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Nº 254

JULY/AUGUST 1999



Serpentine Walkway – 30

## HOMEWRIGHT

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### Serpentine Walkway

Looking for a dramatic way to improve your home's appearance? A classic brick walk bordered by flower beds and shrubs provides a visual treat for you and your guests.



Trestle Picnic Table – 54

## WEEKEND

### 48

### Magazine Pocket

Here's a space-saving storage idea that tucks into a stud bay anywhere you need it most — kitchen, bathroom, living room, or bedroom.



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### Kitchen Wine Rack

When kitchen counter and floor space is tight, you may not have the luxury of putting wine bottles on display. This compact rack, however, takes up a mere wisp of space in a rarely utilized location.

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### Trestle Picnic Table

Summertime means backyard picnics, and for those you'll need a sturdy table suited to outdoor use. We've designed a hearty model that's built with common cedar lumber using just portable power and hand tools.



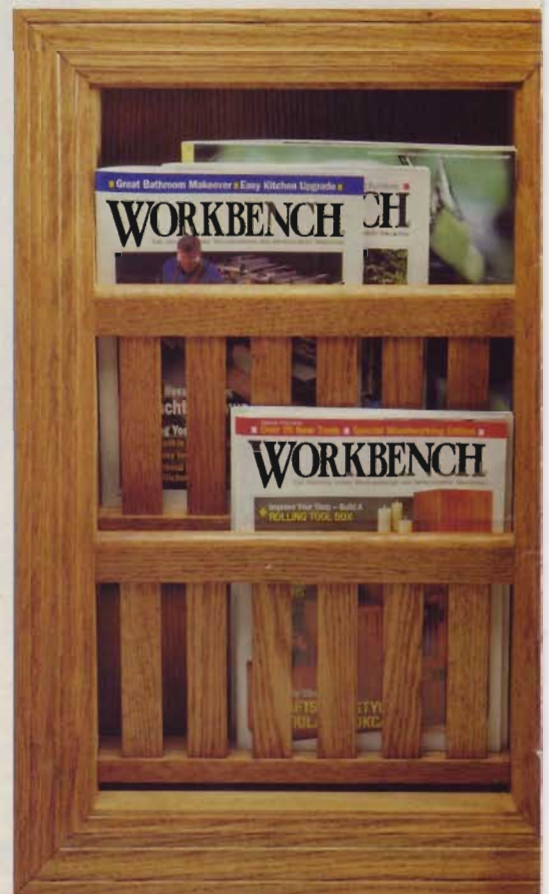
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### Router Fundamentals

Routers have revolutionized the woodshop, and knowing how to use them effectively can make the difference between high-quality work and the not-so-good. Here are some tips and hints that'll help you get the most from this terrific tool.



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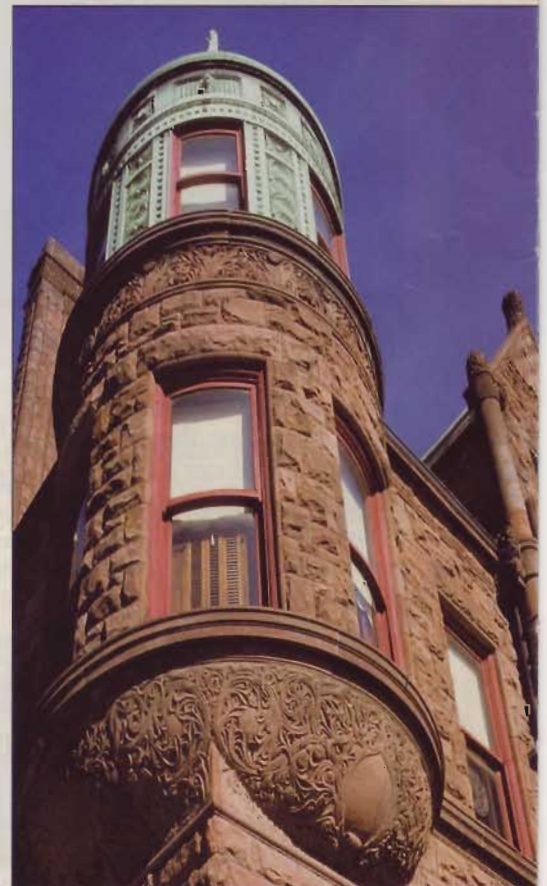
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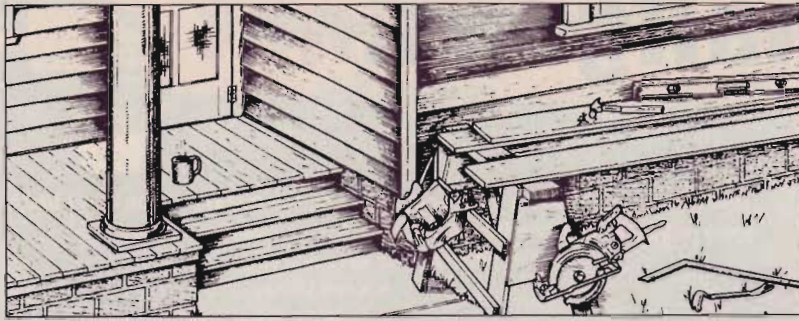


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## LETTER FROM THE EDITOR

### Feedback & Follow-up

Imagine sitting around a table with a dozen *Workbench* readers, and maybe throw in an editor or two. You're talking along, sharing "big fish" stories, when someone starts in about a new power tool. What do you think happens next?

If my experience is anything to judge by, everyone at that table stops what they're doing and jumps into the tool talk with both ears. And soon opinions, mostly well-founded, begin to fly. At a club meeting once, during a heated debate about annular ring direction in wood panels, a friend leaned over to me and whispered "you know, getting two woodworkers to agree is tough enough, how will it ever happen with thirty?"

Well, it probably won't happen, and that's why I believe it's valuable to know your opinions and experiences. We're starting a new column called *Feedback & Follow-up* (see page 8). In it we'll print your comments on the tools we reviewed, as well as the results from tool review surveys we run on the internet. We try very hard to be fair and thorough in our reviews, but you may want to add something more, or tell everyone about your hands-on experience with a tool. Believe me, your fellow *Workbench* readers are eager to know what you think.

We'll also use this column to get back to you on new developments with tools we reviewed recently. This includes new models that weren't available at the time of the review, changes the manufacturers have made, things we missed, and any information that will help you spend your tool money wisely. In this issue I've given an explanation of what our tool review awards mean.

In the *Workbench* family, there's no shortage of opinions, and I hope there never will be.

Chris Inman, Editor

# WORKBENCH

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# Feedback & Follow-Up

## Tool Reviews Workbench-Style

If you want to spark a debate, tell any group of woodworkers and home improvement enthusiasts that one tool is best. Then watch the fur fly as everyone airs opinions based on experience, need, and preference.

Tool debates might never end if it weren't for the phrase "it just feels right to me." That's because with tools there's seldom an absolute right or wrong answer. What does the job in top-notch fashion for one may not be viewed suitably at all to another. When we evaluate tools at *Workbench*, we try to keep all this in mind.

In our reviews we strive to bring you thorough, accurate information, and to conduct objective evaluations of tool performance. That means showing specifications, and examining each tool with an eye on construction quality and adherence to relevant tolerances. But specs and lab tests won't tell all you need to know to choose the best tool.

Thoroughness also means testing that's based on real-world applications, and recruiting testers who have a variety of home improvement and woodworking experience to put the tools through their paces. This is

often where a tool's true character — strengths and weaknesses — are seen.

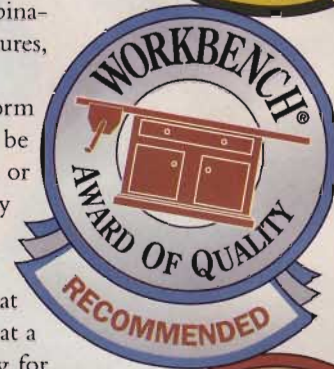
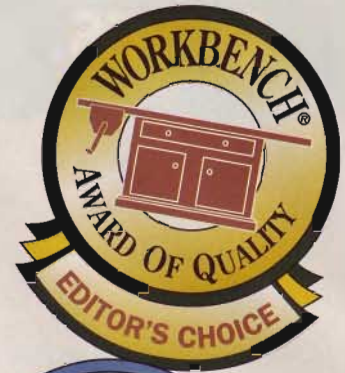
No matter how we conduct our tests, our goal is to help you make informed buying decisions. To reflect our positive comments we've developed three awards you can use as guides:

**Editor's Choice** goes to tools that offer the best overall combination of performance and features, regardless of price.

**Recommended** tools perform well, but their strength may be concentrated more in a feature or two, which makes them worthy contenders depending on your needs.

**Solid Value** goes to tools that offer good quality and features at a modest price — plenty of bang for the buck for the budget-minded.

Of course, we know that whatever we say about a tool, you may feel differently. That's what we'd expect. What feels just right to one doesn't to someone else. At *Workbench* we're glad to share our experiences and opinions, and we hope they help. We hope you'll share your opinions on tools with us, too (see below).



## Do You Have an Opinion about a Tool?

We want your input! Without you, the craftsman, tools are nothing but bits of plastic and metal. Your hands bring them to life, and it's your experience that's so valuable to fellow *Workbench* readers.

In this issue you'll find a review of cordless circular

saws (see page 40). My conclusions are spelled out in the story, but I'm sure you and other *Workbench* readers have opinions on some of these tools. Do you own a cordless circular saw? If you do, tell us which brand and model, and what you think of it. Are there features you particularly like? If you were in the market for this tool now, are there different things you would look for?

I've also been working on an air nailer review for the Sept/Oct

issue. If you want to pass along your two cents worth, there's a survey on the *Workbench* web site ([www.workbenchmag.com](http://www.workbenchmag.com)) that asks about your experience with these tools. Let me know your opinions, and I'll pass along the survey results in the article.

You can also e-mail me at [workbench@workbenchmag.com](mailto:workbench@workbenchmag.com). Or you can drop me a note the old-fashioned way at *Workbench* Tool Feedback, 2200 Grand Ave., Des Moines, IA, 50312.





# Questions & Answers

## Shed Water with Grooves, Flashing, and Caulk

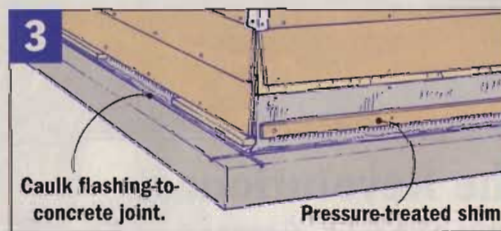
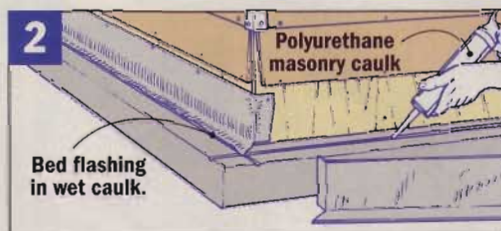
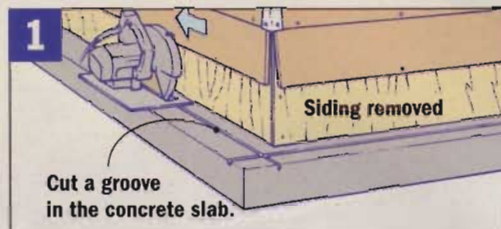
**Q** My workshop was built on an oversize slab — the slab extends 6" beyond the walls on all sides. When it rains, water collects on the slab and runs under the sill into the shop. How can I solve the problem without a great deal of expense?

John T. Haas  
Mechanicsville, VA

**A** Hopefully, the sill hasn't rotted. For discussion's sake, I'll just address correcting the slab drainage problem. You need to create a seal that prevents water from reaching the sill and channel the water away from the building.

First, I'd remove the bottom row of siding in order to install some flashing between the wall and slab. To make the flashing-to-concrete joint more secure, use a grinder or a circular saw with a diamond blade to cut a 1/4"- to 1/2"-deep groove around the perimeter of the slab about 2" away from the sill plate (FIG. 1). At the corners, cut the grooves through the slab's edge to help channel excess water away.

Clean any dust and/or water out of the grooves and apply a bead of polyurethane-based masonry caul-



Remove the bottom row of siding. Using a circular saw with a diamond blade, cut a shallow groove into the slab parallel to the wall and about 2" away from sheathing.

Clean out the groove and apply a bead of masonry caulk. Bed the edge of a pre-bent piece of flashing in the wet caulk, then nail the flashing to wall sheathing.

Apply a second bead of caulk along the concrete-to-flashing joint and seal where the corners overlap. Nail on pressure-treated shims and reattach the siding.

ing in the grooves (FIG. 2). While the caulk is still wet, bed the outer edge of the galvanized tin flashing in the grooves and nail the flashing to the wall. When the caulk sets up, apply a second bead over the flashing and along the groove to further seal the flashing-to-concrete joint.

Before reinstalling the siding, rip pressure-treated shims from 1x stock and nail them to the wall to raise the lower edge of the siding to the correct slope (FIG. 3). Prime the back and edges of the siding with an oil-based primer before nailing it into place.

## SHARE YOUR QUESTIONS!

If you have a question about woodworking or home improvement, write it down and mail it to WORKBENCH Q&A, 2200 Grand Ave., Des Moines, IA 50312. Please include your name, address and daytime phone number in case we have any questions for you. You can also reach us via Fax at (515) 283-2003 or by E-mail message at [workbench@workbenchmag.com](mailto:workbench@workbenchmag.com).

If we publish your question, we'll send you one of our handsome and fashionable Workbench caps.



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## Biscuit Joinery vs. Doweling — Which to Choose?

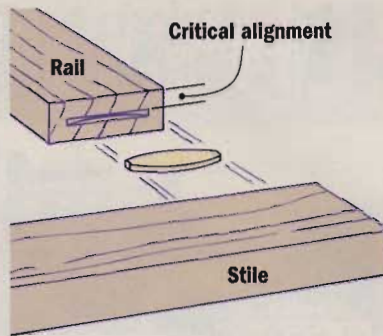
**Q** What are the pros and cons of using biscuits or dowels in butt joining rails and stiles?

Beldon Peters  
Canyon Lake, TX

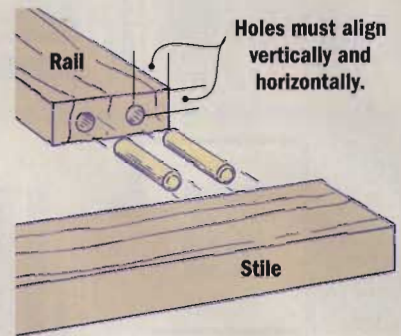
**A** Both biscuits and dowels strengthen a butt joint by bridging the seam and reinforcing the joint. Biscuits offer the following advantages:

- They're quick and easy to install and only the vertical alignment of the slots is critical.
- They provide more glue surface and greater load bearing capacity than dowels.
- On the downside:
- A biscuit joiner typically costs \$100-\$200.
- Biscuits are about twice the price of commercial dowel pegs and not as widely available.

### BISCUIT JOINERY



### DOWEL JOINERY



- Rail stock must be at least 2 1/4" wide to use a number 0 biscuit. (Ryobi makes a detail biscuit joiner that will join pieces only 1"-wide.)

Advantages of doweling are:

- Low cost — you probably already own a drill and drill bits, and dowels are cheaper and

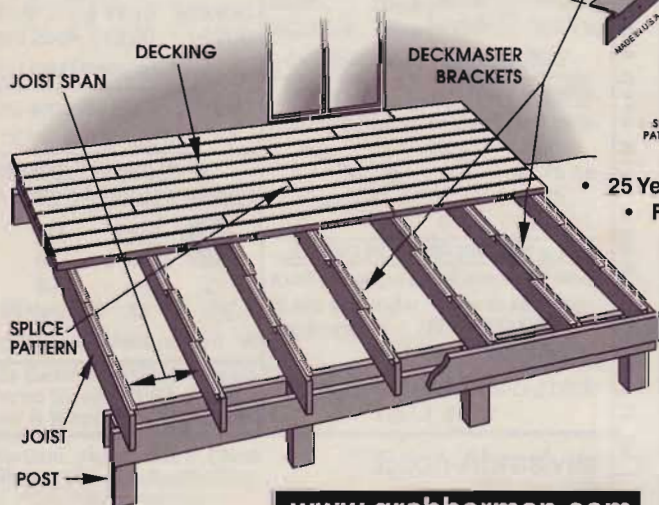
much more widely available than biscuits.

- You can join narrow pieces.
- Drawbacks to doweling are:
- The mating holes must be perfectly aligned both vertically and horizontally, and drilled squarely.
  - Precision drilling takes time to set up and execute.

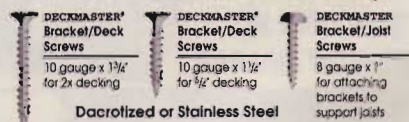
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## 2 Keys to Eliminating Jointer Snipe

**Q** I bought a 4 1/2" jointer at an auction and, despite my attempts to adjust the table, I still get snipe. Is there anything I can do to prevent this?

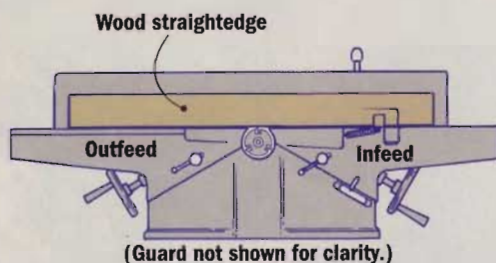
Robert Mesenbring  
Grand Marais, MN

**A** Start by adjusting the outfeed table flush with the knives in the cutterhead. With the jointer unplugged, lay a wood straightedge on the outfeed table surface and raise it until you can spin the cutterhead by hand and

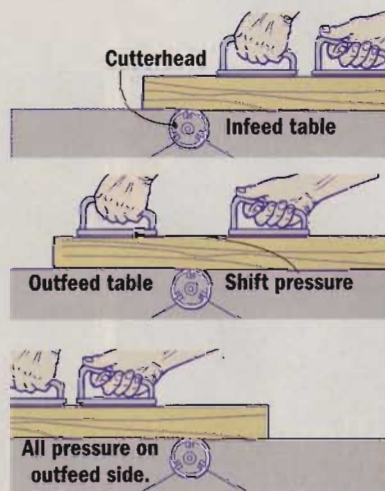
have the knives just miss the straightedge.

Next, lay a long straightedge across both the infeed and outfeed tables and raise the infeed table until the two tables are at the same height. The tables must be parallel to each other with no gaps showing below the straightedge. Chances are the outer end of your infeed table is too high, or the outer end of the outfeed table is too low.

To avoid snipe, you also must apply pressure evenly to the board as you run it through the jointer. To start, the pressure should be on the infeed side. As you get roughly a foot or so of the board onto the outfeed table, shift the downward pressure to the outfeed side. This prevents you from pressing the trailing end of the board into the cutterhead as it leaves the infeed table.



Lay a long wood straightedge (above) to make sure the infeed and outfeed tables are parallel to each other. If gaps appear, you may need to shim the tables to bring them into alignment.



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# Tips & Techniques

## Wire Cleanly Cuts Fiberglass Insulation

I've tried a number of methods for cutting kraft-faced fiberglass insulation, including compressing it with a straightedge and using a utility knife to make the cut. It seemed like the knife blade got dull after only a couple of cuts, tearing the insulation rather than slicing it.

My solution was inspired by a wire cheese slicer. First, I used my table saw to cut a saw kerf lengthwise in a 6"-wide × 36"-long piece of 3/4"-thick plywood, stopping 6" short of one end. Near this end of the kerf, I attached a screw eye.

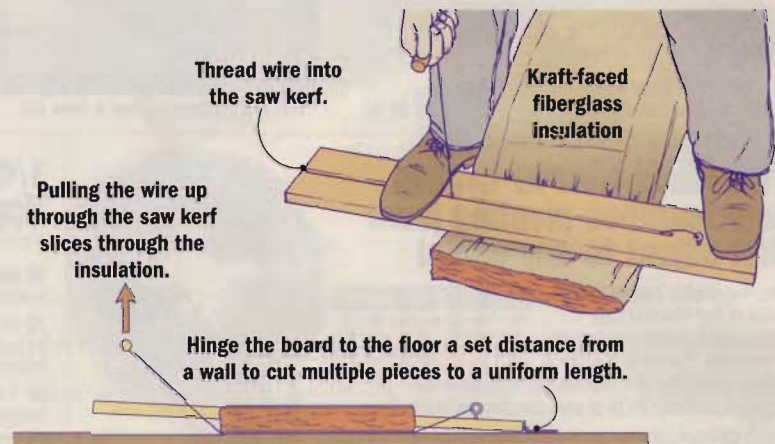
Next, I fastened one end of a 3-ft. length of baling wire (any thin, flexible wire will work) to the screw eye. At the other end of the wire, I fastened a short length of 1"-dia. dowel for a handle.

To use the cutter, I thread the wire through the kerf and lay the

wire out on the floor. Next, I position the insulation over the wire, and lower the kerfed board onto the insulation. The kerf should be directly over the mark for the cut. I carefully feed the wire back into the open end of the kerf and snug it up. After checking

the alignment, I stand with one foot on each end of the board to compress the insulation, grasp the handle, and pull the wire up through the kerf. The wire cleanly cuts through the insulation.

*Tom Brennan  
North Babylon, NY*



## Reversing Doors Provides Better Access

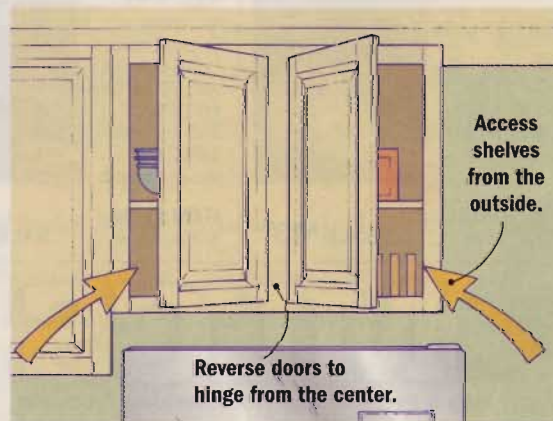
The wall cabinets over a refrigerator typically hold only those items that seldom get used. One reason they don't get used more is that they're hinged to open from the center, making it awkward to reach up over the refrigerator to open the doors.

In my small kitchen, cabinet space is at a premium so I needed to use the over-the-fridge cabinets for everyday items. After struggling to get dishes in and out it occurred to me there was an easier way.

I unscrewed the door hinges from

the face frames and remounted the doors so they hinged on the center stile instead. Now I can reach in from either side without having to get a step stool to store or retrieve items in the cabinet.

*Robert Peter, III  
Dorset, OH*



## SHARE YOUR TIPS, JIGS, AND IDEAS

Do you have a unique way of doing something? Just write down your tip and mail it to:

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Des Moines, IA 50312.

Please include your name, address, and daytime phone number.

If you prefer, e-mail us at [workbench@workbenchmag.com](mailto:workbench@workbenchmag.com). We'll pay you \$75-\$200 and send you a *Workbench* cap if we publish your tip.

In addition, The Stanley Works is sponsoring Tips & Techniques, and will send an award for the tip in each issue that best describes the creative use, care or application of tools.





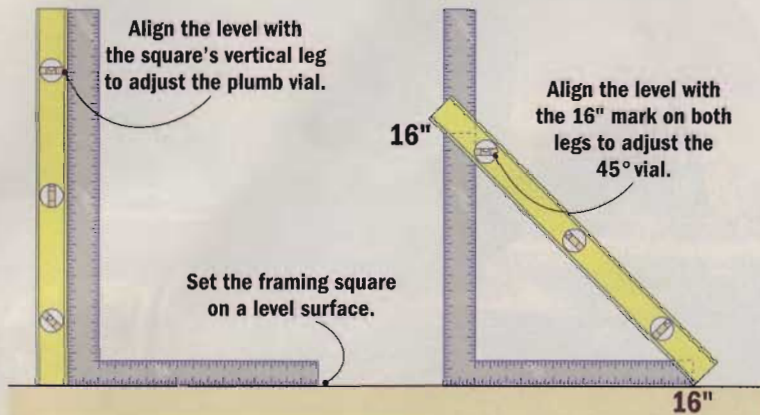
## Use Framing Square to Adjust Your Level for Plumb and 45°

Terry Coffey's tip for leveling a level in the Mar/April issue was good, but it only solved part of the problem. A level that's been dropped will likely need to have adjustments made to the plumb and 45° vials as well.

I've used a framing square for years to make those adjustments. First, I use Coffey's shimming method to adjust the horizontal vial. Using my newly adjusted level, I then set my framing square up on a level surface. Placing the level

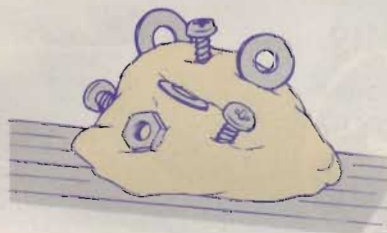
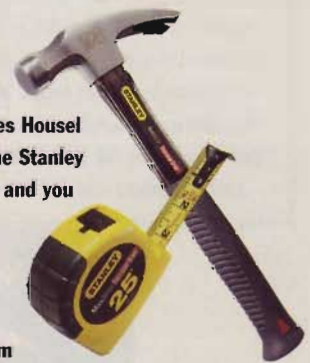
against the square's vertical leg gives me a plumb reading. Aligning the level at the 16" mark on the outside scale of both the vertical and horizontal legs should give you a perfect 45° reading.

*Charles Housel  
Claysburg, PA*



In recognition of his tip, *Workbench* reader Charles Housel wins these tools from The Stanley Works. Send us your tip and you could be a winner too.

The Stanley Works  
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## Putty Holds Parts

Juggling small parts while standing on a ladder may work for some folks, but I'm not that handy. I usually have to make several trips up and down the ladder to retrieve items I've dropped.

To keep screws, nails, or other small parts within reach, I press a blob of putty — the tacky kind used to hang posters — to the ladder. When I remove a fastener, I stick it in the putty so I can find it easily when it's time to put things back together.

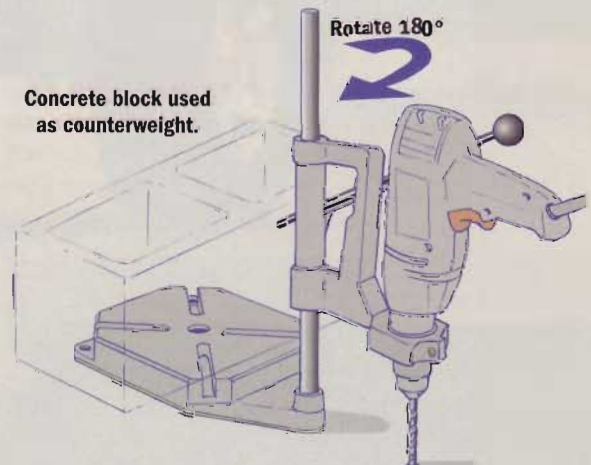
*Carol Edwards  
Westchester, PA*

## Outboard Drilling Extends Usefulness of Portable Drill Stand

When I needed to replace some plank flooring in my home, I was concerned about using a handheld drill to bore holes for the plugs that cover the screws. Even with a brad-point bit, I was worried the bit might wander, or that the bit wouldn't be at 90° to the floor, leaving poorly fitting plugs.

A portable drill stand proved to be the tool I needed. Spinning the column around 180° in the stand base gave me great visibility to line up the bit over the spot for the plug hole. To counterbalance the outboard drill, I set a concrete block on the base of the drill stand.

This technique also works if you need to drill holes in a workpiece that's thicker, taller, or wider than the capacity of your benchtop drillpress. Instead of a counterbalance weight, you should firmly clamp or bolt the machine near the



edge or end of your bench. Position it with the column near the edge so the head will swing out clear of the bench top. Support your workpiece on sawhorses or blocks of scrap wood.

*Allen Weiss  
Fresh Meadows, NY*



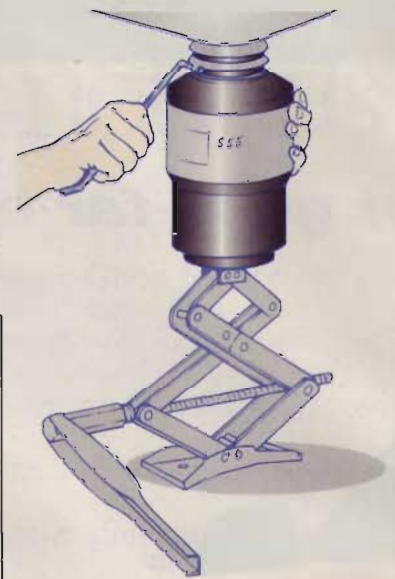
## Scissors Jack Provides “Third-Hand” Lifting Power

When my garbage disposal jammed on a dish rag, I had to remove the disposal to get it unstuck. But when I went to reinstall the disposal, I found I wasn't able to hold it tightly against the flange and also turn the retaining ring.

Lamenting my run of bad luck — my car had a flat tire earlier that

week — gave me an idea. Retrieving the scissors jack from my car, I positioned it under the disposal and raised it until it held the disposal tightly against the flange. With both hands now free, I could tighten the retaining ring.

Steven Ruhl  
Granite City, IL

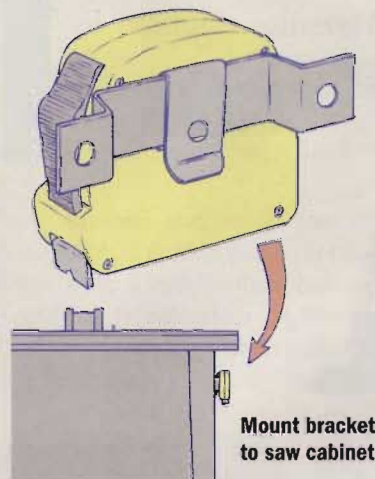


## Tape Measure Where You Need It

One of the unwritten rules of a woodworking shop is ‘you can never find a tape measure when you need one, no matter how many you have.’

To help keep one handy at my table saw, I installed a simple metal bracket to the saw's cabinet. The belt clip on the tape hooks over the bracket. After a while, I got used to putting the tape back on the bracket when I'm done measuring, so it will be close at hand when I need to use it again.

R.B. Himes  
Vienna, OH



## Scan Patterns

To enlarge a pattern for a project, I scan in the original, enlarge it on my computer, and print it the size I need.

Bob Newman  
Rockville, MD

## Inverted Bucket Adds Holding Capacity to Dry Well

In your September/October 1998 issue, you described the benefits of building a dry well to handle rain water runoff. I found a simple way to make a dry well hold more water, without increasing the depth of the well.

I took a five-gallon plastic bucket — the kind drywall joint compound comes in — and drilled dozens of 1/4"-dia. holes in the bottom and sides all the way around. After digging the well, I placed coarse gravel in the bottom, then set the bucket upside down on the gravel. Next, I carefully filled around and over the bucket with more gravel to complete the well.

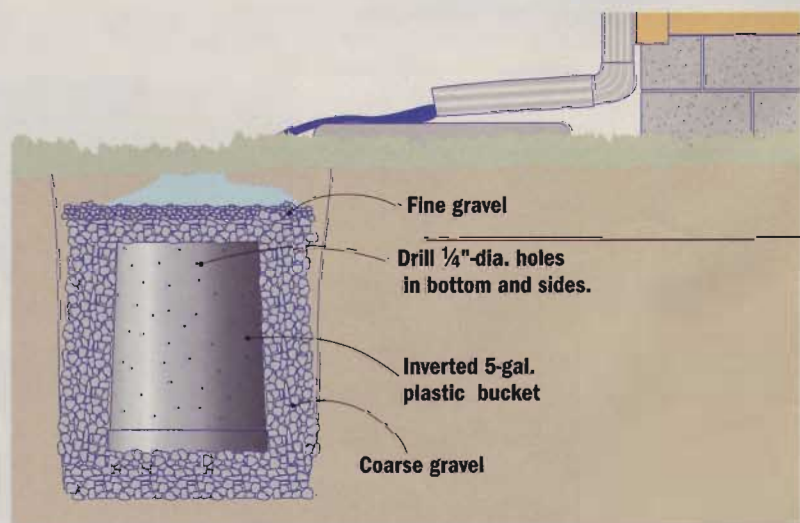
When it rains, water draining into the well can filter into the bucket. Since the space inside the bucket isn't full of gravel, the well

will hold more water.

For added protection against soil plugging up the holes in the bucket, you can wrap the bucket with landscaping fabric before putting it

into the well. For really wet areas, I've dug a larger hole and put two buckets in the well.

Bill Breth  
Mentor, OH





# News & Events

## Taller San Jose: Doing Good with Wood

If idle hands truly are the devil's workshop, then isn't a real workshop the perfect solution to idle hands? An enterprising nun and a creative architect in southern California think so.

Taller San Jose (pronounced *tah-YAIR • san • ho-ZAY*), is the brainchild of Sister Eileen McNerney and architect Dominic Walsh. The name means St. Joseph's Workshop in Spanish.

The effort originally began as a "wholistic learning center" to help young Latinos in Santa Ana make a transition to adult life. Most of the 18- to 25-year-old men and women in the program stay just 6 to 18 months, but it's at a critical time, says staffer Shawna Smith. At 18 years old, troubled kids are often cut loose from traditional support systems. With inadequate education and few job skills, they find it hard to cope with the responsibilities of adulthood. Mentoring helps keep them on track.

### WOODSHOP OFFERS JOB SKILLS

Taller's woodworking shop was launched two years behind the rest of the program, which opened in 1995. Walsh designed simple garden



benches he thought the students could build. He then rounded up some woodworking tools, a few eager students helped rehab some available workspace, and St. Joseph's Woodshop was up and running.

The woodworking program involves up to 15 students at a time, most of whom can qualify for paid positions in the shop. Small, simple benches fetch \$250, while larger, elaborately carved or hand-painted benches can sell for over \$2,000. Local residents and businesses have become supportive customers, but marketing enough work to keep the shop busy is a constant challenge.

### HELP ALWAYS WELCOME

Like most nonprofit agencies, Taller San Jose relies heavily on the kindness of strangers. Though the shop already boasts a late-model Delta Unisaw and several other machines, shop director Kennedy Burkett compiled a long wish list. Especially helpful donations include carving tools, an oscillating spindle sander, routers and router bits, clamps, a pneumatic brad nailer, first aid kits, and an HVLP spray system.

To find out more about Taller San Jose, to order a bench, or to arrange a donation of tools or materials, call (714) 543-5105.





## Outdoor Equipment Industry Examines Emissions Facts, Hype

Lawn mowers and other types of gasoline-powered outdoor equipment are often criticized for the pollution they cause. But according to the Outdoor Power Equipment Institute (OPEI), an association for manufacturers of powered lawn and garden products, much of the information about these machines' emissions is misunderstood.

Outdoor equipment engines are classified as "small non-road engines" which are, by some accounts, responsible for 10% of emissions in the United States. The OPEI points out that lawn and garden equipment is a small part of this category, which also includes marine and industrial engines as well as construction and agricultural equipment. Additionally, the association asserts that current outdoor equipment engines run an

average of 70% cleaner than comparable engines built in 1990. Today's engines also have to comply with Environmental Protection Agency (EPA) Phase 1 emissions regulations.


If you're concerned about reducing pollution caused by your outdoor equipment, there are simple steps you can take, shy of buying

new machines (see below). For more help, contact the OPEI at 341 South Patrick Street, Old Town Alexandria, VA, 22314 or check the web at [www.opei.mow.org](http://www.opei.mow.org). You can write the EPA's Office of Mobile Sources at 2565 Plymouth Road, Ann Arbor, MI 48105. You can also check the EPA web site: [www.epa.gov](http://www.epa.gov).

---

### FIVE QUICK TIPS FOR CLEANER-RUNNING OUTDOOR EQUIPMENT

- 1. Avoid spilling gasoline:** Pour carefully – spills evaporate and pollute the air.
  - 2. Maintain your equipment:** Change oil and filters regularly. Use the proper fuel/oil mixture in two-stroke equipment. Get periodic tune-ups.
  - 3. Reduce mowing time:** Keep blade sharp and underside of deck clean for effective cutting. Use low-maintenance grasses that grow slowly and require less mowing.
  - 4. Use manual tools:** You can meet a variety of lawn and garden needs using hand tools that don't require electric or gasoline engines.
  - 5. Explore cleaner options:** Replace older equipment with new, lower-emission models. Consider electric tools, which pollute less than gas-powered versions.
- 



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## Bosch Offers Rewards to Tool Purchasers

Manufacturers rewarding purchasers with points redeemable for products isn't new. Bosch, though, is among the first to bring this practice to the world of power tool accessories.

In the Bosch Accessory Rewards Program, members earn points with every qualifying Bosch accessory they purchase. Then they redeem the points for merchandise such as sports bags, jackets, watches, and job

boxes bearing the Bosch logo, or for Bass Pro Shops gift certificates.

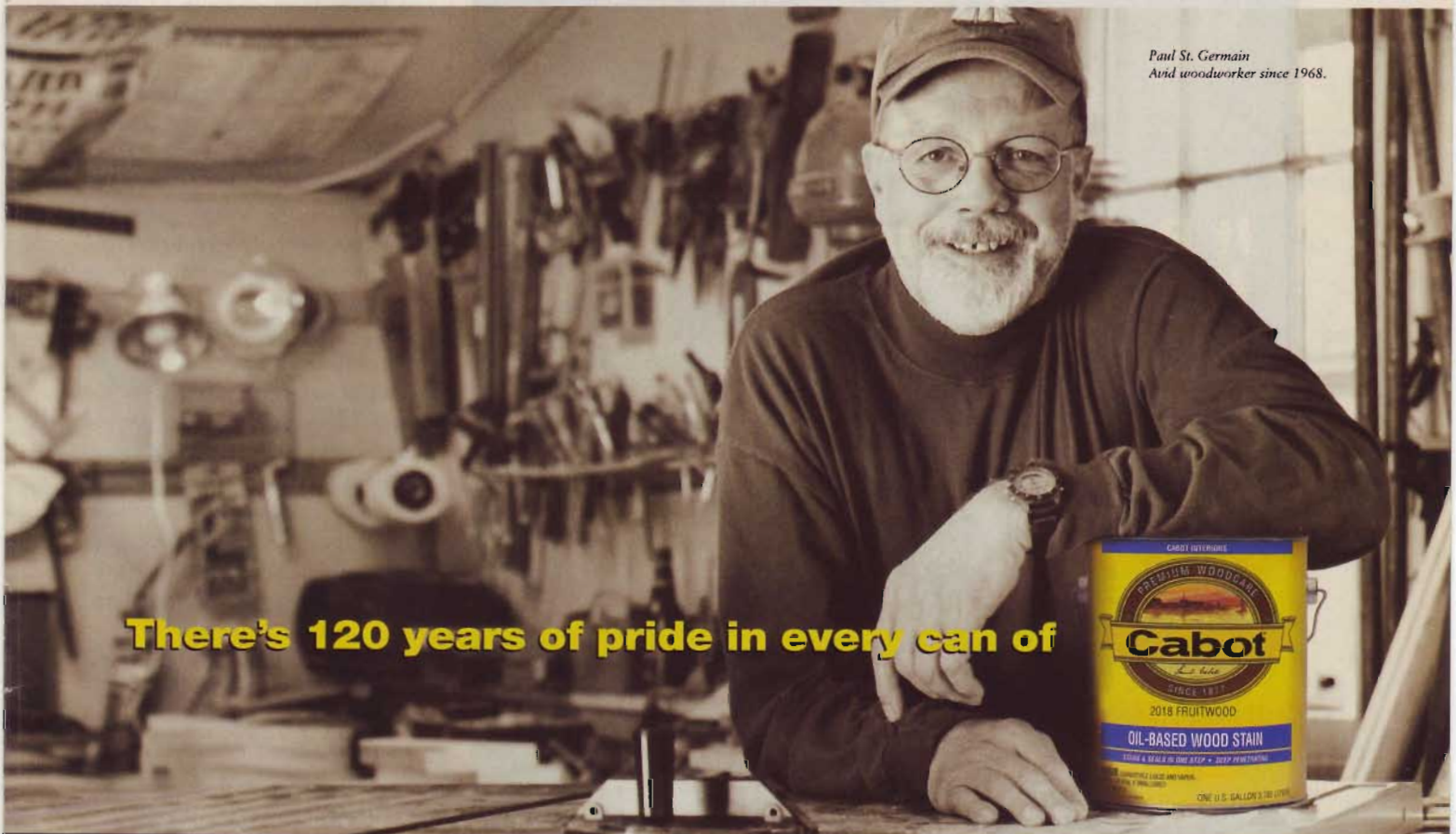
Members receive 1,000 points upon enrolling. Each accessory purchased then has a point value.

To acquire a baseball cap you'll need 4,000 points. For the truly frequent buyer, 115,000 points will get you a fax machine.

New enrollees receive a membership kit that provides details on

how to submit proofs of purchase to earn points. Bosch keeps track of all points earned and informs program members of point totals with periodic statements.

Program applications are available at participating tool dealers and home centers. You can also enroll via the web at [www.boschtools.com](http://www.boschtools.com), or call Bosch at (800) 301-8255 for more information.



Paul St. Germain  
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To locate the retailer nearest you, call 1-800-US-STAIN ext. 346.

Product Information Number 174



## Keep Ladder Safety High on Your List

With summer project season in full swing, the folks at Werner Ladder Co. want to remind us of a few key ladder safety rules. Before climbing, make sure your ladder is in proper working order. Position the ladder with the feet on firm, level ground.

When climbing keep your body centered, and always face toward the ladder. Check the ladder's duty rating and make sure the combined weight of you and your materials don't exceed its capacity. Use common sense, and always climb with caution.



# The All New T50PBN<sup>®</sup> STAPLE + NAIL GUN



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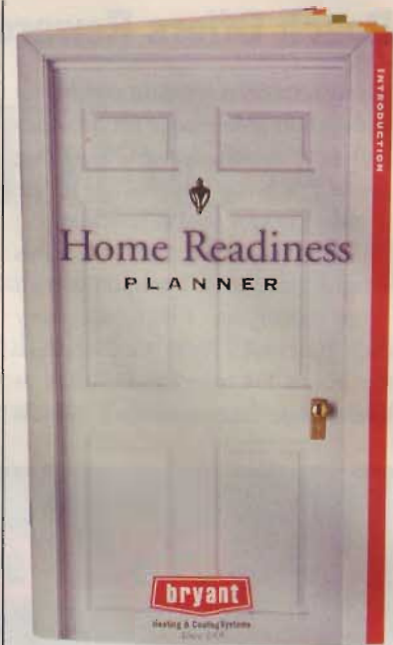
*ARROW tools and supplies are available at home centers, lumberyards and hardware stores.*

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## Be Disaster-Ready

If an earthquake or tornado damages your gas pipes, do you know how to turn off the gas? If you have to evacuate your home quickly, do you know what supplies to bring along? Is your home a safe place for a roaming toddler?

For help answering questions such as these, check out a new booklet published by Bryant Heating and Cooling Systems. The goal of the the *Home Readiness Planner* is to identify ways to prevent accidents and minimize the effects of natural disasters.

Available free, the 24-page planner guides homeowners through the process of inspecting their home for dangers, as well as how to prepare their families for possible evacuation in the event of an impending catastrophe. The planner also includes space to record emergency information and phone numbers such as utility companies, physicians, neighbors, and poison control centers.

For more information about the Bryant Home Readiness Planner or to request a free copy, visit your local participating Bryant dealer. You can also call Bryant at (888) 999-2792, or visit the company's website at [www.bryant.com](http://www.bryant.com).



## Web Site Offers Help Finding Contractors

Finding a good contractor can be a daunting task. If you're lucky, you can ask friends or neighbors about professionals they've used. Otherwise, you're reliant on the Yellow Pages, advertising, and guess work.

Now there's a web site devoted to helping homeowners locate contractors, designers, and architects. At [www.improvenet.com](http://www.improvenet.com) you enter information about your project type (remodel, plumbing, etc.), your budget, and time frame.

ImproveNet staff checks your submission, then passes the information (without your name and address) to contractors in your area. Currently the company database has over 600,000 professionals nationwide who are screened for good credit and legal histories, proper licensing, insurance, and recommendations from customers and peers.

Contractors who receive your information can decide if they want to submit a bid. If so, the contractor pays ImproveNet a small fee to receive your name and contact information. Contractors also pay ImproveNet a fee if they land your job. For you, the service is free.

ImproveNet also features design galleries where you can browse through products from an variety of manufacturers. You can get advice from staff, and learn about special

purchases via e-mail. All this information is stored in your Personal Project File.

In 1999, ImproveNet expects to connect homeowners with building professionals for more than 115,000 projects.



# Age Deepens The Character.

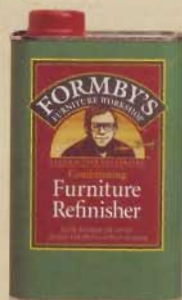
## Formby's® Reveals It.

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### Uncover Wood's Natural Charm™



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## Project Update

After publishing the May/June issue of *Workbench*, we found a couple of incorrect measurements in the Drill Press Table featured on page 56.

In the Materials Cutting List on page 57, the Carcase Sides (K) are listed as 4<sup>3</sup>/<sub>4</sub>"-wide. They should be 4<sup>1</sup>/<sub>4</sub>"-wide, as shown in the Drawer Carcase Elevations on page 60.

Also in the Materials Cutting List, the Drawer Bottoms (O) are shown as 1/2" × 11<sup>3</sup>/<sub>4</sub>" × 4<sup>3</sup>/<sub>4</sub>". The correct measurement for these pieces is 1/2" × 11<sup>3</sup>/<sub>4</sub>" × 8<sup>15</sup>/<sub>16</sub>".





# Serpentine Walkway

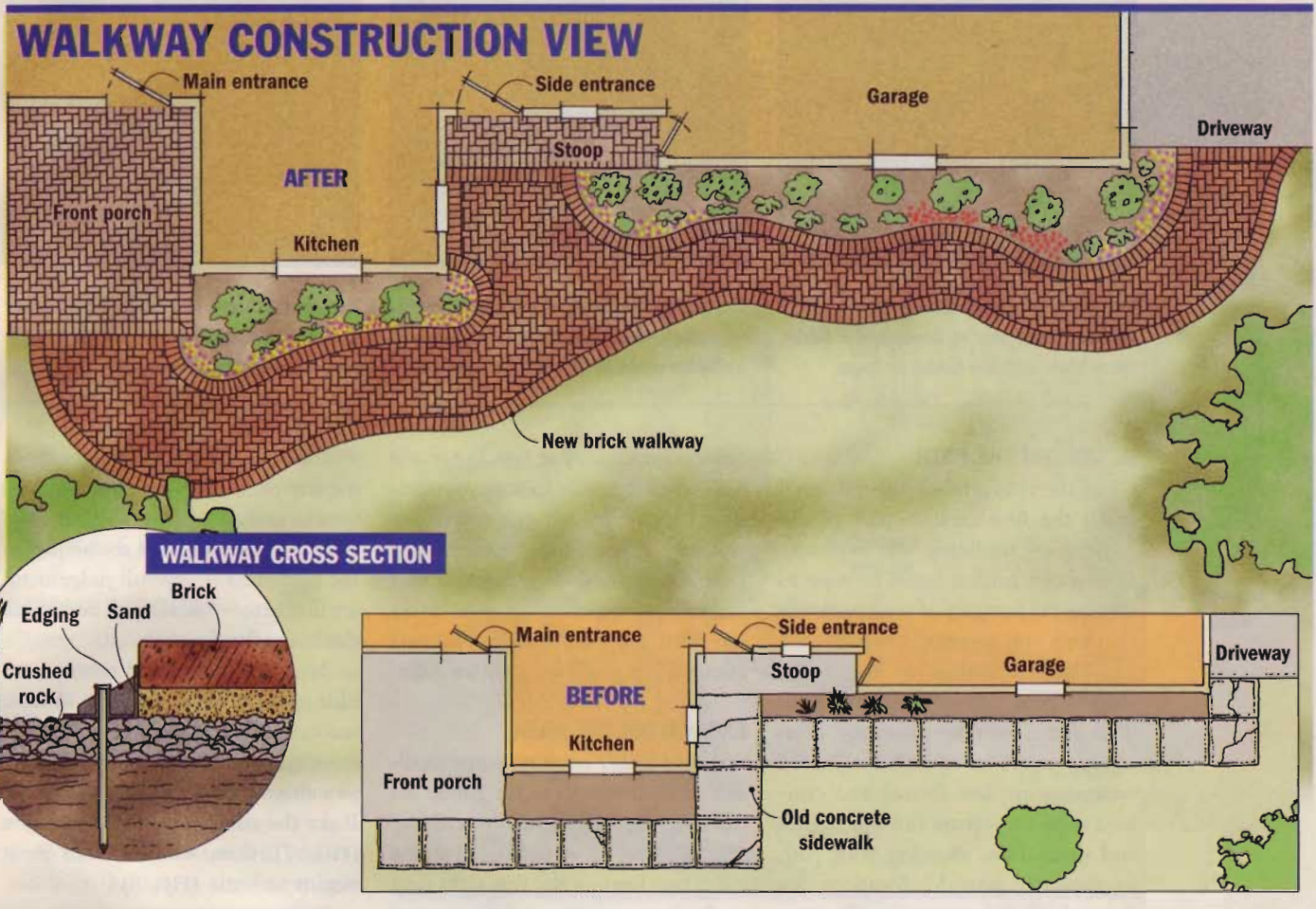


For old-world, man-nerly charm nothing beats a brick walk-way, and on a one to ten scale for visu- al impact, this DIY challenge ranks at least an eight. You might recall that last summer I bricked

over the concrete front porch at the *Workbench* house (see the July/August 1998 issue). At the same time I also tackled this walk- way project. Together, these makeovers dramatically improved the home's main entrance, though without a doubt each can stand in its own right.

Before getting into the project, let me touch on some brick basics. Bricks not only vary in size and hardness, they also have different compression resistance and degrees of "slipperiness," as the brochures described it. Many brands offer square, chamfered, or round edge options. These characteristics and properties target bricks for specific applications. The chamfered Glen- Gery Redfield paver bricks I used measure  $2\frac{1}{4} \times 4 \times 8$ ", and even though they're rated for heavier duty, the foundation I built for the walkway is suitable for pedestrians only. I recommend you talk with your brick supplier to select appropriate bricks for your project.





**OUT WITH THE OLD**

Wouldn't life be easier if we could always start with a clean slate? As a home improvement enthusiast, I know how far-fetched this notion is. To get started on my brick walkway project (WALKWAY CONSTRUCTION VIEW), the first thing I had to face was removing a stubborn old concrete sidewalk.

Unless you have a jackhammer, the best way to get rid of a concrete walk is the old-fashioned way, with a 16-lb. sledgehammer. Let the sledgehammer do the work, striking the concrete repeatedly a few inches from the edges. Work your way toward the center as cracks appear (FIG. 1). An old pro taught me to tap the concrete with the sledgehammer to "sound" for hollow spots and thinner sections (thick, solid areas give a ping sound). Blows directed at weak

points yield impressive results. Be sure to wear safety glasses and gloves.

Sometimes sections of concrete will take a pounding without cracking. No matter how much huffing and puffing you do, nothing gives. In

these cases I use pry bars and a 5" to 6" dia. piece of concrete to gain an advantage (FIG. 2) A good whack with the sledgehammer usually does the trick, making pint-size pieces of the uncooperative section.



**1** Nothing beats a sledgehammer for breaking up concrete. Those with uncallused hands take heed — wear gloves.



**2** Pry up stubborn sections and insert a piece of concrete. A good whack with the hammer should crack the section.





**3** Use utility marking paint to outline the walkway once you've developed a fairly clear plan with the hoses or rope.



**4** There's no shortage of handwork here, especially when it comes to cutting the walkway route in the sod with a spade.



**5** Remove sod and soil from the walkway and, for drainage, make sure the path slopes away from the house.

### DESIGNING THE PATH

Once the concrete is removed you'll reach the first creative part of the project — outlining the walkway. Laying out garden hoses or rope to imitate the margins of your walkway will help you visualize the path.

When it comes to the path's shape I have two recommendations. The first is to take advantage of as many curves as possible. Curved walkways are less formal and contrast with the square lines of houses and yards. Plus, allowing your path to meander provides locations for flower beds and shrubs. Emphasizing the journey should be a primary objective with this kind of walkway.

The second consideration may

seem contradictory at first, but it will help when it comes to start your pattern. I always lay out one end of the walkway with square corners, and make the path wide enough at that end to equal a specific count of bricks (no cuts) laid side by side. This isn't essential, but you'll be glad you did it.

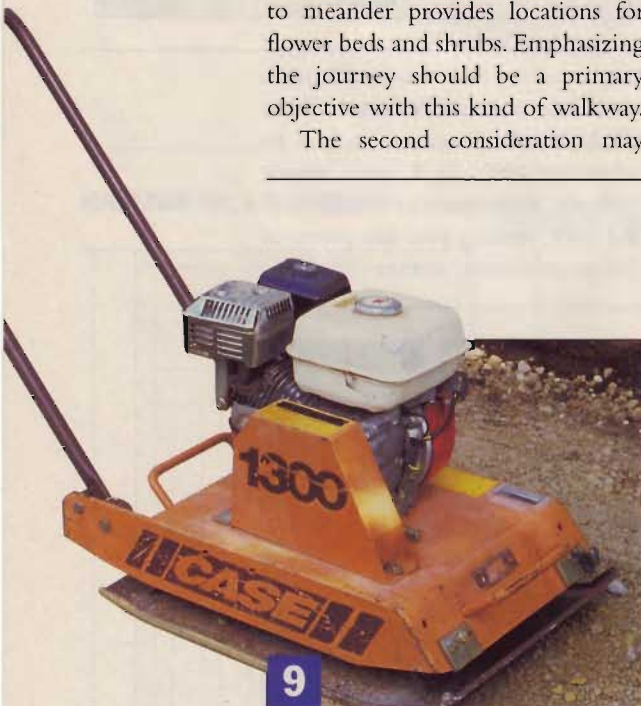
### EXCAVATING THE PATH

A can of utility marking paint (available at hardware stores) is handy for marking the outline of the walkway after you firm up your design. I always make two lines — the first right next to the hose or rope, and the second about 6" outside the first line (FIG. 3). The extra width gives you room for the edging and minor design changes.

Cut the lawn with a spade following the painted outline (FIG. 4), and remove sod and dirt to a depth of 6" (FIG. 5). Shave the dirt so the path is flat-bottomed — eyeball judgements are fine here — and sloped away from the house for drainage.

Now pour crushed stone with dust into the pathway (FIG. 6). This material is commonly available from gravel and rock suppliers — you may want to have it delivered. Rake the stone into a 3"-deep layer (FIG. 7), then wet it down so it begins to settle (FIG. 8).

Now comes the need for the first piece of rental equipment. To build a tough, supportive layer for the brick, go over the wet rock with a



**9** Rent a compactor and run it slowly over the dampened, crushed stone to create a solid foundation.



**10** Cutting edging to length is easy with a hack saw. Use a knife to cut the webbing to bend the edging along a curve.



**11** The path must be flat and slope away from the house for drainage. Partially drive spikes to hold the edging's shape.





**6** Properly compacted, crushed stone and dust will provide a firm foundation for the bricks. It also improves drainage.



**7** Rake the stone into a 3"-deep layer. Make sure the stone pathway is wide enough to support the edging.



**8** Compacting the foundation is critical to the long-term success of your walkway. It starts with watering the stone.

compactor (FIG. 9). It's a vibrating machine that settles the stone into a firm, tight layer, which is essential to the success of all the work that follows. Go over every inch of the pathway to force the rock into a dense mat, then add another 1"-deep layer of crushed rock. Repeat the raking, wetting and compacting steps as needed to fashion a bedding layer 2" to 3" deep.

#### THE EDGING ADVANTAGE

Among the things I learned from professional landscapers before starting this project were the benefits of walkway edging. Made of plastic, this stuff keeps the bricks tightly together to resist the effects of freeze/thaw

cycles that try to push the bricks apart. You're likely to find this material at full-service garden centers.

Lay the edging on the compacted rock, adjusting it until you get the shape you want. It's easy to cut the edging to length or to make it more flexible for curves (FIG. 10). Since the edging won't hold a shape on its own, I suggest you push 8" (60d) spikes through the molded holes and partially drive them into the rock and ground. This holds the curves, but still allows adjustments. As mentioned earlier, you'll do yourself a favor if you size one end of the walk for a full number of bricks laid side by side.

As you define the walkway, check the foundation for flatness

and to see that it slopes away from the house (FIG. 11). Proper drainage is very important.

Completing the edging phase will give you a pretty clear idea of the walkway's design characteristics (FIG. 12). Making major alterations after this point will be difficult, so this is the time to settle any doubts. When everything is set, drive the spikes to full depth.

A layer of sand gives the bricks consistent support, and it helps keep them from shifting. Pour enough for a 1" to 1½"-deep layer when it's raked out (FIG. 13). After raking, smooth the sand with a straight-edged board (called a screed) to make it as flat as you can (FIG. 14).



**12** When all the edging is installed have a good look at the walkway design. Now is the time to make adjustments.



**13** Rake the sand so it extends over every inch of the path. Sand provides a firm, uniformly supportive bed for the bricks.



**14** Work the sand to a uniform depth and keep it flat using a straight-edged 2x4. A trowel is handy for smaller areas.





### BEGIN LAYING BRICK

You've worked hard to get to this point, and your effort is about to pay off big. Thoroughly preparing the walkway foundation, as you see in the photo above, will give you peace of mind as you move into the next phase of the project, setting the brick.

It's best to think of the brick walkway in three sections: the soldier course, which runs along the outside edges, the interior pattern, and the small filler pieces you have to custom fit into odd-size holes that will occur.

Start the soldier course in the square corner at one end of the path (FIG. 16). Lay the soldier course along the entire perimeter of the



16

**Begin the soldier course in the square corner. Whenever possible, lay the bricks so they contact each other.**



17

**To follow curves in the design, flair the bricks apart evenly, though you may need to taper a few as you go.**

walkway, adjusting the spacing as you go to follow the curves in your design (FIG. 17). You'll need to trim some soldier course bricks to a tapered shape to keep the curve smooth and the gaps between bricks manageable ( $\frac{1}{2}$ " is about as wide as you should allow).

To taper the edges of these bricks you'll need a brick cutting saw equipped with a diamond blade, a tool usually available at rental centers (FIG. 18). Operating this tool is very much like cutting with a miter saw. Do wear a mask and safety glasses, because cutting into bricks kicks out a lot of small chips and heavy dust.

As you set each brick, give it a firm whack or two with a rubber mallet to seat it in the sand. This is also a good technique for making minor elevation adjustments.

### SETTING THE PATTERN

After completing the soldier course, go back to the square corner where you started and begin filling the interior of the walk. I chose a herringbone pattern (see *Establishing A Herringbone Pattern* at right), though there are several other traditional designs you can also choose (for more options, see *A Grand Entrance* in the July/August 1998 issue). Set your first interior brick in the corner, then work the herringbone pattern from there (FIG. 19).

You'll reach dead ends regularly as the herringbone pattern meets the soldier course. Just leave the resulting odd-shaped holes unfilled for now.

When you get about 6 to 8 ft. of the herringbone pattern installed, you can return to the beginning and sweep sand over the bricks — take care to avoid getting sand in the



21

**To mark a brick for cutting, hold it over the hole and mark it with chalk. The wood serves as a straightedge guide.**



22

**The chop saw makes quick work of cutting bricks. Hold the brick so the cut line aligns with the blade.**



23

**Once you're used to the routine, mark and cut a number of bricks at one time, then fit them in the pattern.**





**18**  
To follow sharp curves requires that you taper the bricks, a task easily accomplished with a brick cutting saw.



**19**  
Once you lay the first few tiers of the herringbone pattern, the bricking sequence is easy to repeat.




**20**  
Spreading sand into the gaps between bricks solidifies the pattern. Avoid getting sand in the remaining holes.

spaces yet to be filled with brick (FIG. 20). Working sand between the bricks holds the pattern rigid.

Cutting brick pieces to fill odd-size holes is straightforward. First, mark the cut line (FIG. 21), then cut the brick and slip the piece into the hole (FIGS. 22 AND 23). You want a snug fit, but not so tight that you have to force the brick into place.

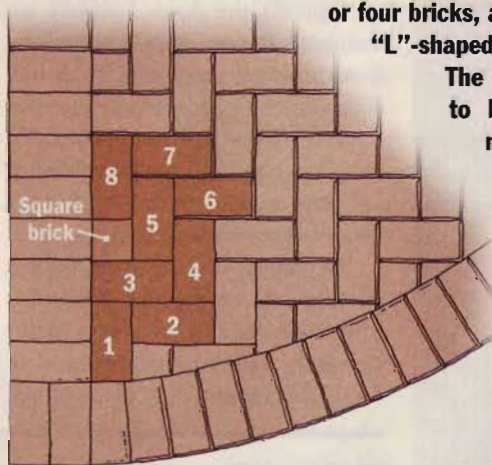
When all the bricks are in, run the compactor over the walkway to settle the bricks and to work more sand between them. Then sweep sand over the entire walkway (FIG. 24) and run the compactor again. Repeating this step several times locks everything together.

What's left? Nothing but shoveling in soil along the walkway borders, laying sod, and preparing flower beds. Remember, it's the journey that matters most. 

## Establishing A Herringbone Pattern

Having at least a half-dozen traditional brick patterns to choose from is great, though my preference usually runs to the herringbone design. It offers a pleasing pattern, it sets off well from the soldier course, and it's relatively uncomplicated to lay, even with curved borders.

A square corner makes starting foolproof, but it's not essential. If you don't have a square corner just pick a starting orientation for the first three or four bricks, and go from there working in "L"-shaped pairs (steps 1-8 at left).



The one constant, however, has to be your brick size. Bricks need to be uniform in size, with a length that is twice the width (a 1:2 ratio).

This pattern does introduce one irregular feature — you'll need to cut a square brick periodically to fill spaces next to the soldier course. This is caused by the half-brick offset of the pattern.



**24**  
When the entire walk is set in place, spread more sand and run the compactor to lock it all together.





# Replacing an Interior Door

Hanging an interior door is a remodeling task that lands nicely between carpentry and woodworking, drawing on skills from both camps. The structural requirements are relatively minor, and your craftsmanship need only be careful, not hair-

splittingly precise — especially if you leave the existing jambs intact.

Typically, the doors I replace are the hollow core type favored by homebuilders because of their low cost. I prefer solid wood doors for their durability and good looks. My six-panel pine upgrade, purchased at a home center, set me back only \$80. Hardware was extra.

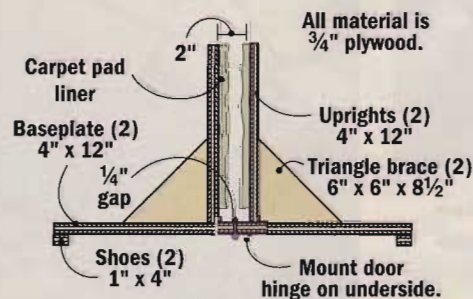
To prevent bowing, most hollow core doors have three hinges. This is fortunate since solid wood doors definitely require three hinges to carry the weight. But chances are,

the hinge jamb was never shimmed around the middle hinge, which means it may bow outward when supporting this additional weight. So your first task is to remove the hinge-side casing and install a pair of shims behind the jamb just below the middle hinge (SHIM DETAILS). As you snug the shims into position, hold a long straightedge against the jamb. This way you'll see if the jamb bulges any, and you can correct the problem right away. You want the jamb to be perfectly flat. Drive a couple of finish nails through the

## Door "Dogs" Lend a Hand

Seasoned carpenters rely on self-clamping "dogs" to hold doors on edge as they work. Hinged together, the identical halves are forced tight by the door's weight.

### DOOR DOG ELEVATIONS





## DOORWAY ANATOMY

jamb and shims, and into the 2x framing, to lock everything tight.

Your next task is to determine the size of door you need. This is simple, though you should be aware of some “insider” jargon. First, door dimensions are often given in architectural jargon — that is, in feet and inches. For example, a “three-oh” door measures 3 ft., 0 in. wide. Interior doors are typically “two-six,” measuring 2 ft., 6 in. wide. Standard height is 6 ft., 8 in., called a six-eight at most lumberyards.

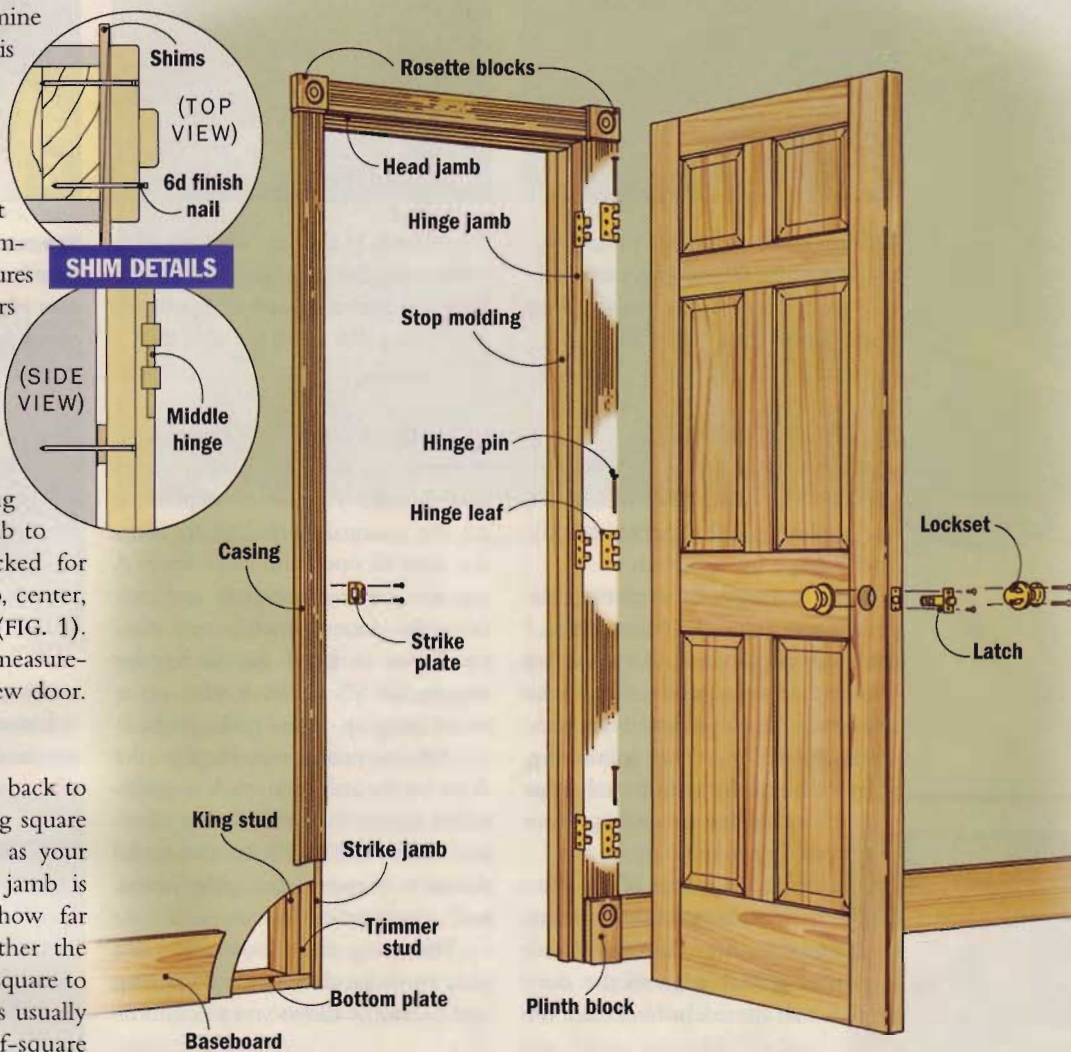
The doorway opening itself is measured from jamb to jamb, and should be checked for consistent width at the top, center, and lower hinge locations (FIG. 1). Use the closest nominal measurement when purchasing a new door.

### GETTING STARTED

With your door on site, go back to the doorway with a framing square and, using the hinge jamb as your reference, see if the head jamb is out-of-square, and if so, how far (FIG. 2). Check also whether the floor (or door threshold) is square to the hinge jamb. Two factors usually contribute to an out-of-square doorway — settling of the house frame, or someone else’s sloppy carpentry. Either way, you’ll have to accommodate those irregularities with your new door.

It also helps if the strike jamb, where the door latches, is perfectly parallel to the hinge jamb, but this isn’t critical. You’ll be making adjustments as you trim the door.

That reminds me — you’re dealing with a big workpiece here, one you can’t just toss onto your bench. Because you’ll be doing most of the work on the door’s edges, borrow a trick from the pros — door dogs — to hold the door steady and conveniently positioned while you work (see *Door “Dogs” Lend a Hand*, at left.)



**Measure jamb face to jamb face to get accurate door width. Check for consistency by taking readings at several heights — top, center, and bottom.**



**Use the hinge jamb as your reference to determine the squareness of the doorway opening. The door’s ends must be trimmed accordingly.**





**3** A simple cutoff jig precisely aligns the saw blade with the cut line, making it easy to match any angle you may need at the end(s) of the door.



**4** Adjustments to the door's width are made along the latch edge. A slight bevel provides clearance for opening and closing, but keeps the tight fit.



**5** Saw marks can be avoided or removed by using a hand plane to bevel the door edge. Planing takes time, but allows you to make fine adjustments.

### GETTING A CUSTOM FIT

Once you've taken measurements of the door opening and noted any odd angles, you can start to alter the door's shape for a custom fit.

I always begin by trimming the end(s) first (FIG. 3). Most often, I trim only the bottom of a door, but if more than an inch of stock must be removed I cut some from both ends. Though this jig reduces splintering, after trimming I chamfer each edge with a block plane or sanding block to prevent future splinters.

Trimming the width of the door can be trickier. As mentioned earlier, the hinge side of the doorway is your reference, so that edge of the door shouldn't be altered. Instead, mark the

latch edge of the door if trimming is required. You want just enough clearance (usually  $\frac{1}{16}$ " to  $\frac{1}{8}$ ", depending on the seasonal humidity) to allow the door to open and close freely. A gap any larger is unsightly and may cause the door to latch poorly. Also, you need to bevel the latch edge slightly ( $3^\circ$ - $5^\circ$ ) so the inside corner won't hang up on the strike jamb.

If the carpenter who installed the door jambs and trim took a craftsman's care with his work, the nominal width (30") will be the actual distance between the side jambs, with the door cut narrower.

Trimming the door edge not only provides clearance for opening and closing, it allows you to custom-

fit it to the doorway's irregularities (FIG. 4). Be sure to orient the door so the side that will face the stop molding gets the deeper end of the bevel. For light trimming or for cleaning up saw blade marks, you can use a hand plane (FIG. 5).

Whatever your method, resist the temptation to remove a lot of material at once without fitting the door to check your progress. Often it takes two or three adjustments.

### CUTTING THE HINGE MORTISES

Once you're satisfied with the fit of your new door, you can install the hardware. Here precision does count, so I mark the position of each hinge directly from the jamb



**8** An ordinary router with a straight bit will clear most of the waste from each hinge mortise. Cutting depth should equal the thickness of the hinge leaf.



**9** Freehand routing will leave some waste wood around the perimeter of the hinge mortise. Use a sharp chisel to clean up right to the edges.



**10** Using a self-centering (Vix-type) bit is the most reliable way to drill accurate pilot holes for the hinge screws. For heavy doors, use 1" or longer screws.





**6** Hinge alignment demands precise marking and cutting. Avoid measuring errors by shimming the door in place and marking each hinge location directly.



**7** An inexpensive butt marker will score clean outlines for the hinge mortises, ready to rout.

(FIG. 6). Before marking the hinge locations, however, fit the door in the opening with shims. Place shims between the bottom of the door and the floor and use them to raise the door up, and put shims between the top of the door and the head jamb to preserve a  $\frac{3}{16}$ " gap. It's helpful to have an extra pair of hands during this step.

You can cut the hinge mortises by hand with a chisel, but a router and a  $\frac{1}{2}$ "-dia. straight bit will produce good results more quickly. I also recommend investing \$10 to buy a butt marker (named for the type of hinges used to hang doors). You just need to specify the size: 3",  $3\frac{1}{2}$ ", or 4". With tabs that index it

along the door edge, a butt marker has three chisel-like edges that score the outline of the hinge (FIG. 7).

Next, carefully rout away the waste inside the scored outline (FIG. 8). Then use a sharp chisel to clean up the corners and edges of the mortise (FIG. 9).

When all the mortises are cut, fit the hinges and drill pilot holes for the screws (FIG. 10). Then fasten the hinges in place and refit the door in the doorway. I try to couple the bottom hinge first, then pivot the door to align and pin the other hinges. If any of the hinges get stubborn about lining up, back the screws out some to afford a little play, then retighten them after you get the pin seated.

## HELPFUL RENTAL TOOLS

Specialized tools come in handy for a couple of door-hanging steps. With a power plane (top) you can quickly trim and bevel a door's edge. A lock boring jig (bottom) accurately positions your drill for precise lockset holes. Buying them may be unreasonable, but a one-day rental is money well spent if you have several doors to hang.



### INSTALLING THE LOCKSET

The standard requirement for a lockset installation is a  $2\frac{1}{8}$ "-dia. hole with a  $2\frac{3}{8}$ " backset (the distance from the door edge to the center of the lock.) You can use a  $2\frac{1}{8}$ "-dia. hole saw to bore the large hole for the cylinder and handle (FIG. 11).

For the 1"-dia. latch hole, I first drill a  $\frac{1}{8}$ "-dia. hole, since this bit is easier to keep on target, which serves as a guide for the larger bit (FIG. 12). After marking and chiseling the shallow mortise for the latch plate, install the lock for a trial run (FIG. 13). Finally, check the strike plate position and, if it needs to be moved or the strike plate needs to be replaced, use a chisel to alter the mortise. ■



**11** Carefully layout the hole centers for the lockset, and clamp scrap wood to the door to prevent tearout as the hole saw exits the workpiece.



**12** For the latch assembly, drill a  $\frac{1}{8}$ "-dia. pilot hole first, then follow this guide hole with the 1"-dia. bit. Mark and chisel the mortise for the faceplate.



**13** With the latch faceplate nesting flush with the door edge, the tail of the assembly will align with the lockset cylinder. Screws secure the handles.



# Cordless 'Circ' Saws

No doubt about it, cordless tools have come of age. Check the shelves of any tool dealer and you'll see lots of drills — the “old” standbys of the cordless world — as well as quite a few cordless jig saws and reciprocating saws. And now a newcomer is hitting the market. At tool stores and home centers catering to contractors, the cordless circular saw is coming on strong. In fact, judging by the number of models available, circular saws

represent the next big wave in cordless technology, with a wider selection than any tool so far but the drill.

That these saws are more commonly found at stores frequented by professionals isn't surprising. All of the models are descendants of the trim saws used by carpenters to cut exterior trim, soffits, and roof sheathing material to size. Because maximum thickness for these materials is usual-

ly under 1", manufacturers equipped corded trim saws with small-diameter blades (around 3½" to 6"), just large enough to get through the stock. The saws are generally lighter and more compact too, since heavy-duty motors and the hefty packages they depend on aren't needed for these light-duty cutting chores. More often, trim saws are used when portability is more important than absolute power, such as while working high on a ladder or rooftop.

As better batteries have yielded greater power from cordless tools,

eliminating the cords from trim saws seemed a logical step toward making them even more useful.

## CUT TO THE TEST CRITERIA

If these tools are so specialized, why should a do-it-yourselfer care? Any cordless drill owner will tell you not having to drag a cord around is wonderful. And most cordless circular saws, despite their trim saw heritage, will make square cuts through 2x stock, giving them adequate cutting capacity for the majority of home project needs.



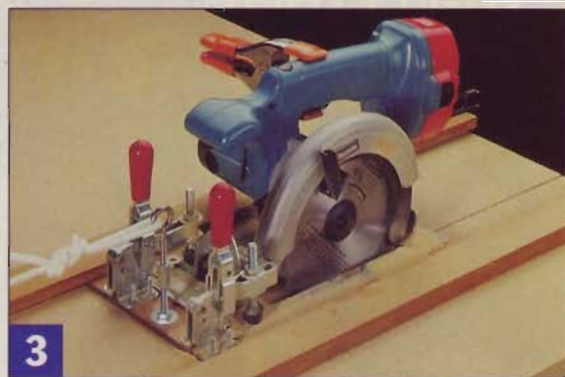




The saws may have been designed with a trim carpenter in mind, but a DIY'er will probably use them to cut 2x stock, so we made this a requirement.



All the saws tested can be tilted to make bevel cuts of at least 45°. We did this with each one, noting capacity, adjustability, and ease-of-use.



We clamped each saw to a sled, then used weights to pull the rig through 3/4"-thick MDF. This gave us an objective comparison of each saw's power.

We wondered, then, if a cordless saw is a sound investment for DIY use, and if one can replace a corded saw. And we wanted to determine which is the best saw available from the current crop.

To do this, we gathered cordless saws for a head-to-head test. All had to have the capacity for square cuts through 2x stock, and at least 12-volts of power. These criteria gave us a field of nine: DeWalt 12-, 14.4-, and 18-volt saws, 12-volt and 15.6-volt models from

Panasonic, and one 18-volt saw each from Ryobi, Hitachi, Craftsman, and Makita (a 14.4-volt Makita is in the works, but wasn't available at the time of our test).

To test the saws' performance and abilities we cut 2x and 1x stock, and plywood (FIG. 1), then made bevel cuts to compare adjustability and cutting capacity (FIG. 2). All the while we paid attention to cutting quality, vibration, and speed. To assess raw cutting power, we mounted each

saw to a weight-driven sled and pulled the saw through 3/4"-thick medium-density fiberboard (FIG. 3). After each cutting pass through the sheet, more weight was added until the saw stalled.

Our testers also looked at factors such as the ergonomics and fit-and-finish of each saw. In the end, each tester ranked the saws and gave an opinion on the tools' worthiness for home improvement use.





## PANASONIC EY3503 & EY3531



## THE BOTTOM LINE

### VIRTUES

Compact size; light weight; good balance; come with two batteries; good trigger release; adjustable metal kerf indicator.

### VICES

Small front handles; excessive arbor bearing noise on 12-volt model; adjustment knobs tough to reach; right-hand blade.

### VERDICT

These saws are very capable, and we liked their compactness, but they fell short with right-hand blades, awkward front handles.

### COMPARISON AND CONTRAST

At first glance, you'll see many similarities among these saws, but there are some major design differences. The most obvious are in blade position and blade size.

Most saws have the blade on the left side. Only the Hitachi and Panasonic mount the blade on the right. The majority of our testers are familiar with using worm-drive framing saws that have left-hand blades, so working with the cordless saws of this design felt natural. Since most of us are right-handed as well, the left-blade saws provide a clearer

view of the cut during normal use.

One of our saw testers is a lefty, and preferred the blade mounted on the right side of the saw. At least as important as blade position, though, is blade size. Keep in mind that these saws were descended from trim saws, and have blades smaller than a standard 7 $\frac{1}{4}$ "-dia. corded circular saw blade.

Seven of the saws use blades of either 5 $\frac{3}{8}$ " or 5 $\frac{1}{2}$ " diameter. These saws will all make a square (0°) cut through 2x material, but none of them quite reach through that same 2x stock with the blade tilted to 45°.

The saws from Hitachi and Makita are both brand new, and come equipped with 6 $\frac{1}{2}$ "-dia. blades. Both saws will cut through 2x stock at 45°. The teeth barely make it through, but they do the job. Even though cutting 45° bevels in 2x stock isn't something most of us do often, all of our testers liked this capability and thought it would be a nice feature on any cordless saw.

All nine saws came standard with thin-kerf, carbide-tipped blades. Tooth count, though, ranges from 16 teeth on the DeWalt saws to 40 teeth on the Hitachi. Each manufacturer, it seems, has a different view on the tooth count that will yield optimum saw performance.



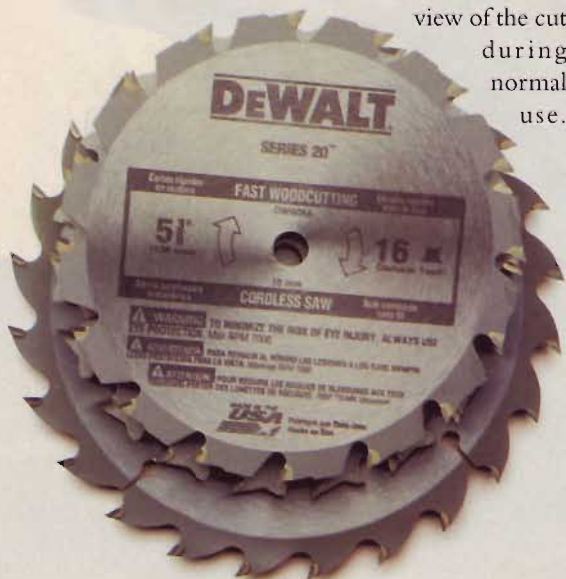
Adjustable kerf indicator on Panasonic saws eases cut line viewing. Spindle lock button is large and well-positioned.



As you'd expect, the number of teeth influenced how smoothly and quickly the blade could cut. The DeWalts made rough but acceptable cuts. The Hitachi left a very smooth edge, and other saws fell between these two extremes.

DeWalt offers blades with higher tooth counts, and aftermarket blades are becoming available in sizes to fit these saws. For testing, though, we used the original-equipment blades.

Other common features among the saws are a spindle lock to aid blade changing, a retractable blade





## THE BOTTOM LINE

### VIRTUES

Comfortable handles; good power in all models; 14.4-volt well-balanced; variety of optional blades available.

### VICES

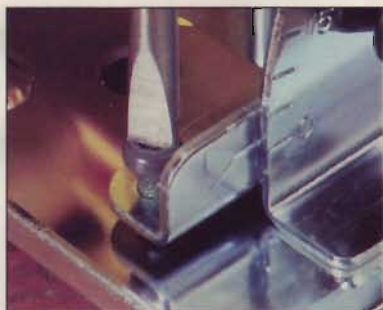
No edge guide capability on 12-volt and 14.4-volt models; 18-volt feels heavy; standard 16-tooth blades make rough cuts.

### VERDICT

18-volt and 14.4-volt are strong saws, but trail larger-bladed saws on cutting capacity. Most comfortable handles of saws tested.



**DeWalt's handles are sized and positioned for a secure, comfortable grip. Adjustable stop sets 0° cuts accurately.**



guard, and angle markings on the tilt scale. A few have inch markings on the saw shoe. All saws but the Hitachi have on-board storage for blade wrenches — the T-handle Hitachi wrench stays in the case.

Each saw also has a kerf indicator. On the Hitachi and the Panasonics it's adjustable, though oddly these saws do not come equipped with the tool needed for adjustments. The Hitachi has a Phillips-head bolt, the Panasonics a Torx-head bolt. Adding this function to the blade wrenches would have been a nice touch.

## DEWALT 930K, 935K & 936K



One feature that drew more attention than expected was the trigger release, designed to prevent users from accidentally turning on the saw (see photos at right). All of our testers remarked about the different types.

Ryobi, Craftsman, and DeWalt all use a traditional push-button release which you squeeze against the saw's handle. Panasonic and Hitachi chose a rocker-style switch you push straight down with your thumb. Only Makita chose a top-mounted button.

While no tester said the release was a big factor in their evaluation of the saws, all of them declared the rocker-style design the easiest to use.

### ON TO THE SLED

After examining each saw's features, it was time to get testing under way. This started with the sled test I mentioned earlier. The sled was made of phenolic plastic, and had a large opening for the blade. Strips of super-slick UHMW plastic applied to the sled's top and bottom edges kept friction to a minimum. The sled traveled between rabbeted guides that eliminated unwanted lateral movement, again without causing undue friction. Weights

attached to a rope pulled the sled and saw over an MDF sheet. The rig looked a bit like a high school science experiment, but it worked like a champ, allowing each saw to cut with equal force applied, and under more strain than would be common in normal use.

We chose to run the sled over MDF because of its dense, uniform structure. MDF is tough to cut, and its even consistency prevented the skewed outcome that variations in solid lumber might have caused. If the saws could handle this material, we figured they'd have no problem with most anything else.

Before testing, each saw was equipped with a fully-charged battery and a fresh (original equipment) blade.

Testing each saw began by clamping it to the sled, aligning it for a straight cut, then cutting a few inches into the sheet by hand. Weights attached to the opposite end of the rope pulled each saw, and clamping the switch allowed the saw to run hands-free.



**PUSH BUTTON**



**ROCKER-STYLE**



**TOP PUSH**



## HITACHI C 6DC



With the 12-volt saws, we started the sled test with 10-lbs. of weight. If the saw traveled four feet without stalling, we stopped it, added 2½-lbs. more weight, then let the saw run again. Both the Panasonic and DeWalt 12-volt saws ran fine at 10-lbs., but stalled at 12½-lbs.

The DeWalt 14.4-volt and the Panasonic 15.6-volt came next, starting with 12½-lbs. of weight. Both saws handled this weight fine, and both stalled when we increased the weight to 15-lbs.

When we began strapping 18-volt saws to the sled, we expected to see the same sort of pattern emerge — we'd start with 15-lbs., then each saw would handle the approximate pound-per-volt we'd been seeing so far. A surprise awaited us. When the first saw ran only about a foot before

stalling, we reduced the weight to 12½-lbs. and started again.

With the lower weight, every 18-volt saw flew through the MDF. At 15-lbs., though, the Hitachi, Craftsman, and Ryobi stalled after just a couple feet — not much better than the 14.4-volt models. The DeWalt 18-volt handled 15-lbs., but stalled quickly at 17½-lbs. We were surprised again when the Makita cut without problem at the same weight, and tried to make a go at 20-lbs. At this weight it bucked to a stop after about 2-ft.

To top off this phase of testing, we set the sled aside, and made some cuts through the MDF by hand. When we could adjust feed rate to match each saw's cutting speed, every saw cut with little complaint.

### REAL WORLD EXPERIENCE

While the sled test clearly demonstrated each saw's raw power, it doesn't represent the kind of real world cutting you're likely to encounter. So we gathered our group of testers again and set about cutting up sheets of sheathing-grade plywood, and reducing a stack of 2x and 1x stock into kindling. This gave everyone a chance to evaluate how each saw performed in ways we'd

## THE BOTTOM LINE

### VIRTUES

Powerful; 6½" blade cuts 2x stock at 45°; 40-tooth design cuts smoothly; light is handy; cast aluminum shoe; great balance.

### VICES

Right-hand blade; non-adjustable shoe pivot; saw dust clogs depth adjustment mechanism.

### VERDICT

A great saw that ran a close second to the Makita. If Hitachi had mounted the blade on the left, first place might have been a tie.



**Hitachi is the only saw with a cast (not stamped) shoe. Also exclusive is a light that illuminates the cut line.**



normally use them. In the process we examined balance, adjustability, cutting quality, and cut-line visibility. We also looked at other attributes such as general feel and comfort.

Weights of all the saws are similar, ranging between 6½-lbs. and 7½-lbs. Much of this is attributable to the batteries — the higher the voltage, the more they weigh. Most testers preferred lighter saws, but felt increased weight was fine if coupled with better performance.

With weight running this close, balance became more of an issue for



**Only the 6½"-dia. blades (left) cut completely through 2x stock at 45°. The smaller blades don't quite get through.**



## THE BOTTOM LINE

### VIRTUES

Great power; 6½" blade cuts 2x stock at 45°; thick aluminum shoe; lever-style depth lock; great blade break; solid construction.

### VICES

Main handle diameter is a bit too large; top-mounted trigger release tougher to reach; slightly front-heavy.

### VERDICT

This saw's virtues far outweigh its vices. Closest to corded capability of any saw tested. Can't wait for the 14.4-volt version.



**Only the Makita has a metal mount for the shoe pivot. A lever locks depth-of-cut settings, rather than a knob.**



our testing team. The Hitachi was judged best balanced, and scored well for overall feel. Both balance and feel were influenced by this saw's more upright handle.

Handles were discussed at length here too. The long, round front handle on all three DeWalt saws felt best to most testers. These handles are offset slightly to the right, which was just right for all but our left-handed tester. The Panasonic saws, on the other hand, have front handles that all testers felt were too small to provide a firm, comfortable

## MAKITA 5620DA



grip. The Makita's rear handle was judged by some to be a bit too large in diameter.

Adjusting the shoe for depth of cut doesn't vary greatly from saw to saw, but placement of the knobs and their sizes make a big difference in how easily adjustments are made. Here the Makita scored well, with a large lever rather than a knob. It was easiest to grasp. The tilt knob on our 15.6-volt Panasonic is a very small metal wing knob that was hard to get a good grip on.

When judged on visibility of the cut-line, left-bladed saws ruled for everyone except, once again, the left-handed tester. Everyone liked the Hitachi's on-board light that shines on the saw kerf, but even this slick feature didn't overcome the saw's right-hand blade.

Saws equipped with a blade brake also won praise for the confidence they inspired over saws without a brake. The brake on the Makita was ranked best, stopping the blade almost instantly.

One of the final areas of testing and discussion revolved around overall feel. As you might guess, quieter saws were judged better than noisier saws, but the quality of the noise also seemed to make a differ-

ence. Excessive arbor bearing noise from the 12-volt Panasonic decreased its standing. Though this noise didn't seem to affect the saw's performance, it did make us question long-term durability.

By now, you may have noticed one test we didn't perform — cuts per charge. Not all manufacturers make a cuts-per-charge claim, but those who do vary between 40 and 80 crosscuts through 2x6 material. In our experience, all the saws made more cuts on a single charge than any of us thought we'd need in one sawing session. Sawing with two batteries allow quick recharging, and even those with one battery recharge in one hour or less.

### THE FINAL CUT

So, when all was said and done, how did the saws rate? The battle between first and second place was very close, with the Makita barely nosing out the Hitachi. The biggest reason these saws came out on top was their larger-diameter blades, which meant neither required the cordless saw buyer to compromise much on cutting capacity. If the Hitachi was available with a left-hand blade, the contest might have been too close to call.



**CRAFTSMAN**  
351.271810



## THE BOTTOM LINE

### VIRTUES

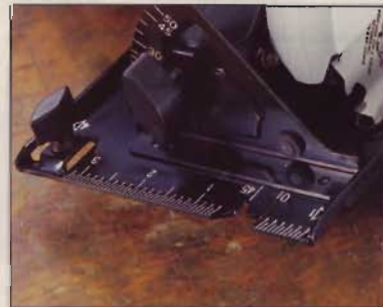
White-on-black shoe markings easy to read; powerful; quiet; comes with edge guide.

### VICES

Batteries seemed to drain quickly; side-push trigger release.

### VERDICT

A solid performer with nice features. Opt for the combo pack that includes a drill, rather than buying the saw alone, for better value.



**Only Craftsman paints the saw's shoe, allowing measurement scales painted in contrasting color — a nice touch.**

Both the Makita and Hitachi saws also offer performance that feels closest to that of a corded saw. Granted, neither one has the freight train power of a worm-drive or a pro-quality sidewinder saw, but most of our testers thought they offer plenty of grunt to handle the medium-duty requirements of remodeling and home improvement projects.

Third place in the competition went to the DeWalt 18-volt model.

It offers excellent performance, but doesn't have quite the big saw feel or performance of the top two. Its ranking also fell due to its inability to cut through a 2x at 45°.

We also recommend the DeWalt 14.4-volt. We liked the Craftsman 18-volt too, if you buy it in the combination pack that includes a drill. Buy the saw alone, and you'll pay \$250. Spend \$299, and you get a drill too, a much better deal.

Speaking of combination kits, the Ryobi is also sold only that way for now. With a drill it sells for \$249, the same price as most of the other saws

## Low Down On The Saws

Model	Panasonic EY3503	Panasonic EY3531	Hitachi C 6DC	Ryobi R 10631
Volts	12	15.6	18	18
Blade dia. / side	5 <sup>3</sup> / <sub>8</sub> " / Right	5 <sup>3</sup> / <sub>8</sub> " / Right	6 <sup>1</sup> / <sub>2</sub> " / Right	5 <sup>1</sup> / <sub>2</sub> " / Left
Cut capacity 0° / 45°	1 <sup>13</sup> / <sub>16</sub> " / 1 <sup>3</sup> / <sub>16</sub> "	1 <sup>13</sup> / <sub>16</sub> " / 1 <sup>3</sup> / <sub>16</sub> "	2 <sup>1</sup> / <sub>4</sub> " / 1 <sup>1</sup> / <sub>2</sub> "	1 <sup>9</sup> / <sub>16</sub> " / 1 <sup>1</sup> / <sub>8</sub> "
Weight	6.0 lb.	6.6 lb.	7.3 lb.	7.25 lb.
Batteries / charge time	Two / 20 min.	Two / 30 min.	One / 60 min.	Two / 60 min.
Motor speed (no load)	3,100 rpm	3,400 rpm	3,400 rpm	4,200 rpm
Edge guide	Available	Available	Included	Available
Warranty	1 Year	1 Year	1 Year	2 Years
Street price	\$260	\$290	\$250	\$250 (with drill)
Telephone number	(800) 338-0552	(800) 338-0552	(800) 598-6657	(800) 525-2579



## THE BOTTOM LINE

### VIRTUES

Good power; quiet; attractive price; expansion slots in blade; two batteries.

### VICES

No blade brake; currently only available in kit with drill.

### VERDICT

Good saw overall at an exceptional price. For same price as many other saws, you get a saw *and* a drill, plus two batteries.



**Blade wrench storage on the Ryobi saw is good. The hex wrench is out of the way, and held securely in place.**

alone. Even if it doesn't have quite the performance of the top three, it does work well, and the kit price makes it a good value.

## RYOBI R 10631



Now for the big question: Does a cordless saw belong on the must-have list for a do-it-yourselfer? The answer isn't simple. We were pleased, if not a bit surprised, that all the saws handled most cutting chores. While none offer corded saw power, they're getting closer all the time, as exemplified by the Makita and Hitachi.

If you need a good trim saw — this is after all what they're built for — we highly recommend a cordless

version. For those who do mainly heavy-duty cutting, stick with a corded model. But as a second saw, or if your saw usage falls more often in the medium-duty range, a cordless saw is a great way to go. If you own a corded and a cordless drill then you already know it's the cordless you reach for first. With their power, capacity, and cutting quality, you'll do the same with a cordless circular saw. **W**

DeWalt 930K	DeWalt 935K	DeWalt 936K	Makita 5620DWA	Craftsman 351.271810
12	14.4	18	18	18
5 <sup>3</sup> / <sub>8</sub> " / Left	5 <sup>3</sup> / <sub>8</sub> " / Left	5 <sup>3</sup> / <sub>8</sub> " / Left	6 <sup>1</sup> / <sub>2</sub> " / Left	5 <sup>1</sup> / <sub>2</sub> " / Left
1 <sup>5</sup> / <sub>8</sub> " / 1 <sup>3</sup> / <sub>16</sub> "	1 <sup>5</sup> / <sub>8</sub> " / 1 <sup>3</sup> / <sub>16</sub> "	1 <sup>5</sup> / <sub>8</sub> " / 1 <sup>3</sup> / <sub>16</sub> "	2 <sup>1</sup> / <sub>8</sub> " / 1 <sup>1</sup> / <sub>2</sub> "	1 <sup>9</sup> / <sub>16</sub> " / 1 <sup>1</sup> / <sub>8</sub> "
6.5 lb.	6.8 lb.	7.5 lb.	7.5 lb.	7.0 lb.
One / 60 min.	One / 60 min.	One / 60 min.	One / 60 min.	Two / 60 min.
2,500 rpm	3,000 rpm	3,200 rpm	2,600 rpm	4,000 rpm
Not available	Not available	Included	Included	Included
1 Year	1 Year	1 Year	1 Year	1 Year
\$225	\$250	\$275	\$250	\$250
(800) 433-9258	(800) 433-9258	(800) 433-9258	(800) 462-5482	(800) 377-7414



# Magazine Pocket

Is your kitchen table like mine, a magnet for newspapers and magazines? I don't know about you, but managing this clutter is a constant challenge at my house. And, to be honest, I have to admit I'm part of the problem, largely because I like to read newspapers and magazines at the table. So when I got

to thinking about a solution, I knew whatever I came up with would have to keep my reading material within easy reach.

Since an on-the-floor rack wasn't practical in the tight quarters of my kitchen, this inset magazine rack became the perfect choice. It's sized to fit into a standard stud bay (14½" wide), which means it can go almost anywhere in the house.

Building the rack took just about half a day of one weekend. And the project's modest tool requirements make it appropriate for even the most basic shops. You need a table saw, a drill, and a router with a ¼" radius round-over bit.

The materials list is also short. A 5-ft. length of ¾"-thick red oak for the carcass and rails, a couple feet of ½"-thick stock for the slats, and a small amount of ¼"-thick oak for the fillers (MAGAZINE RACK CONSTRUCTION VIEW).

## CARCASS AND RAILS

Go to work on the ¾"-thick stock first, cutting and ripping material to size for the four carcass pieces and the upper and lower rails (see the MAGAZINE RACK ELEVATIONS on page 50). Before swapping your standard blade for a dado blade, rip the bevel on each lower rail (LOWER RAIL DETAIL).

Now set the rails aside and concentrate on the carcass joinery. You can do all the joinery with a ¾"-wide dado blade if you cut a pocket in an





auxiliary wood face clamped to your rip fence (FIG. 1). The wood face will protect your fence and "hide" part of the blade while you cut the narrow rabbets.

To get set up, lower your dado blade below the saw table, then clamp a wood face to the rip fence and move it over the blade. With the saw running, raise the blade slowly into the wood face to cut a pocket for concealing the blade. Be sure the blade will not contact the rip fence. Cut a 1/2" high pocket, enough to allow 1/8" clearance for the deepest cuts in this project.

Rip the 1/4"-wide rabbet in the back edge of each carcass piece first (FIG. 1). Then adjust your rip fence and cut the 3/4"-wide rabbet at both ends of each side (FIG. 2).

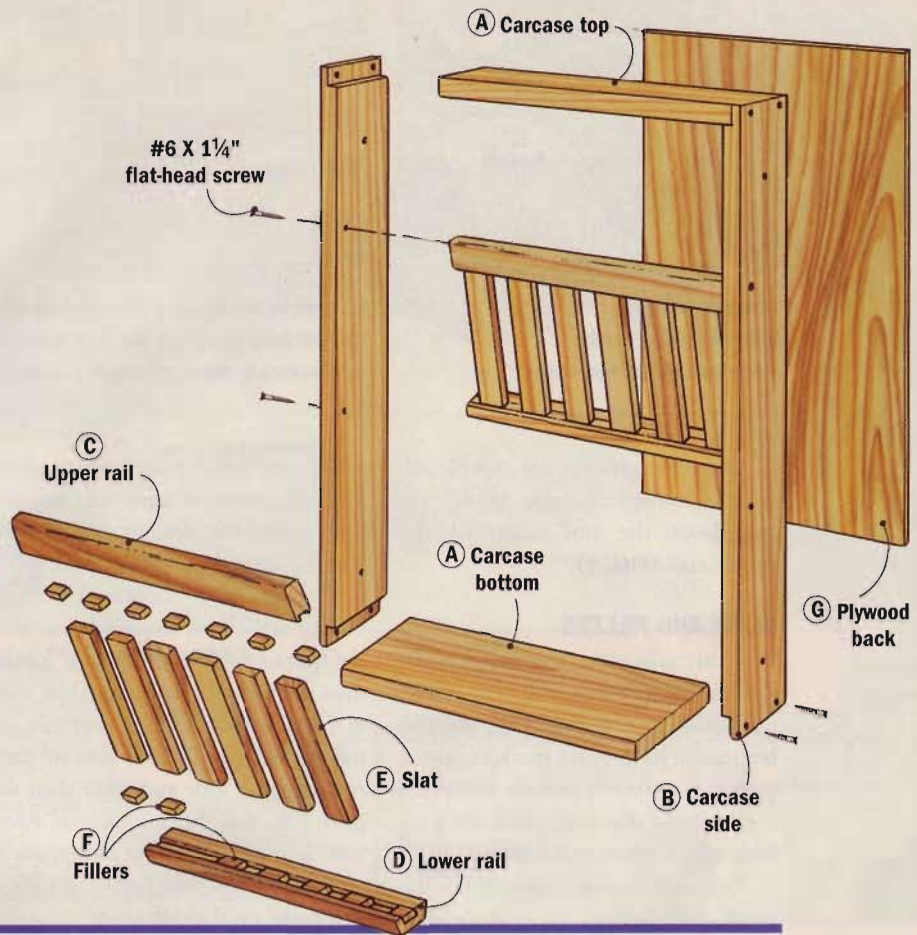
### CARCASS ASSEMBLY

Clamp the four carcass pieces together so you can drill and countersink pilot holes through the sides into the top and bottom. Then remove the clamps, spread glue in the rabbets, and screw the carcass together.

While the glue sets up, you can machine the upper and lower rails. To cut the groove in each rail, equip your table saw with a 1/2"-wide dado blade. First plough a 1/4"-deep groove centered in the bottom edge of each upper rail (UPPER RAIL DETAIL). Then adjust the rip fence and cut a 1/4"-deep groove in the top face of each lower rail (FIG. 3).

## MAGAZINE RACK CONSTRUCTION VIEW

OVERALL SIZE: 24<sup>3</sup>/<sub>4</sub>"H x 14<sup>1</sup>/<sub>4</sub>"W x 3<sup>1</sup>/<sub>4</sub>"D



## MATERIALS LIST

### MAGAZINE RACK

- A (2) Top/bottom 3/4" x 3 1/4" x 13 1/2"
- B (2) Sides 3/4" x 3 1/4" x 24 3/4"
- C (2) Upper rails 3/4" x 1 1/2" x 12 3/4"
- D (2) Lower rails 3/4" x 1 1/2" x 12 3/4"

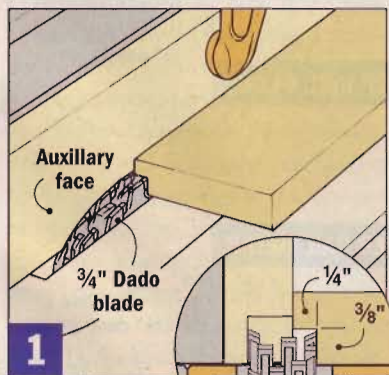
- E (12) Slats 1/2" x 1 1/4" x 6 1/4"

- F (28) Fillers 1/4" x 1/2" x 3/4"

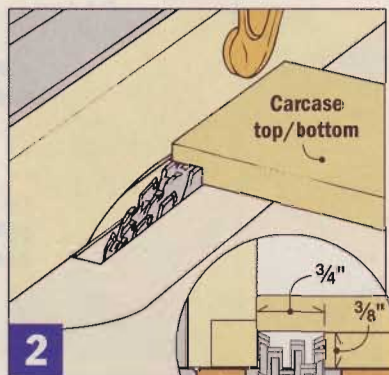
- G (1) Back 1/4" x 13 1/2" x 24" (ply)

### HARDWARE

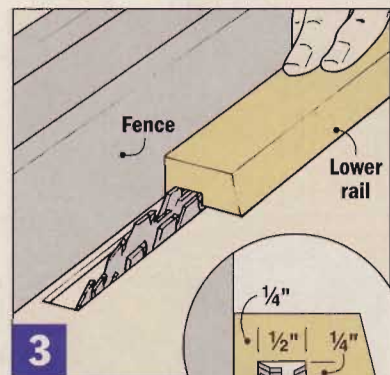
- (12) Flat-head wood screws #6 x 1 1/4"



**1** An auxiliary fence conceals most of the blade for cutting narrow rabbets.

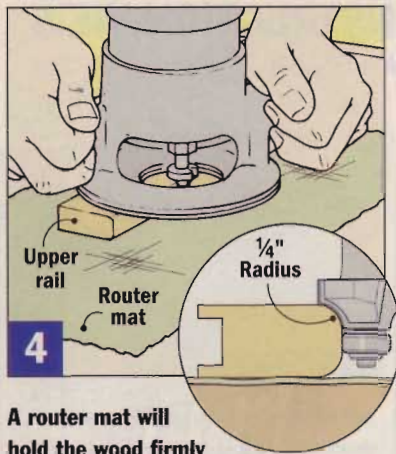


**2** Leave the auxiliary fence in place while you cut the wider rabbets.

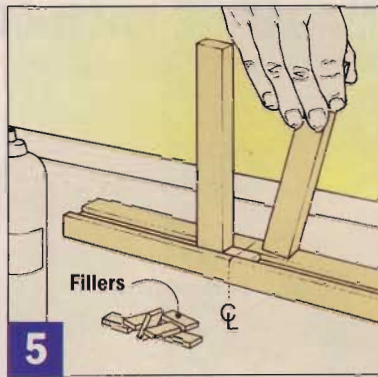


**3** Cut the groove in the lower rails with the beveled edge away from the fence.

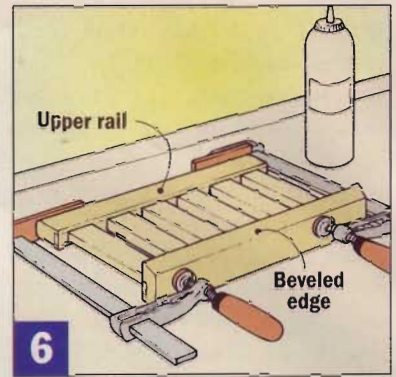




**4** A router mat will hold the wood firmly while you shape the edges.



**5** Centerline marks on a filler and on the rail will help you align the first piece in the assembly. Work toward the ends.



**6** Have the beveled edge of the lower rail facing up when the assembly is glued and clamped. Check for square.

Once the grooves are completed, set the lower rails aside while you roundover the top edges of the upper rails (FIG. 4).

### SLATS AND FILLERS

You can now start working on the slats and fillers that will seat in the rail grooves you just cut. As you begin machining the stock for these pieces, there are a couple of steps I recommend that will make the process safer and more foolproof.

First, use a setup guide to cut the small filler pieces to a consistent length (see *THE SKILL-BUILDER* at right). The guide also makes it safer to hold small stock close to the blade

and makes a kickback very unlikely. The same type of setup can be used for cutting the slats to a consistent length, though holding the stock with a pencil isn't necessary.

My second recommendation is to cut four of the fillers about  $\frac{1}{4}$ " longer than the others. These should be used as the end pieces in each assembly. Let me explain why. If your slats are each ripped just a little narrower than the plan calls for, the cumulative effect will cause an extra-long filler space at each end of the rails. The longer fillers will make up the difference.

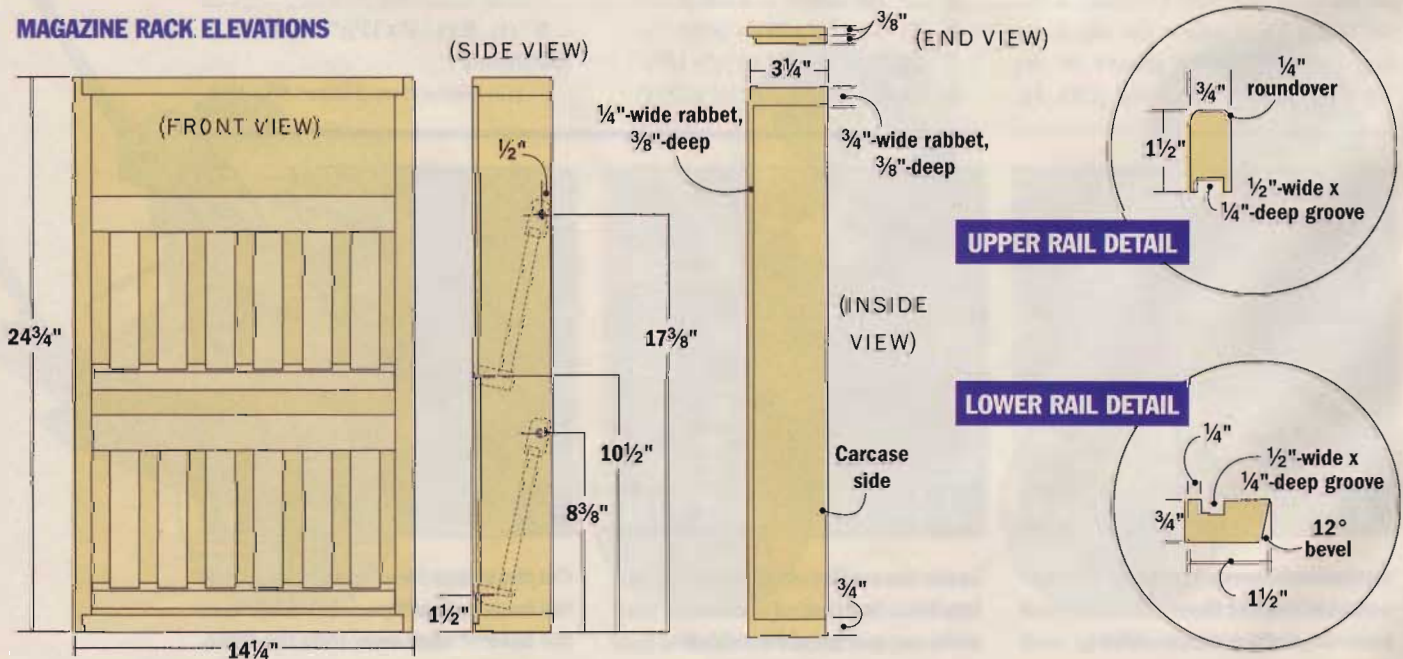
I also suggest sanding the fillers before they're installed. After assembly, there won't be enough room for this.

### RAIL ASSEMBLIES

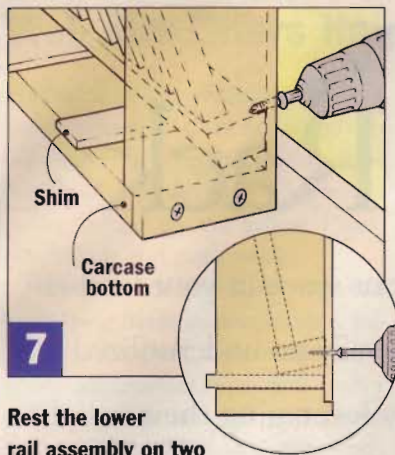
You'll enjoy putting the rails, slats and fillers together, especially if you know about an important tip. For consistent spacing between slats, begin each assembly by gluing in a center filler and working symmetrically toward the ends (FIG. 5). This way, if your pieces weren't sized right on the money, the sequence will split the difference at the ends of the rail, where you can install the longer fillers. When all the pieces are in place, add clamps (FIG. 6). Trim the end fillers flush after the glue sets.

This is a good time to cut the plywood back to size and dry-fit it into the carcass. Once you're satis-

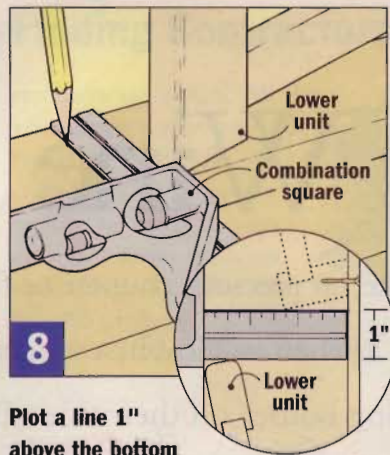
### MAGAZINE RACK ELEVATIONS



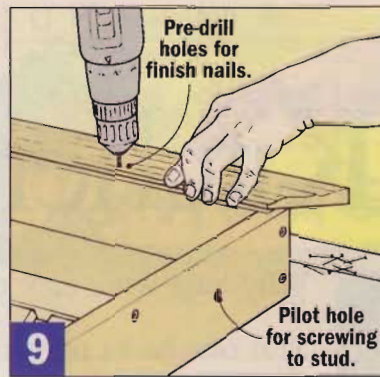




**7** Rest the lower rail assembly on two 1/4"-thick shims while driving screws.



**8** Plot a line 1" above the bottom assembly to position the top assembly.



**9** Install the casing by pre-drilling through the casing and into the carcass. Fasten with finish nails.

fied with its fit, spread glue on the rabbets and install the back. Tacking the back with brads will hold it in position while the glue dries.

### FINAL ASSEMBLY


After the glue has set in the slat and rail assemblies, install them in the carcass. Start by placing 1/4"-thick shims in the carcass to position the lower unit (FIG. 7). Be sure to drill pilot holes and drive screws through the back panel into the lower rail, and through the carcass sides into the ends of the upper rail.

With the lower unit installed, mark a line 1" above its upper rail for positioning the upper unit (FIG. 8).

The 1"-wide blade of a combination square is perfect for this. Now set the upper unit into the carcass and align its lower rail with the mark. Then drill pilot holes and drive the screws.

### PRE-INSTALLATION STEPS

For convenience, drill countersunk pilot holes for mounting the project to studs in your wall. I also added casing at this time (FIG. 9).

After the stain and finish dry you can install the rack in the wall (see *Installing The Magazine Rack*). Take your time to get it plumb and level, then get your magazines and newspapers organized. I bet it'll be nice to see your table top again. 



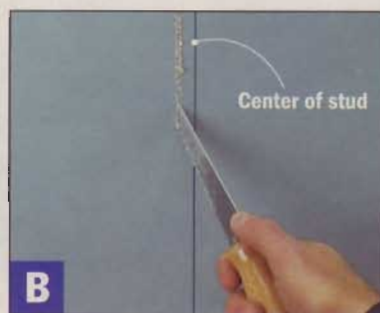
**SKILL-BUILDER**

**Cut small pieces safely**

When crosscutting multiple pieces the same length, clamp a stop block to your miter gauge fence to set the length of the cut. For small pieces, use a pencil to hold down the wood — it prevents kickback and keeps your hand out of harm's way.

## INSTALLING THE MAGAZINE RACK

Install the rack in a space that's free of any utilities or obstacles. A stud finder locates studs on either side of where you plan to mount the rack (FIG. A). Mark the center of each stud, then measure over 3/4" to indicate the stud faces and cut the opening (FIG. B). Check the studs with a level (FIG. C) and, if they're out-of-plumb, compensate with shims — the rack is sized to allow for shimming. You may need to slip the rack in and out of the opening several times before the shimming is completed. When all is set, fasten the rack to the studs with wood screws (FIG. D).





# Kitchen Wine Rack

Why let a wine rack take up precious counter or floor space in your kitchen?

This one tucks under a kitchen wall cabinet — generally an underutilized space — properly storing bottles on their sides. By leveraging their weight against “gummy” plastic tubing the bottles stay anchored until they’re

deliberately removed. You can build the wine rack in an afternoon, and it only requires a table saw, jig saw, drill, router, and a few clamps.

## UNCORK THE SHOP

Any wood will do for this project. I chose oak because it matches the trim in my house and contrasts nicely with the white kitchen cabinets.

Begin by ripping and crosscutting  $\frac{3}{4}$ "-thick stock for the fronts, sides, top, and bottom (WINE RACK

CONSTRUCTION VIEW). Once you have these pieces cut to size, set aside the fronts and focus on cutting the tongue-and-dado joints in the sides, top, and bottom.

Tongue-and-dado joints are easy to machine and plenty strong for this application. You can form both parts of the joint with a table saw and a  $\frac{1}{4}$ "-wide dado blade. If you don't have a dado blade, making multiple passes with a regular saw blade will do. Use the miter gauge for support

when dadoing the top and bottom panels (DADO DETAIL). And be sure to clamp a protective wood face to the table saw fence before you rabbet the sides to form the tongues (TONGUE DETAIL). Cut a test piece first to check its fit in a dado.

Before you glue up the assembly, drill two  $\frac{5}{16}$ "-dia. holes in the top panel for T-nuts (WINE RACK ELEVATION). Locate the holes  $\frac{1}{2}$ " from the front edge, and  $2\frac{1}{4}$ " from each end of the stock.





Position the T-nuts in the holes, then slip a washer on each 1/4"-dia. hex-head bolt and thread them into the T-nuts. Tightening the bolts with a socket wrench forces the prongs into the wood.

Glue and clamp the top, bottom, and sides together, making sure the assembly is square.

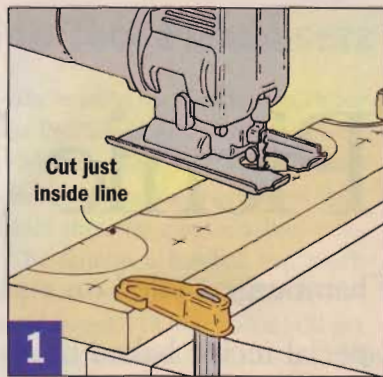
### MAKE THE FRONT PANELS

Now lay out five 3 1/4"-dia. half circles on each front panel (FRONT PANEL ELEVATION). To cut the half circles, I used a jig saw (FIG. 1), then removed the saw marks with a drum sander chucked in a drill. Once the edges are smooth, rout them (front and back surfaces) with a 1/4"-radius round-over bit. Follow up with 120-grit sandpaper, then glue the front panels to the assembly.

### STOPS AND BUMPER

The stops serve a simple purpose — they're for the plywood back to rest against (WINE RACK ELEVATION). Rip and crosscut two stops and glue them into the assembly.

For the bumper strip, I recommend you select a 2" or wider piece of 3/4"-thick stock, then cut a



**Use a jig saw to cut the half circles in the fronts. A coping saw will also work, though it'll require more elbow grease.**

7/16"-wide x 1/4"-deep groove centered in one edge for the plastic tubing. After completing the groove, rip the bumper strip to width. Machining in this fashion is safer than grooving the bumper strip after it's cut to size.

Clear plastic tubing is easy to find at most hardware stores, and you can cut it to length with a scissors. Once you've cut the tubing, press it into the groove in the bumper strip and drive six small nails to fasten it. Take care to avoid locating nails where the wine bottles will contact the tubing, and drive the nails only

## MATERIALS LIST

### LUMBER

- A (2) Fronts 3 1/4" x 3" x 21 1/4"
- B (2) Top/Bottom 3 1/4" x 3" x 21 1/4"
- C (2) Sides 3 1/4" x 3" x 5 1/8"
- D (2) Stops 3 1/4" x 1 1/2" x 19 3/4"
- E (1) Bumper strip 3/4" x 1" x 19 3/4"
- F (1) Back 1/4" x 4 5/8" x 19 3/4"

### HARDWARE

- (1) 1/2"-dia. plastic tubing, 19 3/4"-long
- (2) 1/4" T-nuts
- (2) 1/4" x " hex-head bolts
- (2) 1/4" I.D. washers
- (6) 1"-long (2d) nails

until the heads contact the tubing.

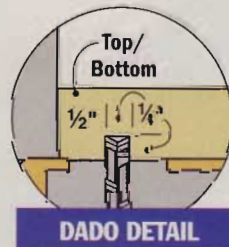
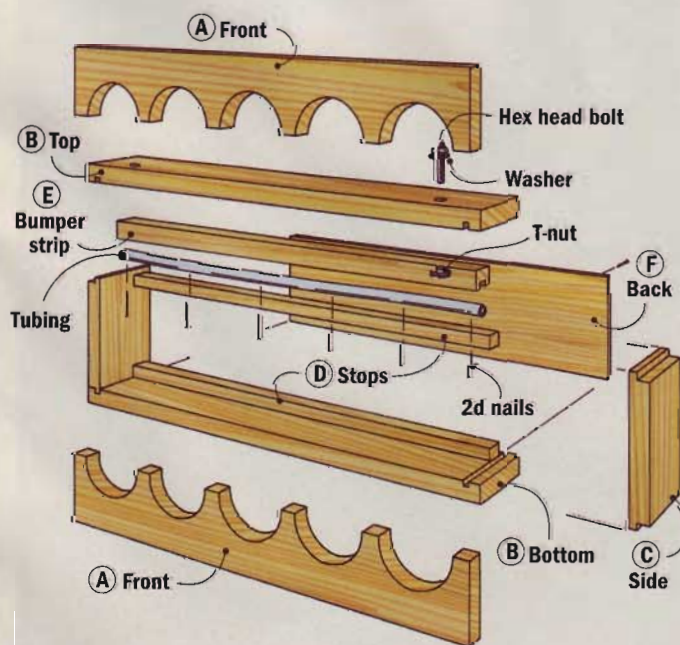
After gluing the bumper strip into the wine rack assembly, cut a piece of 1/4"-thick plywood to size for the back. Nail it to the assembly after the finishing is completed.

To mount the wine rack, hold it under the cabinet and poke an awl or nail through the T-nuts to mark the drilling locations. Drill 1/4"-dia. pilot holes, then install the project with the hex-head bolts.

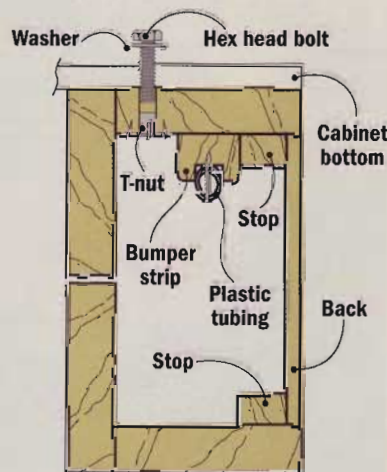
Not that you need it, but you now have the perfect excuse to buy five bottles of wine. Cheers!

## WINE RACK CONSTRUCTION VIEW

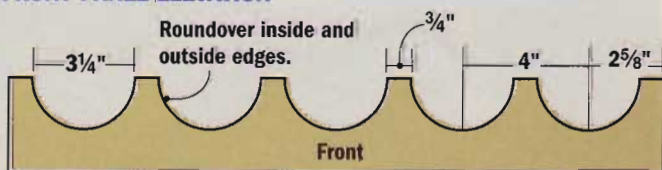
OVERALL SIZE: 6 1/8"H x 3 3/4"D x 21 1/4"L



### WINE RACK ELEVATION (END VIEW)



### FRONT PANEL ELEVATION





# Trestle Picnic Table

Picture this. Mounds of hamburgers piled on a platter, a canning kettle filled with corn-on-the-cob, special recipe baked beans spilling over the brim of a dutch oven, and two-gallon tubs of potato salad. What am I talking about?

A family reunion picnic, of course. And what holds it all up? Stoutly built park tables that take two strong men and a couple of boys to move.

These heavy-duty tables were built to withstand the rigors of public use, and they're great for big

events, but most of us don't need (or want) such a behemoth sitting on our own deck or patio. Even scaled back to a modest length, the attached benches make them bulky, awkward, and not much to look at.

My backyard patio demanded a

table that's trimmed down to a more streamlined, classic appearance. With seating for six, the sturdy table you see below handles any home-grown gatherings in style. And freestanding benches mean you can use the table and seating independently of each





other, plus they're each a lot easier to move as separate pieces. Your back will be grateful.

Trestle styling gives the table and benches great stability, and the table's lower stretchers are positioned to provide plenty of legroom. Placing the legs near the ends of the benches helps prevent tipping and positions their feet to nest outside of the widest feet of the table.

Best of all, building this project falls at the lighter end of the tool spectrum. You'll need a circular saw, jig saw, router, and drill. I built mine out of weather-resistant Western red cedar, though redwood or pressure-treated pine will work too.

### GLUE AND SCREW ASSEMBLY

There's no complicated joinery in this project, just butt joints held together with construction adhesive and exterior screws (TABLE CONSTRUCTION VIEW). This strong combination will stand up to years of outdoor exposure.

The instep on each foot of both the table and benches creates small contact points with the ground for easier balancing and firm footings. And raising the legs above the ground prevents moisture from wicking into the vulnerable endgrain.

Also, to reduce the chance of splinters, I chamfered the edges of all the pieces before I assembled them.

## TABLE MATERIALS LIST

### LUMBER

- A (4) Foot 1 1/2" x 3 1/2" x 32"
- B (4) Top rail 1 1/2" x 3 1/2" x 32"
- C (2) Center rail 1 1/2" x 3 1/2" x 17"
- D (4) Leg 1 1/2" x 3 1/2" x 28 1/4"
- E (4) Leg cleat 1 1/2" x 1 1/2" x 5 1/2"
- F (2) Upper stretcher 1 1/2" x 3 1/2" x 43"
- G (2) Lower stretcher 1 1/2" x 3 1/2" x 43"
- H (4) Top: wide pcs. 1 1/2" x 5 1/2" x 72"
- I (3) Top: narrow pcs. 1 1/2" x 3 1/2" x 72"
- J (3) Table top cleat 3/4" x 3 1/2" x 32"

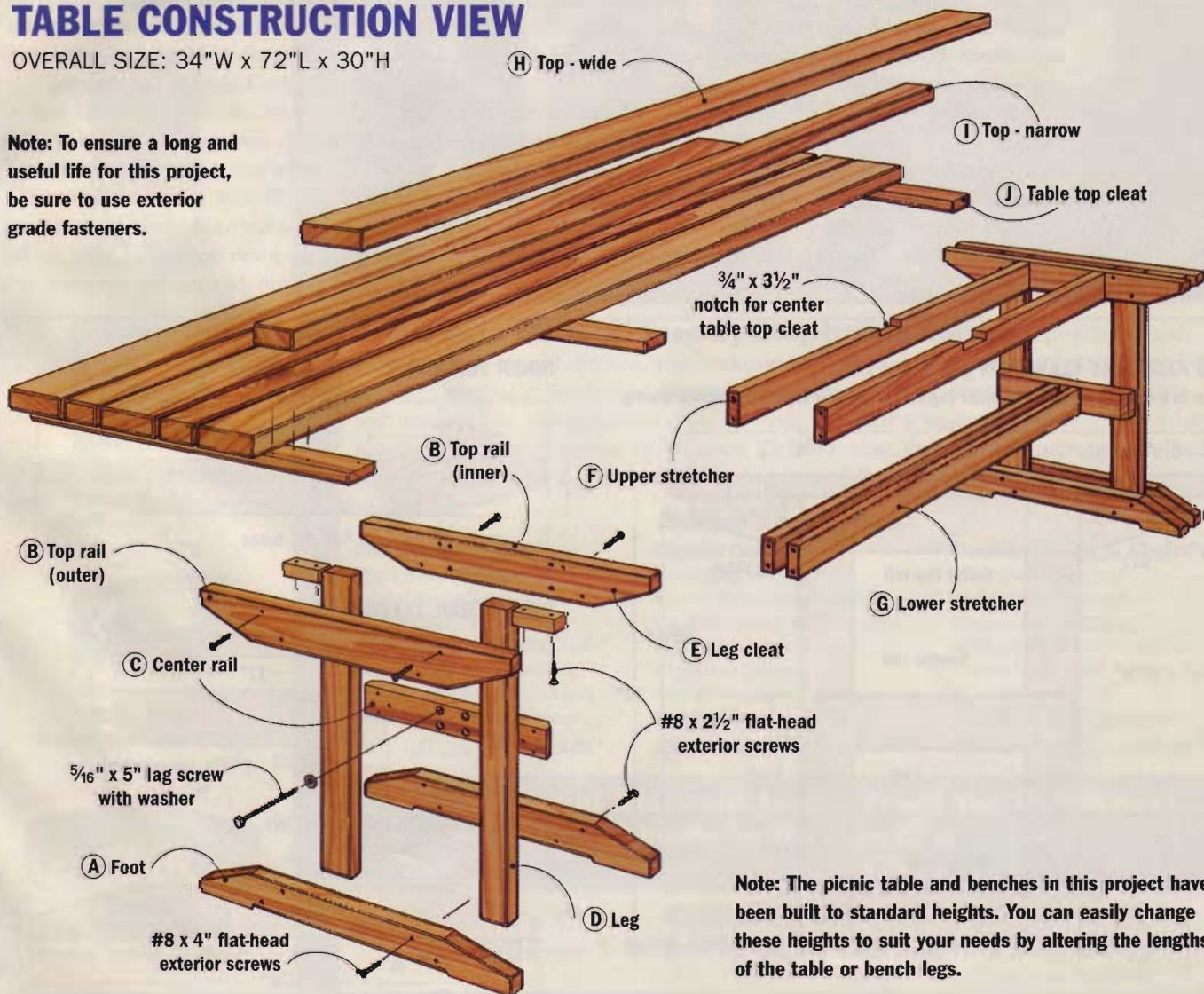
### HARDWARE

- (42) #8 x 2" Flat-head exterior screws
- (44) #8 x 2 1/2" Flat-head exterior screws
- (18) #8 x 4" Flat-head exterior screws
- (16) 5/16" x 5" Lag screws (plus washers)

## TABLE CONSTRUCTION VIEW

OVERALL SIZE: 34"W x 72"L x 30"H

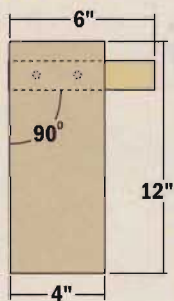
**Note:** To ensure a long and useful life for this project, be sure to use exterior grade fasteners.



**Note:** The picnic table and benches in this project have been built to standard heights. You can easily change these heights to suit your needs by altering the lengths of the table or bench legs.



## JIG ELEVATION



**1** Create a cut-off jig by screwing a 2x2 cleat to one end of a piece of  $\frac{3}{4}$ "-thick plywood. Use a square to align the pieces before driving the screws.



**2** Clamp a pair of foot pieces with their bottom edges together. Drill a  $\frac{1}{2}$ "-dia. hole, centered on the seam between the pieces, at each end of the instep.



**3** Complete the instep by using a jigsaw to remove the waste between the holes. Cut to the waste side of lines, separate the pieces, and file and sand to the line.

## START WITH THE FEET

The centerpiece of this project is the table, and that's where I started. You'll build it and the benches using the same simple joinery and techniques. The assembly sequence for each piece, however, is important and unique, as you'll see later on.

Although the joinery is simple, the pieces need to be cut squarely to create tight-fitting butt joints. I built a simple T-shaped jig out of two pieces of scrap to guide my circular saw squarely through the cuts (FIG. 1 and JIG ELEVATION).

After cutting the foot pieces to length, clamp one pair of feet together (edge to edge) and shape the instep (FOOT ELEVATION). First, drill a  $\frac{1}{2}$ "-dia. hole at each end of the cutout (FIG. 2), then used a jig saw to remove the waste between the holes (FIG. 3). Repeat the process for the second set of feet.

Because the ends of the feet and the top rails have the same tapered shape, I cut the four top rails to length, laid out the tapers on all eight pieces and made the cuts with my jig saw (FIG. 4).

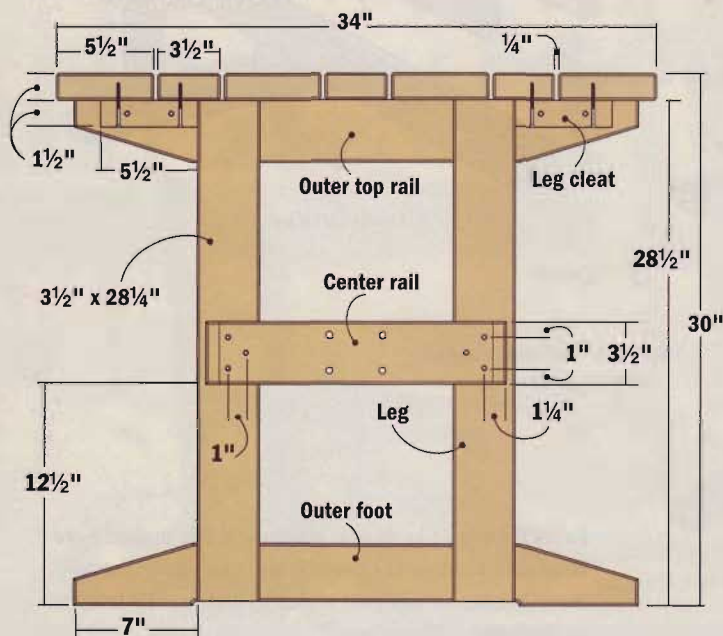
Lag screws will hold the two inner top rails to the upper stretchers, and they require predrilled mounting holes to prevent splitting the stock. Lay out the mounting hole pattern on the inner top rails (INNER TOP RAIL ELEVATION), then drill  $\frac{3}{8}$ "-dia. holes on your marks.

Next, cut the two center rails to length, then use the cut-off jig and circular saw to bevel the ends (FIG. 5 and CENTER RAIL ELEVATIONS).

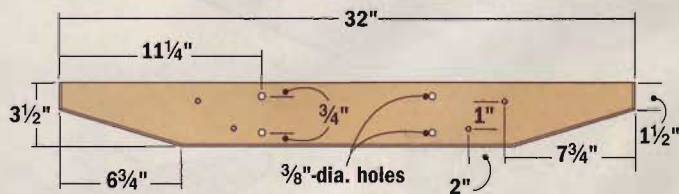
Lag screws also hold the center rail to the lower stretchers. Unlike the lag screws in the inner top rails, these will

## LEG ASSEMBLY ELEVATION (SIDE VIEW)

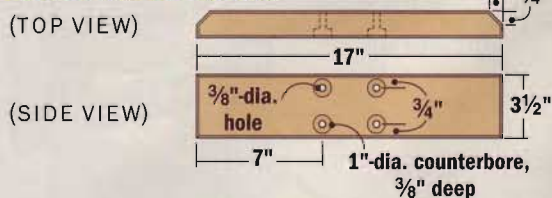
View is from the inside with inner top rail and inner foot removed for clarity.



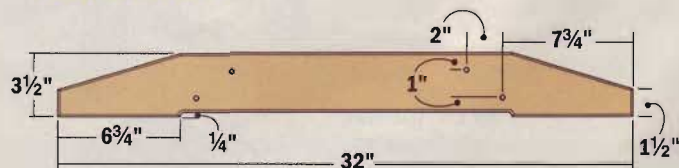
## INNER TOP RAIL ELEVATION (SIDE VIEW)



## CENTER RAIL ELEVATIONS



## FOOT ELEVATION (SIDE VIEW)







**4** Layout the tapers on the top rails and feet, then make the cuts with a jig saw. Cut to the waste side of the line, then sand the pieces flush to your line.



**5** Clamp your cut-off guide to the center rail, tilt your circular saw to 45° and bevel one end. Reposition the guide and bevel the other end.



**6** For some insurance against splinters, rout a 1/8"-deep chamfer on all edges and ends of the pieces, except the upper edges of the top rails.

be exposed, and the screw heads need to be recessed to prevent potential snags. I marked the four mounting hole locations, then drilled countersunk mounting holes in two steps (see the SKILL-BUILDER below).

#### ADD THE LEGS

Four legs complete the parts needed for the leg assemblies. When you cut the legs to length, allowing 1 1/2" for the table top and 1/4" for the instep keeps the table 30" high — standard dining table height (LEG ASSEMBLY ELEVATION). Before proceeding, rout a chamfer on the edges and ends of all the components, except for the top edges of the top rails (FIG. 6). I left these square to provide the maximum mating surface when the table top and base come together.

To build the leg assemblies, set two legs on your workbench and position the inner top rail and one foot on them (FIG. 7). After making sure the pieces are square, drill two countersunk pilot holes through both the foot and top rail, staggering the hole positions. Then mark the locations where the legs intersect the foot and top rail.

Before screwing the pieces together, separate the foot and top rail from the legs and lay down a thin bead of construction adhesive on the mating faces of the joints (FIG. 8). The thick adhesive doesn't run like most glues, and its high bonding strength makes the joints strong and weather-resistant. The last thing you want are loose table joints that wobble and squeak.

The lines you marked earlier simplify realigning the pieces when you screw the feet and inner top rails in place. To complete the assembly, position the center rail, predrill two countersunk pilot holes at each rail-to-leg joint, then glue and screw the center rail to the legs. Repeat the entire process for the second leg assembly.

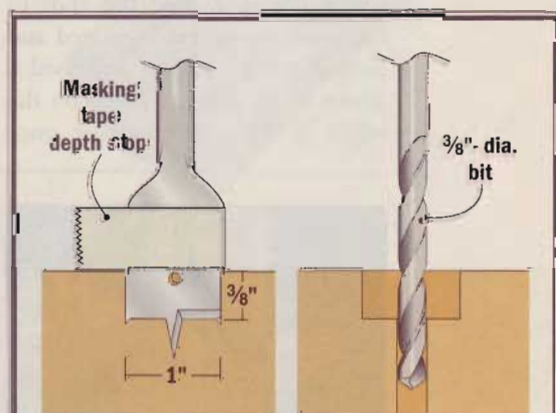
At this point, you can set the leg assemblies aside. Leave the outer top rails off to give you unhindered access to lag screw the inner top rails to the upper stretchers.



**7** Position one foot and the inner top rail on a pair of legs. Hold the assembly firm and drill 5/32"-dia. countersunk pilot holes for the mounting screws.



**8** Spread construction adhesive on the mating faces of the joints. Realign the pilot holes and attach the rail and foot to the legs with #8 x 2 1/2" screws.

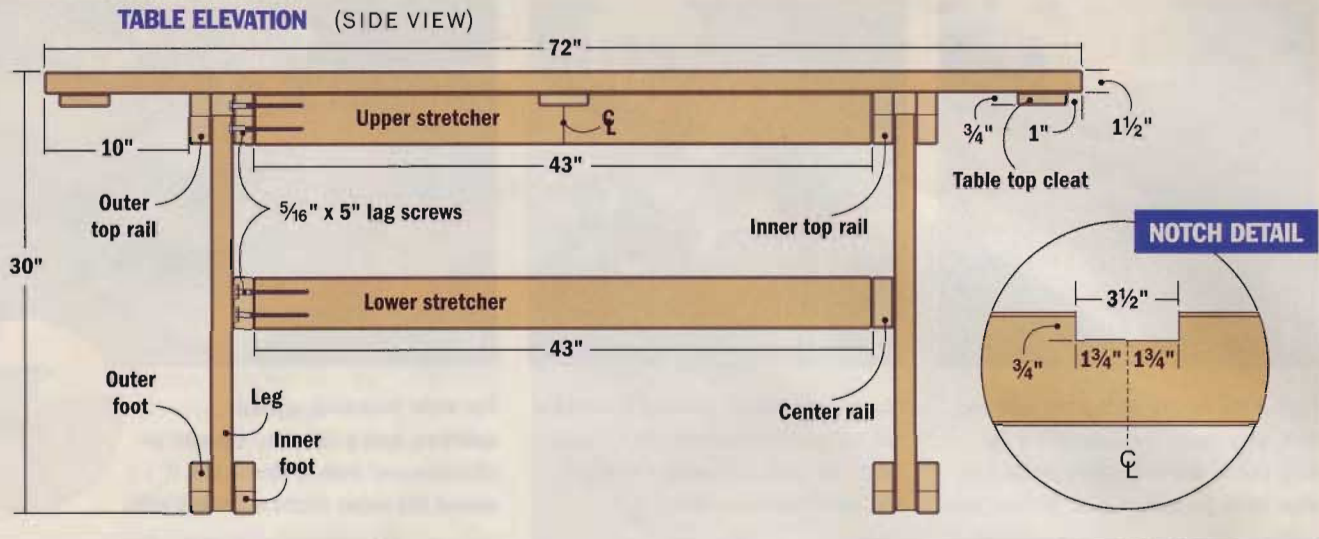


#### SKILL-BUILDER

##### Counterbore Holes in Two Steps

Begin by drilling the counterbore, using a spade bit (or a Forstner bit). Mark the depth on the bit with a felt-tip marker or a piece of tape. Switch to a twist or brad-point bit, center the point in the counterbore hole and drill the shank hole.





### PREPARE THE STRETCHERS

Part of this table's stability comes from its wide-stance feet. Adding to that strength are four stretchers that fit between the leg assemblies, creating the rigid base on which the table top rests. You cut all four stretchers the same length and rout a chamfer on all the edges. The upper stretchers, however, have to be notched to accommodate the center table top cleat (TABLE ELEVATION).

When you cut these notches, the pair of upper stretchers must be identical so the two leg assemblies will align squarely. To ensure proper positioning, I aligned the ends of the upper stretchers, measured and marked the centerline, and used a square to lay out the notch on the edges of both stretchers at once

(NOTCH DETAIL and FIG. 9). Then I transferred the layout lines to the side of each stretcher and cut the notches with a jigsaw (FIG. 10).

### ASSEMBLE THE BASE

At this stage, the table finally begins to take shape. It's also a good time to make sure you have adequate clearance to get the assembled base out of your shop — you don't want to wind up with the proverbial boat-in-the-basement mistake.

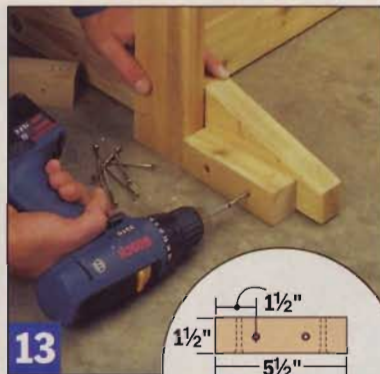
Begin by placing the upper stretchers — on edge with the notches down — on a flat surface. (I found a section of my garage floor where the stretchers could rest firmly without rocking.) Invert one leg assembly and position the inner top rail against the stretchers, cen-

tering the stretchers on the lag screw holes. Holding each stretcher tightly, drill through the pilot holes in the inner top rail and into the ends of the stretchers (FIG. 11). Then repeat the process for the other end of the base assembly.

When drilling through the top rails, my drill bit wasn't long enough to complete the pilot holes in the ends of the stretchers. To keep the base parts oriented so the holes still line up, lay the leg assemblies down flat on the floor and, without changing the stretchers' reference position, finish drilling the pilot holes. (I marked the proper depth on the bit with a piece of masking tape.) Then realign the leg assemblies with the stretchers and drive the lag screws home.



**12** Clamp a piece of 2x4 scrap to the center rail at each end. Rest the lower stretchers on these "ledges" while you drill the 1/4"-dia. pilot holes.



**13** Drill 3/16"-dia. pilot holes in the leg cleats. Glue and screw the cleats to the inner top rails.



**14** Place the tabletop boards, with the best faces down, on a clean, flat surface. A wall can help keep the ends aligned and spacers create uniform gaps.





**9** Align the ends of the upper stretchers and mark the centerline. Use a square to lay out identical notches for the tabletop center cleats.



**10** Make the two notch end cuts in the upper stretcher first. Make an angled cut from the center to one corner, then complete the bottom of the notch.



**11** Use the holes in the top rail to start the 1/4"-dia. pilot holes in the upper stretchers. Finish drilling the pilot holes to depth.

Installing the lower stretchers presented a challenge — I couldn't rest them on the floor while I drilled and bolted them in place. Clamping some scrap 2x4's to the center rails solved the problem, creating a ledge that kept the stretchers flush with the center rail while I drilled the pilot holes (FIG. 12). Again, I had to drill the pilot holes deeper in the stretcher ends before I could drive the lags.

Adding leg cleats to the inner top rails completes the base (FIG. 13). Mark and drill all the countersunk pilot holes before screwing the leg cleats to the top rails.

### CONSTRUCT THE TOP

The table top consists of alternating 2x6's and 2x4's held together with 1x4 cleats — the fasteners are hidden.

After cutting the top pieces to a uniform length and chamfering all edges and ends, place them on your shop floor with the best faces down, butting one end against a wall to keep the ends flush (FIG. 14). A series of 1/4"-thick spacers and a couple of clamps will keep the boards positioned while you mark the location of the table top cleats, put a dab of construction adhesive on each 2x top board, and screw the cleats down (FIG. 15).

### COMBINE THE BASE AND TOP

With the assembled top still upside down on the floor, set the base assembly in place. Align the notch in the upper stretchers with the center table top cleat, and center the base from side-to-side. Drill pilot holes

through the upper stretchers into the center table top cleat, then drive the screws (FIG. 16).

The other connecting points between the top and base are the leg cleats. Using the holes in each leg cleat as a guide, drill pilot holes into the tabletop and drive the screws.

Before flipping the table upright, you need to attach the two outer top rails. First, drill the pilot holes and add construction adhesive to the mating surfaces, then drive 4"-long screws through the outer rail and leg, into the inner rail (FIG. 17). Turn the table upright, and add the outer feet.

Except for finish, the table is complete. I decided, however, it made sense to apply finish to the table and benches at the same time, so I moved on to building the pair of benches.



**15** Drill two staggered pilot holes in the table cleats at each board location. Apply construction adhesive to each top board, then screw the cleats down.



**16** With the base aligned over the inverted tabletop, drill 3/16"-dia. pilot holes through the upper stretchers. Then drive #8 x 4" screws in place.



**17** Position the outer rail, clamp it to the leg, and drill pilot holes. Unclamp the outer rail, then glue and screw it in place with #8 x 4" screws.



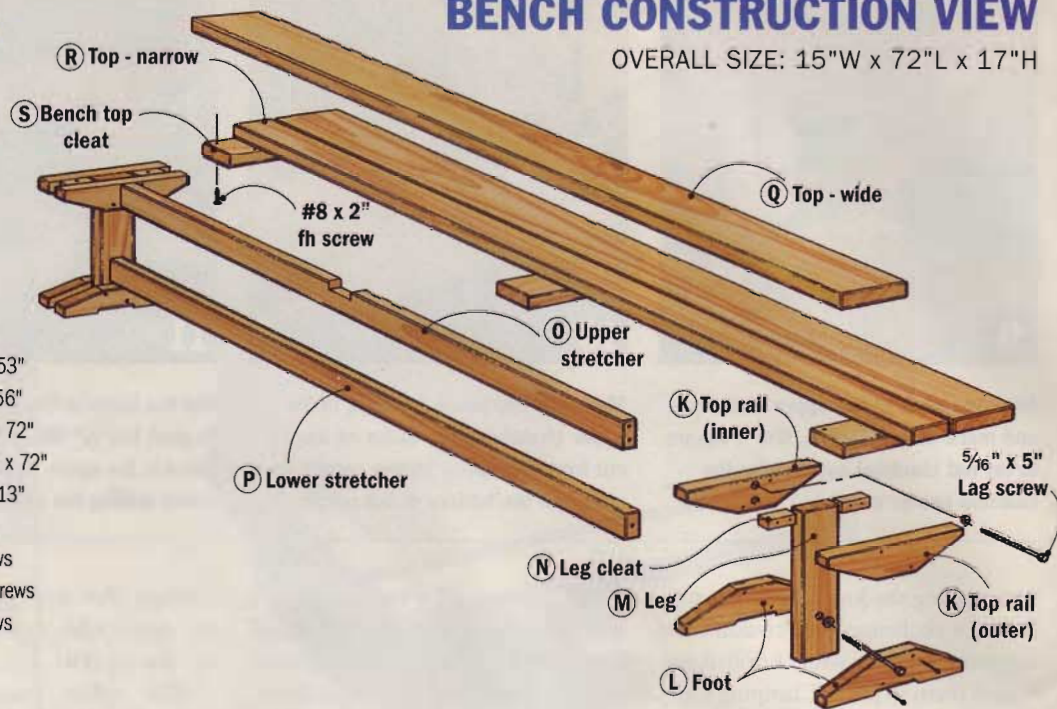
## MATERIALS LIST - TWO BENCHES

### LUMBER

- K (8) Top rail 1½" x 3½" x 13"
- L (8) Foot 1½" x 3½" x 16"
- M (4) Leg 1½" x 3½" x 16"
- N (8) Leg cleat 1½" x 1½" x 3½"
- O (2) Upper stretcher 1½" x 3½" x 53"
- P (2) Lower stretcher 1½" x 3½" x 56"
- Q (4) Top: wide pieces 1½" x 5½" x 72"
- R (2) Top: narrow pieces 1½" x 3½" x 72"
- S (6) Bench top cleats ¾" x 3½" x 13"

### HARDWARE

- (36) #8 x 2" Flat-head exterior screws
- (40) #8 x 2½" Flat-head exterior screws
- (18) #8 x 4" Flat-head exterior screws
- (12) ⅝" x 5" Lag screws
- (12) ⅝" ID washers



## BENCH CONSTRUCTION VIEW

OVERALL SIZE: 15"W x 72"L x 17"H

### BUILD THE BENCHES

Constructing the benches follows steps similar to building the table, only the scale is smaller (BENCH CONSTRUCTION VIEW). I built both benches at the same time, cutting the parts and performing each assembly step on both benches before proceeding.

Just as you did with the table, start by cutting the top rails and feet to length. And using the technique

described on page 56, create the insteps in the feet. Then cut tapers on all the pieces, and drill counterbored mounting holes in the inner top rails (TOP RAIL DETAIL).

Each bench has only one upper stretcher, which is notched to fit over the center benchtop cleat like those in the table. For consistency, I marked the stretchers for both benches at the same time, then cut the notches with my jig saw.

With the stretchers completed, cut the legs to length, then drill counterbored lag screw holes for mounting the legs to the lower stretchers (BENCH ELEVATIONS). Only one lag screw is used to hold each leg to the stretchers.

Before moving to the assembly stage, cut the remaining pieces for the bench tops — the seat planks and cleats — then chamfer the ends and edges of all the pieces.



18

Position the inverted upper stretcher against the inner top rail and drill two pilot holes. A ratchet makes quick work of driving the ⅝"-dia. lag screws.



19

Clamp the leg to the inner top rail and drill pilot holes through the rail on either side of the stretcher. Secure the leg with #8 x 2½" screws and glue.

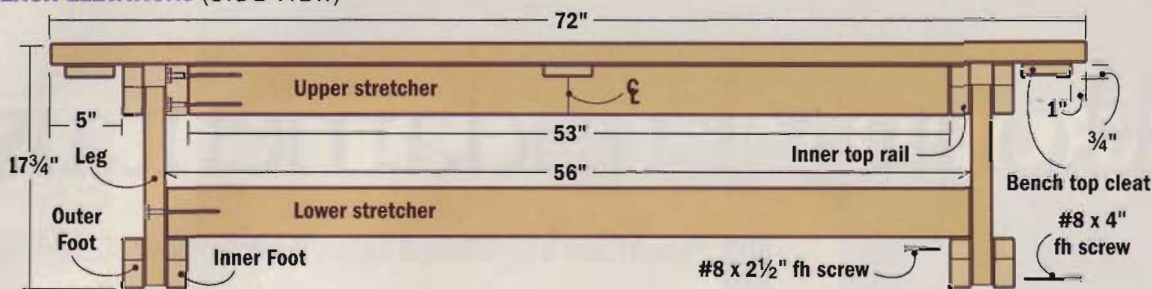


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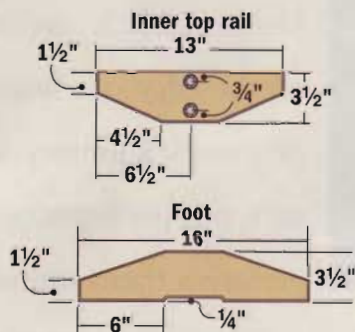
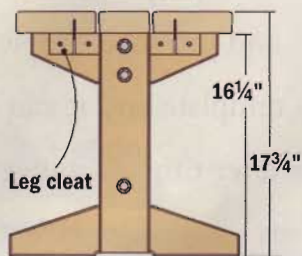
Attach the leg cleats to the top inner rails with #8 x 2½" screws and glue. Use the same size screws to fasten the leg cleats to the bench top.



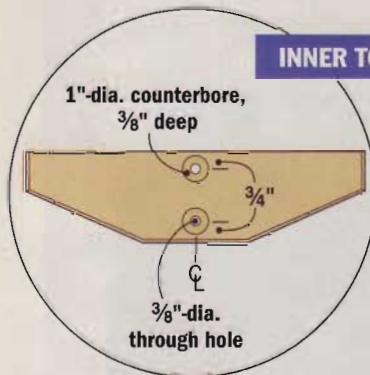
## BENCH ELEVATIONS (SIDE VIEW)



### (END VIEW)



### INNER TOP RAIL DETAIL



## SEATING ASSEMBLY

Assembly of the benches varies somewhat from the process used on the table. You begin by aligning the inner top rails with the upper stretchers. Drill all the pilot holes, then glue and lag the rails to the stretchers (FIG. 18). Next, clamp the legs to the rails and drill the mounting screw pilot holes (FIG. 19). Construction adhesive and four screws hold each leg to the rails.

Attach the inner feet to the legs by drilling pilot holes from the inside face of the inner foot, applying glue, and driving the screws. Then add the outer feet, using glue and 4"-long screws to secure them to the legs.

Stand the bench base on its feet and rest the lower stretcher atop the inner feet. Drill lag screw pilot holes into the stretcher ends, apply construction adhesive to the joint, and lag screw the stretcher to the legs.

All that remains is to build the bench tops and mount them to the bases. Again, lay out the tops against a shop wall to keep the ends flush, and use 1/4"-thick spacers between the planks. Then glue and screw the bench cleats to the planks.


Position the base on the bench top and drill a pilot hole in the upper stretcher at the notch location. Glue and screw the leg cleats to both the rails and the bench top (FIG. 20). Adding the outer top rails completes the construction.

### APPLY THE FINISH

Before I put the table and benches into service I wanted to apply a finish that would provide lasting protection against both sun and rain. Some research produced a couple of possibilities, although like any outdoor finish, both options require periodic maintenance.

I chose Penofin, a penetrating oil finish, over traditional spar varnish for a couple of reasons. My picnic table will sit in full sun and even though both finishes have ultraviolet

light protectants, Penofin goes on more easily and is easier to renew. Spar varnish creates a harder film finish, but is likely to crack and peel as it weathers, making it necessary to strip off the old finish before new varnish can be applied.

No matter how anxious you are to use your new table and benches, resist the urge until the third coat of finish has thoroughly dried. The pay off for your patience is a more durable finish that's bound to draw compliments from your picnic guests. But that doesn't mean you can't get beans going in the slow cooker and whip up a load of potato salad. The weekend is just around the corner. 





# Router Fundamentals

You'd have to look mighty hard to find a tool more versatile than a router. Given the array of bits available, it can create almost limitless profiles on the edge of a workpiece, and produce simple or complex joinery. Make a template and it can turn out perfect copies time after time. A router performs these and other feats so effortlessly, it's

easy to take this workhorse for granted. And that's a shame, because employing a little routine care and some simple techniques can dramatically improve the results this tool can give you.

## TWO TYPES OF ROUTERS

Even if you don't subscribe to the adage that you can never have too many tools, I think it at least applies to routers. A quick survey of *Workbench* staffers showed most owned at least two (a couple of fanatics had five or more). Why? Well, there are times when you need raw power — getting shaper-like performance from a table-mounted router.

Other times, such as cutting the relief for inlay in a jewelry box, plunge capability, balance, and control are the critical factors.

It's difficult to find one router that can do it all well — that's why manufacturers make so many different models. Options and horsepower aside, routers fall into two main categories — fixed-base and plunge (FIG. 1).

Generally speaking, the more traditional, fixed-base router is what I reach for when a job requires a lot of handheld routing. Because the clamping, ring-shaped base encircles the motor, these routers are solid and stay locked once the depth is set. This design also gives them a low center of gravity which, when coupled with a pair of low-slung handles, results in good balance and control.

The typical fixed-base router is a no-frills machine with a

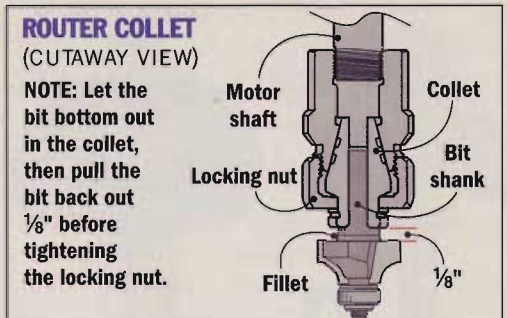






Many fixed-base routers (left) have a depth adjustment collar that when turned, moves the threaded motor housing up or down in the base. The motor

assembly on a plunge router (right) rides up and down on spring-loaded columns. Once the proper depth is reached, a locking lever holds it there.



### SKILL-BUILDER Seat Router Bits Properly

Most bits have a taper, or fillet, where the shank meets the cutter portion. If you let the bit bottom out, the collet grasps the slight larger diameter fillet rather than the bit shank. Motor vibration will loosen a bit that is bottomed out. Rings around the shank are evidence that the bit has been slipping.

single-speed, 1 1/2 horsepower motor. Most have circular baseplates that will accept guide bushings (used in template routing) and a host of other accessories and guides.

By contrast, most plunge routers pack more horsepower than the average fixed-base machine and come equipped with amenities such as multiple speeds, electronic speed control, and soft start. This combination of power, speed control, and ease of depth adjustment makes them naturals for use in router tables.

As the name implies, plunge routers give you the ability to lower the bit into your workpiece to make plunge cuts such as stopped dados, grooves, and mortises (FIG. 1).

The bases on plunge routers are typically round with one flat side. With the added bulk that comes with more horsepower and a higher center of gravity (particularly when the motor is in the up position), plunge routers lack the overall balance of their squat, fixed-base cousins.

#### COLLET KNOWLEDGE

Whether you choose a fixed-base or plunge router, pick one with a collet that accepts 1/2"-dia. shank bits. When a bit is spinning at 25,000 rpm, it's comforting to have the extra

strength the beefier bits offer over 1/4"-dia. shank bits (four times the cross-sectional area). Upgrading to a router with a larger collet doesn't make your 1/4"-dia. bits obsolete — most manufacturers offer reducer collets or sleeves. Over time, however, I've replaced most of my low-cost 1/4"-dia. shank bits with higher quality 1/2"-dia. versions.

Compression gives a collet its grip on a bit, and the more slots a collet has, the more uniform its clamping power. Any dust or pitch buildup in these slots, however, can prevent the collet from cinching

down on the bit shank when the lock nut is tightened. Removing pitch usually requires soaking the collet in solvent (FIG. 2). Periodically clean your bit shanks as well. Bit placement in the collet also affects the collet's holding power (see the SKILL-BUILDER above).

Tightening the collet lock nut can be a knuckle-bustin' experience, particularly on models without a shaft lock that require two wrenches. For the best results, position the nut and shaft wrenches so you can "squeeze" them together with one hand (FIG. 3).



Regularly remove and clean the collet with solvent and a brush, such as a shotgun bore brush.



To tighten or loosen the lock nut without pinching your fingers, position the shaft and nut wrenches so you can squeeze them together with one hand.

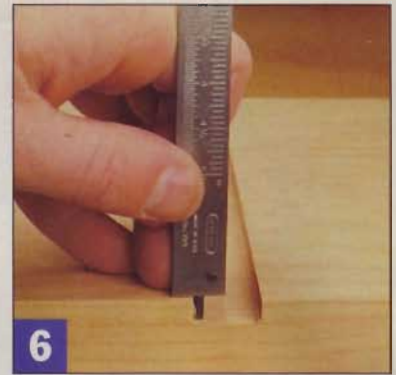




**High-speed steel bit (left) produces inferior cuts. Choose carbide-tipped bits (right) with anti-kickback bodies that limit the “bite” the bit can take.**



**Use a crystalline diamond sharpening hone to touch up the edges of a carbide bit. Be sure to hone only the flat side of the cutting edges.**



**A test cut gives you an accurate measurement of bit depth. It's also easier than trying to measure the amount of bit protruding beyond the baseplate.**

### A BIT ABOUT BITS

I've already made a pitch for using 1/2"-dia. shank bits, but there are other things to consider here. First, buy quality bits with polished carbide cutting edges and anti-kickback (or chip-limiting) bodies (FIG. 4). A Teflon or oxide coating helps reduce pitch build-up.

Replaceable ball bearing guides are a must for edge profiling bits — solid guides will leave burn marks where it contacts the workpiece's edge. (To learn more about router bits, see *Router Bit Basics* in the July/August 1998 issue.)

Even high-quality bits get dull with use. Besides cleaning the pitch from the shanks and cutting surfaces, you can use a diamond sharpening hone for minor touch-ups on

a cutting edge (FIG. 5). For serious reshaping, however, I send my bits out to have them professionally reground and polished.

### CUTTING SAVVY

A powerful router outfitted with a good, sharp bit can work wonders producing clean, crisp, cuts. But it can't compensate for poor technique — *how* you make those cuts can mean the difference between great results and merely good enough.

For starters, make a test cut in scrap to determine proper bit and fence settings (FIG. 6). And position the router so the bit's cutting edge rotates into the wood.

Deep cuts or profiles that remove a lot of material call for multiple passes (FIG. 7). Taking smaller cuts

compares to using a chisel to slice away wood rather than chopping it out in one piece. The results are better and it's easier on the tool.

Most plunge routers are equipped with a three-stop turret that lets you preset depths without readjusting between cuts (FIGS. 8 and 9).

In my shop, there's always plenty of scrap to use for fine-tuning the set-up. With the bit depth set, I'll often make a practice pass in the same wood species as my project to get a feel for the proper feed rate. You have to find that balance between where the bit produces shavings (not fine dust) along with a smooth cut. Too fast or too slow and the cut won't be clean (FIG. 10). Also, keep the bit moving steadily — pauses can leave burn marks, particularly on endgrain.



**Using the proper feed rate is almost as important to a clean cut as a sharp bit. Push things too fast and you risk chatter and/or burn.**



**The wider stance and offset handle on an auxiliary baseplate gives you more control when edge routing, and helps keep the bit perpendicular to the edge.**



**Raise the workpiece to provide clearance for the guide bearing. A board clamped flush with the workpiece edge can give added support for the bearing.**

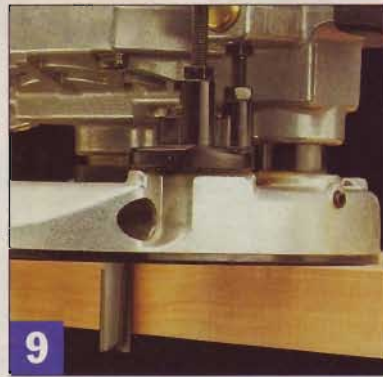




**7** Make deep cuts in several passes. Also, an upcut spiral bit helps lift chips clear of the cut.



**8** Most plunge routers have a turret with three adjustable depth stops. You can preset the turret stops to make a shallow cut first.




**9** Rotate the turret to make progressively deeper cuts. This feature allows you switch between cutting depths without having to recheck your settings.

Typically, it pays to rout endgrain first — any chips lifted near the corners will be trimmed off when you rout the edges. Clamping a backing strip to an edge, flush with the end, also solves this problem.

When you trim an edge, less than half the router's base rests on the workpiece. If the router tips outward, even slightly, it can change the edge

profile. An auxiliary baseplate — store-bought or homemade — can remedy this (FIG. 11). My table-mounted router is fastened to a phenolic insert and I've used this router handheld with the insert intact when I need an extra-wide support base.

At times, it's also necessary to support the workpiece to provide clearance for the guide bearing (FIG. 12).

Complex routing applications and specialty cutters will require you to vary these techniques and adopt new ones too, and we'd like to help. In coming issues, we'll show you different router techniques and how to apply them. We'll also offer plans for jigs and accessories you can make to get even more out of the most versatile tool in your shop. 

## 12 Common Sense Precautions for Safer Routing

Routers may not seem as dangerous as a 10" table saw, but even a small piece of a damaged bit flying at 25,000 rpm can become a deadly projectile. To prevent such a mishap, observe these precautions.

- Use clamps or a routing mat to hold workpieces firmly in place.
- Keep your work surface clear of tools or anything that might interfere with the bit's path.
- Carefully inspect bits for damage before installing them, and keep them clean and sharp.
- Make sure the switch is "off" before plugging in the machine.
- Always unplug your router before changing bits.
- Grip the router firmly with both hands before switching it on, especially if your router lacks a soft start feature.
- Bring the bit up to speed before contacting the workpiece.



- Don't force a bit through a cut — listen and feel for signs that the router is bogging down.
- When finished routing, keep the base (but not the bit) in contact with the workpiece until the bit comes to a stop.
- Hold the router so the bit's cutting edge rotates into the wood.
- Don't operate bits over 1½"-dia. at high speed or in a hand-held router (use a router table).
- Always wear adequate hearing and eye protection.



# Tools & Shop Gear

## Australian Hand Planes Follow Far-East Tradition

Traveling in Malaysia, Australian woodworker Terry Gordon became impressed with traditional Chinese hand planes. Unlike Western planes, the Chinese planes have dowel-like handles installed perpendicular to the plane body. By grasping the handles in the crook of your thumb and resting your fingers on the plane body, you can shift the plane's balance from nose to tail, increasing control. Chinese-style planes have the iron seated at 60°, with a 30° bevel. This helps them resist tearout on hard and highly-figured woods. Reversing the iron allows using the plane as a scraper.

Now Gordon makes his own versions of three Chinese-style planes, which are just becoming



available in the United States through The Japan Woodworker. All three planes have bodies sculpted to shape from super-dense hardwood. Brass throat plates are dovetailed into the sole.

At the small end of the line is an ebony-bodied palm plane for \$110. It's 4<sup>3</sup>/<sub>4</sub>" long, with a 1<sup>1</sup>/<sub>2</sub>"-wide

blade. Next is the smoothing plane made from Australian red ebony. It's 8<sup>1</sup>/<sub>4</sub>" long, with a 2"-wide blade, and sells for \$135. The trying plane, at \$165, is 18"-long. It's also made of red ebony, and has a 2"-wide iron.

For info, call The Japan Woodworker at (800)537-7820 or go to [www.japanwoodworker.com](http://www.japanwoodworker.com).

## Quick-Grip Redesign Makes Clamps Useful as Spreaders

American Tool Company has expanded its line of Quick-Grip bar clamps with the addition of new Quick Change models that feature removable, reversible heads. The head is held on with a clip that slips over a stud in the clamp's bar. Pull the clip and you can reposition the head on the bar, or remove it and turn it around. With the clamp pads facing away from

each other, the clamp can be used as a spreader or a cabinet leveler.

Quick Change clamps are available with capacities from 6" to 50".

Prices start around \$25. For more information call

American Tool Co. at (800)866-5740, or check the web at [www.americantool.com](http://www.americantool.com) for more information.







## Compass Heads Scribe Arcs on the Mark

Veritas Beam Compass Heads attach to any wood stock from  $\frac{5}{8}$ "- to  $\frac{3}{4}$ "-thick. Since this stock can be any length, you're able to mark arcs of any radius. Knobs clamp the heads to the stock and press small pins into the wood to

keep the heads from slipping. The offset tip on one of the steel points allows you to fine tune the radius. The heads will also accept a pencil. A pair of heads sells for \$19.95 from Lee Valley/ Veritas at (800) 871-8158.

## The Glass Gator is a Substantial Scraper

The Glass Gator from Hyde Tools has a large, well-shaped handle you can grip in different positions. It accepts utility knife blades rather than the razor blades used in most scrapers. Retail price for the Glass Gator is around \$4 from Hyde Tools at (800) 872-4933.



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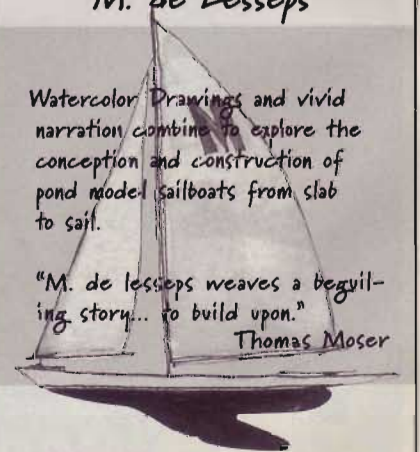
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## Pond Models: Some Simple Thoughts on the subject of Building and Sailing Them by M. de Lesseps

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## Bosch Cordless Drills for Work in Close Quarters

Bosch has added two new drills to their cordless lineup, both aimed at woodworkers and cabinetmakers. These drills are more compact and lighter than other Bosch models of similar voltage. This makes the drills easier to fit inside cabinets or other tight areas for drilling holes and driving screws.

The 9.6-volt 3105K and the 12-volt 3305K share features such as dual-range variable speed, reversible motors, and a multi-position chuck clutch. Both also come with two batteries and a one-hour

charger, all in a plastic case. The 3105K weighs 3.1-lbs, and sells for around \$110. The 3305K weighs 3.4-lbs, and carries a \$130 price. You can

contact Bosch at (800) 301-8255, or on the web at [www.boschtools.com](http://www.boschtools.com).



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## New Milwaukee Circular Saw Features Adjustable Handle

The new model 6390 7 $\frac{1}{4}$ " circular saw from Milwaukee Electric Tool features an adjustable handle that tilts to eight different positions.



Whether you have the saw set for a full-depth cut or tilted up for shallow or scoring cuts, with this capability you can position the handle so it's comfortable and offers a good grip. And unless the handle is locked in one of its stops, the trigger will not operate. This prevents any use of the saw without a secure handle.

Other ergonomic improvements on the 6390 include soft grip surfaces on the main and front handles, and a clearer view of the blade and cut line. The bevel scale has been relocated from the front

of the saw to the back, so you don't have to spin the saw around or crane your neck to see adjustments being made.

Even with the tilting handle, Milwaukee kept the saw light weight — just under 10 $\frac{1}{2}$ -lbs. — by building much of it from magnesium.

The 6390 has a 15-amp motor, and comes with a carbide-tipped blade. Retail price is around \$140. You can contact Milwaukee for more information by calling (800) 414-6527, or on the web at [www.mil-electric-tool.com](http://www.mil-electric-tool.com).

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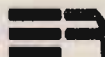
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Product Information Number 186



## Battery Holder Extends Cordless Tool Run Time

The Nomad Energy System from Fiskars Energy Systems offers a way to get increased power and run time from your cordless tools.

At the heart of the system is a

"power conversion unit" (PCU) that you attach to your cordless tool (using an adapter) in place of the battery. From the PCU, a coiled

cord runs to a small bag that holds

two or three of your existing batteries that are linked in series. Adapters are available now for DeWalt tools, and models for other brands will follow. The bag attaches to your belt, or can be worn like a backpack.

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By running the batteries in series, power is increased and less power is drawn from each battery. The PCU regulates the voltage delivered to a tool to avoid exceeding the tool's load capacity.

According to Fiskars, the Nomad delivers up to 30% more power than standard batteries used separately. Manufacturer's tests showed a drill hooked up to a Nomad system containing three batteries could drive 950 more 1 1/4"-long screws than if using the same three batteries individually — 2,000 screws versus 350 per battery.

Price is \$200, plus \$25 for each adapter (for 12-v and 14.4-v DeWalt tools). Contact Fiskars at (800) 422-9744 or [www.nomad.fiskars.com](http://www.nomad.fiskars.com).



# Home & Yard Products

## Maytag Gemini Fits Double Ovens in Single Oven Space

Maytag Appliances has a new option for anyone who wishes for a double oven, but lacks the kitchen

space for stacked in-wall units. The company's new Gemini range combines two ovens and a cooktop in

an automatic temperature setting of 170° for keeping foods warm.

one unit the same size as a conventional freestanding range. What Maytag did is replace the broiler or storage drawer found on a conventional unit with a smaller, full-function oven that sits above the standard full-size oven.

The upper oven bakes and broils, and is useful for cooking small-size dishes. It preheats twice as fast as the full-size unit, and has

The Gemini cooktop is a smooth glass ceramic surface with four induction heat coils. One coil has a system that lets you select a large- or small-diameter heating element, depending on pan size.

Color choices for the range include white, black, and brushed chrome. Prices run from around \$1,400 to \$1,500. For more information, or to locate a dealer in your area call Maytag at (888) 462-9824. Or you can check out the Gemini on-line at [www.gemini.maytag.com](http://www.gemini.maytag.com).



## Kohler's Trilogy Puts New Twist on Triple-Basin Sink

New this year from Kohler Co. is the Trilogy triple basin kitchen sink. This cast iron sink measures a whopping 43"-wide × 24"-deep, and has large main basins. There's also a built-in backsplash designed to ease cleaning behind the faucet.

What really makes this sink unique, though, is the third basin designed specifically for the garbage disposal. It's located out of the way at the left rear of the sink, and has a shallow, oval shape that keeps waste and water moving toward the drain.



The shallow basin also positions the disposal higher than a standard sink does, so it intrudes less on under-counter cabinet space.

The Trilogy is available in a variety of colors, starting around \$675. Call (800) 456-4537 or check the Kohler web site: [www.kohler.com](http://www.kohler.com).



## A Quick Patch

The WallSpan Drywall Patch from CCX Fiberglass Products is a perforated aluminum sheet covered with self-adhesive fiberglass tape. Press the patch over the hole, and cover with joint compound. The patches (4", 6", or 8" square) cost \$3 to \$5 each. Call CCX at (800)828-5329.



## Spray Texture for Walls

Even the best drywall patch can be obvious if the texture doesn't match the surrounding area. To get the right look, you might want to try Easy Touch Spray Texture from Homax Products. This water-base aerosol spray lets you recreate orange-peel and splatter textures, and other patterns using any of three included applicator straws.

The product is available in a 10-oz. can that covers up to 35 sq. ft., or a 20-oz. size that covers twice that area. Prices are around \$9 and \$13 respectively. Call Homax at (800)729-9029.



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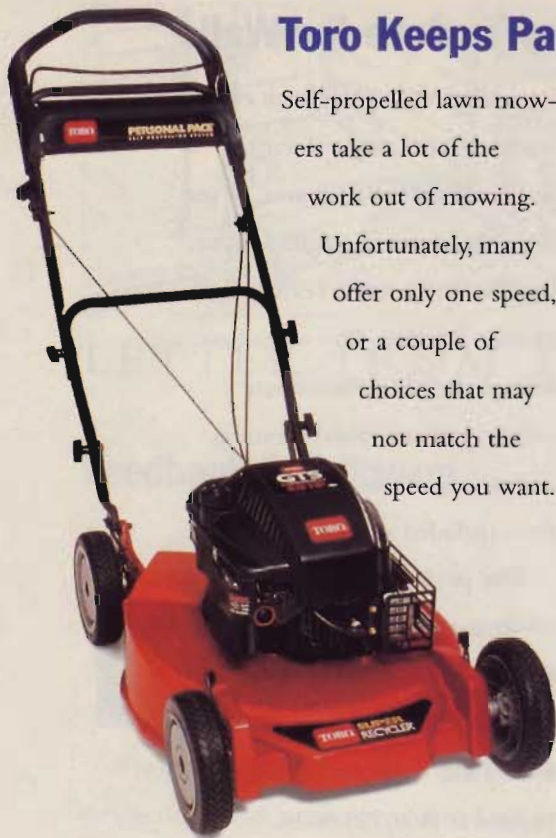
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## Toro Keeps Pace with Mowing Chores

Self-propelled lawn mowers take a lot of the work out of mowing. Unfortunately, many offer only one speed, or a couple of choices that may not match the speed you want.

Toro's answer to this problem is the new Personal Pace system, which allows you to vary speed infinitely between zero and 4-mph. You control the mower's speed by pushing on the telescoping, spring-loaded handle. The handle slides easily, so as you push with more pressure, the mower moves faster. Release pressure on the handle, and the mower's drive mechanism goes immediately into neutral, making the mower easier to back up. On many other self-propelled machines, you have to push the mower forward several inches after

disengaging the drive before the mower kicks into neutral.

Toro offers the Personal Pace system on its Recycler (steel deck) and Super Recycler (cast aluminum deck) mulching mowers. High-end models come with a rear bag, and rear bag kits are available for other mowers in the line. Depending on the model, the mowers carry two- or five-year warranties. All are guaranteed to start in one or two pulls for the first five years. Prices start around \$420. Go to [www.toro.com](http://www.toro.com), or call Toro at (800) 348-2424.

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Product Information Number 200

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Product Information Number 188



## Garage Doors Mimic the Carriage House Look

Modern overhead garage doors function far better than old fashioned swinging doors, but even the best looking modern doors often lack the personality found on the doors that graced carriage houses and early garages. Luckily, there are manufacturers who've noticed that some of us want modern function and classic style.

One such manufacturer is Clopay, which recently acquired Holmes-Hally Industries, a manufacturer of custom garage doors. Clopay's Carriage House line includes eight styles that faithfully

replicate traditional doors. Custom styles are also available. From a distance, it's tough to tell these are sectional overhead doors. Even up close, the look is very convincing. All the doors are made to measure from kiln-dried cedar, fir, mahogany, and hemlock, and ride on commercial grade hardware. A single width door sells for around \$2,500 on average, and requires about six weeks lead time to build. You can call Clopay at (888) 760-5058.



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## Electric Chainsaw Has an Odd Name, but Big Saw Features

Almost every homeowner has to cut up tree limbs or logs on occasion, but many don't face these chores often enough to justify buying and maintaining a gas-powered chainsaw.



If that description fits you, an electric chainsaw may be a better option than old-fashioned arm power. If you haven't looked at electric chainsaws recently, you'll be surprised by how much better today's models are than their predecessors.

New among these electric chainsaws is the Log Hog from Black & Decker, which has features often found only on higher-end gas models. First, there's a 16"-long bar which can span large limbs. With a 12.5-amp motor driving the chain, the saw has reasonable power for large cuts. The Log Hog

also has a tool-free tensioner. Just turn a knob on the side of the saw body to keep the chain in check. A 6-oz. oil reservoir automatically lubricates the chain during use.

For safety, the saw has a blade brake system that activates in two ways if the saw kicks back. Either the inertia of the kickback or your wrist contacting the guard above the handle will trip the brake, stopping the blade in a half-second or less. The Log Hog weighs 8-lbs. and sells for around \$100. Call Black & Decker at (800) 544-6986, or check [www.blackanddecker.com](http://www.blackanddecker.com).

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# The Cupples House

Railroads, shipping, lumber. These industries built the fortunes of many of early America's wealthiest businessmen, but Samuel Cupples took a simpler path to riches — woodenware. At the tender age of 15, the Pennsylvania-born

Cupples left home to "go west." He sold utensils, bowls, tool handles, and other woodenware for an Ohio company until he saw the opportunity to set up his own shop in St. Louis, the gateway to the frontier. The decision paid off, apparently.

In 1888, Cupples used his wealth to commission a new home, a 42-room mansion built of granite and carved sandstone. The home, later purchased and restored by St. Louis University, boasts 22 fireplaces, leaded glass windows by *Louis Comfort Tiffany*, and an astonishing array of woodwork in English oak, mahogany, and walnut. Elaborate carving was done on both the exterior stone and the interior woodwork, most of it by craftsmen brought in from England. Total cost? About \$500,000 (\$15 million in today's dollars.)

For more information, call (314)977-3575.

