curved shape.

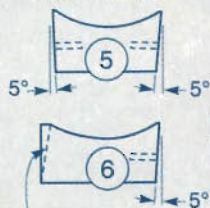




Side
(End and
Side Views)

NOTE:
The author
mortised the
hinges into
the door
first, then
marked their
corresponding
placement on
the cabinet.

Door Staves
(End Views)



NOTE: There are
right and left
pieces 6.

Fluted Door Wall Cabinet

(Front View)

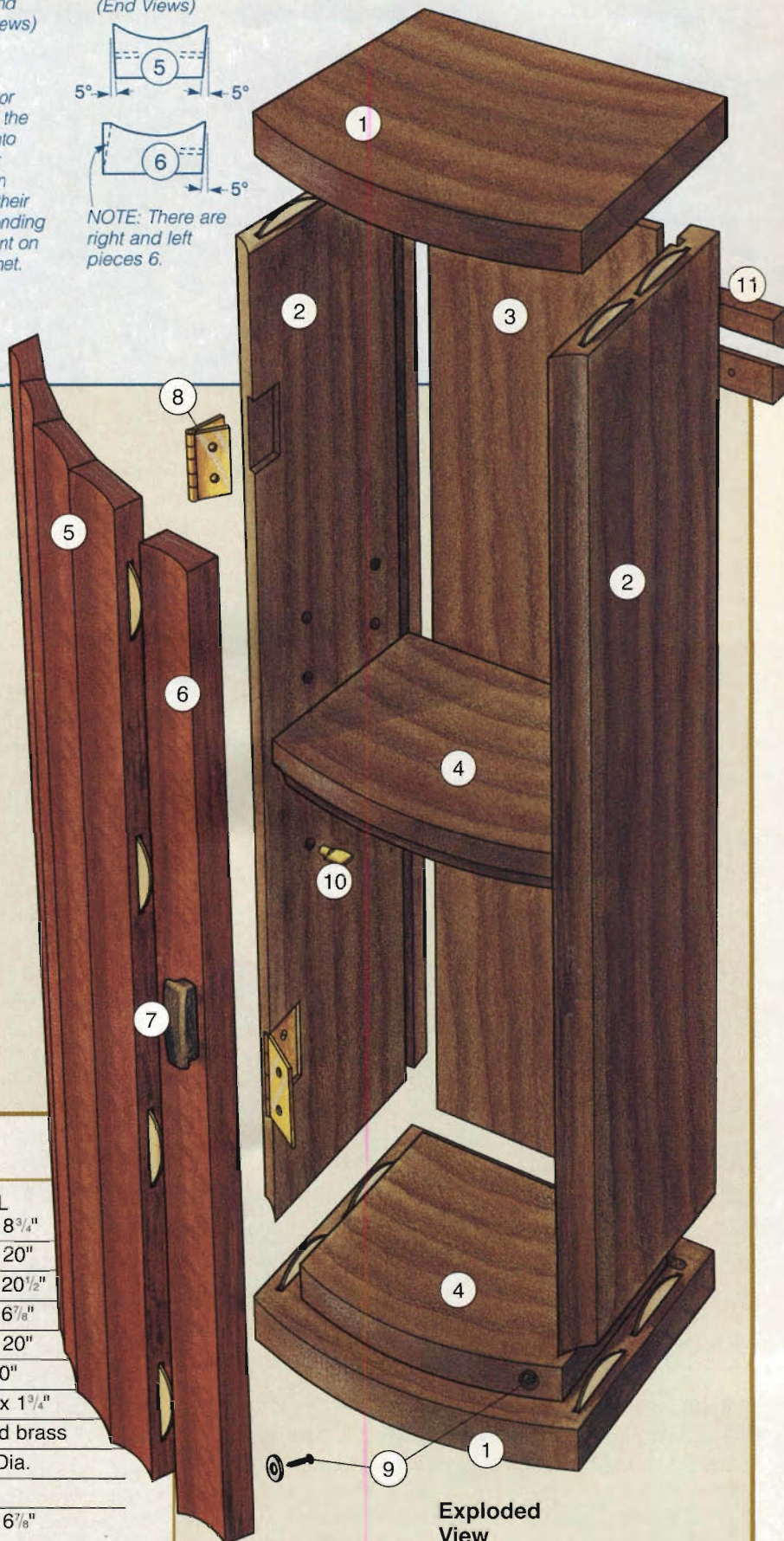
(Side View)



MATERIAL LIST

	T x W x L
1 Top and Bottom* (2)	3/4" x 7 1/4" x 8 3/4"
2 Sides (2)	3/4" x 6 1/4" x 20"
3 Back (1)	1/4" x 7 3/8" x 20 1/2"
4 Shelf and Door Stop* (2)	3/4" x 5 3/8" x 6 7/8"
5 Inner Door Staves (3)	3/4" x 1 3/4" x 20"
6 Outer Door Staves (2)	3/4" x 2" x 20"
7 Handle (1)	9/16" x 1/2" x 1 3/4"
8 Hinges (2)	1 1/2" Extruded brass
9 Magnetic Door Catch (1)	Round, 5/16" Dia.
10 Shelf Pins (4)	Brass
11 French Cleats (2)	1/2" x 1 1/4" x 6 7/8"

*Trim front edge to accommodate arc.



**Exploded
View**

I glued the middle strip onto one of the outer pairs and clamped again. Finally, I glued the two-strip and three-strip halves together along the last joint, drawing the halves together with pipe clamps set on a plywood panel to just beyond flush and clamping down with handscrews at the ends between the door and the underside of the plywood to bring the joint tight.

The sanding block worked just as I hoped it would, sharpening the arrises nicely and smoothing out the blade marks in the coves with 60 grit paper and polishing with finer grits through 220. Lacewood has a coarse texture which doesn't really require anything beyond that. I then trimmed the edges of the finished door. It was important to have the extra width there for this operation, so the blade could skim the high point of the outer arrises while cutting a clean edge all the way to the bottom.

“What I wanted was another way of working: a project that would be freeform and improvisational, preferably with minimum reliance on paper, pencil and measuring tape.”

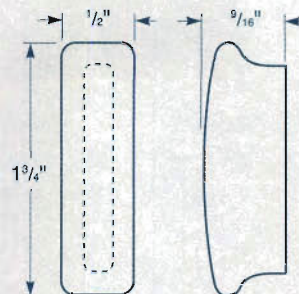


Building a Carcass for a Door

The rest of the cabinet was straightforward. While the height of the sides and the width of the top and bottom pieces are determined by the door, a few points deserve mentioning. I wanted the edges of the side pieces to also have shallow angled coves to complete the visual rhythm of the door. I discovered that a vertical cove



Door Pull



Rather than break up the wooden door's appearance with a metal pull, the author carved an organically shaped version instead.



panel-raising bit cut the perfect gentle cove with the sides run across it horizontally in the router table. To leave nothing to chance, I mortised the extruded butt hinges into the cabinet and door and hung the door before determining the final width of the cabinet by clamping two plywood spacers between the sides and adjusting the width of the spacers until the door fit perfectly, with a minimal gap. I then used the spacers to register the biscuit joiner to cut the slots in the top and bottom pieces.

I was lucky enough to find a piece of walnut for the top with a natural curve to the grain that closely followed the curve of the door. I marked the curve on the front of the top and bottom pieces by springing a 1/8" strip of wood between the end vise and a dog in my bench until it matched the curve of the door. I set the cabinet upside down on the top piece, slid the top piece under the bent strip, butted the door against the strip and traced the curve onto the top piece. This simultaneously faired the curve described by the high points of the arrises and spaced it 1/8" away from them for a nice overhang. I discovered that the angle of the coves on the side pieces of the cabinet tightened the radius at the ends of the top and bottom curves, which was a happy accident because I think this kind of curve has a tension that a simple segment of a circle lacks. I used the top as a template to mark the bottom. The grain at the front edge of the top and bottom pieces is arranged to suggest a mild oval shape. The back is walnut veneer plywood let into grooves in the sides and top and bottom. I recessed it 1/2" to leave a little room to mount the cabinet half of a 1/2" thick French cleat. With the other half mounted on the wall, this cabinet is simple to install. With the cleats in place, I completed this project by finishing it with oil and wax.

Mike Stevesand is a Minnesota woodworker with a cabin in Wisconsin. Crappie and sunfish are never safe when Mike is afloat. When he is not chasing panfish, Mike can be found hanging out with his wife Patty and dog Spike.

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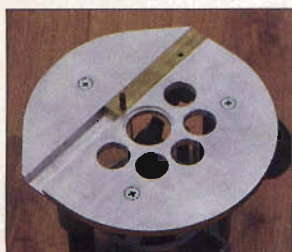
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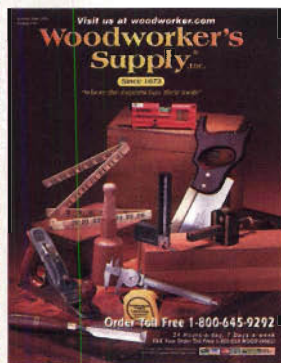
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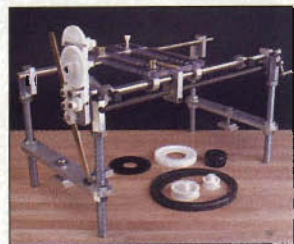
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All-purpose Accessories Cart

By Brad Becker



Here's a useful shop project you can complete in one weekend. You'll never have to look far for your shop supplies and accessories again they're right behind you!

The last time Rick White and I tackled a project for the Journal, we decided there was an important fixture missing in the Woodworker's Journal shop. We've got plenty of storage space and benches in our shop. But when you're working on a project, the little things, accessories and supplies, have a tendency to spread out all over the shop. That's OK when it comes to major subassemblies, but if you're installing a lot of hardware or other small parts, or need ready access to a set of bits or chisels, you want them close at hand as you move around the shop. Otherwise, it's too easy to lose track of things.

So we came up with this little accessory cart that, like a kid brother, will follow you all around the shop. It's got industrial grade wheels that can be locked in place, a drawer that stays shut and a replaceable top that's enclosed by its apron so nothing rolls off. As an afterthought, I added a tool holder and power strip to give it a little extra versatility.

It's light, it's fast and it fills a big need for the project builder. Rick and I didn't cut any corners on ours (hey, it's for the Woodworker's Journal shop!), but this is a project you could easily make out of the scrap wood and spare stock lying around in your shop.

Starting With the Legs and Aprons

The Material List at right lists all the parts for this project and, with the exception of the tool hanger, everything is square. The first pieces to cut to size are the legs and aprons (pieces 1 through 3). The legs are rabbeted on two sides of their tops and bottoms, creating a notch for the aprons. This material can be removed on your table

saw, with your dado head installed or, as shown below, with a tenoning jig. (Check the Elevation Drawings at right for details). There are two different size aprons and a number of holes to be drilled and countersunk. The last step is to miter the ends.

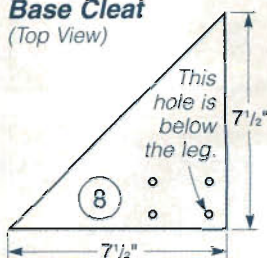
Bringing the Legs and Aprons Together

With the legs and aprons cut and machined, turn to your plug cutter to create some fancy plugs for the screw holes. I was using oak for my cart, so I went with scrap walnut to create my plugs. Use some of your clamps to bring the legs and aprons together and extend pilot holes into the legs. Now glue and screw the legs and aprons together, checking for square as you

The rabbets on the outside faces of each leg can be formed on the table saw. Here, the author uses a tenoning jig to make quick work of the task.



Base Cleat
(Top View)

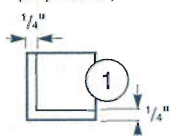


Leg
(Front View)

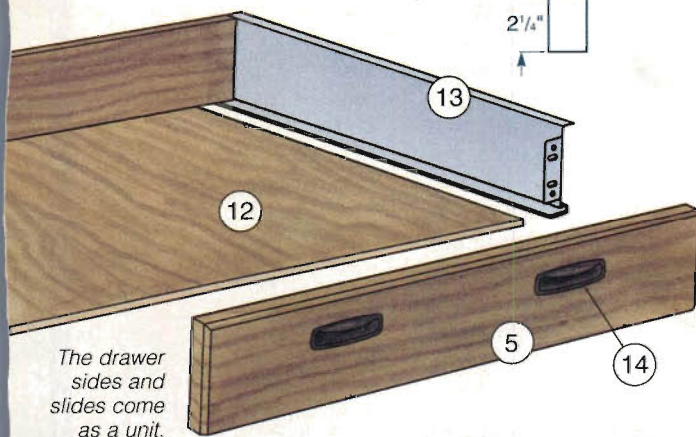


Note: All four legs are identical, but there is a top and bottom leg orientation when you are assembling the cart.

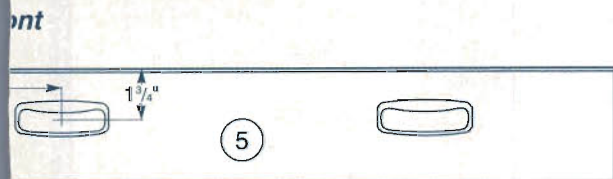
Leg
(Top View)



attached with
through the base
aster attachment
templates.



The drawer
sides and
slides come
as a unit.



Accessories Cart Supplies

The following supplies are available from
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Metal Drawer Sides/slides #30622.....\$14.99

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*Four required. **Two required.

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go. Next, cut the slide mounts (pieces 4) to size and install them inside, as shown in the *Exploded View*. Cut the drawer front and rear drawer cover (pieces 5) to size and chamfer their edges, but don't install these pieces yet.

Cut the tool hanger (piece 6) to size and clamp it in position as you drill pilot holes from the inside. There's a stopped tongue on the tool hanger and a stopped groove in the apron (see *Elevations*). I drilled a few holes to hold my main screwdrivers right away, but you may want to let your tool selections dictate the number, size and proximity of these holes.



You don't want to scrim on the wheels when you're in a shop setting. This brute features ball bearings and easy-to-use locks. In 20 years, it'll still be on the job.

Cut the melamine top and base shelf (pieces 7) to size and create the notches at the corners of the base shelf, as shown in the *Elevation Drawings*. Cut the cleats (pieces 8) to size and clamp them in position as you drill pilot holes and countersink holes for their plugs (pieces 9) through the aprons.

Install the cleats and test fit the melamine bases. The top one sits right on the top of the legs, the bottom one sits on the cleats. I chamfered the bottom edges of both pieces of melamine to ensure a smooth, friction fit.

While the bottom is in place, position your wheels (pieces 10) on the bottom of the cleats and drill all the way through for the hefty bolts. Note from the *Elevation Drawing* that one of the holes goes right into the leg bottom — use a large screw for this location. Install the wheels and turn the unit back upright.

continues on page 50 ...

	T x W x L
8 Base Cleats (4)	3/4" x 7 1/2" x 7 1/2"
9 Walnut Plugs (48)	3/8"
10 Casters (4)	3" Locking
11 Drawer Back (1)	1/2" x 3 1/8" x 23 3/8"
12 Drawer Bottom (1)	1/4" x 24" x 18 1/4"
13 Drawer Sides/slides (2)	Metal, pre-made
14 Drawer Pulls (2)	Walnut

You'll wonder how you ever worked without this handy "everything cart." It's simple enough to build in a weekend, and sturdy enough to last a lifetime.

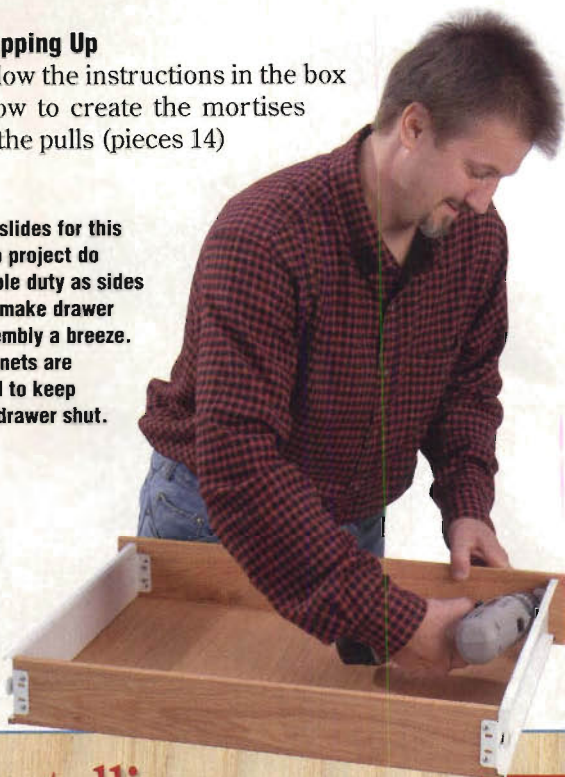


Cut the drawer back and bottom (pieces 11 and 12) to size and assemble the drawer, as shown below. I used drawer slides that come complete as metal drawer sides (piece 13). These sides simply screw to the front and back, and then the drawer bottom slides into place. It's a pretty slick little system, especially nice for shop projects like this.

Wrapping Up

Follow the instructions in the box below to create the mortises for the pulls (pieces 14)

The slides for this shop project do double duty as sides and make drawer assembly a breeze. Magnets are used to keep the drawer shut.



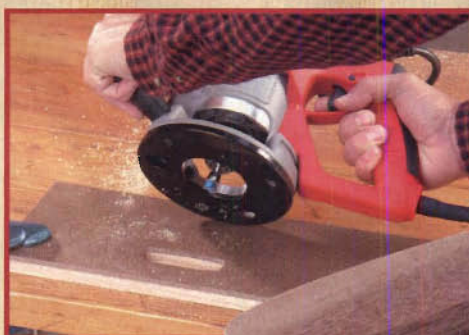
and install them on the drawer front. Sand everything through 220 grit. Fit the drawer slides on the slide mounts and test fit your drawer. I also added some magnets on the ends of the slide mounts and on the back of the drawer front to keep the drawer from slipping open as you wheel around a corner. When you're happy with the fit, apply a good coat of finishing oil.

When it's dry, reinstall the top — remember, it's a friction fit so it's easy to replace if it gets a little too funky. Now, find your most common shop companions and introduce them to their tool hanger or new drawer — they're going for a ride.

Brad Becker is a woodworker in Rick White's shop.

Installing the Pulls

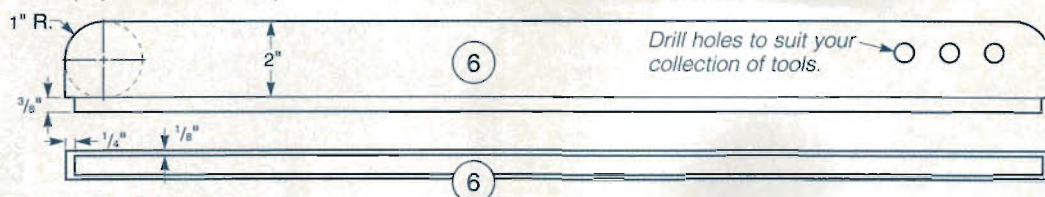
I went with some simple walnut pulls that feature a tiny lip. If you have pulls left over from your last job, they'll do just fine, but I wanted my plugs and pulls to match. Follow the simple, two-step process shown at right to install your pulls. As with any template routing job, the key is to get the template right. Use a jigsaw to cut the opening. Sand exactly to the lines using sandpaper wrapped around a 3/4" dowel. Then, it's a simple matter of clamping the template in place and routing out the opening. The small lip on the pulls even gives you a little margin of error.



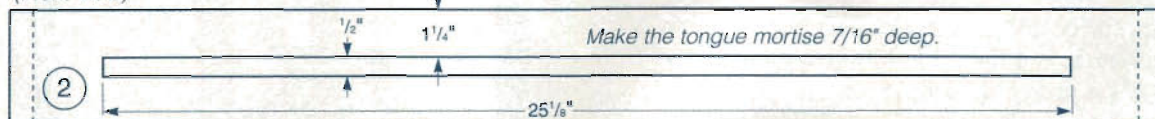
Creating the mortises for the pulls was a simple, two-step process. First, make a hardboard template with a jigsaw and sandpaper. And second, rout the mortise with a special (short) bearing guided bit. The pull features a slight shoulder to cover minor slips.



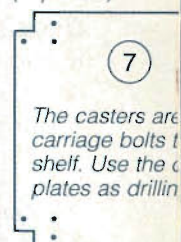
Tool Hanger (Top and Rear Views)



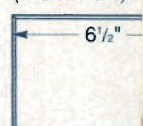
Back Apron Mortise Location (Front View)



Base Shelf (Top View)



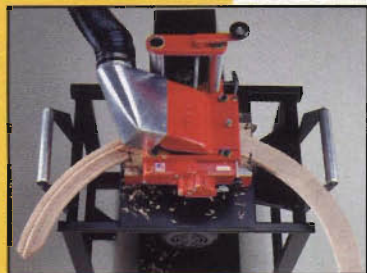
Drawer Front (Front View)



MATERIAL LIST

	T x W x L
1 Legs (4)	1 3/4" x 1 3/4" x 30"
2 Front/back Aprons (4)	3/4" x 3" x 30"
3 Side Aprons (4)	3/4" x 3" x 20 1/2"
4 Slide Mounts (2)	1/2" x 4" x 19 1/2"
5 Drawer Front & Rear Cover (2)	1/2" x 4" x 25 5/8"
6 Tool Hanger (1)	3/4" x 2 3/8" x 25 5/8"
7 Top and Base Shelf Inserts (2)	3/4" x 19" x 28 1/2"

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More Dovetail Lore

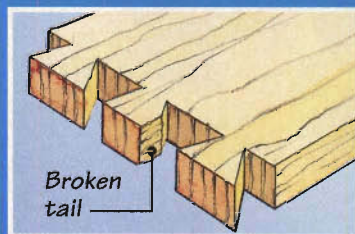
Design principles and secret miter fundamentals

By Ian Kirby

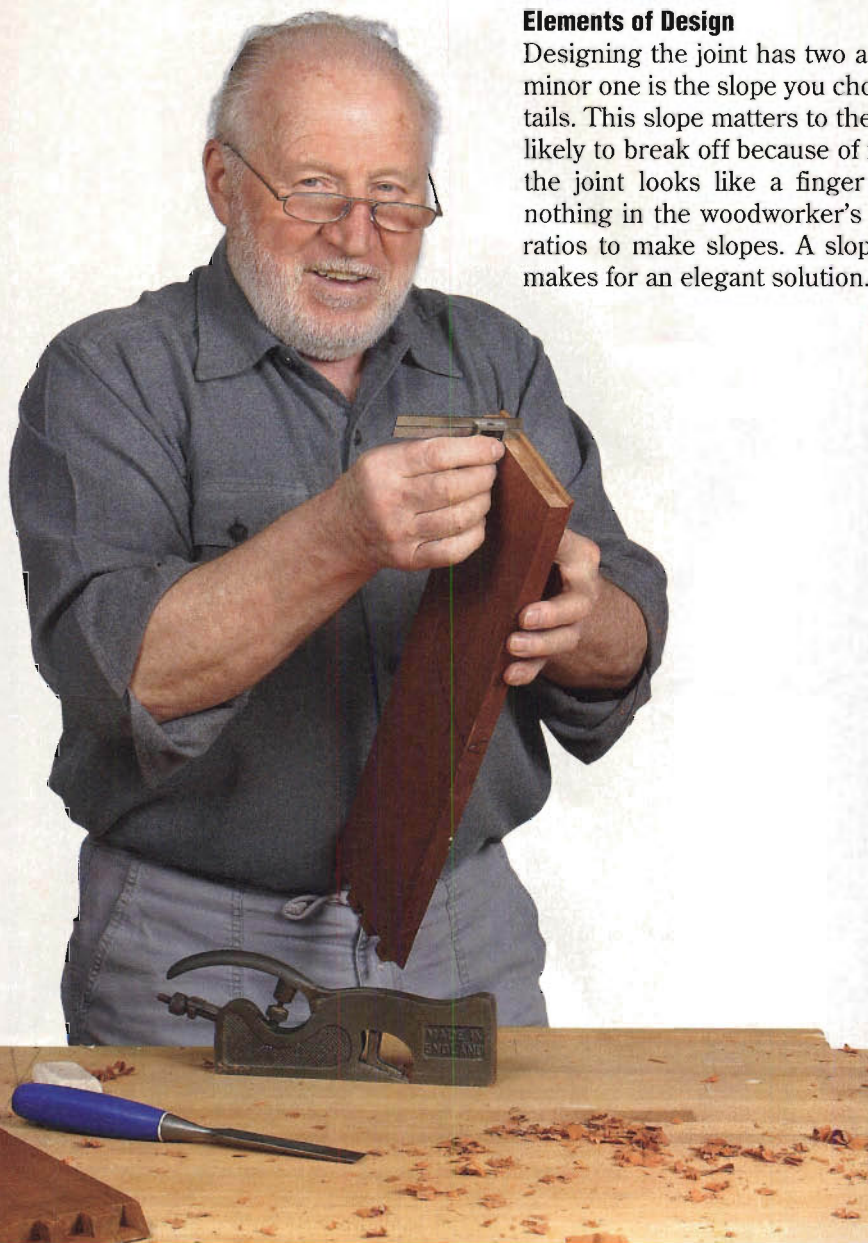
Few aspects of woodworking evoke as much emotion as the dovetail joint. The through or common dovetail in particular is seen to indicate some higher form of workmanship, some superior form of furniture detail. My friend Frank Klausz, who delights in showing how to make dovetail joints in a few minutes, tells us that in his early life in Eastern Europe it was the way to make packing cases. You can't get more common than that! It also underscores that it truly isn't a difficult joint to make and it doesn't take long to make it. Having described in earlier articles through and single-lap dovetail joinery, I would like to focus now on the design of the joint because that's what really matters. An ugly dovetail joint, no matter how well-made, is still ugly. Later I will show how to make a secret miter dovetail.

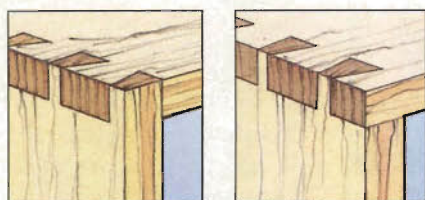
Elements of Design

Designing the joint has two aspects: one minor and one major. The minor one is the slope you choose for the interface between pins and tails. This slope matters to the tail, too much slope and the corner is likely to break off because of fragile short grain. Too little slope and the joint looks like a finger joint gone wrong. Because there is nothing in the woodworker's tool kit graduated in degrees, we use ratios to make slopes. A slope of somewhere between 1:4 and 1:5 makes for an elegant solution.



“Too much slope and the corner is likely to break off because of fragile short grain. Too little slope and the joint looks like a finger joint gone wrong.”





Half pin on outer edge.

Half tail on outer edge.



Half pin on outer edge, with mitered corner.

Half tail on outer edge, with mitered corner.

The lines of the outer edges of the joint are affected by four corner options. Starting with a half pin is more attractive, but there is no technical reason to prefer this option over a half tail. A mitered corner unifies the sides and top.

The major aspect of the design is the layout, the relative size of pins and tails. Over time, woodworkers have come to accept the following layout principles. Tails are made bigger than pins. The tails go on the longer side of a rectangular case: on the front if it's a chest, on the top if it's a sideboard.

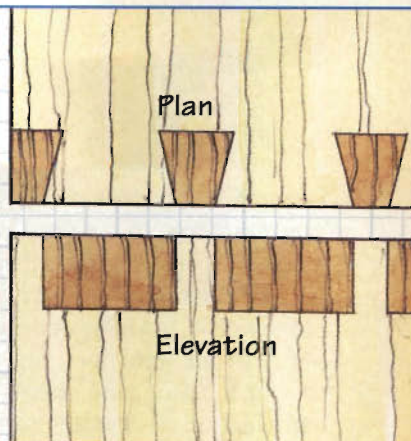
Some of the most elegant single-lap dovetails ever made graced drawers during the late 1700s and just after the time of Chippendale. The pins were so fine that when cutting the tails the maker started the second cut of the pin socket by entering the saw into the first cut. In some of these drawers the ratio of tail wood to pin wood was about 19 to 1. That they rarely broke is worth considering when discussing the strength of this joint.

Design Details

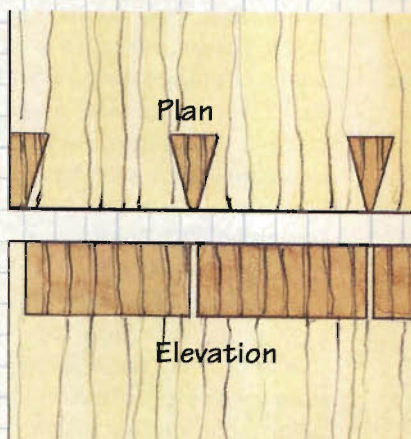
Although we laud the dovetail joint, the reality is that it's a design detail in terms of furniture. It is only seen at close quarters and it has nothing to do with the general form or the proportions of the piece and its parts, which are the primary design elements. Nevertheless, it's a detail that can be designed well or poorly. I'm not referring here to its execution — tightness of shoulders and faces — getting execution right is a matter of practice. I'm talking about the pattern value that we create on the row of end grains and shapes when we design the joint.

The end grain is always more dominant than side grain because of the structural nature of wood and because it soaks up more finish, becoming darker.

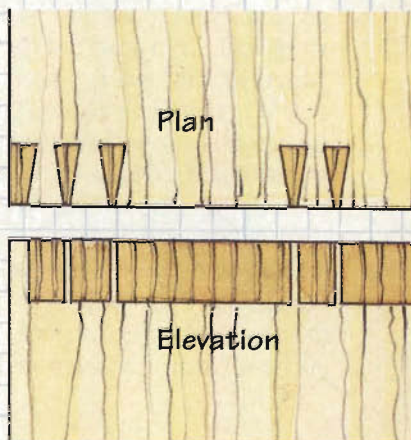
This layout creates a boring pattern because the visual weight of each end grain of the pins between the end grain of the tails is less refined than that on the layout below because the pins are so large.



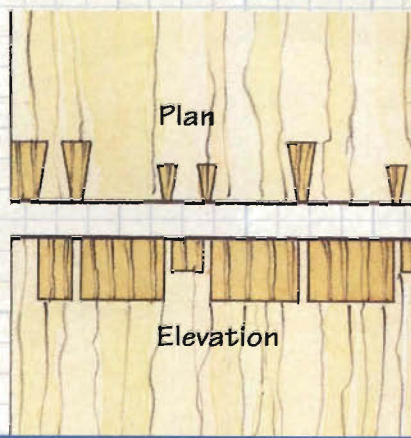
In this layout, we see the tails more powerfully as an entity in plan, and the pins take on a finesse because they are smaller. The band of end grain on the elevation is pierced by fine lines which emphasize the delicacy of the pins. In both instances the pattern is repetitious end to end. We don't have to follow this formula.



In this layout, the two small outer tails add variety and visual weight at each end. They also create five glue lines very close to the outer edges. This prevents the edges from curling up and, if used on a large structure, resists the stress of lifting usually applied in that area. The tail between the twin pins is the same size as the outer tails, lending a strong sense of continuity when seen in elevation.



Probably the most dramatic version of the through joint is the hound's tooth dovetail. This layout has small tails and pins sitting between larger ones.



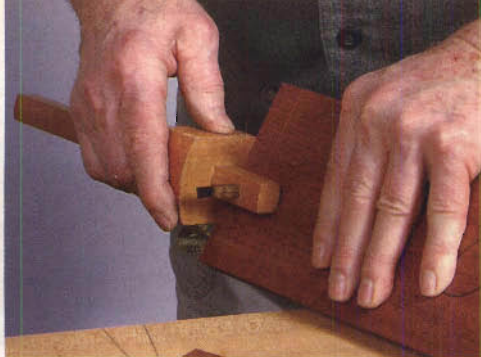
Strength of Dovetails

The joint has to be very poorly made or poorly designed not to resist considerable stress: in other words, it's inherently strong because of interlocking parts that are also glue faces. The combination of layout design and accuracy of fit affect strength, and given that you control both of these things, strength is not an issue. Furthermore, dovetailed cases are subjected to far less stress than mortise-and-tenon joints on tables and chairs.

Designing With Confidence

If you are setting off to make a piece of work using dovetails, say, a blanket chest or a hand-made drawer, then spend some time drawing different layouts before committing to the work. Draw them full-size and as accurately as possible, as if you were making a working drawing, which in the end is what you've got. Whatever you do, don't set off to make four rows of dovetails and think that it's OK to lay them out directly on the wood: you sell yourself short that way.

Start with the joint at the outer edges, which requires some design decisions. You can begin and end with a half pin or a half

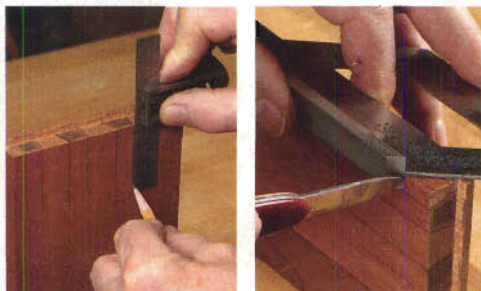


Knife the shoulder and rabbet lines with a cutting gauge — two settings produce a total of six lines.



Chamfer the end of the rabbet with a chisel (above) to prevent

breakout when planing. Then cut your rabbets with a shoulder plane, as demonstrated above.

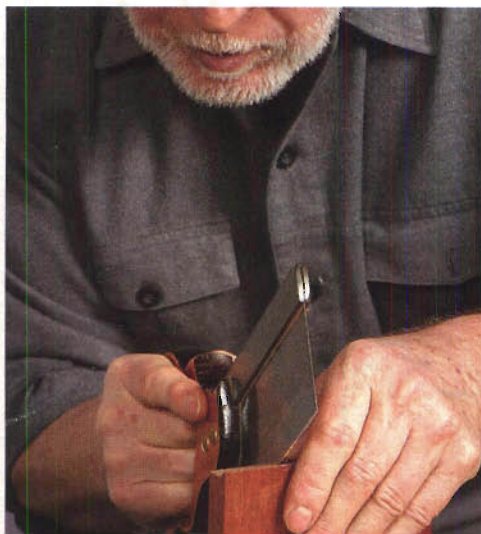


Mark out the pins.

Mark the corner miter.



Chamfer the miter end with a chisel, as shown above, to prevent breakout when planing. Then you can remove most of the miter waste with a shoulder plane, as shown at right.



tail. You can miter the corners or leave them with square shoulders. All of these possibilities are illustrated at the top of page 53.

A Hidden Argument

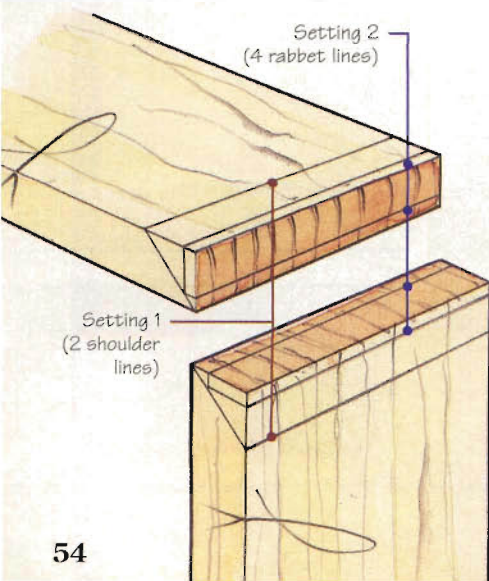
Making a dovetail which is hidden probably seems odd to a woodworker who is struggling to make the through joint. For the sake of completeness I'm bound to include the two hidden joints as part of the handmade and solid wood basic inventory of methods and making handed down to us. There are circumstances when a through joint detracts from the design of a piece or the exotic wood used to make it. The benefit of dry position holding as the piece is being made is an advantage, and the permanence of the glued joint is undeniable.

Making a Secret Miter Dovetail

If you have made a single-lap dovetail — the one typically used on a drawer front — (*Woodworker's Journal*, June 2003) then you have learned the necessary sawing and chiselling skills to make a secret miter dovetail. As I've explained earlier, this joint is normally used when you are working with highly figured or colorful wood so as not to compete with its beauty. However, for the sake of clear photographs, I used Honduras mahogany. For your first attempt,

Saw the pins. Be sure to first establish the line across the end grain, then saw down the vertical line.

In the drawing at left, you can see all gauge lines marked, plus miter. You make six cutting gauge lines with two gauge settings. Pin and tail pieces are flipped from normal assembly position to make gauge lines visible.



so should you. These are the dimensions of the pieces I used: $4\frac{3}{4}$ " x 11/16" x 18".

Marking Out

Begin the joint by making a rabbet at the end of each piece. The marking out is done with two gauge settings.

First, set the cutting gauge to the thickness of the wood. Knife the shoulder lines on the inside faces — the face sides. Knife around the corner on the edge, about one-quarter of the way across. Next, set the gauge to $3/16$ " and knife the lines that will define the rabbet.

Cutting the Rabbets

I use a shoulder plane. You could use a router or a table saw for this operation, but you still have to use a shoulder plane to complete the miter once the joints are cut.

Laying Out the Joint

The secret miter joint cannot be made tails first like the three other dovetail joints. Why it must be made pins first will become obvious further into the exercise.

Marking the Pins

There is no need to vary the pin and tail size as we do on a through joint. The joint is easier to make if tails and pins are about the same size. What you do have to do is decide how many glue lines you want for the job in hand to be strong enough.

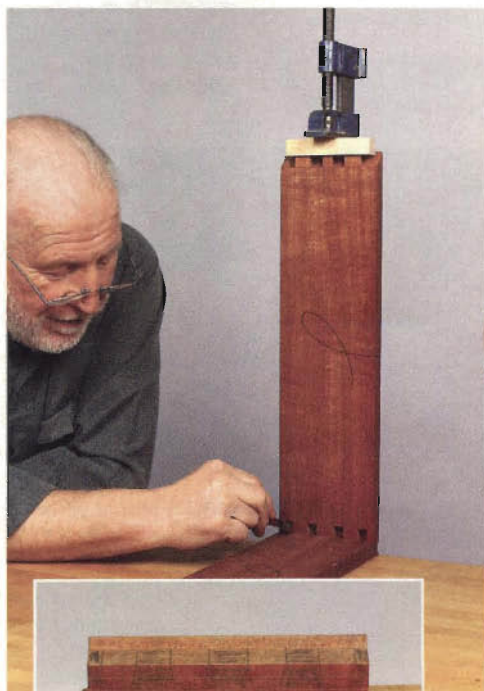
I mark the corner miter after laying out the joint. It could be done earlier, when the gauge lines



Left, chop across the grain up to $1/16$ " of shoulder line to remove what comes easily. Then (right), chop slivers down the grain to $1/16$ " of the rabbet line — no fallout.



Return the work to the bench and chop carefully into the corner of the socket to clean out the bulk waste.



Clamp the parts (above) to position the pins and mark out the tails. Mark the pin sockets (inset) for clarity. Saw on the waste side of the line. Then saw the tails, blowing sawdust from the kerf as you go, as shown at right.

are cut. It's your call. Before sawing the joint, cut most — but not all — of the end miter with chisel and shoulder plane. The unfinished miter serves two purposes: as a reference stopping you from over-sawing the joints; as a land for the chisel when paring the end walls of the sockets.

Sawing the Pins

The saw cut is similar to any of the closed socket cuts you make in dovetailing. Saw across the end grain and establish that line, then saw down the vertical line. Divide and conquer. The trick to making a clean kerf is to keep the saw in the end grain kerf as you saw down the vertical line.

The photo at the bottom of the previous page shows how I let the saw just touch the unfinished miter.

Chiseling Out the Waste

Cleaning out the closed sockets is the same for tails and pins. Lay the workpiece on the bench and chop across the grain in small bites to within 1/16" of the shoulder line. Put the workpiece upright in the vise and chop with small bites to 1/16" of the wall.

Return the work to the bench and clean out the bulk waste by chopping carefully into the corner of the socket. Then clean out the socket by using the sawn faces as a guide. First cut the end grain fibers using a skew chisel; otherwise, the waste on the socket end wall won't come free. Note that to clean up the socket I use a chisel that's narrower than the pin is high. This gives a much better read on the plane the chisel must follow.

Clean out the waste from the end wall by vertically paring with the work in the vise. The edge of the workpiece is aligned with a clear pencil line marked on the bench. That line is at parallel and perpendicular to the extension bar on the Record® vise. When the workpiece is set against the bar and aligned with the pencil line, it's held vertically.

Check your chisel work for square in both planes and, when you're satisfied, that's the first part done.

Marking the Tails from the Pins

The next task, marking the tails from the pins, requires a new technique. No matter how large or small the case that you're making, the two parts must be held in place by clamping because it's impossible to hold them by hand. I clamped the two parts to the bench. Another way is to clamp the tail piece to the bench with two C-clamps, leaving the joint projecting from the bench about



Clamp the pin piece in the vise and sever the corner end grain fibers with a skew chisel.



Continue the socket cleanup with a chisel narrower than the height of the pin so you can see the sawn pin face that guides your cut. Clean up the end wall by vertical paring, using the rabbet as a guide.



Check the back wall cut for parallel: press a chisel against the wall and check against a straightedge.



Check bottom of socket (left) for square. Tail sockets (below), cleaned out by careful chisel work, are ready to mark out the tails.



three inches. Then clamp the pin piece to it — it's your choice.

Whichever way you do it, if the other end is already jointed, use a clamping block big enough to avoid damaging the mitered end. Marking is best done with a sharp soft pencil. On most woods a knife line just fades into the grain. A pencil leaves a clearly defined line on the side you have to cut to. To avoid error, identify which areas must be removed. Another aid is to lay the completed pin piece in front of you as you cut the tail piece.

Sawing and Chiseling the Tails

Remove the waste and check for accuracy as you did earlier for the pin piece.

Once the pins and tails are completed, the next job is to cut the corner miters. Saw just shy of the knife line and chisel to clean up. Put the parts in the vise to chisel. The tail is straight forward. Use a chisel that's a bit less than the length of the miter so you can better see what you're doing.

The pin piece obliges you to chisel into a void. I chisel about 1/16" down to establish the miter, then put the piece in the vise at 45° and use the small land as a guide to complete it.

You can now put the joint together to check and adjust the fit.

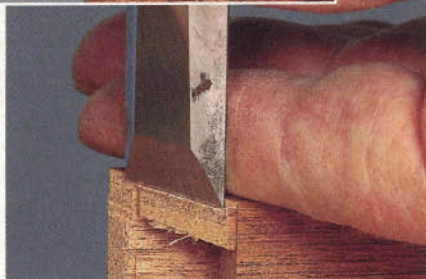
Separate the two parts and clean up the miter with a shoulder plane. Close the joint one more time and there you have it, your first secret miter joint!

Machine-made Dovetail Joints

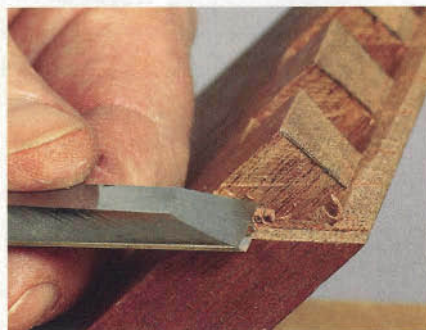
The first dovetail machine I used was a thorough going industrial gem made by Brookman, an English company in a small village called Rothly.



Saw the miter but leave the knife line.



Cut the open socket miter about 1/8" deep by vertical paring.



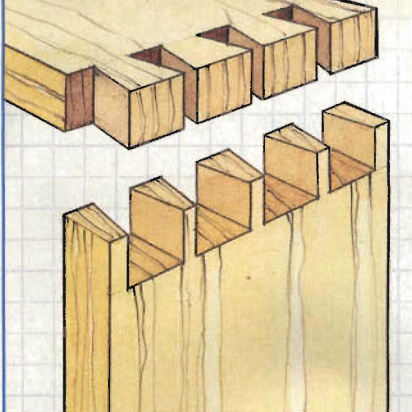
Clamp the workpiece in the vise at 45° and pare to finish, using the land from the vertical cut.



Assemble the joint. Over-tight areas will show themselves by crushed tissue. Adjustments can be made to these areas after the joint is parted (using a protection piece).

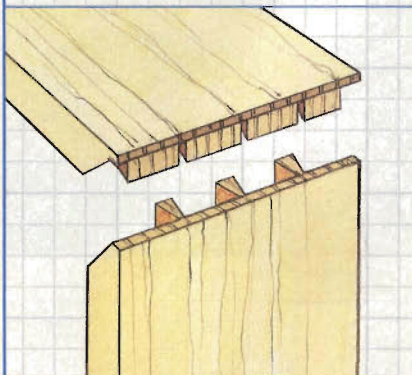


Cut the miter to size using a shoulder plane (left), then close the joint and enjoy.



Through Dovetail

More than any other joint, the through dovetail leaves nothing unsaid. The interfaces between the long grains and end grains demonstrate the hand skill of the maker, and the layout demonstrates the design skill. It's usually the first dovetail joint you learn to make, but it should be viewed as just one of the family — no more or less a star than the other three.



Double-lap Dovetail

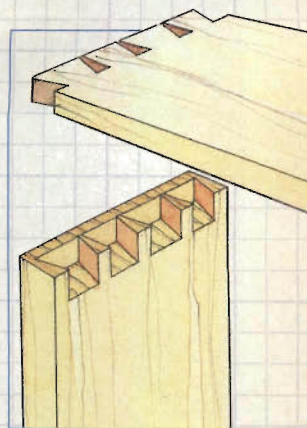
Only a thin strip of end grain announces that the double-lap dovetail is hidden inside. It's a bit easier and quicker to make than the secret miter dovetail. It was mostly used on larger cases, such as sideboards or chests, rather than smaller cases, such as jewelry boxes and knee desks. When the end grain is molded with a scratch stock along with the long grain edges, the resulting shadow lines subtly define the architecture of the piece.

The Dovetail Family

Single-lap Dovetail

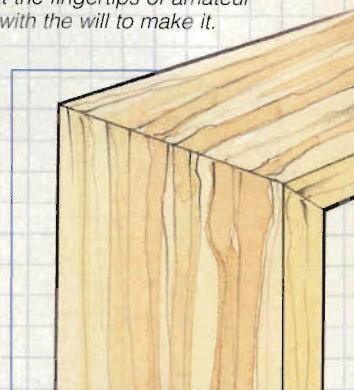
The single-lap is the best known of the dovetails since it's used to join the front to the sides of a drawer.

Whether the drawer is housed in a veneered or solid wood case, opening it reveals the pedigree of the piece. At its best, if it's a hand-made drawer, the feel and sound of its opening is the prelude to enjoying the refinement of the thin drawer sides, the choice of wood, and the elegance of the single-lap dovetail joints. It's an experience no longer available from the furniture industry, being too expensive for all but the few of discerning taste and limitless budget, and at the fingertips of amateur woodworkers with the will to make it.



Secret Miter Dovetail

Some woods that hand-makers are privy to are simply so beautiful or so striking that a row of through dovetails, no matter how elegant, detract from the piece rather than enhance it. Similarly, some cases can be made so refined in their proportions that their quiet sophistication would be destroyed by a through joint. Or the wood may be so dark that the pattern value of pins and tails is scarcely visible.



In recent years routers and dovetail jigs have become commonplace. There is no argument that they work: the smooth, tight mating faces produce ideal gluing conditions. Of the two design aspects I've explained, one of them, the slope, is a function of the router bit. It's pretty much the slope we use in hand cutting. Most jigs have no provision for varying the layout. Of the ones that do, the pin socket

size is controlled by the size of the router bit, the smallest of which is a bit bigger than the socket that can be made by hand. So on technical grounds the jig is first-rate; on aesthetic grounds it falls flat.

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



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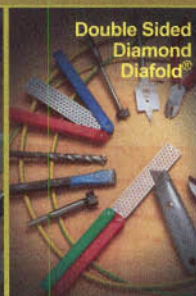
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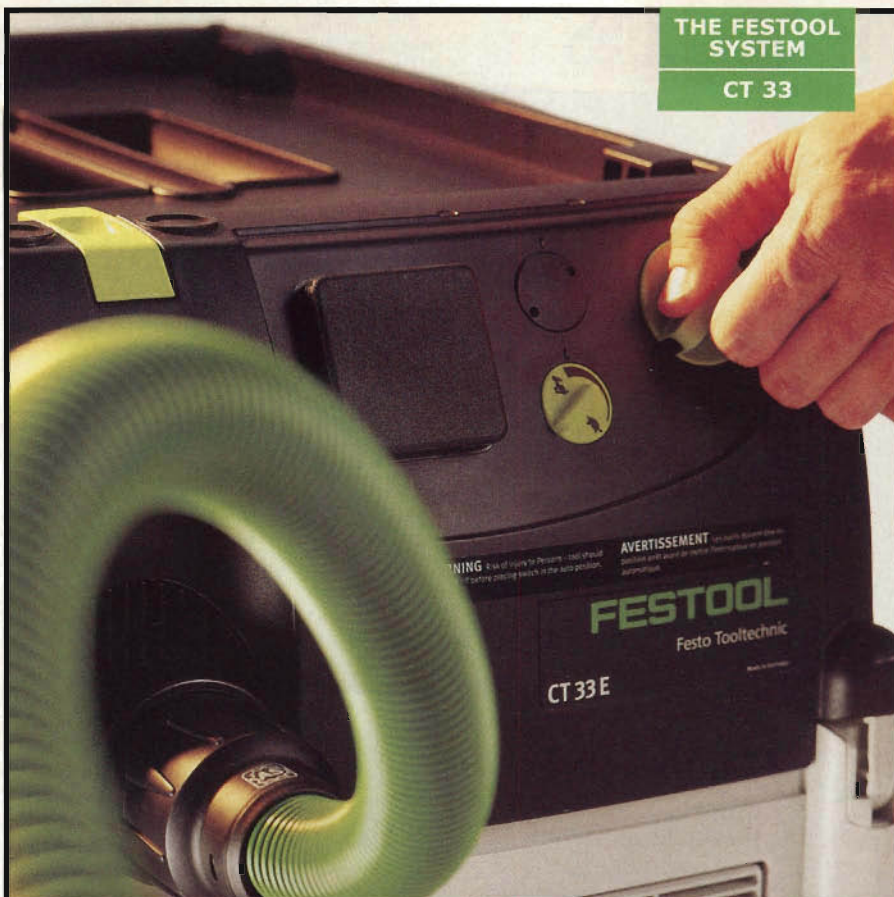
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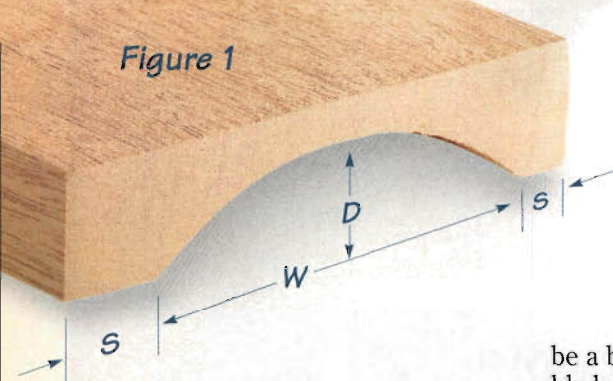
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Two Easy Ways to Calculate Cove Cuts

By Len Urban

Figure 1



Using formulas to determine blade height and fence angles is easy in the computer age. Try one of these mathematically sound techniques for accurately cutting coves on your table saw.

Setting the fence angle for cutting a cove on a table saw can be somewhat of a hit-or-miss proposition. The following method eliminates most of the mathematics involved, yet results in an accurate and predictable shape.

Start off by sketching out the cove molding that you wish to make. Determine the cove width (W) and depth (D), and if you want it to have shoulders (S), mitered edges, etc. Rip sufficient stock to create the molding you are making (with just a bit extra for testing). Now you are ready to go to work.

Slot Length = Blade Height

The first measurement you need for the process is the blade height, because it creates the depth (D) of your cove cut. As an alternative to measuring the blade height from the tabletop — which can

be a bit tricky — you can raise the blade until you reach the pre-determined length of the blade slot. Since the slot length is longer than the blade is high and is easier to measure, it is the more accurate method. (Slot length, for our purposes, is the kerf left in a piece of hardboard by a 10" saw blade, as demonstrated in the photo below.) Slot length can be calculated using this formula:

$$2 \times \sqrt{25 - (5-D)^2}$$

A calculator with a square root function will get you the measurement you need, or you can put the whole thing into a spreadsheet. If you use that approach, the formula bar in cell B2 should read:

$$=2*SQRT(25-SUMSQ(5-A2))$$

When you enter the desired cove depth into cell A2, the slot length will appear in cell B2. Remember, you'll get an answer with a decimal that you'll need to convert into a fraction. Clamp a piece of 1/4" hardboard or plywood to the top of your table saw and slowly raise the blade until it creates the desired slot length, then turn off the saw and lower the blade.

Finding the Fence Angle

Next, set a compass to the width of the cove ("W" in Figure 1). Locate the pointed leg of the

Figure 2. After you have created the proper slot length in the plywood, set a compass to the width of the desired cove and strike an arc, as shown below.



With the fence angles determined, and the shoulder width accommodated, begin the task of nibbling out the cove. Multiple passes are required. As always, be sure to use proper safety equipment and techniques.



compass as close as you can to the lower right edge of the slot and draw an arc to the left of the slot, as shown in Figure 2. Then draw a straight line (AB) from the left edge at the top of the slot, tangent to the arc (point C), as shown in Figure 3. Next, draw a line (DE) parallel to AB (see Figure 4) at a distance equal to the width of the appropriate shoulder of the cove ("S" in Figure 1).

Now, clamp a fence to the top of the hardboard with the face along line DE. I like to clamp a second fence to the table to create a "shoot" to help guide both edges of the molding. Use the pre-ripped molding stock to locate the

second fence. To cut the cove, raise the blade so that it just protrudes above the hardboard and pass the workpiece over the saw blade, using the fence as a guide.

The workpiece must be firmly pressed against the fence. Raise the blade a small amount and repeat the process. When you have raised the blade to the pre-cut slot length, the process is complete and the width of the cove will be equal to "W" and the depth will be dead on.

Safety is always a concern when using the table saw, especially in this case, since a blade guard cannot be used. The proper use of push blocks or push sticks is a must. Happy calculating!

Len Urban is a woodworker from Rancho Mirage, California. His sandpaper caddy was featured in the October 2002 Woodworker's Journal.

Figure 3. The next step is to draw a straight line (AB) from the left edge at the top of the slot, tangent to the arc (point C).

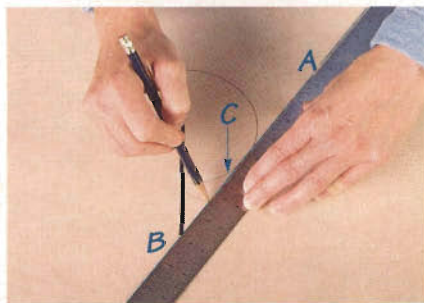
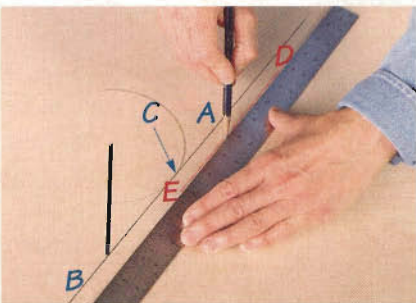


Figure 4. Finish by drawing a line (DE) parallel to AB at a distance equal to the width of one of the shoulders of the cove, "S" in Figure 1.



To make a 2" wide cove that is 3/8" deep, use a fence angle of 31.75°.

Fun with Formulas: Woodworking with Microsoft® Excel

There is more than one method to accomplish almost any woodworking task. When I began my cove cutting quest, my first thought was that all I would need was an easy way to calculate the fence angles which would accommodate my various cove requirements. After some head scratching and reviewing some — by now — very old math books, I came up with an equation. I then turned to my trusty computer, equipped with a spreadsheet program, for help. I entered the following formula into cell C2 of an Excel spreadsheet (see chart):

=ASIN(B2/(2*SQRT(25-((5-A2)^2))))*180/3.14159

As soon as you enter the depth of the cove into cell A2 and the width of the cove into B2, the correct fence angle magically appears in cell C2.

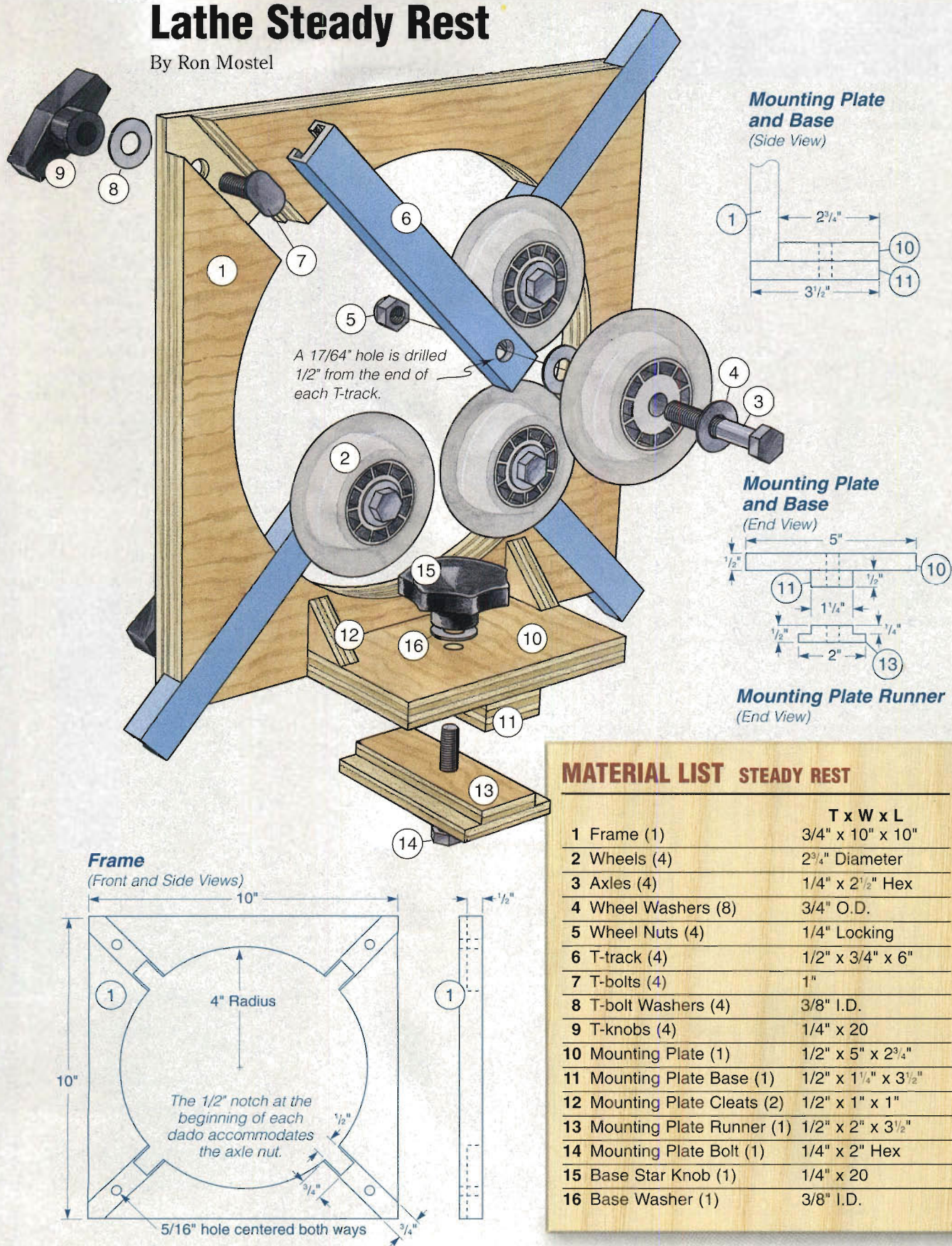
While this fence angle is just the beginning of the process, it is a very good start!

If you receive a "#NUM!" error in the fence angle cell ... you've entered data that does not allow for a fence angle that will cut a cove. Adjust one or both of your dimensions.

	A	B	C
	Cove Depth (inches)	Cove Width (inches)	Fence Angle (degrees)
1			15.258889259
2	0.375	1.0	13.262687210
3	0.500	1.0	10.942965927
4	0.750	1.0	9.594076330
5	1.000	1.0	23.25171338
6	0.375	1.5	20.12832328
7	0.500	1.5	16.54376396
8	0.750	1.5	14.4775244
9	1.000	1.5	31.7599611
10	0.375	2.0	27.3117529
11	0.500	2.0	22.3128407
12	0.750	2.0	19.4712370
13	1.000	2.0	41.1438781
14	0.375	2.5	34.997434
15	0.500	2.5	28.331966
16	0.750	2.5	24.624339
17	1.000	2.5	52.142777

Lathe Steady Rest

By Ron Mostel



We really started something when we featured Ellis Hein and his inside-out turnings in our April 2002 issue. Turners across the country are firing up their lathes, and among them is Ron Mostel of the Western New York Woodturners Club. Ron added a new twist when he introduced this innovative steady rest.

It didn't take me long to discover that my JET mini lathe needed a little help turning inside-out vases. The problem was that, when it came to drilling and forming the neck opening, I needed to remove the tailstock. With the vase now only supported at the headstock, it was impossible to work. So, with the help of fellow turners Paul Mazchowski and Elmer Baumer, I came up with the idea of using T-track and inline skate wheels to create the steady rest jig shown here.

Construction

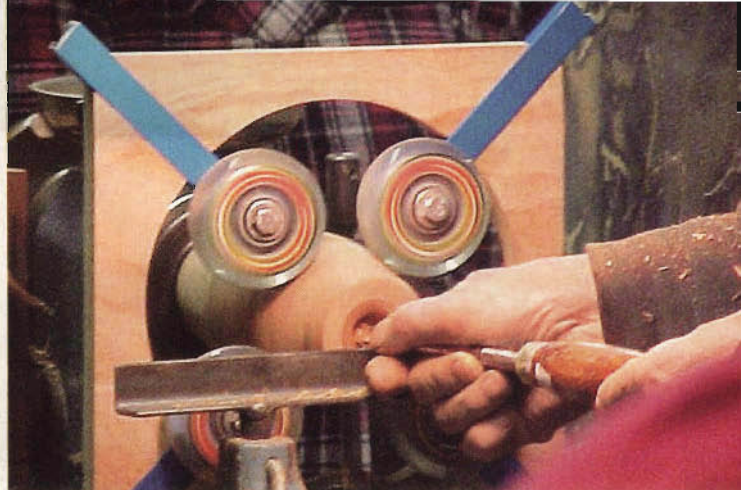
Begin by cutting a piece of plywood to size for the frame (piece 1). Mill two diagonal dados in one face, then lay out the circle on the frame and cut it out with your saber saw. Sand the edges with a drum sander chucked into the drill press, and form the small notch for each wheel nut to slide into, as shown in the *Drawing* at lower left.

Slide the wheels (pieces 2) onto their axles (pieces 3) with a washer (piece 4) located between each wheel and bolt head. Slide a second washer onto each axle, so you have one on either side of the wheel. Keep them in place temporarily with the wheel nuts (pieces 5).

Cut the T-track (pieces 6) to length and gently sand each end to remove any burrs. Drill a 17/64" hole located 1/2" from one end of each T-track. Remove the nut and slide each axle into a hole. Secure each axle with a washer and locking nut, noting that the nut is on the open side of the T-track.

Installing The T-tracks

The diagonal dados in the jig are milled to accept standard T-track. To install it, begin by drilling a 5/16" hole in each dado, centering it both side-to-side and along the length of the dado. Slip a T-bolt (piece 7) into each hole so that the large head of the T-bolt lies in the



The steady rest allows a vase to be chucked and comfortably supported while the inside of the neck is being shaped.

dado. On the other side of the base plate, slide a T-bolt washer (piece 8) onto the protruding threads of each bolt, then screw the knob in place with a couple of turns. Push the knob in to raise the T-bolt's head in the dado, and slide the track into the dado, catching the bolt head as you do.

Mounting the Jig On Your Lathe

No two lathes are alike, so the mount for your jig may have to be customized. A good starting place is to create a mounting plate (pieces 10 and 11) at a right angle to the face of the jig. These pieces are cut to size, glued together, and glued in place. Glue a couple of triangular cleats (pieces 12) in place and then move on to creating the rest of your base (pieces 13 through 16), which will vary with the type of lathe you own.

To size your mounting and locate the jig correctly, chuck a piece of straight dowel or steel pipe between the centers, slipping it through the jig as you do. Then you can adjust the wheels so they are centered and locked on the dowel. The jig is now located properly, and you can measure for your custom mounting device.

Safety Tip

After I've mounted a workpiece in the jig and the wheels have been drawn up to ride freely and lock in place, the first thing I do is install a chuck on the tailstock. I prefer to use a Forstner bit to core out the neck, rather than a gouge. It's safer and smoother.

For more on Ellis Hein's inside-out turning technique, visit www.woodturnedart.vcn.com or see our April 2002 issue. For more information on Ron Mostel's turning club, visit them online at www.wnywoodturners.com.

Here's an example of an inside-out turning made by Ron Mostel. Ron has experimented with various materials using his steady rest, including Corian®.



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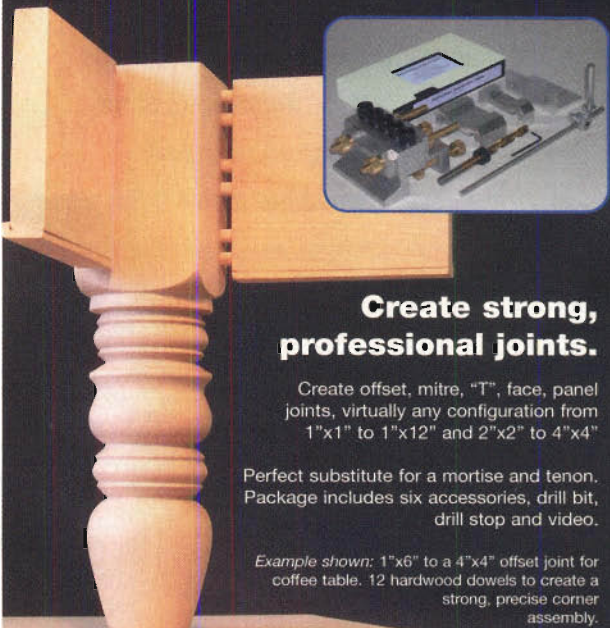
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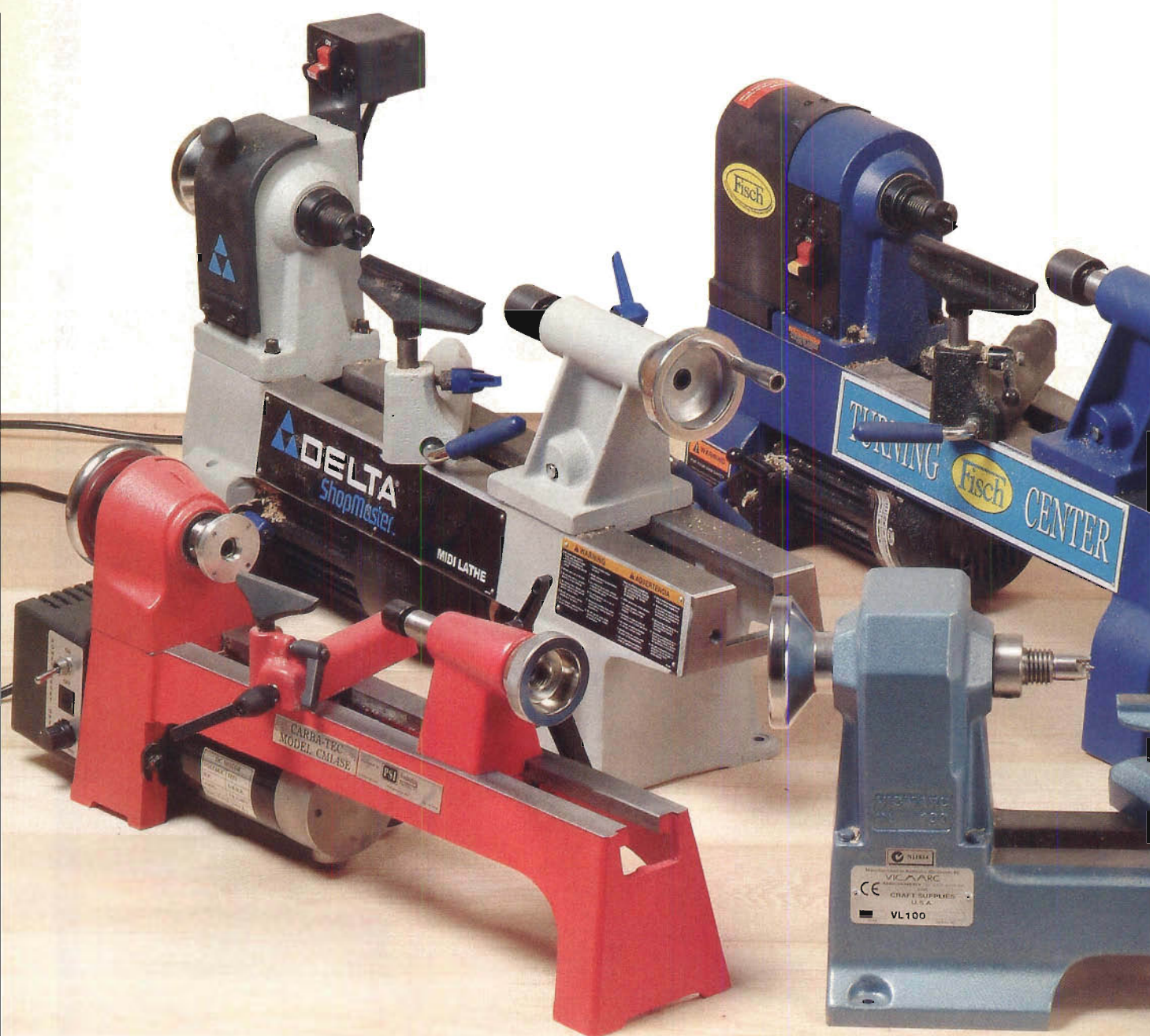
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Small Lathes Are Growing Up

By Steve Blenk

A lathe has always been one of the “I want” items on a woodworker’s wish list. But a full-size machine is a hefty investment in money and precious shop space. Add in the cost of chisels, chucks and other sundries, and it can quickly become too expensive for many would-be occasional turners.



As turning has grown in popularity over the last decade, manufacturers have responded by creating a whole new class of machines. Dubbed “mini lathes” by turners, some of these small machines are surprisingly capable critters. Many are priced to sell as entry-level tools, and yet are well designed. They are, of course,

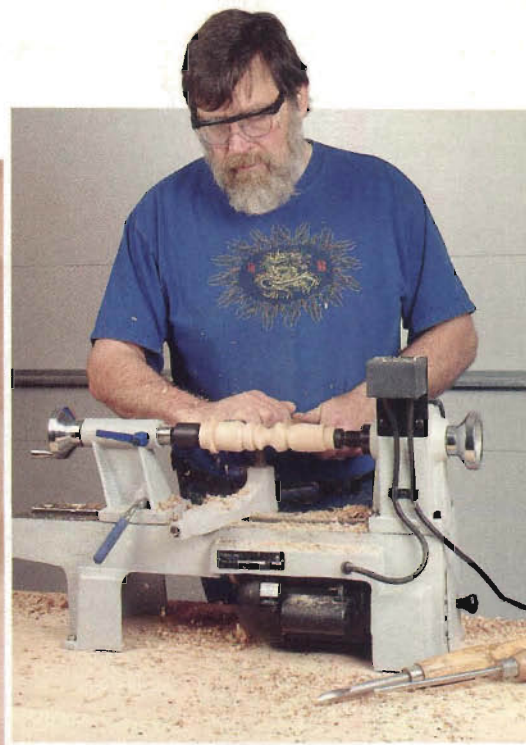
limited by such factors as bed length, swing diameter, speeds and horsepower. But within these limits, they can do a good job.

Their advantages are apparent: they are low cost, they require little space, and they can do many of the jobs for which their big brothers are designed. They are also, to some degree, portable, for demos and the like. They're particularly attractive if you're a beginner wanting to turn smaller projects like pens, bottle stoppers or small vessels. To a full-time turner like me, the idea of being able to keep

an entire lathe in a cabinet or under a bench is still pretty novel! (I guess it appeals to me the way owning a chihuahua might to some folks!)

Now, if you're planning on making four-poster beds for the entire family, this is NOT the way to go. There are bed extensions available for many models, and you can do the occasional 40" turning. However, little lathes lack the muscle for a steady diet of furniture turning. Likewise, trying a lot of bowl turning on these small machines would quickly become frustrating due to limited horsepower, speeds and swing. But for the occasional small vessel or

Tool Review continues on page 70 ...



The author gives Delta's lathe a test drive. There are mini lathes on the market designed for beginners, hobbyists and pros. If you're tight on shop space, specialize in miniatures, or just want to have fun doing small turning projects, a mini may be right for you.

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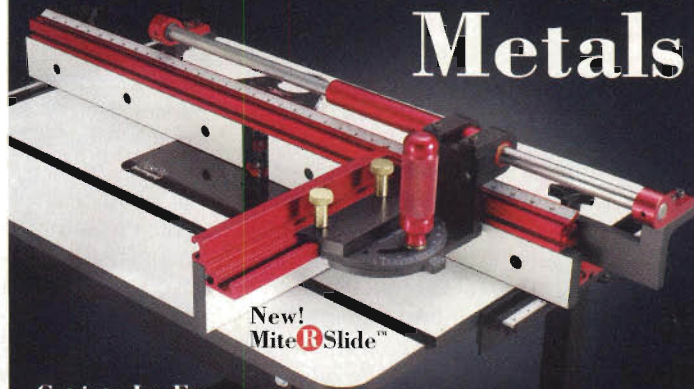


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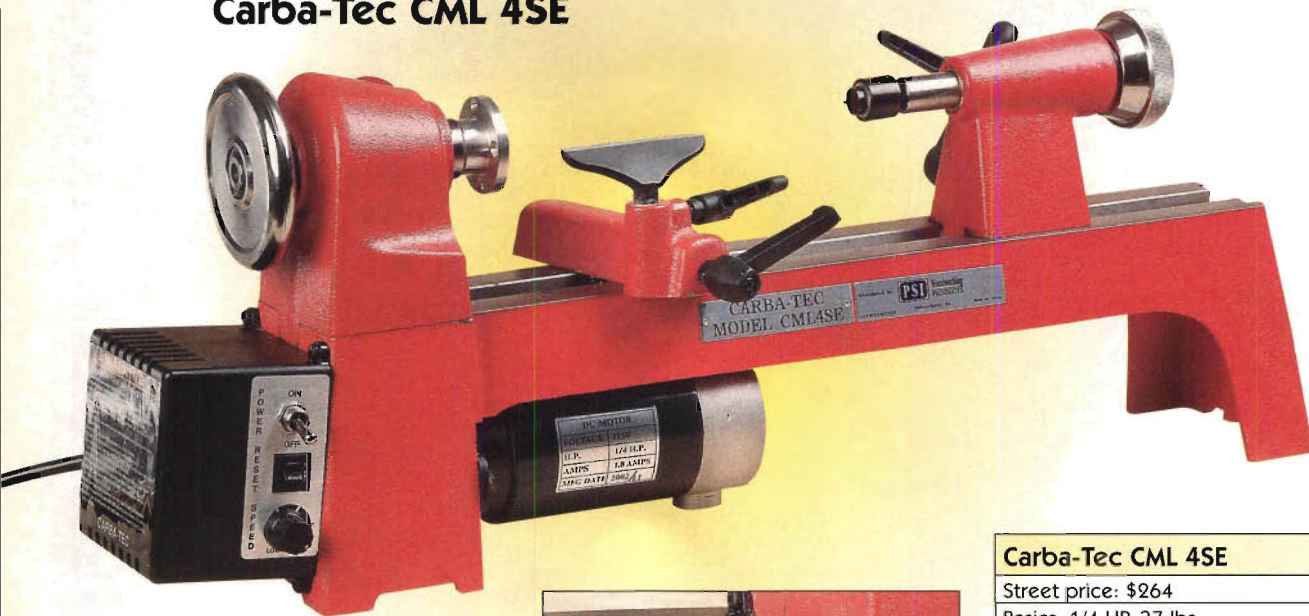
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Carba-Tec CML 4SE



box, they are just fine. And with good wood becoming increasingly expensive, smaller projects are becoming more attractive, even to pros. A mini lathe may be just the ticket for turning some of your scrap into cash. Miniaturists will love these machines, and the very high speed ranges (3,000 rpm plus) incorporated into their design are perfect for tiny work.

For this test, I rounded up "the usual suspects," and some newcomers as well. Included are machines from Carba-Tec, Delta, Fisch, JET, Oneway™, and VicMarc [note; listing is alphabetical ... no favorites yet]. All arrived in good shape, and all but one was in what I'd call "plug 'n play" condition.

Just open the box, bolt the lathe to a benchtop, and plug it in. Three of the lathes required switches or controls be mounted, but this was a minor matter of a screw or two. All but the Oneway are cast-iron machines. Oneway's lathe is heavy-duty steel welded to a rigid steel tube with multiple gussets and is, if anything, more solid than the cast-iron machines. All were ready to use in short order except the VicMarc, which arrived in its econo version without a motor and



Carba-Tec's electronic D.C. variable speed is a nice feature, but the 1/4 HP motor lacks the power for all but small spindle work.

required real setup time and a bench to be built for it with motor mounting below. This machine is also available in a version with motor and cabinet.

The Carba-Tec Lathe

The Carba-Tec lathe is perfect for the miniaturist, hobbyist or perhaps someone making only pens. I tested this machine some years back, and not much has changed. It has the smallest drive spindle of the bunch at 3/4" diameter x 16 threads per inch, and has only a #1 Morse taper head and tailstock. The single included tool rest is small, about 3". The motor is on the light side as well, at only 1/4 HP, bogging down quickly on

Carba-Tec CML 4SE

Street price: \$264

Basics: 1/4 HP, 37 lbs.

Swing: 6" over bed, 3 3/4" over rest

Dist. between centers: 12 1/2"

Headstock: 3/4" x 16 tpi #1 Morse taper

Tailstock: #1 Morse taper, hollow

Speeds: variable, 400 - 4,000 rpm

Phone: 800-377-7297 (distributor)

www.carbatec.com.au

larger diameter test cuts. Power is transferred to the spindle by a small single V-belt. The electronic variable speed DC drive is nice, allowing you to dial up a good cut. Changing speed ranges (there are two) is clumsy, requiring an Allen key to open the headstock port and a wrench to loosen the motor mount. The supplied faceplate is lightweight aluminum, and its longevity would be doubtful as there was already evidence of the threads dragging off. This said, the machine performed well enough on small diameter (under 1") spindles, and it would be a good choice for a hobbyist or model builder. A spur center, a good live center with two separate points and required tools are provided, as well as a spare main drive belt (a sinister omen?). There are numerous accessories available for this machine, including a duplicator offered for it by Penn State Industries.

Delta's Midi Machine

Delta's machine is dubbed the "Midi" lathe, meaning that with an optional 23" bed extension or two it can be used to do some full-length turning work. But in its basic form it is really a mini, having a short bed and limited 10" swing. It performed well, and was remarkably vibration-free even at the highest speeds. It is bored for a #2 Morse taper (MT) head and tailstock, and has a 1" x 8 tpi spindle. The machine work is clean, but I was disappointed in the plastic locking handles on the tool rest and tailstock quill. They index, but felt flimsy and were

less substantial than the metal ones on the JET and Fisch machines. I was afraid of possibly stripping them. The tailstock quill's throw was a bit short at 1 1/2" as well. Both JET's and Fisch's are 2 1/4" long. The supplied cast-iron faceplate must be used in conjunction with an included washer to prevent the spindle nose from protruding through the faceplate. The 1/2 HP motor is adequate for a small lathe like this, and did not strain under a heavy cut at 8" diameter in the lower speed ranges. Changing speeds is fairly easy, but the tensioning handle for the motor is

Tool Review continues on page 72 ...



Delta LA-200

Street price: \$319

Basics: 1/2 HP, 85 lbs.

Swing: 10" over bed, 7 1/4" over rest

Dist. between centers: 14"

Headstock: 1" x 8 tpi #2 Morse taper

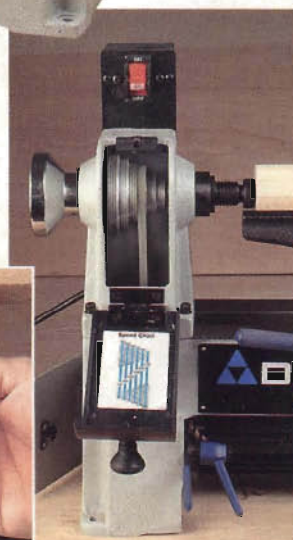
Tailstock: #2 Morse taper, hollow

Speeds: 6 speeds, 500 - 3,700 rpm

Phone: 800-438-2486

www.deltawoodworking.com

Delta's Midi Lathe does the job, but the plastic locking handles may not stand up well to hard use. Changing speeds is fairly easy, but the tensioning handle is awkwardly placed.



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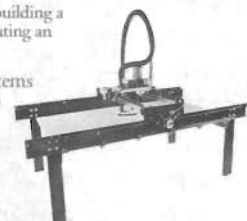
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Oneway: In a class of its own



Oneway Mfg.'s 1018 is in a class all by itself. This is at least partially because it's priced up where the air gets pretty darn thin for a small lathe. At \$995 bare or \$1,500 plus with 1HP motor, variable speed drive and stand, it is the highest priced of all the small lathes.

But, if you want the best you pay for it — and this machine is decidedly the best. As Tim Clay (Oneway owner and design engineer) likes to say, it's not really a mini, it's a full-size professional lathe that was just born small. Essentially a small scale copy of Oneway's very successful full-size machine, it provides three variable speed ranges (0 - 4,000 rpm) and is a real sweetheart to use.

My test model was the "uptown" version, with variable speed A.C. drive and cabinet. The fit and finish are near perfect, the steel surfaces mirror-like. The 1" x 8 tpi spindle has a locking groove for faceplate lock screws, and is bored for a #2 Morse taper. The headstock has 24-point indexing clearly marked and easily accessible to the operator. The controls of the variable speed drive system include dynamic braking and reverse functions and are conveniently placed for use.

Vibration is (literally) non-existent. I turned several small scale and miniature pieces on this machine and then maxed out its 10" swing and tried a hard maple



Oneway's 1018 has electronic variable speed drive, 24-point indexing, and wide poly V-belts. The tailstock quill lock (a knob instead of a lever) is the only negative.

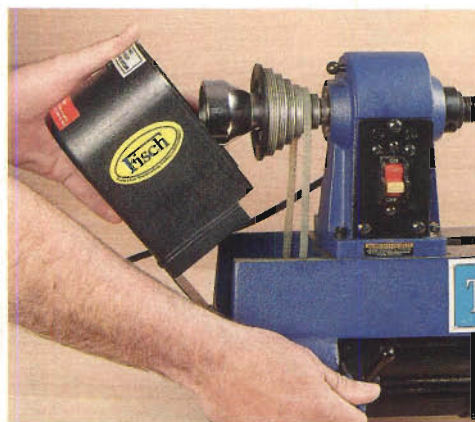
bowl. The drive operated to perfection, and there was no discernible slippage or surging. My only personal dislike (Yep, I had to find one, or I'd be shelling out \$1,500!) was the lock for the tailstock quill. It operates with a knurled brass knob rather than a lever, which makes it harder to achieve the "tight" feel I am used to when the quill is locked. It may be an improvement over the usual setup, as the steel quill is not marred by the brass tip coming in contact with it, and is not over-tightened by musclebound turners like me.

Bed extensions are available, and on this machine I would not hesitate to turn anything that will fit. A very spendy machine, worth every cent.

awkwardly placed on the machine's front surface. Six set speeds cover most needs, and the poly V-belt drive was smooth and free of slippage. The position of the motor below the bed leads to debris buildup, and it should be cleared regularly to prevent overheating. All in all, this is a good solid machine for about \$300.00, with an available 23" bed extension.

Fisch's TC Machine

Fisch's mini, dubbed the TC for turning center, is a nice machine. Positive lockdowns, a chip plate to help keep the motor clear of debris and easier access to the spindle sheaves for belt changes make this little six-speed lathe more user-friendly. I did have a problem with a label peeling off the inside of the plastic belt cover and fouling up the drive belt, but the 1/2 HP motor ate it with good appetite and very little trouble(!). Once cleared of the dead label, the poly V-belt delivered good power. The indexing metal locking handles on this machine had a much more solid feel. Like the Delta, it requires a supplied washer aligned behind the included cast-iron



Belt changes on the Fisch are easier with its swing-away cover, but the cover is thin plastic and may crack easily (mine did). Shown is the newest model, with handwheel.



JET JML-1014

faceplate to keep the 1" x 8 tpi spindle nose from protruding. This machine, which comes with a #2 Morse taper, has a longer (2 1/2") tailstock spindle throw than Delta's. Included is a live center, spur center, and necessary tools. A nice machine for the money, but it, too, has that protruding motor handle in the front. This lathe lists on Fisch's web site for \$329.00

JET JML-1014

Street price: \$319
Basics: 1/2 HP, 72 lbs.
Swing: 10" over bed, 7 1/8" over rest
Dist. between centers: 14"
Headstock: 1" x 8 tpi #2 Morse taper
Tailstock: #2 Morse taper, hollow
Speeds: 6 speeds, 500 - 3,975 rpm
Phone: 800-274-6848
www.jettools.com

JET's Turning Machine

JET's machine is another good bet. Very much like both the Delta and the Fisch (some parts actually interchange on these three ...!), the JET machine also does a good job on small turning work. Indexing metal handles provide positive locks for rest and tailstock quill, but they are smaller than the Fisch handles. (This may be a double-edged sword, as they also get in the way less.) The motor sheaves also



JET's JML-1014 mini, shown above with available bed extension, is "a good machine for about \$300." Changing spindle speeds on the unit is a bit cumbersome, as the access door is on the back of the headstock.



Fisch TC90-100

Street price: \$329
Basics: 1/2 HP, 81 lbs.
Swing: 10" over bed, 7 1/8" over rest
Dist. between centers: 15"
Headstock: 1" x 8 tpi #2 Morse taper
Tailstock: #2 Morse taper, hollow
Speeds: 6 speeds, 500 - 3,700 rpm
Phone: 724-663-9072
www.fisch-woodworking.com

Fisch TC90-100



provide six speed ranges, and the poly V-belt drive gives good, vibration-free power transmission. While the motor is rated at 1/2 HP like the other two, the one on my test model seemed to stall more easily than Delta's or Fisch's motors. But set in the proper speed range, it handled heavy cuts well enough. This motor is also located below the bed and will need to be kept clear of chips. Changing belt speeds is a bit tricky, but gets easier with practice. Be sure to get the poly V-belt on all the grooves! This cast-iron faceplate does not need a washer to fit correctly, but does not have flats for a wrench, either(!). Another good machine for about \$300.00, with an available bed extension.

Tool Review continues on page 74 ...

VicMarc VL100



VicMarc: Made in Australia

VicMarc is the fourth of these very similar machines. From my earlier research, it may well have been the first, and it's still the best. It has grown a bit in size and swing, and now has bed extensions available as well. Made in Australia rather than China, the machine work is cleaner, and the fit and finish generally better than what I found on the Delta, JET or Fisch. Motor power is 1/2 HP on the factory motor version, which I did not test. If you go for the "bare" version, I wouldn't put less than 1/2 HP on this machine, and a 3/4 HP might be better. A variable speed motor system (available from Craft Supplies USA) would really ice the cake. A poly V-belt and motor sheave were supplied, with six speed steps.

This lathe also has a feature the others lack: the headstock has 24-point indexing built in. This allows for some more complex work like spiral layout. It comes with two tool rests, 3" and 6", and a good solid faceplate. A spur center and live center came with my model. Headstock is #2 Morse taper, and spindle is 1" x 8 tpi. Tailstock quill travel is 2 1/2". Changing speeds requires a screwdriver to open the belt cover, which is located on the rear of the headstock (which most turners will leave off after the first encounter!). At \$600, the factory motorized version of this machine

VicMarc VL100

Price: \$329 w/o motor; \$600 with
Basics: (optional 1/2 HP), 55 lbs.
Swing: 10" over bed, 7 1/8" over rest
Dist. between centers: 14"
Headstock: 1" x 8 tpi #2 Morse taper
Tailstock: #2 Morse taper, hollow
Speeds: 6 speeds, 684 - 4,300 rpm
Phone: 800-551-8876
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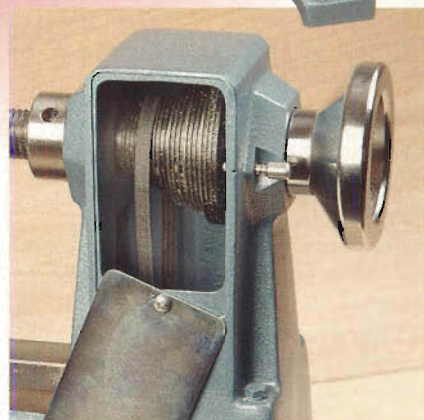
makes it a little spendy. I would buy the bare-bones version for \$279 and then spend the money on a 1/2 HP variable speed drive to go with it. A very nice little lathe.

Conclusions

If you want real capability, and demand big lathe performance from a small machine, you have to like the Oneway 1018. Working on it is a joy, but you'd better have the wallet to match your appetite. You get what you pay for.

For us mere fiscal mortals, my pick goes to the VicMarc. It's cleaner and a bit more solid than the Chinese-made versions. Whether you go \$600 for the factory motorized version or go bare-bones and supply your own drive, it's a good value, and the spindle indexing is a nice added feature.

I'd have a hard time choosing a favorite among the Delta, Fisch, and JET machines, as they are so much alike. They are all capable, low-cost mini lathes, and are all a good value, especially for an entry-level turner.



The VicMarc has 24-point indexing on the headstock like a professional machine, a nice feature. The screw-on cover for the belts is awkward to access and will probably be left open by most turners.



The locking handles on the VL-100 are solid enough, but they do not index.

The Carba-Tec is best left to the hobbyist, model maker, or occasional pen turner. Its lower power and smaller size will limit its versatility for significant turning work. It is adequate for small scale miniature work.

Steve Blenk is a professional woodturner and writer living in the Pacific Northwest, where he has more than once been mistaken for Sasquatch by city folks.

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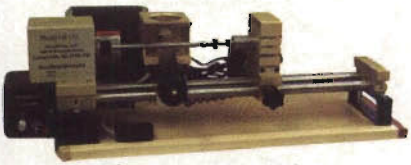
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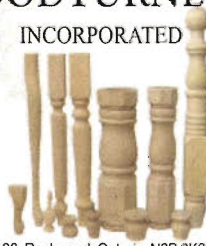
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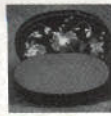
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Sawing Accessories That Make the Cut

By Chris Marshall

Turn your shop workhorse into a stallion with these handy add-ons.

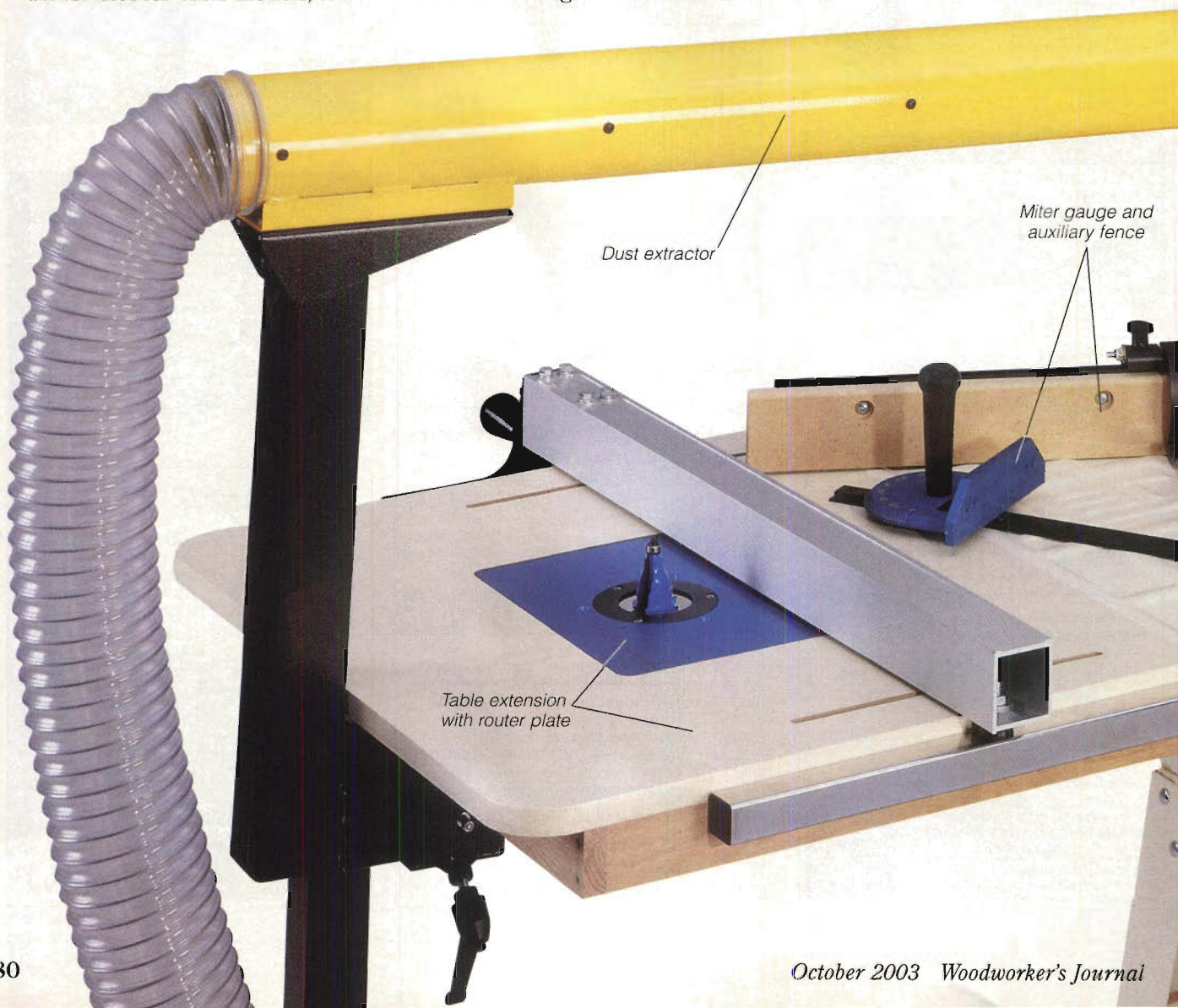
Straight from the shipping carton, most new mid-priced table saws and band saws offer decent to downright exceptional performance and features. Still, no saw is a dream machine. You can always eke out more precision, boost your saw's versatility or make it safer to use with a few aftermarket bells and whistles. If your table saw or band saw has seen more than a few winters already, there are plenty of add-on accessories for older models, too.

Let me tell you straight away, the inventory of accessory options for saws is long and deep. I've boiled down the options, asked other experts in the *Woodworker's Journal* community for their favorites and prepared a survey of some of the better choices for you. It's never too early to start that wish list ...

Precision Miter Gauges

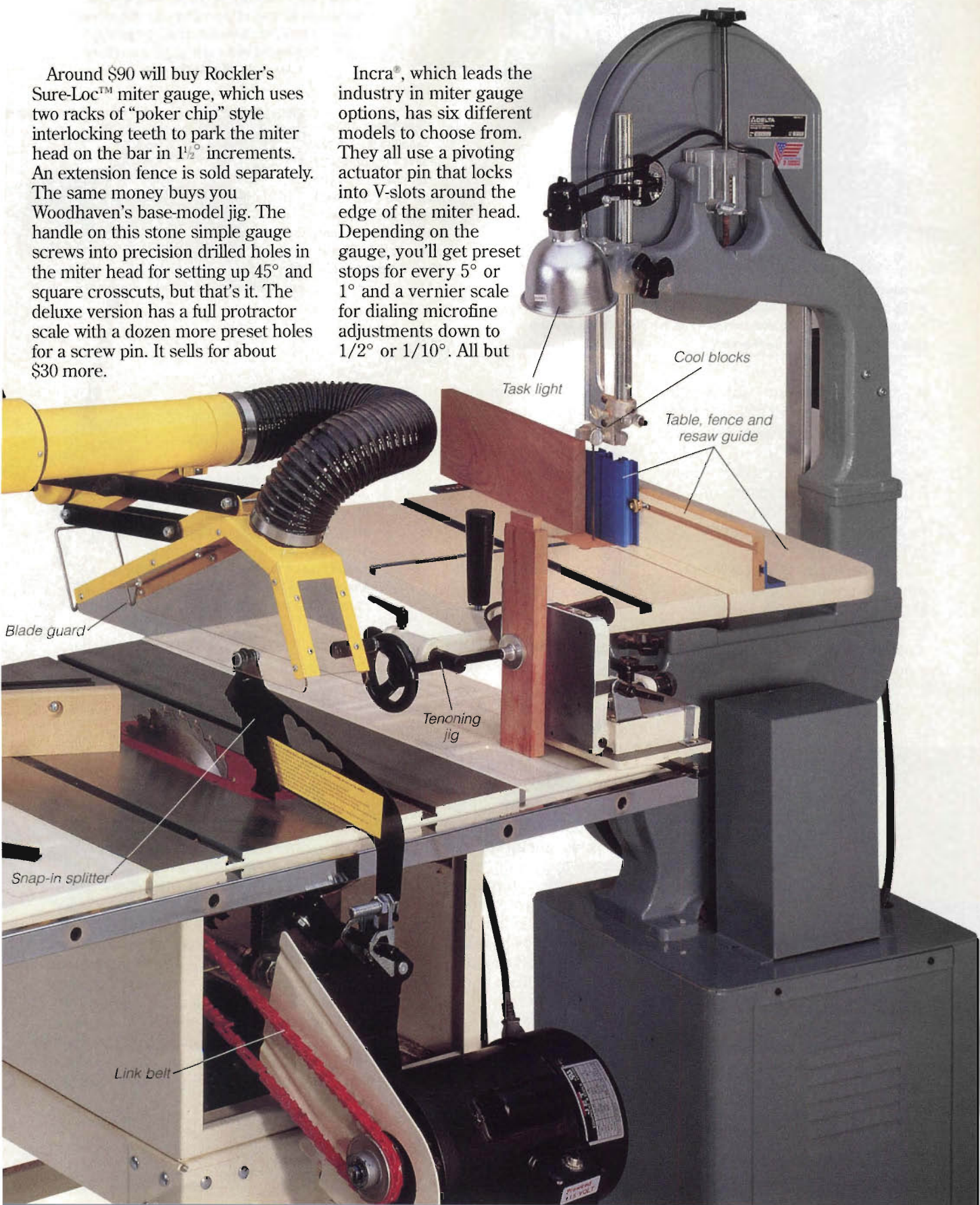
Tired of tuning and retuning your table saw's miter gauge just to cut a decent 45° angle? These hot rod

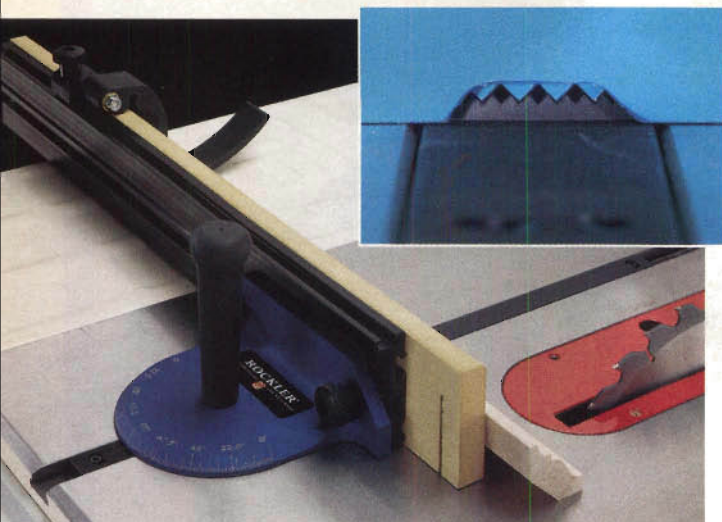
miter gauges nail those elusive 45s, plus nearly every other angle, without fuss. Each one uses a unique system for locking the miter head positively at different angle settings, with no fiddling on your part. Plus, all the miter bars have provisions for snugging them into your saw's miter slots to eliminate the extra play that leads to rough cuts. Most come with extension fences to bolster work-piece support and flip stops to stop things creeping laterally during use.



Around \$90 will buy Rockler's Sure-Loc™ miter gauge, which uses two racks of "poker chip" style interlocking teeth to park the miter head on the bar in 1½° increments. An extension fence is sold separately. The same money buys you Woodhaven's base-model jig. The handle on this stone simple gauge screws into precision drilled holes in the miter head for setting up 45° and square crosscuts, but that's it. The deluxe version has a full protractor scale with a dozen more preset holes for a screw pin. It sells for about \$30 more.

Incra®, which leads the industry in miter gauge options, has six different models to choose from. They all use a pivoting actuator pin that locks into V-slots around the edge of the miter head. Depending on the gauge, you'll get preset stops for every 5° or 1° and a vernier scale for dialing microfine adjustments down to 1/2° or 1/10°. All but





Rockler's Sure-Loc™ miter gauge uses a pair of "poker chip" style racks between the miter head and bar to lock the head solidly every 1½° of miter swivel. The company sells an auxiliary fence and flip stop separately to soup up this gauge.

the base model come with a T-slot extension fence and a stop. Prices range from \$55 to \$230. As prices rise, you get more preset V-slots — 364 on the flagship models — and longer, telescoping extension fences. Contact Woodpeckers (see page 90) to check out the full product line.

For a different twist on the old miter gauge design, have a look at the Osborne EB-3. Designed by the folks at Excalibur, it uses a patented extension arm, not a protractor, to set the aluminum

fence to different angles. A detent plunger on the arm drops into nine preset holes for nailing common angle settings. The company claims that this gauge is accurate to within 1/30th of a degree, right out of the box. It is available from Woodworker's Supply or Tool Crib for \$160.

Link Belts and Pulleys

If your contractor's saw motor bounces when it runs, or the cuts are ragged even after a careful tune-up, the culprit is usually a lousy drive belt or pulleys. These long V-belts transfer power inefficiently and don't always track the pulley sheaves evenly, especially when they stiffen and develop "memory" with age. An easy way to dampen vibration and deliver more torque to the arbor is to replace your stock belt with a link style belt from one of the suppliers listed on page 90.

The performance boost that came from adding a link belt to my contractor's saw made a believer out of me!

These belts usually sell for around \$6.50 per foot or in a 4' loop for \$25, and they'll fit any saw by adding or removing links. Switching to a set of machined pulleys in

addition to the link belt may give your saw an even smoother ride. Some suppliers sell these, too.

Blade Guards

If you're still playing the table saw version of Russian roulette by sawing without a blade guard, why not make this the year to give your spouse some peace of mind and add one? Excalibur, Delta, Biesemeyer and HTC Products all offer blade guards that mount with a long, telescoping arm to either the rear fence rail or the end of the side extension table of your saw. If you don't have a side extension table mounted on your saw, HTC sells a guard that fastens right to the extension wing.

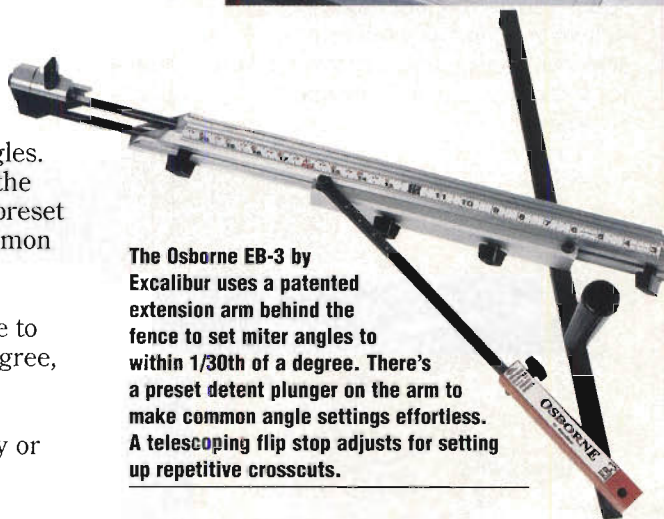
The actual shroud that covers the blade and its supportive hardware is suspended on the guard arm.

Today's Shop continues on page 84 ...



Incra® offers six different miter gauges to suit any budget or level of precision. The Miter 3000, shown here, has a vernier scale for setting microfine angles and a telescoping auxiliary fence with adjustable stop.

Two miter gauge options from Woodhaven let you choose the number of preset miter stops you want. The base model (left) stops at 0° and 45°. A deluxe gauge (right) adjusts to more angles using a threaded pin.



Cut blade vibration down to size while improving power transfer on your contractor's saw by slipping on a link belt. Buy these belts by the foot or in a 4' loop. You'll get positive results right off the bat.

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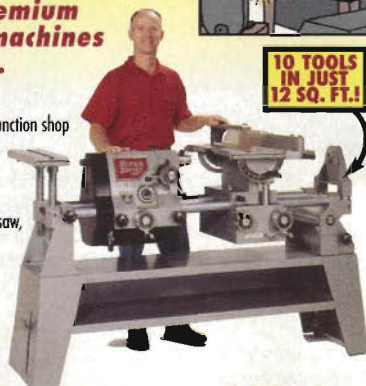
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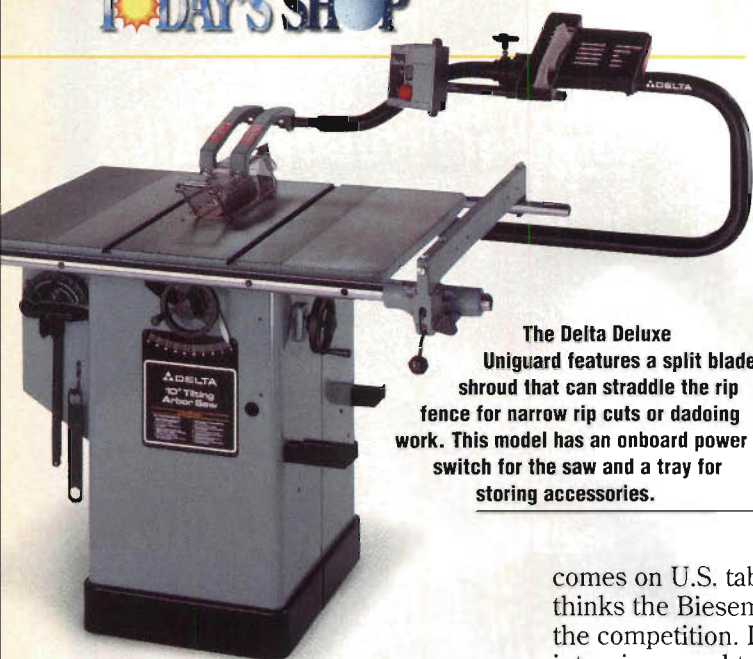


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The Delta Deluxe Uniguard features a split blade shroud that can straddle the rip fence for narrow rip cuts or dadoing work. This model has an onboard power switch for the saw and a tray for storing accessories.



Biesemeyer Blade Guards mount to any 10" table saw with a 30" or 50" side extension table and T-square style rip fence. The blade shroud raises and lowers by way of a pair of counterbalanced springs.

You can move the shroud horizontally by adjusting the arm's telescoping tubes. This way, the shroud can be set close to the fence for narrow ripping operations or moved clear of the blade for cutting tall workpieces. Since these guards don't mount to a splitter, you can leave them in place for dado blade work and stay protected.

Height adjustments differ, based on the guard style. Delta's Deluxe Uniguard pivots up and down on a pair of short arms that hold each half of the blade shroud. The Biesemeyer and Excalibur guards move vertically in a cantilever fashion, with the Biesemeyer held down under spring tension and the Excalibur by a counterweight. HTC's Brett-Guard® cranks up and down rather than floating over the blade. It can even be used as a makeshift hold-down for pressing workpieces against the table.

All models except the Delta come with provisions for drawing sawdust up through the shroud and along the extension arm tubing or through a separate dust hose. Only HTC's Brett-Guard and the Delta Deluxe Guard come with splitters that mount on the saw.

I asked Kelly Mehler, probably the nation's leading educator on table saws, which guard he prefers. Kelly gives a thumbs-up to all the models mentioned here because any pick is better than the stock guard that

comes on U.S. table saws. Still, he thinks the Biesemeyer edges out the competition. It's the least intrusive guard to use or move out of the way, and it adds fewer pounds to your saw.

Prepare yourself for sticker shock when buying an aftermarket saw guard. You'll drop anywhere from \$270 to more than \$400, depending on the model and guard size.

However, a guard at any price still beats the hospital and therapy fees for losing a hand, right? Contact HTC Products, Rockler, Tool Crib, Woodcraft or Woodworker's Supply for more information on these systems.

Snap-in Splitters

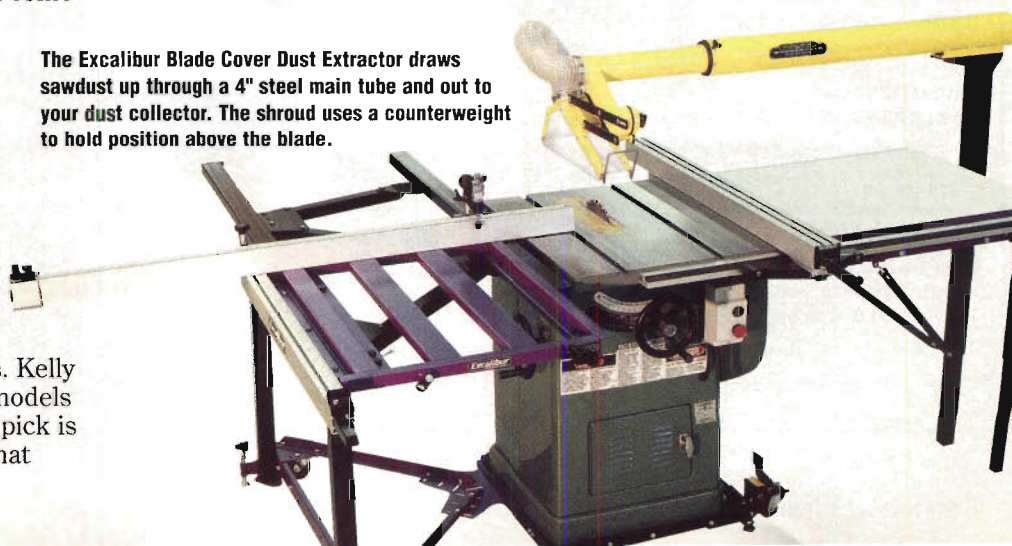
Despite their many benefits, the trouble with most aftermarket blade guards is they don't come with splitters to keep saw kerfs open behind the blade. When the cut closes, your odds for kickback go up faster than stock prices did during the dot-com rage.

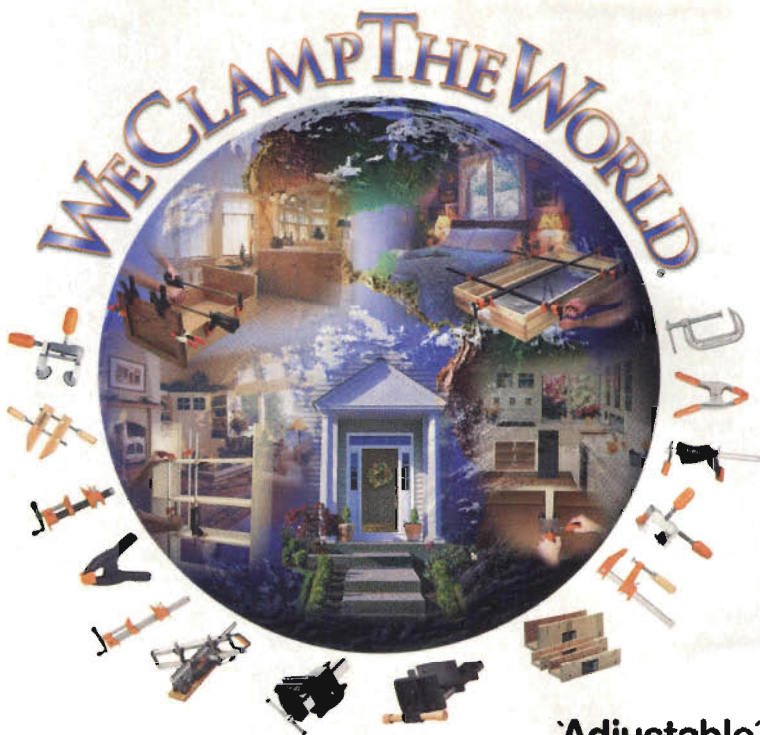
Today's Shop continues on page 86 ...



HTC's Brett-Guard Sawguard has a thick box-style blade shield that cranks up and down to adjust for different stock thicknesses. It doesn't ride up and over workpieces like other guard styles that act on gravity, so it provides "fixed" protection from the blade.

The Excalibur Blade Cover Dust Extractor draws sawdust up through a 4" steel main tube and out to your dust collector. The shroud uses a counterweight to hold position above the blade.





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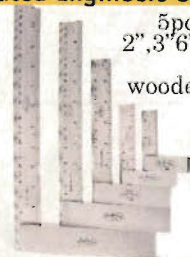


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Thankfully, there's help in the accessory world from the folks at Biesemeyer and Merlin. Biesemeyer splitters have a base that bolts in place, and the combination splitter and anti-kickback pawls pop in and out with a spring-loaded pin. The Biesemeyer splitter only works behind a full 1/8" thick blade. Tool Crib sells models to fit various Delta, Powermatic and General saws for \$130.

For a few dollars less, you can buy a Merlin splitter to fit many of the same saw models plus some JET and Sears saws. The Merlin splitter also comes on and off the saw without tools by pressing a release accessed on a receiver beneath the throatplate. The back end connects to your saw's stock blade guard mounting rod. Merlin's splitter works with thin-



Biesemeyer's Snap-In Splitter has a base that mounts beneath the throatplate to your saw's trunnion assembly. The splitter and anti-kickback pawls snap in place without tools and remove quickly for making non-through cuts.

kerf blades, although the assembly is much larger than the Biesemeyer design. Find Merlin splitters at Woodcraft, Woodworker's Supply and Tool Crib.

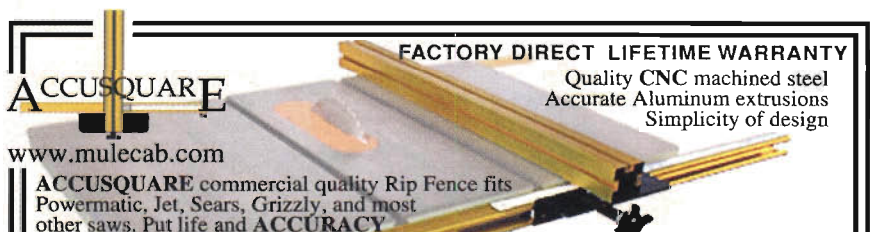
Tenoning Jigs

There's no faster, safer way to cut tenons with a standard saw blade than to use a dedicated tenoning jig. Delta, JET and a few other manufacturers offer similar



Merlin's splitter attaches to a receiver underneath the saw table and to the blade guard rod that comes with your saw. Unlike Biesemeyer's, it can be used in tandem with thin-kerf blades.

designs. These jigs feature a heavy, cast-iron and steel body that rides on a standard miter bar. A stout clamp holds workpieces securely against the jig's vertical and rear fences. Other levers and micro-adjusters move the workpiece both horizontally and vertically to cut tenons at various angles. You'll find home shop versions of these helpful jigs for around \$100 through most of the suppliers listed on page 90.



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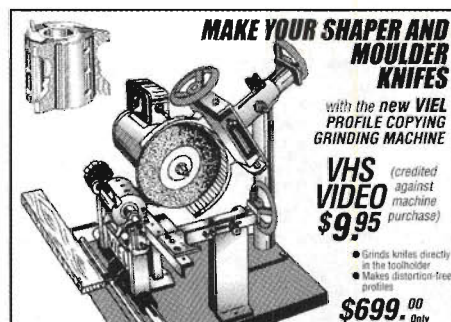
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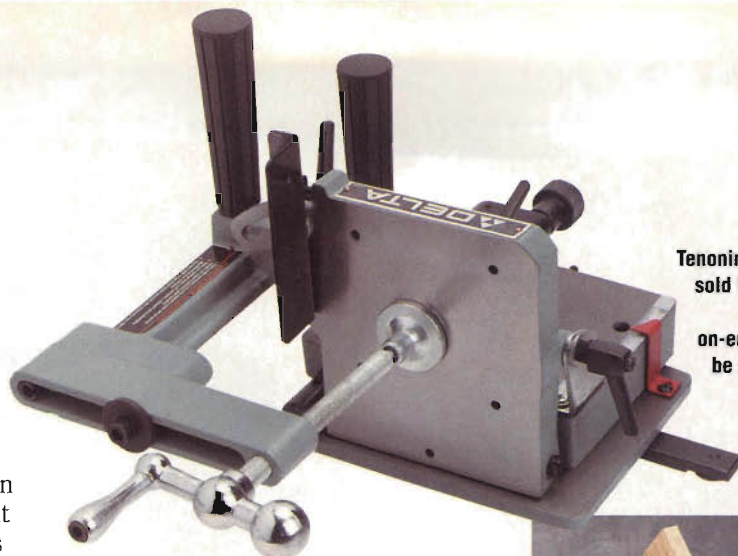
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Box Joint Jigs

If you'd rather make projects than build jigs, you can cut box joints using prefabricated jigs from Woodsmith or Eagle America. The Woodsmith version is an aluminum construction that rides on its own miter bar. It has a micro-adjuster for fine-tuning pin spacing in increments of less than 1/64". The jig will make joint pins ranging from 1/4" to 13/16" and sells for \$100 from Rockler. Eagle America offers a thriftier, \$50 alternative called the Mitey-Jig™. It mounts directly to your Delta or JET miter gauge and uses 1/4", 3/8" or 1/2" templates to set pin spacing. For other saw makes, you'll also need Eagle America's \$40 Mitey Sled™.



Tenoning jigs, like this version sold by Delta, offer a sturdy, safe way to cut tenons on-end. The jig's fences can be set to mill both straight and angled tenons on stock of any size.

Band Saw Guides

Does your band saw blade wander willy-nilly through resaw or rip cuts? The culprit could be poor blade guides. Give your 14" Delta or JET saw a front end alignment that will keep it tracking straight and true with a set of Carter Ball Bearing Blade Guides. Fellow contributing editor Michael Dresdner says these



Today's Shop continues on page 88 ...



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Made of extruded aluminum, Woodsmith's Box Joint Jig has a micro-adjust knob for fine-tuning pin spacing. It rides in any standard table saw miter slot and comes fully assembled and ready to use.



Eagle America's Mitey-Sled™ (above) and Mitey-Jig™ (left) let you make 1/4", 3/8" or 1/2" box joints on your table saw. Simply select the proper size of joint index template, fasten it to the jig, set the spacing for the first cut, and you're ready to go.

Carter guides are vastly better than the stock guides on most band saws and well worth the upgrade money. Each set includes side and rear bearings for both the upper and lower wheels and all the necessary mounting hardware. The bearings are permanently lubricated and have eccentric mounts for precise positioning. Kits will handle blade widths from 1/8" to 1" and sell for \$150.

If your blades seem to overheat and break frequently, here's

a thrifty fix: Replace those stock metal or plastic blade guide blocks with a set of Cool Blocks™. These little wonders are made from a special blend of plastic impregnated phenolic laminate, which basically means they're self-lubricating. Less than \$15 buys you a set of four blocks that fit the standard blade guide mounts of most Delta and Sears band saws as well as many other imports.

Shop for Carter and Cool Block™ blade guide products at Hartville, Rockler or Woodworker's Supply.

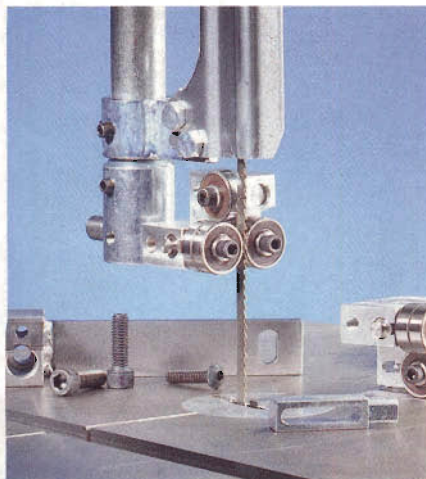
Quick Release Blade Tensioner

Get rid of those tension headaches that come with changing blades by installing a Carter Quick Release™ lever on your band saw. Blades not only go on and come off faster, but you'll extend their life by relieving tension from the blade brazing. The lever has three control positions: full release, partial tension and full tension, but you can still fine-tune the setting with the stock screw control. The lever fits 14" Delta, JET, Ridgid and Sears band saws. Around \$150 buys one from Hartville Tool or Woodworker's Supply.

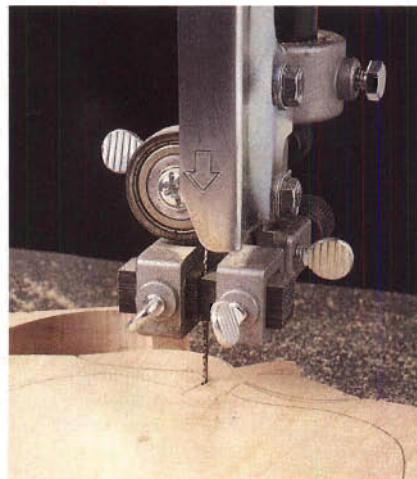
Saw Tables and Fences

Ever need a little more real estate on your band saw table when cutting long stock or wide sheet material? Tool guru Sandor Nagyszalanczy recommends Rockler's 24" x 24" add-on table that fits any standard two-wheel saw. The MDF table has a tough melamine work surface outfitted with a miter gauge slot, so you won't have to pull it off for those occasional miter gauge-guided cuts. A second T-slot houses a handy circle-cutting attachment that comes with the table. The fence slides left and right over the full table width and has a large handle for locking rip settings. The table clamps to your saw's original table without additional alteration of the saw. Add one to your machine for \$150.

Many stock band saw fences leave much to be desired. They deflect lengthwise, provide only coarse adjustability and make jig mounting inconvenient. If these



Carter's Ball Bearing Guides for band saws feature fully adjustable thrust and side support bearings for perfect blade tracking. The basic kit fits round guide support shafts and comes complete with everything you need.



Install a pair of Cool Blocks™ side blade guides on your saw, and you'll dramatically reduce the heat that leads to blade fatigue and eventual breakage. They're sized to fit most import saws.

Today's Shop continues on page 90 ...

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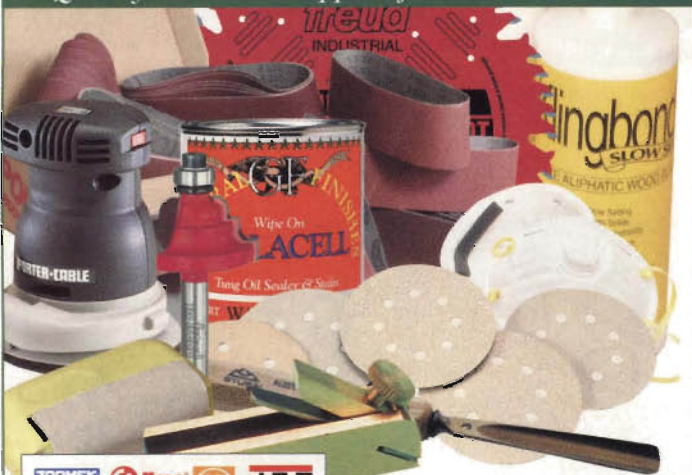
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hassles sound familiar, toss your original fence and replace it with an aftermarket FasTTrack fence designed by noted band saw expert Mark Duginske. This stout 18" fence and mounting rail are made of extruded aluminum and simply bolt in place on most 12" and 14" Taiwanese saws. T-slots on the fence body allow you to attach your shop-made jigs, or you can buy micro-adjusters, flip stops and resaw attachments separately. Most major suppliers listed here sell the basic system for around \$80.

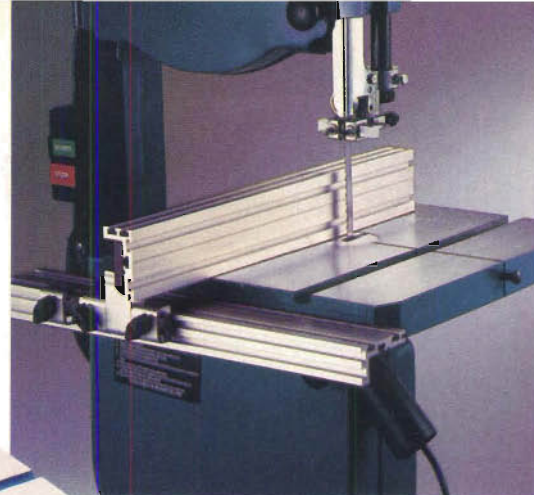
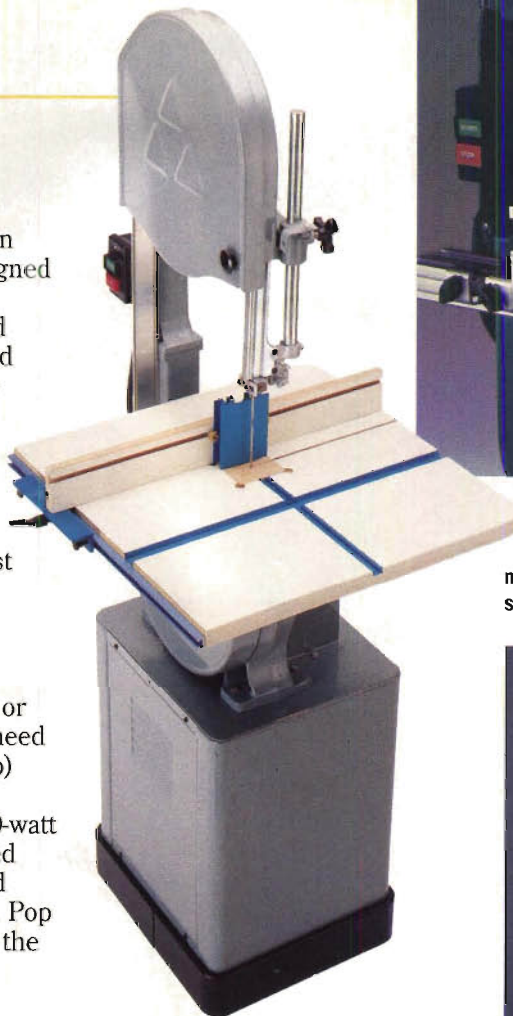
Task Lights

Shed some light on your band saw or drill press table (or wherever you need more task lighting around the shop) with these removable task lights. Various suppliers offer the same 60-watt model, which features an articulated arm, 18 ft. cord, swiveling head and both magnetic and clamp-on bases. Pop one on your machine and step into the light for about \$23.

NOTE: Photos from various suppliers were reprinted with their permission.

Chris Marshall is a Woodworker's Journal contributing editor. He builds projects and tests tools on a regular basis.

Carter's Quick Release™ band saw blade tensioner takes the work out of blade changes. Releasing tension on the blade between uses is a good practice: it prevents the blade from developing "memory" over time and releases stresses on the brazing.

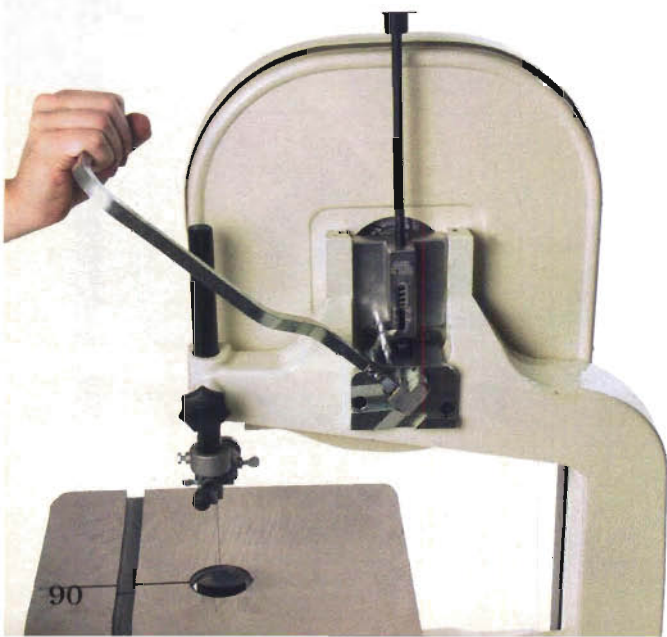


Bolt a FasTTrack fence to your band saw and get ready for dead-on rip cuts and resawing. The aluminum fence body and mounting rail have T-slots for attaching stops, resaw guides or other shop-made jigs.

Rockler's Band Saw Table and Fence system offers plenty of support for sawing larger stock safely and accurately. It requires no special retrofitting to fit any 14" band saw.



Give your eyes a break and improve your machining accuracy with a magnetic-base task light. An articulated arm directs light just where you need it most.



Getting the Goods

Learn more about the products featured here by calling these suppliers.

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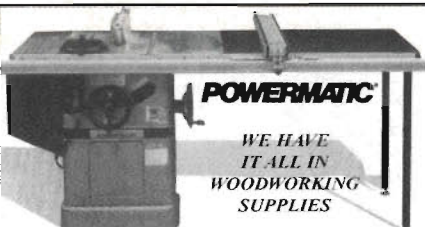
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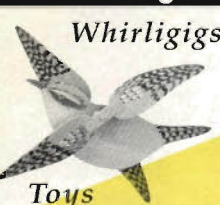
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Ridgid's TS2424 Contractor's Saw

By Charles Self

About five years ago — back when it was first rolled out with the rest of the Ridgid line — the *Journal* previewed the Ridgid TS2424. This U.S. built, 13 amp contractor's saw has spent some hard time in my shop since then. After this long-term evaluation, it has made the cut and is the latest tool to be selected as a *Woodworker's Journal*

Tool that Endures.

Cutting and cutting capacity are extremely important aspects of a saw, and Ridgid's TS2424 has a slickly operating fence, plus iron waffle weave table extensions, that allow cuts to a 24" center to the right of the blade. It's also a very smooth saw, due to a five-V poly belt and beautifully machined pulleys. The table doesn't have a T-slot for the miter gauge — just a rectangular slot. A miter gauge clamp is standard.

The 6" adjustment wheels are nicely sized. It takes 35 turns to raise the blade from all the way down to all the way up, and it's very easy to move it only a tiny fraction of an inch at a time.

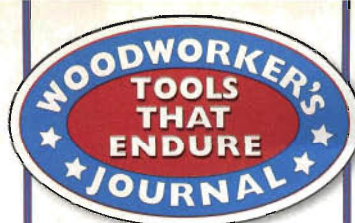
The fence is quite nice, but proved a bit fragile over time. It works very slickly, is accurate and required readjustment only a couple of times after I banged it very hard with



Long-lasting and convenient: Ridgid's TS2424 contractor's saw comes with fence and miter gauge hooks, a clamp to fit the miter gauge, and a built-in mobile base.

The TS2424 cuts accurately and with ample power. The blade guard is standard equipment.

The multi-groove pulley provides an excellent transfer of power to the 10" saw blade.



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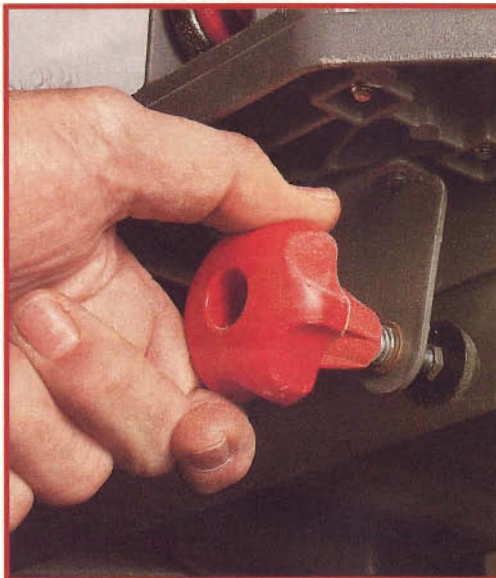
some long sycamore. It's a quick lift-off type, though it locks both front and rear. T-slots in the fence faces and top make it exceptionally easy to build and attach jigs.

Accurate Cuts

The motor on the TS2424 can be slowed down in oak, sycamore, cherry or walnut if you feed too fast, but then so can any other 1.5 HP table saw. It cuts accurately, the fence aligns quickly, and it stays in adjustment. The stand is very sturdy, and the mobile base works easily and adds value to the saw at no extra cost: a boon for those with small shops.

The saw came with a standard Vermont American® blade. I also tested it with a SD506 dado set, and it worked beautifully. The 6" diameter was easier on the 13 amp motor than an 8" diameter dado head would have been.

I also tested the Freud LM72R010 rip blade (24-tooth, flat top grind) for days when lots of ripping was going to happen, and the Freud 410 (40-tooth, alternate top bevel grind) as a standard, on-the-saw-all-the-time, general use blade. I didn't use a thin kerf blade, which might have prevented a couple of the over-fast feeds from slowing up the motor.



Some Improvements

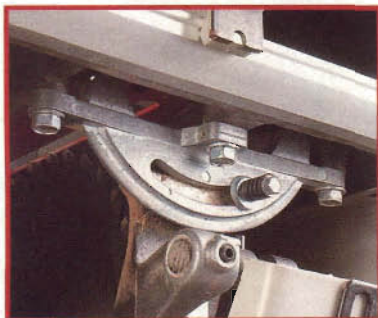
Ridgid has made some moderate changes to the original TS2424 saw since it showed up in my shop. On today's model, a Herc-U-Lift caster platform now comes standard. It also has four button head screws that let you adjust parallelism quickly. Ridgid now calls its trunnion adjustments "micro-adjust"

assemblies. Essentially, the bolt heads are now easier to reach. Setting the trunnions remains a finicky job, but easier access does simplify and speed up the process of adjusting the blade square to the miter groove.

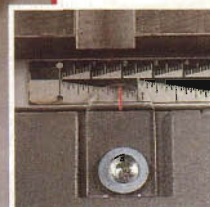
Based on my experience with this saw, here's my final evaluation: this is an easy to assemble, moderately priced (about \$600), nicely finished contractor's saw, with a fence that may be a bit of a lightweight, but is otherwise fine. There's plenty of power for hobby and light pro woodworking. Two fairly minor objections arise because there's no T-slot for the miter gauge and no front bevel on the table. Other than that, it's a solid, long-lasting tool and a terrific value. For these reasons, *Woodworker's Journal* is pleased to select the Ridgid TS2424 as a "Tool that Endures."



A handy micro-adjust feature (top photo) is used by pushing the knob forward and engaging a cone-shaped rubber friction unit.



The TS2424 rear trunnion assembly offers easy access for quicker adjustments.



The TS2424 T-square fence (left) is simple to use and read (inset), but a bit lightweight.

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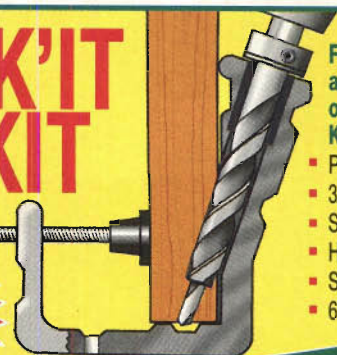
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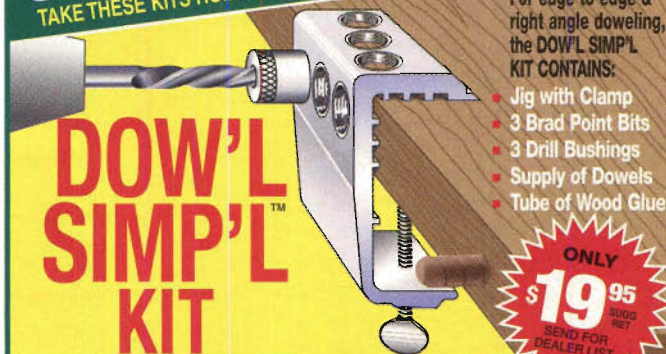
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JET has a patent on the Clamp-On Casters, available in two different sets (depending on your machine's weight and center of gravity). The standard set, has a suggested price of \$59.66; while the all-swivel set, which has four swivel casters for machines with a higher center of gravity, sells for \$69.99. For more info, call 800-627-4538 or visit www.jettools.com.

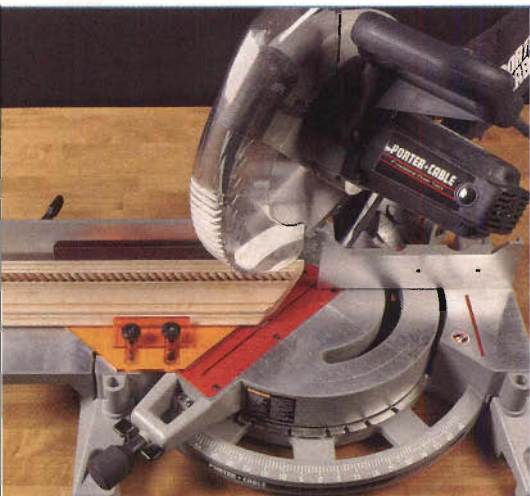


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Complex cuts, like crown molding, are easier with Rockler Woodworking and Hardware's Compound Miter Jig. You don't need the bevel on your miter saw to make compound cuts when you're using this jig: the miter setting will do it all.

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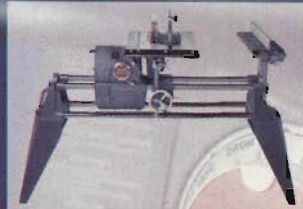
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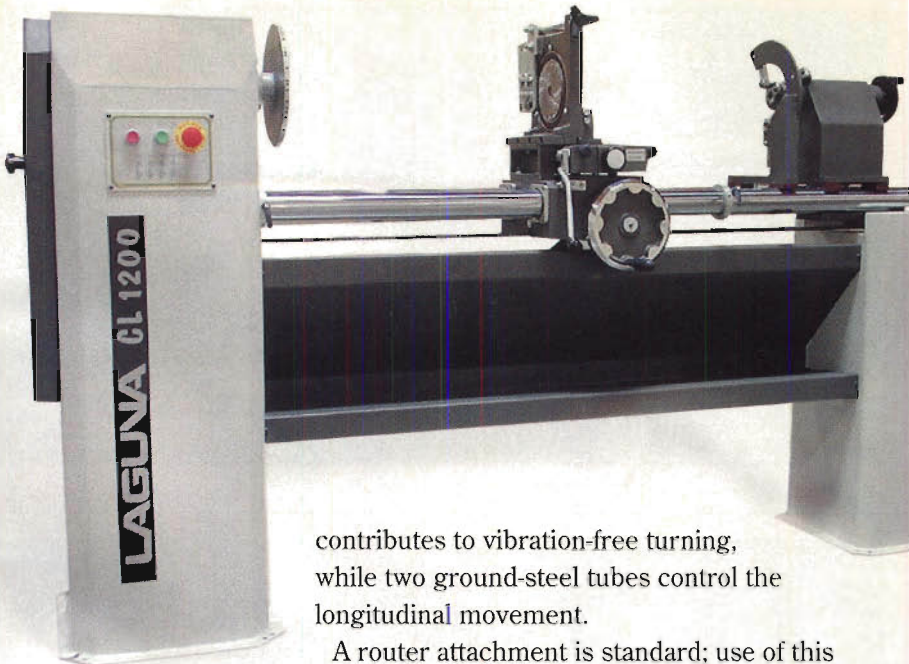
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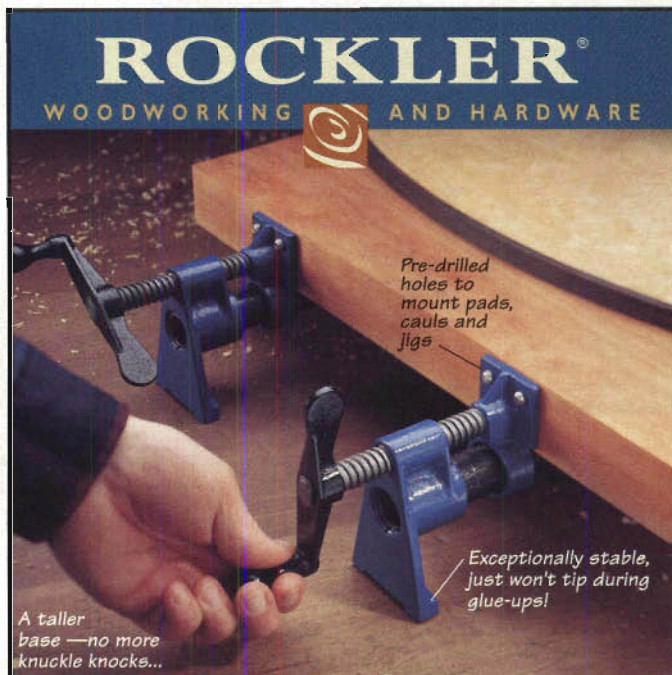


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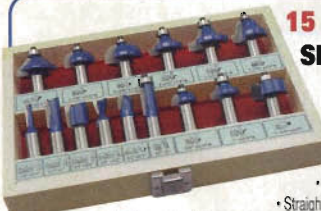


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Bleaching Wood: Staining in Reverse

By Michael Dresdner

Staining means adding color to wood. Bleaching, its logical opposite, is the process of chemically removing color from wood. You can remove accidental stains, intentional (but ill-advised) wood dyes, or the original colors that nature placed in wood, using one of three basic bleaches. Here's a description of each, a guide on how to mix and use them, and an explanation of what they will do.

Safety and Use Guidelines

All these bleaches are waterbased, and all finishes repel water. Hence, all bleaching must be done on raw (unsealed) wood. If you're trying to remove a stain from a finished piece

of furniture, you must strip the finish first. It's also a good idea to lightly sand the wood, to make sure the bleach can easily penetrate.

More important, these bleaches are either acids or bases, and as such are reactive. That means they can harm us, so use gloves and goggles, and work in a well-ventilated room. Any gloves will do, but don't get these bleaches on your skin. You might also want to wear a vinyl apron, or choose clothes you are ready to abandon.

Bleaches eat cloth and natural bristles, so apply them with synthetic bristle brushes, or nylon abrasive pads (such as Scotchbrite®). Always apply bleach to the entire surface of the wood, not just the area with the stain. "Spot" bleaching can cause permanent watermarks, or hard-to-blend light spots, in the wood.

Typically, you allow the bleach to

work until it dries, but you can stop the bleaching action at any time by diluting the surface with plenty of clean water. Because it contains water, bleaching raises the grain of wood, so plan on sanding with 320 or 400 grit paper once the wood dries.

Laundry Bleach

Old-fashioned chlorine laundry bleach, or sodium hypochlorite, will remove many accidental stains as well as most wood dyes. However, it will not substantially change the color of wood itself. For that reason, it is a great tool for "erasing" dye stain, either on new wood or old dyes on stripped pieces. Think of it as the "undo" button. It won't remove pigment stains, but it will remove a wide variety of common food and drink stains, some dye-based inks and felt-tip markers.

Laundry bleach is sold in a 5% or 6% solution, so use it straight from the container. Opened containers of bleach get weaker with time, so buy a new bottle for stain removal. If you need a stronger solution, you can mix your own using swimming pool

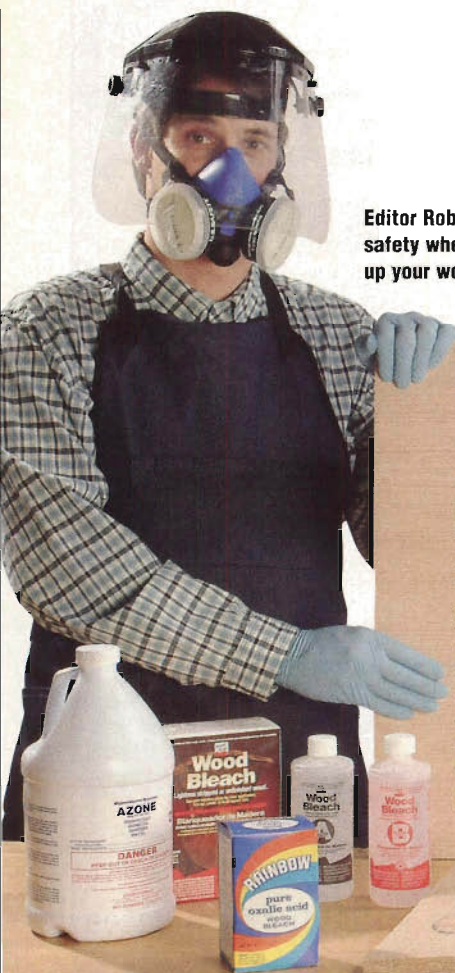
chlorine (typically calcium hypochlorite) mixed in water. These dry granules are sold at all different active bleach concentrations, so you'll have to read the label and do the math.

Don gloves, flood the bleach on evenly and liberally, and let it dry. Remove any salt residue the next day by washing the surface with plenty of clean water, then wipe off the excess water and let the wood dry overnight.

Editor Rob Johnstone is dressed for success — which means safety when using bleaching products. These chemicals can clean up your wood, but they're also caustic.

When to use each bleach...

	Chlorine bleach	Oxalic acid	A/B bleach
Lighten wood	no	no	yes
Iron stains	no	yes	no
Grayed wood	no	yes	no
Dye stains	yes	no	no
Pigment stains	no	no	some
Food stains	most	no	some
Ink, felt markers	some	no	some





Chlorine bleach, applied top and bottom, will remove a variety of accidental stains but won't remove pigmented stains. Here, the swimming pool version ... Clorox® on steroids — is shown on maple, walnut and mahogany.

Oxalic Acid

Sold as a dry crystalline powder, oxalic acid will remove blue-black iron stains that show up on oak and other high tannin woods, as well as some iron-based inks. Iron stains can come from hardware, cans or bits of steel wool that show up as tiny black dots in the oak pores. Widely sold as deck brightener, oxalic acid reverses the silver-gray of oxidized wood, but it won't change its original color, nor will it affect most wood stains or dyes.

Oxalic acid is toxic and irritating to skin and mucous membranes in its dry form. Wear a dust mask and goggles while mixing it into water, and again when you sand the wood

after the bleach has dried. Make a 6% solution by mixing about a tablespoon of it into one cup of warm water. Once it is mixed, it is fairly benign and won't smell much. Flood it onto the wood, let it dry, and wash off the salt residue the next day with clean water.

Two-part Wood Bleach

This is the one bleach that actually lightens the color of wood. Wood bleach will also knock out some, but not all, pigment stains but, curiously, won't affect most dyes. It is the most dangerous of the lot. Each component will burn your skin on contact: handle with care.

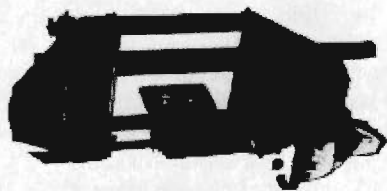


Oxalic acid can remove iron stains from wood. Use proper precautions while mixing; flood it onto the wood; let dry; then use clean water to remove the residue.

continues on page 102 ...



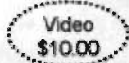
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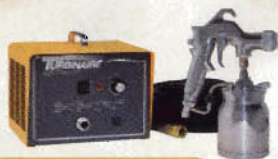


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FINISHING HOTLINE

I need patina ... now!

My cherry project is too light, and I don't want to wait for it to darken. Tell me more about the use of sodium hydroxide to accelerate the aging of cherry to its rich reddish brown color.

A friend of mine did that on a project and got beautiful results, but he's vague about how he did it.

Can you help me out?



*John Klouda
LaCrosse, Wisconsin*

Sodium hydroxide (lye) is a traditional chemical stain that darkens or ambers most woods. Mix one ounce of lye crystals into three ounces of water. Add the lye to the water — not the other way around. Mix it in an oversize glass container to allow for foaming, and stir it with a clean stick until the crystals dissolve completely. You'll find lye crystals (be sure it is pure sodium hydroxide, not a drain cleaner) in the drain cleaner section of your hardware or grocery store.

Wear rubber or vinyl gloves, goggles, an apron and a respirator, and work in an area with good ventilation. Both the dry dust and the liquid are toxic and irritating, and will immediately burn skin on contact. This stuff is dangerous, so handle it with extreme care.

Brush the mixture onto clean, well-sanded wood. Lye will instantly dissolve natural bristles, so use a synthetic bristle brush or a Scotchbrite pad. Wet the wood and let the lye mixture stay on until it dries, usually overnight. Neutralize the wood the next day by washing it with a mixture of an ounce of white vinegar in one cup of water. Wipe off any standing water and let the wood dry thoroughly before finishing.

Colors vary, but lye will darken cherry, mahogany, oak, maple and most other woods. Try it on a few of your favorite wood scraps to see what color results before putting it on a project.

— Michael Dresdner

Oak

Mahogany

Cherry

FINISHING THOUGHTS

Two-part bleach is the most dangerous. Use it with caution.



Wood bleach is sold in two containers, usually labeled A and B — respectively, sodium hydroxide (lye) and hydrogen peroxide (not the 3% peroxide sold in pharmacies, but a wicked 35% concentration). Wet the wood thoroughly with the lye solution, followed quickly by the peroxide. When the two wet solutions come in contact with one another, they create a strong oxidizer that bleaches the color out of wood. It is important that the wood is still wet from solution A when the B is applied, so speed is of the essence.

Pour each component into a glass, plastic or porcelain container for application. Wear gloves and goggles, and use synthetic brushes to apply the bleach. Some brands suggest mixing the two components together, then applying the solution. Again, speed is important, because the strongest action comes just after the two chemicals meet. Don't let the bleach contact metal, particularly steel wool, or it will quickly erupt into a Vesuvius of caustic foam.

Let the wood dry overnight, and repeat the process if the wood isn't white enough. Once you're happy with the results, wash the surface with plenty of clean water to neutralize and remove the alkaline residue. Be careful when sanding: the bleaching doesn't penetrate deeply, and it's easy to sand through to the original wood color on the edges.

Contributing editor Michael Dresdner's latest book, *The New Wood Finishing Book*, is available from Taunton Press.

Winner! For simply sending in the question on staining with lye, John Klouda of LaCrosse, Wisconsin, wins a complete ZAR® Wood Finishing Kit shown at left.



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