

5 Great Router Jigs

60+
Router tips, jigs
& products

AMERICAN WOODWORKER[®]

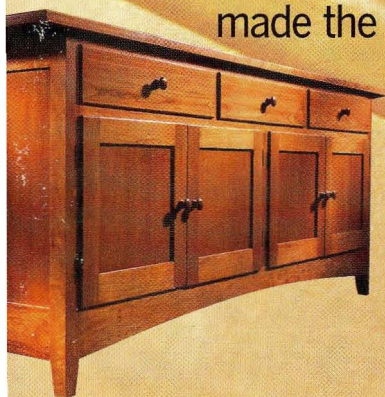
Annual

WhereWeShare.com

Router Special

- Plunge routers!
- Trim routers!
- Cool router joint-maker!
- Router tune-up tips!
- New router accessories!

Shaker Sideboard
made the easy modern way



Plus

12 tips for successful gluing

Simple outdoor bench

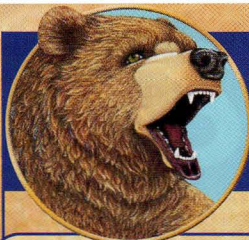
Use your router as a biscuit joiner

BUILD YOUR SKILLS • BUILD YOUR SHOP

#127 February/March 2007
www.americanwoodworker.com

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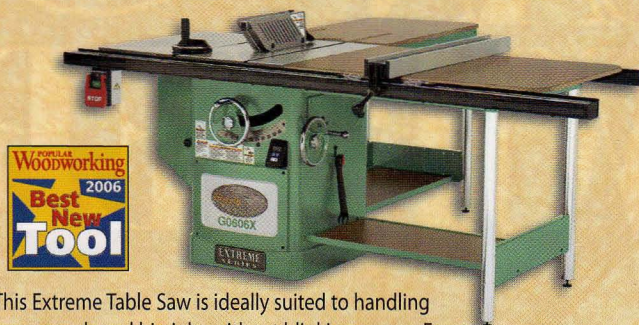




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THE 12" EXTREME SERIES TABLE SAW w/RIVING KNIFE!



This Extreme Table Saw is ideally suited to handling large panels and big jobs without blinking an eye. Front and rear mounted extension tables are included and support the widest panels before, during and after the cut. Ample storage shelves, a user friendly blade guard, a riving knife, a digital readout for blade angle and an efficient dust management system that includes an internal dust port. The left-tilting blade moves up and down, allowing the riving knife to remain at a constant height just under the blade.

AN INCREDIBLE SAW!

- Motor: 5 HP, 220V, single-phase
- Precision ground cast iron table
- Table size with extension: 30¹¹/₁₆" x 78¹³/₁₆"
- Arbor size: 1" • Arbor speed: 3600 RPM
- Max. dado width: 1"
- Max. depth of cut: 4" @ 90°, 2³/₄" @ 45°
- Max. rip capacity: 52"
- 3/8" x 3/4" T-slots & miter gauge
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- Quick release steel splitter
- Digital readout for bevel angle
- Dimensions: 91"W x 93"D x 42¹/₂"H
- Approx. shipping weight: 966 lbs.



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G0605X

INTRODUCTORY PRICE

ONLY \$1995⁰⁰

\$169⁹⁹
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G0606X
7¹/₂ HP,
3-Phase
also available

2 HP, 10" HYBRID CABINET SAW

- Motor: 2 HP, 110V/220V, single-phase
- Precision ground cast iron table
- Table size w/wings: 27" x 39¹/₂"
- Arbor: 5/8" • Rip capacity: 30"
- Cutting capacity 3" @ 90°, 2¹/₈" @ 45°
- Approx. shipping weight: 439 lbs.

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INCLUDES SHOP FOX® ALUMA-CLASSIC™ FENCE & CAST IRON MITER GAUGE

G0478

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10" TILTING ARBOR HEAVY-DUTY TABLE SAW

- Motor: 3 HP, 220V, single-phase
- Precision ground cast iron table w/ 2 cast iron extension wings
- Table size w/ wings attached: 27" x 40"
- Arbor: 5/8" (accepts dado blades up to 1³/₁₆")
- Cutting capacity: 8" left & 26" right of blade
- Approx. shipping weight: 420 lbs.

2006 TOOL BUYING GUIDE Editors' Choice



INCLUDES SHOP FOX® CLASSIC™ FENCE & CAST IRON MITER GAUGE

G1023S

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10" LEFT-TILTING TABLE SAW W/CAST IRON ROUTER TABLE

- Motor: 3 HP, 220V, single-phase
- Precision ground cast iron table
- Table size (with 2 solid extension wings attached): 48" x 27"
- Arbor: 5/8" diameter (accepts dado blades up to 1³/₁₆")
- Cutting capacity: 8" left & 26" right
- Max. depth of cut @ 90°: 3"
- Max. depth of cut @ 45°: 2¹/₈"
- Approx. shipping weight: 503 lbs.

ROUTER NOT INCLUDED



48" x 27" TABLE W/ WINGS

INCLUDES SHOP FOX® CLASSIC™ FENCE & CAST IRON MITER GAUGE

G1023SLW

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THE ULTIMATE 14" BANDSAW

MADE IN ISO 9001 FACTORY!



- Motor: 1 HP, 110V/220V, single-phase, TEFC
- Precision ground cast iron table
- Deluxe extruded aluminum fence
- Cutting capacity/throat: 13¹/₂"
- Max. cutting height: 6"
- Blade size: 92¹/₂" - 93¹/₂" long (1/8" - 3/4" wide)
- 2 blade speeds: 1500 & 3200 FPM
- Approx. shipping weight: 198 lbs.

INCLUDES FENCE, MITER GAUGE, 3/8" BLADE & QUICK BLADE RELEASE SYSTEM



G0555

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17" HEAVY-DUTY EXTREME SERIES BANDSAW



- Motor: 2 HP, 110V/220V, single-phase, TEFC, 1725 RPM
- Precision ground cast iron table
- Table size: 24" x 17" x 1¹/₂"
- Max. cutting height: 12"
- Blade length: 131¹/₂"
- Blade sizes: 1/8" - 1"
- Blade speeds: 1700 & 3500 FPM
- Dust port: (2) 4"
- Approx. shipping weight: 414 lbs.

INCLUDES 1/2" BLADE, FENCE & HEAVY-DUTY MITER GAUGE

MADE IN ISO 9001 FACTORY!

EXTREME SERIES

G0513X ONLY \$975⁰⁰

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3 HP CYCLONE DUST COLLECTOR



- Motor: 3 HP, 220V, single phase, TEFC Class "F"
- Amps: 19.5
- Cycle/RPM: 60 Hertz/ 3450 RPM
- Intake hole: 8"
- Impeller: 15" steel
- Suction capacity: 1654 CFM @ 2.0" SP
- Max. static pressure: 14.2"
- Filtration: 0.2-2 micron, 99.9% efficiency
- Filter surface area: 108 sq. ft.
- Approx. shipping weight: 421 lbs.

G0441 ONLY \$1195⁰⁰

H7509 STAND ONLY \$169⁹⁵

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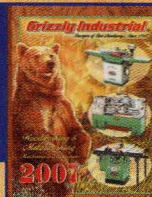
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MACHINES, TOOLS &
ACCESSORIES!



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New!

6" PARALLELOGRAM JOINTER

- Motor: 1 HP, 110V, single-phase
- Precision ground cast iron table
- Table size: 6" x 55 1/2"
- Max. depth of cut: 1/8"
- Rabbeting capacity: 1/2"
- Cutterhead diameter: 3"
- Knife size: 6" x 3/4" x 1/8"
- Cutterhead speed: 4850 RPM
- Cuts per minute: 19,400
- 4" dust port
- Approx. shipping weight: 347 lbs.



**4 KNIFE
CUTTERHEAD**

BUILT IN ADJUSTMENT
ASSURES THAT TABLES
ALWAYS REMAIN PARALLEL

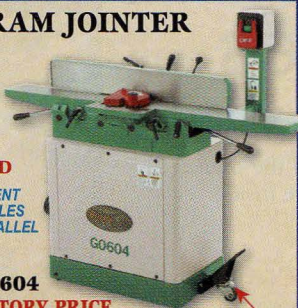
G0604

INTRODUCTORY PRICE

ONLY \$525⁰⁰

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BUILT-IN
MOBILE
BASE



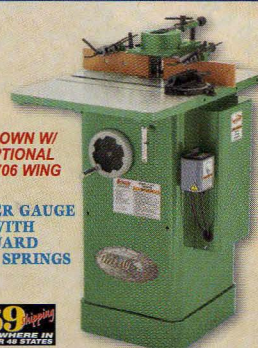
1 1/2 HP SHAPER

- Motor: 1 1/2 HP, 110V/220V, single-phase
- Precision ground cast iron table
- Table size: 20 1/4" x 18"
- Spindle travel: 3"
- 2 interchangeable spindles: 1/2" & 3/4"
- Spindle openings on table: 1 1/4", 3 1/2" & 5"
- Spindle speeds: 7000 & 10,000 RPM
- Max. cutter diameter: 5"
- Approx. shipping weight: 221 lbs.

SHOWN W/
OPTIONAL
G1706 WING

INCLUDES MITER GAUGE
& FENCE WITH
SAFETY GUARD
& HOLD-DOWN SPRINGS

\$69⁹⁹
ANYWHERE IN
LOWER 48 STATES



G1035 ONLY \$515⁰⁰

8" X 76" JOINTER

- Motor: 3 HP, 220V, single phase, TEFC
- Table size: 8" x 76 3/8"
- Infeed table size: 8" x 43 3/8"
- Cutterhead knives: 4 HSS, 8" x 3/4" x 1/8"
- Cutterhead speed: 5350 RPM
- Cuts per minute: 21,400
- Cutterhead diameter: 3 3/16"
- Max. depth of cut: 1/8"
- Max. rabbeting depth: 1/2"
- Approx. shipping weight: 597 lbs.

INCLUDES
CAST IRON
FENCE



PARALLELOGRAM
TABLE
ADJUSTMENT
SYSTEM!



G0490 ONLY \$795⁰⁰

\$139⁹⁹
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LOWER 48 STATES

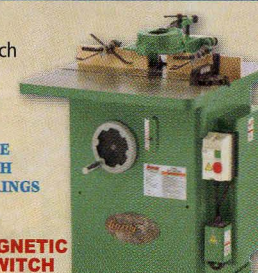
3 HP SHAPER

- Motor: 3 HP, 220V, single-phase w/ reversing switch
- Precision ground cast iron table
- Table size w/ standard wing attached: 30 1/2" x 28 1/4"
- 3 interchangeable spindles: 1/2", 3/4" & 1"
- Spindle travel: 3"
- Spindle openings on table: 1 3/8", 2 3/4", 4 & 5 1/2"
- Spindle speeds: 7000 & 10,000 RPM
- Approx. shipping weight: 357 lbs.

INCLUDES
MITER GAUGE
& FENCE WITH
HOLD-DOWN SPRINGS

MAGNETIC
SWITCH

\$89⁹⁹
ANYWHERE IN
LOWER 48 STATES



G1026 ONLY \$975⁰⁰

12" x 83 1/2" PARALLELOGRAM JOINTER

- Motor: 3 HP, 220V, single-phase
- Precision ground cast iron table
- Table size: 12 3/4" x 83 1/3"
- Max. depth of cut: 1/8"
- Rabbeting capacity: 3/4"
- Cutterhead dia.: 3 3/4"
- Cutterhead speed: 4950 RPM
- Dust port: 5"
- Approx. shipping weight: 1036 lbs.

4 KNIFE
CUTTERHEAD

New!



HANDLES
FOLD IN FOR
ADDED SAFETY



G0609
INTRODUCTORY PRICE
ONLY \$1595⁰⁰

\$225⁹⁹
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18" OPEN END DRUM SANDER

- Motor: 1 1/2 HP, 110V, single-phase
- Drum surface speed: 4000 FPM
- Feed rate: variable, 2-12 FPM
- Max. stock size: 4 1/2" thick x 18" wide
- Min. board length: 6"
- Min. board thickness: 1/8"
- Drum size: 6"
- Conveyor belt size: 18" x 44 1/2"
- Approx. shipping weight: 350 lbs.

SANDS BOARDS
UP TO 36" WIDE!

INDEPENDENT
DUST
COLLECTION
W/ DUST BAG



G0458

ONLY \$850⁰⁰

\$89⁹⁹
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LOWER 48 STATES



15" PLANER/MOULDER

- Motor: 2 1/2 HP, 110V, single-phase
- Table size: 15" x 16"
- Max. cutting width: 15"
- Max. cutting height: 6"
- Min. stock thickness: 1/8"
- Min. stock length: 17"
- Max. cutting depth: 3/64"
- Feed rate: 11 FPM & 22 FPM
- Cutterhead dia.: 3 15/64"
- Cutterhead speed: 5500 RPM
- Approx. shipping weight: 181 lbs.

LIGHTWEIGHT
& PORTABLE
YET INCREDIBLY
RUGGED!



FEATURES
STURDY STAND,
CONVENIENT
PRESET DEPTH
STOP & AMAZING
BUILT-IN DUST
COLLECTION!

G0477 ONLY \$750⁰⁰

\$69⁹⁹
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LOWER 48 STATES

15" PLANER

- Motor: 3 HP, 220V, single-phase
- Precision ground cast iron table size: 15" x 20"
- Max. cutting width: 15"
- Max. cutting height: 8"
- Min. stock thickness: 3/16"
- Min. stock length: 8"
- Max. cutting depth: 1/8"
- Feed rate: 16 FPM & 30 FPM
- Cutterhead dia.: 3"
- Knives: 3 HSS
- Cutterhead speed: 5000 RPM
- Approx. shipping weight: 675 lbs.

PRECISION GROUND
CAST IRON BED &
INFED OUTFEED
TABLES!

BUILT-IN
MOBILE
BASE



G0453 ONLY \$850⁰⁰

\$139⁹⁹
ANYWHERE IN
LOWER 48 STATES

20" PLANER

- Motor: 5 HP, 220V, single-phase
- Table size: 20" x 25 3/4" (20" x 55 5/8" w/ extension)
- Max. cutting width: 20"
- Max. cutting height: 8"
- Min. stock thickness: 3/16"
- Min. stock length: 7 1/2"
- Max. cutting depth: 1/8"
- Feed rate: 16 FPM & 20 FPM
- Cutterhead dia.: 3 1/8"
- Knives: 4 HSS
- Cutterhead speed: 5000 RPM
- Approx. shipping weight: 920 lbs.

PRECISION GROUND
CAST IRON BED &
INFED OUTFEED
TABLES!

BUILT-IN
MOBILE
BASE



G0454 ONLY \$1250⁰⁰

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Contents

#127, MARCH 2007

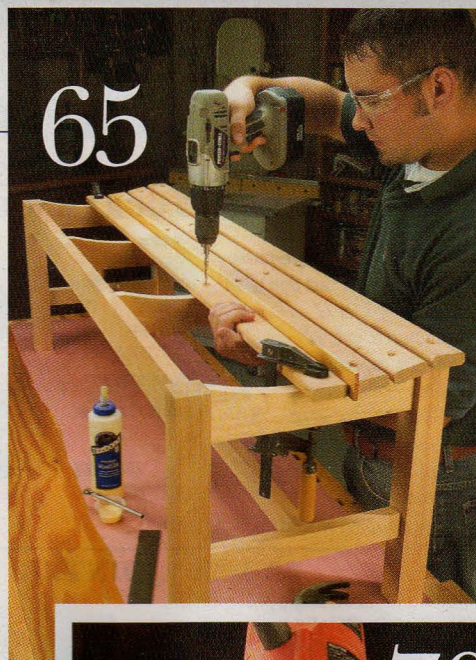
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Features

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Traditional on the outside,
modern on the inside.
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12 tested, 1 chosen.
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Your Trim Router
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Mortise-and-tenon joints,
sliding dovetails and Miller Dowels
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To Own a Plunge Router
It's a must-have tool
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- 80 **5 Router Jigs**
Build a micro-adjuster,
springboard, depth gauge,
trammel and coping sled.

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freud®

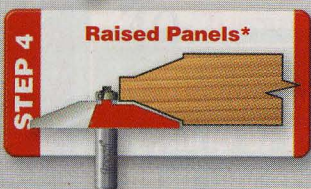
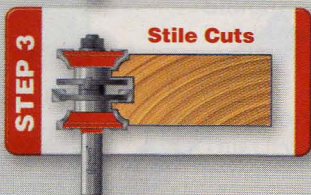
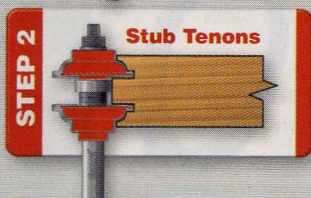
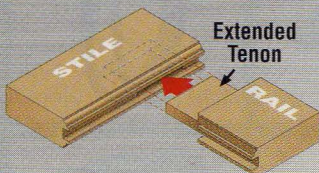
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Strong joints & unique designs at a fraction of the cost.

Entry Door
Router Bit Set
Now Available for
2-1/4" Stock! Item # 99-277

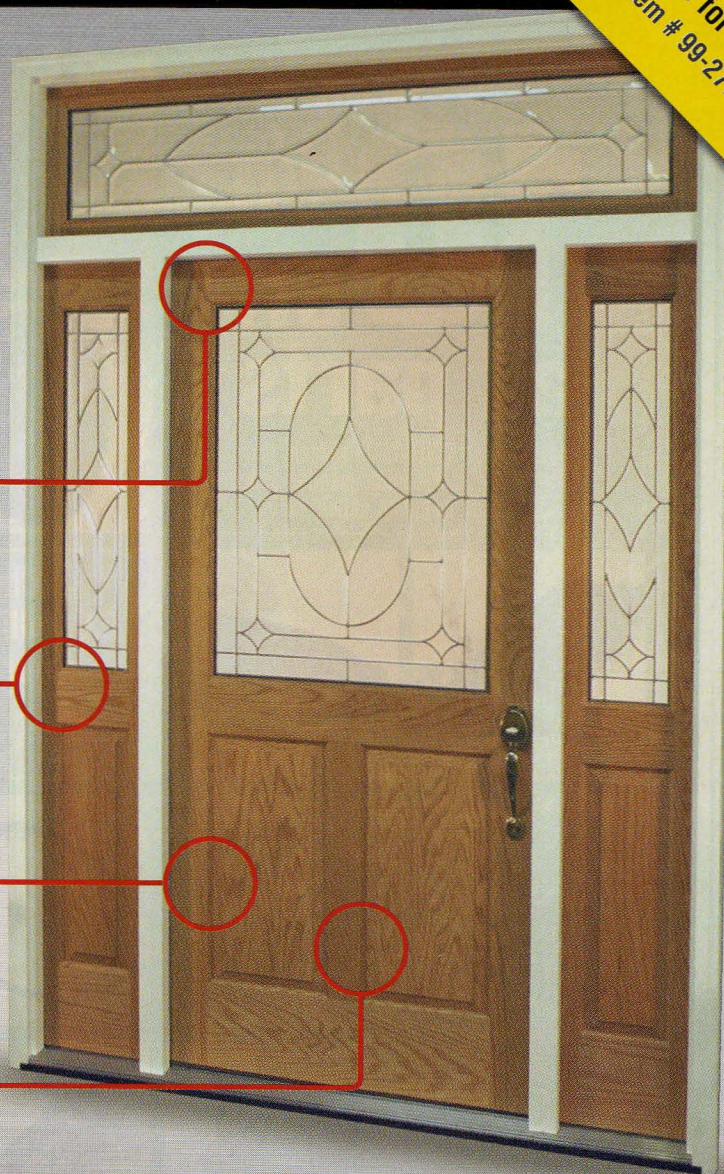
Introducing Freud's **NEW** Entry & Interior Door Router Bit System

NEW Freud Innovation (Patent-Pending Design)

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*Raised Panel Bit not included in all sets.



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www.freudtools.com

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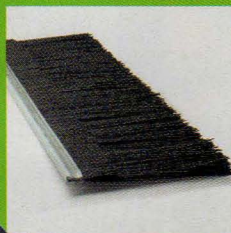
Item #: 99-267 shown here.
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Sears
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Departments

10 Question & Answer

Make biscuit joints with a router, choose between water- and oil-based polyurethane and remove more dust with an electrostatic air filter.

16 Workshop Tips

Build a scissors-action shop table base, adhere sandpaper back to back, color-code your old tools' switches, make a handheld featherboard, burnish an open miter, wrap a clamp handle with tubing for a better grip, build a finishing rack, make a router-bit depth guide and assemble an iron-pipe solvent decanter.

24 Well-Equipped Shop

Revo ornamental mill from Legacy Woodworking, CMT tenon-cutting router bit, Grizzly 6-in. parallelogram-bed jointer, Milescraft SignPro, Sommerfeld router-bit height gauge, Milwaukee and JessEm router table motor and Hitachi hybrid tablesaw.

30 The Tool Nut

We'll pay \$150 for your contribution to this new department.

32 My Shop

Stargazing Woodworker
Building telescopes in a super-organized shop.

34 ToolTalk

The WoodRat
This clever jig uses a plunge router to make 7 joints.

40 Turning Wood

Reshaping the Skew Chisel
A different profile produces a friendlier tool.

61 American Woodworker Extra

Subscribe to our e-newsletter for more great ways to build your skills and improve your shop.

84 Modern Cabinetmaker

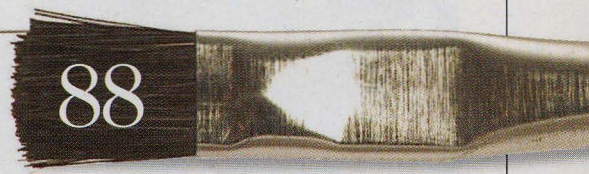
Precision 3-Wall Scribes
You're guaranteed a perfect fit if you use this simple template.

88 Build Your Skills

12 Tips for Successful Gluing
Follow the Scouting rule:
Be prepared!

92 Oops!

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can get you in big trouble.



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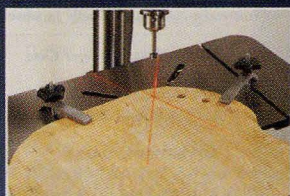
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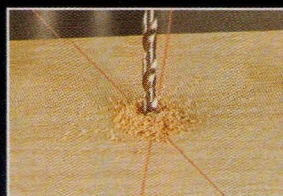
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Circle No. 27

EDITOR'S LETTER

A Good Day in the Shop

Of all the steps in building a piece of furniture, the two I most enjoy are cutting joints

and gluing parts.

I had plenty of practice doing both when I built the Shaker-style sideboard you'll find on page 46.

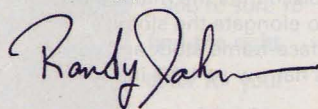
I like joinery work because it tests my skills. I also like the satisfying sound of a joint that slips smoothly and snugly together. Although I aim for a good fit on

the first try, I prefer to savor rather than rush the process. In fact, I usually find paring and tweaking a joint to make a perfect fit a very relaxing part of woodworking.

Gluing, on the other hand, makes my adrenaline flow. It demands more attention to the moment. The parts must be test-fitted, an order of assembly determined, the clamps readied, and then I have to *go for it*. That's not to say gluing has to be frenzied, although sometimes it is. Much like cutting a board to final length, when you glue there's no going back. For me, the satisfaction comes in seeing that all my careful measuring, cutting, fitting and preparing has been worth it. What started as a sketch on a coffee-stained sheet of paper has finally become a reality.

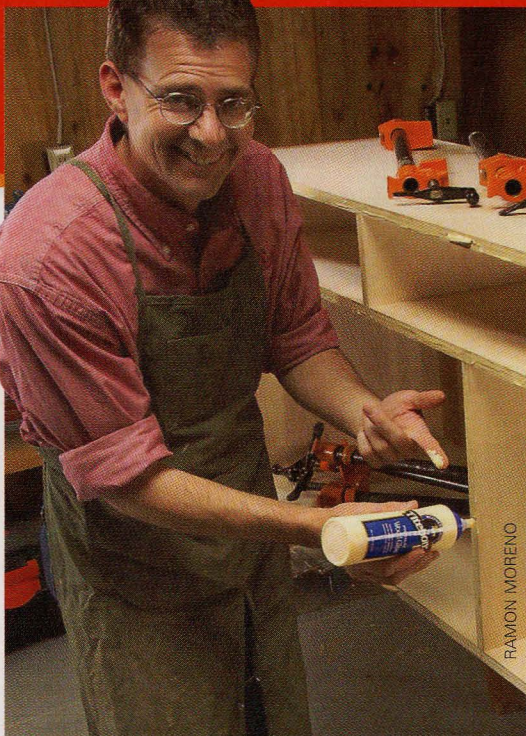
When everything goes well, I not only end up with a project that looks good and functions well, but I also have had the pleasure of spending a good day in one of my favorite places—my shop.

Wishing you lots of success in *your* shop,



Randy Johnson
Editor

American Woodworker magazine
randy_johnson@rd.com



IT WAS LIKE HIS NEIGHBOR'S SHOVEL WAS **NEVER BROKEN**

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Use a Router for Biscuit Joinery

Q I would like to try biscuit joinery but I do not own a biscuit joiner. Is it feasible to use a router to make the slots?

A A router with a 5/32-in. slot cutter will work fine for making an occasional biscuit joint. You can alter the slot depth to accommodate No. 0, No. 10 and No. 20 biscuits by using different router bits or by changing bearings.

To cut a biscuit slot with a router, you generally need to make the initial plunge cut and then move the router approximately 1/2 in. left and right of center. It's best to eyeball a couple tick marks 1/2 in. to either side of your biscuit layout mark. With the router running, push the bit in at the left-hand tick mark and slide it to the right-hand tick mark. The resulting slot has a different shape (see photo, above right) but the same joint-holding strength as one made with a biscuit joiner.*

Biscuit joiners do have an advantage when it comes to simplicity and range of possible joints. With a router, it's hard to slot bevels or execute a T joint—although it can be done with 5/32-in. straight cutter and a fence.



5/32" x 2-3/8"
SLOT CUTTER



1/8" x 1-1/2"
SLOT CUTTER



5/32" x 1-13/32"
SLOT CUTTER



#20 BISCUIT



#H-9 BISCUIT



#11 BISCUIT

Many manufacturers offer biscuit joining bits. Some use a single 5/32-in. slot cutter plus different sizes of bearings for different biscuit sizes. Others offer three separate bits for each biscuit. The MLCS system shown above uses three different bits. A specialized round biscuit fits the midsize bit without the need to elongate the slot. It's perfect for joining face-frame stock and can be used on rails as narrow as 1-1/2 in.

Source MLCS, (800) 533-9298, www.MLCSwoodworking.com No. 20 biscuit/slot cutter kit includes the bit and 250 No. 20 biscuits, 1/4-in. shank, #6065, or 1/2-in. shank, #8365, \$30. No. 11 biscuit/slot cutter kit, includes the bit and 100 No. 11 round biscuits, 1/4-in. shank, #6064, or 1/2-in. shank, #8364, \$33. No. H-9 biscuit/slot cutter kit, includes the bit and 100 No. H-9 mini biscuits, 1/4-in. shank, #6063, or 1/2-in. shank, #8363, \$28.

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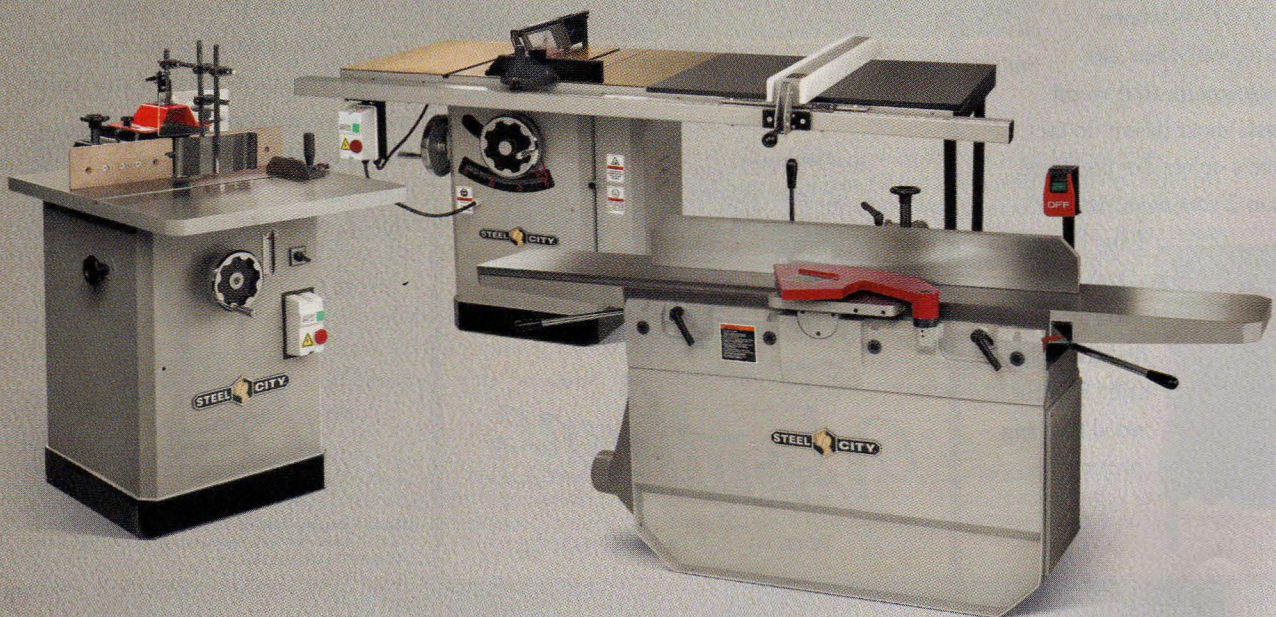
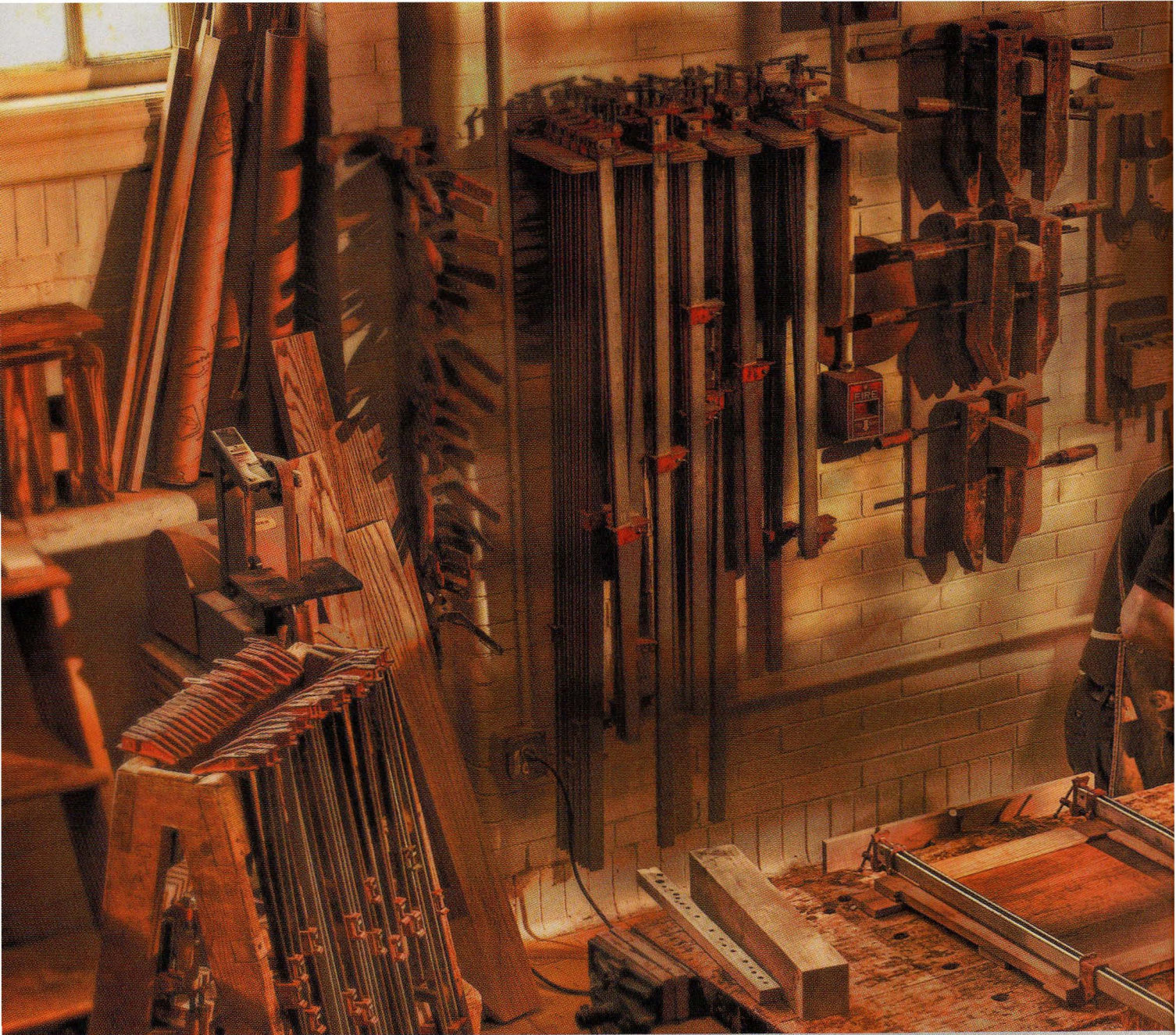


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Minwax is a registered trademark of the Sherwin Williams Company.
*Source: Preference Test of the Varathane Line versus the Minwax Line of Interior Wood Stains, May 2003



EXT. THRU MAR 31, 2007
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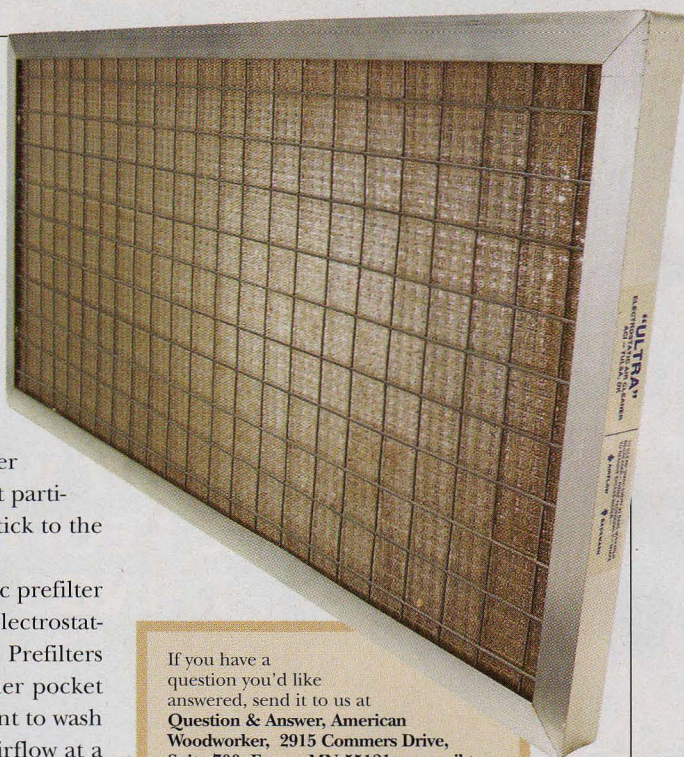
BY TOOL GUYS. FOR TOOL GUYS.

ELECTROSTATIC PREFILTERS' ADVANTAGES

Q I don't see anything special about the electrostatic prefilter that came with my air cleaner. There's no wire or contact point that would tell me it's electro-anything. Is this really any different than an ordinary filter?

A Although your prefilter is referred to as an electrostatic filter, the only electricity involved is static. When your fan is operating, the air passing over the filter media generates a static charge that attracts and holds dust particles. It's the same type of charge that causes a balloon to stick to the wall after you've rubbed it across your hair a few times.

For a woodworker, the main advantage of an electrostatic prefilter is that it can be washed and reused repeatedly. That's why electrostatic filters are typically used as prefilters on air scrubbers. Prefilters catch the larger dust particles before they plug up the finer pocket filters inside (which are a lot harder to clean). It's important to wash your electrostatic filter often for two reasons: 1. It keeps airflow at a maximum. 2. An electrostatic filter's effectiveness decreases as the filter loads with dust. That's because the media has become insulated by the dust, thus reducing the static charge.



If you have a question you'd like answered, send it to us at **Question & Answer, American Woodworker**, 2915 Commers Drive, Suite 700, Eagan, MN 55121 or e-mail to qanda@readersdigest.com. Sorry, but the volume of mail prevents us from answering each question individually.

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WATER-BASED VS. OIL-BASED POLY

Q I plan to finish a kitchen table with polyurethane for durability. Should I use water-based or oil-based poly?

A If you're looking purely at durability, then an oil-based polyurethane is still superior, but only marginally. There used to be distinct differences between water- and oil-based polyurethanes when it came to durability. Today, the differences are fairly minor.

Oil-based poly will be slightly more resistant to scratches, moisture and heat when compared with water-based poly.

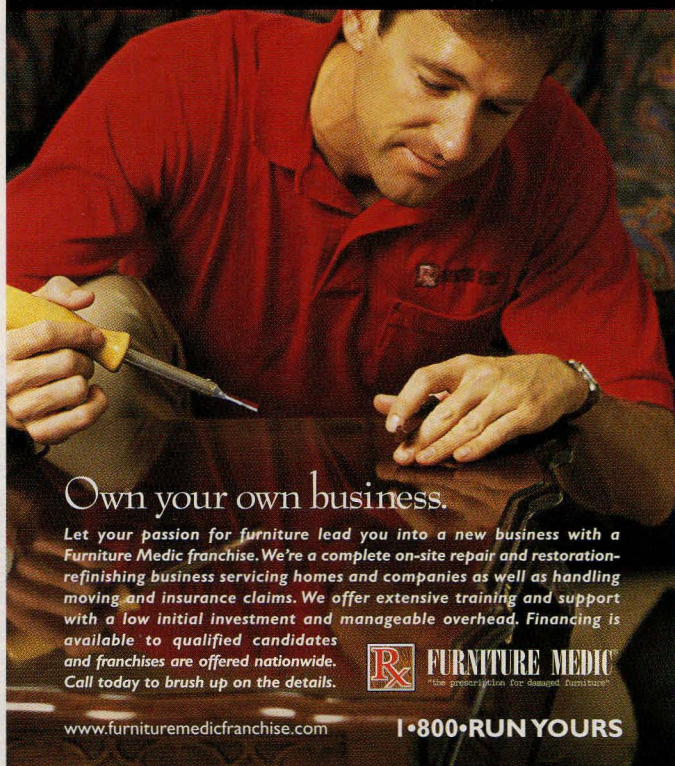
So, why use water-based when oil-based offers improved protection? There are three primary considerations: color, odor and drying time. Some woodworkers dislike the yellow cast oil-based polyurethane puts on white woods, such as maple. In general, a water-based polyurethane will not add color to the wood and will preserve the wood's natural tone. On woods such as cherry or walnut, this can be a disadvantage, because a straight water-based finish can make the wood look cold and uninviting. That's why finishers often use a seal coat of dewaxed shellac to impart

color and warmth before they put on a water-based finish. Another consideration is odor. Water-based polyurethane will give off little if any odor compared to oil-based poly—a real issue if your finish room happens to be in your basement. Finally, water-based poly dries a lot faster, giving dust less time to settle out of the air into your finish.



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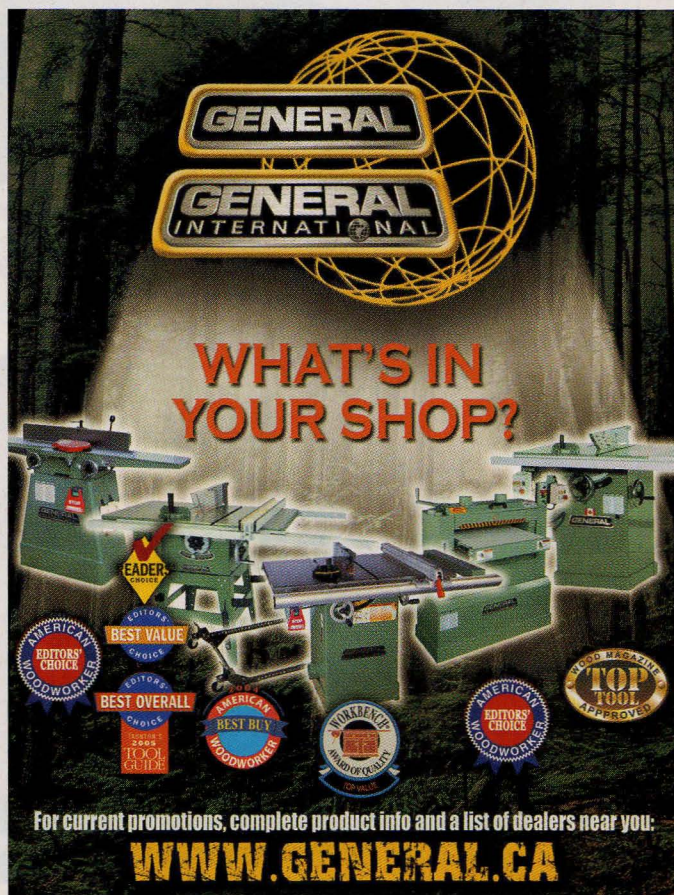


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edited by Tim Johnson
and Brad Holden

Folding Table Base

Want a mobile table base that provides a huge work area, holds a ton and folds up to only 7 in. thick? You can get everything you need to make the one shown here at the local home

center for about \$65. Build it to any size. Just make sure the folding support arms (E) and panels (F) fit inside the end frames, so the assembled table folds up completely. Screw on a top when you need a work surface and remove it when you're ready to stow the table. Hook-and-eye catches hold the folding supports open when the table is in use and keep it closed during storage.

Dick Ayers



CUTTING LIST Overall Dimensions: 24" x 28" x 44-3/4"

Part Name	Number	Dimensions
A Frame stile	4	1-1/2" x 3-1/2" x 21"
B Frame rail	4	1-1/2" x 3-1/2" x 24"
C Fixed support	4	1-1/2" x 3-1/2" x 21"
D Hinge mounting strip	4	3/4" x 2" x 21"
E Folding support arm	4	3/4" x 3-1/2" x 19-7/8"
F Folding support panel	2	3/4" x 13-3/4" x 19-7/8"

Hardware: Eight 3-in. butt hinges, four 5-in. strap hinges, five hook-and-eye latches, four 3-in. locking swivel casters.

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SUPER SANDPAPER

Whenever I was sanding by hand, the sandpaper would roll or slide in my hands, eventually tearing and turning into small, useless scraps. I tried folding it every which way until I finally solved the problem with a little spray adhesive. Now I cut a sheet of sandpaper in half and spray on a light coat of adhesive. Then, I fold the sandpaper to a quarter-sheet size, which is just right for hand-sanding. The glued paper doesn't roll or slide and its double thickness makes it stronger.

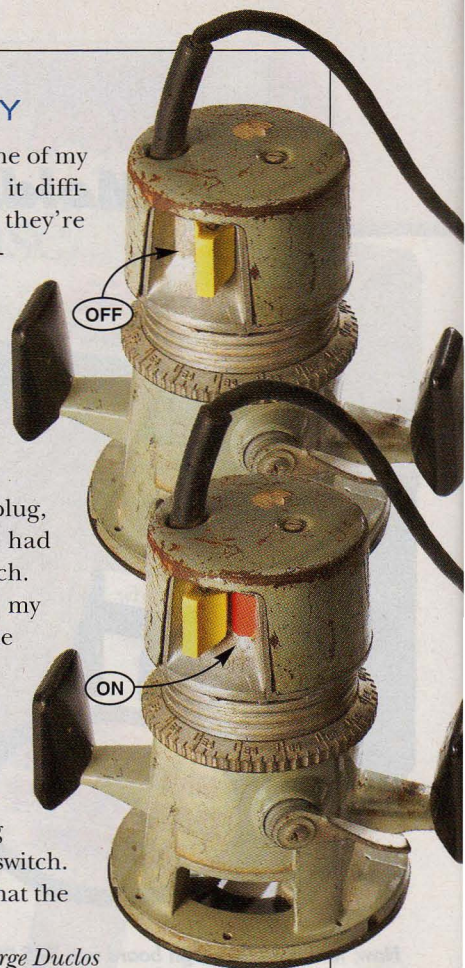
Brian Roesch

SWITCH SAFETY

Sliding switches on some of my older power tools make it difficult to tell whether they're switched on or off. I didn't think much about it until the time my router started right up when I plugged it in—I had unknowingly switched it on while I was changing bits. Before I could pull the plug, the runaway router had jumped right off my bench.

To easily tell whether my tools are on or off, I slide the switches to the on position—with the tool unplugged, of course—and apply a little bright-colored paint on the portion of the housing exposed by moving the switch. Now, bright paint warns that the power is on.

Serge Duclos



HANDHELD FEATHERBOARD

This unusual push stick provides fingertip control without risking your fingertips. Its V-notch end wraps around the board's edge to hold the workpiece against both the table and the fence, and its flexible tines produce a gripping action. The curved handle provides a comfortable hand position and effective control.

To make this handy helper, you'll need a piece of oak or other hard wood that measures 3/4 in. x 4 in. x 18 in. Start by making the V-groove. Saw one end of your blank at a 35-degree angle. Then tilt your tablesaw blade to 45 degrees and use your miter gauge to cut the V-notch. Finish by sawing the curved handle and the 1/16-in.-wide tines on a bandsaw.

Robert Strigley



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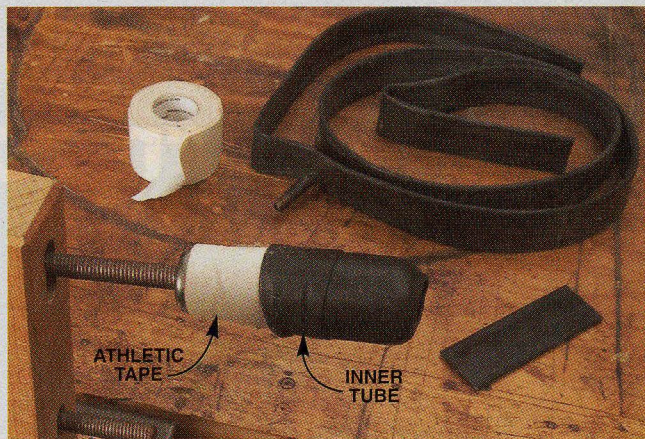
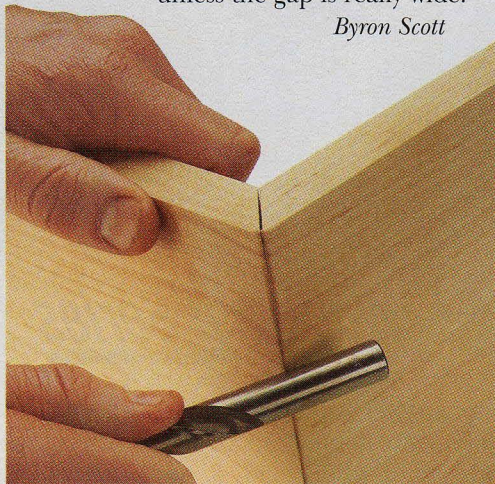
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RIKON

CLOSE AN OPEN MITER

I didn't notice this misfit miter until glue-up. Fortunately there's an easy way to hide narrow gaps like this one. Before the glue dries, rub the corner with a hard, rounded object, like a big drill bit. Rubbing crushes the wood fibers inward and closes the gap. The fibers stiffen as the glue dries. This leaves a rounded corner that's barely noticeable unless the gap is really wide.

Byron Scott



POWER-GRIP HANDLES

After 37 years of pushing pencils and typing on a keyboard at the office, my grip is not what it used to be. So I found an easy way to get a powerful yet comfortable grip on my clamp handles. First I wrap the handle with athletic tape. Then I stretch on a piece of bicycle inner tube that is slightly smaller in diameter than the handle. That's it! The tape helps hold the tube in place. If you don't have any used inner tubes, new ones are inexpensive, and a couple tubes will cover a lot of handles.

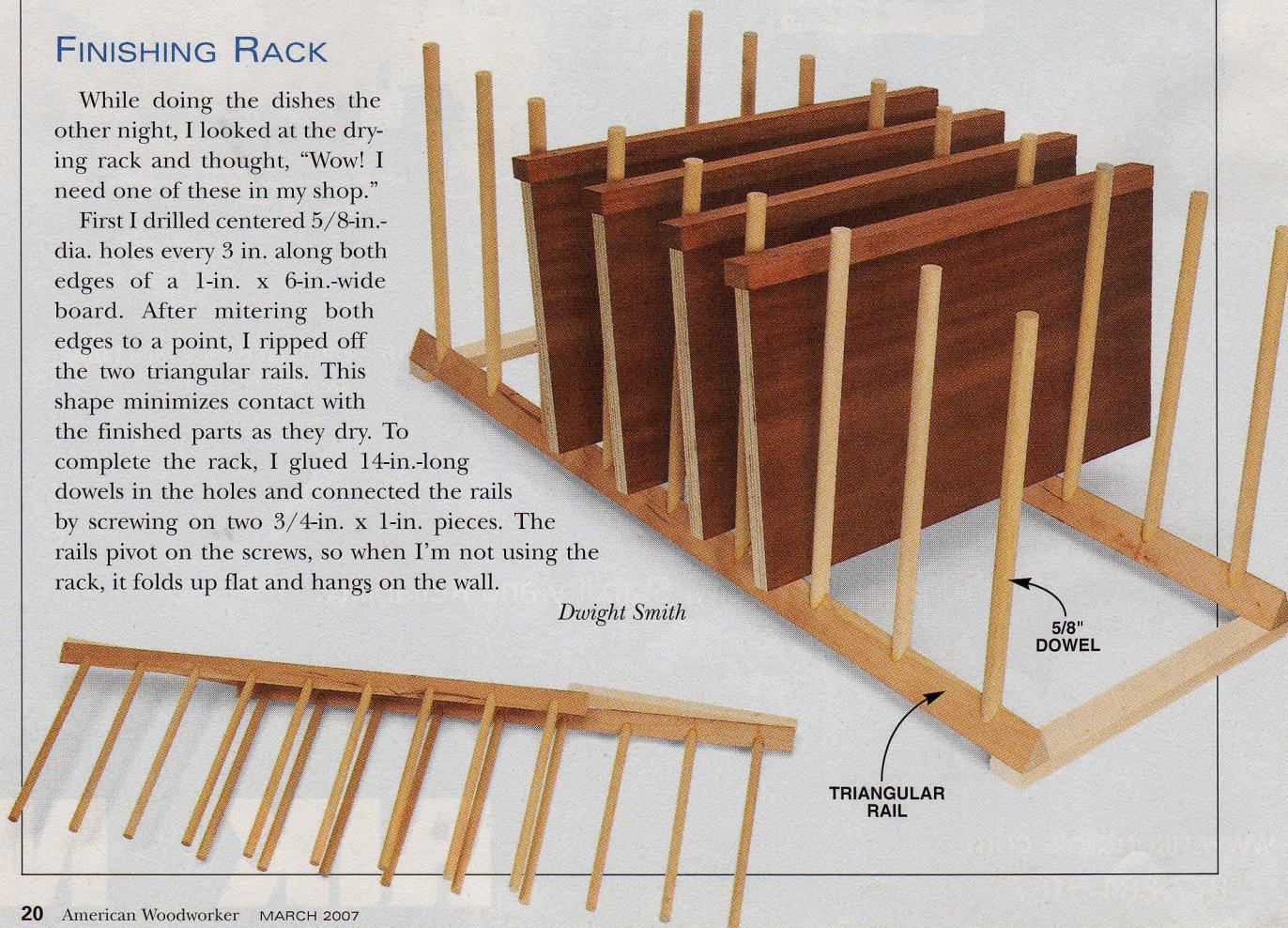
Serge Duclos

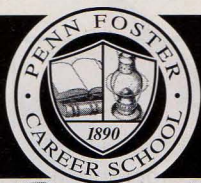
FINISHING RACK

While doing the dishes the other night, I looked at the drying rack and thought, "Wow! I need one of these in my shop."

First I drilled centered 5/8-in.-dia. holes every 3 in. along both edges of a 1-in. x 6-in.-wide board. After mitering both edges to a point, I ripped off the two triangular rails. This shape minimizes contact with the finished parts as they dry. To complete the rack, I glued 14-in.-long dowels in the holes and connected the rails by screwing on two 3/4-in. x 1-in. pieces. The rails pivot on the screws, so when I'm not using the rack, it folds up flat and hangs on the wall.

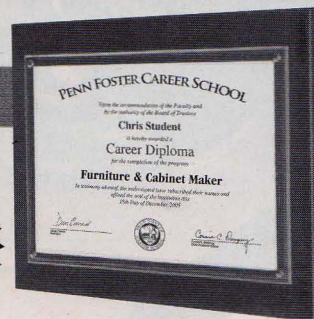
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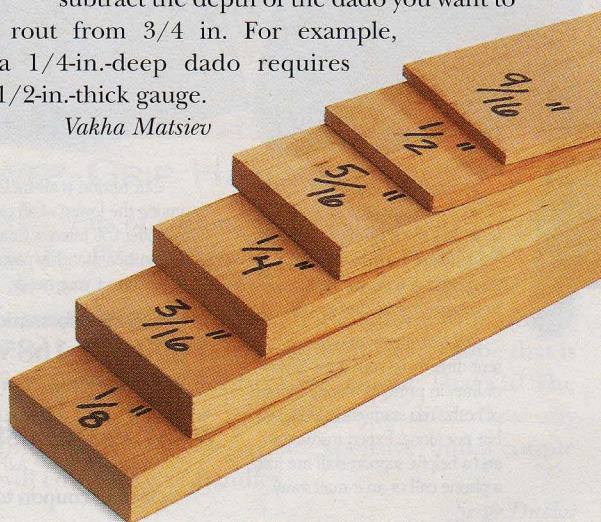
Rebate offer good on purchases made Jan. 1–Apr. 30, 2007. Rebate cannot be combined with any other offer from manufacturer.



ROUTER DEPTH SETTER

This jig makes it easy to set the bit for routing flutes or dadoes. I simply drop the appropriate depth gauge into the channel, set my router on top and lower the bit until it touches the gauge. The base is an 8-in. square piece of 3/4-in. MDF. Two strips of 3/4-in. MDF on top create a channel for the gauges. To make the gauges, subtract the depth of the dado you want to rout from 3/4 in. For example, a 1/4-in.-deep dado requires a 1/2-in.-thick gauge.

Vakha Matsiev



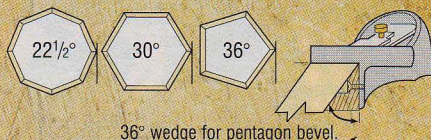
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SOLVENT DECANTER

I came up with this 5-ft.-tall decanter to recycle my varnish-contaminated mineral spirits. It's made from standard plumbing supplies from the local home center (about \$50). It holds a gallon of mineral spirits and hangs in a cool, dry place, away from heat or flames, as recommended on the mineral spirits container. I used high-strength Loctite adhesive for all the joints except the bottom cap. There I used medium-strength Loctite, so I can easily remove the cap to clean out the solids that accumulate in the trap. Two to three days after pouring in used mineral spirits, the varnish solids settle out, leaving everything above the ball valve clear and ready to reuse.

Rick Rule

STEP 1
Pour in varnish-contaminated mineral spirits.

STEP 2
Wait for solids to settle in the trap.

BALL VALVE

MOUNTING CLAMP

TOP CAP

TRAP

STEP 3
Draw reusable mineral spirits from above the ball valve.

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by George Vondriska

Benchtop Ornamental Mill



Legacy Woodworking has a long history of producing ornamental mills. These incredible machines are similar to a lathe, with the workpiece mounted between head and tail stocks, but they use a router rather than handheld tools. The router can cut spirals, flutes, coves, ropes and dentil moldings. Turning the handle on the machine's left end rotates the workpiece and tracks the router left to right. The gears and router bit can be changed to achieve different effects.

Until now, a Legacy ornamental mill was quite large and cost as much as \$9,300, depending on the model. The new Legacy Revo has a smaller footprint, 24 in. x 48 in., and a smaller price tag, \$795, router not included. Weighing only 65 pounds, it can be placed on a workbench and put away when you're done.

The Revo has many of the same creative capabilities of its larger cousins but a smaller capacity. The Revo will handle stock as big as 6 in. in diameter and 32 in. long. Other machines in Legacy's line can handle stock as large as 13 in. in diameter and 126 in. long.

Ornamental mills are very cool machines, capable of many operations. If you're interested in learning more, call Legacy and ask for a free DVD. You'll become hooked!

Source Legacy Woodworking, (800) 279-4570, www.legacywoodworking.com
Legacy Revo, #LREVO, \$795.



The Legacy ornamental mill is capable of making complex decorative designs on round objects, both large and small. It will also make moldings for flat objects, such as the jewelry box shown above.



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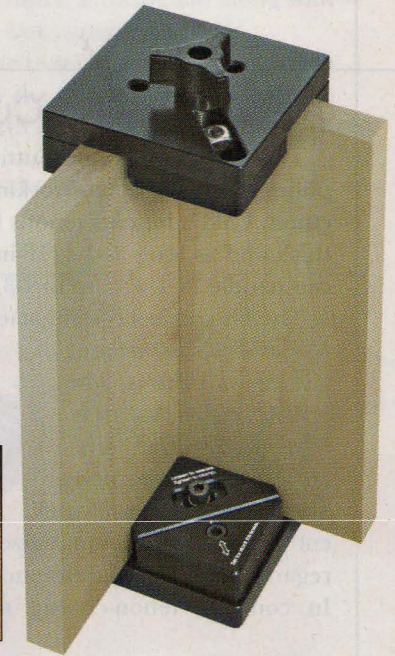
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FEATURE-PACKED 6-IN. JOINTER

Grizzly's G0604 jointer includes great features usually found on more expensive machines. At 56 in., its bed is about 10 in. longer than those on standard 6-in. jointers. As you know, every extra inch is helpful for jointing straight edges on long stock.

The G0604's four-knife cutterhead spreads out the workload more than a typical three-knife cutterhead, so you can go longer between knife changes. My tired back appreciates the easy-to-reach on/off switch. I also like the extra large off paddle. A mobile base is built in, saving you the cost of adding one later.

The infeed and outfeed tables operate on a parallelogram system, instead of sliding on dovetailed ways. It's easier to tweak the tables into alignment on parallelogram-bed jointers if needed, because shimming isn't necessary.

Source Grizzly Industrial, (800) 523-4777, www.grizzly.com
G0604 6-in. jointer, \$525.



NEW WAY TO CUT TENONS

The new CMT Tenon-Cutting Router Bit, \$99, simplifies making tenons. Working like a massive tongue cutter, CMT's bit cuts tenons from 3/16 in. to 3/8 in. thick and as long as 1-1/16-in. in a single pass. It can handle material up to 1-3/8 in. thick.

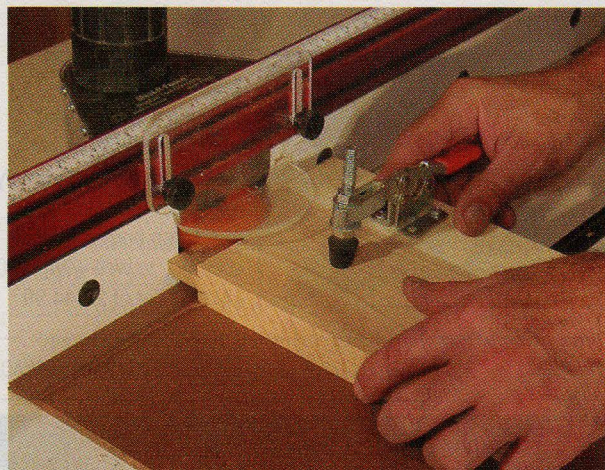
The bit consists of four stackable slot cutters and an assortment of spacers and shims. The beauty of this system is that once the slot cutters are correctly spaced, every tenon you cut is exactly the same size, regardless of minor differences in material thickness. In contrast, tenon-cutting techniques that require

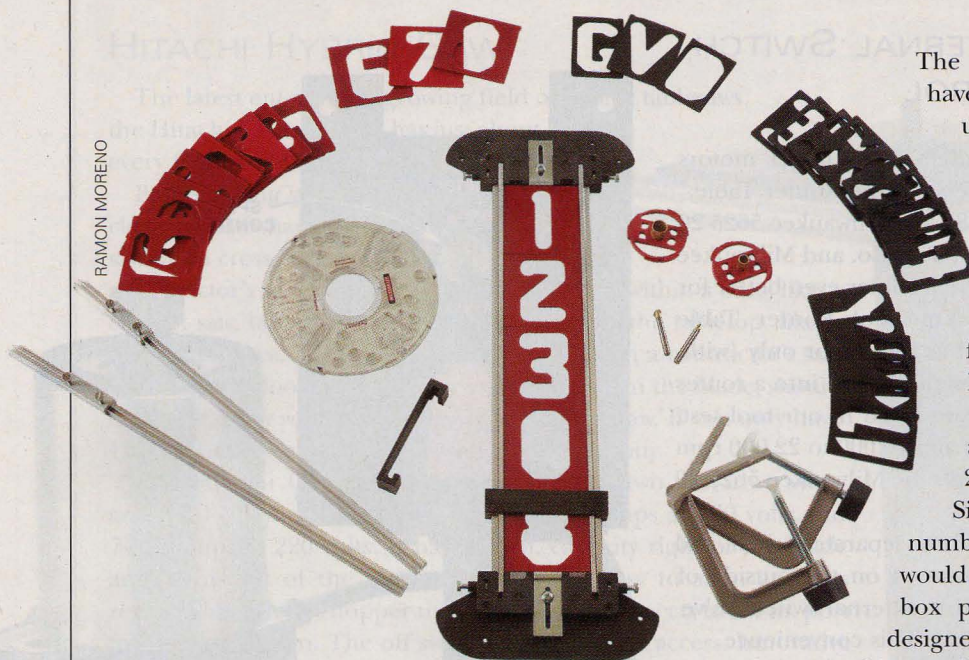
machining one face, then flipping the board to cut the other face, may result in irregularly sized tenons.

A guide sheet is included with the bit, indicating which shims and spacers to use to achieve a tenon of a given size, but test cuts are still recommended to perfectly match the tenon to a mortise.

You'll need at least a 2-1/4-hp router to rout the longest tenons in a single pass. You also need variable speed, since this bit should run at 12,000 rpm. The shop-made sled (see photo, left) is a must when cutting narrow rails.

Source CMT, (888) 268-2487, www.cmtusa.com
Tenon-cutting router bit, #800.627.11, \$99.





RAMON MORENO

The SignPro's new guide bushings have brass necks, which should hold up better than the ABS plastic ones on the Signcrafter. The mounting brackets are larger and easier to clamp to the work. In fact, two C-clamps are included with the kit.

The SignPro comes with four sets of letters and numbers. Each piece is clearly labeled to identify the character. Two sets are 1-1/2 in. tall and two are 2-1/2 in. tall. New with the SignPro is the ability to place the numbers vertically in the jig, as you would to rout numbers along a mailbox post. A universal router plate, designed to accept the Milescraft guide bushings, is included with the kit, along with 3/8-in. and 1/4-in. core-box router bits.

Milescraft will continue to sell the Signcrafter, which retails for \$10 less than the SignPro, but I think the SignPro is definitely worth the extra dough.

Source Milescraft, (815) 874-2400, www.milescraft.com
SignPro, \$49.99.

REWORKED SIGN-MAKING KIT

Having recently used a Milescraft Signcrafter to rout names into nearly 1,000 fence pickets for a playground project, I was excited to look at the new Milescraft SignPro, \$49.99, a beefier version of the Signcrafter.

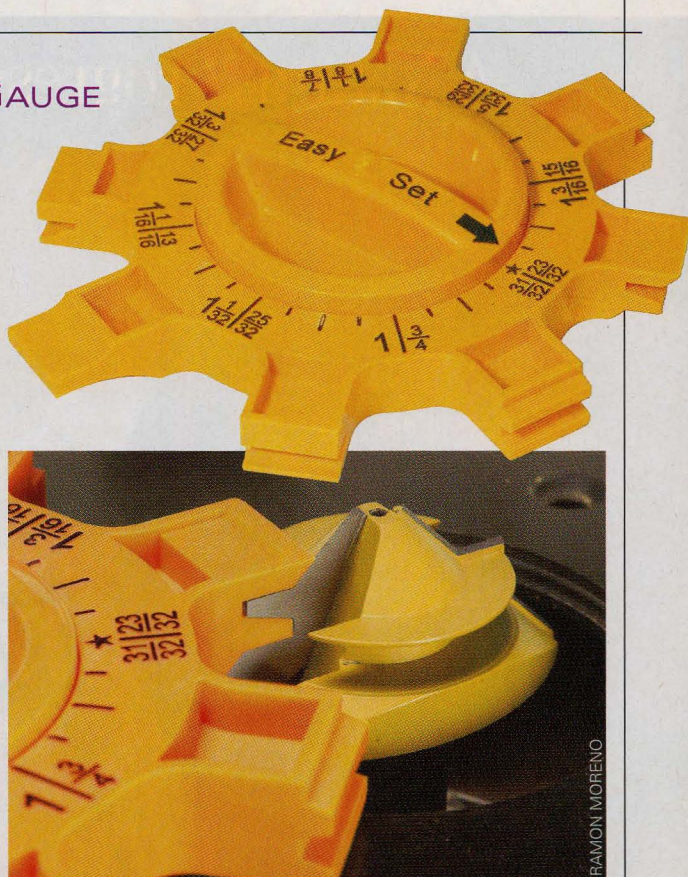
SIMPLE, ACCURATE BIT-HEIGHT GAUGE

The new Easy Set from Sommerfeld's Tools, \$29, is one of the best ideas I've seen in a long time. It easily and precisely sets the height of eight different Sommerfeld's and CMT router bits.

Each arm on the Easy Set matches a different bit profile. To use the Easy Set, first measure the thickness of the material you'll rout. The more accurately you measure your material's thickness, the more accurately you can adjust the Easy Set. Each click on the dial raises or lowers the profiles by 1/128 in. Turn the dial to position the pointer at your material's thickness. This adjusts the profile to the perfect distance above the router table. Slide the Easy Set up to your router bit and adjust the bit's height to match the profile.

The Easy Set works with material from 23/32 in. to 1-3/16 in. thick. The eight profiles it contains are lock miter, 22.5-degree lock bit, drawer lock, reverse glue joint, groove of a tongue and groove, glass-panel cope cutter, raised-panel cope cutter and raised panel. These profiles are specific to CMT and Sommerfeld's bits and may not work with other brands.

Source Sommerfeld's Tools for Woodworking, (888) 228-9268, www.sommerfeldtools.com Easy Set router setup jig, \$29.



RAMON MORENO

ROUTER WITH EXTERNAL SWITCH AND SPEED CONTROL

When we tested routers with 3-hp or larger motors ("Tool Test: Powerhouse Routers for the Router Table," AW #106, March, 2004, page 58), the Milwaukee 5625-20 was our Editors' Choice. JessEm Tool Co. and Milwaukee have teamed up to make this great router even better for router tables. The new JessEm Tool Router Table Milwaukee Motor, \$489, is sold as the motor only (without base) and is specifically designed to go into a router lift. It's the same great motor we loved in our tool test, with electronic variable speed from 10,000 to 22,000 rpm and soft start. Any lift that accepts the Milwaukee 5625-20 motor will accept this one.

The new model comes with a separate switch and speed control that can be mounted on the outside of your router table. This is the first external switch we've seen that combines both features. This convenience does come at a price, though. This machine is about \$150 more than the same router with base and built-in controls.

Source JessEm Tool Co., (866) 272-7492, www.jessem.com
Tool Router Table Milwaukee Motor #05626, \$489.



A Natural Progression to...



HITACHI HYBRID SAW

The latest entry in the growing field of hybrid tablesaws, the Hitachi C10LA, \$950, has just about every feature you could want.

Before giving you the details, let's clear up just what hybrid means in a saw: It's a cross between a cabinet saw and a contractor's saw. A hybrid's motor is enclosed within a base, like a cabinet saw, but its trunnions are mounted to the tabletop, like a contractor's saw. The result is less vibration than a contractor's saw and a smaller footprint, but more work to realign the blade, should it need it, than you would have with a cabinet saw. If you only have 120-volt outlets, a hybrid saw is the best type to buy.

The Hitachi C10LA is a left-tilt saw with two cast-iron wings and a 1-1/2-hp motor. The motor pulls 15 amps at 120 volts and 7-1/2 amps at 220 volts. It has a 30-in. capacity right of the blade and 18-in. left of the blade. The fence is easy to align and has replaceable sides. A hopper under the blade connects to a 4-in. port for dust collection. The off switch is very easy to access. Innovative features include a 21-in.-long folding outfeed table, a bevel-tilt scale built into the tabletop and a blade-tilt wheel in front of the cabinet rather than on the side. All in all, it's a very nice machine.

Source: Hitachi, (800) 706-7337, www.hitachipowertools.com
10-in. saw, #C10LA, \$950.



American Woodworker MARCH 2007 29

... The Best Wood Glue Ever

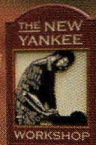
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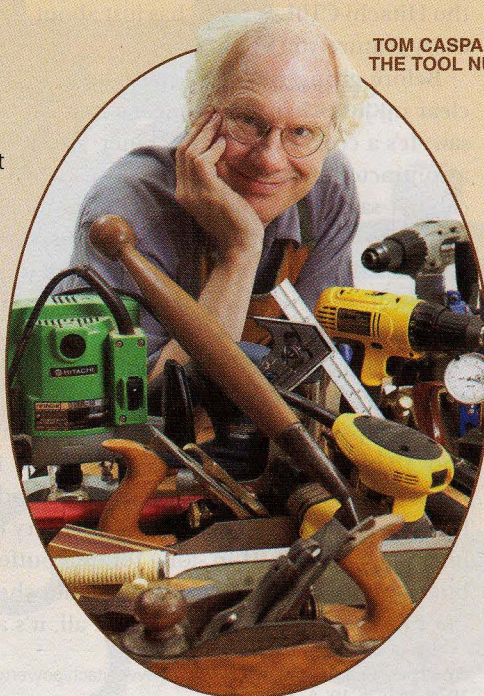
I really don't need five cordless drills, seven routers or 24 antique hand planes, but I can't help it. I'm a tool nut. **Are you?**

Have you ever bought an old woodworking machine just because it looked cool? Tried a new tool and said, "Wow! This just changed my life!" Used a big, industrial machine and wondered how in the world you could sneak it into your shop?

We'd like to hear your stories. So e-mail or send us a letter about a tool or machine that really gets you excited. We'll pay you \$150 if we publish your story. Please include a photograph, too. We'd prefer a digital image, but a slide or print is OK. Visit our Web site, www.americanwoodworker.com/toolnut for some examples of what we've got in mind.

E-mail your entry to thetoolnut@readersdigest.com or write to us at The Tool Nut, American Woodworker magazine, 2915 Commers Dr., Suite 700, Eagan, MN 55121.

**TOM CASPAR,
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Superior Dust Collection



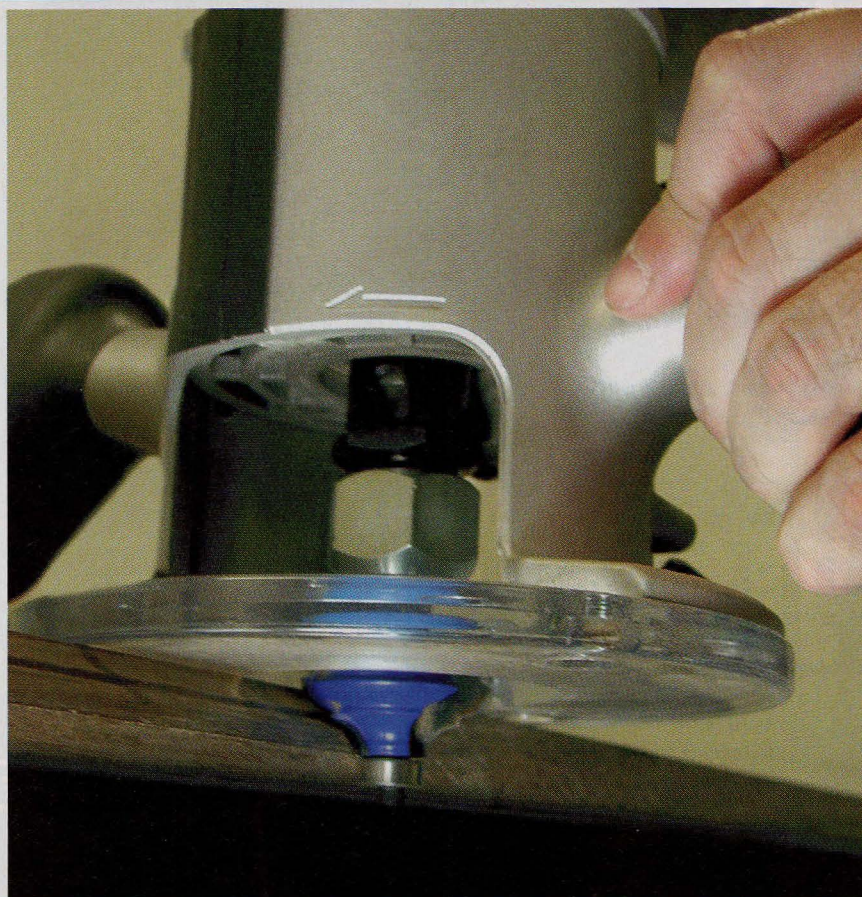
JDS Dust Force
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w/ 1 mic Bag
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w/ 1 mic Canister
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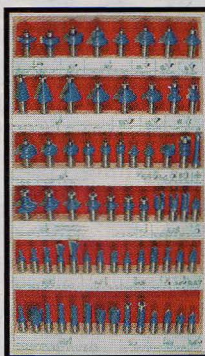
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ONLY \$**189⁹⁵**

WL-2066 : 1/2" Shank
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Route-R-Joint

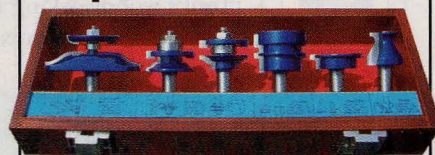
As seen on DIY Network! This simple system uses interchangeable guide templates to produce an ever growing number of beautiful decorative dovetails for drawers, boxes and furniture in no time at all. Amateurs, children and professional woodworkers will enjoy the ease of use, safety and simplicity of this system while making magnificent joints!

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- 2-piece ogee rail & stile
- reversible glue joint
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- door lip

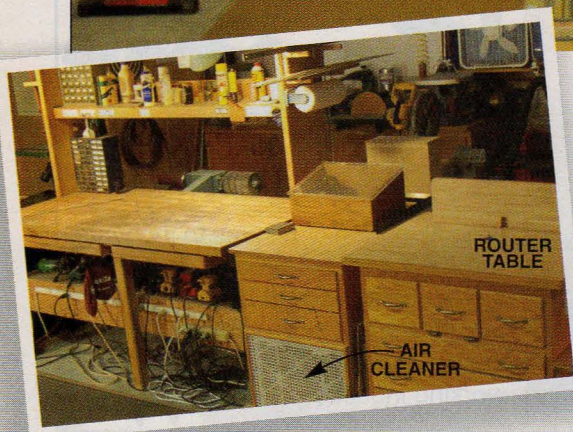
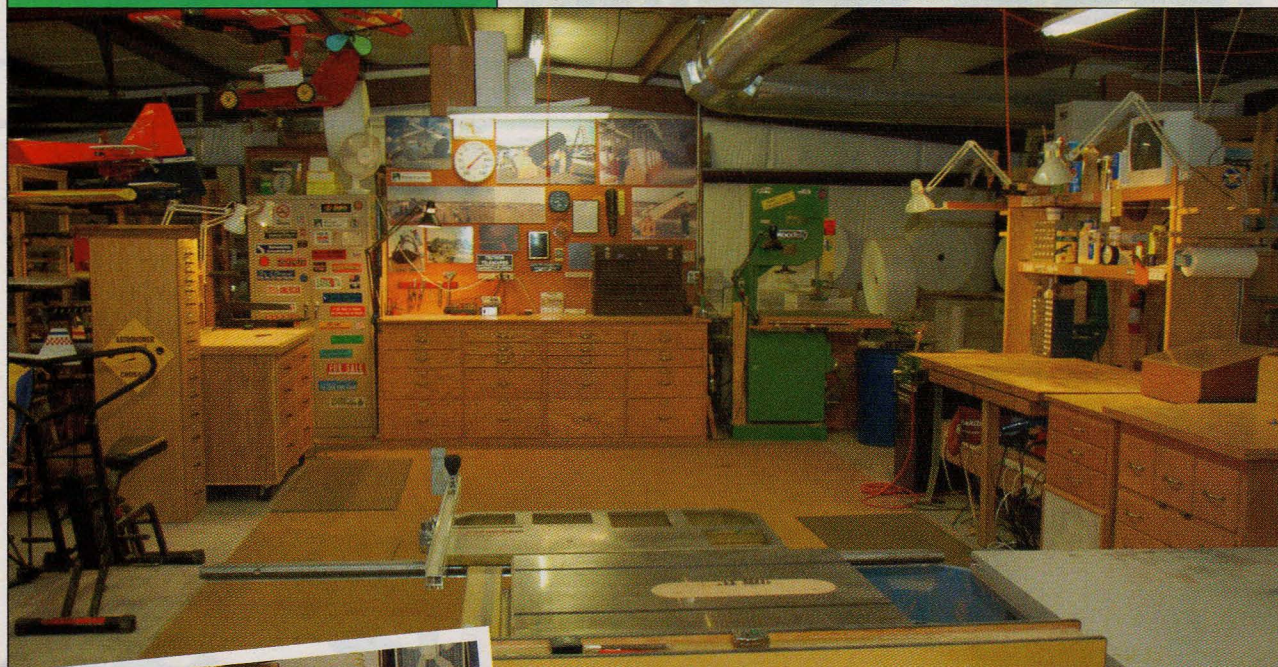
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WL-2020-1 : 1/2" Shank

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Stargazing Woodworker

"My shop has more than 100 drawers to store all the parts and special tools for my projects," says Tom Clark of Chiefland, Fla. Tom got hooked on woodworking while pursuing lifelong interests in building telescopes and radio-controlled model airplanes. "I needed storage cabinets," he explains, "and my woodworking just took off from there."

Tom's freestanding 40-ft. x 60-ft. shop includes well-lit workstations for intricate work and open space for large assemblies, because some of his telescopes are as large as cars (to see one,

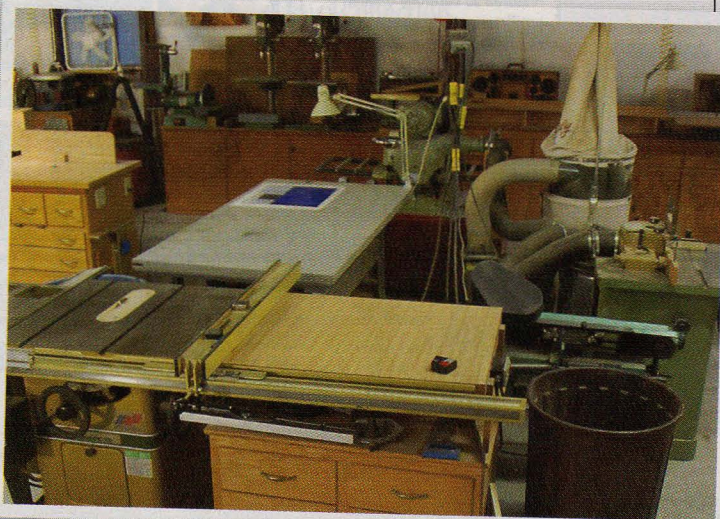
visit www.floridastars.org/icons/yardscope.jpg).

Tom's woodworking machines are clustered for efficiency. His shop-built air cleaner sits right where it's needed—next to his workbench. Tom also designed and built the lift-top router table, as well as many furniture pieces in his house. Tom describes his furniture designs pragmatically: "In my life, almost everything has been square." And his next project? "A real airplane!"

Tell us about your shop!

Send us photos of your shop and a description of what makes it interesting. What do you make in it, and what makes your shop important to you? Readers whose shops are featured will receive \$150.

E-mail your entry to myshop@rd.com with digital photos attached. Or mail your description with prints or digital photos on a disc to **My Shop, American Woodworker**, 2915 Commers Dr. Suite 700, Eagan, MN 55121. Please include your phone number. Submissions cannot be returned and become our property on acceptance and payment. We may edit submissions and use them in all print and electronic media.

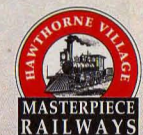


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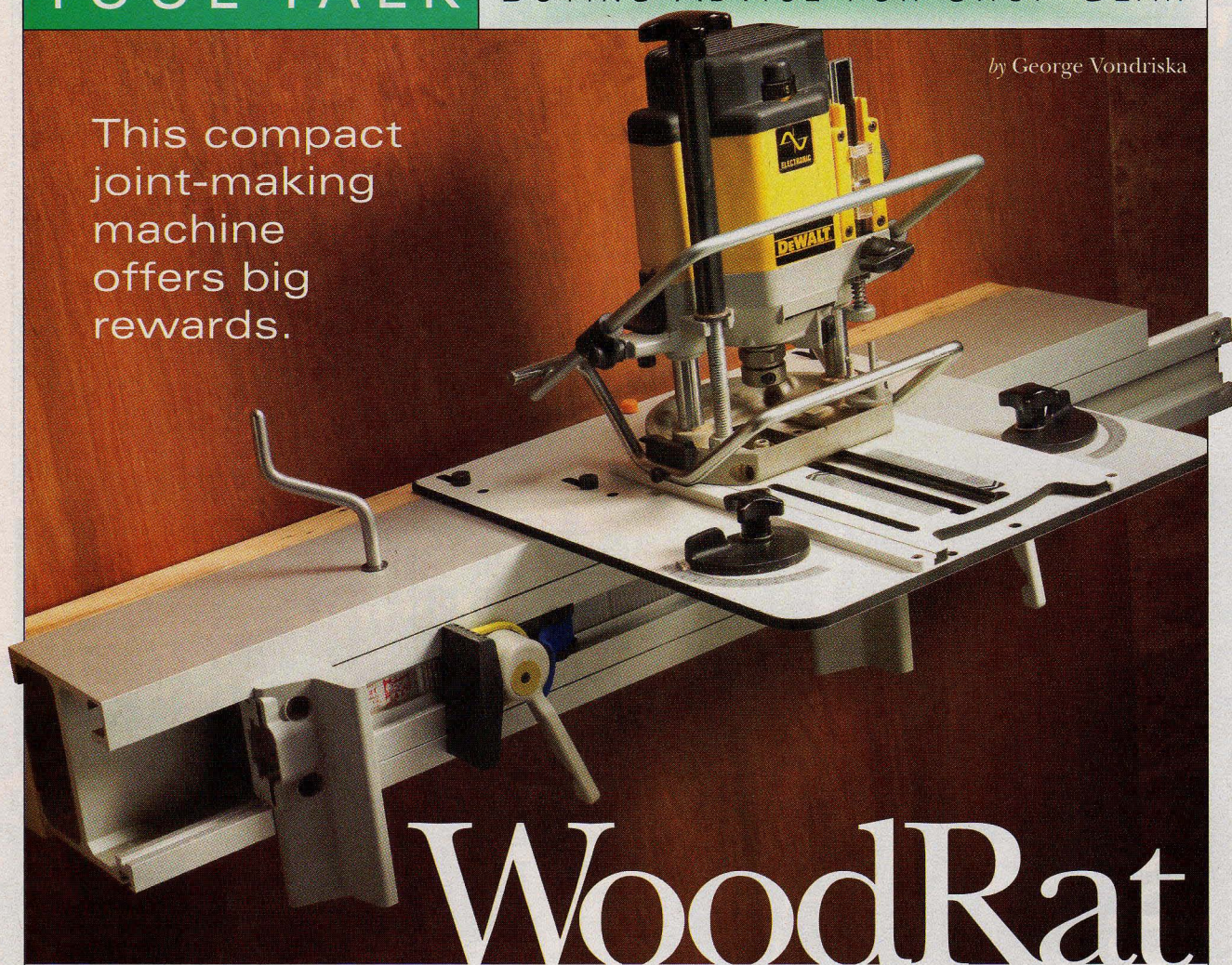
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* Plus \$8.99 shipping and service. All sales subject to acceptance and product availability. Please allow 4-6 weeks for delivery.

49177-E80901

by George Vondriska

This compact joint-making machine offers big rewards.



WoodRat

The WoodRat cuts finger joints, through and half-blind dovetails, sliding dovetails, grooves, dadoes, mortises, tenons, raised panels and even circles and dowels. That's a lot of versatility for the money. In fact, the WoodRat WR5 (\$629) is one of the most versatile machines I've ever used.

If you have limited space, you'll appreciate the WoodRat's compact size. Designed to be wall-mounted, it extends only about 7 in. when the baseplate is removed. If wall space is unavailable, the WoodRat can also be adapted to mount on a bench.

The WoodRat requires a plunge router. The mounting plate is predrilled to accept numerous brands. I recommend at least a 2-1/4-hp 12-amp router.

PRECISE CONTROL

The WoodRat provides excellent joint-cutting control. The wood and router are both secured in the

jig, so for most cuts, you don't have to hand-hold the material or router as you would on a router table or with other router-based jigs. I really love the power-feed capability you get by turning the crank to feed the material past the bit. This allows such operations as climb-cutting shoulders on tenons. Climb-cutting greatly reduces splintering when you rout end grain.

PRACTICE MAKES PERFECT

The WoodRat isn't the most intuitive machine to operate. Even if you've used other router-based jigs, such as dovetail jigs, plan to spend plenty of shop time learning to use it. When you understand how the WoodRat works, cutting dadoes, mortises and tenons becomes easy. But some operations—dovetails, for example—are fussy to set up and tricky to execute. I found I had to work completely through the dovetailing process start to finish to get the big picture and then tweak my skills on another practice joint before moving to the real thing.

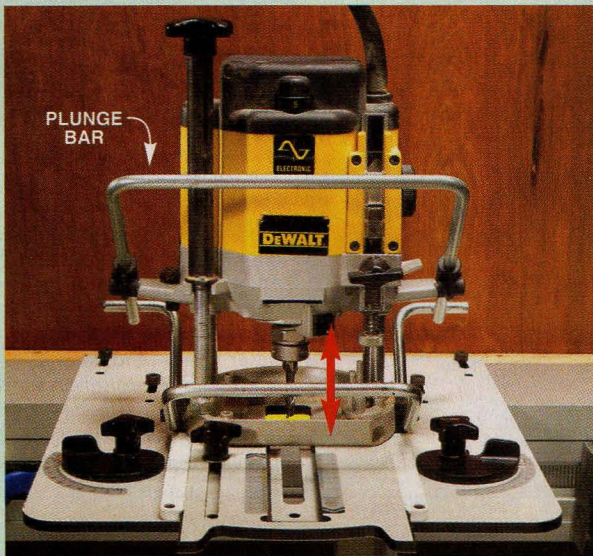
HOW THE WOODRAT WORKS

The WoodRat consists of a baseplate and an extruded channel. The baseplate holds a mounting plate for the router that slides and can be locked in any position. The channel cradles a crank-operated sliding bar. Clamps on the sliding bar hold the workpiece and sometimes an indexing piece. The sliding mechanism operates with virtually no play, so no lock is needed.

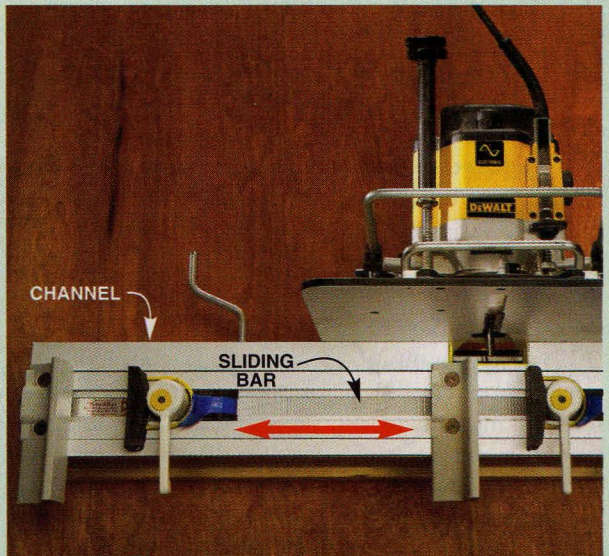
To operate the WoodRat, you move the mounting

plate and the sliding bar separately or in tandem, depending on the joint you want to rout. Four types of movement are possible (see photos, below).

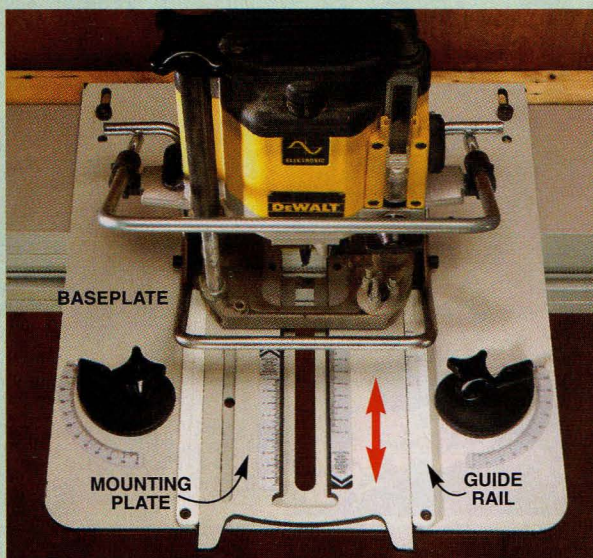
In addition, the WoodRat can operate like a router table, with both the router and the sliding bar stationary. You simply push the workpiece through the bit, using the extruded channel as a fence and a clamped-on brush that holds the workpiece against the baseplate.



UP AND DOWN. The router's plunge mechanism controls the depth of cut and allows creating the distinct starting and stopping points required for mortises and stopped grooves and dados. The plunge bar makes this a simple one-hand operation (see "Must-Have Accessories," page 36).



SIDE TO SIDE. Turning the crank moves the sliding bar left and right past the router and bit, which are fixed in place. Cam-lever clamps mounted on the sliding bar hold the workpiece and indexing piece (used for some operations) in position, so they move with the sliding bar. Used when routing mortises, tenons, dovetails and finger joints.



FORWARD AND BACKWARD. The router's mounting plate slides in and out on the baseplate. Guide rails ensure it tracks perpendicularly to the face of the jig. Used when routing dados, dovetails, finger joints, tenons, or wide mortises.



AT ANGLES. The router's mounting plate can move forward and backward at angles, instead of perpendicularly to the face of the jig. Eccentric spiral discs determine the angles. Used when routing dovetail sockets.

To cut dovetails, you make a mark on the face of the jig and use that mark to index subsequent cuts (see "Dovetails," page 38). This system allows you to infinitely vary the spacing between dovetails, but it takes practice to learn how to position your work relative to the index mark, which is critical for good results. The digital scale simplifies making these adjustments (available as an accessory, see Sources, page 38).

FINAL ANALYSIS

In most shops, the WoodRat WR5 will be used for joint-making, but it can also function like a router table to produce dadoes, grooves, edge moldings and even raised-panel doors.

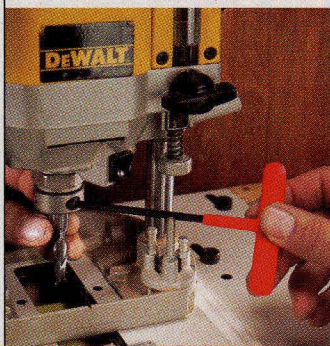
The WoodRat can't be compared dollar-for-dollar to dovetail jigs, because it's more versatile. If you focus on dovetailing capabilities, such as infinitely variable spacing and bit size choices, the WoodRat is comparable to premium dovetailing jigs, such as the Leigh D4R and the Porter-Cable Omnijig, but it costs more.

If you only want a basic dovetail jig, you don't need a WoodRat. But if you want to add a multi-function machine to your shop, and you're willing to put in practice time, the WoodRat is a great choice. It's definitely a machine you can grow with.

Must-Have Accessories

Many accessories are available for the WoodRat. Here are two I really found useful.

THE PLUNGE BAR, \$35, adds leverage and control that make plunge-routing smooth and easy—you can even plunge with one hand while finessing the stop rod for depth of cut with the other. In addition, the bar is great for pulling the router through the cut. Versions are available for many different plunge routers.



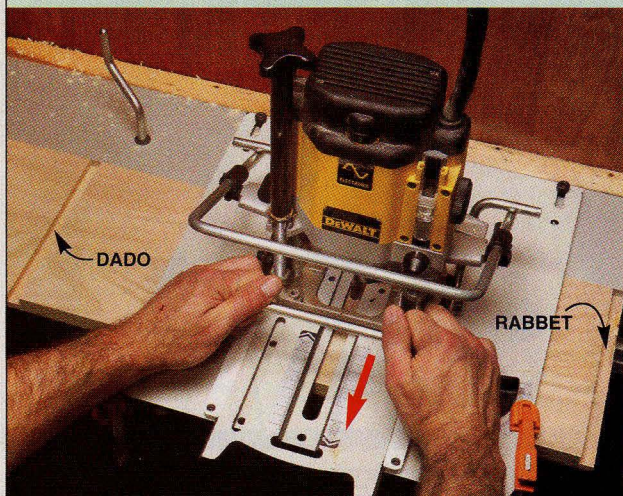
THE QUICK-CHANGE CHUCK, \$52, makes changing bits easy because it allows tightening and loosening the collet with one hand. This means you can hold on to the bit with the other hand—and keep it from falling through to the floor. Available for DeWalt, Porter-Cable and Bosch plunge routers.

MAKING JOINTS WITH THE WOODRAT

DADOES, RABBETS AND GROOVES

Routing dadoes and rabbets requires only the WoodRat's forward-and-backward movement. Routing grooves in a board's edge requires side-to-side movement. Routing grooves in a board's face is even simpler. Just push the board (see photo, below right).

You'll need to follow the owner's manual step by step when routing joints, but here's a quick look at the WoodRat's joint-making capabilities.



Route dadoes and rabbets by clamping the workpiece in place under the baseplate and pulling the router across it.



Route a groove—for a drawer bottom, for example—by locking the router in place and pushing the board under it. The WoodRat comes with a stiff bristled brush that clamps underneath and holds the board tightly against the baseplate. To rout a groove in a board's edge, clamp the board to the sliding bar and turn the crank.

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- 1 Double Round Over • 3 bearings & allen wrench

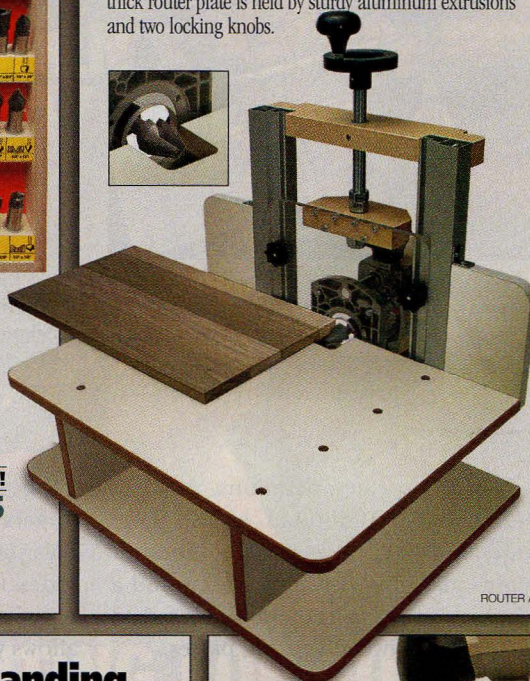
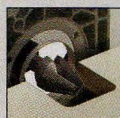
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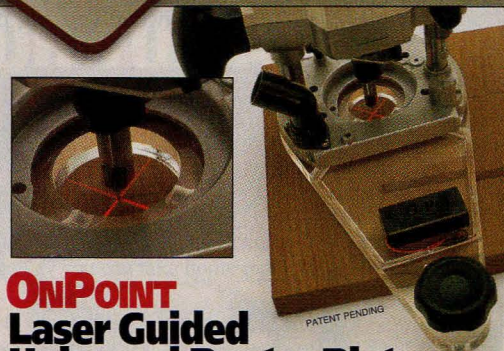
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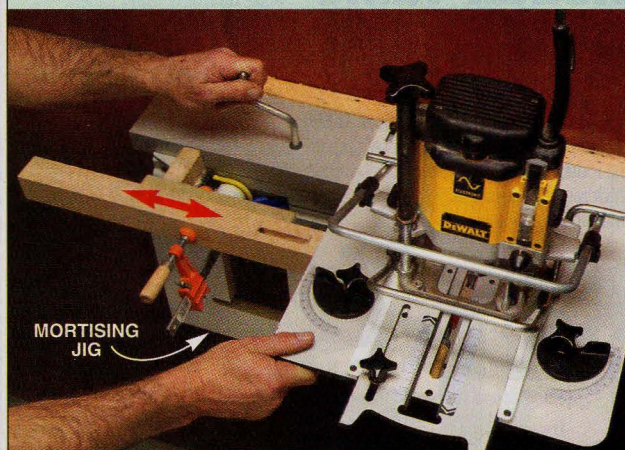
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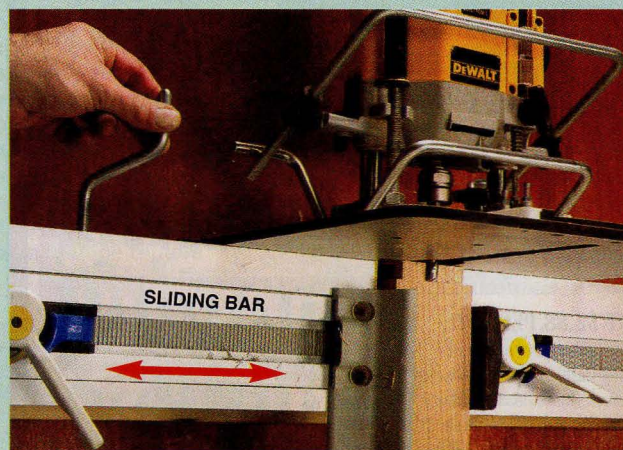
MORTISES AND TENONS

Combine the WoodRat's up-and-down and side-to-side movements to rout mortises. For mortising, the workpiece must be clamped in a jig that's held in the clamps. This jig can be shop-made or purchased as



Rout mortises by locking the router in position, plunging into the workpiece and then using the crank to advance the cut. Rout to full depth in several shallow passes.

an accessory (\$59). To rout tenons, combine side-to-side and forward-and-backward movements. For this operation, the workpiece must be clamped against the sliding bar.

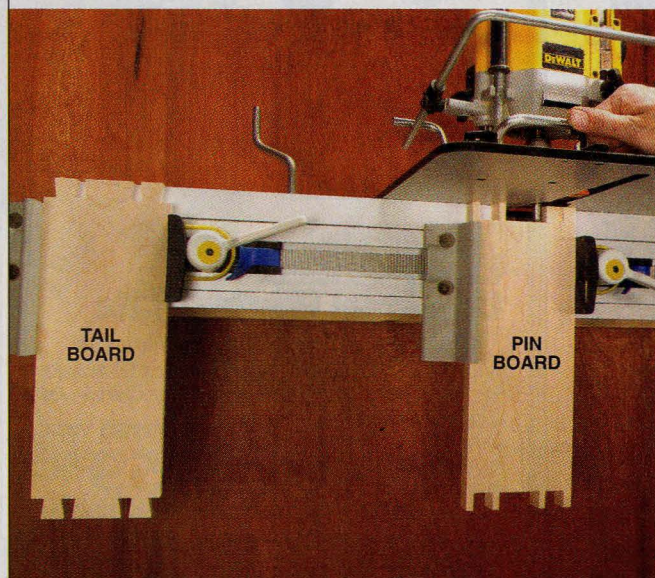


Rout tenon sides by locking the router in position and cranking the sliding bar. To rout the edges, crank the workpiece into position and then move the router forward and backward.

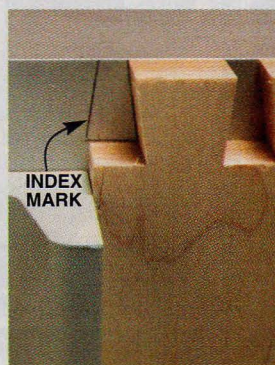
DOVETAILS

Dovetails require two separate operations. You rout tails in one board, using a dovetail bit and the WoodRat's forward-and-back movement. In another board, you rout pins, using angled movements and a straight bit. In both operations, the crank is used to move the board laterally between routing passes.

The WoodRat doesn't have templates or adjustable fingers like other dovetailing jigs do. Instead, you rout tails in one board and then use that board and an index mark (see photo, below) to rout pins and tails on all the remaining boards. This unique system allows you to freely space pins and tails.

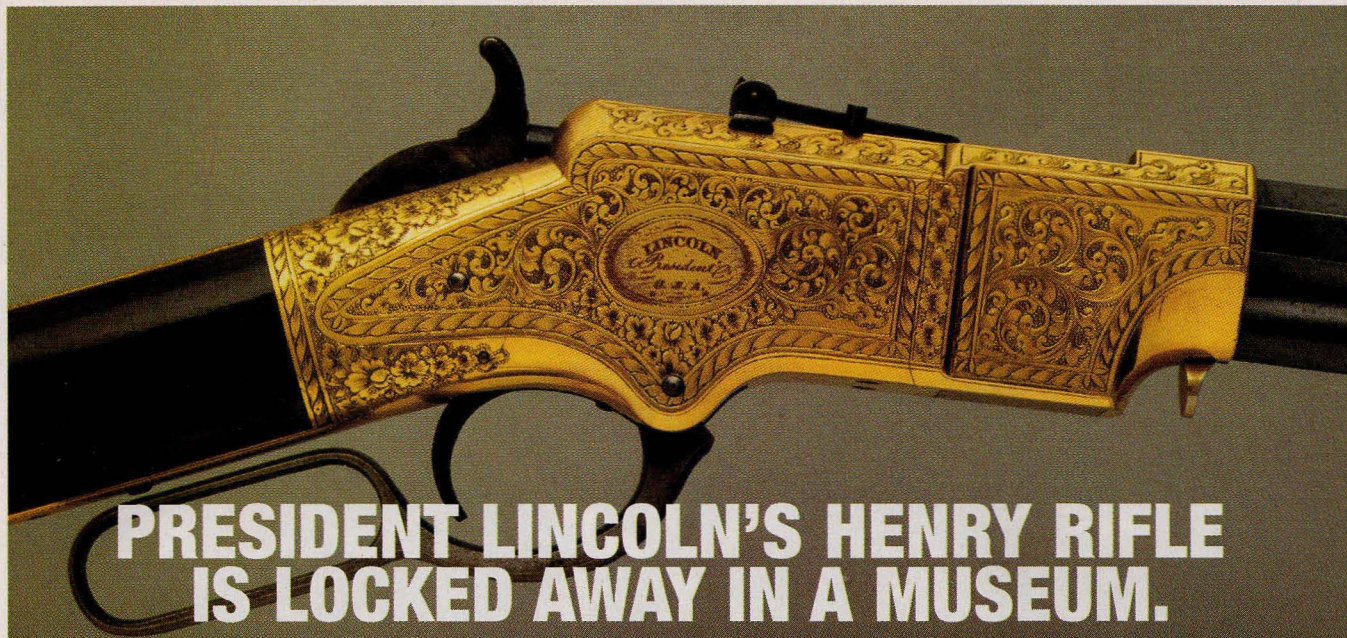


To rout dovetails, two boards are mounted on the sliding bar (see photo, left). One completed tail board is used as a template to rout all the other tail boards and all of the pin boards. The wedge-shaped pins are cut with a straight bit (see photo left). Rout one side of the pin with the router's plate angled to the left and the other side with the plate angled to the right.



A single tail board and a bit-shaped index mark traced from a pin socket are the keys to perfect dovetails. The mark allows using the tail board as a template for routing all the other boards. Because the two clamped boards move simultaneously, centering the index mark inside each pin socket automatically locates the second board for the corresponding cut.

Source The Craftsman Gallery, (866) 966-3728, www.craftsmangallery.com WoodRat WR5, #10-105, \$629. WR5 package deal including digital scale and six other accessories, #11-105, \$699. Plunge bar, #14-110, \$35. Quick-change chuck, #13-190, \$52. T-handle hex driver, #32-290, \$3.50. Digital scale, 7-1/2-in. capacity, #30-150, \$48; 10-in. capacity, \$54. Mortise rail, #30-115, \$59.



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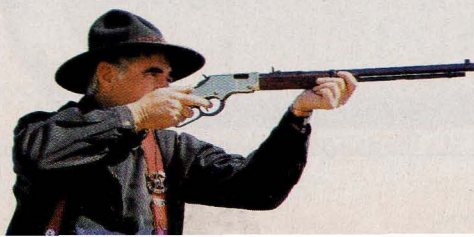
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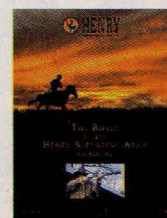
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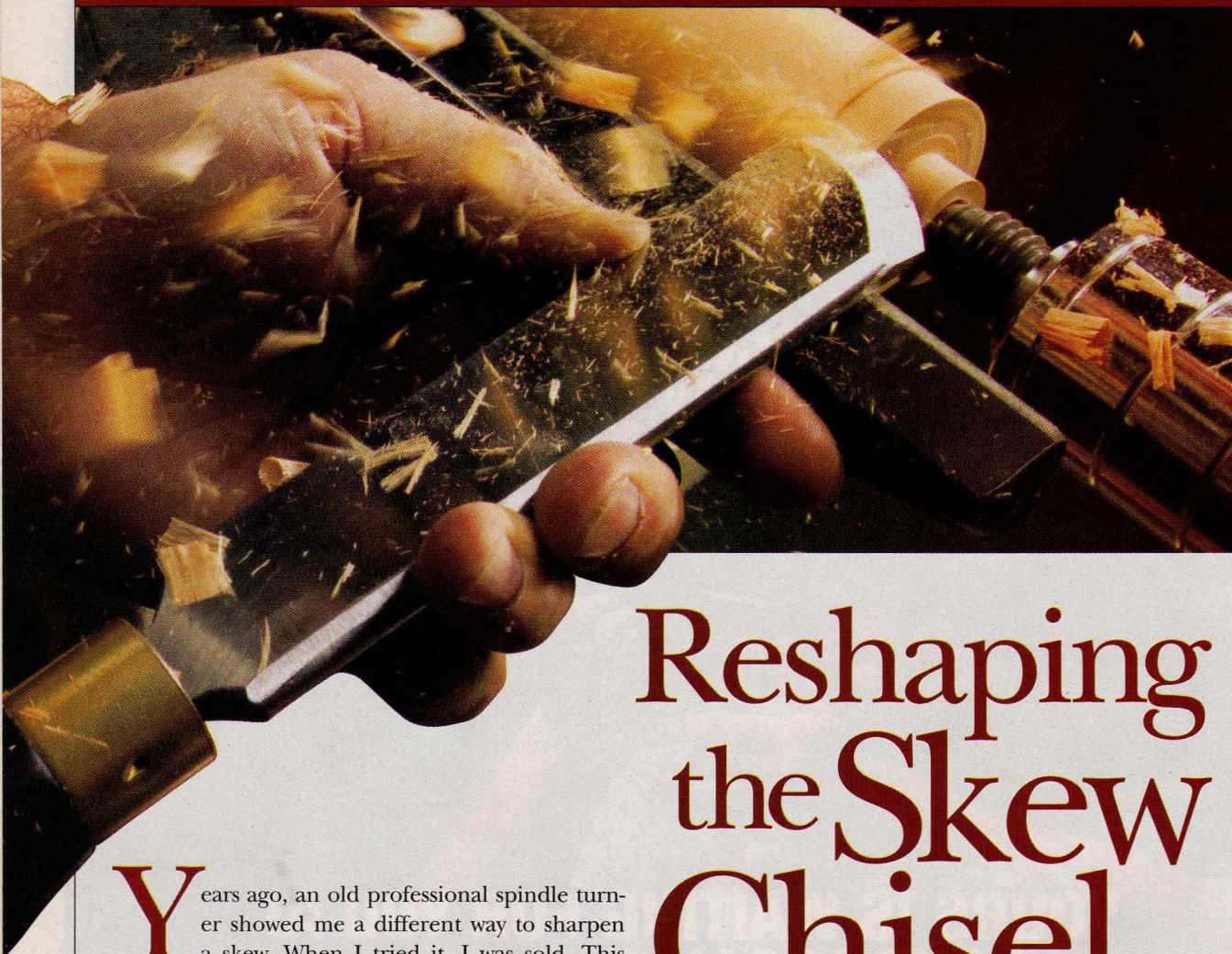


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before

after

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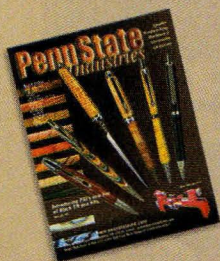
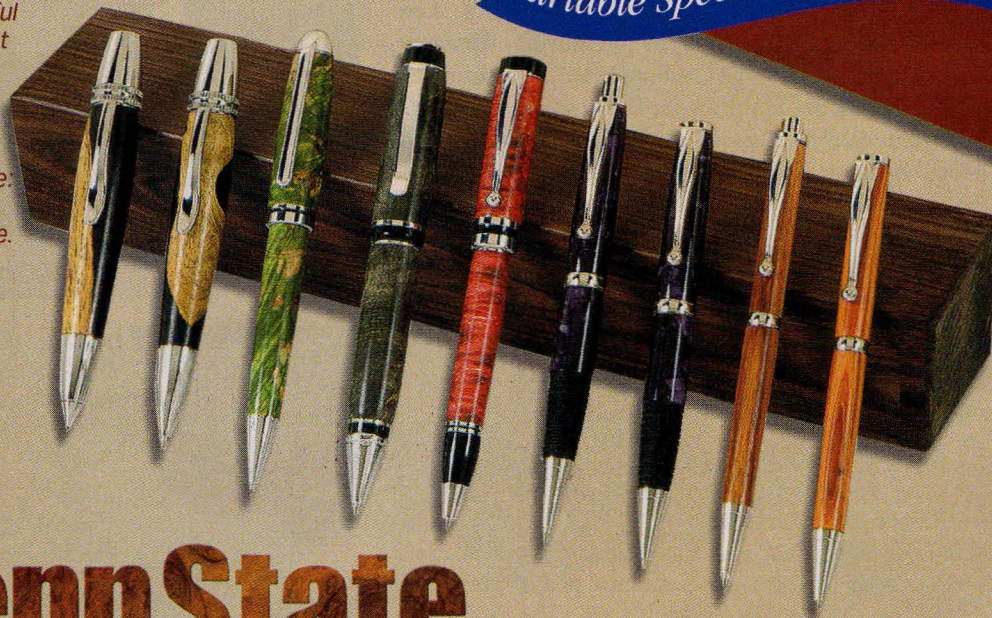
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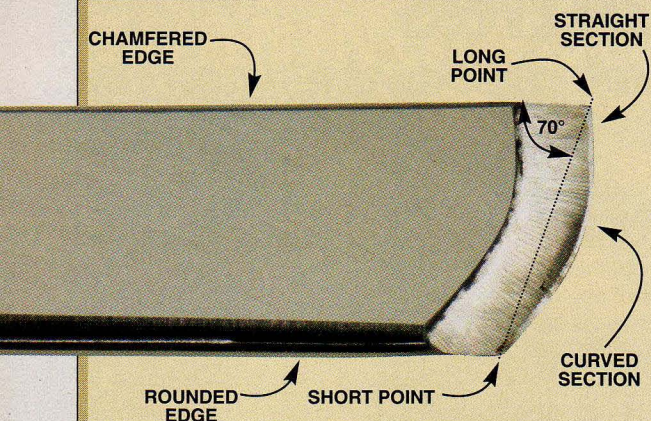
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The Modified Profile

My skew's profile has two sections: straight and curved. The straight section begins at the skew's long point and extends one-fourth to one-third of the blade's width. The curved section continues to the skew's short point. The angle from long point to short point is about 70 degrees, the same as on a conventional skew.

I also modify my skew's body. I round over the short point side and lightly chamfer both edges of the long point side.

SHAPE THE SIDES

Begin modifying a conventional skew by reshaping its sides (Photo 1). I prefer to do this on a belt sander mounted in a stand and equipped with a belt designed to cut metal (see Sources, page 44). Be sure to remove all the dust from the sander and set aside its bag to avoid starting a fire. Start with a 60-grit belt; finish with a 120-grit belt. I round the short point side to glide with a smooth motion when planing and to easily rotate and pivot the tool when rolling beads.

Grind the tool's profile on a 36- or 46-grit wheel (see "The Modified Profile," above, and Photo 2). I use a coarse wheel because this step removes a lot of material.

SHARPEN THE EDGE

Switch to a 60- or 80-grit wheel. Adjust the tool rest to grind the same angle as on a conventional skew. I prefer to set this angle by measuring distances. The length of the bevel should be approximately 1-1/2 times the tool's thickness. The angle between both bevels will then be 35 to 40 degrees. As you grind, you'll probably have to tweak the tool rest's angle to get it right.

Two Tools in One

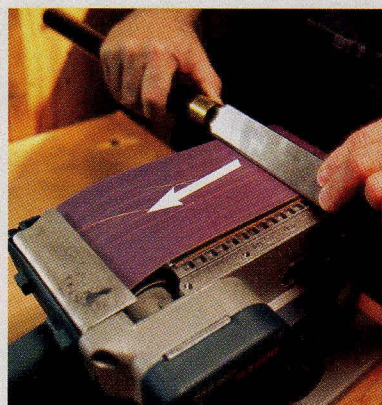
With both straight and curved sections, a modified skew is quite versatile.

The curved area is great for these tasks:

- Planing and rolling cuts. If you lead with the short point side and cut with the tool's curved section, you cannot dig in. Digging in is a real problem with a conventional skew and a bane to all novice turners.
- Planing chip-prone woods, such as red oak or figured maple.
- Forming the concave and convex sections of a spindle.

The straight section is great for these tasks:

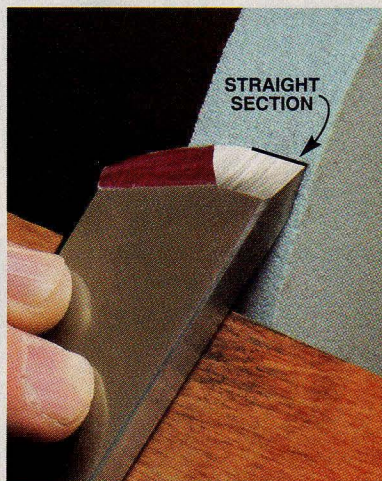
- Peeling away wood, like a large parting tool.
- Slicing rounded pommels (with the long point down).
- Scraping end grain and knots.
- Working in tight areas. The curve creates a small clearance.



1 Begin modifying a standard skew on a belt sander. Hold the tool so the belt always travels away from you. Completely round the short point side up to the ferrule; chamfer the sharp edges of the long point side.



2 Grind the straight and curved profiles. Position the tool rest about 90 degrees to the wheel. I've mounted a wood platform on my tool rest to have a broader area of support, which is critical for modifying and resharpening a skew.



3 Begin grinding the profile's straight section. Color the old bevel with a felt-tip marker to identify where the wheel cuts.

MISSION ACCOMPLISHED!



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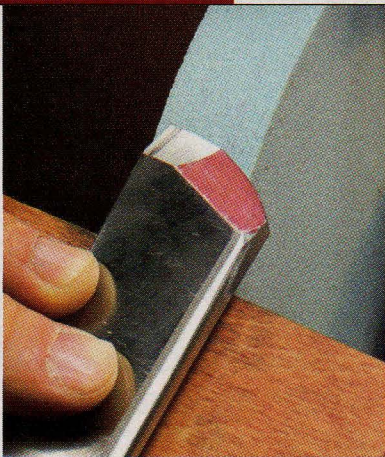
- Lonnie Bird

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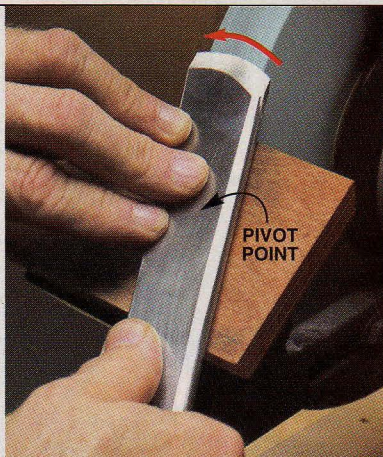
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Circle No. 2



4 Flip the tool now and then as you continue grinding. It's important to keep the bevels on both sides of the tool equally long to center the cutting edge.



5 Grind the curved section by using your fingers as a pivot point. Keep the spot you're grinding square to the wheel.

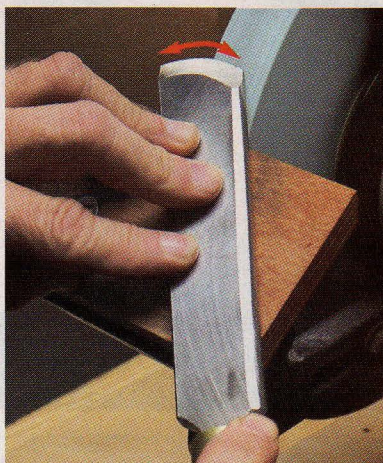
Begin sharpening the straight section (Photo 3). Flip the tool as you go to remove the same amount of material from each side (Photo 4).

Now for the curved section. You'll grind and sharpen this in one long sweeping motion, using your fingers as a pivot point (Photo 5). Start next to the straight section, then rotate the long point off of the wheel. Continue in one fluid motion down to the short point. Stop when the area around the short point is square to the wheel (Photo 6). Then, without changing your hand position, rotate the tool in the opposite direction, back toward the straight section. The idea is to fan the tool back and forth without lifting it from the tool rest. Make three or four passes on one side of the tool. Then flip the tool and make an equal number of passes on the other side. Continue sharpening and flipping until the bevels meet at the cutting edge.

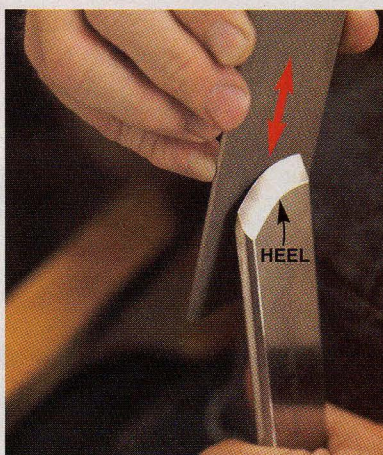
As with any turning tool, you'll know when to stop sharpening by watching the sparks. When they fly off evenly both above and below the bevel, the cutting edge is sharp. To confirm that it's sharp, lift the tool and look down at the edge under a bright light. A dull area reflects light; a sharp edge disappears into a black line.

HONE AND TEST THE EDGE

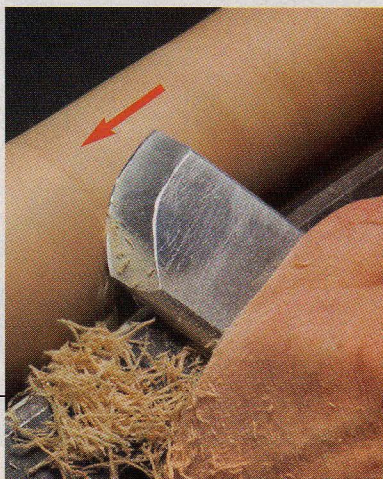
I'm a big believer in honing. An extra-sharp skew is safer and performs better. I use a diamond slipstone on high-speed steel tools because it cuts fast (see Sources, below). To get the angle right, hold the slipstone so it only rubs on the bevel's heel (Photo 7). As you move the slipstone up and down, incline it until it touches the cutting edge as well; then maintain this two-point contact. Repeat on the other side. Hone the tool's sides near the short and long points, too. Test your tool by making a light planing cut (Photo 8).



6 Continue grinding with a fanning motion. When you reach the short point, as shown here, reverse the direction without lifting the skew from the tool rest.



7 Hone the cutting edge with a diamond slipstone. It's easy to find the correct angle by feel. Hold the slipstone so it contacts two points on the bevel's concave surface: the heel and the cutting edge.



8 Check the tool's sharpness by putting it to work. Make a planing cut on a cylinder. A sharp tool will require little effort to push, produce lots of shavings and leave a very smooth surface.

Sources Alan Lacer, (715) 426-9451, www.alanlacer.com Diamond slipstone plated on two flat sides and two round sides, \$88. • MSC Industrial Supply Co., (800) 645-7270, www.mscdirect.com Diamond whetstone plated on one flat side only, #01054931, \$58. Sanding belts for metal, Norzon, Three-M-Ite or MetaLite brands, many sizes and grits available.



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shaker si

The essence of Shaker design is simplicity. Although I didn't use traditional construction techniques in this

project, I did keep it simple. Behind this sideboard's elegant front and sides is a very easy-to-build birch-plywood box



deboard

by Randy Johnson

joined with biscuits. It's strong and durable. The front and sides are assemblies that are added onto the box. The

result is a beautiful, traditional-looking piece that doesn't require complicated joinery.





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BUILD THE PLYWOOD CASE

1. Cut the plywood case parts (A1 through A7, Fig A, Plywood Cutting Diagram, page 50; Cutting List, page 52).

2. Assemble the bottom, lower partition, middle divider, drawer partitions and subtop with glue, screws and biscuits.

3. Attach the sides (A6) to the plywood case (A1 through A5). Use a 1-in. spacer board at the front corners to create a notch for the legs (B1) to fit into (Photo 1). A precise 1-in. setback ensures that the face frame, which later attaches to the plywood case, lines up evenly with the front face of the legs.

ADD THE LEG PANELS

4. Make the legs (B1). Cut the tapered foot (Fig. A) on your bandsaw and use a belt sander to smooth it. Cut a stopped groove for the 1/4-in. center panel (B2) using a slot cutter on your router table (see Sources, page 52).

5. Cut the stopped rabbet in the back of the rear legs for the back panel (A7) (Fig. A).

6. Make the top and bottom panel rails (B3, B4) and rout grooves in these parts for the center panel.

7. Assemble the leg panels (Photo 2). Use biscuits and glue to join the rails to the legs. When the glue is dry, clamp the leg panels to the plywood case.

8. Cut filler boards (B5, B6) and test their fit (Photo 3). You'll need to adjust the thickness of these fillers if the plywood you used for the plywood case sides (A6) is not exactly 3/4 in. thick (3/4-in. plywood commonly runs undersize).

9. Unclamp the leg panels and glue the filler boards to the inside surface of the rails. When the glue is dry, attach the leg panels to the plywood case with screws only (Photo 4). **Note:** Do not use glue at this time. Notice that the screws run through the plywood sides in the drawer opening and below the case's bottom. These screws are hidden when the sideboard is complete.

MAKE THE FACE FRAME

10. Cut out the face-frame parts (B7 through B11). Test-fit the face-frame rails between the front legs on the cabinet to make sure they are the correct length.

11. Assemble the face frame with dowels (Photo 5).

12. Attach the face frame to the plywood case (Photo 6). Use biscuits to align the face frame to the plywood case. **Note:** At this time, do not put glue on the end of the rails where they meet the legs.

13. After the face frame is attached to the case and the glue has dried, unscrew and remove the leg panels.

14. Cut biscuit slots in the ends of the rails. The middle and top rails are too narrow for a full biscuit. Position your biscuit joiner on the ends of these rails so the slot breaks out at the top of the rail, but not on the bottom. This will produce a slot for a half-length biscuit. The bottom rail is too narrow for two full biscuits. Position the biscuit joiner on the ends of this rail close together so they don't break out at either the top or bottom. Cut the biscuits for these slots to about three-quarters of their length. Cut corresponding biscuit slots in the front legs.

15. Apply glue to the filler boards' inside surfaces, the ends of the face-frame rails and the biscuit slots on the legs. Reattach the leg panels to the plywood case (Photo 7).

COMPLETE THE CASE

16. Glue up the top (B12) and attach it to the plywood case with screws. The holes in the plywood subtop (A5) should be drilled oversize to allow seasonal movement of the top because it's solid wood.

17. Attach the back panel (A7).

18. Cut the shelves (A8) and glue on their edging (A9).

19. Drill for shelf pins (see Sources, page 52).

ADD THE DRAWERS

20. Make drawer boxes with lipped fronts (Fig. A, Detail 1). I used a half-blind dovetail jig with a 1/2-in.-dia. 14-degree dovetail bit. My jig produces dovetails on 7/8-in. centers, so I ended up with good-looking half pins on both the top and bottom of the drawer sides (see photo, page 52, bottom). (For information, see "Making Lipped Drawers with a Dovetail Jig," AW #84, December 2000, page 91, or www.americanwoodworker.com/lippeddovetaildrawers.)

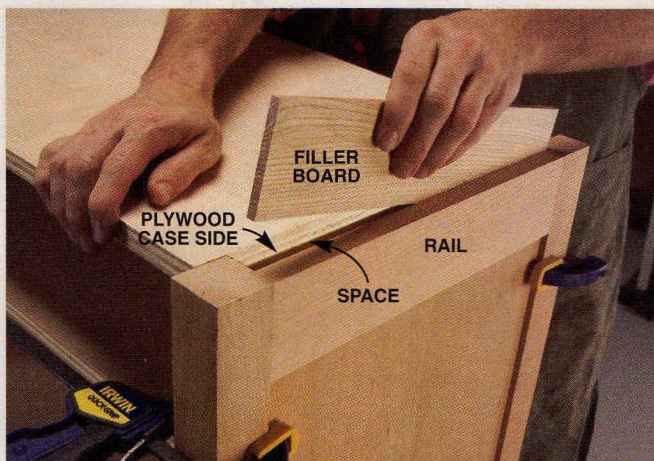
21. Groove the drawer sides, back and front for the drawer bottoms (C1 through C4). Round the front edges using a 1/4-in. round-over bit in your router table. Then assemble the drawers.



1 Begin building the sideboard by constructing a simple plywood case using glue, screws and biscuits. When you attach the sides, use a spacer to ensure a precise setback from the case's front. The legs will fit into the notch that this setback creates.



2 Glue the leg panels. The center piece fits into a groove in the top and bottom rails and legs, and the rails attach to the legs with biscuits.



3 Clamp the leg panel to the plywood case. Test-fit the thickness of filler boards in the spaces between the rails and the plywood case side. When the fillers are planed to the correct thickness, remove the leg panel and glue the fillers to its top and bottom rails.

PROJECT REQUIREMENTS AT A GLANCE

Materials

20 bd. ft. of 4/4 cherry
20 bd. ft. of 5/4 cherry
10 bd. ft. of 8/4 cherry
10 bd. ft. of 4/4 birch
1-1/2 sheets of 3/4-in. birch plywood
1 sheet of 1/4-in. birch plywood
1/2 sheet of 1/4-in. cherry plywood

Tools

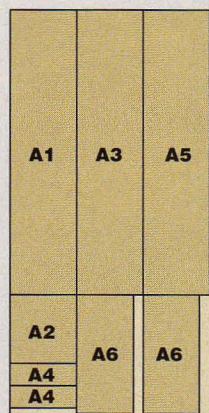
Tablesaw, bandsaw, planer, jointer, router, router table, biscuit joiner, dado blade, sander

Hardware

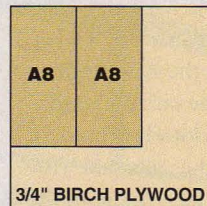
Six brass hinges, Seven wood knobs, two magnetic door catches

Cost Approximately \$600

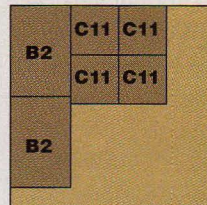
PLYWOOD CUTTING DIAGRAM



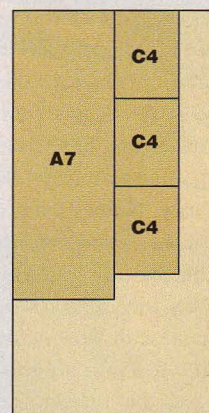
3/4" BIRCH PLYWOOD



3/4" BIRCH PLYWOOD

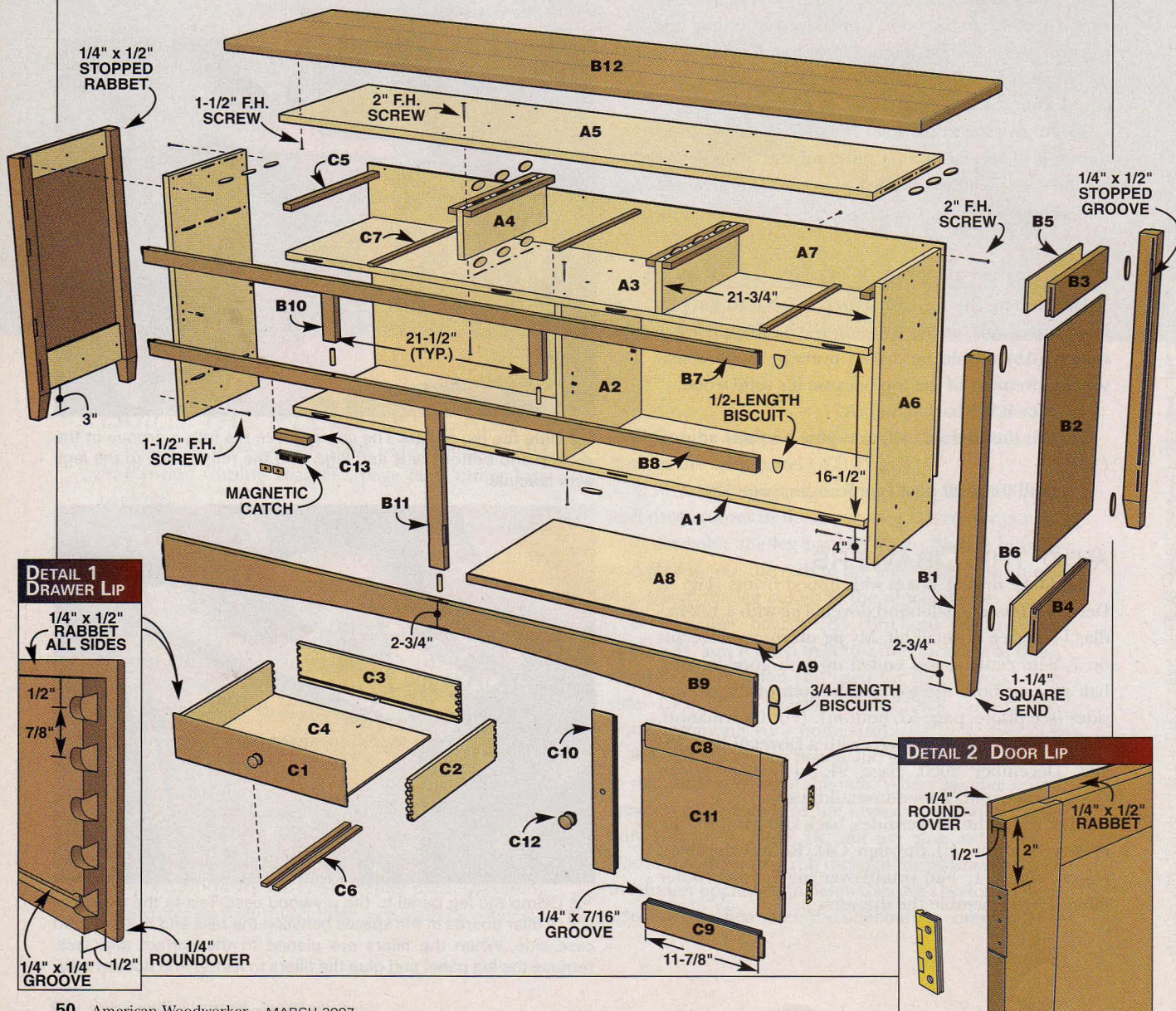


1/4" CHERRY PLYWOOD



1/4" BIRCH PLYWOOD

FIGURE A EXPLODED VIEW



22. Attach kicker guides (C5) to the inside of the drawer openings. Adjust the thickness of these guides so there is 1/8-in. clearance between them and the top of the drawer sides.

23. Cut a notch in the bottom edge of the drawer back for the center guide (C7). Attach the bottom guides (C6) to the drawer boxes (Photo 8). Use a spacer between the guides to assist with positioning, but slide the spacer out before the glue sets to prevent it from sticking to any glue that squeezes out.

24. Attach the center guide to the inside of the drawer opening with screws at the front and back. Test the fit of the drawer box. There should be about 1/8-in. clearance along the sides of the drawers.

BUILD THE DOORS

25. Cut out the parts for the doors (C8 through C11). Use a slot-and-tenon cutter to machine the joints (see Sources, page 52). Assemble the doors.

26. Round the outer front edge of the doors to match the drawer fronts' roundovers.

27. Rabbet the top and bottom back edges of the doors (Fig. A, Detail 2).

28. Rout and chisel mortises for the butt hinges in the doors and front legs (see Sources) and hang the doors. (Self-closing European-style hinges can be substituted for the butt hinges; see Sources.)

29. Drill the doors and drawers for the wood pulls (C12) and install them (see Sources).

30. Glue the door catches' cleats (C13) to the back of the center rail and attach the magnetic catches.

31. Remove the doors, drawers, cabinet back, and hardware and finish-sand all the parts.

APPLY THE FINISH

I used the following products and procedure to achieve the rich, even, cherry tone that you see on the finished sideboard. It looks close to unstained cherry after it ages but somewhat redder. If you prefer the browner tone of naturally aged cherry, skip Steps 33 through 36.

32. Brush on a coat of SealCoat dewaxed shellac (see Sources, page 52) and let it dry overnight.

33. Sand lightly with 220-grit paper.

34. Brush on a second coat of SealCoat and let it dry overnight.

35. Sand lightly with 220-grit paper.

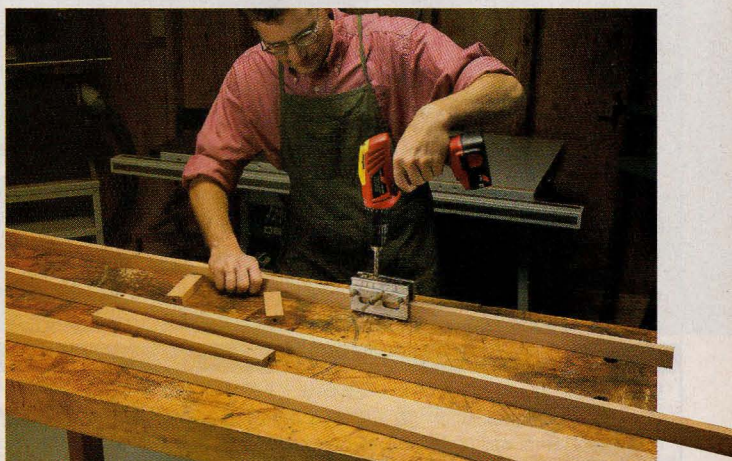
36. Apply a coat of General Finishes Candlelite gel stain (see Sources). Let it dry overnight.

37. Apply a second coat of gel stain to sapwood areas or other light boards and let it dry overnight.

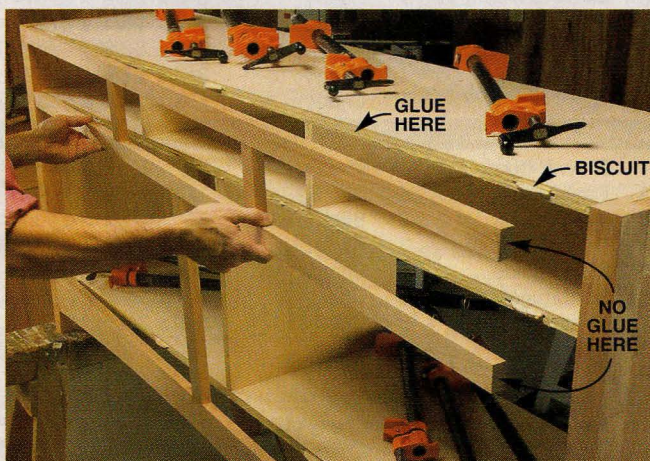
38. Apply a clear topcoat. I applied Deft semi-gloss with a spray gun, but the aerosol cans also work well (see Sources). A brushed or sprayed-on varnish would also be good choice.



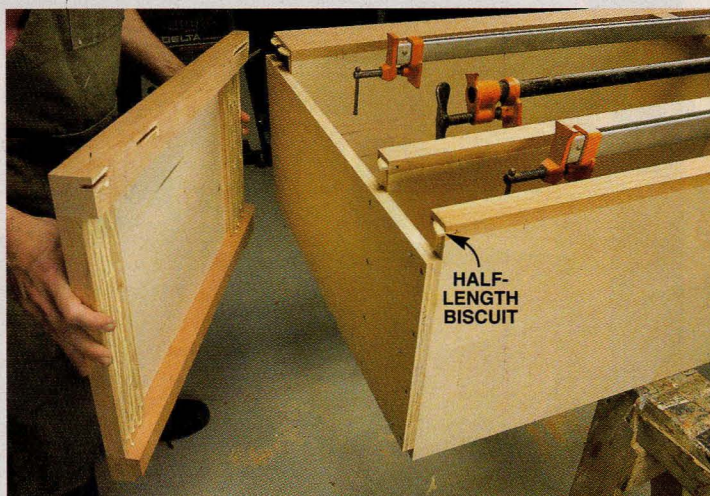
4 Attach the leg panels to the sides of the plywood case. Secure the leg panels with screws for now; you'll need to remove these parts later.



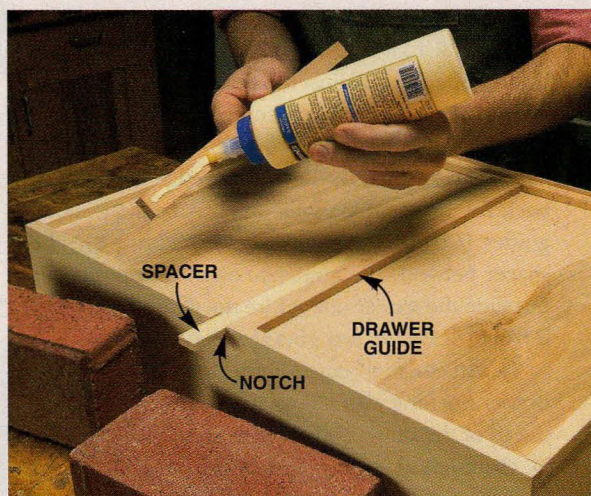
5 Drill dowel holes in the face-frame parts. Only a single dowel is needed at each joint, but you must make sure the joints do not twist during final gluing and clamping.



6 Glue and clamp the assembled face frame to the front of the plywood case. Biscuits on the case's front help with alignment. Don't put glue on the ends of the rails at this time; you'll make biscuit joints and glue them in the next step.



7 Permanently attach the leg panels to the plywood case using both screws and glue. The face-frame rails are joined to the front legs with biscuits. Use half-length biscuits in the middle and top rails and two three-quarter length biscuits in the bottom rail.



8 Glue guides to the bottom of the drawers. A spacer set in a notch in the drawer back and centered at the front of the drawer keeps the two guides correctly positioned. Use a couple of bricks to hold the guides in place while the glue dries.

CUTTING LIST

OVERALL DIMENSIONS: 18-3/4"L x 32"W x 77-3/4"H

Part Name	Qty.	Material	Dimensions
Inner Plywood Case			
A1 Bottom	1	Birch plywood	3/4" x 15-3/4" x 67-1/4"
A2 Lower partition	1	Birch plywood	3/4" x 15-3/4" x 16-1/2"
A3 Middle divider	1	Birch plywood	3/4" x 15-3/4" x 67-1/4"
A4 Drawer partition	2	Birch plywood	3/4" x 15-3/4" x 5-1/4"
A5 Subtop	1	Birch plywood	3/4" x 15-3/4" x 67-1/4"
A6 Side	2	Birch plywood	3/4" x 13-1/4" x 28"
A7 Back panel	1	Birch plywood	1/4" x 24" x 68-1/4"
A8 Shelf	2	Birch plywood	3/4" x 15-1/2" x 33-1/8"
A9 Shelf edging	2	Cherry	1/4" x 3/4" x 33-1/8"
Outer Case			
B1 Leg	4	Cherry	1-3/4" x 1-3/4" x 31"
B2 Center panel	2	Cherry plywood	1/4" x 14-1/4" x 21-1/2"
B3 Top panel rail	2	Cherry	3/4" x 3" x 13-1/4"
B4 Bottom panel rail	2	Cherry	3/4" x 4-1/2" x 13-1/4"
B5 Top rail filler	2	Hardwood	1/4" x 3" x 13-1/4"
B6 Bottom rail filler	2	Hardwood	1/4" x 4-1/2" x 13-1/4"
B7 Top face-frame rail	1	Cherry	3/4" x 1-3/8" x 67-1/4"
B8 Middle face-frame rail	1	Cherry	3/4" x 1-3/8" x 67-1/4"
B9 Bottom face-frame rail	1	Cherry	3/4" x 4-3/4" x 67-1/4"
B10 Drawer divider stile	2	Cherry	3/4" x 1-3/8" x 4-5/8"
B11 Center stile	1	Cherry	3/4" x 1-5/8" x 15-7/8"
B12 Top	1	Cherry	1" x 18-1/2" x 77-3/4"
Drawers and Doors			
C1 Drawer front	3	Cherry	3/4" x 5" x 21-7/8"
C2 Drawer side	6	Birch	1/2" x 4-1/2" x 15-1/8"
C3 Drawer back	3	Birch	1/2" x 4-1/2" x 21-1/4"
C4 Drawer bottom	3	Birch plywood	1/4" x 15-1/4" x 20-3/4"
C5 Kicker guide	6	Cherry	5/8" x 1" x 15-3/4"
C6 Bottom guide	6	Cherry	3/8" x 3/4" x 14-3/4"
C7 Center guide	3	Cherry	3/8" x 3/4" x 16"
C8 Upper rail	4	Cherry	3/4" x 2-1/4" x 12-3/4"
C9 Lower rail	4	Cherry	3/4" x 2-3/4" x 12-3/4"
C10 Stile	8	Cherry	3/4" x 2-1/4" x 16-1/4"
C11 Panel	4	Cherry plywood	1/4" x 12-11/16" x 12-5/16"
C12 Pull	7	Cherry	1-1/4" dia.
C13 Catch cleat	2	Cherry	5/8" x 1" x 4"



9 Install the hinges and doors. The top and bottom of the doors have a lip, but the sides do not. This allows you to use standard butt hinges. The hinges are mortised into both the door and the case.



Sources Freud Inc, (800) 334-4107, www.freudtools.com Tongue-and-groove bit, #99-036, \$70. 1/4-in.-radius round-over bit, #34-120, \$27. • Woodcraft, (800) 225-1153 www.woodcraft.com SealCoat, 1 quart, #823195, \$9. General Gel Stain, Candlelite color, 1 quart, #826966, \$9. Deft clear semi-gloss finish, 1 quart, #143194, \$10, or 12-ounce aerosol can, #143197, \$6. 5-mm shelf pins, bag of 25, #27132, \$3. Double magnet catch, #27H04, \$2 ea. 1-3/8-in. x 2-in. butt hinges #85112, \$4 a pair. 1-1/4-in.-dia. cherry knobs, package of 10, #125437, \$15.

World's Most Valuable Timepiece Disappears

Back in 1933, the single most important watch ever built was engineered for a quiet millionaire collector named Henry Graves. It took over three years and the most advanced horological technique to create the multifunction masterpiece. This one-of-a-kind watch was to become the most coveted piece in the collection of the Museum of Time near Chicago. Recently this ultra-rare innovation was auctioned off for the record price of \$11,030,000 by Sotheby's to a secretive anonymous collector. Now the watch is locked away in a private vault in an unknown location. We believe that a classic like this should be available to true watch aficionados, so Stauer replicated the exact Graves design in the limited edition Graves '33.

The antique enameled face and Bruguet hands are true to the original. But the real beauty of this watch is on the inside. We replicated an extremely complicated automatic movement with 27 jewels and seven hands. There are over 210 individual parts that are

assembled entirely by hand and then tested for over 15 days on Swiss calibrators to ensure accuracy. The watches are then reinspected in the United States upon their arrival.

What makes rare watches rare?

Business Week states it best... "It's the complications that can have the biggest impact on price." (*Business Week*, July, 2003). The four interior complications on our Graves™ watch display the month, day, date and the 24 hour clock graphically depicts the sun and the moon. The innovative engine for this timepiece is powered by the movement of the body as the automatic



27 jewels and 210 hand-assembled parts drive this classic masterpiece.

rotor winds the mainspring. It never needs batteries and never needs to be manually wound. The precision crafted gears are "lubricated" by 27 rubies that give the hands a smooth sweeping movement. And the watch is tough enough to stay water resistant to 5 atmospheres. The movement is covered by a 2-year warranty.

Not only have we emulated this stunning watch of the 1930s but just as surprising, we've been able to build this luxury timepiece for a spectacular

price. Many fine 27-jewel automatics that are on the market today are usually priced well over \$2,000 dollars, but you can enter the rarified world of fine watch collecting for under \$100. You can now wear a millionaire's watch but still keep your millions in your vest pocket. Try the handsome Graves '33 timepiece risk free for 30 days. If you are not thrilled with the quality and rare design, please send it back for a full refund of the purchase price.

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Tool Test

Trim Routers

One new router
leads the way

by Richard Tendick

Take a good look around your shop. How many routers do you own? Most woodworkers have a couple midsize routers and a plunger. If this describes your set, you're missing one: the trim router. It can make your workshop life a whole lot easier.

A trim router is a surprisingly versatile tool. Although it only accepts 1/4-in. shank bits, you can put it to work cutting grooves, inlays and molding profiles as well as flush-trimming edging, banding and laminate. Its small size is a huge asset, not a liability. For many jobs, it's much more comfortable to use than a larger router.

Trim routers cost from \$38 to \$170. With such a big range in prices, we found clear differences in the overall usefulness and quality of the 12 models gathered for this test. Read on to learn about their role in the shop, features to look for, individual profiles of each machine and our recommendations.



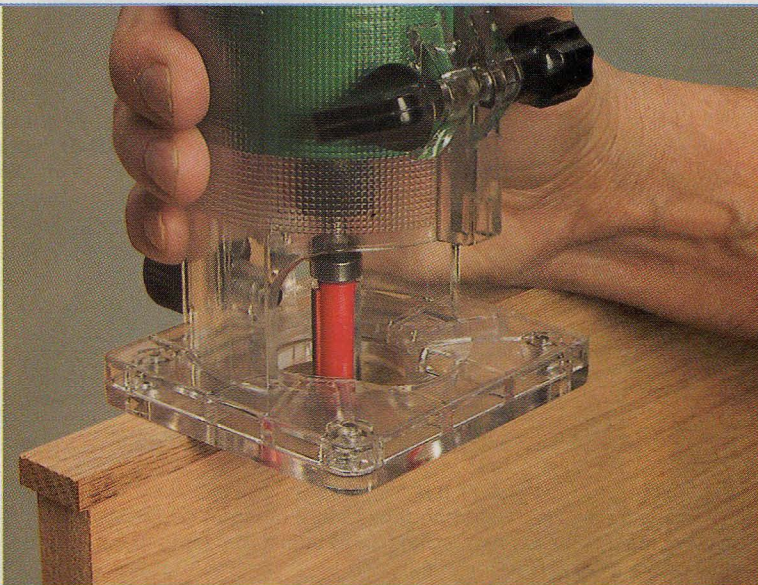
The Versatile Trim Router

EASY TO HANDLE

A trim router's small size is a big plus when you must rout lots of edges. It's particularly easy to balance a trim router's small baseplate on a narrow edge. A large, heavy router with its big baseplate is prone to tipping.

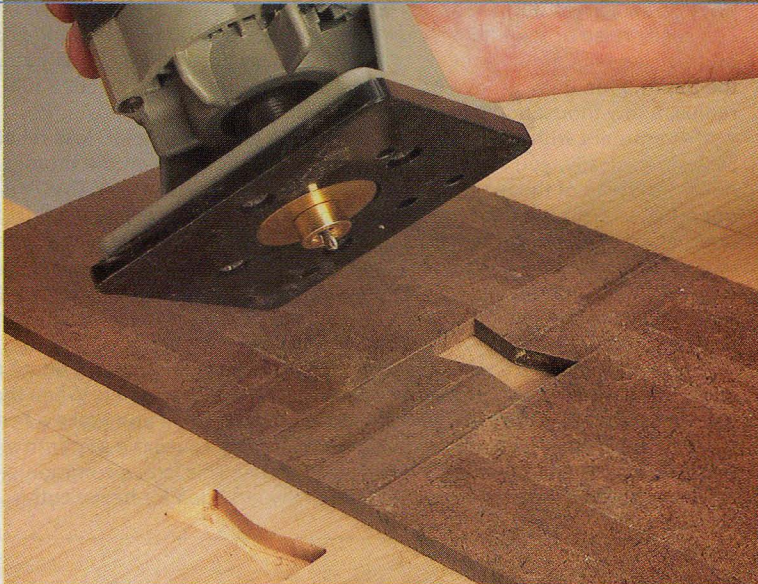
Despite their small size, most trim routers have plenty of power for cutting small profiles, grooves and hinge mortises. Many of these jobs don't require the extra power of a larger, bulkier router.

It's easy to guide a trim router with one hand. This frees your other hand to trail the cord around or reposition the workpiece. Large routers generally require two hands.



IDEAL FOR DELICATE WORK

A trim router is better-suited for fine and delicate work than a larger router is. Cutting this recess for a butterfly inlay, for example, requires a fragile 1/8-in. bit. With a large, heavy router, you can easily overpower and break this bit. You'll have a much better feel for how the cut is progressing when using a lightweight trim router.



AN INEXPENSIVE DEDICATED ROUTER

A trim router is the least expensive type of router to add to your tool kit. Three models we tested cost \$40 or less.

Reserve your workhorse midsize and plunge routers for big jobs. You can dedicate a trim router to a single job you must repeat throughout the course of a project, such as cutting molding, as shown here. Pick it up whenever you need it; the router will always be ready to go.



Features



DEPTH-OF-CUT ADJUSTMENT

This is by far the most important feature of a trim router. We prefer routers that have a screw mechanism to adjust the depth of cut, but most don't have it (see Chart, page 60).

A screw makes it much easier to achieve a precise setting, because you can easily raise or lower the bit by a few thousandths of an inch. This degree of precision is often essential with the bits you're likely to use. When you set the depth of an inlay groove or adjust a small roundover bit to cut a full radius, a few thousandths can make a big difference.

Trim routers without a screw adjust rely on a much simpler, less reliable system. Basically, you slide the base by hand up or down on the motor housing. Some of these routers have a roller gear to assist you. This is a good feature, but the gear has a much coarser pitch than a screw adjust does, so it isn't as sensitive. It can be quite difficult to achieve a precise setting with routers that don't have a screw adjust because the base usually doesn't slide smoothly. It often sticks, slips and sticks again. Lubricating the motor housing can alleviate this problem (see "Tune Up Your Trim Router," page 62), but the lubricant wears off and must be renewed.

Trim routers with a screw adjust or roller gear have another important benefit: a mechanical interlock between the base and motor housing. When the base is tightened, it can't accidentally move up or down. If you make a heavy cut with machines that don't interlock, vibration may cause the motor to slip down inside the base, leading the bit to cut deeper. This isn't a common problem, though, since trim routers aren't generally intended for heavy cuts.



BASEPLATE FOR TEMPLATE GUIDES

We prefer trim routers with baseplates that accept template guides of any size. A template guide allows you to trace around a pattern. It's particularly useful for routing round, oval or butterfly-shaped inlay, a job well-suited for a trim router.

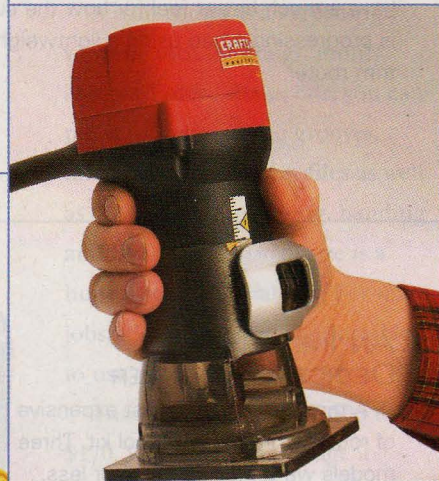
Many trim routers accept Porter-Cable-style template guides, which come in a variety of sizes. Some trim routers accept only one special 3/8-in.-dia. guide that's supplied with the router. No other sizes are available. A few trim routers don't accept any kind of template guide.



BASE STYLE

Trim routers have two different base styles. Some bases wrap completely around the motor housing; others attach in cantilever fashion to one side of the motor. We prefer the wraparound style.

You must loosen both kinds of bases from the motor housing to adjust the bit's depth of cut. Cantilevered bases tend to tilt a little when you tighten them back onto the motor, which changes the depth of cut—not much, but enough to be annoying. Wraparound bases don't shift when you tighten and lock them, so the depth of cut doesn't change.



COMFORTABLE GRIP

Trim routers are designed to be held with one hand. Some are much more comfortable than others, but you can't be sure if one fits your hand until you try it. We like models with a cushioned motor housing that swells just above your fingers. The larger top makes it easier to grip the router between cuts, when it's not supported by a workpiece.

Accessories



A CLEAR VIEW

Sometimes you want to clearly see the bit as it's cutting. If you've drawn start and stop marks for a molding, for example, you'll want to see them through the router's base and inside the opening around the bit. Visibility is much better on routers with clear plastic bases; others have black phenolic bases you can't see through.

One router, the Makita 3707FC, has a clear base and two LED lights to illuminate the bit and workpiece. This handy feature could prevent a costly mistake.

VARIABLE SPEED AND SOFT START

We really like variable speed and soft start on large, powerful routers, but they're really not necessary features on trim routers.

Variable speed is most useful with large-diameter bits, which you must slow down for safety. Trim routers, of course, aren't designed to handle large bits. Variable speed is useful in cutting plastic with a trim router, however. Slowing the bit's speed reduces the chance of melting the plastic as you cut it.

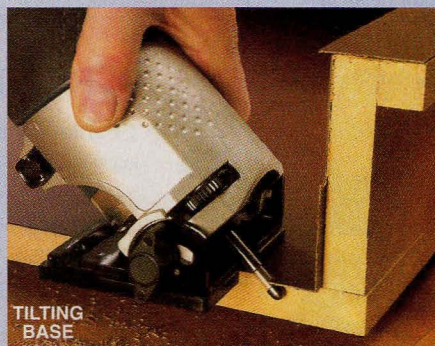
With soft start, the bit ramps up to speed when you turn on the machine. That's fine with a big router with a large startup torque, but this feature's benefit is barely noticeable with the much smaller startup torque of a trim router.

OFFSET AND TILTING BASES

If you'll be using your trim router with plastic laminate, you may need two additional bases. Offset and tilting bases are only available for a few routers. Generally, they come in a laminate-trimming kit that also includes a standard base.

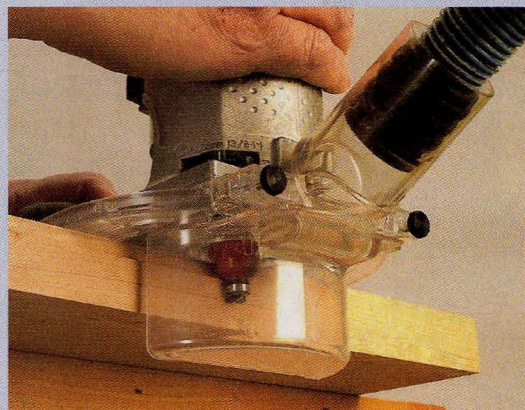
An offset base is handy for scribing and other jobs with little clearance (see photo, below left). The bit goes into a collet mounted inside this base. The bit is driven by a belt that's connected to a drive pulley mounted on the end of the motor's shaft.

A tilting base is used with a flush-trim bit to get into corners or trim angles greater than 90 degrees (see photo, below right). For more information about how to use these bases, go to www.americanwoodworker.com/trimbases.



DUST COLLECTION

Routing can create a cloud of fine dust that's unhealthy to breathe. You can capture that dust right at the source with a vacuum hose that attaches to a dust port. The Bosch trim routers are the only models with this accessory.



EDGE GUIDE

An edge guide is useful when cutting any type of groove, especially for inlay. We prefer models that either come with an edge guide or have one available as an accessory.

Unfortunately, none of the guides are as precise as the best guides on larger routers. When cutting a groove for inlay, for example, we'd prefer to use a guide with a micro-adjust knob for widening the groove or for fine-tuning the distance between the wood's edge and the groove. Trim router edge guides aren't that sophisticated.

Profiles



BOSCH PR10E • \$99 PR20EVSK • \$119

This is our favorite trim router, hands down. It's the only model capable of making both fine and coarse depth-of-cut adjustments and the only one with a self-releasing collet. The PR20EVSK is a variable-speed version of the PR10E. The standard base for both models doesn't accept template guides, however. Two additional bases, one for Porter-Cable guides (\$7.50) and one for Bosch guides (\$7.50) are available. An edge guide is included with the PR20EVSK and is available as an accessory for the PR10E.

Source (877) 267-2499, www.boschtools.com



CRAFTSMAN 27715 • \$100 RYOBI TR45K • \$80

These basic trim routers are very similar machines. Their small diameters make them very easy to hold. Visibility around the bit is good. Both come with a useful accessory: a large base-plate with two handles. It's handy for bridging a large opening in a template for inlay. You don't get any extra features, however, such as a screw adjust, edge guide or provision for template guides. These are the only models without loose collets. Their collets are integral to the shaft; when they wear out and no longer hold a bit, the whole machine must be replaced.

Sources (800) 377-7414, www.craftsman.com • (800) 525-2579, www.ryobitools.com



DEWALT D26670 • \$110 PORTER-CABLE 7310 • \$110

These two are very similar machines. Both have a screw adjust for setting the bit's height. Tightening the cantilever-style base slightly alters the setting, however, because the base tilts a small amount as it's tightened. Beyond that quibble, we found these to be fine machines with most of the features we want. Edge guides aren't available, though. The DeWalt D26670 is a new model (the DeWalt DW673 has been discontinued).

Sources (800) 433-9258, www.dewalt.com • (800) 487-8665, www.portercable.com



GRIZZLY H7790 • \$40 H7791 • \$40

Sometimes a small, inexpensive router is handy to have around. You dedicate it to one job that you'll do repeatedly on a long project. Both of these Grizzly routers fit that bill. The H7790 requires two hands to tighten the base. It has a metal motor housing and slightly more power than the H7791. The H7791 requires only one hand to tighten. It has a plastic housing and a small roller gear. Both models come with an edge guide. They only accept the 3/8-in. template guide that's included with the machines.

Source (800) 523-4777, www.grizzly.com



HARBOR FREIGHT 44914 • \$38

Like the Grizzly H7790 and H7791, this would be a good auxiliary router, suitable for dedicating to a single purpose. The base has a roller gear to assist in setting a bit's depth of cut. The router includes an edge guide and a special 3/8-in. template guide. Other template guides won't fit this machine.

Source (800) 444-3353, www.harborfreight.com



MAKITA 3707FC • \$140

If you work in situations in which seeing the bit as it cuts is crucial to success, take a close look at this trim router. It's the only model with LED lights built into the base to illuminate the bit. Precisely adjusting the bit's height is not as easy with this router as with models that have a screw adjust. The 3707FC has a solid rubber roller to assist in sliding the base up and down, but it's not as effective as a roller gear. This machine has soft start.

Source (800) 462-5482, www.makita.com



MLCS 9059 MARVEL 40 • \$80

This is the only trim router we tested that comes with a 1/8-in. collet in addition to a standard 1/4-in. collet, so you can use the wide range of bits available for rotary cutout tools. The price includes a variety of accessories, including a metal base and large handle for drywall cutout (using the 1/8-in. collet), a two-handled tilting plunge base, a circle-cutting guide and an edge guide. The bases do not accept template guides.

Source (800) 533-9298, www.mlcswoodworking.com



PORTER-CABLE 310 • \$160

This classic router is the first choice of many professional laminate workers because its robust design can stand years of use. Adjusting the bit's height is simple and precise. Here's how it works: The motor housing is threaded all the way around. A large ring around the base engages this thread; rotating the ring raises and lowers the base. This style of screw adjustment is easier to use than that on any other trim router. On the downside, the motor's diameter is relatively large and awkward to hold if you have small hands.

Source (800) 487-8665, www.portercable.com



RIDGID R2400 • \$100

This slim machine is very easy to grip, whether your hands are large or small. It has a large roller gear to assist you in setting the bit's height. It's awkward to remove the base to change bits, however. You must rotate the clamping screw 10 full turns to loosen the base enough to remove it. This router comes with an edge guide. It has variable speed, soft start and an extra-long 12-ft. cord (most cords are 8 to 10 ft. long).

Source (800) 474-3443, www.ridgid.com



RYOBI P600 • \$50

This is the only trim router that runs on an 18-volt battery. It's handy for an occasional small job or one where an outlet is far away. With the battery fully charged, this router feels as though it has about half the power of Ryobi's corded model, the TR45K. That's plenty for small bits, however. The battery also makes the router a bit top-heavy. The battery and charger aren't included, but if you have other Ryobi 18-volt tools, you're all set.

Source (800) 525-2579, www.ryobitools.com

BATTERY NOT INCLUDED

Recommendations

Trim routers are good for more than just trimming. They only take 1/4-in. or 1/8-in. bits, but they have plenty of power for small grooves, dadoes and profiles. Their light weight and compact size make them perfect for jobs that are awkward to do with a larger router. They're not a substitute for a larger router, however; many jobs require a 1/2-in. bit and more power.

The best trim routers have all the features you'd expect from a larger router. Most important is the ease with which you can precisely adjust the bit's height. Here, three routers stand out: the Bosch PR20EVSK and PR10E and the Porter-Cable 310. On either machine, you dial in the depth of cut with a screw-type adjustment,

lock the base and you're ready to go. Two other routers get an honorable mention: the DeWalt D26670 and the Porter-Cable 7310. They also have good screw-adjusts, but their cantilevered bases may shift when tightened, slightly changing the depth-of-cut setting.

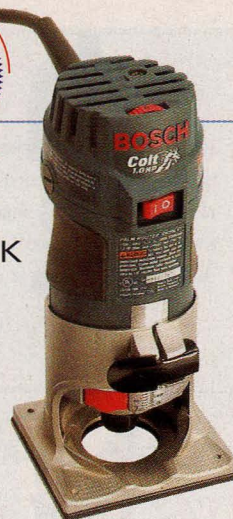
Three other features are important for all-around work: an edge guide, a baseplate that can accept a variety of template guides and two special bases for laminate work (see Chart, below). Here again, the Bosch models stand out. They are the only trim routers with every important feature.

If you'll be using your trim router for a wide variety of laminate work, look for a model that has an offset and a tilting base available (see Chart).



BOSCH PR20EVSK \$119

This new model is packed with excellent features for a wide variety of routing jobs.



If you want a small router that can double as a rotary tool, look into the MLCS 9059 Marvel 40.

If you want an inexpensive, no-frills router that can be dedicated to one small job, such as rounding over an edge, check out the Grizzly H7790, H7791 or the Harbor Freight 44914.

Tool Test TRIM ROUTERS

Model	Price	Screw-type height adjustment	Wraparound base	Edge guide available	Accepts template guides	Tilting & offset bases available
Bosch PR10E	\$99	Yes	Yes	Yes ¹	Yes ²	Yes ³
Bosch PR20EVSK	\$119	Yes	Yes	Yes ⁴	Yes	Yes ³
Craftsman 27715	\$100	No	Yes	No	No	No
DeWalt D26670	\$110	Yes	No	No	Yes	Yes ⁵
Grizzly H7790	\$40	No	Yes	Yes ⁴	Yes ⁶	No
Grizzly H7791	\$40	No ⁷	Yes	Yes ⁴	Yes ⁶	No
Harbor Freight 44914	\$38	No ⁷	Yes	Yes	Yes ⁶	No
Makita 3707FC	\$140	No	Yes	Yes	Yes ⁶	No ⁸
MLCS 9059 Marvel 40	\$80	No	Yes	Yes	No	Yes ⁹
Porter-Cable 310	\$160	Yes	Yes	No	Yes	No
Porter-Cable 7310	\$110	Yes	No	No	Yes	Yes ¹⁰
Ridgid R2400	\$100	No ⁷	Yes	Yes	Yes	No
Ryobi P600	\$50 ¹¹	No	Yes	No	No	No
Ryobi TR45K	\$80	No	Yes	No	No	No

1. Accessory #PR002, \$15. 2. Must use accessory bases. 3. Bases available separately or in kit #PR20EVSNK, \$200. 4. Included with model. 5. Model D26670K, \$220. 6. 3/8-in. diameter only. 7. Has roller gear. 8. Tilting base is available separately, #153351-1, \$20; model 3708FC has a tilting base, \$175. 9. Included with model 9059. 10. Models 97310, \$215, and 97311, \$239. 11. Price excludes battery and charger.

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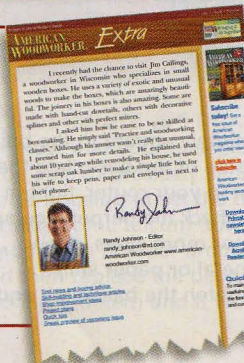
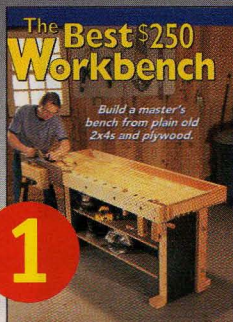
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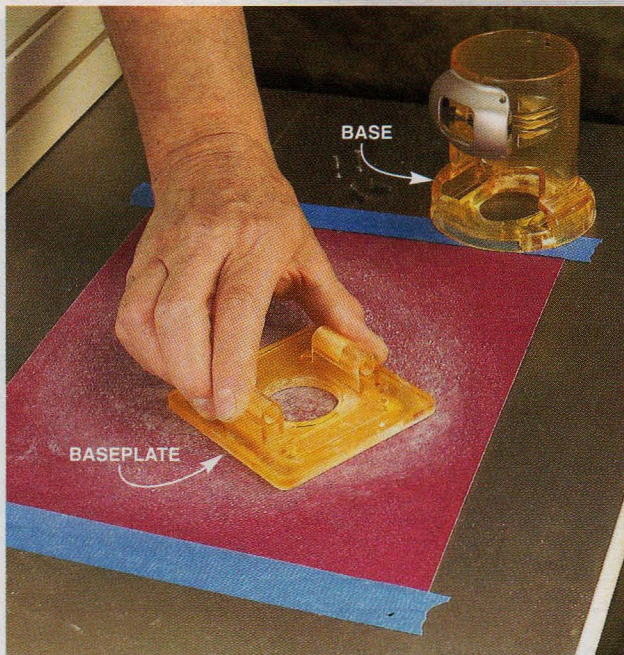


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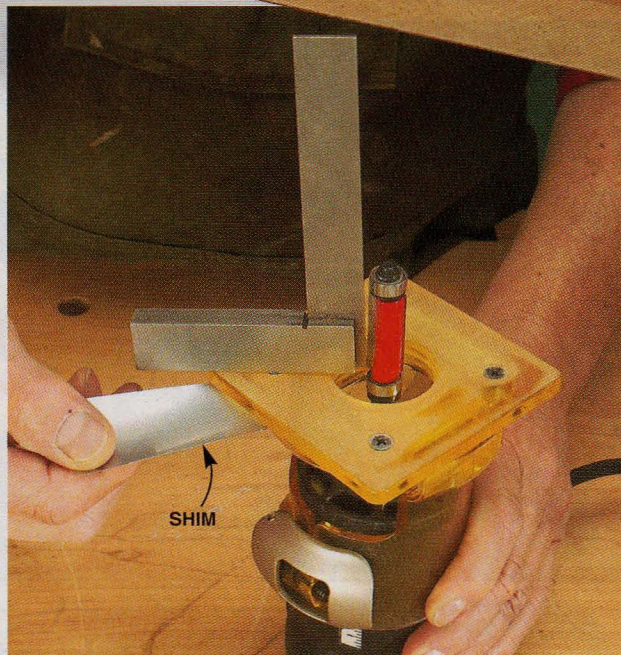
Tune Up YOUR TRIM ROUTER

UNWANTED
FILLET



1 FLATTEN THE BASE AND BASEPLATE

Begin tuning your trim router by examining its base and baseplate. Unscrew the baseplate and try to rock both parts on a flat surface. If they don't sit flat, your depth of cut will change as you go around a top. Tape a sheet of 120-grit sandpaper to the top of your tablesaw and sand the baseplate's top and bottom sides until they are flat. Sand the base flat, too.



2 SQUARE THE BASEPLATE

A flat baseplate should be absolutely square to the bit. If it isn't, you'll cut deeper from one side of the baseplate than from another. Put a long straight bit in your router, tighten the base and use a small square to check the perpendicularity of the bit to the baseplate. If one or more sides is low, loosen the baseplate and insert a metal or paper shim between the base and baseplate. Tighten the baseplate and use the square to check each side.

3 Steps to Precise Cuts

by Richard Tendick

DESIRED
ROUND OVER

A trim router is a precision tool—if it's tuned up correctly. Tuning corrects two common problems: an uneven cut and a sticky base.

By an uneven cut, I mean a roundover, chamfer or molding that's deeper on one side of a top than on another. If you're routing a roundover with a router that's not tuned, one side may be perfect, but another side may have an unwanted fillet (see photo, above left). A difference as small as 1/64 in. in the depth of cut can be troublesome. You can work around this problem by rotating the router as you go around the top—that is, always keeping the same side of the base on the top. The trouble is you must then remember which side is which, so it can be easy to foul up.

The uneven-cut problem has two causes. First, your router's base and baseplate may not be flat. This is easy to fix: Lap them both on sandpaper (Photo 1). Second, the baseplate may not be square to the bit. A few shims can solve that (Photo 2).

The sticky-base problem makes it hard to achieve a precise depth-of-cut setting. On many trim routers, you slide the base up or down the motor housing to set the depth of cut. Sliding the base in a smooth motion can be difficult or impossible, however. Some bases stick and slip in a herky-jerky fashion. Lubricating the base makes it slide much easier (Photo 3).



3 LUBRICATE A STICKY BASE

Now that your baseplate is flat and square, you'll want to be able to precisely slide the base up and down on the motor housing to set the depth of cut. Remove the base and sprinkle some talcum powder on the motor housing. Smooth the powder around until only a thin film remains and then replace the base. The powder should eliminate any sticking problem and it won't harm the machine.

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The Balanced Spectrum® floor lamp will change the way you see and feel about your living or work spaces. Studies show that sunshine can lift your mood and your energy levels. But as we all know, the sun, unfortunately, does not always shine. So, to bring the benefits of natural daylight indoors, use the floor lamp that simulates the full spectrum of daylight. You will see with more clarity and enjoyment as this lamp provides sharp visibility for close tasks and reduces eyestrain.

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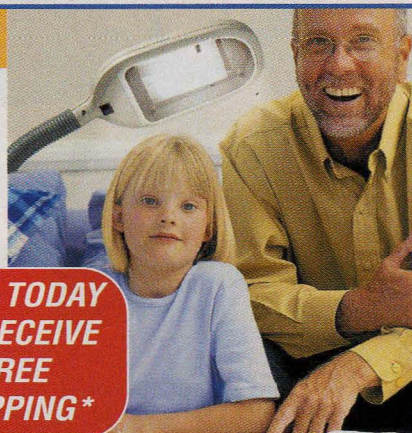
**Source: "Lighting the Way to Energy Savings"; 1999

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that's easier to use than traditional toggle or twist switches. Its flexible gooseneck design enables you to get light where you need it most. The high-tech electronics, user-friendly design, and bulb that lasts 10 times longer than an ordinary bulb make this lamp a must-have.

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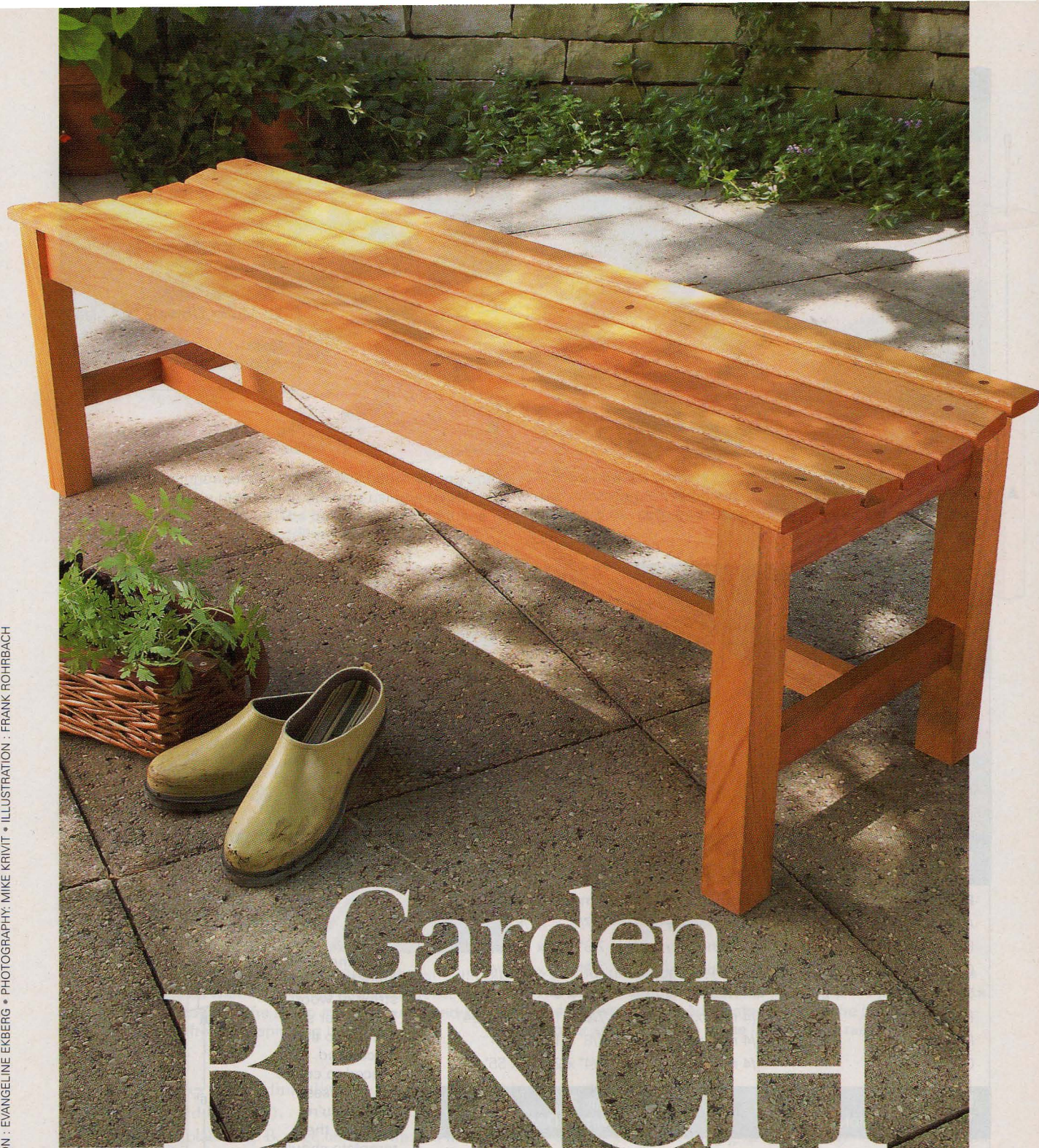
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Height as shown: 50"



Garden BENCH

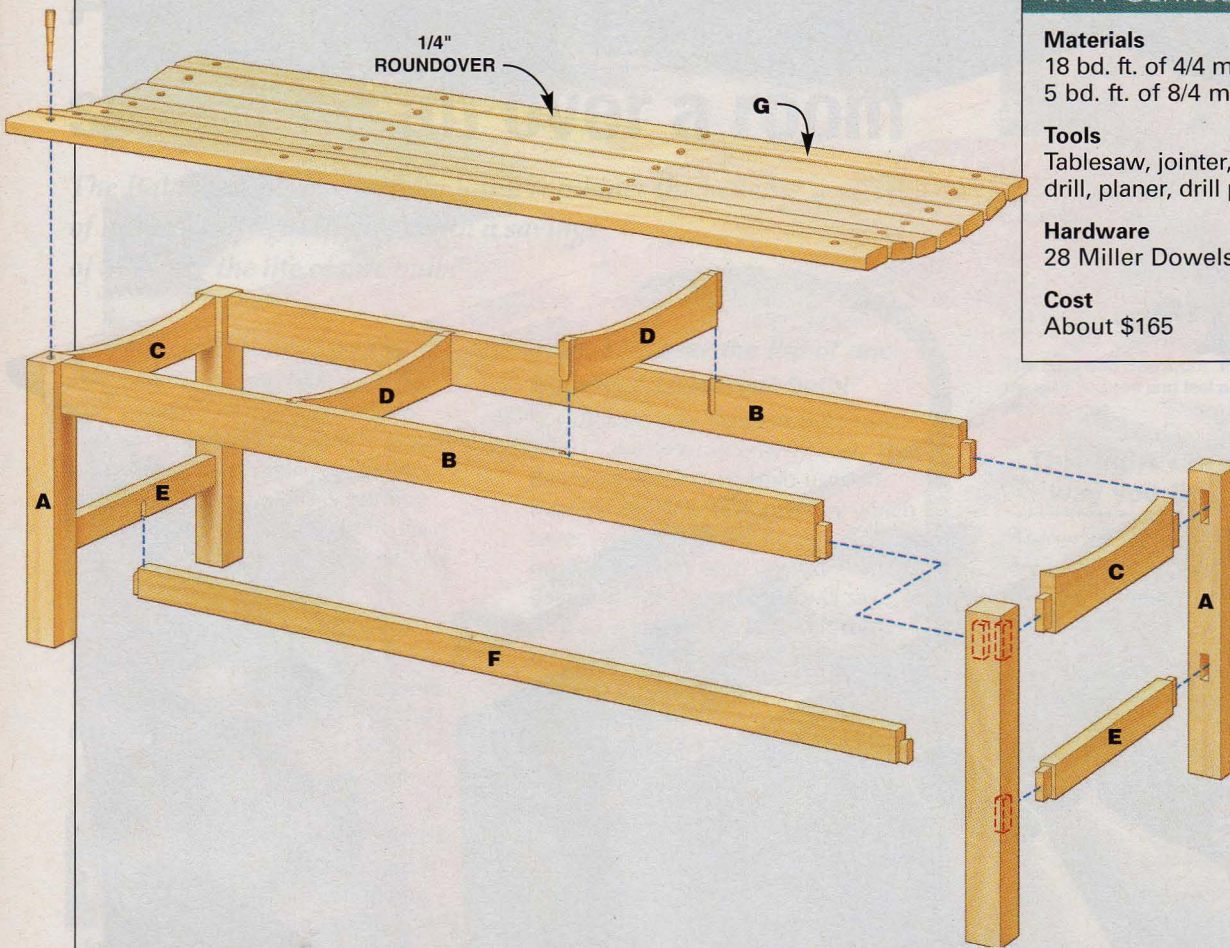
Graceful, comfortable and built to last

It dawned on me the other day that every single project I've made resides in my house. Since I spend a lot of time in my back yard garden, I decided it was high time I made something to enjoy in my outdoor living space as well. This backless bench is the perfect project. The bench is now the centerpiece of my yard. Stout mortise-and-tenon joinery and naturally rot-resistant mahogany ensure that it will retain its exalted position for

years to come. Traditional joinery holds the framework together; the seat slats are secured with a newer joinery technique, the Miller Dowel system (see "Miller Dowel Joinery System," page 68). The bench seemed to be the perfect project on which to try these high-tech dowels. I really liked how quick and easy they were to use compared with the traditional screw-and-plug approach.

by Luke Hartle

FIGURE A EXPLODED VIEW



PROJECT
REQUIREMENTS
AT A GLANCE

Materials

18 bd. ft. of 4/4 mahogany
5 bd. ft. of 8/4 mahogany

Tools

Tablesaw, jointer, cordless drill, planer, drill press

Hardware

28 Miller Dowels, 1X size

Cost

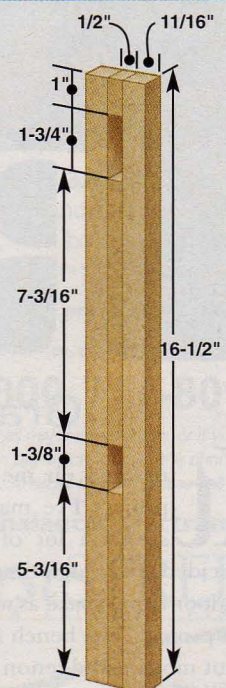
About \$165

CUTTING LIST OVERALL DIMENSIONS: 55"L x 16-1/4"W x 17-1/4"H

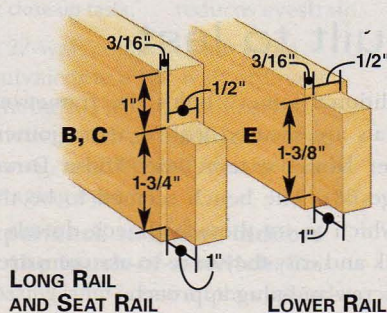
Part	Qty.	Material	Dimension
A Leg	4	8/4 mahogany	1-7/8" x 1-7/8" x 16-1/2"
B Long rail	2	4/4 mahogany	7/8" x 3" x 50-3/4"
C Seat rail	2	4/4 mahogany	7/8" x 3" x 13-3/4"
D Spreader	2	4/4 mahogany	7/8" x 3" x 14"
E Lower rail	2	4/4 mahogany	7/8" x 1-3/4" x 13-3/4"
F Brace	1	4/4 mahogany	7/8" x 1-3/4" x 51"
G Slat	7	4/4 mahogany	3/4" x 2-1/8" x 55"

FIGURE B
MORTISE TEMPLATE

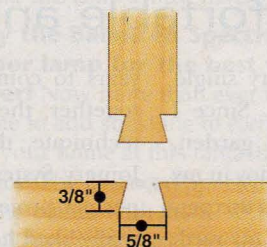
Make the template from three strips of wood. The center strip is cut into three pieces and spaced to create the mortises. When you're finished, the template should be the exact length and width of the leg stock.

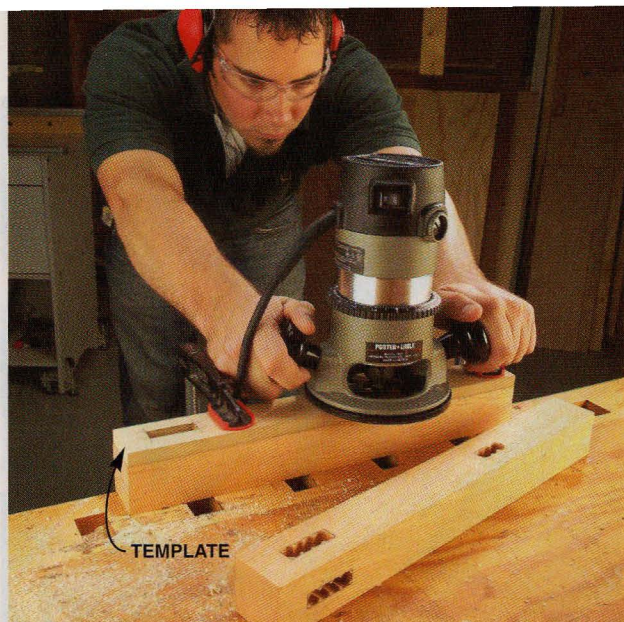


DETAIL 1
TENON DIMENSIONS



DETAIL 2
DOVETAIL DIMENSIONS

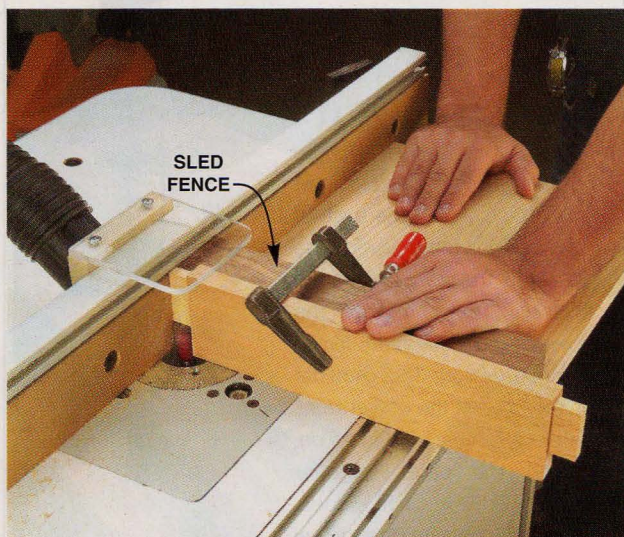




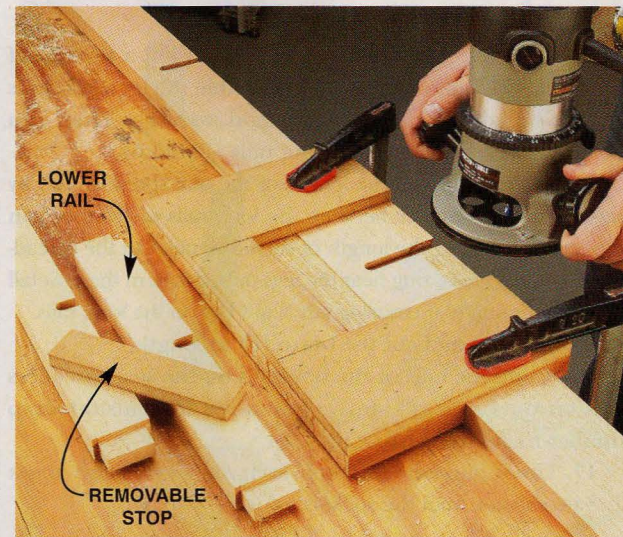
1 Mortise-and-tenon joinery makes this bench strong and durable. Rout the mortises in the legs using a template and a top-bearing pattern bit. The bulk of the material has already been removed on the drill press.



2 Square the corners of the mortise with a chisel before removing the template. The template serves as a guide to square the corners and ensure a perpendicular cut.



3 Cut the tenons on the rails with a 3/4-in.-dia. straight bit. A plywood sled with an attached hardwood fence ensures the shoulders of the tenon are cut square and keeps your hands away from the spinning bit.



4 Rout the stopped-dovetail sockets for the seat supports using a simple shop-made jig. Clamp the jig to the stock and the workbench. Add a stop-block to the jig to cut the shorter sockets for the brace in the lower rails.

1. Mill all pieces to their final dimensions, except for the spreaders (D) and brace (F).

2. Make a template (Fig. B, page 66) to route the mortises.

3. It's easy to end up with misplaced mortises. To avoid mistakes, label each leg as front or back, left or right (Fig. A, page 66). Use the template to lay out the mortises.

4. Drill out the mortises on the drill press.

5. Rout the mortises in the bench legs (Photo 1).

6. Use a chisel to square the mortise's corners (Photo 2). Do this right after you rout each mortise to avoid having to reposition the template.

7. Rout the tenons on the long rails (B) seat rails (C) and the lower rails (E) (Photo 3). Use a large-diameter straight-cut bit for a smooth cut. Rout the tenons on all the long and

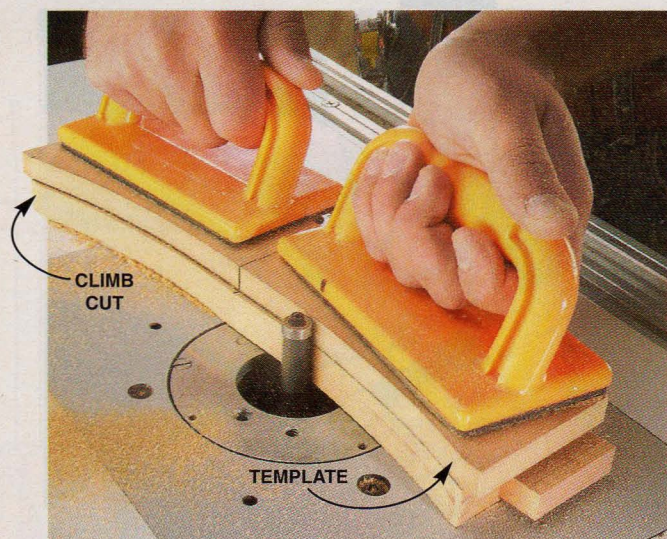
seat rails before routing the lower rails so you only have to change your setup once.

8. Use the dovetail jig (Fig. C, page 68) to rout the stopped-dovetail grooves in the long rails (Photo 4). Match the centerline of the socket with the centerline on the jig. Clamp everything firmly to the workbench.

9. Insert the stop block in the jig and rout the dovetail sockets in the lower rails.

10. Rough-cut the seat template pattern (Fig. D, page 68) on the bandsaw and sand smooth.

11. Rough cut the curves in the seat rails on the bandsaw. Finish the profile with the seat template and a pattern-cutting bit (Photo 5). Center the template on the rail with the back edges flush.



5 Rout the curve in the seat rails and spreaders using a template. Center the template on the rail and secure it with double-sided tape. Climb-cut the last portion of the curve first to prevent tearout.

12. Sand all the parts to 180 grit.

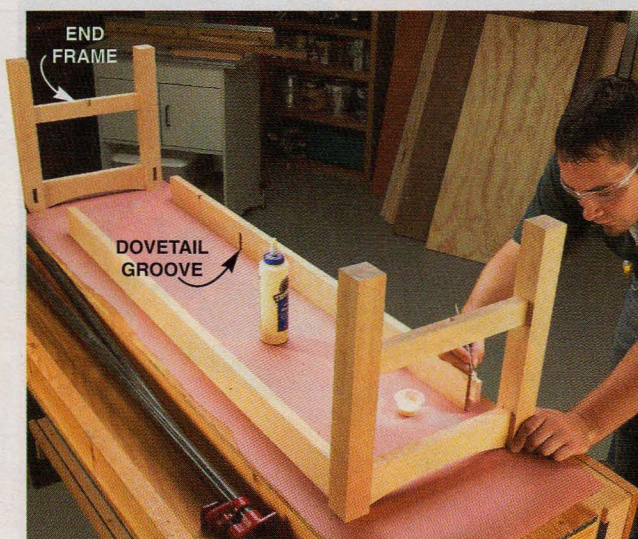
13. Glue the bench frame in stages, using a waterproof glue, such as Titebond II or III. Assemble the legs, seat rails and lower rails first to create an end assembly. Then join the end assemblies with the long rails (Photo 6).

14. Determine the exact length of the seat spreader (D) by measuring the distance between the long rails where they join the legs and adding the length of each dovetail. Cut the spreaders to length. Measuring near the legs rather than in the dovetail grooves eliminates measuring any slight bow in the long rails.

15. Measure and cut the brace (F) to length.

16. Route the tails of the dovetails on the seat spreaders and on the brace (Photo 7). Run a few test cuts on scrap lumber to get the perfect fit.

17. Use a handsaw to notch each tail so they are about 1/8 in. shorter than the sockets.



6 Glue the long rails to the assembled end frames. Keep the dovetail groove opening faceup (that is, down on the bench) on the long rails. The grooves on the lower rails face the opposite direction to hide the dovetail joint.

Miller Dowel Joinery System

The Miller Dowel system combines the strength of wood joinery with the ease of a screw. Drill the hole, add the glue, tap the peg and you're finished. The secret to the dowel's success lies in its stepped design. The shoulder on the head of the dowel seats before the other shoulders do, driving the parts together much like a nail does.

Horizontal ribs on the dowel absorb moisture from the glue, causing the dowel to swell in the hole and lock in place. The head of the dowel serves as a plug in the hole, but unlike traditional plugs, the Miller Dowel leaves dark-looking end grain exposed for a decorative look after the plug is sanded and finished.

Miller Dowels are available in three sizes and a wide variety of species. A companion stepped drill bit is specifically designed for each size of dowel. (see Sources, page 69).

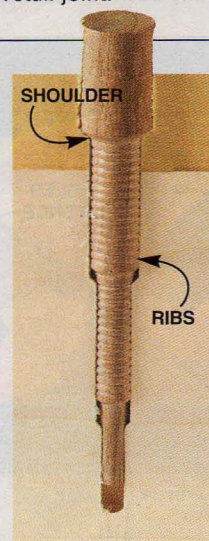
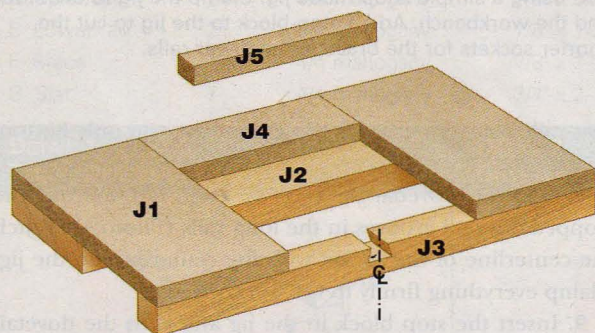


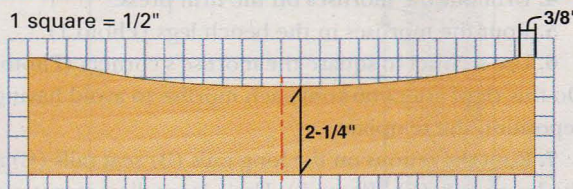
FIGURE C DOVETAIL JIG

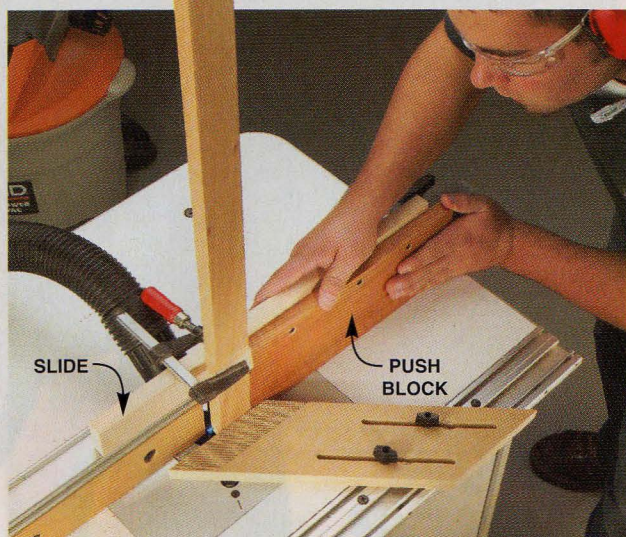


Part	Name	Qty.	Material	Dimension
J1	Top	2	MDF	1/2" x 4" x 8"
J2	Large base	1	Hardwood	3/4" x 4" x 14"
J3	Small base	1	Hardwood	3/4" x 1" x 14"
J4	Fixed stop	1	MDF	1/2" x 2-1/4" x 6"
J5	Removable stop	1	Hardwood	1/2" x 1-1/4" x 6"

* Distance between guide boards equals router base width.

FIGURE D SEAT TEMPLATE





7 Rout the tails on the ends of the brace and the seat spreaders. Stabilize the stock using a push block with a slide attached. Fasten the slide so it runs along the top of the fence. Clamp the stock to the slide so it butts against the push block.



8 Glue the spreaders and the brace to the bench frame. Slide the dovetails together by hand as far as possible. Use a rubber mallet to tap the joint home. Alternate tapping each end to prevent binding.

18. Rout the curves in the spreaders, as done on the seat rails in Step 11. Make sure to use the centerline for reference. Unlike the rails, the spreaders will have short flats on each end of the curve (Fig. A, page 66).

19. Sand the seat spreaders and the brace.

20. Glue in the spreaders (Photo 8). Then, flip the bench and add the brace.

21. Shape the seat slats on the router table with a 1/4-in. round-over bit.

22. Lay out all dowel locations on the seat slats (Fig. A).



9 Install the slats to the bench frame using Miller Dowels. When the first board has been doveled, use a 1/4-in. spacer to set the gap between the slats. Clamp the end of each slat as you drill and dowel, working your way across the bench.

23. Attach the seat slats to the bench (Photo 9). First clamp an outside slat so it overhangs the leg by 1/8 in. Run the drill at the maximum rpm level with a slow feed rate to prevent tearout around the hole.

24. Use a framing square to keep the slats' ends aligned.

25. Trim the dowel heads with a flush-cut saw.

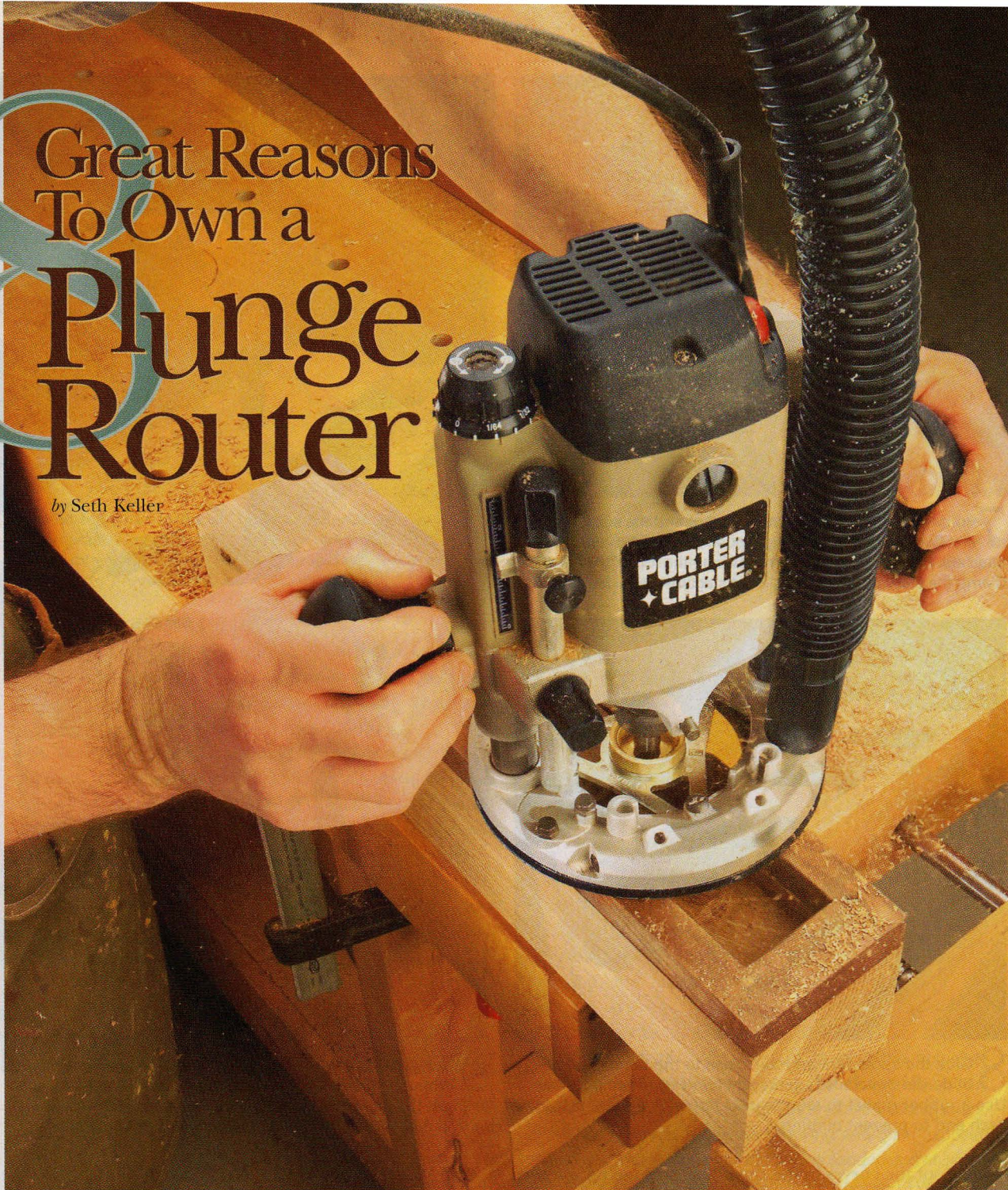
26. Sand the slats to 180 grit.

27. Finish the bench with an outdoor finish to preserve its color and appearance or skip the finish and let it age naturally to a silver-gray color.

Sources Steve Wall Lumber Co., (800) 633-4062, www.walllumber.com Select 4/4 mahogany, \$4.30 a bd. ft. Select 8/4 mahogany, \$4.60 a bd. ft. • Miller Dowel Co., (866) 966-3734, www.millerdowel.com 1X Miller TruFit drill bit, \$18. 1X mahogany Miller dowels, 100-count bag, \$35. • Rockler, (800) 279-4441, www.rockler.com 5/8-in.-dia. x 14-degree dovetail bit, #91034, \$13. • Woodworker's Supply, (800) 645-9292, www.woodworker.com 3/4-in. double-flute straight bit, #04-140, \$17. • Amana Tool, (800) 445-0077, www.amanatool.com 1/2-in.-dia. x 1-in. flush-trim template bit with upper ball bearing, #45460, \$23. 1/2-in.-dia. x 1-1/2-in. flush-trim bit, #47124, \$25.

Great Reasons To Own a Plunge Router

by Seth Keller

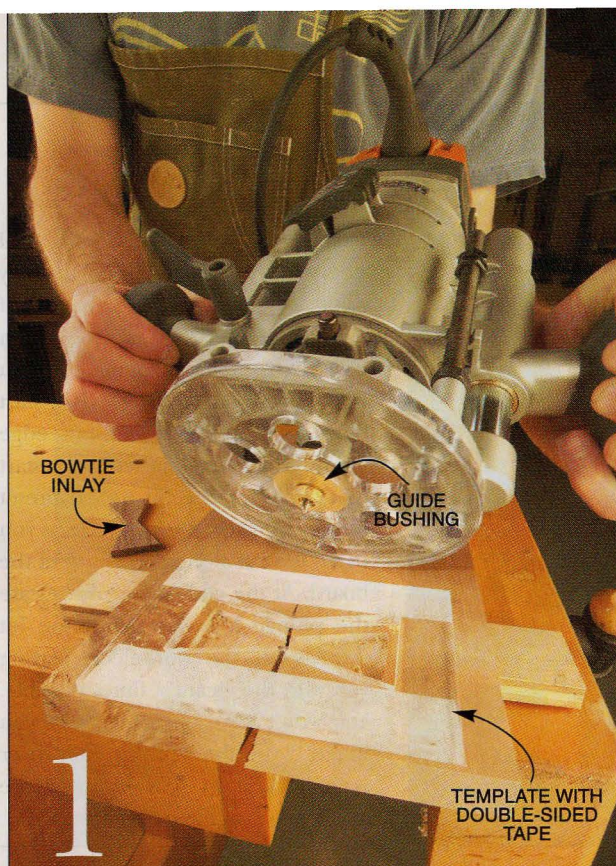


Plunge routers go where no other router can.

The plunge router deserves a place in every shop. Routing chores, such as mortising, stopped dados and inlay pattern work, are safer and easier to perform using a plunge router. Its unique base allows the motor housing to ride up and down on a pair of posts fixed to the base. The plunge mechanism is spring-loaded so the motor housing always wants to spring up to the top of the posts. A lock/release lever allows free up-and-down movement of the router housing or locks it in place at a given depth. The depth

of cut can be preset, allowing you to position the router over the work and plunge the bit to an exact depth. The depth stop works much like the stop does on a drill press.

Plunge routers have been around for years. Some die-hard users of fixed-base models may argue that a fixed-base router can do everything that a plunge router can do, but they don't realize what a great, unique tool the plunge router is. Here are eight things a plunge router can do with ease that present a challenge for a fixed-base model.



1

Great Template Routers

Template routing with guide bushings is trouble-free when you use a plunge router. Just set the router over the template, turn it on, plunge the bit to the preset depth and rout. The plastic bowtie inlay template, shown above, would probably have a few battle scars if a fixed base router had been used. You may get away with tipping it into the cut for a while, but sooner or later that template would be nicked.



2

Required by Some Jigs

A plunge router is a must when it comes to sophisticated jigs, such as the WoodRat (see Tool Talk, page 34) and the FMT by Leigh (see photo, above). These jigs cut mortises, tenons, dovetails and a whole lot more, but they simply can't perform all their operations without the use of a plunge router.



3

Ideal for Inlay Grooves

The plunge router is ideally suited for stringing and delicate inlay work, often called captured inlay, because the plunge mechanism allows a smooth entrance and exit from the cut. Try tipping your fixed-base model into a cut like this and your cut will likely be misaligned right where the groove starts. This is one operation you definitely want to get right the first time, and a plunge router is the surest way to get the job done well.

4

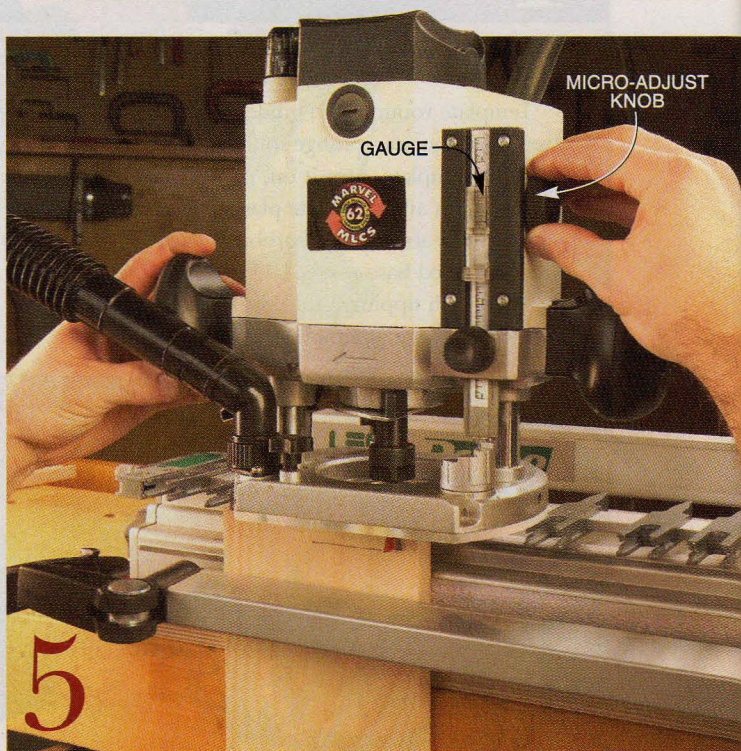
Burn-Free Stopped Flutes

There's no better way to mill stopped grooves and flutes than by using a plunge router. This type of milling is safer and simpler than using a fixed-base router. All you need to cut perfect flutes is a start block, a stop block and an edge guide. With the router set on the start block, plunge the bit to the preset depth and press the lock lever as you make the cut along the length of the board. At the end of the cut, release the plunge lock lever and the bit retracts off the workpiece, leaving you with the cleanest flutes possible. You won't leave burn marks, as you might if you tipped the router in or waited for it to spin down before extracting it at the end of the cut.



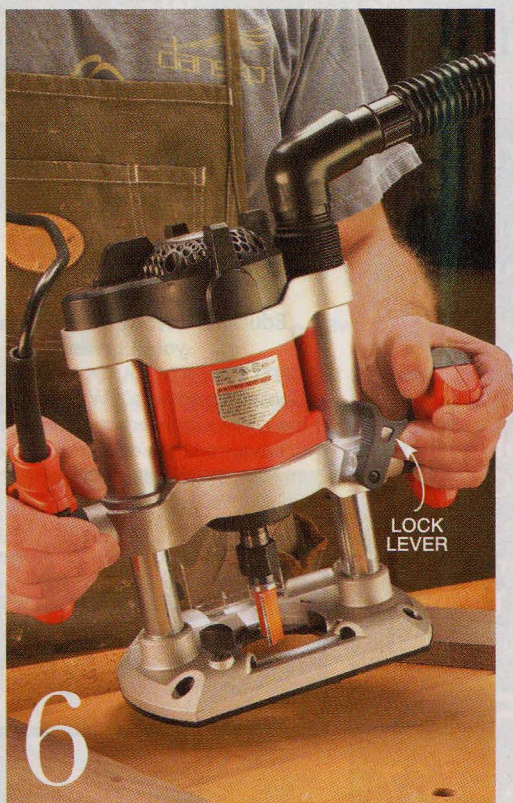
Use the Right Bit for Plunging

Take advantage of bits designed for a plunge router. Plunge-cutting straight bits have bottom cutters that allow the bit to bore a hole as it is plunged into the work. Bits without a bottom cutter aren't capable of making plunge cuts, because they bottom out in the center.



Onboard Scale for Fine Adjustments

Micro-adjustable depth knobs make fine-tuning a plunge router simple. Small changes in bit height can be frustrating to make on some fixed-based routers. Plunge routers allow you to read and fine-tune the depth right on the router's face.



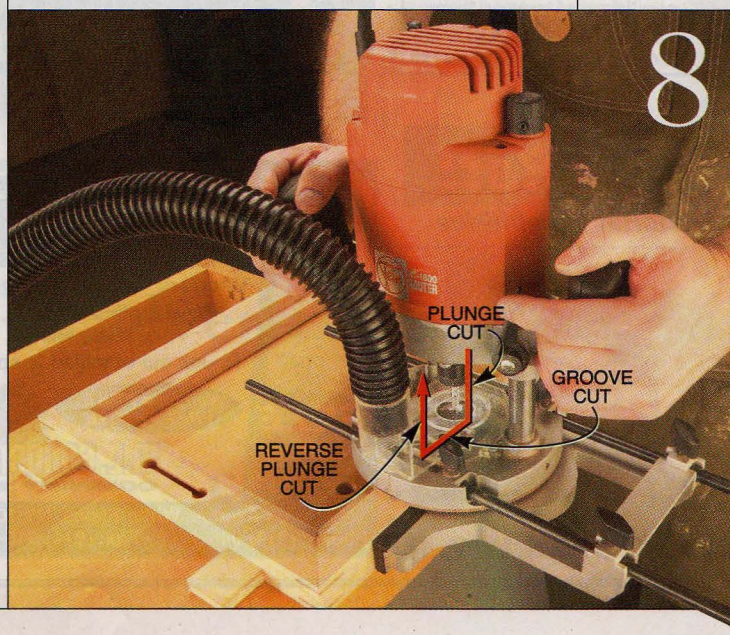
Built-In Bit Protection

One advantage a plunge router has over a fixed-base model is bit protection. A plunge router automatically surrounds and protects your expensive bits when it's not in use. Just push your finger to disengage the lock lever and the spring-loaded mechanism retracts the housing, lifting the bit into the safety of the router base. This protects your bits, your fingers and your benchtop from accidental nicks.



A Star at Cutting Mortises

Cutting mortises is much easier with a plunge router than with a fixed-base model. A deep mortise can be cut without overtaxing the router or the bit. An adjustable stepped turret is the key. It allows a plunge router to make a series of relatively shallow but ever deeper cuts. You don't have to tip a spinning bit into the work as you would with a fixed-base router. A simple twist of the plunge router's stepped turret allows you to increase the depth-of-cut setting for the next pass, guaranteeing a cut that's not too deep.



Best for Some Specialized Bits

Some popular bits are best used with a plunge router. A keyhole/picture-hanging groove, for example, would be virtually impossible with a fixed-base router. To create this keyhole groove requires the bit to plunge down into the stock, slide laterally to cut the groove and then reverse-plunge to create the keyhole on the opposite end. These specialized bits have cutters on the top, bottom and side.

Imagine lifting the bit up out of the cut while using a fixed-based router. On second thought, don't even try to imagine it.



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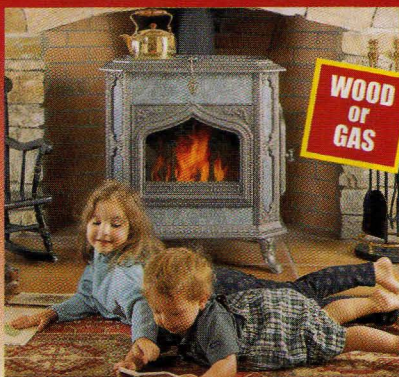
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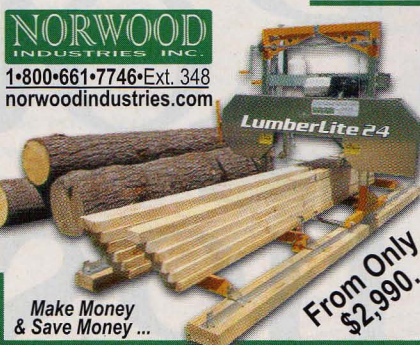
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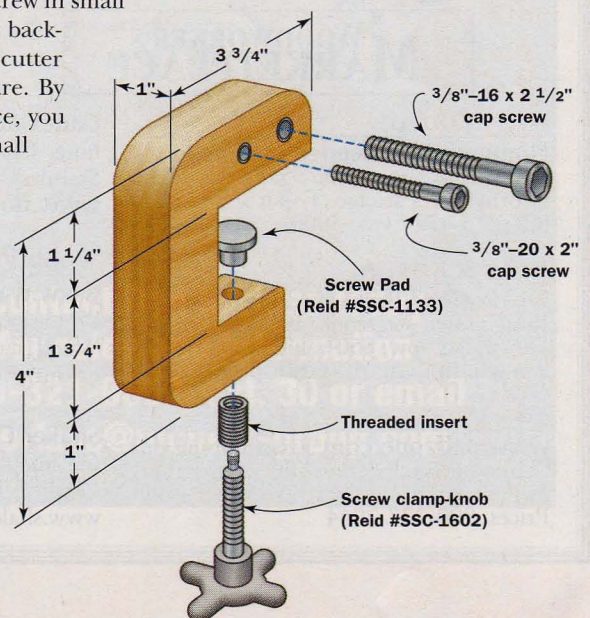
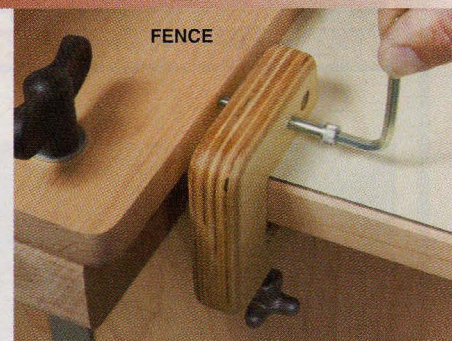
by Bill Hylton

Why buy a commercial jig when making one yourself will triple your enjoyment? First, you'll experience the joy of building a useful shop fixture from nothing more than some scrap wood and a good idea. Second, you'll enjoy the money you'll save. And finally, as all woodworkers understand, you'll have the satisfaction that comes with saying, "I made it myself." The five jigs described here are all designed to deliver improved accuracy, control and adjustability for a lifetime of better routing.

FENCE MICRO-ADJUSTER

This jig enables you to make tiny, accurate adjustments in positioning a router table fence. A pair of jigs clamp to the tabletop, one at each end of the fence. Each jig has a stop that extends to meet the back of the fence. The stop is a simple cap screw that you turn with an Allen wrench (see photo, right). The two screws, in 3/8-in.-16 and 3/8-in.-20 sizes, have different thread pitches that produce different rates of adjustment. An L-shaped Allen wrench makes it easy to track the amount of adjustment, for example, a quarter turn or half turn. By retracting the cap screw in small increments, you move the fence backward to slowly reveal more of the cutter or forward to reduce bit exposure. By moving only one end of the fence, you can make some incredibly small adjustments. For example, if one end of the fence is moved back 1/64 in. (a quarter turn of the 3/8-in.-16 bolt) and the other end remains stationary, the router bit will make a 1/128 in. deeper cut.

Face-glue two layers of 1/2-in. multi-ply plywood to create a blank for the jig body. Adjust the opening and overall dimensions as needed to match your router table. The hardware is available at hardware stores.



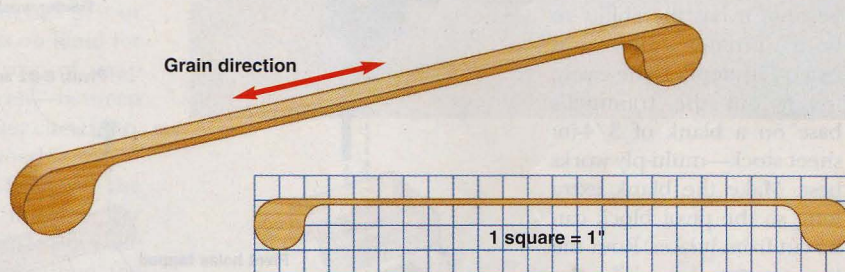
SPRINGBOARD

This unusual jig—a bow-like affair with a clamp pad on each end—can be secured to the fence or tabletop and employed in place of a featherboard.

Making the jig is a straightforward bandsaw project (see the pattern, below right). The jig's length can be adjusted to suit any router table. Species with natural resilience, such as oak, ash or hickory, make the best springboards.

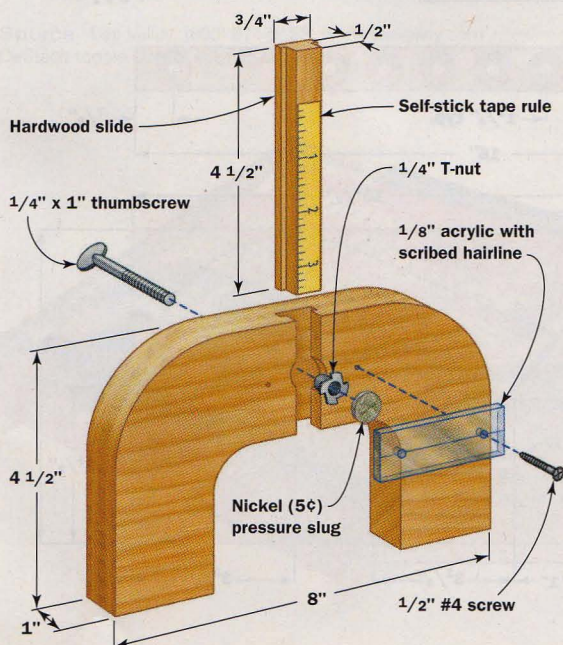
To use the springboard, clamp one end in place, flex the jig to create pressure against the workpiece and then clamp the other end in place. Two springboards can be used simultaneously to hold a workpiece against the fence and the table as it passes by the bit.

Select a straight-grained board and lay out the springboard so its thin middle section follows the grain direction exactly. Avoid any grain run-out because it could result in a weak point that might fracture under tension. After you cut the springboard from the blank, sand it smooth to reduce friction where it contacts the stock.



DEPTH GAUGE

Setting bit height is either a hit-or-miss proposition based on eyeballing or a simple measuring task featuring a depth gauge jig (see photo, right). The latter approach is faster and more accurate. Plus, it saves aging knees by eliminating that awkward hunkering-down motion to reach bit level. With a depth gauge, you simply set the desired bit height and then raise the bit until it hits the bottom of the slide bar. With a piloted bit, make sure the slide clears the bearing and touches the cutter.



Built from multi-ply for strength and stability, this depth-gauge jig requires a short length of self-stick measuring tape with large numbers, a thumbscrew and a little piece of clear acrylic.

Lay out the depth-gauge body on some plywood. Drill the hole for the nickel 1/16-in. deeper than the T-slot using a 7/8-in. Forstner bit. Plow the T-slot with a T-slot router bit before shaping the body. The slide is a simple T-molding made by cutting two rabbets on the edge of a board and then ripping the molding free. Apply the self-stick tape rule at the bottom. Secure the acrylic plate with a couple of screws.

Zero the gauge by setting it on a flat surface, for example, your tablesaw. Let the slide drop to the table and lock. Score a line on the face of the acrylic over the 0-in. mark on the tape. Drill the holes slightly oversize in the acrylic plate to allow some minute adjustment, if necessary.

Sources Lee Valley, (800) 871-8158, www.leevalley.com Adhesive bench measuring tapes, 48 in., #25U02.02, \$6 ea. • MLCS, (800) 533-9298, www.mlcswoodworking.com T-slot cutter, #6334, \$17.

ADJUSTABLE TRAMMEL

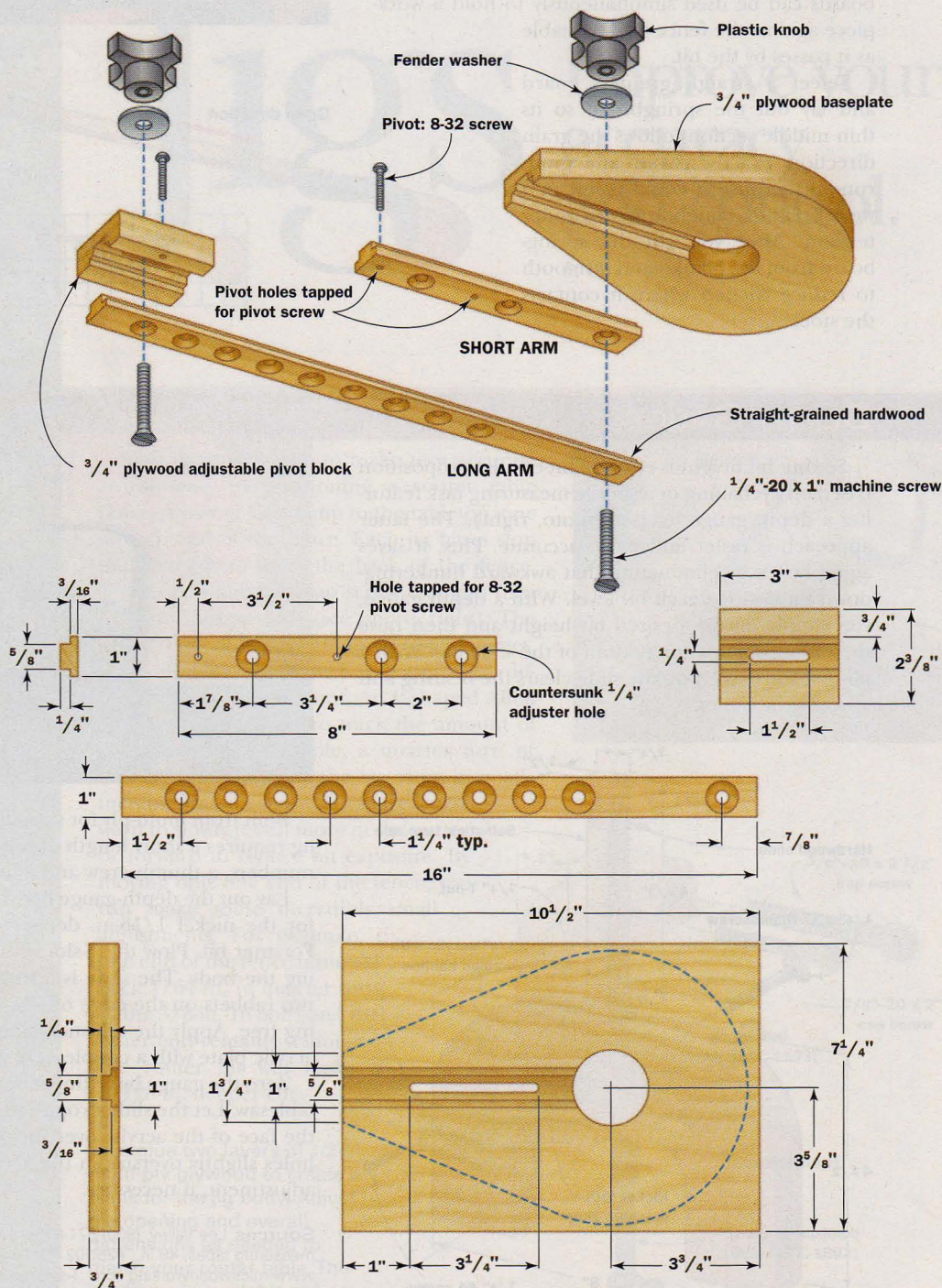
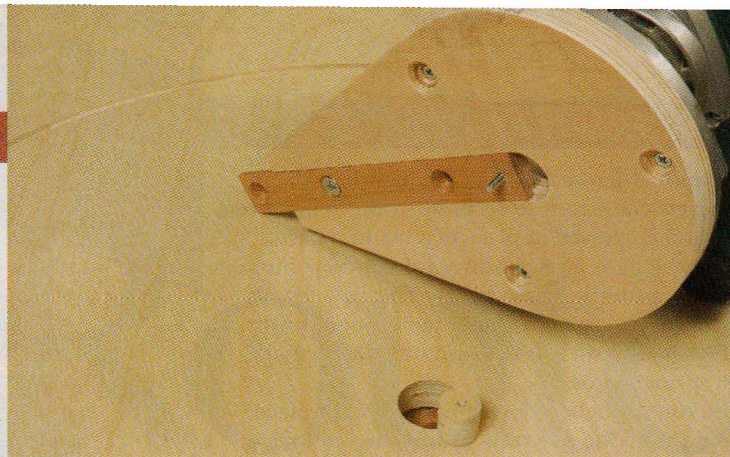
This trammel uses interchangeable arms to create circles and arcs of different diameters. It can handle jobs as varied in size as the small plug you see in the photo at right and the broad arc on the base of a wide cabinet. The short arm has two pivot holes and three mounting holes. You can reverse the arm and use different pivot-mounting hole combinations to cut 1-1/2-in. to 16-in. diameters. The longer arm creates diameters up to 36 in. A small plunge router works best with the trammel because it has the ability to both initiate a cut and extend its depth quite easily.

Lay out the trammel's base on a blank of 3/4-in. sheet stock—multi-ply works best. Make the blank extra long so the pivot block can be cut from it later. Rout the two-step groove while the blank is still a rectangle. Cut the pivot block from the blank. Drill the bit opening with a Forstner bit. Then cut the baseplate profile on a bandsaw and sand the edges.

Each arm is a simple T-shaped molding made to fit the stepped groove in the base and pivot block. To machine the arms, rout two rabbets on the edge of a wide board and rip it to thickness. Cut the T-shaped molding to the desired lengths. Drill and countersink holes for adjustment bolts. Then tap holes for a pivot screw.

Tip If you don't have a trammel and want to cut a small hole or disc, drill a small hole in the router baseplate and drop it onto a headless nail driven partway into the workpiece. Doing so makes the base a very short-armed trammel.

Source Lee Valley, (800) 871-8158, www.leevalley.com 2-in. four-arm knob, #00M55.40, \$2 ea.



COPING SLED

End-grain milling can be difficult. The stock tends to walk, angling forward or backward instead of staying at right angles to the fence. In addition, the leading corner can dip into the bit opening in the fence.

A coping sled solves these problems. It holds a rail securely during a cut and backs the cut to protect against tearout. The sled doesn't rely on a miter-gauge groove, and it is large enough to bridge the opening in the fence. The comfortable handle provides a sure grip on the sled and keeps your hands out of harm's way.

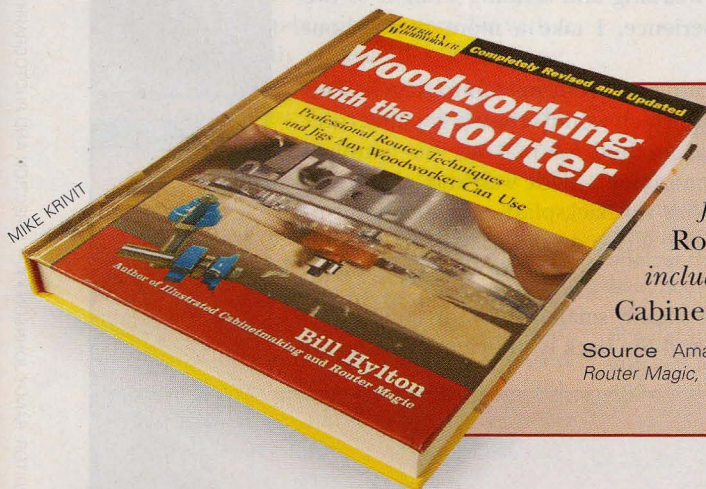
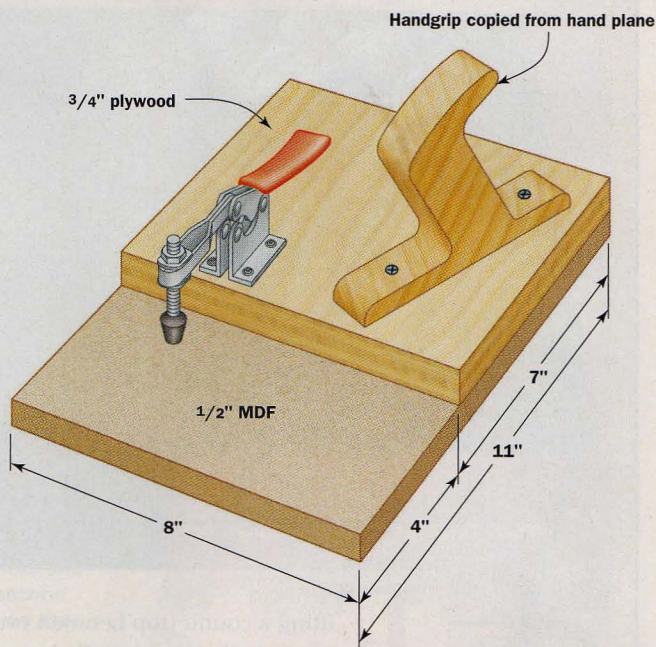
The router bit mills the sled's fence. This isn't a problem as long as you use the same sled with the same bit and height every time. In fact, it helps set the bit height. Because these sleds are easily made from materials in your scrap bin, you could have a number of sleds on hand for various bits. An alternative is to install a strip of scrap wood—3/4-in. square pine would work nicely—between the fence and the workpiece and let the router chew it up. Or simply replace or rotate the 3/4-in. plywood fence.

To use the jig, make sure your fence is set flush with the cutter bearing. Position the workpiece on the sled. For incremental cuts, hold the piece slightly back from the edge of the sled for the first cut. Then reposition the piece flush with the sled base. Hold the sled firmly against the fence while you make the cut.

Use 1/2-in. stock for the base so the toggle clamp's force won't distort it. Make the handle from doubled up 1/2-in. birch multi-ply or from maple. If you use maple, pay attention to the grain direction; it should move diagonally across the handle profile to minimize short-grain weaknesses. Trace the profile of a bench plane handle onto the handle blank. Cut out the handle on the band-saw and file and sand it smooth. Install the handle at an angle so that during operation the pressure is naturally applied into the fence as well as down on the sled.

Apply a thin coat of paste wax or shoe polish to the bottom of the sled. Let it dry and then buff it to a high shine. This will virtually eliminate friction between the sled and the tabletop.

Source Lee Valley, (800) 871-8158, www.leevalley.com
DeStaco toggle clamp, #88F05.01, \$17.

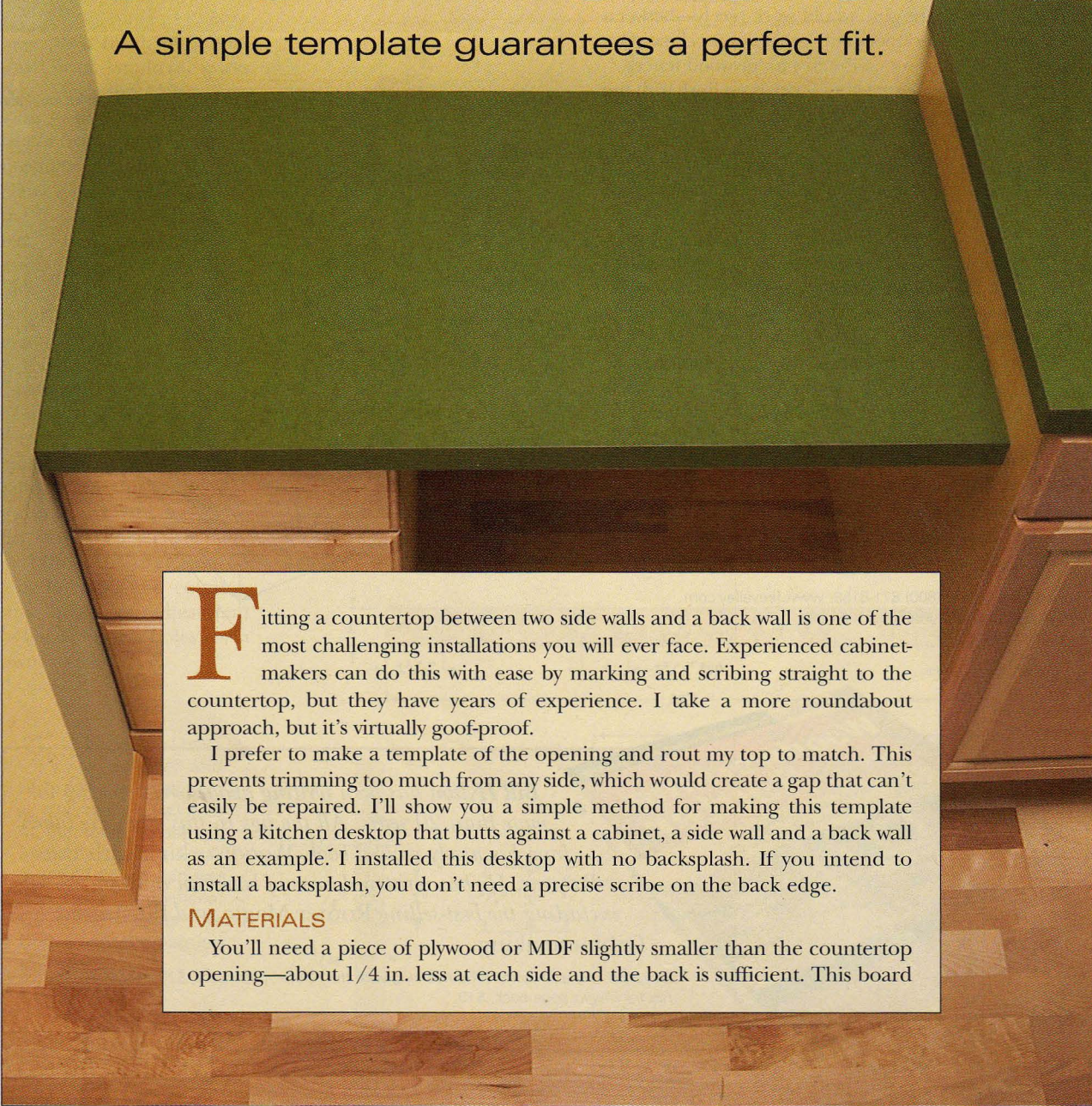


Bill Hylton has been writing about woodworking for more than 20 years. All the jigs in this story are taken from his newly revised book, Woodworking with the Router. He has written dozens of books on the topic, including the best-selling Router Magic and Illustrated Cabinetmaking.

Source Amazon.com Woodworking with the Router, paperback, \$20; hardcover, \$30.
Router Magic, paperback, \$19.

Precision 3-Wall Scribes

A simple template guarantees a perfect fit.



Fitting a countertop between two side walls and a back wall is one of the most challenging installations you will ever face. Experienced cabinetmakers can do this with ease by marking and scribing straight to the countertop, but they have years of experience. I take a more roundabout approach, but it's virtually goof-proof.

I prefer to make a template of the opening and rout my top to match. This prevents trimming too much from any side, which would create a gap that can't easily be repaired. I'll show you a simple method for making this template using a kitchen desktop that butts against a cabinet, a side wall and a back wall as an example. I installed this desktop with no backsplash. If you intend to install a backsplash, you don't need a precise scribe on the back edge.

MATERIALS

You'll need a piece of plywood or MDF slightly smaller than the countertop opening—about 1/4 in. less at each side and the back is sufficient. This board

will be your template's base and will rest on top of the base cabinets or wall cleats. You'll also need three guide boards of any 1/4-in.-thick material. Cut them about 4 in. wide. Make two a couple inches longer than the countertop's depth and one a few inches shorter than the countertop's width.

MAKE THE TEMPLATE

Lay the template base on top of the cabinets or cleats and temporarily secure it with a couple of screws (Photo 1). Position one guide board on either the left or right end and push it up against the side and back wall (Photo 2). Next, you'll need a washer whose rim is big enough to span the widest gap between the wall and the guide board. Put your pencil tip in the washer's hole and draw a line on the guide board, letting the washer follow the wall's contour (Photo 3). Clamp the guide board to your workbench, and use a belt sander to sand down to the line (Photo 4). Check the fit against the wall. When you've got a snug fit, screw the guide board to the template (Photo 5). Repeat the same steps on the guide boards on the other side and on the back. Cut the back guide board so it fits between the two side guide boards.

Make a mark on the side guide boards to indicate where you want the front edge of the countertop to line up (Photo 6). Then, remove the template assembly and set it on the countertop to be trimmed. Line up the marks you made with the front edge of the countertop, and clamp the template in place (Photo 7). **Note:** Build your countertop about 3/8 in. larger in width and depth than the opening.

ROUT THE TOP

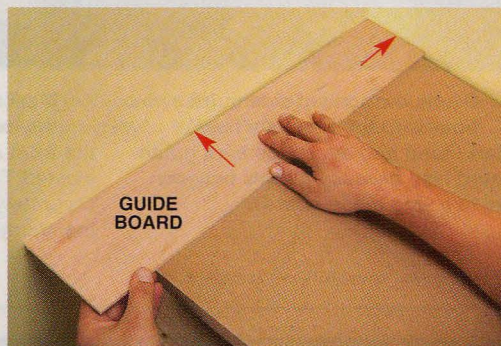
Using a top-bearing pattern bit with a cutting length at least 1-1/2 in. long, trim around the template (Photo 8; see Sources, page 87). Stop short of the front left corner so you don't blow it out, and carefully finish the cut with a belt sander (Photo 9).

Tilt the countertop into place (Photo 10). It should fit snugly, but if it's too tight, you may need to adjust the fit slightly. To do this, reattach the template slightly off center and rout the exposed edge to gain a little clearance. If you follow these steps carefully, you'll end up with a perfect fit.

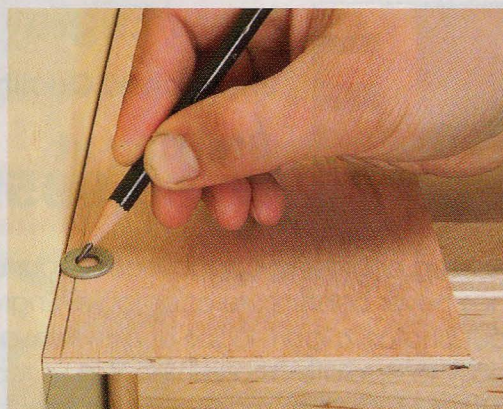
1 Three-wall scribes are tricky because both ends and the back of the countertop all have to fit snugly. My technique removes most of the difficulty by starting with a loose-fitting template base. I'll scribe three guide boards, one for each wall, and screw them to the template base.



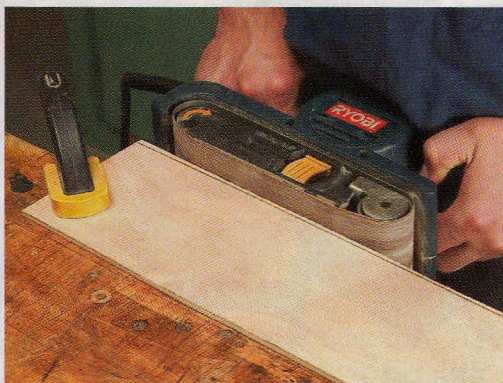
2 Position the first guide board on the template base by sliding it up against both the side and back wall. It must be long enough to overhang the front of the template base by a couple of inches.



3 Along the side and back wall, mark a scribe line on the guide board using a pencil and a small washer. The washer follows any bumps or curves in the wall. Repeat this step with a second guide board on the other side.



4 Clamp the guide board on your workbench and carefully sand to the pencil line. When you're done, check the fit against the wall. The beauty of this method is that if the fit's not quite right, you can just mark and sand again.





5 Screw the scribed side guide boards to the template base. Mark, sand and attach the back guide board last, because it butts between the two side guide boards.



6 Mark both side guide boards at the exact point where you want the front edge of the countertop located. This mark will be used to accurately align the guide boards on the countertop.



7 Use a square to align the countertop's front edge with the marks on the side guide boards. The countertop must be slightly larger than the template assembly.



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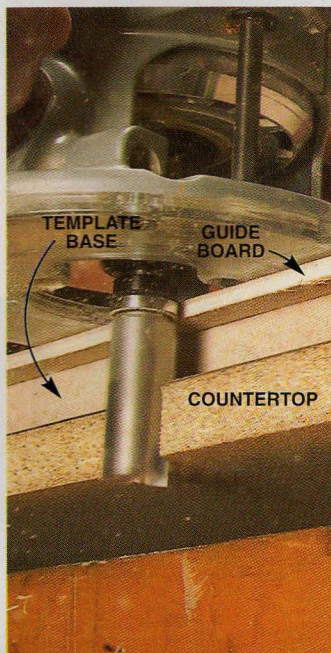
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8 Rout the countertop's finished shape using a top-bearing pattern bit. Start at the countertop's front right corner and rout counterclockwise.



10 Tilt the counter into place. Fasten it with screws from underneath through the top of the base cabinet. A wood cleat screwed to the right-hand cabinet supports this top on the right side.

Sources Router Bit World, (800) 630-2260, www.routerbitworld.com
Amana Top bearing 3/4-in.-dia. plunge bit, #45465, \$40.



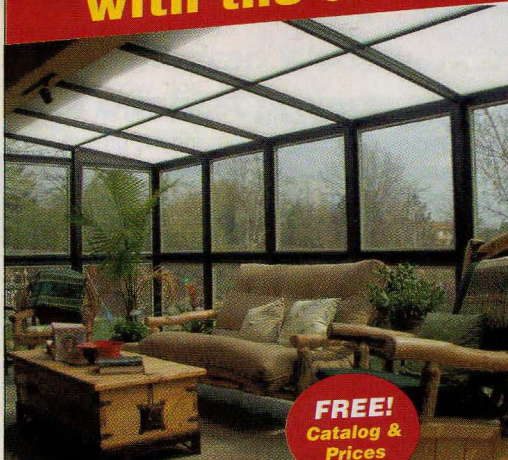
9 Stop routing short of the front left corner and use a belt sander to remove the remaining material. This prevents the router bit from chipping out the front edge. A piece of masking tape provides a clear mark where to stop sanding.

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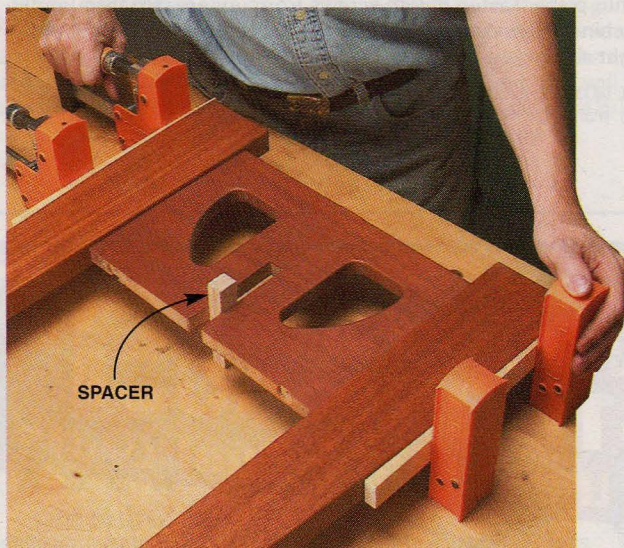
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12 Tips for Successful Gluing



SPACER

Do a Dry Fit

Clamp your pieces without glue to make sure the joints come together tightly. This step also serves as a test for your choice of clamps and blocks. Here, a dry run revealed that I need wedge-shaped strips and a spacer to clamp these tapered legs.

Prepare the Glue Brush

If you use a brush, remove any loose bristles. Acid brushes are inexpensive and work well, but you should cut the bristles to about half their length to more easily control where the glue goes. You can find these brushes at a hardware store.



Prepare a Cleanup Tool

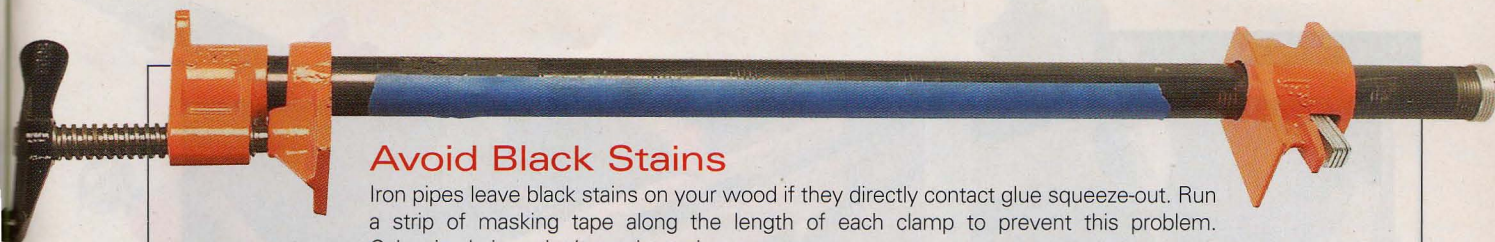
It's best to remove glue squeeze-out before it hardens. Use a clean putty knife on wide surfaces and a freshly sharpened stick in corners. Wipe them often on a damp rag.



Protect Your Wood

Small clamp heads can put big dents in your project. Make sure you've got blocks, strips or pads handy to place between the clamp heads and the project's parts. I prefer to make blocks from a soft wood, such as pine, to avoid crushing my project.





Avoid Black Stains

Iron pipes leave black stains on your wood if they directly contact glue squeeze-out. Run a strip of masking tape along the length of each clamp to prevent this problem. Galvanized pipes don't require taping.



Fix Too-Tight Joints

If you must pound parts together, the joints are probably too tight. Tenons swell a bit when you add glue, which makes a tight joint more difficult to assemble. The most accurate way to pare a tenon is using a rabbit plane. Its iron is the full width of the plane's body, so it can cut up to the tenon's shoulder.



Clean Your Bottle's Applicator

If your glue bottle's cap is clogged with congealed glue, soak it in a jar of very hot water for 15 minutes or so. This softens hardened glue, making it easier to remove.

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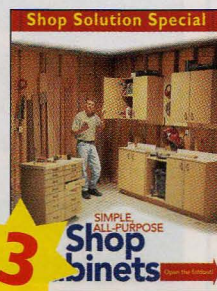
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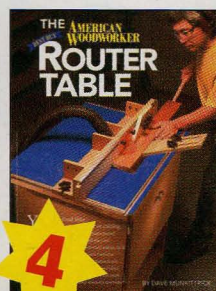
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Check the Glue

If you're uncertain about your glue's age, test its bond strength. Glue together two small scraps that are each about 1 in. wide, clamp and let dry 24 hours. Hit one piece with a hammer. If the two pieces shear apart with no fibers from one piece stuck to the other, your glue is probably too old. Replace it.



Arrange Your Clamps and Parts

Keep handy all the clamps and blocks you used in the dry fit. Arrange them so each is oriented correctly. Place all your parts in a logical order, so you can assemble them in sequence. Just remember—don't panic.

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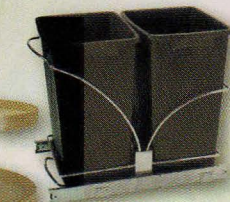


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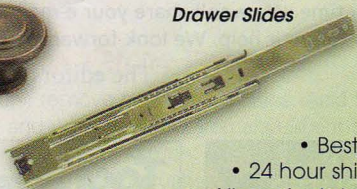


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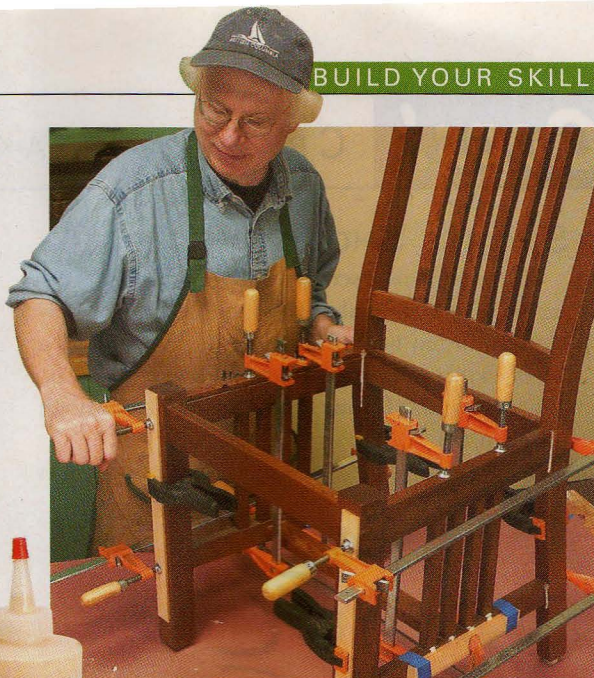
Adjust Your Clamps

Make sure your clamps are ready before you glue. Unscrew the handles until you have a maximum amount of thread available. Sticky clamps can slow you down. Slide the sliding head on a small bar clamp or the tail stop on a pipe clamp to make sure it moves freely.



Get Ready for a Mess

A cotton rag and a jug of warm water are handy for wiping up spilled glue or lots of squeeze-out. I cut out the side of a plastic jug to make a convenient, disposable container.



Consider a Slow-Set Glue

Most wood glues have a 5-minute open time. If you have a complicated assembly, use a glue that gives you extra time, such as Lee Valley's 2002 GF. Its open time is 15 to 20 minutes.

Source Lee Valley, (800) 871-8158, www.leevalley.com
Lee Valley Cabinetmaker's Glue 2002 GF, #62K01.11, 17 oz., \$8.

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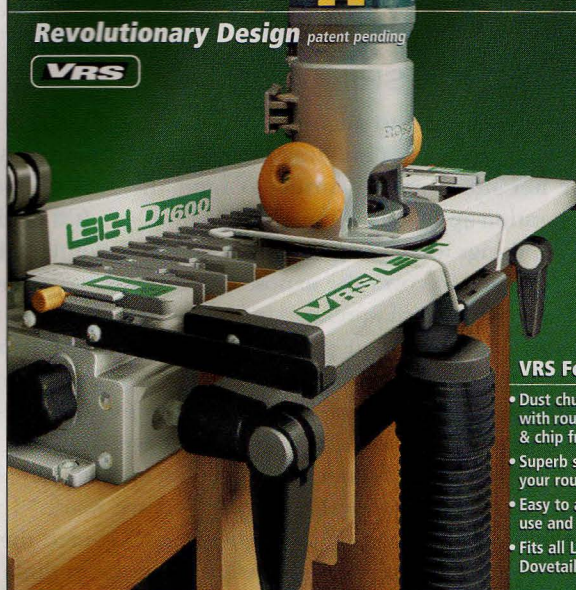
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SHORTS SHOCK

edited by Tim Johnson

My husband uses scraps of wood, called "shorts," for carving. In a lumber store, he saw some lovely pieces in a bin behind the counter. But he had a lot of explaining to do after he asked the clerk, "Do you mind if I come around and poke through your shorts?"

Cathy Groves



GUIDE-BUSHING BOO-BOO

I used biscuits to align the boards when I glued together the seat of the rocking chair I was building for my granddaughter. After chiseling a hollow for her little butt, I started to sand the seat smooth. When a slight discoloration appeared, I thought, "No problem. It'll sand out." But sanding only made things worse: Eventually I exposed one of the alignment biscuits. Argh!

I decided to cover the exposed biscuit with a little heart-shaped inlay. After all, one measure of woodworking prowess is concealing unintentionally imparted "character flaws"! I practiced routing on scrap stock, using a shop-made template and two guide bushings. First I routed the recess. Then I changed bushings and routed the inlay. The parts fit perfectly. Unfortunately, I didn't have time to complete the job, but I left everything set up on my workbench.

I returned a week later, excited about embellishing the rocking chair's seat with what I was now calling my "signature mark." I would add little inlaid hearts in all of my projects. Immediately, I routed the recess in the seat. But when I installed the heart-shaped inlay, my heart sank. The recess was way too big. I'd forgotten that the router was still set up to rout the inlay. Because I hadn't swapped the bushings, instead of a signature mark, I'd given the rocker another character flaw!

Tony Abbruzzi



Make your woodworking mistakes pay! Send us your most memorable "What was I thinking?" blunders. You'll receive \$100 for each one we print. **E-mail to oops@readersdigest.com or send to AW Oops!, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121.** Submissions can't be returned and become our property upon acceptance and payment. We may edit submissions and use them in all print and electronic media.

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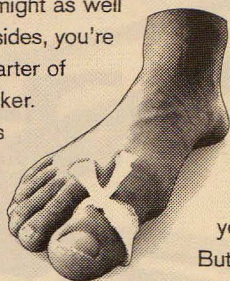


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We'd be willing to venture that you're probably wearing pants right now. And those pants have probably got a couple pockets in front. See there? You've already got a lot in common with this ad. So you might as well just keep reading. Besides, you're now better than a quarter of the way into this sucker. And it's pretty painless so far, right? Good. So let's talk about something that wouldn't be so painless. Trying to stick ten pounds worth of stuff in those pockets of yours. Unless you're already wearing



Haggar® pants with our bigger, unrippable pockets.* Because if not, all that weight would tear right through and make a b-line for your piggies.

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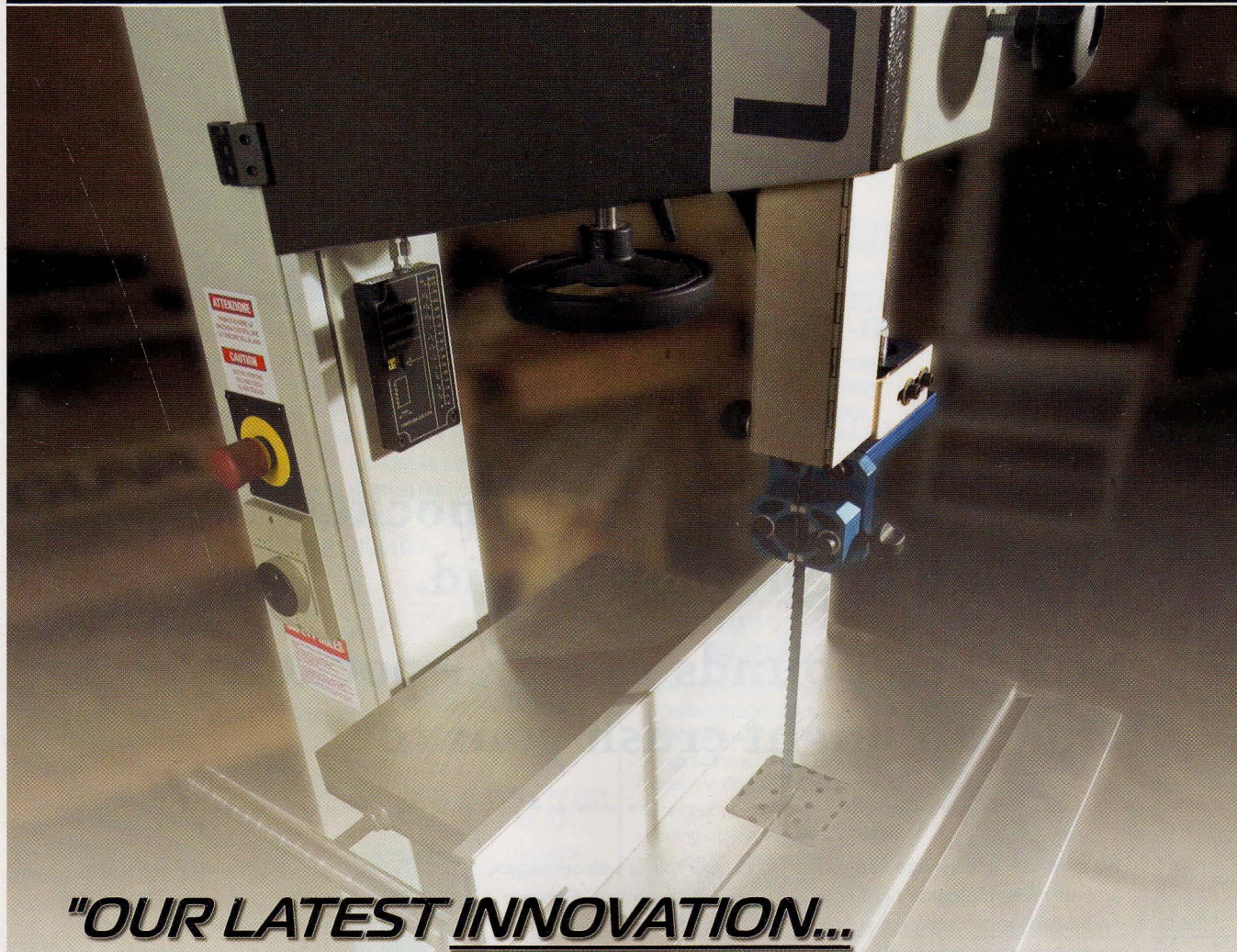
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