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# WORKBENCH<sup>®</sup>

THE ORIGINAL HOME WOODWORKING AND IMPROVEMENT MAGAZINE

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## Built-in Dresser

- Top **25** Tips for Building a Stud Wall
- Insulation Innovations

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www.workbenchmag.com

Nº 255

September/October 1999



Wall Framing Know-How – 32

HOMEWRIGHT

**32**

## Wall Framing Know-How

*In an existing home, building plumb, level, and flat wall frames can be a challenge. We've detailed over 25 tips and tricks-of-the-trade that will give you the carpentry know-how to turn out accurate stick frames for any remodeling project.*

WOODWORKING

**46**

## Space-Saving Dresser

*Starved for space in a bedroom? The answer could be a built-in dresser, especially if you have a 1½-story or Bungalow-style home. They're easy to build and add architectural richness to any decor.*



Space-Saving Dresser – 46



Knife and Spice Racks – 63

WEEKEND

**63**

## Knife and Spice Racks

*Here's a pair of great ideas for a user-friendly kitchen. Designed to fit in a wall cabinet and built around pairs of clever shop-built slides, these storage racks keep your knives and spices organized and within easy reach.*

WORKSHOP

**66**

## Shop Utility Station

*Whether it's a grinder, a phone, sharpening stones, or some other items you need to keep at the ready, this stand provides an uncomplicated, practical place for them. The stand is made with scrap bin leftovers, and you can build it in an afternoon.*



Shop Utility Station – 66

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Nº 255

September/October 1999



*Insulation That Works - 40*

FEEDBACK &  
FOLLOW-UP  
**8**

QUESTIONS &  
ANSWERS  
**10**

TIPS &  
TECHNIQUES  
**16**

NEWS & EVENTS  
**24**

MATERIALS  
**40**

**Insulation That Works**



*Shop-Built Slides - 60*

IN-DEPTH REVIEW  
**52**

**Air Nailer Smorgasbord**

TECHNIQUES  
**60**

**Shop-Built Slides**

TOOLS & SHOP  
GEAR  
**68**

HOME & YARD  
PRODUCTS  
**78**

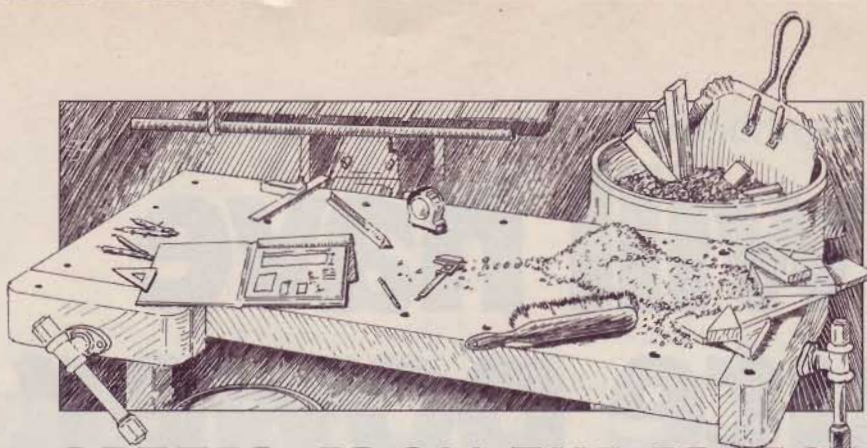
CRAFTSMANSHIP  
**88**



*Craftsmanship - 88*



*Air Nailer Smorgasbord - 52*



## LETTER FROM THE EDITOR

### WHAT A FINE MESS

**M**y shop is clean and tidy today, and I hardly recognize it. The sawdust has been swept up, tools are neatly back in their places, cutoffs fill the “burn” barrel. There’s no smell of cut wood anymore, not a trace. Even the spiders have skittered for cover since their cobwebs were removed, at least temporarily.

You should have seen my shop before I cleaned it. It was great. I had a half-completed bathroom vanity sitting in the center being used for a miter saw stand. Around it were drywall scraps of all sizes — the kind you never need until the day after the garbage crew hauls them away. Right next to the drywall was a pile of salvaged studs, ragged and scarred from all the nails that were pulled. And best of all there was sawdust, visible proof that good work had been happening here. Though the shop may have appeared to be a mess to many, it was the hub of creativity for me.

Oh, alright. I’ll admit I was having trouble walking through the shop, and finding tools was getting a little difficult. But I remember reading somewhere that to succeed, people should play to their strengths. Who am I to argue? I’ve always been better at making messes than cleaning them up. Ask anyone.

So I’ve decided that cleaning the shop is a chore of last resort, avoidable until there’s a crisis (like when you can’t find the table saw anymore). But if end-of-summer cleaning has swept through your shop, don’t worry. It’s only a minor setback. With cooler weather coming, you know there are projects about to get underway, and that means this spick-and-span stuff will never last. I give it a week, two at the most, before my shop feels right again.

Chris Inman, Editor

# WORKBENCH

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# Feedback & Follow-Up


## Readers Share Opinions About Air Nailers



A few months back, while getting organized for the air nailer story in this issue (see page 52), I had an idea. I thought, "what better way to help readers learn about a tool than to hear from those who already own and use them." So I put a few questions on our internet site asking people to share their firsthand experiences with air nailers.

Well, I got a lot of responses, and I'd like to share them with you.

Far and away, nail gun users most often commented on the increased speed and accuracy air nailers offer compared to swinging a hammer, especially if a nail set is required.



One fellow wrote that air nailing "beats a hammer in half the time," and another said "they're fast, neat, safe, and eliminate the need for three or four hands."

This ability to free up one hand


for positioning a workpiece was the second most frequently mentioned benefit. Others pointed out that air nailing doesn't mar the wood like a misplaced hammer blow can. "I installed 5"-wide cedar all over my home," one response read. "Without that finish nailer . . . the place would be wall to wall hammer blossoms."

Others claimed they get fewer splits and find it easier to toenail, after some practice, with air nailers.

As for features, most folks had a preference for tool-free access to clear jams. "The most important thing . . . is quickly clearing jammed nails," however, several people added that jams occur only rarely. Others wanted you to know that it's important to have depth of set control.

One reader had such an interesting insight, it's worth repeating here in full. He wrote, "My air nailers were purchased to relieve arthritic elbows from hammering so much. I had viewed finish nailers in a home shop as a luxury. Now there's no going back to manual methods!" A professional builder summed up the same sentiment this way: "they're just easi-

er on my body."



Respondents also offered up a couple of cautionary observations. "Framing nailers do take awhile to get used to," one reader wrote. Until then, just be prepared for the fact that "air driven nails are difficult to pull out if you have to."

And finally, there was this important safety note: "Make sure you're not holding the wood near the nailer or you may nail your hand to the work. This could be very embarrassing!" And painful.

You might like to know that more than half of the folks who answered the survey questions either own or want to own a brad nailer, followed closely by finish nailers and staplers.

Thank you to everyone who offered comments. Keep 'em coming. If you have anything to add, go online at [www.workbenchmag.com](http://www.workbenchmag.com) or write me at Feedback and Followup, *Workbench*, 2200 Grand Ave., Des Moines, IA, 50312.

## Porter-Cable Throws its Hat in the Cordless 'Circ' Saw Ring

Our July/August issue featured a review of cordless circular saws. About the time that issue hit your doorstep, a new cordless saw hit ours.

The Porter-Cable model 9845, a cordless version of its popular 6"-dia. Saw Boss, has a left-hand blade, a feature favored by our testers. Like its corded counterpart, the 9845 cuts through 2x stock at 45°. The blade guard is durable cast magnesium and has an integral dust port. We liked the long lip on the lower guard that moves the guard easily out of the way as you begin a cut.

High marks go to the adjustable

90° and 45° stops. Other adjustments are lever actuated. A nice touch, but molded levers would feel better than the stamped metal units.

Power comes from a 19.2-volt battery which should, in theory, be more powerful than an 18-volt model. In our sled test, the 9845 handled 17½-lbs before stalling—equal to the Makita 18-volt. The Saw Boss cut well in normal use, and should be a worthy contender.

The saw's projected price is \$300, a bit higher than the other saws we test-

ed. You can call Porter-Cable at (800)487-8665.



# Questions & Answers

## Felt, Flashing, and Caulk Keys to Deck Ledger Installation

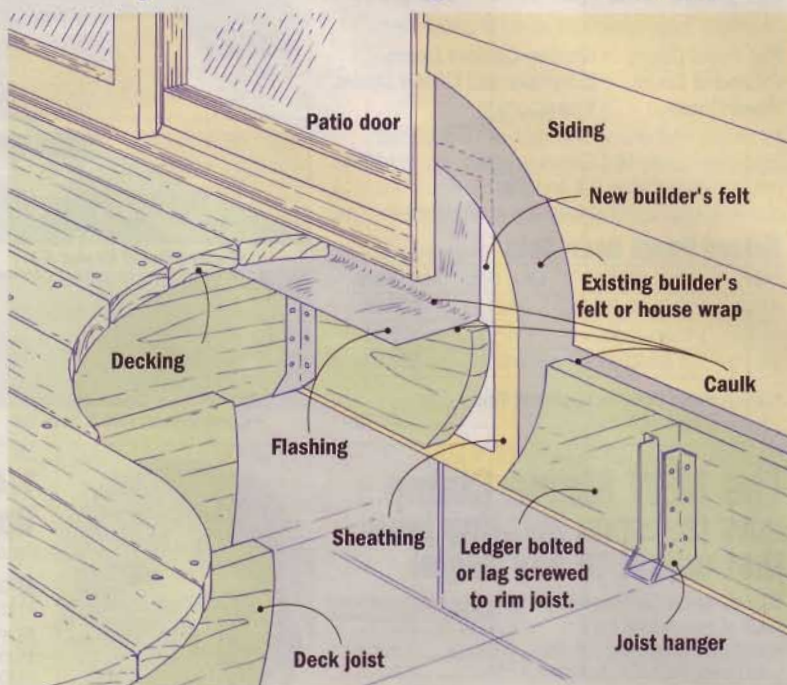
**Q** I recently discovered water damage to the siding, sheathing, and rim joist where the deck attaches to my house. The ledger was fastened over the siding and the flashing seems to direct water to the siding instead of away from it. How should I install the flashing to prevent this water damage from recurring?

Derrick Bell  
Garner, NC

**A** It's not uncommon to install the ledger on top of the siding, but since you'll have to replace the damaged siding and sheathing, I'd use another method.

Once you have the sheathing replaced, cover the area with new 30-lb. builder's felt. Make sure the new felt overlays the existing felt or housewrap membrane below and to either side of the repair, and slip it under the felt/membrane above to shed water properly.

If you can access the rim joist from the inside, drill holes through the ledger and rim joist and bolt the ledger in place. (Otherwise, drive lag screws through the ledger and into the ends of the floor joists, if possible, or into the rim joist.)



With the ledger attached, spread a bead of silicone caulk along the top and ends of the ledger where it meets the builder's felt. Now nail flashing to the wall sheathing above the ledger. The flashing should overhang the top of the ledger so that water striking the flashing is diverted down over the ledger and away from the siding.

Apply a bead of silicone caulk along the top edge of the flashing underneath the sliding door sill and along the joint where the siding overlays the flashing. Then reinstall the decking.

Be sure to keep leaves and debris cleaned out from between decking and flashing — this stuff can prevent water from draining away.

## 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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## Air Drying Lumber Requires Stickered Stacking and Patience

**Q** I live near a small mill that sells air-dried hardwood lumber. Is air-dried lumber okay for cabinet use or should I buy kiln-dried stock? Also, how long does it take to air dry lumber?

Andrew Stoner  
Rushsylvania, OH

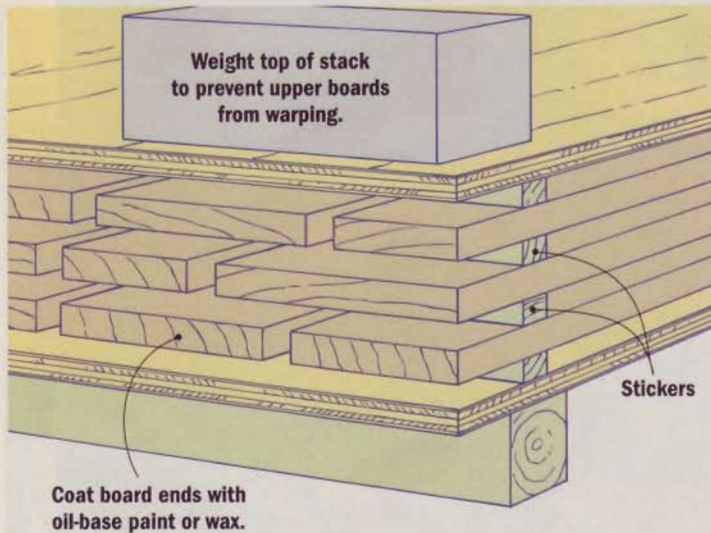
**A** Kiln drying is much faster, but many woodworkers prefer to use air dried lumber because the finished product has fewer checks and cracks. How long it takes to dry depends on the type of wood being dried, the thickness of the lumber, the climate, and the wood's exposure to the elements. It generally takes one year of drying time for each inch of thickness.

The key to air drying lumber is the way you stack it. Choose a spot that's sheltered from rain and snow, as well as direct sunlight. To keep your lumber straight, stack the rough-sawn planks on a level surface, leaving space between them for air to circulate. Create air space

between each layer with stickers, typically 1x2 strips, placed perpendicular to the planks roughly every 18". You'll need to weight down the boards on the top of the stack with concrete blocks to keep them from warping.

Finally, you need to paint the ends of the boards with wax or oil-base paint. As a number of readers pointed out (in response to *Paint Stops Checks* in the March/April issue), latex paint won't adequately prevent moisture loss through the endgrain. Unless the ends are sealed, the boards will dry out too quickly and check.

Lumber will air dry down to a moisture content of 15% to 20% when stored outside. You'll need to move it indoors to a heated location to reduce the moisture to between 6% and 8% before using it for projects. A handheld moisture meter can tell you when the wood's ready to use.



## Align Table Saw Blade and Fence to Reduce Burn Marks

**Q** How do I eliminate burn marks when I cut raised panels on my table saw?

Bob Weick  
St. Charles, IL

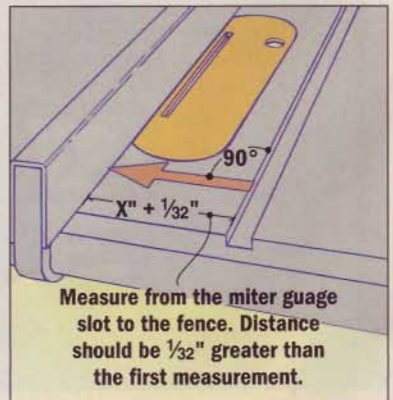
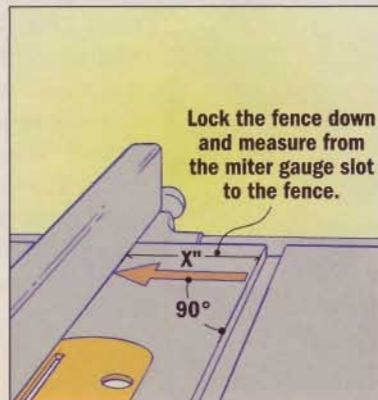
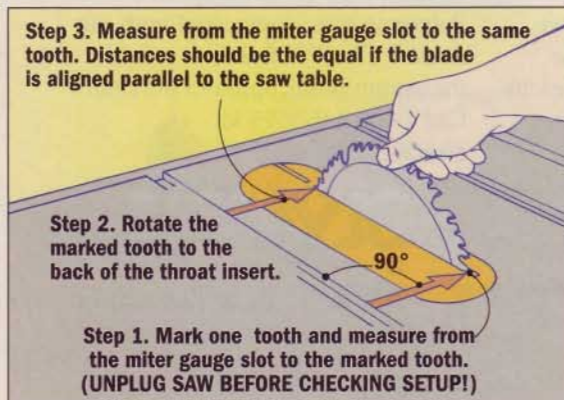
**A** For starters, I'd check your table saw setup. If the fence and blade aren't parallel, the workpiece will bind against the blade, leaving burn marks.

Unplug the saw, raise the blade to the maximum height, and mark one tooth with a felt tip marker. Use this tooth as the reference point to check the distance from the miter gauge slot. (Check your owner's manual if you need to adjust this setting.)

With the blade set parallel to the table, slide your rip fence next to the miter gauge slot and lock it

down. Measure the distance between the slot and the fence at the front and back of the table. Adjust the fence so the outfeed end is slightly canted ( $1/32$ ") away from the slot. This will still give you straight cuts while reducing the chance the wood will bind.

Always use a clean, sharp blade, and install a tall auxiliary face on your fence to support the panels.



## Panel Stamps Offer Information on Plywood, OSB Usage

**Q** What do all the numbers and letters mean that are stamped on plywood and OSB?

Jonathan Uecker  
Slinger, WI

**A** The stamp you're referring to probably has the letters APA featured predominantly, meaning the sheet complies with the Engineered Wood Association's quality auditing program. The numbers and letters are used to

indicate various specifications as shown below.

The backstamp appears only on rough surfaced (unsanded or touchsanded) panels or panels with A or B faces on one side only. Plywood panels that have B-grade or higher faces on both sides aren't backstamped, but carry the same information on an edgestamp applied to the end of the panel.

### PANEL EDGESTAMP

#### FACE GRADES:

First letter is face, second letter is back.

**N** - Intended for natural finish, free of open defects.

**A** - Smooth and paintable, neat repairs permissible.

**B** - Solid surface veneer, repair plugs, and tight knots permissible.

**C** - Sanding defects permitted, some knot holes to 1½" dia. permitted.

**D** - Used only in interior type panels for inner plies and backs.

A-B • G-1 • EXPOSURE 1 • 000 • PS1-95

**PRODUCT STANDARD:**  
See description below

**SPECIES CLASSIFICATION:**  
One of five groupings for type of wood used in panel

**GLUE:**  
See description below

**MILL NUMBER:**  
See description below

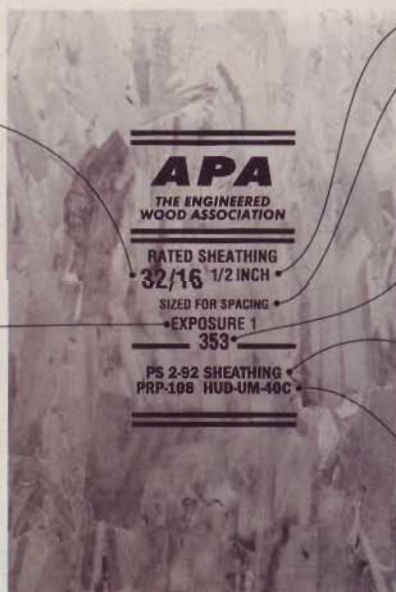
### PANEL BACKSTAMP

#### SPAN RATING:

Left number (32) is maximum recommended center-to-center spacing (in inches) of supports when the panel is used for roof sheathing. Right number (16) is maximum recommended center-to-center spacing (in inches) of supports when the panel is used for subflooring. In both cases, the panel is used with the long dimension across the support.

#### GLUE:

Exterior - Waterproof bond designed for permanent exposure to weather/moisture.  
Exposure 1 - Waterproof but designed for limited exposure to weather/moisture.  
Exposure 2 - Intermediate glue with only short term exposure to moisture.  
Interior - Intended for interior applications only.



#### NOMINAL THICKNESS

**SIZED FOR SPACING:**  
Indicates panel is trimmed during manufacture (typically 1/8" in both width and length) to encourage proper panel spacing and prevent buckling.

**MILL NUMBER:**  
Designates mill where panel was made.

**PRODUCT STANDARD:**  
Industry manufacturing specifications to which the panel was produced.

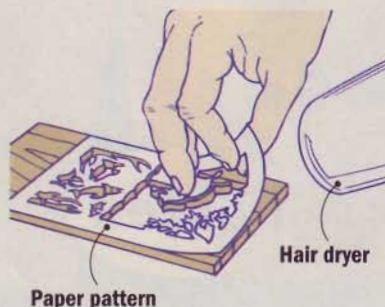
**PERFORMANCE RATED PANEL (PRP):**  
Performance ratings based on criteria for specific end-use applications.

## Heat and Peel Stuck-On Patterns

**Q** I've made a number of scroll sawn items using spray adhesive to attach the patterns to the wood. What's the best way to remove the paper and adhesive?

Pat Kent  
Westerville, OH

**A** Use a hair drier or a heat gun, set on low, to heat the pattern and adhesive. Once it's heated up, the pattern should



peel off, usually in one piece. Mineral spirits will remove any remaining adhesive residue, giving you a clean surface that's ready for final sanding and finishing.

## Bond Wood to Glass With Cyanoacrylate

**Q** What kind of glue should I use to bond wood to glass?

Fernando Rashe da Motta  
Sent via email

**A** Cyanoacrylate adhesives, such as SuperGlue or Hot Stuff, will bond wood to glass, as will polyurethane glue and epoxy. The cyanoacrylate adhesives are better because they set up instantly so your work won't shift.



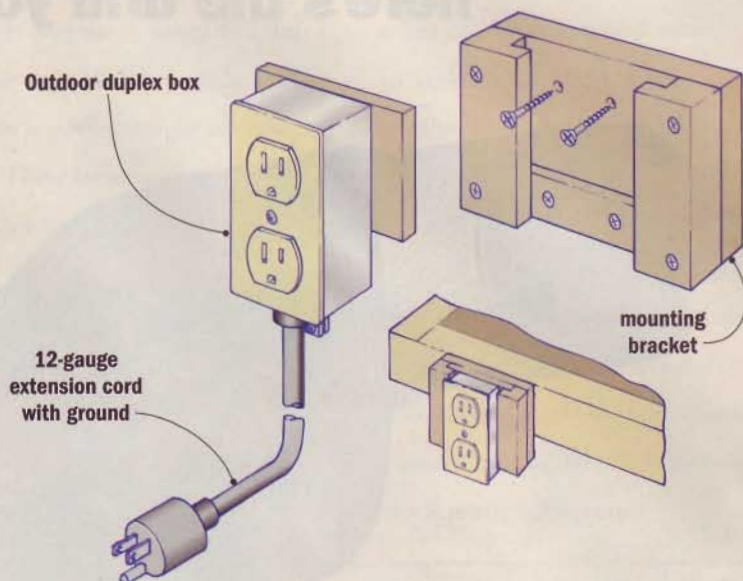
# Tips & Techniques

## Brackets Give You Power Outlets Where You Want Them

Most extension cords have only one outlet and require two hands to use. So when the outlet plug on one of my cords (12 gauge, three-wire) went bad, I installed a surface mount duplex box so I could have a regular two-outlet power source. And while it was easier to plug tools into it, I sometimes still found myself capturing the box between my feet to hold it as I plugged the cords in.

I solved the problem by building some simple brackets that mount to my workbench, sawhorses, or walls where I don't have close access to a regular outlet. A piece of plywood mounted to the back of the duplex box drops into the bracket and holds the box steady.

*Tony LoRusso  
Wolcott, CT*

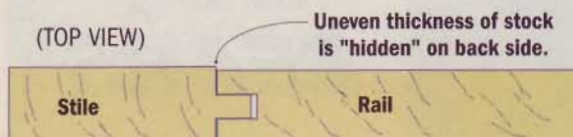


## Frame-and-Panel Doors Without a Planer

When I read the bathroom vanity article in Jan/Feb 1999 issue, you suggest cutting grooves for the

frame-and-panel doors with the front facing away from the fence. That's okay if you've planed the stock to a uniform thickness. If you don't have a planer, cut the grooves with the front face toward the fence. That way the front faces will be flush even if the stock thickness varies slightly.

*Doug Young  
Clearville, PA*



Keep front faces of rails and stiles toward table saw rip fence.

## Golf Grip Tape Holds Tired Tires

I recently refurbished an old Atlas 10" band saw that had "tired" tires. The original glue had failed, but the tires themselves were still okay (which was good because I haven't been able to locate replacements).

After cleaning the tires and wheels, I wrapped a layer of dou-

ble-face golf grip tape around the wheels. I wet the surface of the tape with mineral spirits and slipped the tires on. The spirits quickly evaporated, leaving the super sticky tape holding the tires.

*Dale Stansbery  
Upper Sandusky, 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:

*Workbench Tips & Techniques*  
2200 Grand Ave.

Des Moines, IA 50312.

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

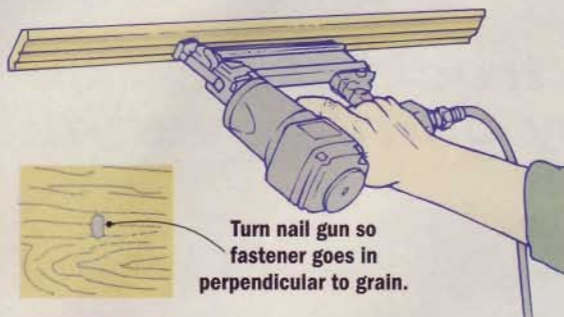
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In addition, The Stanley Works is sponsoring Tips & Techniques, and will send an award for the tip in each issue that best describes the creative use, care or application of tools.

**STANLEY**

MAKE SOMETHING GREAT™

## Turning Finish Nailer Sideways Prevents “Shiners”



I work with a custom interior trim crew and use pneumatic nailers for installing trim. One of the problems we run into, especially when working with hardwoods, occurs when the nail hits a curly grain pattern or denser portion of the wood. The nail wants to follow the path of least resistance and curves

which allows the nail to cut through the wood. But if the flat part of the tip is parallel with the grain of the wood, the tip guides the nail wherever the grain of the wood leads it.

We started turning our finish nailers parallel to the trim so the chisel point on the nails goes in

out the side of a piece of casing. We call these blowouts shiners.

If you look closely at the tip of the finish nails for your nail gun, you'll notice they have a chisel point

perpendicular to the wood grain. That way, the chisel point cuts straighter through the wood and shiners are much less likely to occur (now usually just the result of poor aim).

David J. Barbaree  
Longmont, CO

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

The Stanley Works  
New Britain, CT  
[www.stanleyworks.com](http://www.stanleyworks.com)



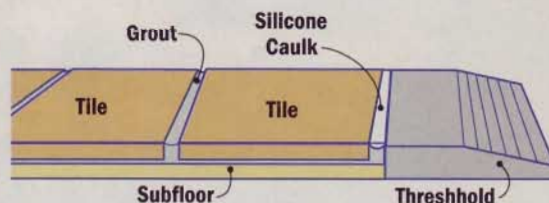
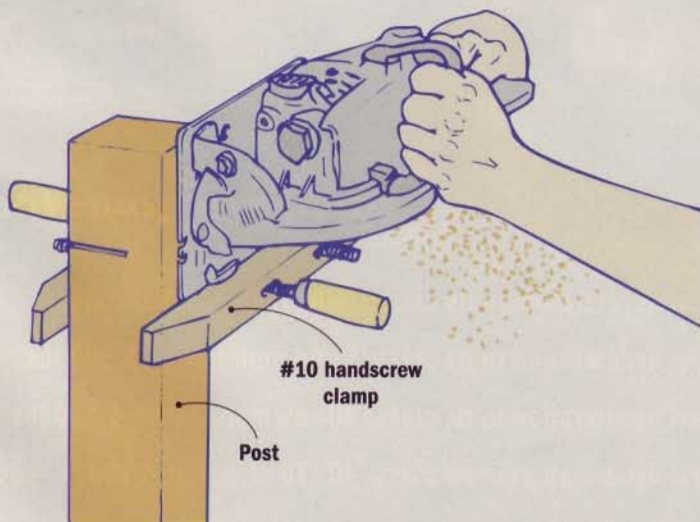
## Handscrew Clamp Substitutes for Jig

In the March/April issue, the article on circular saw techniques showed a U-shaped plywood jig for cutting posts off squarely. You position the jig, clamp it in place, then make a cut on two opposing sides.

Well, I simply use a large wooden handscrew clamp (#10) and

clamp it on the post. The jaws line up parallel on either side of the post and it beats messing with building a jig. It also gives you longer support for starting and ending the cut.

Bill Wright  
Greenwood, SC



## Silicone Caulk Saves Grout

The tile in our entryway was installed flush with the metal threshold. The gap between the threshold and the first row of tile was grouted, but the grout didn't adhere to the threshold and eventually cracked and fell out.

My remedy was to remove the remaining old grout and regrout the joint. Once the grout dried, I applied a bead of silicone caulk over the grout joint. A year later, the grout is still in place and I haven't noticed any cracks.

Brian Bollhoefer  
Palm Bay, FL

## Rescued Swing-Arm Lamps Shine as Workbench Lighting

There was never enough light in my shop where I needed it, so on a recent trip to a local thrift store, I bought a couple of those swing-arm desk lamps. The only trouble was that they were missing the base that clamps onto the desk — hence their \$3 price. When I got home, I drilled some holes in my work-

bench to match the diameter of the shaft on the lamp.

As long as the cord will reach, I can move the lamp around to just where I need it. I even drilled a hole in my router table for one of the lamps.

Bob Kuehn  
Clinton, WA



## Quick Fix for Hollow-Core Doors

A friend recently asked me if I could repair a hollow-core luan door that had several deep dings in one side. They were too deep to fill — the patch would have been very visible.

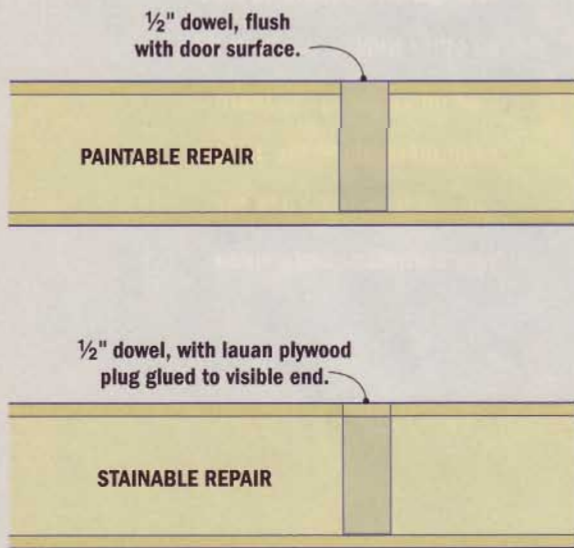
Using a 1/2"-dia. Forstner bit, I

carefully drilled a hole at the location of each ding. Next, I used a 1/2"-dia. plug cutter to cut a patch from a piece of luan plywood and glued the patch to the end of a length of 1/2"-dia. dowel.

A pencil inserted into the hole let me measure the depth to the inner face of the opposite side. After cutting the dowel to the proper length, I put glue on the end and around the edge of the hole and glued the dowel in place, aligning the grain of the patch with the grain in the door. With a little sanding and new finish, the patch is all but invisible.

If the door will be painted, forget about the luan patch and simply cut and sand the dowel flush with the surface of the door. A little sawdust mixed in with the glue helps fill in any gaps around the edge of the hole and give you a sandable surface.

Craig Rethwilm  
Kennesaw, GA



## Cooking Oil Cleans Up Oil-Base Paint

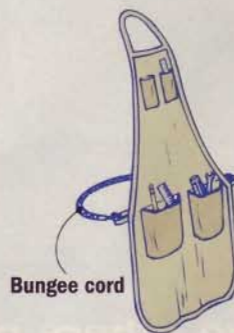


To clean oil-base paint from paint brushes, I wipe off as much excess paint as possible, then work cooking oil into the brush. I wipe the brushes until they're clean, then wash them with dish detergent to remove the cooking oil residue.

Phyllis Waytekumas  
Baltimore, MD

## Bungee Relaxes Apron Pockets

Most shop aprons I've owned had pockets on the front that lay flat when you've got the apron tied around your waist. This keeps excess fabric out of the way so it won't catch on machinery, but it makes it hard for me to get my hands into the pockets to retrieve fasteners or a pencil.



By tying each strap in a loop, I can still fasten the apron with a short bungee cord. The elastic cord lets me pull the apron away from my body and relaxes the pockets for easy access.

Bill Glisson  
Syracuse, NY

## Add Landscape Fabric for Maintenance-Free Fence



Your cedar fence (May/June 1999 issue) is beautiful, and there are many good tips in the article. You failed, however, to perform one step that will save hours of work in the future. To avoid having to trim grass growing under the fence, where it's impossible for a lawn mower to reach, I recommend laying down landscape fabric. I cut the fabric into 12"-wide strips and lay them on the grass, centered under the fence. Then I cover them with mulch.

Ken Erickson  
Kennewick, WA

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## Clean Putty Knife Reduces Sanding

While patching some minor damage to the drywall in my condominium, I was having problems getting the spackling compound smoothed out. The patched areas had ridges that I had to sand off once the spackling dried. I realized that thin layers of spackling compound were drying on my putty knife, eventually building up to create ridges and grooves in the spackling on the wall.

Eliminating the problem was simply a matter of wiping the putty knife off with a damp rag periodically. The clean knife left the patched area smooth so I didn't have to sand it.

Susan Jessen  
Workbench Staff



# News & Events

## Winners Announced in National Furniture Refinishing Contest

"Turn nothing into something" was the challenge issued to woodworkers across the country by the Dremel Furniture Refinishing Contest. Refinishers from around the country responded with gusto.



Turning a box full of pieces into a Hunsinger hall tree brought Tom Kelly top honors in the Dremel Furniture refinishing contest.

Grand Prize winner Tom Kelley of Fort Collins, CO, claimed the \$3000 first prize with his restoration of a Hunsinger hall tree. The hall tree came to Tom as a box full of parts and pieces, purchased by a



Edward Monnie was first runner-up with his restoration of a Hoosier cabinet. The piece had spent 35 years in storage.

friend at an antiques auction. When the friend enlisted Tom's help to restore his "good deal," Tom said he just hoped all the parts were there.

It took 85 hours of hard work and attention to detail to restore the hall tree to its original grandeur. Besides refinishing most of the old parts, Tom also had to manufacture several new ones to replace those that were rotted or damaged beyond repair.

Edward Monnie of Butler, PA, claimed first runner-up honors and a \$500 prize by returning a long-neglected Hoosier cabinet to its earlier beauty. The family heirloom had been stored in a barn for some 35 years before Ed's wife rummaged it out and brought it home to be refurbished.

Today, the newly-renovated treasure and the broken down cabinet are barely recognizable as the same piece.

## Tips for Surviving a Remodeling Project

Your house needs some attention. Not just a little work, but big-time remodeling. Some of it you'll do on your own, but you're going to need a pro for the rest. Hiring the right contractor is just the first challenge of many you'll face.

The National Association of the Remodeling Industry (NARI) offers the following advice to build a good working relationship with your contractor.

- Know your contractor**

Choose a company that is bonded and insured and has a reputation for quality workmanship, reasonable speed, and fair prices.

- Make a list of procedures**

Have the contractor explain the work he will do and his estimated timetable for each phase.

- Plan adequate storage space**

Make room for materials, tools, and equipment by clearing the work area of unnecessary clutter.



- Post phone numbers**

Know who to call with questions. Delegate one family spokesperson to talk to the contractor.

- Know where the keys are**

If the contractor or his employees have a key to your home, know who is going to be responsible for it.

- Stay out of the work area**

Keep yourself, children, pets, and toys out of the way for safety and to maintain the work schedule.

- Plan to do without utilities**

Water and electricity may have to be shut off for awhile. Avoid food spoilages and other troubles by planning ahead.

For a complete list of remodeling survival tips, visit the NARI website at [www.nari.org](http://www.nari.org).

## What Are You Doing In There?

A survey conducted recently on behalf of American Standard, a leading manufacturer of bathroom fixtures, reveals some predictable and some pretty interesting facts

about people and their bathrooms. More than 800 people were polled for the study, and a few of the more interesting results are included in the table below.

### 1999 BATHROOM HABITS SURVEY SAMPLING

#### ■ What we do in the bathroom . . .

. . . Read a newspaper, magazine or catalog . . . . .	<b>42%</b>
. . . Have a conversation with another person . . . . .	<b>22%</b>
. . . Have a telephone conversation . . . . .	<b>16%</b>

#### ■ Shower habits . . .

. . . Prefer a hot shower to a bath . . . . .	<b>53%</b>
. . . Admit to singing in the shower . . . . .	<b>17%</b>
. . . Have a telephone conversation . . . . .	<b>6.5%</b>

#### ■ Most desired dream bathroom features . . .

. . . Whirlpool bath . . . . .	<b>53%</b>
. . . Personalized shower system . . . . .	<b>17%</b>
. . . Bidet . . . . .	<b>6.5%</b>

#### ■ Celebrity whose bathroom men and women would most like to see . . .

. . . **Women:** First: Martha Stewart, Second: Oprah Winfrey . . . **Men:** First: Bill Gates, Second: Cindy Crawford

SOURCE: American Standard Inc.

## Deck Design Guide

Had enough of winter weather? Planning some of those outdoor projects for next spring might help. Here's a way to get started.



For \$3, Georgia Pacific (GP) Building Products is offering "The New Deck Guide." The guide has some useful information on deck design and construction, as well as gazebos, fences, and other outdoor amenities. And the plugs for GP products really aren't too bad.

You can order the guide from Georgia-Pacific, PO Box 1763, Norcross, GA, 30091.



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## Contest Seeks Oldest "Hole-Shooter"

Even long after a faithful old tool has been retired, you may have trouble parting with it. "Besides," you say, "it might be valuable someday."

If you've been holding onto an old Hole-Shooter drill for a few years, today might just be your lucky day. To celebrate its 75th anniversary, Milwaukee Electric Tool Corporation is searching for the oldest working Hole-Shooter it can find.

The contest winner will receive a prize package that includes a Milwaukee Super Sawzall, a Magnum Drill "Hole-Shooter," a 75th anniversary leather jacket, and an additional \$750 worth of Milwaukee products.

To enter, contestants must mail two clear photos showing both a complete view of the drill and a close-up view of the Hole-Shooter

serial number, along with a brief description of the drill's history to: Find The Oldest Hole-Shooter, Milwaukee Electric Tool Corporation, 13135 West Lisbon Road, Brookfield, WI, 53005. Complete contest rules are available on the company's website at [www.mil-electric-tool.com](http://www.mil-electric-tool.com), or by calling (414) 291-7620.



## Mendocino Tree is Tallest Living Thing

One massive redwood tree has replaced another as the tallest living thing according to the Guinness Book of World Records. The previous record holder, cleverly named "Tall Tree," stood 368 ft. tall before recent storms took 10 ft. off its top. That gave the edge to runner-up "Mendocino Tree," which stands 367½ ft. tall.

The towering redwood, estimated to be between 600 and 800 years old, is barely distinguishable from its two dozen or so neighbors that stand 350 ft. and taller. This lofty family of redwoods is part of an 80-acre cluster growing in Montgomery Woods State Preserve located about 12 miles outside Ukiah in Northern California. There will be no official marker identifying the tree.

Pike Noyes  
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## Little Bugs Attacking “The Big Easy”

You might think first about Jambalaya and jazz music, but it's termites that are getting most of the attention in the French Quarter these days. It's there that Formosan termites, one of the most destructive and aggressive species in the world, have taken root, so to speak.

A colony of termites estimated to be 70 million strong was recently discovered under a building not far from the historic entertainment district. It is the largest recorded colony of termites in the world and the latest of several thriving termite communities located within the city.

A typical colony of 5 million termites consumes 1,000 pounds of wood each year. Ed Bordes, of the city's Mosquito and Termite Control Board, compares the damage from this particular colony to

“having a 500-pound animal eating on the building every day.”

Standard treatments don't affect these termites, but new treatments are the goal of a campaign dubbed Operation Full Stop. The project will report its progress this Fall.

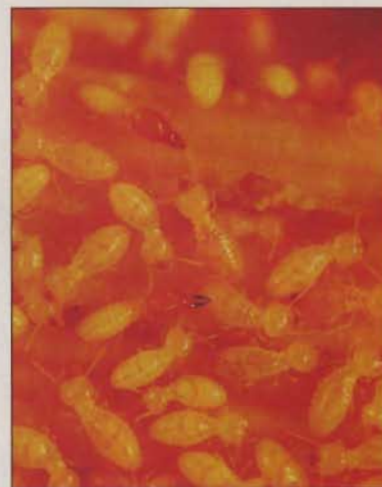


Photo courtesy of Nan-Yao Su, Ph.D., University of Florida.

## Main Street America Tops Endangered List

This year marks the 11th anniversary of the National Trust for Historic Preservation's (NTHP) 11 Most Endangered Historic Sites List. In past years, the list has been topped by landmarks only some of us are lucky enough to visit. Places like Montpelier, the one-time home of founding father James Madison, or the Waikiki World War I Memorial Natatorium in Hawaii. This year, however, the list begins in the heart of Everytown, USA.

According to the NTHP, America's town squares are in danger of being taken over by “cookie-cutter strip malls with expansive parking lots.” And while the NTHP calls the choice of large retailers to invest in downtown praiseworthy, it says the companies' site development strategies aren't always “sensitive to Main Street's unique character, sense of place, and pedestrian-oriented nature.” For that reason, this year's endangered list begins at “The corner of Main and Main.”

The complete NTHP list of endangered historic sites for 1999:

- The Corner of Main and Main, Nationwide
- Richard H. Allen Auditorium, Sitka, AL
- Angel Island Immigration Station, San Francisco, CA
- Country Estates of River Road, Louisville, KY
- Four National Historic Landmark Hospitals, New York, NY
- Hulett Ore Unloaders, Cleveland, OH
- Lancaster County, PA
- Pullman Administration Building and Factory Complex, Chicago, IL
- Traveler's Rest, Lolo, MT
- San Diego Arts and Warehouse District, San Diego, CA
- West Side of Downtown Baltimore, Baltimore, MD

For more information, visit the NTHP website at [www.nthp.org](http://www.nthp.org) or call 1-800-944-6847.



# Wall Framing Know-How



A couple months ago my friend Jim asked if I could help with a remodeling project. He had gutted a bedroom in his house, and wanted me to lend a hand with the

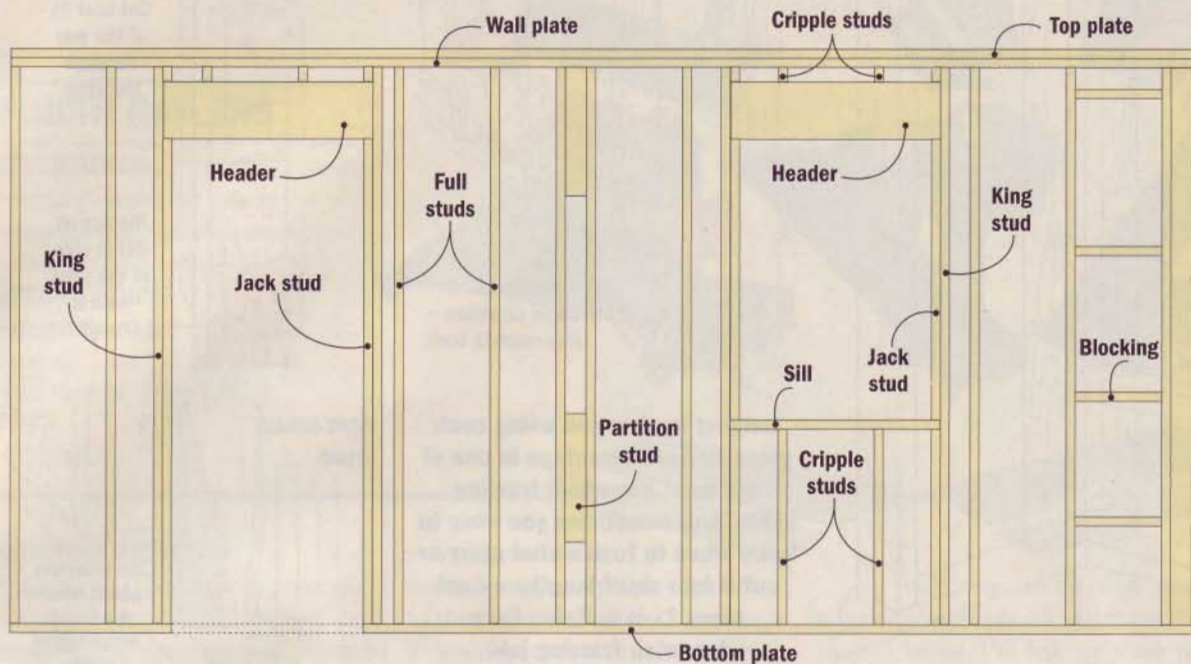
rebuilding. I was glad to help since I'd be able to renew some rusty carpentry skills and burn off a few extra Fourth of July pounds.

The bedroom in his 1½-story, expansion-style house presented several challenges, including its small size and a ceiling that sloped with the roofline. On the plus side, there was lots of unused space in the surrounding attic that Jim had already exposed when the old walls came down. After it was all said and done, his new room was much bigger with a better lay out and plenty of accessible storage space (see *Gaining Space* on page 39).

## HOW DID WE DO THAT?

I could give you a step-by-step rundown of the work we did, but unless your house is exactly like Jim's, it wouldn't do you a whole lot of good. Instead, I've pulled together a bunch of tips anybody can use in their own remodeling projects. I put the tips in an order I think makes them easy to understand, but truthfully, you need to know all this stuff before you get started. So the order really isn't all that important.

## ANATOMY OF A WALL FRAME



Some of this you probably know, but I'd bet there's a tip or two here that you'll want to use in your next project. And I encourage you to send us your tips for anything you've done differently (see *Tips and Techniques* on page 16).

### SPEAK THE LANGUAGE

A good place to begin is with the names of the frame parts. If "jack stud," "header," and "top plate" sound

like characters in a kung fu movie, spend some time with ANATOMY OF A WALL FRAME. Learning the lingo will make understanding the building process much easier. Plus, you'll find it less exhausting to talk to your building partners — no more saying "hey, cut me one of those boards that goes over the doorway."

It's also important to have the right tools (see *Tools You'll Use* below). At one time framing was

done by hand, but power tools make the job easier and the results are often more accurate. My advice? Investing in tools almost always pays off.

### LAYING THE GROUNDWORK

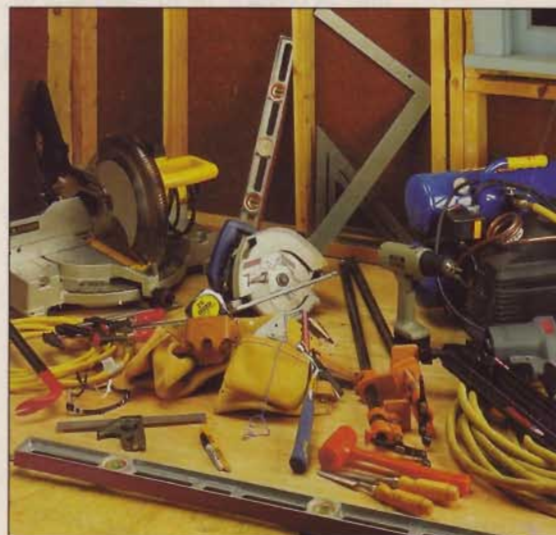
A lot of preparation goes into building even a simple wall — from organizing your plan, purchasing and sorting materials, to wall layout. Here are some strategies that will help you get the job done right.

## Tools You'll Use

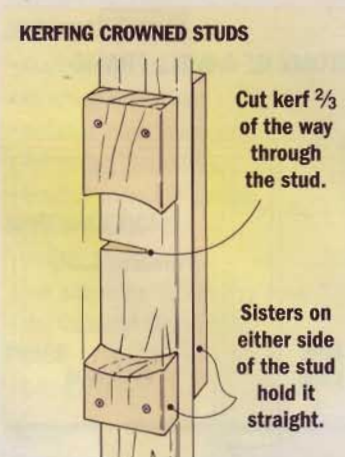
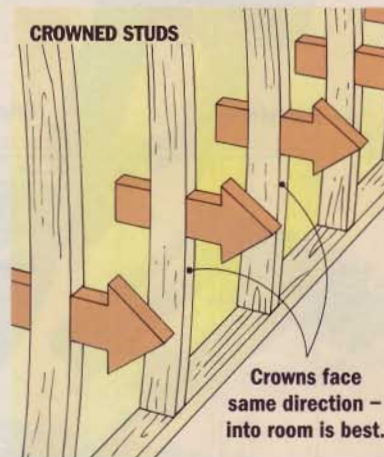
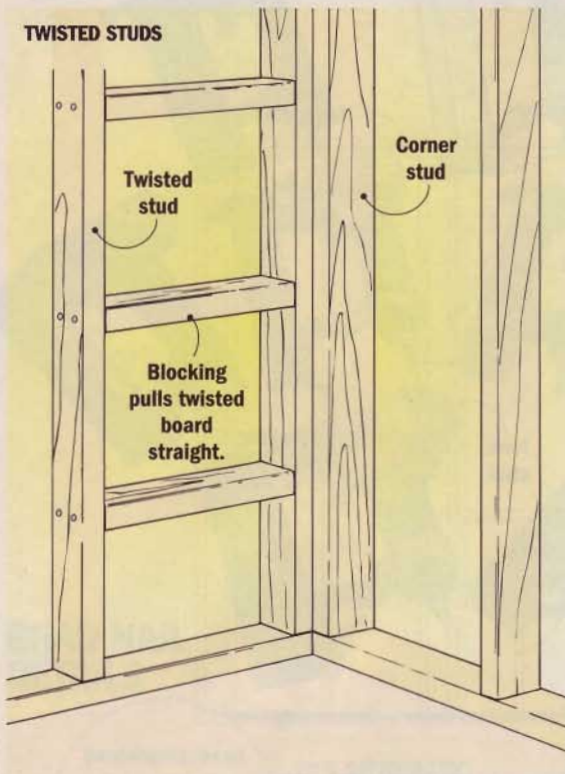
There's a tool for every job, but some jobs, like framing, require a whole pile of them. You probably have many in your shop already, such as a hammer, tape measure, a speed square, and framing square to name a few. You'll also get a lot of use out of a 4-ft. level and a portable circular saw.

Basic tools will meet most of your needs, but there are a few specialty tools worth considering, even if you have only a modest amount of framing to do.

**Plumb bob** — Essential for aligning walls with the ceiling.  
**Chalk line** — Another carpentry tool you can't live without.  
**Clamps** — A big plus when persuading studs into position.  
**Power miter saw** — Nothing beats this tool for crosscutting studs. It's fast, accurate, and consistent.  
**Pneumatic nailers** — I know this sounds extravagant to the uninitiated, but once you try air powered nailers you may never go back (see *Air Nailer Smorgasbord* on page 52).



## MATERIAL MANAGEMENT



**Judging lumber and using each piece to best advantage is one of the most important framing skills. And sometimes you have to know when to toss a stud away or cut it into short lengths — not every 2x is suitable for a topnotch framing job.**



**DRAW A PICTURE** — A well-built wall is always preceded by a thoughtful plan drawn to scale or plotted out on graph paper. Rough out a sketch of each wall and you'll see things that you hadn't thought of — both problems and solutions.

But be sure your pencil has an eraser. Remodeling work means you'll have to adapt to a room's limitations and quirks. Don't be so committed to an early idea that you miss an obstacle, or an easier way to do something. Having a detailed drawing of each wall also makes it easy to calculate and order the materials you'll need.

**MATERIAL MANAGEMENT** — Choosing lumber is a balancing act. There is no way you'll put your hands on enough defect-free boards to do a framing project. So you have to select stock with defects that you can manage or locate them where they won't cause problems.

Warped or twisted studs can make getting a straight wall difficult. You can often force modestly

warped or twisted boards straight by blocking between studs. This is best done if you're blocking to a corner, where there's greater rigidity. Cut studs that have more than a slight twist into short pieces for headers, sills, and blocking.

If I have to use crowned studs I usually collect enough for an entire wall, then make sure all the crowns face the same direction, preferably into the room if there's a choice. Having some crowned boards and some straight studs in the same wall makes for a wavy drywall installation. You can cut a kerf or two in a crowned stud, then, after pulling the board straighter, nail sisters to either side of the stud to hold it straight. I only bother with this if I'm running short of material and need one more stud in an otherwise flat wall frame.

Wane edges are okay, unless they make a significant part of a stud's edge less than  $\frac{3}{4}$ "-thick. Anything thinner than that and you won't have much to fasten the drywall to. Definitely avoid using wane-edged studs at drywall seam locations.

And last, cut shorter boards out of lumber with knots or gashes that are larger than about 2". Pitch pockets generally aren't worth worrying about unless they're very large.

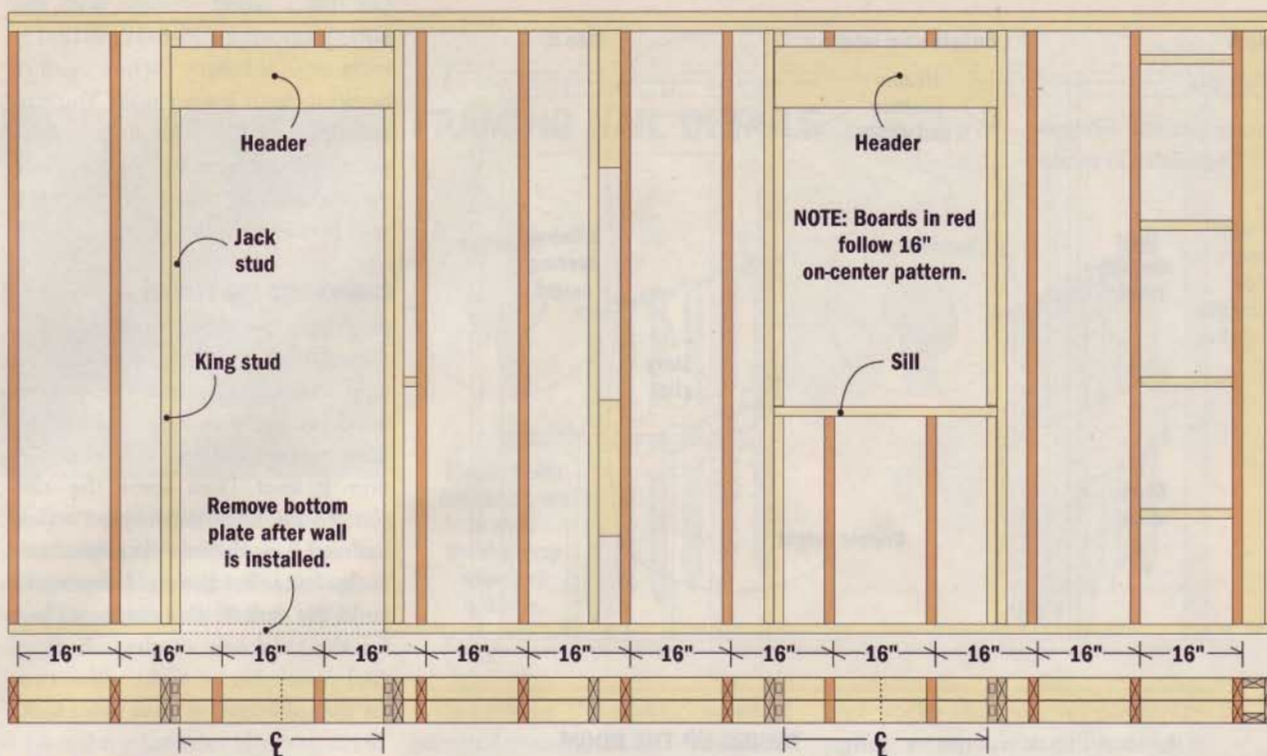
### DIAGRAM THE DETAILS

Once you have a plan and the lumber, you can transfer the layouts to the top and bottom wall plates. This information will serve as a road map to guide you through the construction of your wall.

Since you're going to put a lot of information on these boards you'll need a good system to make sure it's accurate. Here's what I do:

**PENCIL FIRST** — It's good practice to do your initial layout in pencil, then finalize it with fine-point felt markers. It may seem like an extra step, but as details begin to overlap each other, markers will make them much easier to recognize.

**LAYOUT THE PLATES** — Clamping the wall and bottom plates together while you mark out stud locations



## LAYOUT THE PLATES

guarantees consistency. You have to stay alert while you do this, however, since not all studs contact both plates.

One tip an old-timer taught me is to mark out rough openings for the windows and doors first, then add the full length studs. This way you can see early on where conflicts lie and find good solutions.

I always leave the bottom plate intact along the length of the wall, and don't remove it from doorway rough openings until after the wall frame has been installed. You can cut it out pretty easily with a handsaw.

**ROUGH OPENINGS** – It's best to layout rough openings starting at the center of each opening. This helps avoid measuring mistakes and keeps your mind focused on the size of the opening you need, and not on the stud spacing.

Measure in from one end of the plates to mark the center of each opening. Then measure from these lines to define the locations of the jack studs. Use the 1½"-wide leg of a framing square (called the tongue)

to mark the other side of each jack stud, which also indicates the king stud location. Having marks for both faces of each stud always makes it easier to hold the boards square to the plates as you drive the nails.

Mark jack stud locations with a "J" and king stud locations with an "X" (to indicate a full stud) as a quick visual reminder when you're building the walls.

**STUD SPACING** – Think 16. It's the most important number you can know in wall framing. Studs should be located at 16" on-center intervals (14½" between studs). This is the furthest distance 2x4's can be apart and meet code requirements for load-bearing walls. And it's the spacing that works best for fastening all 4x8 and 4x12 sheathing materials.

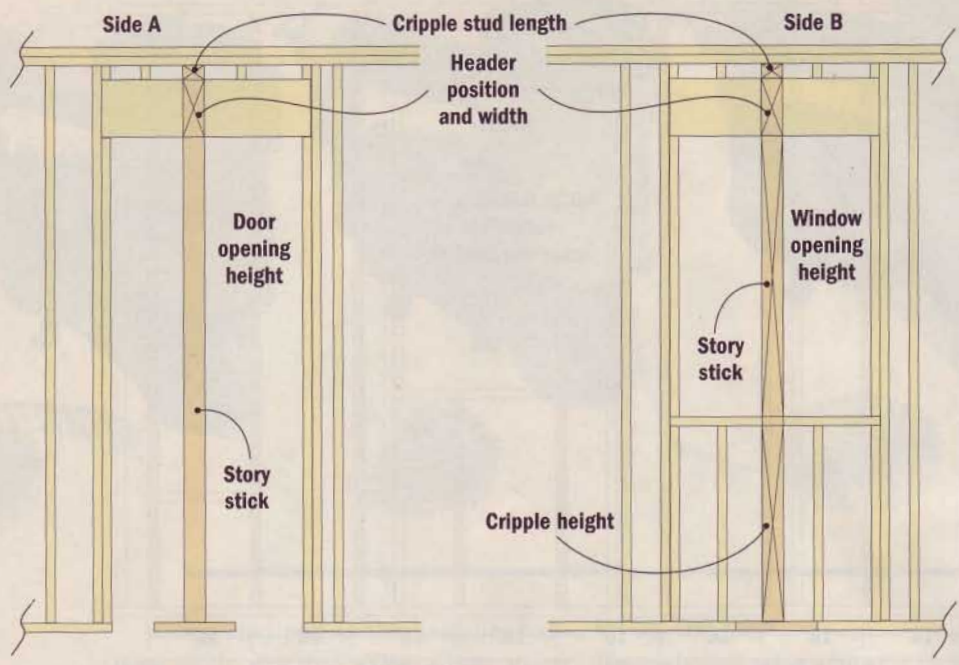
Windows and doorways may interrupt this interval, but make sure cripple studs continue the 16" spacing above and below the rough openings. Sometimes full stud locations fall in the same spot as king or jack stud locations, which is fine.

Also, you'll sometimes end up with studs or cripples close together. That's okay, too. You'll be thankful for it when you drywall the room and know you have a nailing surface every 16".

I start my 16" on-center layouts at the same end of the wall and bottom plates I used for marking the window and door layouts. Making marks every 16", however, won't actually indicate the center of each stud position. Instead, you'll be marking for one side of each stud. Use the framing square tongue (that's the 1½"-wide blade) to layout the second side of each stud. Then, as with the king stud locations, make an "X" between these marks to indicate each full-length stud location.

**STORY STICK** – One of my favorite tools for any type of remodeling work is a story stick. Carpenters, brick masons, and woodworkers all use them and, if made accurately, they put tape measures on the sidelines once building gets under way.

## STORY STICK



A story stick is just a long, straight piece of lumber with the framing layout marked on it. The story stick can be used over and over for common situations, like window and door rough-in work. You can make them for vertical and horizontal layouts, but since the horizontal details are drawn on the plates, you really only need to make a vertical story stick. Make one side of the story stick for windows, and the other side for doorways. Don't forget to allow for a sub-plate or a double top plate if you need either.

### TRUING UP THE ROOM

When you're sizing up your room for the new walls, don't be surprised if you find a slope in the floor, a sag in the roof, or walls that are out of square. But don't tear the house down just yet. There are some tried-and-true techniques for keeping your project on the straight and level, even if your room isn't.

**START SQUARE** – Other than rare exceptions, walls should meet at a 90° angle. An old-fashioned 3-4-5 right triangle is the best way to

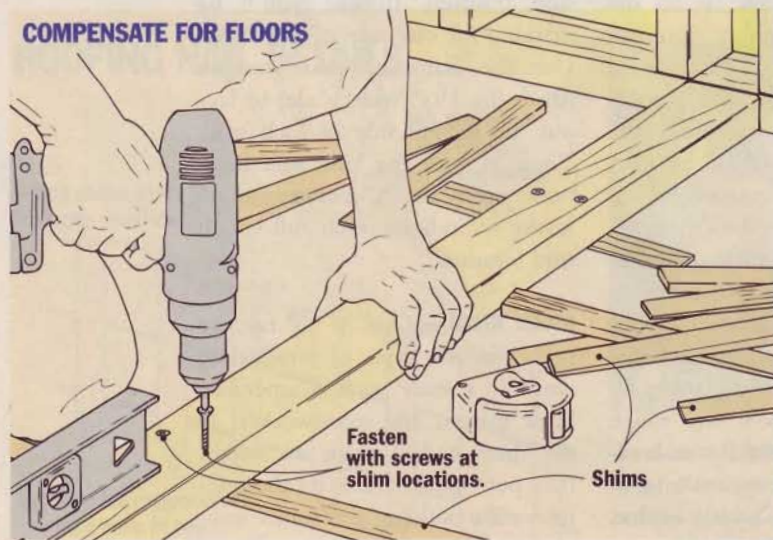
ensure that squareness. And remember that a larger triangle with the same proportions (6-8-10, 9-12-15) increases accuracy when you're working with longer walls. You can use this technique to align a sub-plate (see the next tip) or to square up a chalkline when marking the wall position on the floor.

**COMPENSATE FOR FLOORS** – The simplest way I've found to deal with a sloped or uneven floor is to create a level 2x4 sub-plate for the wall to stand on. Set a straight 2x4 on the floor where your wall will stand, and shim it level. Then screw the sub-plate to the floor. When your wall is built, set it on the sub-plate for a perfectly level installation. Be sure to build the wall 1½" shorter to allow for the thickness of the sub-plate. And remember to make allowances for the sub-plate on your story stick.

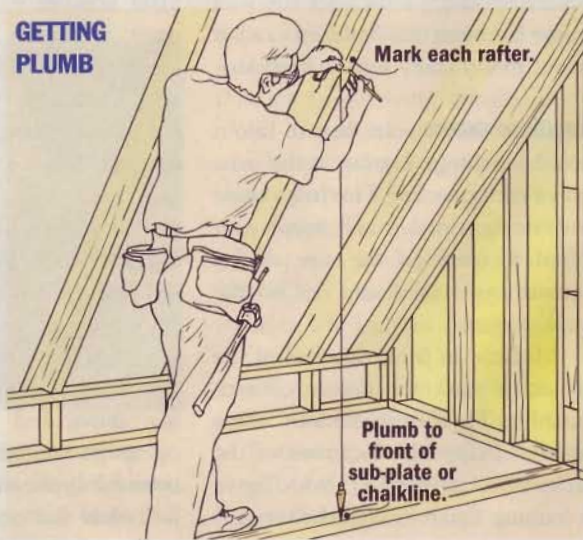
**GETTING PLUMB** – Depending on the room you're working on, the top of your wall may attach to a finished ceiling, the joists of the floor above, or even the roof rafters. Whichever it is, you can pinpoint where the wall should be by hanging a plumb bob over your floor lay out.

If your wall is going to mate directly to joists or rafters, plumb up to each one and mark it. If you're building up to a finished ceiling, mark every 16" or so. That may seem like a lot of marks, but they're

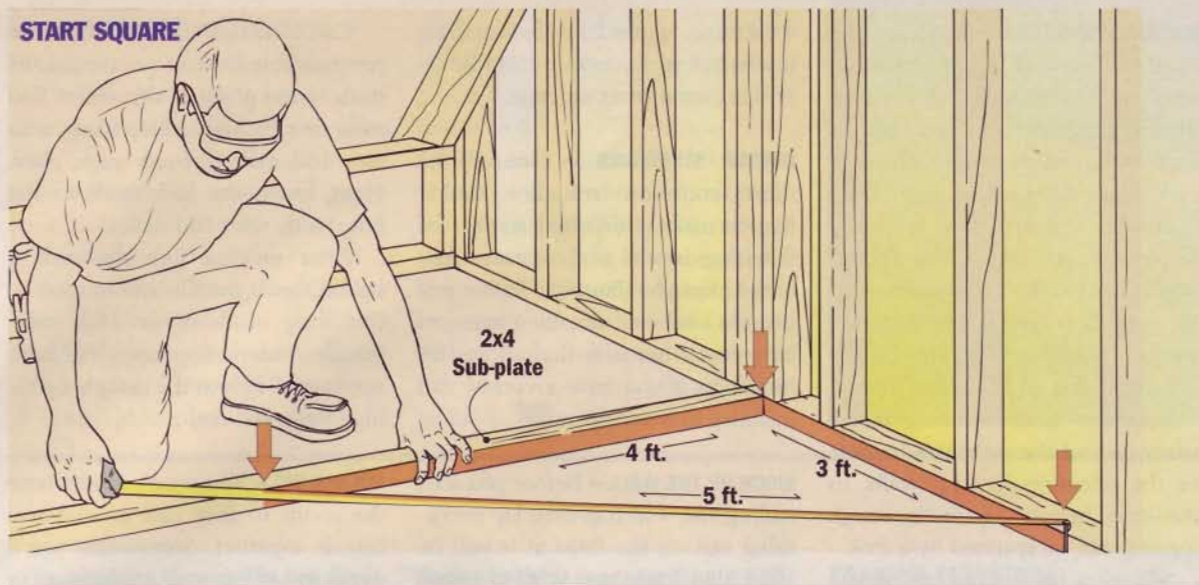
### COMPENSATE FOR FLOORS



### GETTING PLUMB



## START SQUARE



real handy when you're measuring for wall height or fine tuning the wall position after it's raised.

**SAGGING CEILING** — Just like sloping floors, sagging ceilings are common in older homes. You should plan for that when figuring your wall height. Measure the height from floor to ceiling at several locations to find the lowest point. Build your new wall to fit that height and shim above it where the ceiling is higher.

**MEETING RAFTERS** — If you're building your wall up to rafters, you'll want to match the top of your wall to the pitch of the roof. This is easier than mating the sloping rafters to a standard top plate orientation.

To find the roof pitch, mark the run (12") on a level and butt it against a rafter. Hold it level while you measure from the 12" mark straight up to the rafter — that dimension is the rise. So if you measure 10" from the level to the rafter, your roof pitch is 10/12.

Use a framing square to transfer the pitch onto a stud, then cut the stud at the angle. Use this stud as a pattern to mark the rest. Also, use this angle for ripping the front edge of the top plate so it will be flush with the studs when the wall is built.

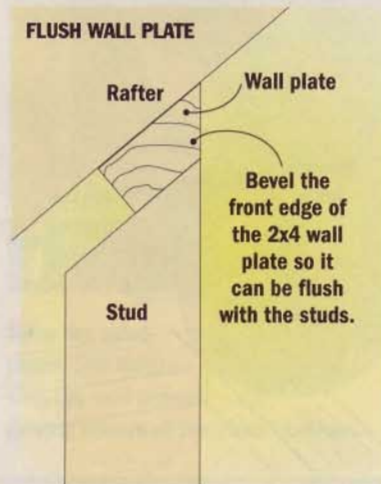
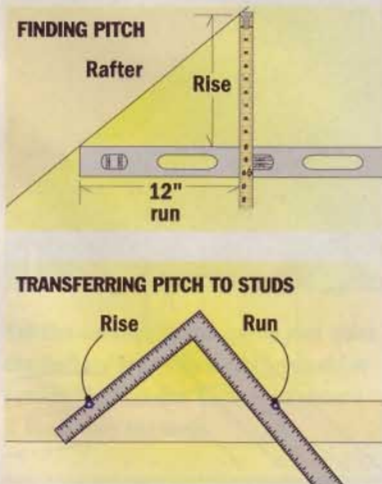
## PUTTING THE PUZZLE TOGETHER

You probably think of a wall as a single unit. And in the end, that's true. But when you're building a

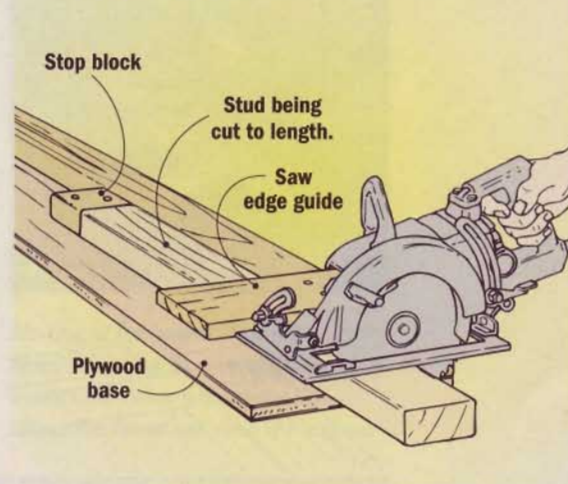
wall, it's like putting together pieces of a jigsaw puzzle. Here are some techniques you can use to make sure the pieces fit together and are strong enough to do their job.

**CROSSCUTTING JIG** — I always like to cut the studs starting with the longest and working to the shortest. First I cut the king studs and full studs. Next come the jack studs, then the cripples, headers, and sills. If I have a lot of cutting to do and I don't have a miter saw, I build a simple crosscutting jig with a movable stop block. It takes only a few minutes to build, and saves me time since I don't have to make the same measurements over and over. This also ensures consistent lengths for pieces that need to match.

## MEETING RAFTERS



## CROSSCUTTING JIG



**HEADERS AND SILLS** — In load-bearing walls, the tops of rough openings need to be spanned by headers. Headers provide the strength in place of the studs that would normally carry that load.

Header construction is pretty simple — a piece of 1/2"-thick plywood sandwiched between two pieces of 2x is typical. The plywood core adds thickness so the header will match the width of the studs.

Use the header sizing chart below to find the right size headers for the openings in your walls. In non-load bearing walls, a rough opening can be spanned by a 2x4.

Sills go at the bottom of window openings. Because there's usually no load on a sill, a 2x4 set flat on cripples

works fine. For under wide windows, however, I prefer to use a 2x4 header-like assembly set on edge.

**CORNER STRATEGIES** — One of the most common mistakes rookie framers make is forgetting to plan for fastening drywall at the corners. Any of the examples illustrated below will provide a substantial nailing base, just be sure to use one that allows for insulation if you have a corner that includes an exterior wall.

**MOCK UP THE WALL** — Before you start nailing the wall together, lay everything out on the floor as it will be assembled. Make sure you have studs at every marked location and that every piece is sized correctly.

Once you're satisfied with the pre-assembly look of a wall, nail the studs to the plates in this order: Full studs first, including king studs, with two 16d nails through each plate. Next, fasten the jack studs to the king studs with 10d nails.

After making sure the wall is square, fasten the sills and headers to the king studs with 16d nails. Finally, fasten the cripples, both above and below the rough openings, with 16d nails.

**TOENAILING** — You won't always have the room to face nail or end nail boards together. Sometimes you'll need to add a stud, a header, or some other element to a wall that's already installed. In that case, you'll

## Header Sizing Chart

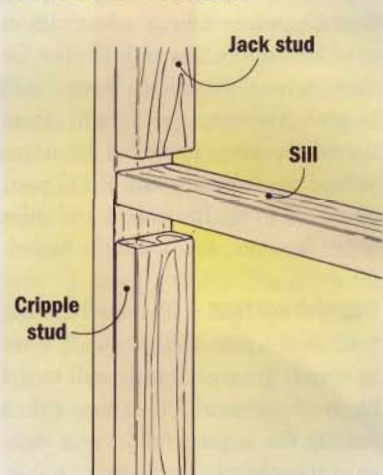
Headers are sized to carry a load based on opening size and which story of the house they are on.

Width of rough opening	Minimum Lumber Dimensions	
	No story above	One story above
3' 0"	2x4	2x4
3' 6"	2x4	2x6
4' 0"	2x6	2x6
4' 6"	2x6	2x6
5' 0"	2x6	2x6
6' 0"	2x6	2x8
8' 0"	2x8	2x10
10' 0"	2x10	2x12
12' 0"	2x12	2x12

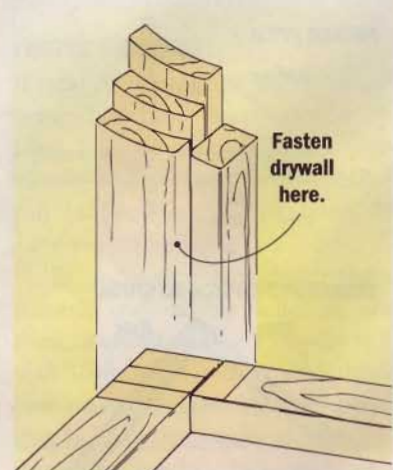
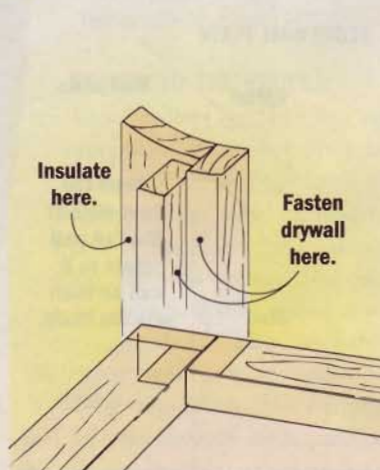
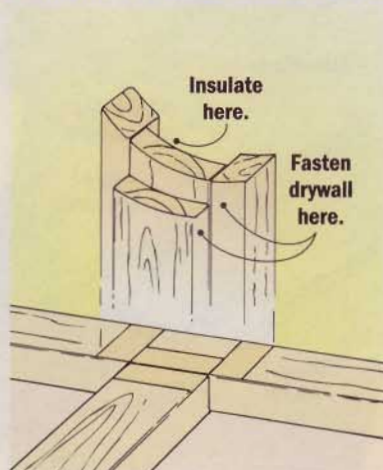
### HEADER ANATOMY



### SILL PLATE ANATOMY



### CORNER STRATEGIES: THREE EXAMPLES



have to toenail. Toenailing is the technique of driving a nail at an angle through one end of a board.


With 2x stock, start the nail about  $\frac{3}{4}$ " to 1" from the end of the board — any closer and it can split the wood. Drive the nail at about a 30° angle and, if you have to, use a nail set to make sure the nail head makes solid contact with the wood.

When installing a stud this way, you may find it hard to hold the board in place while driving the

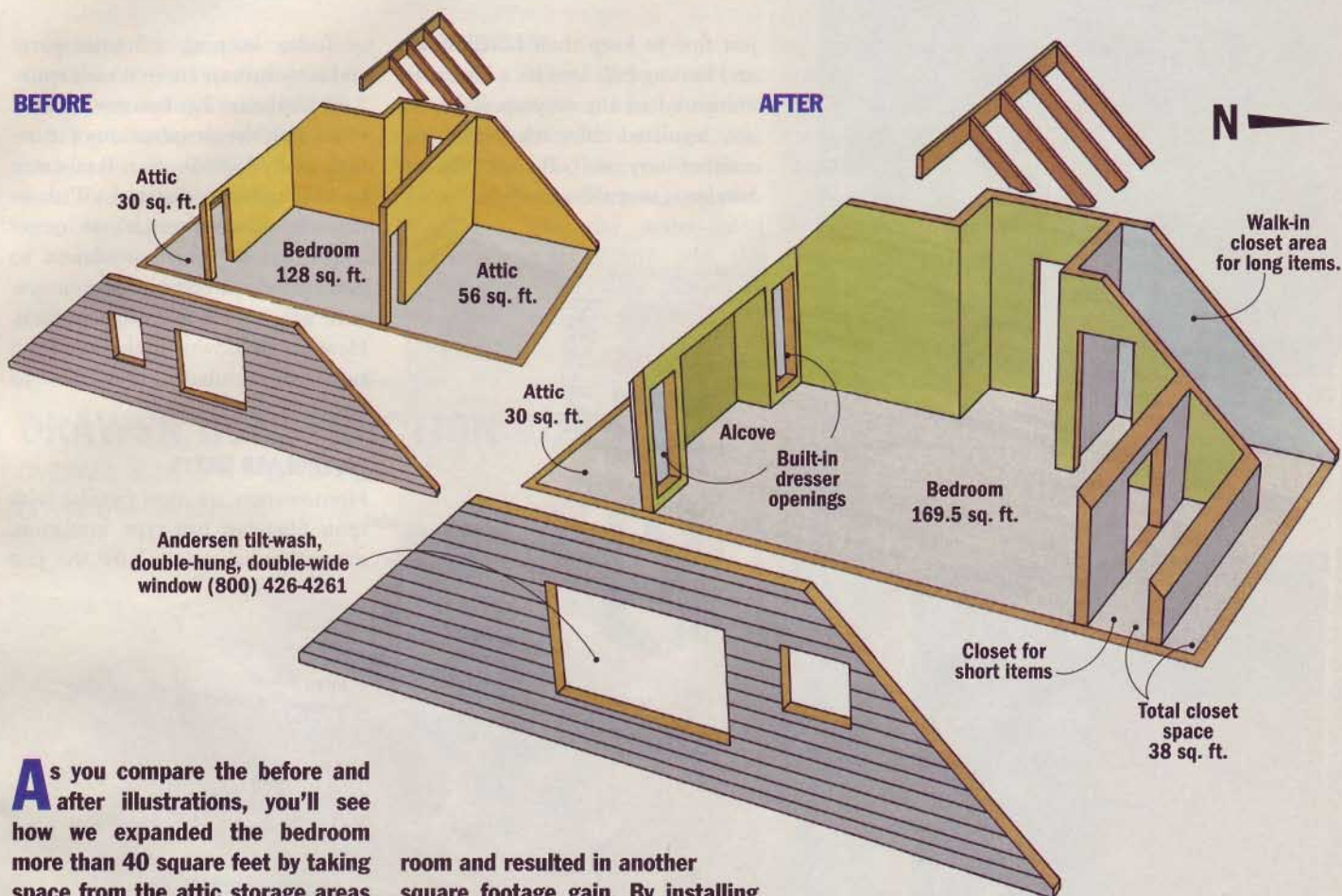
nail. I like to cut a board to fit between the stud I'm installing and the next one in the wall. Setting this board between the studs — behind the nailing location — provides firm support when toenailing.

#### WRAPPING IT UP

The irony about wall framing is that doing a great job means you'll never see your work again. After all, you'll end up covering it with drywall that will last for a long, long time.

But taking time to do the framing correctly does pay dividends. Your walls will be true and intersect each other at 90°, you'll have solid support for doors, windows, and drywall, and trimming will be a breeze. After the paint dries, when you stand back to look at your finished room, you'll be able to take pride in knowing that some of your best work is hidden behind what everyone else sees, and that's a mark of a real craftsman. 

## GAINING SPACE: A NEW FLOORPLAN FOR AN OLD BEDROOM



**A**s you compare the before and after illustrations, you'll see how we expanded the bedroom more than 40 square feet by taking space from the attic storage areas on the north and south sides of the house. Even for storage, this space had limited usefulness, but now it definitely adds to the charm and comfort of the room.

Jim still has plenty of closet space, and we made sure to allow for both his tall and short hanger needs.

The alcove for the headboard end of the bed adds interest to the

room and resulted in another square footage gain. By installing built-in dressers on either side of the alcove, we squeezed every bit of use out of the remaining attic area, and avoided losing newly opened floor space to furniture.

Installing a large double-hung Andersen window in the east wall lets more light in the room and offers a great view of the back yard. The small window allows light and

ventilation into the north closet.

We didn't do anything to the roof structure, but did make sure to preserve the support it got from load bearing walls.

All in all, the room is much more comfortable, larger, and includes architectural details that add a lot of character.



# Insulation That Works

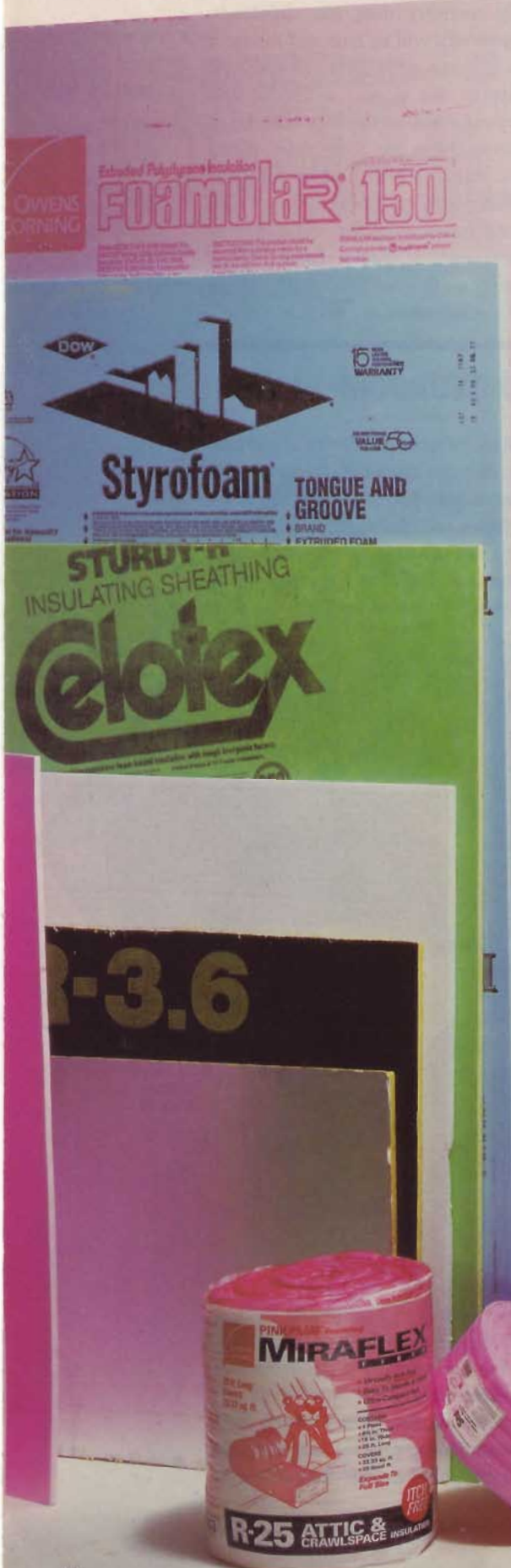
People laugh when I tell them I have friends who live in a Styrofoam house. But it's true — the walls and roof are solid polystyrene “stress-skin” panels, almost a foot thick, and they work

just fine to keep their home warm and heating bills low. It's a bit exotic compared to the way most homes are insulated, but it's really just another way to build an efficient barrier against the elements.

Today, keeping a home warm and cozy isn't an art — it's a science. And insulation has become a “hot” topic with the introduction of many high-tech, high-R (for Resistance to heat transfer) materials. With so much to choose from, it's no longer a question of which insulation to use, but which combination or system works best in your situation. Here's a rundown of the common types of insulation available to homeowners.

## FIBERGLASS BATTS

Homeowners are most familiar with spun fiberglass batt-type insulation, the residential standard for the past



50 years. What's new in this area is high-density fiberglass, which packs more insulating fibers into each square inch, increasing the material's insulating capacity without adding thickness. This is important for several reasons. A 3 1/2"-thick high-density batt, rated at R-19, fits into the same 2x4 stud wall cavity as a conventional R-11 batt, yet it yields almost 75 percent greater insulation value.

High-density batts also put more insulation into a wall without compressing the fiberglass, a mistake often made with R-11 batts that reduces its effectiveness. Fiberglass batts insulate by trapping air around the fibers. It's this air that's the insulator, not the fibers themselves. The density and thickness of a batt are designed to balance the amount of trapped air with other heat retention factors (see *How Insulation Works* on page 43). Given the improvements high-density 3 1/2"-thick batts offer, it's no longer necessary to build 2x6 walls to meet recommended heat retention ratings.

New batts are also sized to fit cathedral ceilings so popular in homes today. Their slightly less-bulky dimensions allow for proper ventilation space under a roof deck to avoid condensation, while providing better insulating value. A typical 2x12 ceiling rafter, which has an



### FIBERGLASS BATTs

Fiberglass batts offer ease of installation, and lots of R-value choices in faced or unfaced variations.



### CELLULOSE FIBER

The popularity of cellulose fiber has returned for good reasons. It's made from renewable resources, fills stud cavities thoroughly, and is flame-retardant when certain chemicals are added.



11 1/4"-deep cavity, can now be insulated to R-38 with a 10 1/4"-thick batt. This R-value meets current federal energy guidelines for insulation in many areas of the country.

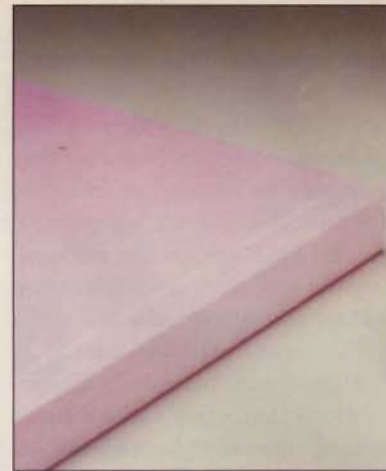
### CELLULOSE FIBER

Loose-fill insulations such as mineral wool and cellulose fiber were widely used around the turn of the last century, but they had many shortcomings and were gradually eclipsed by newer insulation materials like fiber-

glass. Cellulose insulation has made a strong comeback in recent years, however, by offering significant improvements and some new-age advantages of its own.

The cellulose now used is raw fiber from wood pulp, lumber-mill byproducts, and recycled newspapers, so it is considered a natural, renewable resource. Mixed with a glue binder and blown into wall cavities, it effectively fills every nook and cranny, becoming a semi-solid





### RIGID FOAM

Closed cell rigid foam panels have excellent moisture and compression resistance — ideal for exterior use, even as forms for foundations (left).

blanket that helps to soundproof and strengthen the wall itself. Non-toxic, flame-retardant chemicals like borax — which also repels insects — are added to the mixture as well. Cellulose insulation offers measurable R-values as high as R-13 in 2x4 stud walls, but because air infiltration is virtually eliminated, the living space retains heat better and feels warmer to occupants.

Loose-fill cellulose is easy to

install in new construction or open floor-joist areas like attics. Blown-in applications are usually professional jobs, but some home centers and insulation suppliers rent equipment for do-it-yourself installation.

For existing walls, installation requires boring holes at the top and bottom of every stud cavity (from the exterior or interior side), then vacuuming the material into the wall. After filling the cavities, the holes can

be plugged and the walls refinished.

For unfinished walls and ceilings, plastic mesh is first stapled over the framing and the cellulose is blown or sprayed in behind it.

### RIGID AND SPRAY FOAMS

Plastic foam insulation is another 20th Century weapon in the battle between heat and cold, and the versatility of this material is creating more uses all the time. Available in many forms, including solid boards, sheet panels, flexible rolls, laminated with other materials, or in liquid sprays, foams are used today as insulation in virtually every part of a home — and even as the home itself. Unlike some new plastic woods, rigid foam panels have no structural strength, but when bonded to materials like plywood the result can be stronger than typical wood framing.

Foam insulation has many advantages. Most solid foam is impermeable to water and vapor transmission, and doesn't lose its insulating qualities when wet. This makes it ideal for use under concrete slabs and other below-grade or wet-area situations. Spray foams that flow and expand into crevices and around pipes, then quickly cure into a solid mass, also waterproof and seal as they insulate. Non-expanding



### SPRAY FOAM

Spraying foam is a job for pros. The foam starts as a liquid and quickly expands to fill the framing cavities.



By sealing every nook and cranny it virtually eliminates air leakage and significantly reduces noise levels.



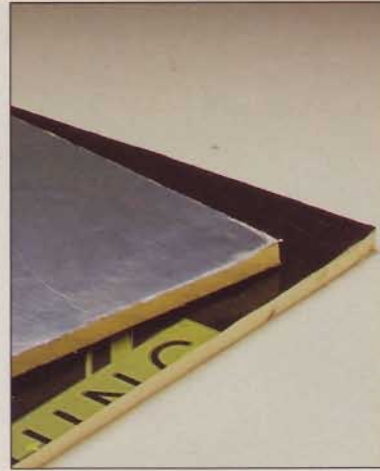
#### FIBERGLASS-FACED RIGID FOAM

Covering foam panels with a fiberglass or polymer coating makes them more rigid for use under vinyl siding, and tougher to withstand rough handling.



#### FOIL-FACED RIGID FOAM

Adding reflective foil improves a panel's ability to block radiant heat loss and reflect heat gain from sunshine, while increasing moisture and air resistance.



Properly installing an appropriate rigid foam panel system to the exterior of a house can eliminate the need for wood sheathing and a vapor barrier.

foams are useful for filling gaps around windows and doors. Foam beadboard, which is easily shaped to create stone-like architectural details, is used as a backer for new exterior acrylic stuccos.

More importantly, foam insulations offer some of the highest R-values around, ranging from R-4 to R-8 per inch of thickness. The

most common types are polystyrene, polyurethane and polyisocyanurate. Polystyrene is available in many forms — as loose beads, "peanuts," coarse beadboard or smooth extruded panels—depending on the application. Polyurethane is often found in aerosol sprays for homeowner use, or is blown into wall cavities by professionals. Rigid polyisocyanurate

panels have somewhat greater structural integrity and higher R-values. They are often laminated with foil facing and used as wall sheathing or underlayment.

Urea-formaldehyde foam, once widely used as insulation, earned a notorious reputation for outgassing toxic fumes, and is no longer used in residential applications.

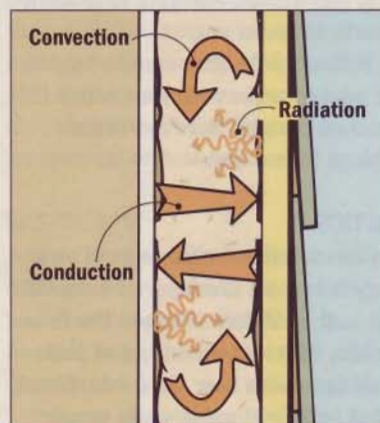
## How Insulation Works

An insulator is anything that isolates two materials, stopping heat transfer between them. Air trapped between two surfaces does this well, which explains why even a wall with no insulation has some R-value. Adding insulation helps air better fight the three causes of heat transfer:

- **Conduction** — Heat or cold transferred when surfaces of different temperatures come into contact.
- **Convection** — Heat gain or loss caused by air movement.
- **Radiation** — Heat or cold emitted by a surface and absorbed by another surface, without physical contact between the surfaces.

In the walls of a house the air space between the interior and exterior surfaces stops most conduction,

since heat energy has a tough time jumping across the gap. Insulation does reduce the volume of air in the wall cavity, but the intertwined fibers in the material form pockets that break the volume of air into thou-



sands of small units. This reduces conductive loss — more gaps for the air to hop across — and inhibits air movement, decreasing convection.

Insulation fibers also reduce heat loss or gain from radiation. For example, in the winter heat emitted by the warm interior wall gets deflected throughout the stud cavities, rather than transferring directly to the outside wall.

Of course, there is a point of diminishing returns. More fibers, for example, reduce radiation and convection, but eventually displace too much air and solidify the connection between the surfaces, leading to an increase in conduction. Insulation manufacturers must aim to strike a balance between these three factors.



### RADIANT BARRIER SHEATHING

Used for roof sheathing, a radiant barrier bonded to plywood or oriented strand board improves a home's summertime cooling capability by reflecting

heat from the sun. A radiant barrier can also raise the effective R-value of the attic insulation system by reflecting interior heat back into the home.



### BUBBLE WRAP

These insulators mate air pockets with highly reflective surfaces made of laminated aluminum foil and polyethylene.

### RADIANT BARRIERS

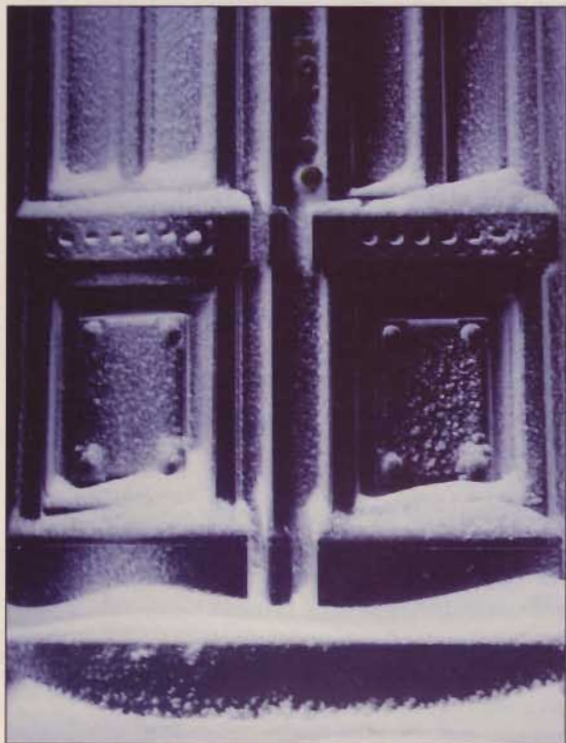
Keeping heat from the sun out during summer months, and preventing interior heat loss in the winter, can be improved with a radiant barrier. The most straightforward method is to use sheathing material covered

with aluminum foil facing. While this offers little R-value in itself, it will, when combined with insulation, significantly improve the R-value of an attic or wall system.

As crazy as it sounds, "bubble wrap" — the same material used to

protect packaging — is growing in popularity as a home insulating material. Thousands of air pockets trapped in the plastic prevent heat transference, and when sandwiched between sheets of metal foil and polyethylene it becomes an excel-

## THE DIY CHECKLIST — GETTING READY FOR WINTER



Your home's insulation is like a big, cozy blanket wrapped around you on a cold night. Now, imagine what happens when your feet aren't tucked in. Brrrrr!

That's what you get when your home isn't adequately "wrapped" by its insulating system. Even a tiny gap lets in cold air like water leaking into a boat. And just as quickly, warm air leaks out.

Before the heating season begins, it pays to make sure your house is tucked in right. Here are some things to look for:

### ATTICS

In an unfinished attic, a good strategy is to have one layer of loose-fill or batt insulation between the floor joists, with a second layer of batts laid crosswise over the joists. Check that soffit and gable vents aren't

covered — you want to be sure that air flows freely in and out of the attic to prevent condensation.

If you have a finished attic floor, with insulation batts stapled above between rafters, make sure there is 1" of air space between this insulation and the roof sheathing. Also, this space should open to vents at the bottom and top of the roof.

Also check that the insulation's paper or foil vapor barrier is properly stapled to the rafters and walls, with no gaps or tears to allow condensation to pass.

### EXTERIOR WALLS

"Air sealing" the interior side of your home's outer walls can increase the effectiveness of the insulation you already have.

A really thorough job involves removing all interior moldings,



### INSULATION QUICK FIXES

Heat loss often occurs around windows and doors. Fill these spaces with fiberglass batting torn from a roll, or use spray foam. Wearing gloves prevents



skin irritation while handling the fiberglass. Inject the foam sparingly since it expands greatly. With foam, wearing disposable gloves is a good idea.

lent radiant-heat barrier for both summer and winter protection. It's also used extensively to wrap ducts, pipes, water heaters and other things to keep heat in or out.

As house insulation, insulating reflective foil, as it is generally

known, is most effective when used to supplement other insulators like blown cellulose or fiberglass batts. It must be installed with an air-space separating it from the other materials, however, because the foil is a good heat conductor.

caulking the joints where walls meet the floor and ceiling, stuffing loose insulation into gaps around electrical outlets, doors and windows, and taping plastic over these gaps. Replace all of the moldings, and you're done forever. If that's too much work, leave the moldings in place and caulk around them.

The best way to find cold spots in exterior walls is to use infrared thermography. A special camera detects heat leaks and areas where insulation is not doing its job.

### WINDOWS AND DOORS

Weatherstripping seals where moving parts intersect can tear, wear out, and dry up. It's easy to replace most types of flexible insulating strips and bumpers, including the "permanent" kind that insert into crevices in jambs and sashes. If you

can't find a proper replacement at your local home center, try an HVAC parts and supplies dealer — they'll also sell you the simple tools needed for this job.

Check and replace exterior caulk that has dried up or disappeared around door and window frames. Choose a quality silicone or polyurethane replacement caulk that stretches and shrinks with the materials it is sealing, and won't dry out. If you have storm windows, be sure that they fit tightly, and have no cracked or broken panes.

### BASEMENTS

Inspect the tops of all exterior walls between floor joists, or where the walls are capped by 2x sills. Insulate between the joists, fill any gaps between the wall and framing with loose insulation, and follow up

### INSULATION QUICK FIXES

You'll find some of the worst heat-loss offenders around door and window jambs. Though difficult to get to without tearing out walls, you can dramatically reduce heat loss and drafts by filling any cracks and crevices with insulation.

Doors and windows comprise the largest wall openings in your home, and potentially the areas of greatest heat loss. Solid wood doors are especially poor insulators, averaging less than R-3 per inch of thickness. By comparison, insulated steel and fiberglass doors offer up to four times that R-value, along with features like magnetic weatherstripping and multiple-pane glazing. New fiberglass and vinyl windows are also available with insulation molded into their frames.

Combined with innovations like low-emissivity glazing (which blocks radiant heat), argon gas-filled spaces between panes, and thermal breaks between conductive sash and jamb sections, windows are no longer viewed as energy losers, but as part of a home's energy-saving system. ■

with caulk to create a permanent seal (this also helps to discourage invading insects and vermin).

Concrete or block walls that reach above the exterior landscape can be insulated on the interior side with conventional insulations, or outside with closed-cell foam panel systems designed for this application.

### HVAC SYSTEMS

The heating, ventilation and air conditioning systems, especially in older homes, are often overlooked as sources of heat loss. Any connection that penetrates an exterior wall can leak air — exhaust or fresh-air ducts, condensation drip tubes, coolant pipes, kitchen exhaust outlets, and dryer vents. Home centers carry a variety of insulating wraps, scrims, and foam tubes to handle these culprits.

# Space-Saving Dresser



Who hasn't dreamed about having more living space? Take my friend Jim, for example. He sketched out a number of plans to enlarge a small bedroom on the second floor of his 1½-story

expansion-style home. Reviewing his ideas, the only viable option I could see (short of adding a dormer) was to utilize the dusty attic spaces hidden behind the walls of the upstairs room.

As it turned out, expanding into the attic improved the usable area of the room in a big way (see page 39). And, by inseting into the wall a pair of built-in dressers with extra-deep drawers, he got a ton of storage capacity and avoided giving up floor space to furniture-style dressers.

## IT'S JUST A PLAIN BOX

While Jim wrapped up the framing and drywall work in the room, I started on the dressers, and believe me, they couldn't be simpler to build. The carcass is just a plain plywood box that's glued and screwed together (CARCASE CONSTRUCTION VIEW). I built Jim's out of nice oak-veneered plywood because of the exposed cubby hole at the top. But if you put doors over this area, using a lower grade of plywood is fine.

Looking at the photo at left, you can see that the upper rear corner of the carcass is sloped. This accommo-

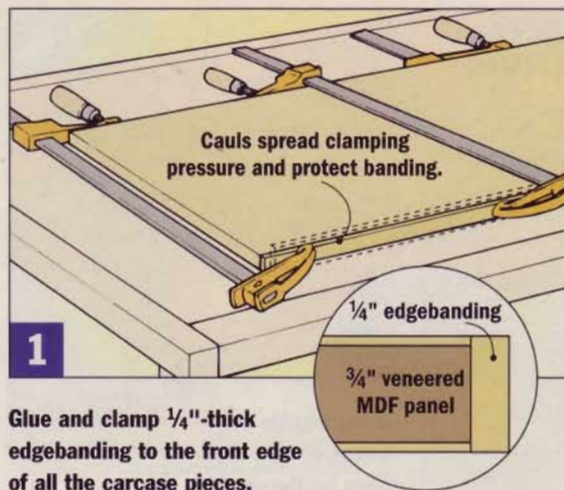
dates the 10/12 roof pitch. If you have to deal with the roof, it's probably at a different pitch than Jim's (ROOF PITCH ELEVATION). The slope on the carcass doesn't have to match your roof slope, just be sure to allow plenty of clearance between the rafters and the carcass.

Chances are, you'll need to change the dimensions of this dresser to fit your house. That's okay. Treat the drawings and measurements here as a guide, and build the project to suit your circumstances. You can also take advantage of this space-saving design

by bumping out the dresser into the closet of an adjoining room. The only thing you have to watch out for is the dresser's depth since you need drawer slides to fit this dimension.

### BEGIN WITH THE BANDING

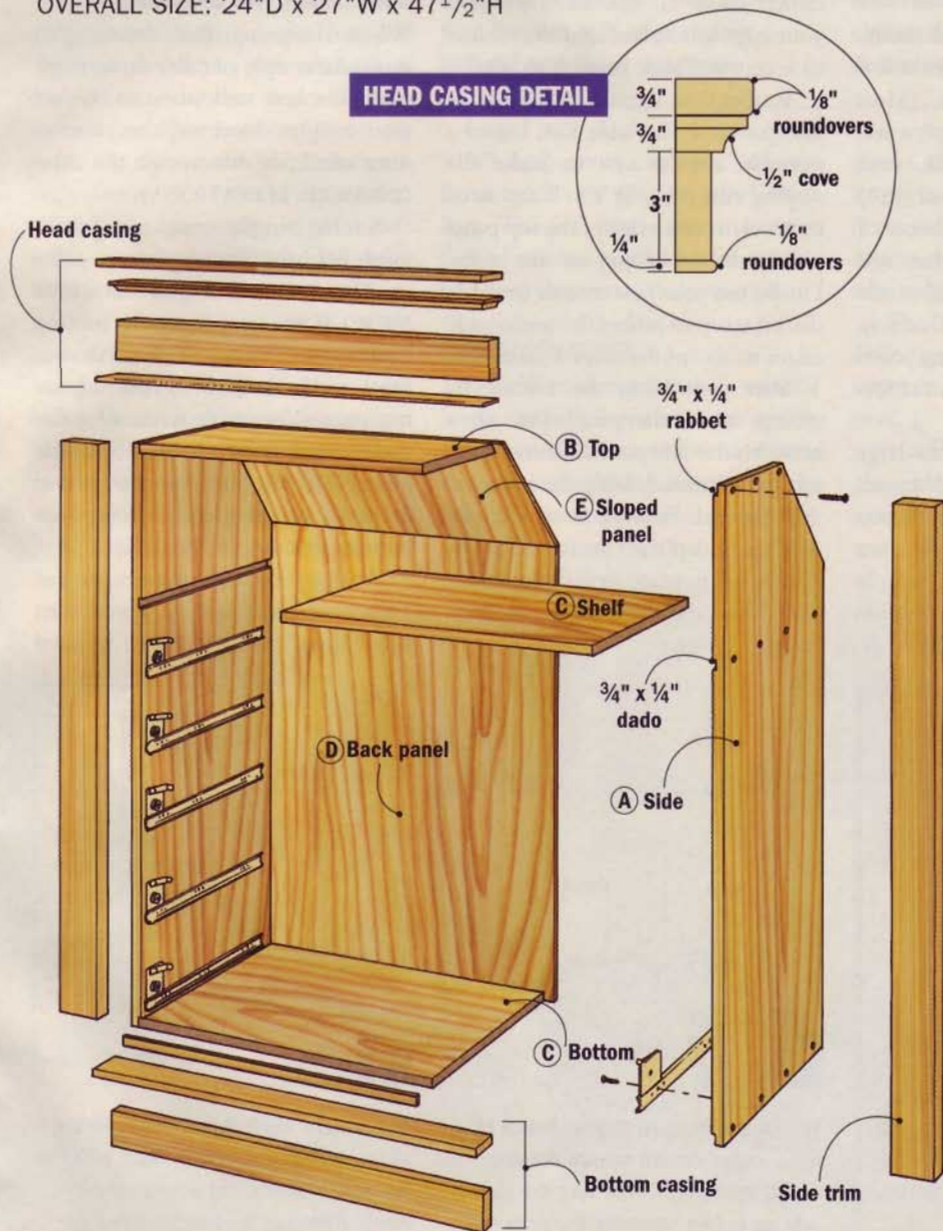
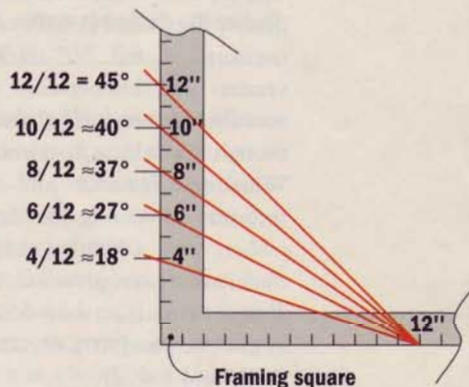
Once I had the carcass panels cut to size, I applied banding to the front edges. I ripped  $\frac{1}{4}$ "-thick banding strips from  $\frac{3}{4}$ "-thick oak stock, then glued and clamped them to the front edges of the carcass sides, top, bottom, and shelf (FIG. 1). Use cauls to ensure a no-gap fit.



## CARCASS CONSTRUCTION VIEW

OVERALL SIZE: 24"D x 27"W x 47 $\frac{1}{2}$ "H

### ROOF PITCH ELEVATION (SIDE VIEW)



## MATERIALS LIST

### LUMBER

- A (2) Sides\*  $\frac{3}{4}$ " x 23 $\frac{3}{4}$ " x 47 $\frac{1}{2}$ "
- B (1) Top\*  $\frac{3}{4}$ " x 12 $\frac{1}{4}$ " x 26"
- C (2) Bottom/Shelf\*  $\frac{3}{4}$ " x 23 $\frac{1}{2}$ " x 26"
- D (1) Back panel  $\frac{1}{4}$ " x 27" x 37 $\frac{3}{4}$ "
- E (1) Sloped panel  $\frac{1}{4}$ " x 27" x 15 $\frac{1}{2}$ "
- F (6) Sm. Drawer Fronts/Backs  $\frac{1}{2}$ " x 5 $\frac{1}{2}$ " x 24"
- G (6) Sm. Drawer Sides  $\frac{1}{2}$ " x 5 $\frac{1}{2}$ " x 22"
- H (4) Lg. Drawer Fronts/Backs  $\frac{1}{2}$ " x 7" x 24"
- I (4) Lg. Drawer Sides  $\frac{1}{2}$ " x 7" x 22"
- K (5) Drawer Bottoms  $\frac{1}{4}$ " x 21 $\frac{1}{2}$ " x 24"
- L (3) Sm. Drawer False Frts.  $\frac{3}{4}$ " x 6" x 25 $\frac{3}{8}$ "
- M (2) Lg. Drawer False Frts.  $\frac{3}{4}$ " x 7 $\frac{1}{2}$ " x 25 $\frac{3}{8}$ "

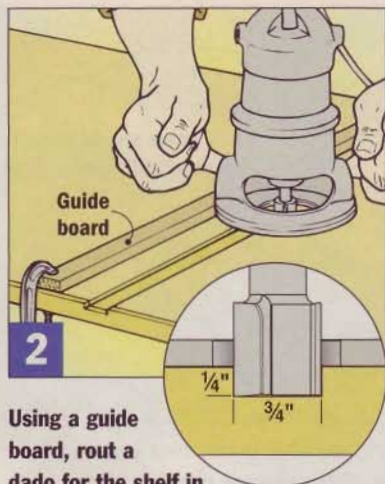
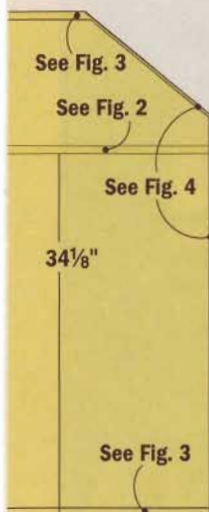
\*Apply  $\frac{1}{4}$ "-thick x  $\frac{3}{4}$ "-wide edgebanding to front edge of these pieces.

### HARDWARE

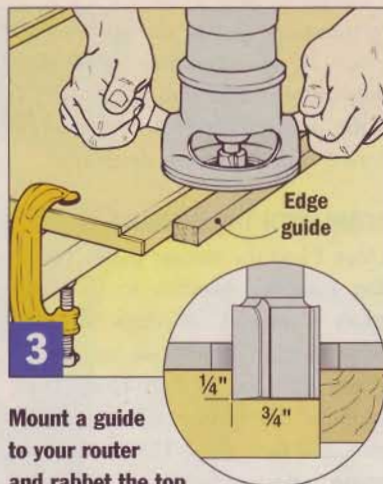
- (22) #8 x 2" FH self-tapping screws
- (5) Pair KV 1300 22"-long drawer slides
- (10) 1"-dia. black epoxy-coated knobs
- (20) #8 x  $\frac{3}{4}$ " FH screws with finish washers



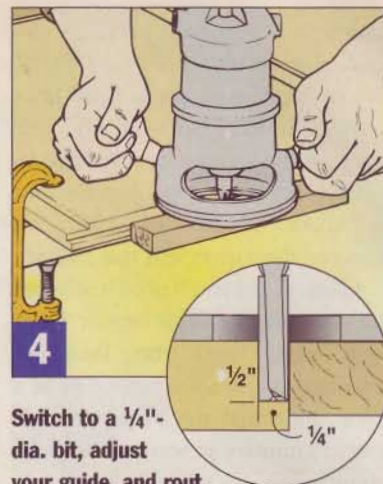
## SIDE PANEL ELEVATION



**2** Using a guide board, rout a dado for the shelf in the carcass sides.



**3** Mount a guide to your router and rabbet the top and bottom edges of the carcass sides.



**4** Switch to a 1/4"-dia. bit, adjust your guide, and rout rabbets for the back panel.

## BUILD THE BOX

The plywood I used had a medium-density fiberboard (MDF) core and it measured a full 3/4"-thick. (Most veneer- and lumber-core plywood actually measures 23/32"-thick, even though it's sold as a nominal 3/4".) Whichever material you choose, I recommend routing the dados and rabbets with a bit that matches the thickness of your plywood. That way, you can cut clean, snug-fitting joints in just one pass (SIDE PANEL ELEVATION and FIG. 2).

Cutting rabbets in panels this large is easier using a handheld router equipped with an edge guide. (If you don't own a commercial guide, see the SKILL-BUILDER for a simple substitute.) Once you cut the rabbets for the top and bottom (FIG. 3),

switch to a 1/4"-dia. bit, reposition your edge guide, and rout the rabbets to accept the back panel (FIG. 4).

Rather than wrestle with the large side panels at the table saw, I used a portable circular saw to make the sloping cuts (FIG. 5). You'll also need to bevel the rear edge of the top panel to match the slope on the sides. Finally, use your router with the 1/4"-dia. bit setup to rabbet the angled side edges to accept the sloped panel.

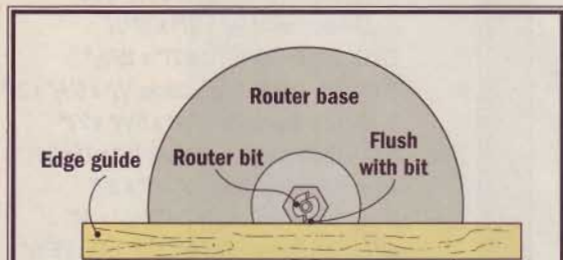
Start assembling the carcass by gluing and clamping the shelf between the side panels, then add the top and bottom. Nailing the back and sloped panels in place now will help you square up the carcass. With the clamps still in place, drill countersunk pilot holes and drive screws to reinforce the joints.

## CONSTRUCT THE DRAWERS

When designing this dresser, Jim wanted a couple of taller drawers for spare blankets and sweaters. Other than height, however, the dimensions of all five drawers are the same (DRAWER ELEVATIONS).

Strong, simple tongue-and-dado joints hold the drawer pieces together (DRAWER CONSTRUCTION VIEW). Form the tongues by routing a rabbet in the ends of all the drawer fronts and backs (FIG. 6). After adjusting your router table fence, rout the dados near the ends of all the side pieces (FIG. 7), then rout the groove in all the drawer pieces to accept the bottoms (CORNER DETAIL).

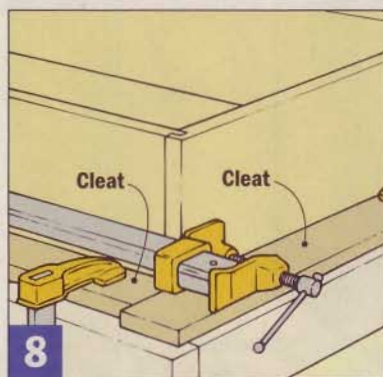
At this point, the drawers are just a stack of parts, but once you start assembling them, you'll be amazed



## SKILL-BUILDER

### Inexpensive Router Edge Guide

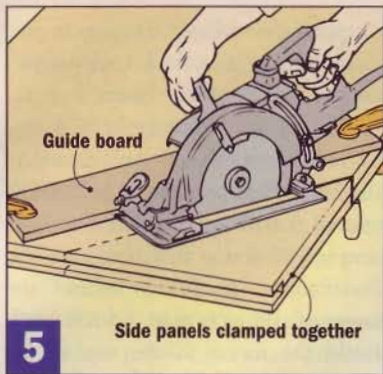
Use cloth-backed, double-face carpet tape to attach a temporary wooden edge guide to your router's base plate. Mount a bit that's the same diameter as the rabbet's width, and align the guide with the edge of the bit.



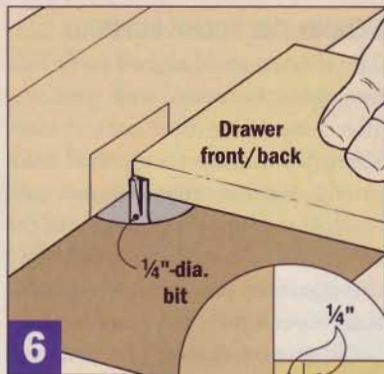
**8** Two cleats clamped to your bench at right angles ensure square drawers during assembly. Make sure the glue sets up before removing the drawer.



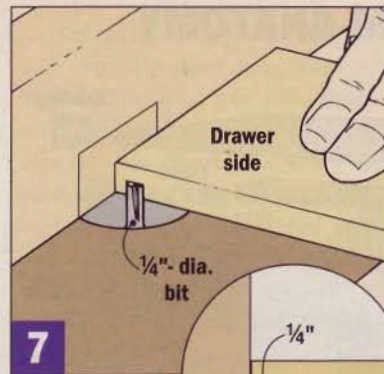
**9** A sacrificial guide board positions the slides during installation. Start with the top pair of slides and work your way down, trimming the board as you go.



**5** Layout the roof slope pitch on one side panel, clamp the side panels together, and use a circular saw with a guide board to make the angled cut.



**6** Set your router table fence flush with the bit to create tongues on the drawer fronts/back.



**7** Adjust your router fence and cut the dados in the drawer sides to accept the tongues.

at how quickly they take over your shop. (Just remind yourself of all the storage space they'll soon provide.)

Since keeping these large drawers square is crucial, I used a pair of cleats set at a right angle to hold the assemblies square until the glue had a chance to set up (FIG. 8). Rounding over the top edges of the drawers reduces the chance of snagging clothing.

### FINISHING UP

If you've built a project with an enclosed space, you know how the smell of some finishes can linger, even months later. To keep finish fumes away from Jim's off-season wardrobe, I used a low-odor, water-based polyurethane. It doesn't add the amber glow of oil-base poly, so I stained the dresser's exposed surfaces before applying the polyurethane.

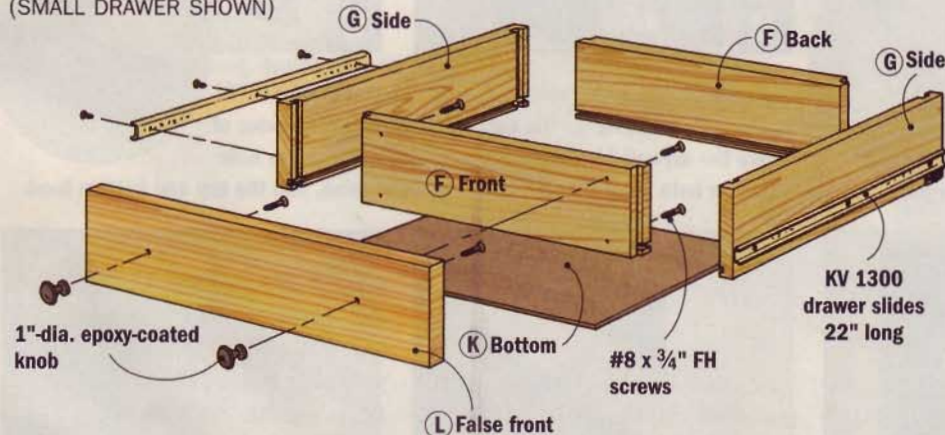
Getting drawer slides to line up may seem challenging, but using a guide board to position each pair makes this task a breeze (FIG. 9 and SLIDE ELEVATION).

Go ahead and complete the false fronts — including the knobs (FALSE FRONT DETAIL) — though you'll want to hold off the installation until you have the carcass installed squarely in the wall.

## DRAWER CONSTRUCTION VIEW

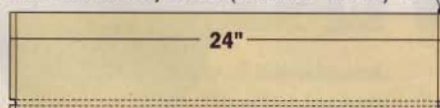
OVERALL SIZE: 6"H x 22"W x 25<sup>3</sup>/<sub>8</sub>"L

(SMALL DRAWER SHOWN)

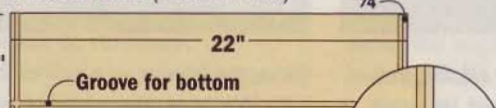


### DRAWER ELEVATIONS

DRAWER FRONT/BACK (FRONT VIEW) 1/4"



DRAWER SIDE (SIDE VIEW) 1/4"

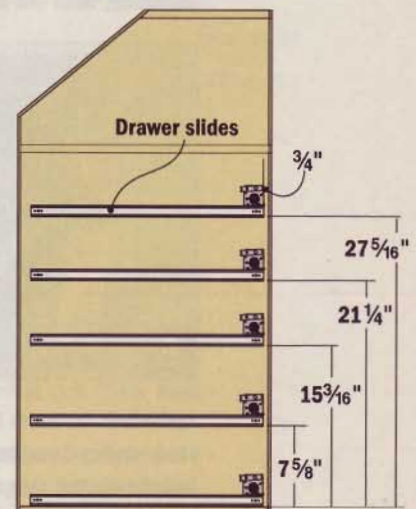


**Note:** Shallow drawer shown. Deep drawers have same dimensions except height is 7".

### FALSE FRONT DETAIL



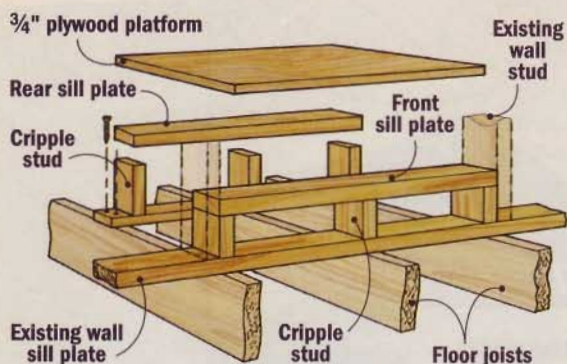
### SLIDE ELEVATION



### CORNER DETAIL



## PLATFORM ANATOMY



### BEHIND THE SCENE SUPPORT

The dresser was designed to fit into two 16"-on-center stud bays — after removing the center stud. Tying the carcass to the wall studs provides some support, but not enough to support the weight of the carcass, the drawers, and everything that goes into the drawers — potentially several hundred pounds.

To support that weight, you need to build a platform for the dresser to rest on. It also gives you a surface to

support the dresser carcass as you slide it into the wall cavity that's several inches off the floor.

The front of the platform is supported by wall framing explained in the installation procedures below. The rear of the platform is held up by a simple 2x4 frame that rests atop the floor joists (or floor) behind the kneewall (PLATFORM ANATOMY). Build the frame so the top of the platform will be level with the bottom of the hole cut in the wall.

## A Built-in Installation Doesn't Require Extensive Demolition

Cutting a hole in an existing wall can seem intimidating, but with a little care you may not even need to touch up the paint. The most important thing to remember is to measure carefully based on what you actually find behind the wall

once you cut small access holes. The reality of your situation could be far different than what's considered standard construction practice. (To learn about proper wall framing, turn to page 32.)

Make sure you steer clear of

wiring and plumbing. (A small inspection hole is easy to patch compared to cutting the entire hole first and finding a waste stack.) After carefully laying out the hole, use a reciprocating saw or a jig saw to make the cuts.



**A** Punch a small inspection hole to check for wiring and plumbing, then cut a larger hole.



**B** Measure from existing studs to mark the edge of the hole for the carcass. Leave the drywall 1 1/2" proud of the studs on both sides of the hole.



**C** Use a level to mark the sides of the carcass hole plumb, and the top and bottom level.



**F** Jack studs fasten to the existing wall studs and rest on the front sill plate. Install only one side so you have clearance to swing the header into place.



**G** Swing the header — a pair of 2x6's with 1/2"-thick plywood in between — into place on top of the trimmer. Then install the other trimmer.




**H** Assemble the dresser platform, lift it into the wall cavity, then secure it to the front sill plate.

## ADD THE FINISHING TOUCHES

How you trim the dresser is up to you. I created a built-up head casing that matches the style of the window casing in the room. It made sense to assemble, stain, and apply finish to the casing in the shop prior to installation.

To install the trim, I predrilled holes and drove 6d finish nails into the 2x4 framing surrounding the wall opening. I left a 1/8" reveal on all sides, giving the installation a

professional look. Consider installing the top and bottom trim pieces first so you can trim the side pieces to fit.

With the trim installed, I helped Jim move the bedroom furniture in from the hallway. This once cramped bedroom was now spacious and the dressers blended in as though they'd been part of the home's original design. And it all came from space that was always there, just waiting to be used. 



To minimize damage to the drywall and avoid popping nail or screw heads loose, I recommend installing the new framing members with 2 1/2" drywall screws. That way you avoid the impacts created by driving nails. It's also

easier to drive a screw than a nail into well-seasoned existing wall studs, particularly those found in older homes.

Before slipping the carcass into the cavity, screw the drywall to the new framing around the hole.



**D** Cut the drywall on your marks. Then cut through the center stud and carefully pry it loose.



**E** Screw short cripple studs to the wall studs. Install the front sill plate on the cripples.

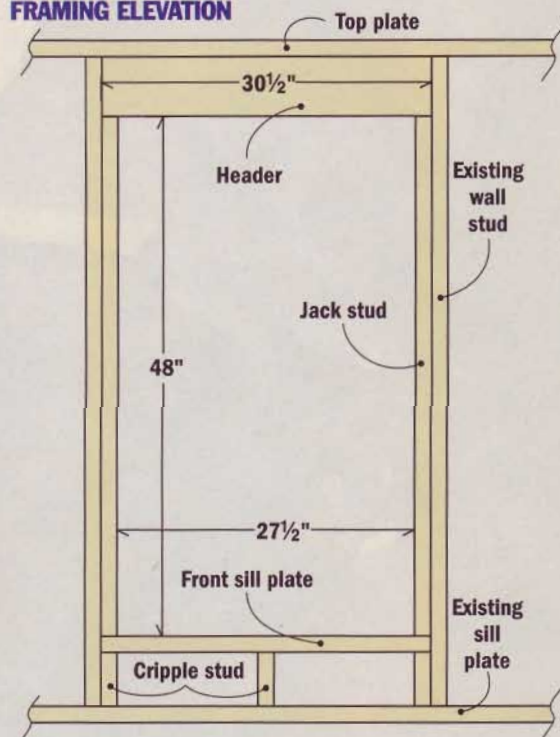


**I** Set the carcass in the cavity and shim the bottom level. Once it's level, drive screws through the bottom to secure it flush with the wall.



**J** Shim the sides plumb and flush with the wall before driving screws at the shim locations.

## FRAMING ELEVATION



**K** Starting at the bottom, install the drawers. Use pennies to shim the false fronts from below and side-to-side. Clamp the fronts and drive the screws.

# Air Nailer Smorgasbord

I can't tell you how many nails I've driven in my lifetime, but I know I'd have to measure in tens of thousands. Even though I've swung a

hammer so many times it feels as natural as taking a step, the bond with that trusty tool is threatened.

Air nailers may put an end to my hammer-swinging ways.

I'm a little late catching on to the virtues of air-driven nails.

Though nailers have been around for 30 years, they weren't often seen outside of construction sites and professional cabinet shops. Like many pro tools, nailers were high priced and not widely available, putting them beyond the reach of most DIY'ers.

## POWER TO THE PEOPLE

Today, nailers are showing up everywhere from job sites to home shops. The popularity of these tools is easy to understand. Forget bragging about your ability to drive a 16d nail in two blows. With a nailer, anyone can look like a hero. Whether you need to drive a 1/2"-long staple or a 3 1/2" framing nail, all you have to do is squeeze the trigger. Prices starting under a

hundred bucks also mean that anyone, not just a pro, can afford to spoil himself by adding an air nailer or two to his tool arsenal.

But which nailer should you buy? Just like there are different hammers for every application, nailers are available in a variety of types, each designed to meet a specific need. This can make choosing the right tool confusing. Before you shop, it helps to understand what type of nailer can best handle your intended uses.

Nailers can be broken into four basic categories: framing, roofing, finish, and brad. Add air staplers, and you have five categories. Within each category there are variations in design, capacity, and features, but the tools function similarly. Let's take a closer look at each type.

## FASTER FRAMING

If you've ever watched a house being built and been amazed by how fast it happens, then you already know what a framing nailer can do. These are the "big guns" of air-powered fastening.

To understand how much faster framing with an air nailer is, just think about the number of nails in a wall 10-ft. long — nine studs with four nails each, a double top plate, nails holding the bottom plate to the floor, plus headers, jack studs, etc.

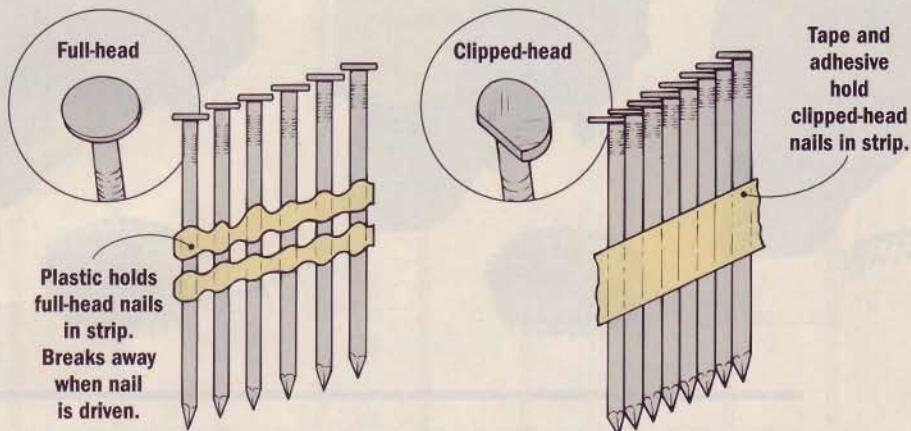


You don't need Popeye's forearms to drive framing nails with ease. A framing nailer sends 3½"-long spikes through wood like a knife cuts through butter.

## FRAMING NAIL DETAILS

Lengths: 2"-3½"

Available with ring or plain shanks, coated or galvanized.



You'll easily need 70 or more nails. If it takes three hammer blows to drive a 16d nail (a conservative estimate for most of us), that's 210 blows.

Great, you may say, I can gain speed, but a 22-oz. hammer is a lot easier to tote around than an 8-lb. framing nailer. In my experience, carrying a nailer for a few hours is far less fatiguing than swinging a hammer all day.

I appreciate increased speed and decreased fatigue, but these aren't my main reasons for using a framing nailer. In my remodeling and renovation projects, I've often reframed areas of existing walls, or added new

walls to them. The rattling caused by repeated hammer blows often cracks plaster or splits drywall seams. Using a nailer eliminates or at least reduces this, meaning less repair work after the framing is done.

Nails for air-powered framers are generally coated with adhesive to give extra holding power. Friction from the nail entering the wood melts the glue, and as it hardens the

glue locks the nail in place. Try pulling an air-driven nail and you'll notice the difference.

Most framing nailers are the stick-type, with a long, angled nail magazine. Nails come in two types: full-head and clipped-head (FRAMING NAIL DETAILS). Full-head nails are collated with space between them so the heads clear one another. Clipped-head nails eliminate the spacing by

## FRAMING NAILERS

### APPLICATIONS

- Wall framing and construction
- Remodeling and additions
- Attaching wall and roof sheathing
- Deck building

### SPECIFICATIONS

- Weight: 7- to 10-lbs.
- Nail size range: 2"- to 3½"-long
- Nail capacity (stick-type): 60-70 full-head, 70-90 clipped head
- Nail capacity (coil-type): 200 or more

### PRICE

- \$250-\$350





## ROOFING NAILERS

### APPLICATIONS

- Attaching roof sheathing and shingles
- Installing wall sheathing

### SPECIFICATIONS

- Weight: 5- to 6-lbs.
- Nail size range: 3/4"- to 1 1/2"-long
- Nail Capacity: 100 to 150

### PRICE

- \$250-\$350

snipping part of the head off flush with the shaft. This allows more nails per strip with a marginal sacrifice in holding power.

Framing nailers are also available with coil-type magazines. These are favored by some for their compact size, and because they'll hold up to four times as many nails.

While a framing nailer is handy, it is limited to driving large nails. So most of us will only use one for projects that involve building, adding on, and remodeling. You can rent a framing nailer for around \$40 per day, but if your job lasts more than a week, your rental cost will equal the \$250-\$350 purchase price.

### UP ON THE ROOF

If you think it takes a lot of nails to build a wall, imagine how many it takes to shingle a roof. And when you're roofing, there's usually one overriding concern — speed. I don't care if skies have been clear for a week. Tear off your shingles and it's guaranteed to pour down rain in your neighborhood. A roofing nailer lets you get things under wraps sooner.

Roofing is also grueling work, and my not-so-young-anymore body appreciates anything that makes the job easier. The nails are short, so they're not tough to drive by hand (ROOFING NAIL DETAILS). But a three-tab shingle requires four nails,

so you go through a lot of them on even a modest roof.

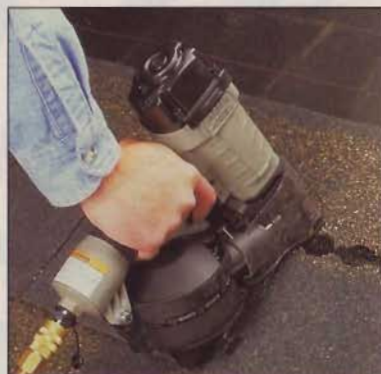
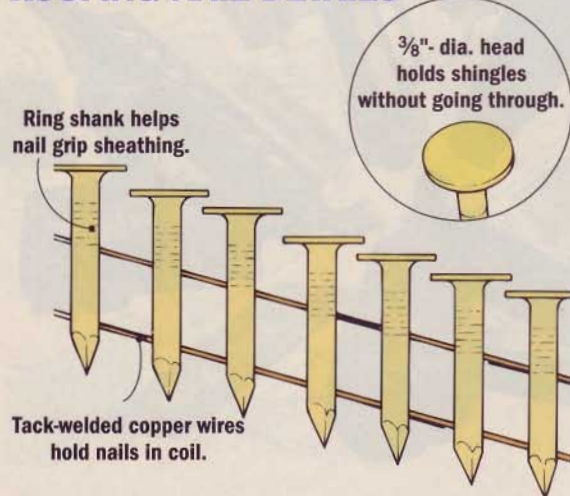
Roofing nailers are smaller than framers, and use the coil-type magazine. Like a coil-framer, they hold more nails, so you spend more time using the tool and less time loading nails. This compact design is also a big help when you're on your knees with little space between yourself and the shingle.

Roofing nailers have other features to make roofing easier. Most have a base designed to aid shingle and nail alignment. Position the adjustable foot to match your shingle exposure, and you can place the nails in each shingle consistently. The base also holds the nailer square to the roof, helping you drive the nails straight. This prevents raised nail heads that eventually poke through an overlying shingle.

It's easy to see the advantages of a roofing nailer, but whether you should buy or rent one is a tougher call. Again, you'll pay around \$40 per day, so a week's rental nears the \$250-\$350 price. But once your shingles are on, you may not need the tool for years.

Of course, if you have a roofing nailer around, your friends will want to borrow it. When you let them, they'll *really* owe you a favor in return some time.

## ROOFING NAIL DETAILS



**Compact and lightweight, a roofing nailer allows you to lay shingles quickly, and can make aligning them easier.**

## FINISH NAILERS

### APPLICATIONS

- Installing molding and millwork
- Assembling cabinets and carcases
- General-purpose nailing

### SPECIFICATIONS

- Weight: 5- to 6-lbs.
- Nail size range:  $\frac{3}{4}$ "- to  $2\frac{1}{2}$ "-long
- Nail Capacity: 100 to 110

### PRICE

- \$175-\$350



### QUICK TO THE FINISH

Framing and roofing aren't everyday activities around my house, but smaller improvements and in-shop woodworking are. Both pursuits can be made easier with a finish nailer.

Finish nailers drive 15- or 16-gauge fasteners, which are available in lengths from  $\frac{3}{4}$ " to  $2\frac{1}{2}$ ". Thicker 15-gauge nails are often individual wire nails joined together into strips (FINISH NAIL DETAILS). The 16-gauge finish nails are sometimes stamped from metal sheets, similar to the way brad nails are made (I'll explain more on this later). For longer nails, I prefer the wire type. They're stiffer than stamped nails, which I've had deflect when driven into a knot or dense grain. Most nailers shoot one gauge or the other, but there are combination 15/16-gauge models available.

As the name implies, these are tools designed for finish carpentry — exterior and interior trim and cabinet work. But finish nailers are handy for woodworking as well. The variety of nail sizes make this tool useful for joinery, attaching face frames and backs to cabinet carcases, building boxes, and other uses in the shop. The nails are too large for delicate work, but fine in larger assemblies.

When you look at finish nailers, you'll notice a couple of different

styles. Some orient the nail magazine perpendicular to the nailer's nose. This is known as a straight magazine. Other finish nailers have angled magazines. As you can see in the photo below, you can reach more easily into corners and tight spots using an angled-magazine nailer.

Another difference among finish nailers is how the moving parts are lubricated. Most require you to regularly add a couple drops of oil in the air intake. Though the amount of oil is small, it can stain your workpiece if it sprays out with the blast of air accompanying the nail. Oil-less nailers are permanently lubricated, eliminating this problem.

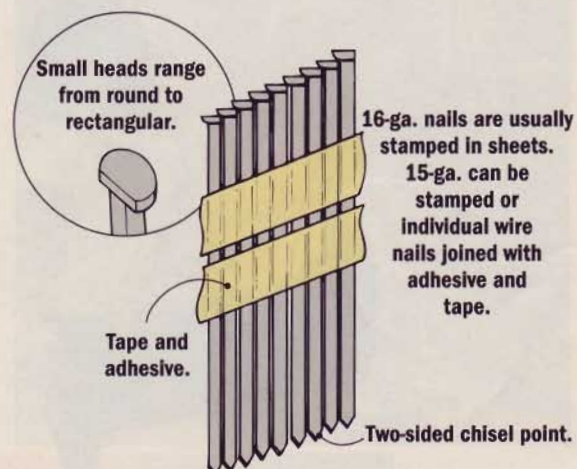
As you'd expect, speed is one advantage with a finish nailer, but it's more a bonus. I've left my share of dents in moldings and casework from misplaced hammer blows. Those mule tracks don't happen with a nailer. The tedium of countersinking nail heads is also history, as is the problem of not having enough hands. You can position the workpiece with one hand while you use the other to drive home the nails with the squeeze of a trigger.

Justifying \$200 for a finish nailer isn't tough if you want a versatile tool for use on remodeling projects, and one that can simplify building large woodworking projects as well.



Either type of finish nailer simplifies installing trim, but the angled-magazine (left) allows more angles of approach.

### FINISH NAIL DETAILS







## BRAD NAILERS

### APPLICATIONS

- Assembling cabinets and carcasses
- Attaching face frames
- Installing molding and trim
- Reinforcing glue joints
- Building boxes and drawers

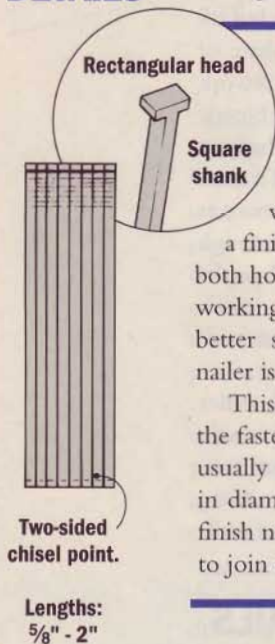
### SPECIFICATIONS

- Weight: 1<sup>3</sup>/<sub>4</sub>- to 4-lbs.
- Nail size range: 3/8"- to 2<sup>1</sup>/<sub>2</sub>"-long
- Nail Capacity: 100 to 150

### PRICE

- \$60-\$200

## BRAD NAIL DETAILS



### IT'S AUTOMATIC

A brad nailer looks like a small straight-magazine finish nailer, and in many ways, that's just what it is. Like a finish nailer, this tool is great for both home improvement and woodworking. While a finish nailer is better suited to carpentry, a brad nailer is a natural for woodworking.

This is mainly due to the size of the fasteners. Brads for air nailers are usually 18-gauge, which are smaller in diameter than 15- and 16-gauge finish nails. The diameter allows you to join smaller pieces and thin stock

with little fear of splitting the wood, even close to a board's edges or ends. But brads are more susceptible to bending. I've had brads bend when they hit the dense fiber of a board's growth ring and exit the board's edge instead of going through.

Brads are made the same way as the 16-gauge nails discussed earlier (BRAD NAIL DETAIL). A strip of brad nails is just a sheet of metal that's been stamped with deep score marks. One edge is flattened to make the heads, the other formed into chisel points. When you squeeze a nailer's trigger, the



**A brad nailer makes quick work of mounting cabinet face frames, and leaves a clean, countersunk nail.**

plunger breaks an individual nail free of the sheet. In cross section, air-driven brads are more square than round. Some brad nailers handle slight-head and headless brads, which leave just a tiny hole to fill.

The variety of brad types and lengths available makes the decision

## The 2-in-1 Alternative: Brads and Staples

Versatility is, as I said above, one of the best things about a brad nailer. From cabinet joinery to carpentry mine gets a lot of use. My stapler is versatile as well, seeing use for everything from hanging shingle siding to upholstering my dining room chairs. About the only fastening tool that could be more handy is one that drives both brads *and* staples.

Recently, several manufacturers have designed tools that do drive both types of fasteners. A 2-in-1 unit is a good choice as a first air tool and for general-duty use. Versatility takes on new meaning when one tool can be used for so many things. To top it off, you don't have to change any settings to swap fasteners. Just drop in the type you need (2-IN-1 DETAIL).



## STAPLERS

### APPLICATIONS

- Attaching wall sheathing and sheathing
- Assembling cabinets and carcasses
- Upholstery, crafts, and picture framing
- Attaching lattice, screen material
- Building jigs and fixtures

### SPECIFICATIONS

- Weight: 1<sup>3</sup>/<sub>4</sub>- to 6-lbs.
- Staple size range: 3/4"- to 2<sup>1</sup>/<sub>2</sub>"-long
- Staple Capacity: 100 to 180

### PRICE

- \$60-\$300



**Air staplers put fasteners where you want them, without recoiling or requiring an iron grip to squeeze the trigger.**

on buying a brad nailer almost automatic. If you're still not convinced, the selection of good quality models available for under \$100 should be enough to justify spoiling yourself with air fastening. As a first gun, or as an all-around performer, a brad nailer is a great choice.



## STAPLE DETAILS

Crown widths  
1/4", 7/16", 1/2"



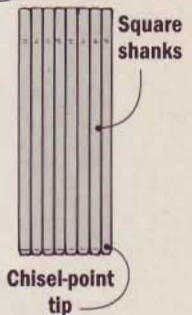
Before you buy a brad nailer, though, consider the work you'll be doing. Brads are available in lengths from 3/8" to 2", but I'm unaware of a nailer that drives the full range of sizes. Most manufacturers offer one model that drives nails from 3/8"- to 1 1/4"-long, and another for nails from 5/8"- or 3/4"-long, through 2"-long.

### TWO-LEGGED NAILS

Among the air nailers, you'd think there's a fastener for every application, but there are cases when a nail isn't the best choice. Brads, for example, pass right through uphol-

stery cloth. For these jobs an air stapler is better. I also use a stapler for joining picture frames and for attaching wood shingles, lattice, and (with the larger staplers) some sheathing materials (STAPLE DETAILS).

In size, fastener length, capacity, and price, an air stapler is similar to a brad nailer. A stapler is also almost as handy. These similarities have led some manufacturers to offer units that drive both 18-gauge brads and staples, a truly versatile setup (see *The 2-in-1 Alternative* below).



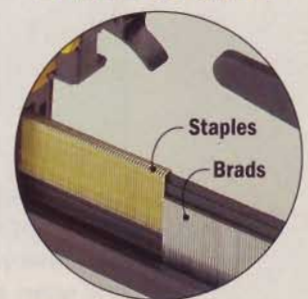
Lengths:  
1/2" - 2"

You can also pick one up for the same price as either of the individual tools — \$100 or less.

Drawbacks are minor. Most work with short to mid-length fasteners only, and the plunger does leave a larger indentation in the stock when firing brads.



## 2-IN-1 DETAIL



## CORDLESS NAILERS

### TYPES AVAILABLE

- Currently, Paslode makes one framer and one finish nailer. Porter-Cable offers two finish nailers and a medium crown stapler.

### SPECIFICATIONS

- Compressed fuel cartridges supply power. Paslode uses a small engine to fill the piston chamber and a battery-driven firing mechanism. You compress the Porter-Cable nailers manually to fill the chamber; the firing mechanism is piezo-electric.

### PRICE

- \$250-\$550



**Fastener loading varies on different guns, even of the same type. Choose one that allows you to insert the nails or staples easily.**

### VARIATIONS ON THE THEME

Beyond these five basic types, there are other nailers. These often serve a very specialized application such as attaching wood to concrete, or driving large nails in tight spots. Generally speaking these aren't tools necessary in the average arsenal.

Two manufacturers currently offer cordless nailers. These tools use gas power rather than air power. The guns are exceptionally portable since you don't need a compressor, but they're priced higher than tools driven by air.

### COMMON DENOMINATORS

By now you're hopefully more familiar with the types of air nailers (and staplers) available. By considering the ways you'll use a nailer, you

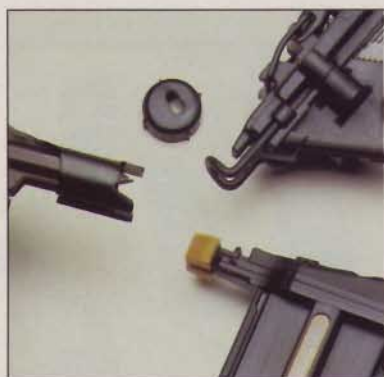
can narrow the field when you shop. But what else should you look for? Whether you need a framing nailer or a stapler, there are some design elements and features that are worth considering.

Of course, you should purchase a tool built by a reputable manufacturer. I've seen off-brand nailers that seem to offer the features of higher-priced models at bargain basement prices. If you've never heard of the brand, though, chances are good that no repair center has either.

Nailers aren't technically complicated, but do require close tolerances and effective seals to prevent air leaks and misfires. Nail plungers should be hardened steel to stand up to repeated use. These are features common to name-brand tools.

While you don't want a nailer from the bottom of the barrel, you don't necessarily need the cream of the crop either. A pro-oriented model may be tested for one million cycles (nails driven). A consumer-grade tool, on the other hand, may test to 300,000 or 500,000 cycles before it fails. I'd bet most of us won't drive a third that number of fasteners in our lifetimes.

Before you can drive a single fastener, you need to load them into the nailer. Check how easily you can insert fasteners in the magazine. You may have to open a cover, and all nailers have a spring of some type to keep tension on the nails. Some nailers are easier to load than others, and only you can best judge which style works best for you.



**The serrated tip on a framing nailer is great for biting into a stud, but could mar a nicer piece of wood. Finish and brad nailers have a smooth, padded tip.**



**Nailers exhaust air after driving each fastener. On many models you can rotate the outlet to direct the blast of air away from you and your work.**



**Most framing, roofing, and finish nailers have an adjustment that allows you to set the depth-of-drive. A thumb wheel is commonly used for fine tuning.**



The magazine on a coil nailer allows the coil to unwind as nails are used. A height-adjustable platform aligns nails of different lengths properly.



While air nailers are pretty reliable, occasional fastener jams are inevitable. When it happens, you have to remove a cover plate on the tool's

nose to extract the fastener. On some nailers, this requires a wrench (left). Others have a quick-release for tool-free jam removal (right).

You may occasionally need to clear jammed fasteners from the tool's nose. On some nailers, there's a quick release cover. Others require a wrench to remove the cover.

Another feature to look for is the right type of nose for the job. You wouldn't want a serrated nose tearing up your millwork, but those serrations can help a framing nailer's nose grip a stud. Finish and brad nailers have rubber guards to prevent scarring your workpiece.

Also nice is an adjustable exhaust. The air that drives the plunger has to be expelled from the gun, but you don't want it blowing in your face, or all over your project.

Some nailers also have depth-of-drive adjustment which allows you to precisely set countersink depth.

Most nailers are sold in "kits" that include oil, wrenches, and sometimes safety goggles and an assortment of fasteners. Make sure your tool includes all the items needed for routine maintenance.

#### CARE AND FEEDING

Maintenance is a critical part of owning a nailer. All but oil-less models need oil every day (or every time they are used) to keep moving parts free and to prevent seal deterioration.

You also need to keep moisture out of the tools by occasionally draining your compressor to rid it of condensation. In-line oilers and water filters are available, but probably aren't necessary for around-home use. For help choosing the right compressor see *Air Compressor Basics* below.

And, of course, you should only use fasteners designed to work with your nailer. Some nailers will accept multiple brands of nails, and some nails fit more than one brand of nailer. But fastener shapes and sizes still vary among manufacturers, and full standardization is yet to come.

I haven't quite developed a bond with my air nailers like I've had with hammers. In fact, I could never completely give up using a hammer. A hammer is sometimes more practical, and I just still enjoy swinging my old favorites. Nonetheless, I'm a real fan of driving nails with air power. At first, my air nailers seemed like luxuries. Now I wonder why I waited so long.

## Air Compressor Basics

When choosing a compressor, it's easy to get hung up on obvious attributes such as horsepower and tank size. But to get the compressor that's right for your needs there are two other important, and related, considerations.

Examine how many pounds per square inch (psi) of air pressure the compressor produces. Most air nailers operate in a range from 70-120 psi. As important as psi is the volume of air, in cubic feet per minute (cfm), the compressor can deliver at a given psi. Brad nailers, for example, require only 1-2 cfm at 90 psi, while a roofing or framing nailer may need close to 5 cfm. Check the specifications listed with your nailers, and make sure the compressor you choose produces at least the minimum required. Higher output is fine. You can use the compressor's regulator valve to tailor psi output to your needs.

A larger tank lets you drive more fasteners before the compressor needs to refill, but also means a bulkier compressor that's harder to move.

**Vertical-tank.** Best suited to stationary use. Large air tank capacity.



**Pancake-style.** Very portable, compact, quick recycle time.



**Single or double side-stack.** Portable, good air capacity.



# Shop-Built Slides

High-tech has its place, but sometimes simple is better. Want an example? Look at the wooden drawer slide below. It's just three pieces of carefully machined hardwood, held together with a couple of screws and washers — a far cry from the complex and expensive steel slides we're all used to.

And my full extension slides can be made to the exact size you need — a real bonus since it's hard to find ready-made slides shorter than 12".

Don't get me wrong. Roller and ball-bearing slides still make sense for drawers that hold a lot of weight, extend a good distance, or where you want very smooth performance. But when economy and short length are the keys, shop-built slides easily answer the call.

## HOW THEY WORK

One unique feature here is that the drawer side can be part of the slide. A rail captured between the drawer side and a second piece form a sort of sliding sandwich (SLIDE CONSTRUCTION VIEW).

Because the pieces must fit together precisely, I recommend cutting the grooves and slots with a table-mounted router. This is best for a couple of reasons. First, you can easily fine-tune the cutting depth and the fence position with great precision. And unlike some dado blade cuts, routing results in flat, smooth-bottomed grooves, an important factor in the operation of your slides.

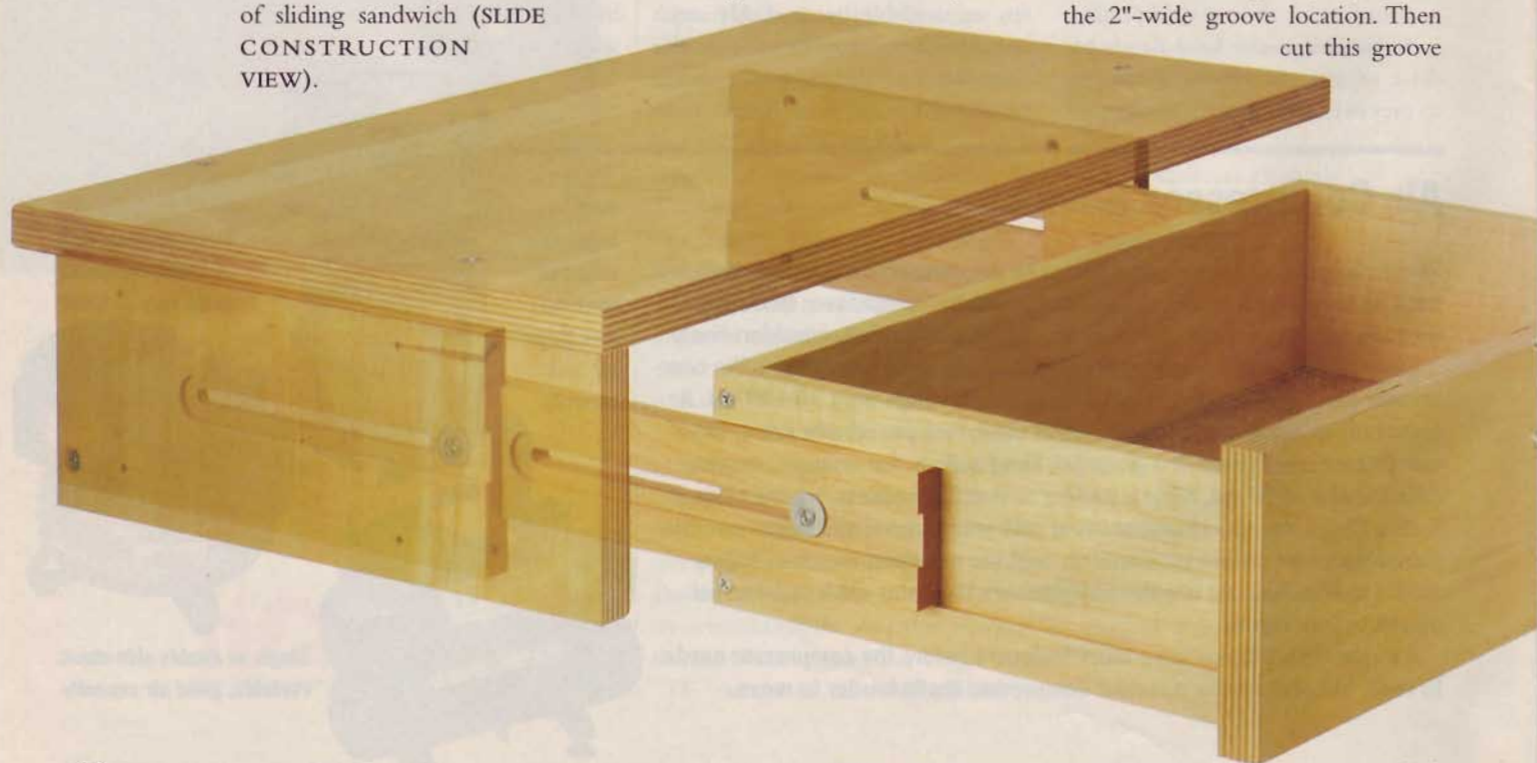
If possible, consider using straight-grained hard maple for its strength and stability. I suggest making a set out of scrap first, however, just to get the technique down. Having a working set will give you a better understanding of the slides and the process.

The slide dimensions described below are for the *Knife and Spice Racks* (page 63) and the *Shop Utility Station* (page 66) projects in this issue. You can easily alter these dimensions to suit other projects.

## MILLING THE TRACKS

When I built my first set of slides, I learned a lot. The first thing was that the grooves in the carcass tracks and drawer tracks needed to be identical (SLIDE ELEVATIONS). To get this kind of consistency, I decided to cut one groove in an extra-long blank, then cut it into the lengths I needed.

With that extra-long stock in hand, you can begin by laying out the 2"-wide groove location. Then cut this groove

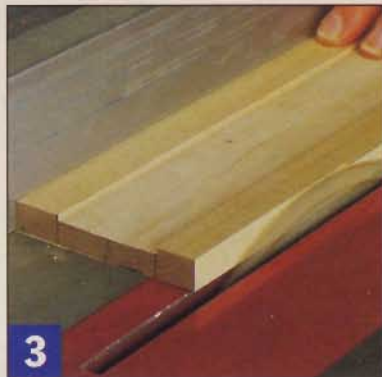




**1** Layout the 2"-wide groove on an extra-long blank and adjust the router fence to make the cut that defines one edge of the groove. Use a 3/4"-dia. bit.



**2** Turn the stock end-for-end and make a second pass. Move the fence to make the third pass.



**3** When ripping the drawer track blank to width, be sure to remove an equal amount from both edges so that the groove remains perfectly centered.

1/8"-deep in three passes using a 3/4"-dia. straight bit chucked in a table-mounted router (FIGS. 1 and 2).

After you have the groove routed, crosscut the carcass tracks from the extra-long blank. The drawer track pieces need to be slightly narrower than the carcass tracks, so you'll want to rip the remaining blank to width for the drawer tracks (FIG. 3).

Once this step is completed, crosscut the drawer tracks to finished length. You can set aside the drawer track pieces for now.

### ROUT THE GROOVES AND SLOTS

Thinking back on my prototype also revealed a couple of routing shortcuts that I've used when making slides since then.

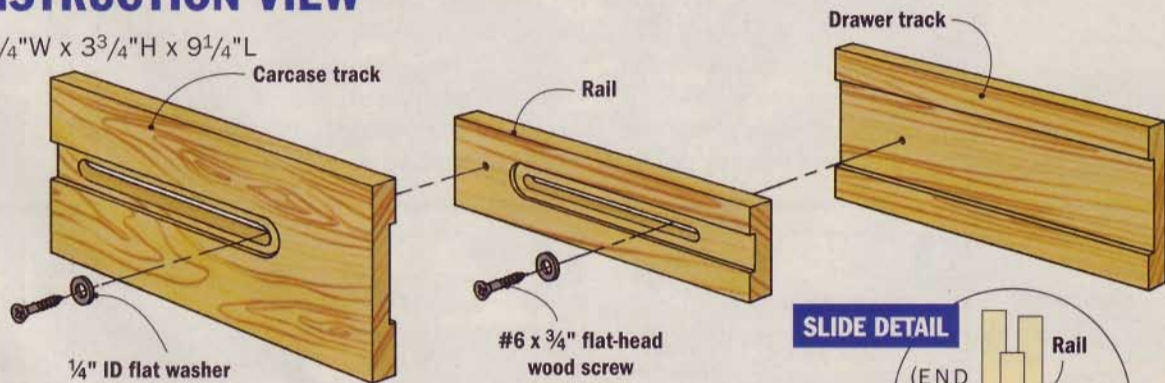
As you can see in the SLIDE ELEVATIONS below, each rail and the carcass tracks have a shallow groove for the washer and a through slot for the screw. These grooves and slots are centered on the width of each piece. And as you probably can guess, getting their position to be identical and consistent is important.

What I learned was that centering the grooves and slots on pieces of differing widths required many adjustments of the router table fence, which introduced chances for errors. But I could avoid moving the fence if the rails started out the same width as the carcass tracks. Then, after machining all the grooves and slots, I could rip the rails to their finished width.

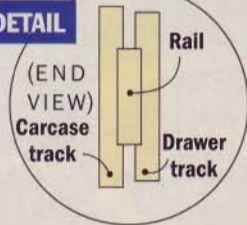
To put this procedure into practice, first rip and crosscut rail blanks to the same size as the carcass tracks.

## SLIDE CONSTRUCTION VIEW

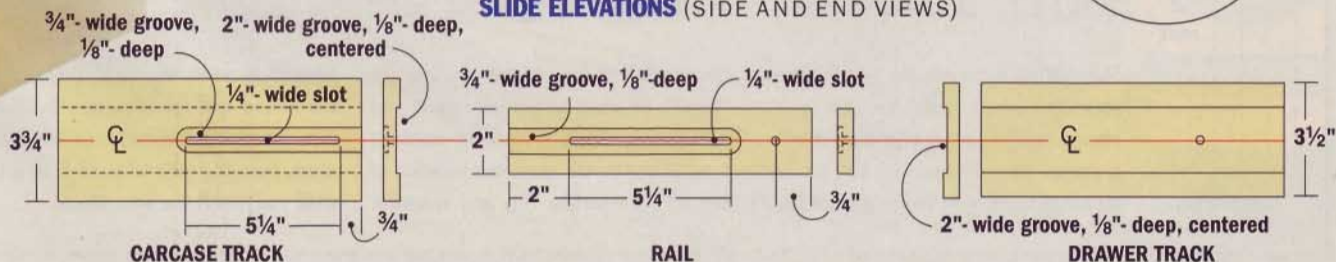
OVERALL SIZE: 1 1/4"W x 3 3/4"H x 9 1/4"L

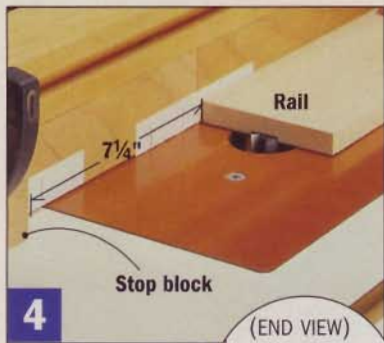


### SLIDE DETAIL

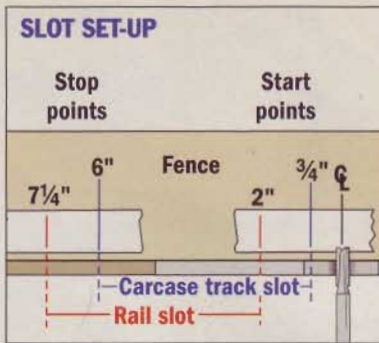


### SLIDE ELEVATIONS (SIDE AND END VIEWS)





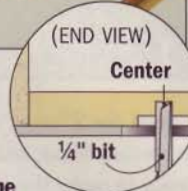
**4** To rout the washer grooves, center the bit on the stock. A stop block clamped to the fence accurately halts the cut.



Layout the start and stop points for the through slots on the router table fence (all measurements are from the bit centerline). Clamp a stop block to the fence at the respective stop points.



**5** Start the router, align the rail with the 2" mark, then lower the rail onto the bit. Cut the through slot in two passes.



Next, mark a centerline on the end of one piece and use it to center the bit on the stock at your router table (which should still be equipped with the  $3/4$ "-dia. bit set  $1/8$ "-deep).

If you look at the slide elevations on the previous page, you'll notice the washer grooves in the rails are longer than those in the carcass track. To rout the washer groove in the rails, clamp a stop block to the router table fence  $7\frac{1}{4}$ " from the center of the bit and make the cut (FIG. 4). Then reclamp the stop block 6" from the center of the bit and rout the washer grooves in the carcass tracks.

For routing the slots you'll want to unplug the router and switch to a  $1/4$ "-dia. bit. *Don't move the fence.*

The slots are stopped at both ends, so you'll rout them by making

plunge cuts (see the SKILL-BUILDER). Don't worry. You may feel a little uneasy at first, but after a few practice runs you'll be an old hand at this operation. I recommend routing these slots in two  $1/4$ "-deep passes so you don't overload the bit. It's also safer to attach a piece of scrap to your stock with double-face tape to serve as a temporary handle when making these cuts.

The slots in the rails and carcass tracks are the same length ( $5\frac{1}{4}$ "), but the start and stop points differ (SLOT SET-UP). To orient the plunge cuts in the rail blanks, make a mark on the fence 2" from the bit centerline. Align the end of a rail with the mark and begin the cut (FIG. 5). Make a first pass in all the rail pieces, then stop the router, raise the bit so it just barely

penetrates the stock, and complete the through slots.

Cutting the through slots in the carcass tracks is done the same way, though you need to use a starting mark  $3/4$ " from the center of the bit. In addition, you must reclamp the stop block 6" from the bit centerline.

### FINISH AND WAX

Rip the rails to match the width of the grooves in the track pieces, again making sure to take equal amounts off both edges. Sand the rail edges so they slide smoothly in the tracks and apply a couple of coats of penetrating oil finish to seal the wood. To keep the slides working smoothly, rub paste wax or paraffin on the mating faces of all the pieces before installing the washers and screws.

Centerpoint  
Length of rout  
Centerpoint

### SKILL-BUILDER

#### Routing Plunge-cut Stopped Grooves

**A**

Length of rout  
Start point  
Stop point  
Lower board onto bit

**B**

Length of rout  
Start point  
Stop point

**C**

Length of rout  
Start point  
Stop point

Stopped grooves require you to lower your workpiece onto the bit — a plunge cut. Since a router bit will leave a radius at both ends of the groove, measure the length of the groove from centerpoint to centerpoint and use this "length of rout" to set your start and stop points. Apply a piece of masking tape to the fence, mark the location of the bit's centerline (¢), and measure from it to mark the start point. With the infeed end raised, align the stock with the starting mark, then lower the stock onto the bit and push it through until you reach the stop block.

# Knife and Spice Racks

Everyone I know has limited counter space, and it seems most of the knife blocks I've seen take up more room than they're worth. So I got to thinking about a slide-out knife holder that fits in a wall cabinet. The space-saving design I came up with is easy to locate near the kitchen work center, and the



knives hang safely inside an enclosed drawer. It worked so well, I adapted the idea for a matching spice rack.

The knife rack is built around a set of simple shop-built wooden slides. The dimensions and machining steps for the slides are detailed in *Shop-Built Slides* on page 60, and you'll want to complete them before you get underway here.

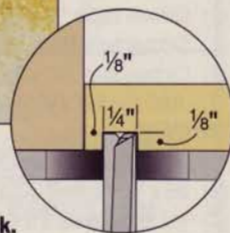
## MAKE THE DRAWER ASSEMBLY

Once you have the slides made you can cut pieces to size for the drawer sides (KNIFE RACK CONSTRUCTION VIEW). Next, rout a groove in each side, as well as the drawer tracks that form the top and bottom, to accept the back panel (FIG. 1).

Drill countersunk pilot holes in one drawer side for mounting the false front. You'll also want to drill countersunk pilot holes for screwing the drawer pieces together.



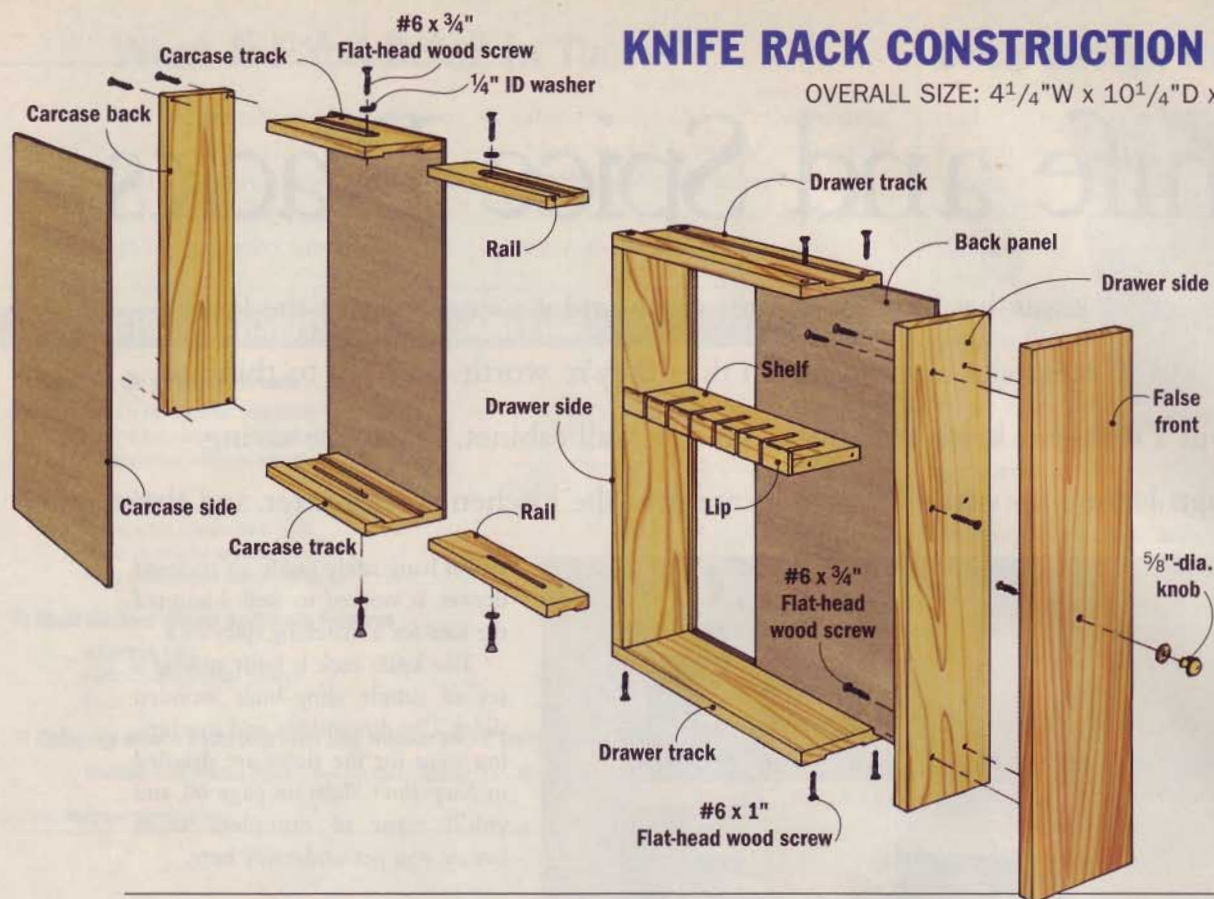
Use a 1/4"-dia. bit to rout grooves in the drawer top, bottom, and sides to accept the back. Inset the groove 1/8" from the edge.





## KNIFE RACK CONSTRUCTION VIEW

OVERALL SIZE: 4<sup>1</sup>/<sub>4</sub>"W x 10<sup>1</sup>/<sub>4</sub>"D x 17<sup>1</sup>/<sub>2</sub>"H



Now glue and screw the drawer tracks to one side piece, slide the back panel into place, and add the other side piece (FIG. 2). Check the drawer assembly for square.

### THE LIPPED SHELF

Adding a lip to the front edge of the shelf holds the knives in place. To make the lip, you start by ripping a 1/4"-thick strip from one edge of a

20"-long, 3/4"-thick piece of stock. Next, glue the strip you just cut to the edge of a 20"-long shelf blank (FIG. 3). Once the glue dries, remove the clamps and roundover the top edges of the lip using a sanding block or a block plane.

Before cutting the shelf to length you'll want to cut slots for the knives plenty of stock to hang onto here.

I recommend you apply an oil finish to the parts now, before installing the shelf (FIG. 5).

### CONSTRUCT THE CARCASE

As you can see in the CONSTRUCTION VIEW above, the carcase tracks form the top and bottom of the carcase (similar to the way the drawer is built). Cut hardboard to size for the carcase sides, and wood for the back,

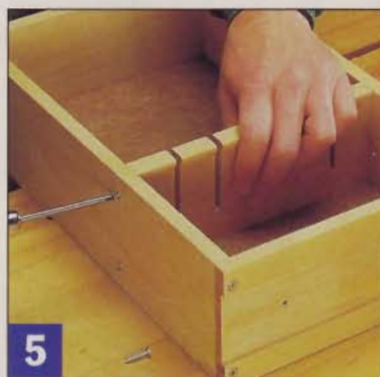
## MATERIALS LIST

### LUMBER (\* - Cut from oversized blank)

- (2) Drawer tracks 1/2" x 3 1/2" x 9 1/4" maple
- (2) Drawer side 1/2" x 3 1/2" x 15" maple
- (1) Back panel 1/4" x 8 1/2" x 15 1/4" hardboard
- (1) Shelf\* 1/2" x 27/8" x 8 3/4" maple
- (1) Lip\* 1/4" x 3/4" x 8 1/4" maple
- (1) False front 1/2" x 4 1/4" x 17" oak
- (2) Carcase tracks 1/2" x 3 3/4" x 9 1/4" maple
- (1) Carcase back 1/2" x 3 3/4" x 17 1/4" maple
- (2) Carcase sides 1/4" x 9 3/4" x 17 1/4" hardboard
- (2) Rails 1/2" x 2" x 9 1/4" maple

### HARDWARE

- (12) #6 x 1" flat-head wood screws
- (8) #6 x 3/4" flathead wood screws
- (4) 1/4" flat washers
- (1) 5/8"-dia. brass knob



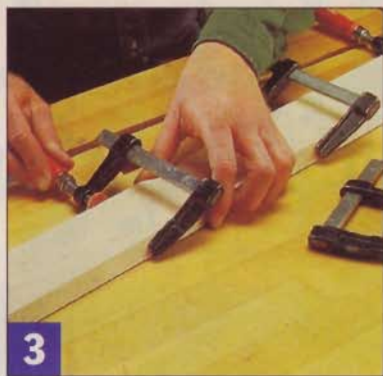
Position the shelf in the drawer and drill countersunk pilot holes for the mounting screws. Drive #6 x 1" screws to hold the shelf in place.



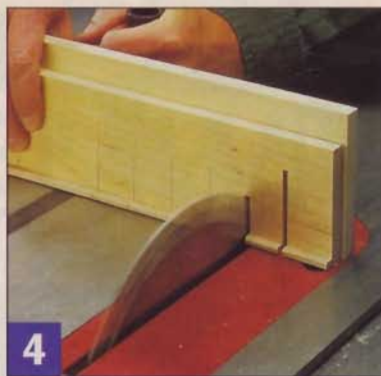
Glue and screw the carcase tracks to the back. Then glue and clamp the sides, aligning the edges with the top, bottom, and back pieces.



**2** Dry-fit and clamp the drawer assembly together and drill countersunk pilot holes. Then apply glue, reclamp the pieces, and drive the screws.



**3** Glue and clamp the lip strip to a 20"-long shelf blank. When the glue dries, use sandpaper or a block plane to roundover the top edges of the lip.



**4** Using a miter gauge with a tall fence for support, cut knife slots in the shelf blank. Layout the slots with your knives in mind. Then cut the shelf to length.

then drill countersunk pilot holes so you can glue and screw the carcass pieces together (FIG. 6).

Like before, this is the time to apply a couple of coats of finish.

### JOINING THE SUBASSEMBLIES

Before slipping the drawer into the carcass, give the slide components (including the rails) a coat of paste wax so they operate smoothly.

Joining the drawer to the carcass is best done in three steps. Begin by setting the drawer on its back and align a rail in the track groove so the ends are flush. Slip a washer on a screw, position the screw at the lower end of the rail slot, and drive the screw until the washer just begins to get snug (FIG. 7). Try sliding the rail, then loosen or tighten


the screw accordingly. Repeat these steps to install the second rail in the other drawer track groove.

Now align the rails with the carcass tracks and slip the drawer into position. When the drawer is fully inserted, drive screws with washers at the back end of the carcass track slots (FIG. 8). Adjust the screws until the drawer slides smoothly.

You can now cut the false front to size — make sure the bottom end of the front will clear the cabinet's face frame — sand it thoroughly, and apply finish. Don't forget to drill a pilot hole and install the knob.

Using double-face tape is the best way to position the false front on the drawer. Once you have it positioned, carefully slide out the drawer and drive the mounting screws.

When I installed the knife rack in my cabinet, I drilled a new set of holes for the shelf support brackets so the shelf could rest on top of the carcass. A couple of short screws driven through the shelf into the carcass top keeps the rack steady.

To build the spice rack, you follow the same procedures — without cutting the knife slots — and install three shelves (SHELF ELEVATION). Organized herbs and an uncluttered counter will be your reward. 



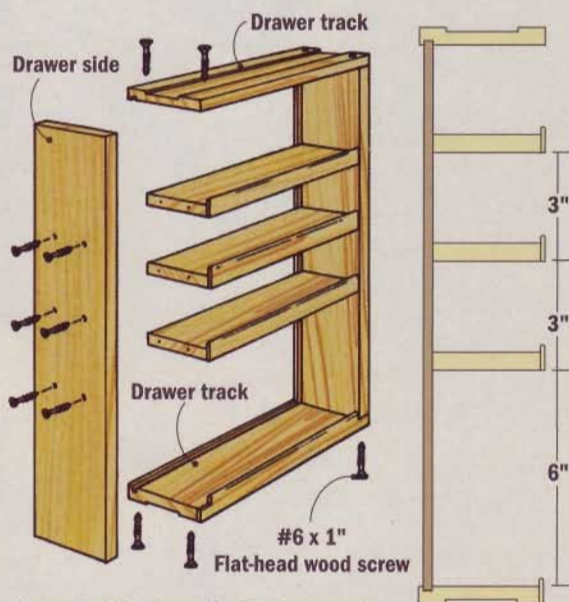
**7** Set the drawer on its back and position a rail in the drawer track. Drive a screw with a washer at the end of the rail's slot and into the drawer.



**8** With both rails attached to the drawer, insert the drawer in the carcass. Position screws with washers at the end of the slot, then snug them down.

## SPICE RACK

## SHELF ELEVATION



**Note:** Rip  $\frac{1}{4}$ " from the front edge of the bottom drawer track and glue on a  $\frac{1}{4}$ "-thick shelf lip prior to assembly. You can adjust the position of the shelves to fit your spice containers.

# Shop Utility Station

In my shop there are a few tools I like to keep out all the time, at the ready. But I can't afford to sacrifice precious bench space to them. And a tool like my grinder — with its spinning wheels and flying sparks — doesn't make a good neighbor to other tools. My wall-mounted utility

station provides a fine way to keep space-hungry tools out where I can use them, without having them interfere with anything else.

Though I use this utility shelf to support a grinder, it can serve equally well as a phone message center, a sharpening stone station, a small potting shelf, or for many other needs.

The utility station is built around wooden slides that you need to make before getting into the steps I'm about to describe here (see *Shop-Built Slides* on page 60). Once you have the slides in hand, you can move on to making the drawer (CONSTRUCTION VIEW).

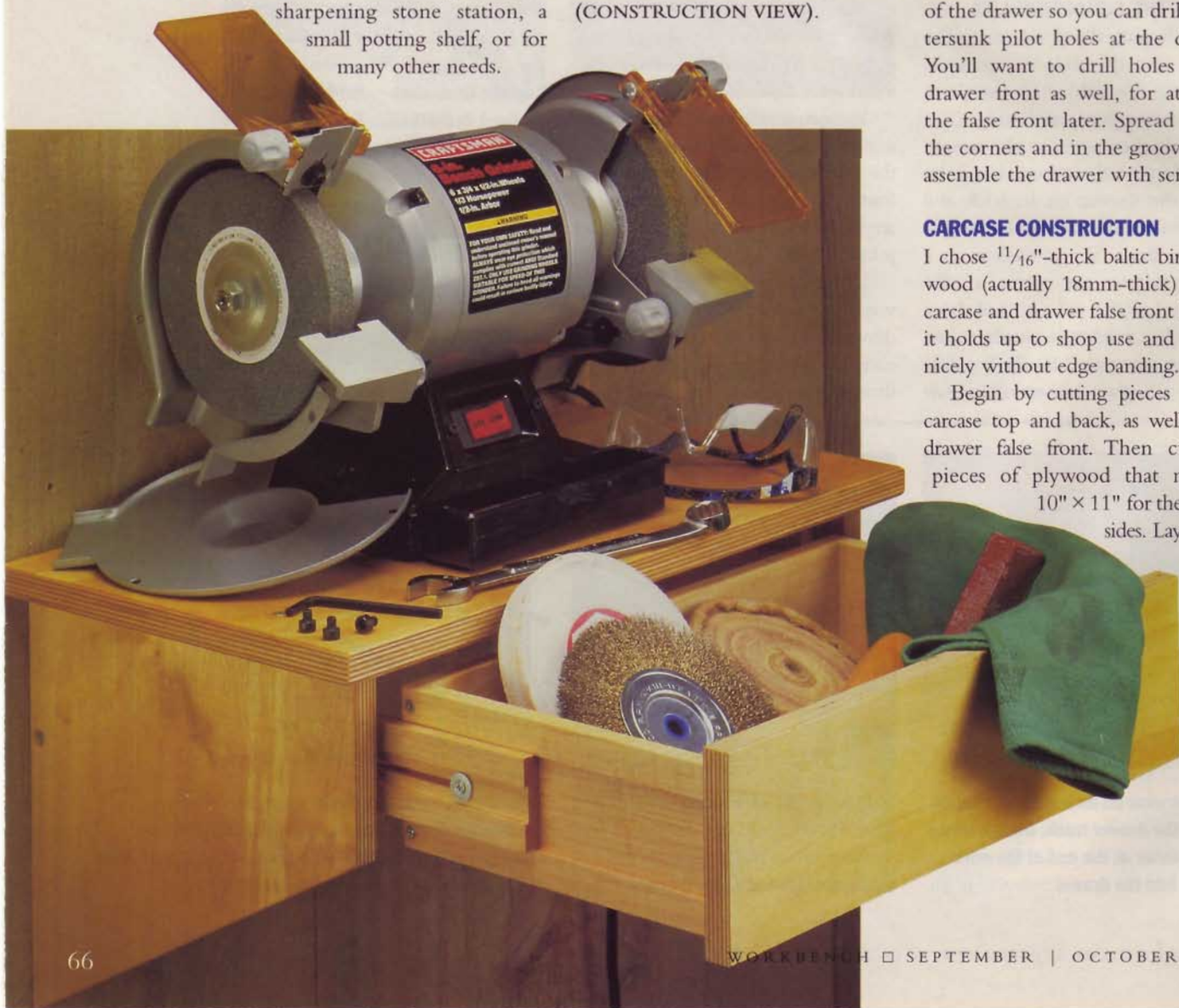
## BUILD THE DRAWER

Cut the drawer front and back to size, then rout a groove in these parts and in the drawer tracks for fitting the bottom panel (GROOVE DETAIL). Cut hardboard for the bottom panel and do a dry assembly of the drawer so you can drill countersunk pilot holes at the corners. You'll want to drill holes in the drawer front as well, for attaching the false front later. Spread glue at the corners and in the grooves, then assemble the drawer with screws.

## CARCASE CONSTRUCTION

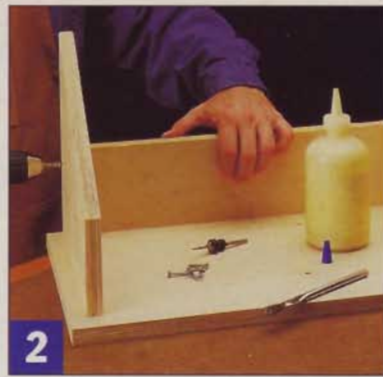
I chose  $1\frac{1}{16}$ "-thick baltic birch plywood (actually 18mm-thick) for the carcass and drawer false front because it holds up to shop use and finishes nicely without edge banding.

Begin by cutting pieces for the carcass top and back, as well as the drawer false front. Then cut two pieces of plywood that measure  $10" \times 11"$  for the carcass sides. Lay out the

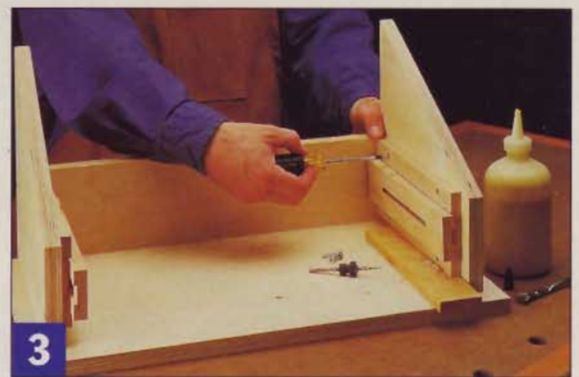




**1** A piece of sandpaper taped to your miter gauge will keep the plywood from slipping while you make the angled cut.



**2** Drill countersunk pilot holes and use glue and screws to join the sides to the back. Then add the top.



**3** When installing the carcass tracks, place a 1/2"-thick shim below each track piece to position them on the carcass sides. Fasten the tracks with 3/4" screws.

angled edge on each piece, set your table saw miter gauge to 60°, and cut the pieces (FIG. 1).

Put the carcass together, centering the sides and back on the carcass top (FIG. 2).

### INSTALLING THE DRAWER

With the rails secured to the carcass tracks (the washers should be barely snug), mount the carcass tracks to the carcass sides (FIG. 3).

While the carcass is still upside down you can mount the drawer. Extend the rails from the carcass tracks and clamp the drawer between them. Use screws with washers to attach the rails to the drawer tracks — again, the washers should just be snug. Slide the draw-

er in and out a couple times and adjust the screw tension accordingly.

Now close the drawer and position the false front using double-face tape. Placing pennies between the top edge of the false front and the carcass top ensures that you create a clearance gap for operating the drawer. Once you have the false front where you want it, open the drawer, clamp the false front in position, and drive screws in the pilot holes you drilled earlier.

Mount the station to the wall by going through the carcass back with wood screws or lag bolts. Make sure to screw into studs. Then get that space-hogging tool moved into its new home, and fill the drawer with all its accessories.

## MATERIALS LIST

### LUMBER

- A (2) Drawer Tracks 1/2" x 3 1/2" x 9 1/4" maple
- B (2) Carcass Tracks 1/2" x 3 3/4" x 9 1/4" maple
- C (2) Rails 1/2" x 2" x 9 1/4" maple
- D (2) Drawer Front/Back 1/2" x 3 1/2" x 15" maple
- E (1) Drawer Bottom 1/4" x 8 1/2" x 15 1/4" hardboard
- F (1) False Front 11/16" x 4 1/4" x 17 1/8" baltic birch plywood
- G (1) Carcass Top 11/16" x 11 3/4" x 20 1/2" baltic birch plywood
- H (1) Carcass Back 11/16" x 4 1/4" x 17 1/4" baltic birch plywood
- I (2) Carcass Sides 11/16" x 11" x 10" baltic birch plywood

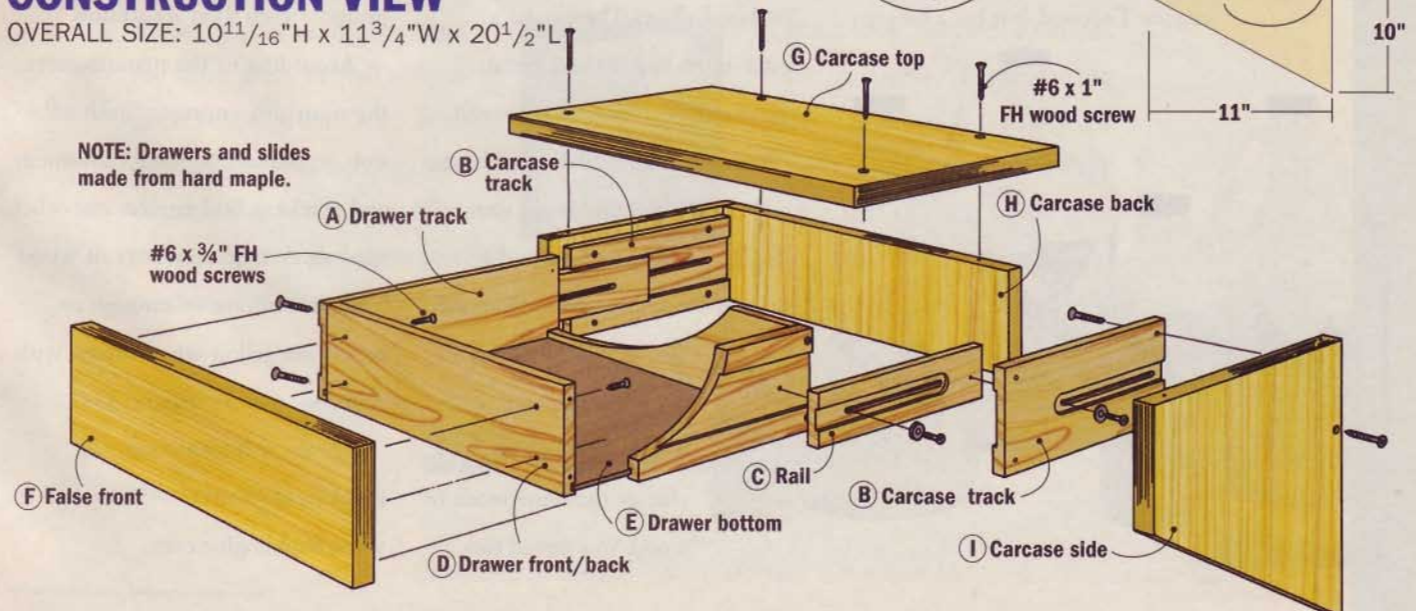
### HARDWARE

- (8) #6 x 1" Flat-head wood screws
- (4) #6 x 3/4" Flat-head wood screws
- (4) 1/4" ID flat washers

## CONSTRUCTION VIEW

OVERALL SIZE: 10<sup>11/16</sup>"H x 11<sup>3/4</sup>"W x 20<sup>1/2</sup>"L

**NOTE:** Drawers and slides made from hard maple.



# Tools & Shop Gear

## Band Clamp Makes Holding Odd Shapes Easier

Band clamps simplify gluing up projects with mitered corners, but the nylon webbing that connects

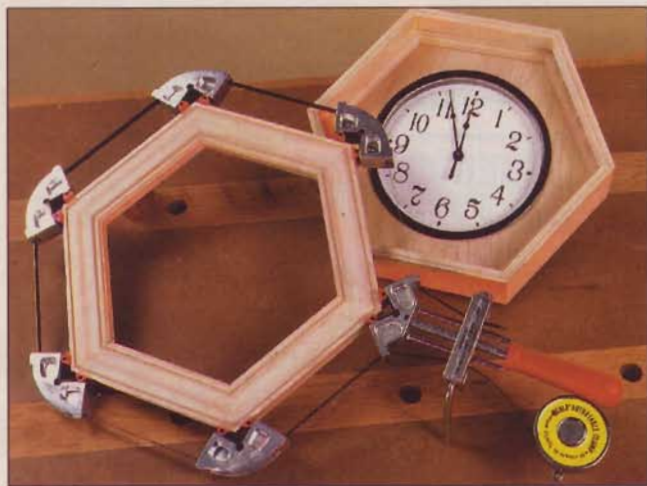
the jaws on many models can get twisted and unruly.

The Merle Clamp from MLCS

eliminates this problem by using  $\frac{3}{8}$ "-wide steel banding instead of nylon. The steel has enough lateral stiffness to keep it from twisting and folding. Plus it's thin, so the Merle stores 23 ft. of banding in an attached reel, keeping extra length out of the way when it's not needed. That's enough to reach around a

69" × 69" object, or one 23 ft. in diameter. The clamp adjusts down to  $2\frac{3}{8}$ "-square.

MLCS recently improved this already excellent clamp by adding pivoting inserts that slip inside the aluminum jaws to hold odd-shaped objects. You can add additional jaws, and even extra banding. The Merle with four corner jaws and inserts sells for \$26.95. Four extra jaws (with inserts) will set you back \$14. Call MLCS at (800) 533-9298, or go to [www.mlcswoodworking.com](http://www.mlcswoodworking.com).



## Glues with Longer Open Times; Filler to "Size" Your Wood

Franklin International has added several products to its popular Titebond line of wood glues.

First, there's Titebond Extend. This aliphatic resin glue works like regular Titebond, but has a longer

open time — the time the glue remains workable after you spread it. Extend glue stays workable for 10-15 minutes, a significant increase over the 3-5 minute period regular Titebond allows. There's also a water-resistant polyvinyl acetate version called Titebond II Extend.

Both glues are available in 16-oz., 1-gal., and 5-gal. sizes. Prices start around \$6.

Also new is Titebond Wood Size. Don't let the name confuse you, it won't allow you to change the dimensions of wood. You spread this

resin mixture to fill open pores in wood, preventing blotchiness caused by uneven absorption of the finish. You can use Wood Size on all wood and composite wood products to promote even stain absorption.

According to the manufacturer, the resin also improves finish adhesion, minimizes seasonal movement and cracking, and enables smoother sanding. A 1-qt. container of Wood Size concentrate — enough to make one gallon when mixed with water — sells for around \$14.

For more information, call Franklin at (800) 669-4583, or go to [www.franklinglue.com](http://www.franklinglue.com).





## Pull-Stroke Saw Cuts Dowels Flush

The Shop Fox Dowel Cutting Saw is designed to cut dowels and plugs flush to the surface without marring the surrounding wood. The spring steel blade is 6½" long and has fine teeth (26 per inch) with no set.

Cutting on the pull stroke adds control. Price for the saw is \$9.95 and extra blades are \$5.95 each, from Woodstock International. Call (800)840-8420 or look online at [www.woodstockinternational.com](http://www.woodstockinternational.com).

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### 'Recip' Saw is a Gas

If your favorite part of remodeling is the demolition stage, you should check out Ryobi's new gasoline-powered reciprocating saw. It uses a 15.9 cubic centimeter two-cycle engine to drive the blade through its 1" stroke. The saw accepts standard universal-shank blades, and you can vary cutting speed from 0-2,000 strokes per minute. The isolated handle and rubber front boot are designed to reduce vibration. At 12-lbs. the saw is no lightweight, but should pack a lot of power. You can reach Ryobi at (800)525-2579 or [www.ryobi.com](http://www.ryobi.com).

## Levels with Laminated Hardwood Bodies

New Exact levels from L.S. Starrett Co. have bodies made of laminated birch instead of traditional (and increasingly rare) mahogany. The levels are available in three series, all with aluminum or brass working

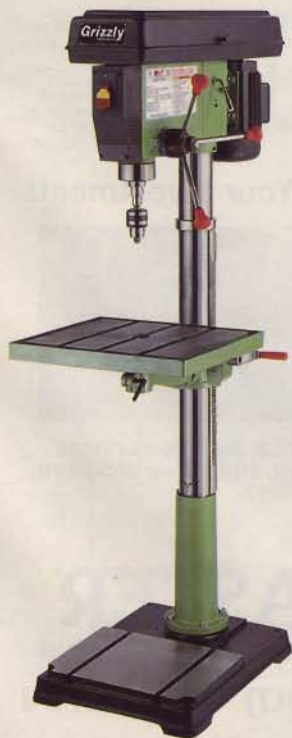
edges, shock-absorbing caps, and Pyrex or acrylic-block vials. All are offered in 24" and 48" lengths.

Prices range from \$50 to \$70. Call Starrett at (978) 249-5330, or check on the web at [www.starrett.com](http://www.starrett.com).



## Grizzly Drill Press

The model G7948 commercial 12-speed drill press from Grizzly offers 20" swing capacity, and can drill 5"-deep holes. A 1½-hp motor drives the spindle at 150-2,700 RPM. The table is huge compared to those on most drill presses, at 19" wide by 17" deep. There's also a built-in light, and rack-and-pinion table adjustment. Price is \$425. Reach Grizzly online at [www.grizzlyindustrial.com](http://www.grizzlyindustrial.com), or call (800) 523-4777.



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Product Information Number 191

## Radial Arm Saw Features a Controlled-Feed Cutting Head

These days, you don't often hear about a new radial arm saw, once king of the home shop. Looking at the Craftsman Professional 10" Radial Arm Saw, though, it appears Sears is still committed to this tool.



The saw's most intriguing feature is "control cut," a motorized cable system that controls how quickly you can pull the cutting head. The system doesn't actually drive the cutting head forward, but increases safety by limiting how fast the cutting head moves. Pulling the head too fast is a common mistake radial arm saw users make, partly because the blade rotates in the same direction as you pull. The system also minimizes climb cutting, another radial arm saw problem caused by the blade's rotation direction. Variable speed lets you set

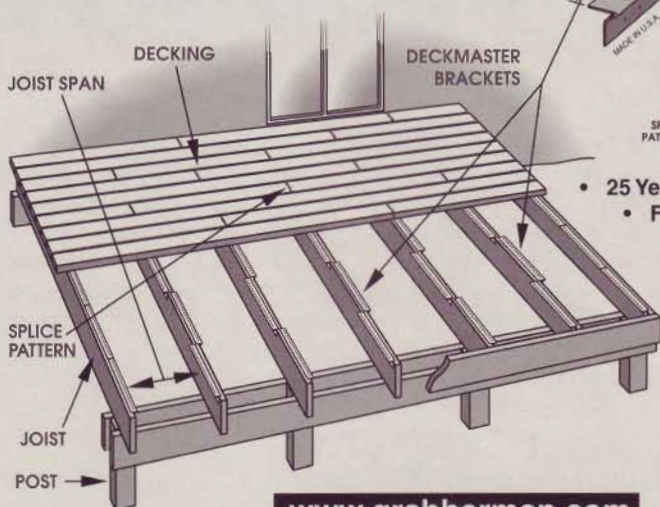
the head's maximum travel speed. Pull too hard, and the cable tightens to restrict your speed. At the end of your cut you can let go of the handle and the head retracts automatically. Under normal use, the system is unnoticeable, except for the auto-retracting feature.

The saw (model #22038) also boasts more refinement than previous versions, with legible scales, well-placed controls, tighter manufacturing tolerances, and a standard carbide-tipped blade. Price is \$650 from Sears at (800) 377-3414, or [www.sears.com/craftsman](http://www.sears.com/craftsman).

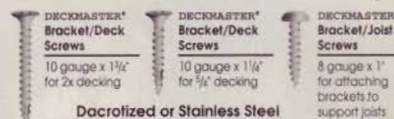
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## Porter-Cable Powers-Up its Cordless Tool Line

Porter-Cable's new Network line of cordless tools includes a drill/driver, a hammer drill, a flash-light, and a cordless circular saw that all run on newly-designed 19.2-volt nickel-cadmium batteries. This voltage (achieved by adding

one more 1.2-volt cell than is used in an 18-volt pack) is an industry first. According to Mike Whitman, Porter-Cable's manager of wood-working and cordless products, the tools offer more power and run time than 18-volt models, with only a modest weight increase.

These batteries have a flat top rather than the stalk that protruded

from the top of the pack on the company's old cordless tools, and is common on other cordless tool batteries. The stalk generally holds a battery cell that connects to the other cells with a welded steel strap. Whitman found many cordless tool batteries fail here, when the welds break or the top cell overheats.

Both drills and the circular saw will sell for around \$300, the flash-light (without battery) is under \$30. For more information, contact Porter-Cable at (800) 487-8665 or [www.porter-cable.com](http://www.porter-cable.com).



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# Home & Yard Products

## General Electric Advantium Oven Cooks Food with Light

Ovens that use light as a cooking source aren't new. My sister had one when we were kids that even came with a cake mix. Of course

the 60-watt bulb wouldn't do much if we tried to cook real food.

General Electric's new Advantium oven shows cooking with light has come a long way. Using three high-intensity halogen bulbs, this oven will bake, broil, grill, or roast foods up to four times faster than a conventional oven. Plus you don't have to pre-heat the oven. GE calls the technology Speedcook, and it works because light actually penetrates the food, cooking the inside and outside at the same time.

Conventional radiant heat doesn't

penetrate food, so it cooks from the outside in. Microwave ovens cook from the inside out.

The oven also functions as a 950-watt microwave, and comes programmed with cooking times for over 100 recipes. The interior is all stainless steel.

Currently the Advantium is available in one model that fits in the same 30"-wide space as an over-the-cooktop microwave. It should sell for around \$1,300. An in-wall model will follow next year. Contact GE at (800) 626-2000 or [www.geappliances.com](http://www.geappliances.com).



## Decorate Walls with Paint-by-Numbers Murals

I've always admired the inventive murals some parents paint in their kids' bedrooms, but as an art-impaired person, I wasn't ready to take on such a challenge. For people like me, there's Transformations mural and accent patterns from Camp Kazoo Ltd.

You tape one of these paper patterns to the wall and go over it with a clothes iron. Peel the paper away, and the outlines for every object in the mural have been transferred to the wall. Then just paint by numbers using colors of your

choice, or the colors suggested in the kit. Murals are available in 15 styles, and there are borders and accent patterns called DooDads. Camp Kazoo plans to introduce

patterns for grown-ups as well. A mural or collection of DooDads costs around \$34. Contact Camp Kazoo at (888) 687-8725 or on the web at [www.campkazoo.com](http://www.campkazoo.com).



## Reinforced Wallboard Stands Up Better in Heavy-Use Areas

Gypsum wallboard is the sheathing material of choice for interior walls these days, and in most applications it's plenty durable. Yet drywall is still easy to damage in high-traffic

and hard-use areas such as stairways, halls, garages, and playrooms. Plaster is tougher, but more costly and time consuming to install.

Another alternative is to use new Fiberock Abuse-Resistant Gypsum Fiber Panels from United States Gypsum Co. (USG). These panels are similar to conventional wallboard, but contain perlite (volcanic glass), cellulose, and fiber-reinforced gypsum. Neither face has a paper covering like regular wallboard, but Fiberock panels are installed and finished the same as conventional panels.

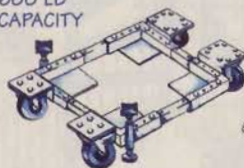
According to USG the panels offer greater nail and screw holding power, and are more resistant to flexing than conventional wallboard. The manufacturer even recommends the Fiberock as an economical alternative to concrete block walls commonly used in commercial buildings and schools.

The 1/2"- and 3/8"-thick panels are 4-ft. wide and come in lengths from 8- to 12-ft. Expect to pay about 40% more for Fiberock than you would for conventional wallboard. Learn more from USG at [www.usg.com](http://www.usg.com) or (800) 874-4968.

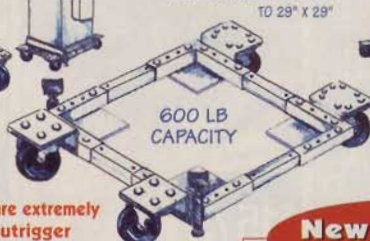


## SHOP FOX® MOBILE BASES

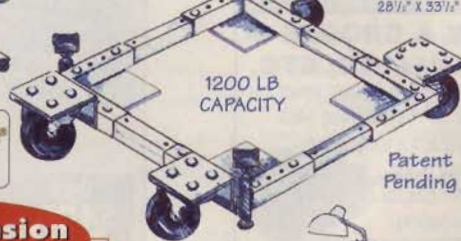
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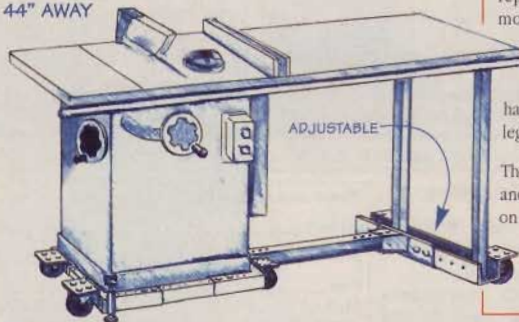


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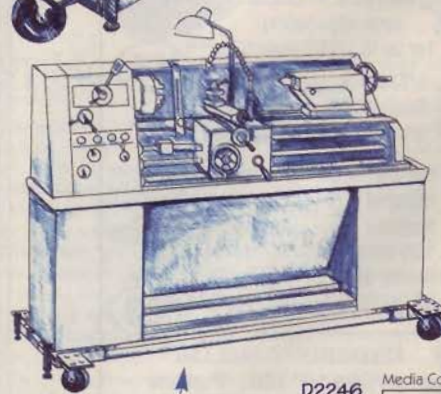
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### New Extension Kits!

The D2259 Extension Kit includes a replacement cross bar to fit the D2057 mobile base (sold separately), an extension bar and an adjustable leg support which can be shifted forward or backward. This kit will handle tablesaw extension tables with legs that are up to 44" away from the base.

The D2246 Extension Bars are 36" long and replace the standard length side rails on the D2058. This allows the base to be assembled with a maximum capacity of 44", suitable for heavier and longer machines such as lathes.



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## Bamboo Makes a Durable Flooring Material

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Bamboo flooring is widely used in

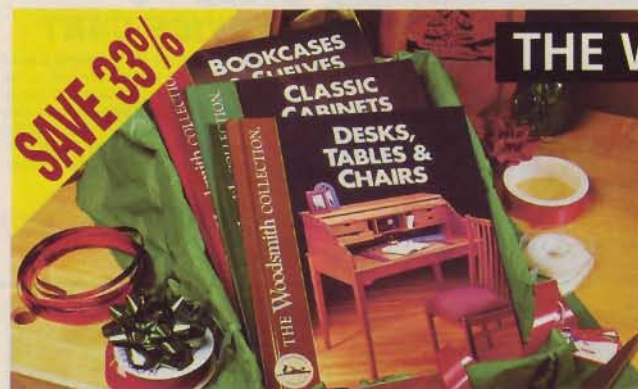
Asia, and is now finding favor in the United States. The California Bamboo Flooring Co. is one manufacturer producing attractive bamboo floors.

Bamboo, ironically, isn't even wood. It's a fibrous grass that grows quickly and is sustainable. This company uses bamboo grown in controlled forests in China. After maturing in three to five years the bamboo is harvested, sliced into thin strips, then glued together in layers. Planks are  $\frac{5}{8}$ "-thick by  $3\frac{1}{2}$ "-wide and 36"-long, with tongue-and-groove edges and ends.

The flooring material has subtle grain textures and an even tone.

According to the company, bamboo flooring tests 13% harder than maple and 27% more stable than oak. Installation techniques are the same as those used for other tongue-and-groove floors.

California Bamboo Flooring comes in two tones (natural and amber), and is available prefinished with polyurethane, or unfinished. Prices range from around \$4.60 to \$5.20 per square foot. Call the company at (888) 548-7548, or go to [www.californiabamboo.com](http://www.californiabamboo.com).



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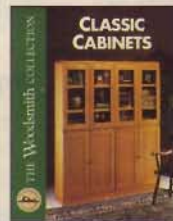


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For information, go to [www.rickenbacker.com](http://www.rickenbacker.com) or call (714) 545-5574. 