



Adirondack Chair ■ 20 Great Home & Shop Tips

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THE ORIGINAL WOODWORKING AND HOME IMPROVEMENT MAGAZINE

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Custom Wainscoting

Also in This Issue:

- Patio Table
- First-Class Mailbox
- Tool Test: Miter Saws
- Hot Woodworking Web Sites

NEW Feature:

- "Take It From a Pro"

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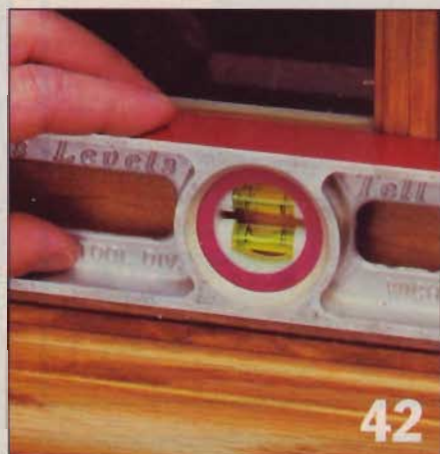
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EDITOR'S NOTES

Most projects start with a good set of drawings. But even with drawings, there are times when you can't really get a feel for some details of a project.

This is what happened with the wainscoting project starting on page 32 of this issue. Kent Welsh, our project coordinator, stopped by my office one day with a pile of drawings. He had done a good job of showing detailed profiles of all the pieces.

Since the drawings were two dimensional, though, I had trouble getting a feel for how the final project would look. Later in the day, I bumped into Kent and explained my problem.

The next day he built a little prototype with all the pieces nailed down to a plywood square. Of course, this led to a series of modifications and more prototypes as you can see in the photo above. Needless to say, the prototypes were very helpful.

A prototype was just as important for the Adirondack chair in this issue. We built one quickly from scrap so everyone could "test sit" in it. Then

we tweaked the fit and ended up with a final design that has a gentle arc on the back and the perfect slope on the matching ottoman.

TAKE IT FROM A PRO

Sometimes I feel the *Workbench* staff is like a family doctor. We see just about everything come through our office on a typical day.

But once in a while, even a family doctor will call in a specialist. That's what we've decided to do in a new section called "Take It From A Pro."

In this issue we've asked Dave Fish, a finish carpenter, to share some of the secrets he's picked up during 15 years on the job. We've also added a few tips of our own from the jobs we've worked on.

Now it's your turn. Write and let us know if you have other carpentry tips to share with *Workbench* readers.

Day

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Editorial Questions:

Workbench Magazine
2200 Grand Ave.
Des Moines, IA 50312
e-mail: editor@workbenchmag.com



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CREATIVE DIRECTOR Ted Kralicek

SENIOR PHOTOGRAPHER Crayola England

PROJECT COORDINATOR Kent Welsh

SHOP MANAGER Steve Curtis

SHOP CRAFTSMAN Steve Johnson

PROJECT DEVELOPER Ken Munkel

ELEC. PUB. DIRECTOR Douglas M. Lidster

PRE-PRESS IMAGE SPECS. Troy Clark
Minniette Johnson

PRESIDENT & PUBLISHER Donald B. Peschke

ADVERTISING SALES MANAGERS

Mary K. Day (515) 282-7000 ext. 2200
George A. Clark (515) 282-7000 ext. 2201

DIRECT RESPONSE ADVERTISING SALES MANAGER

Lisa Wagner (407) 645-5165

ADVERTISING COORDINATOR

Kelsey Hare (515) 282-7000 ext. 2135

PUBLISHING CONSULTANT

Peter H. Miller (202) 362-9367



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Questions & Answers

Quartersawn or Flatsawn? End Grain Provides the Key

Q *I'm considering making a Mission-style bookcase. I've heard this style of furniture was often built from quartersawn oak. How can I tell if a board at the lumberyard is quartersawn?*

*Andrew Brendal
via the Internet*

A Traditionally, most projects built in the Mission-style (or Arts & Crafts-style) were made from quartersawn lumber with straight grain and large ray "flecks." Examine the grain pattern in the photo below and you'll see what I'm talking about.

Today, most boards you'll find at lumberyards and home centers will be flatsawn. The simplest way to tell

the difference is to examine the angle of the growth rings on the ends of the board.

Quartersawn. With the quartersawing method, a log is first cut into four pieces. Then boards are cut from each quartered section.

Take a look at the two photos on the left below. When boards are milled using the quartersawn method, the growth rings will be 60° to 90° to the face of the board. This creates vertical end grain, seen in the smaller photo, and straighter face grain, seen in the larger photo.

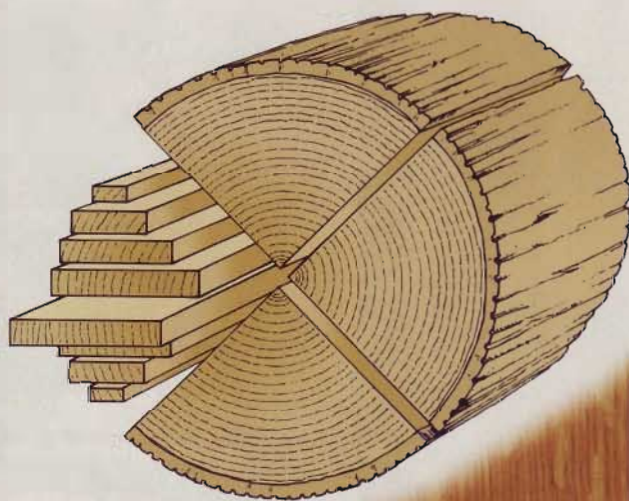
Quartersawing is time consuming and usually produces a bit more waste. These are two factors why quartersawn lumber is more expensive than flatsawn lumber.

It also takes a large diameter log to get boards of any significant width. So it's often difficult to find wide quartersawn boards.

Flatsawn. Flatsawn lumber (also called plainsawn) is the most common cut you'll come across because a log usually yields the most lumber when cut this way. Flatsawing generally produces less waste, too, than the quartersawing method.

Notice in the smaller photo on the right below how most of the growth rings on the end grain are less than 30° to the face of the board. This horizontal end grain indicates a flatsawn board. Plus, a flatsawn board will generally have a V-shaped face grain pattern as seen in the larger photo.

QUARTERSAWN (RADIALLY SAWN)



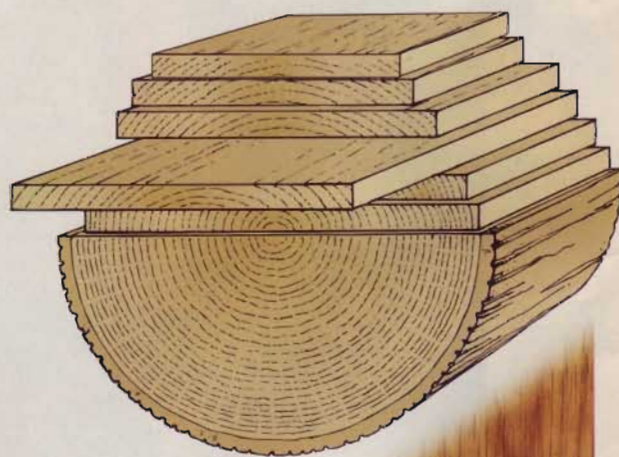
Quartersawn
Characteristics:

- More stable
- May check
- Close, straight grain pattern. Some hardwoods have desirable "flecks" or "rays."

Face View

End View

FLATSAWN (PLAINSAWN)



Flatsawn
Characteristics:

- Less stable
- May cup or warp as it dries
- Slightly wild or irregular grain pattern.

Face View

End View

Allow Room for Hot Air to Escape

Q I really liked the "Outdoor Screen" you showed in your March/April issue to hide a central air-conditioning unit. But I'm curious about how much clearance I need to allow between the air conditioner and the screen?

Randall Carter
Pittsburgh, PA

A The answer to your question really depends on what type of air conditioner you own. The critical element is where the air conditioner discharges hot air it generates while running.

During hot summer days, an air conditioner draws air in from all around the unit to cool a house. In the process, it generates a lot of heat. It's vital that the hot air produced has an easy way to escape from around the unit. If it can't, the air conditioner draws that hot air back in and acts like a pressure cooker. When this happens, the compressor in your air conditioner might overheat and could burn up the entire unit.

The "Outdoor Screen" enclosure in the March/April issue (pictured above) was designed and built to fit around a top-discharge unit. Most air-conditioner manufacturers have been producing only top-discharge units for many years.

With this type of air conditioner, you need to be concerned about restricting air flow above the unit. That's why we didn't put a lid on our screen enclosure. Any screen panels can stick up above the air conditioner a couple feet without causing any harm.

With top-discharge units, the clearance below the screen and the



space between the screen and air conditioner isn't as critical. Air-conditioning specialists still recommend you leave at least a 6" gap between the bottom of the screen and the ground, but your unit shouldn't be in danger of overheating if the gap is slightly smaller.

Some older air conditioners, however, were configured differently. If you have an older unit that forces hot air out the side, you should allow at least three feet of clearance between the air conditioner and any enclosure. This gives the hot air enough space to escape. Another thing you could do is widen the gaps between the individual slats of the screen.

And whether you use a screen or not, proper maintenance is the best thing you can do to keep your air conditioner running smoothly all summer long. It's a good idea to wash or vacuum off the dirt and leaves on a regular basis.

Keep in mind that some air-conditioning specialists urge against restricting air flow around an air conditioner in any way. If you're not sure about your particular unit, you might want to check with a local specialist before using any type of screen enclosure.



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Designing Stairs So They're Comfortable and Safe

Q I need to build a set of stairs for a new deck I recently finished, but I'm unsure of the exact dimensions to use.

Does it really matter what size I make the individual steps?

Steven Knudson
Salt Lake City, UT

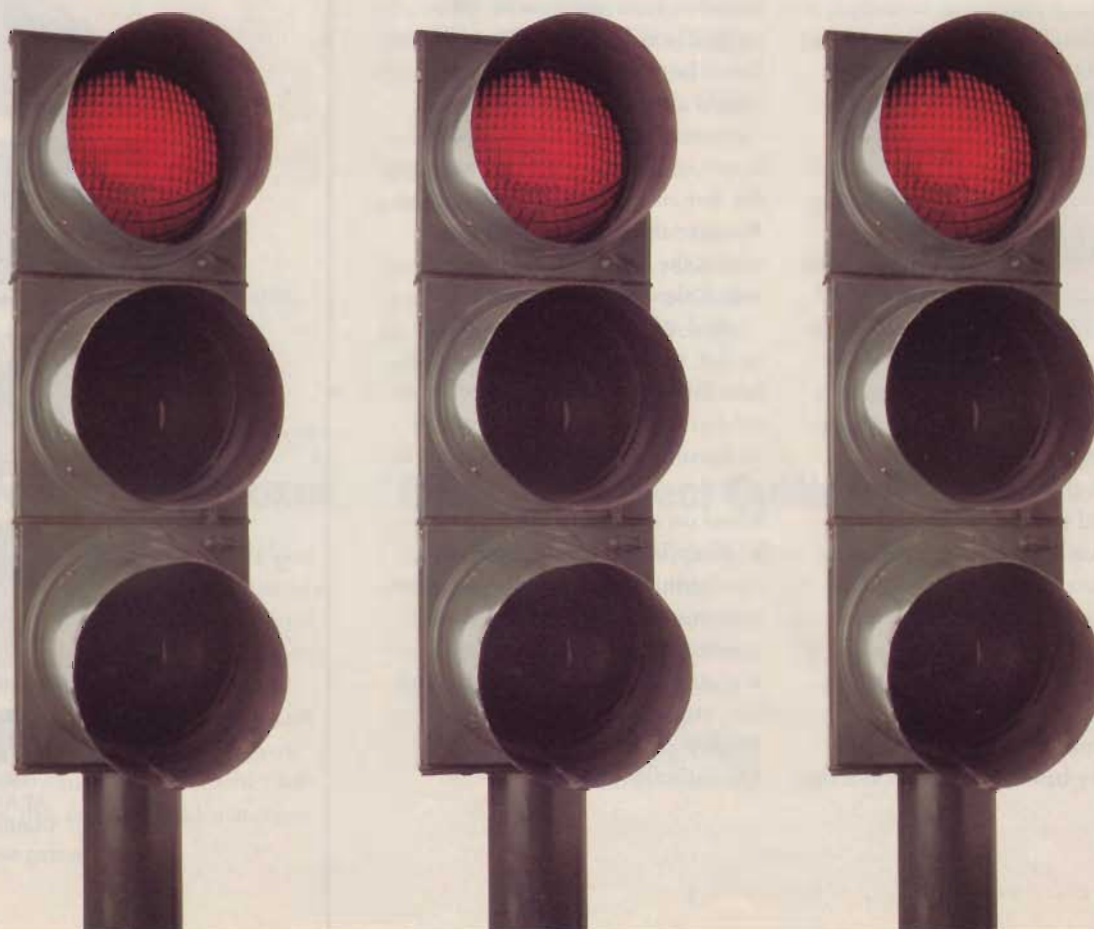
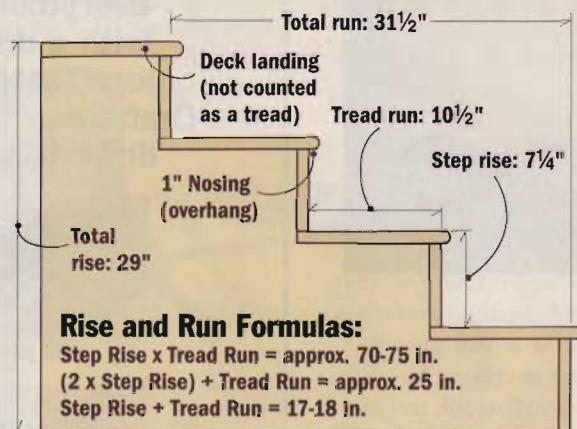
A Consistency is important when building stairs. And even an inch, or less, can make a big difference. Most carpenters consider 7"-8" the ideal step rise, and 10"-11" an ideal tread run or depth (see below).

Risers. To calculate the actual size of the stairs, first measure the

drop from the top of the deck to the ground. That's your total rise. To get the number of risers, divide the total rise (for example 29") by 7 (the desired rise of each step). Next round to the nearest whole number (4.14" rounded to 4"). Now divide the total rise again by this whole number. The resulting figure (7¹/₄") is the exact height of each step.

Treads. Once you know how many steps you'll have, you can figure out the run, or depth, of each tread. In every set of stairs, you'll have one less tread than the number of risers because the landing isn't counted. First measure the total run (31¹/₂"). Then divide this number by 3, the number of treads, to end up with a tread depth of 10¹/₂".

Building requirements for calculating stairs may vary, so check your local codes before you start.



An Easy Way to Calibrate a Miter Gauge

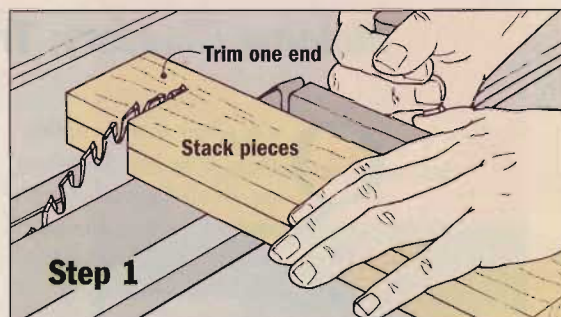
Q I'm not getting really clean crosscuts when I use my table saw. Someone said maybe my miter gauge isn't perpendicular (90°) to the saw blade. Is there a simple way to check this?

Jonathan Ruddy
Indianapolis, IN

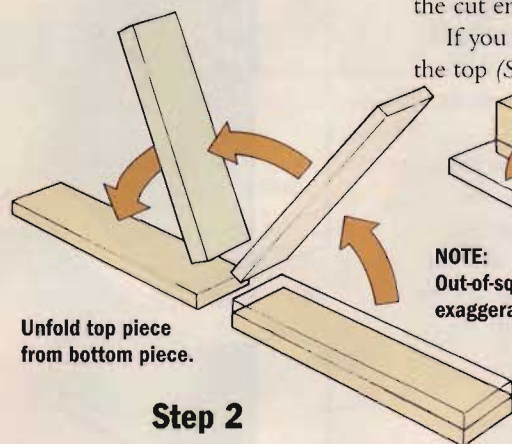
A Here's a quick way to check. Rip two pieces of scrap to the same width. Then stack them and crosscut one end using the miter gauge, as shown in Step 1. You're trying to square up one end of both pieces.

Now unfold the top piece like you're turning a page, see Step 2. Then set the pieces on edge with the cut ends butted together.

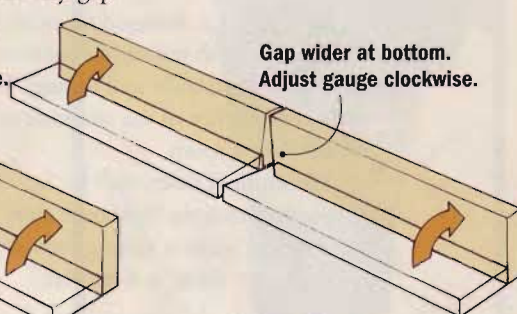
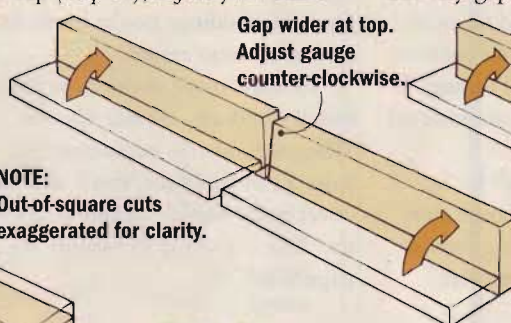
If you notice a gap that's wider at the top (Step 3a), adjust your miter



gauge counter-clockwise. If the gap is wider at the bottom (Step 3b), adjust clockwise. Repeat the procedure until the ends fit square without any gap.



NOTE:
Out-of-square cuts
exaggerated for clarity.



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Molding Glossary: Trim from Floor to Ceiling

Q I'm getting ready to replace much of the trim throughout my Dutch Colonial-style home. When I went to my local home center, I was amazed, and somewhat confused, by the variety of moldings available. Can you help me understand where and how all those different molding pieces are used?

Marianne Ellingson
Cleveland, OH

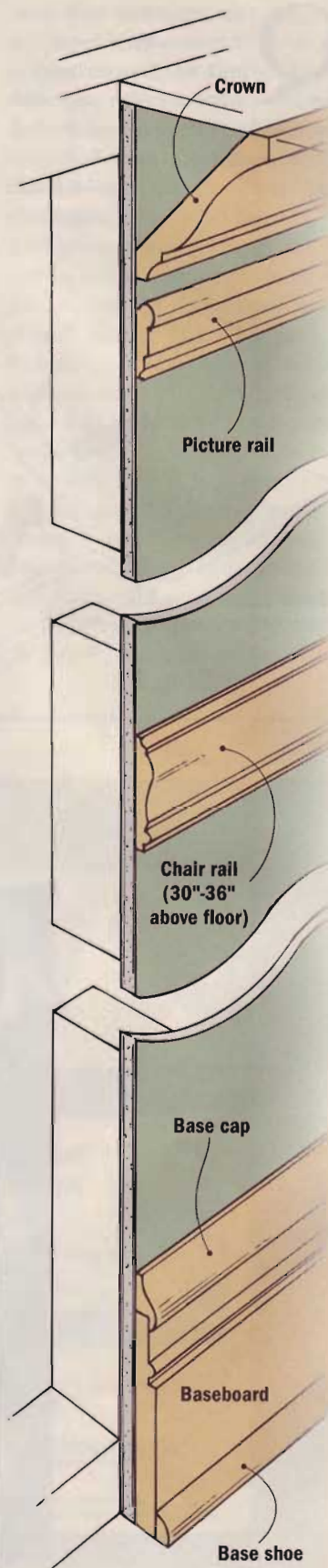
A Trim is designed to create smooth transitions between floors, walls, and ceilings. It helps tie together all the architectural elements in a room.

Trimming a house can be as simple as attaching baseboard shoe to installing elegant ceiling crown — plus everything in between.

When adding or replacing molding, it's important to choose a style or styles that fit comfortably with the existing architecture of your home. Moldings can be plain or fancy, one piece or built up from several pieces. You can also mix different shapes and profiles to create unique architectural effects.

Take a look at the drawing at right and you'll see the names and typical positions of some of the types of moldings you're likely to find at a home center.

To learn more about how to install moldings, see the *Custom Wainscoting* article beginning on page 32 in this issue. You'll also discover some useful trimming tips in the *Take It From A Pro* article on page 66.

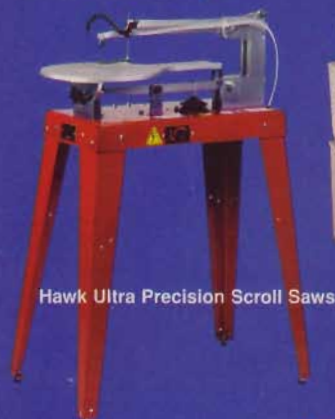


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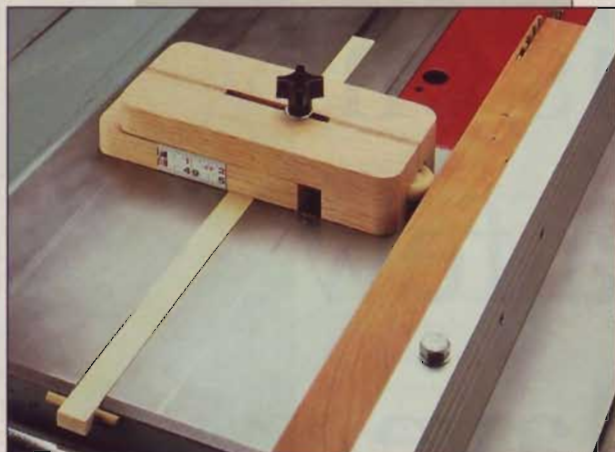
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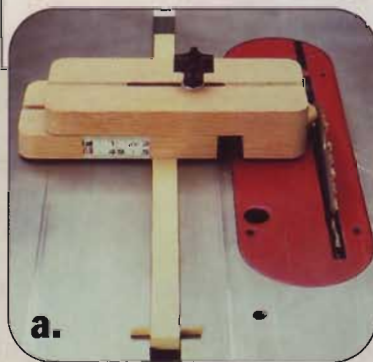
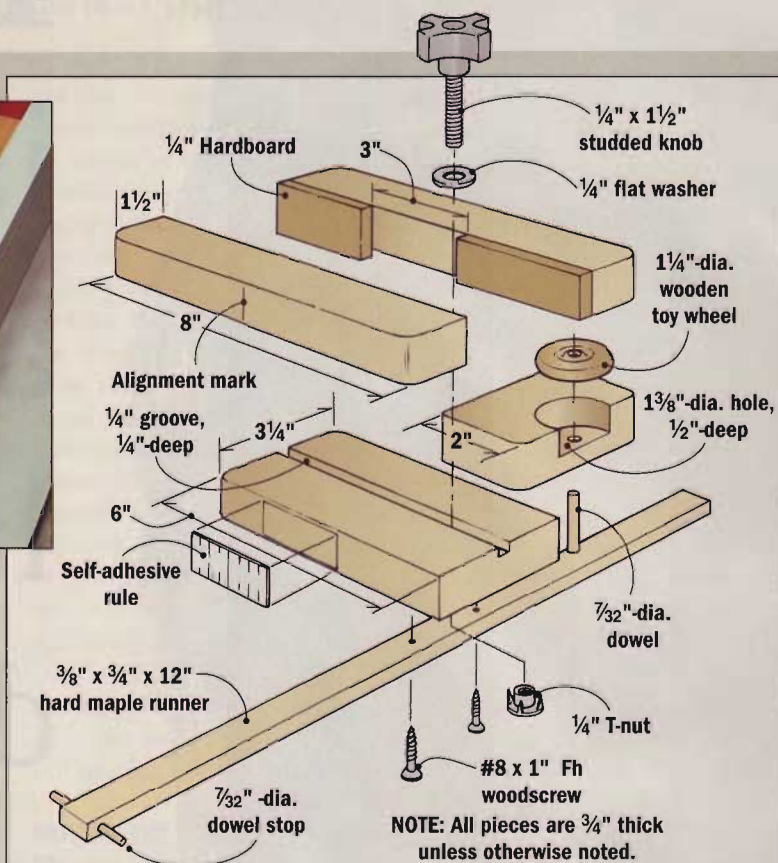
Thin Strip Ripping Guide

In the March/April issue, you showed a quick jig for ripping thin strips. Your jig makes it easy to rip strips on the waste side of the blade so you avoid the kick-back that can occur when a thin piece of stock gets trapped between the blade and rip fence.

Since I spend a lot of time building small craft items, I'm always in need of thin strips of various thicknesses. So I modified your jig to make it adjustable.

The main body of my ripping guide is built out of four pieces (see the drawing at right) which creates a slot for the adjustment knob. A wooden toy wheel acts as both a stop and a roller.

To set up the guide, position it in the miter gauge slot, loosen the knob, slide the wheel up against the blade, and retighten the knob. Then draw an alignment mark on the body and attach a piece of leftover self-adhesive rule to the base as shown in photo a.

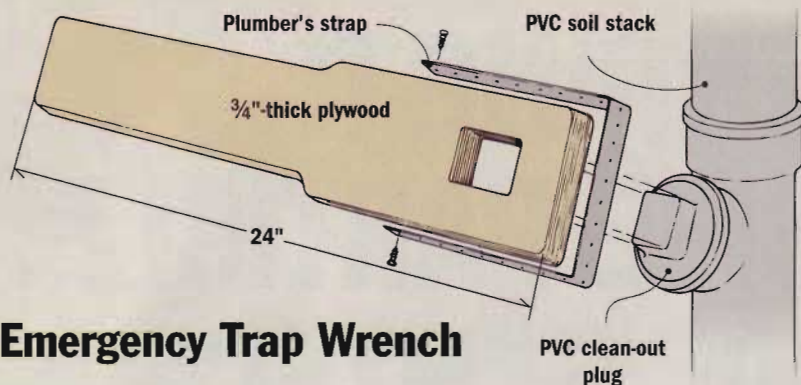


When I need to rip some strips, I use the rule to set the guide to the desired thickness. Then I slide the stock over against the wheel, move the fence against the stock, lock it down and make a cut (photo b). Before each additional cutting pass, I repeat the process of sliding the stock and fence over to the wheel. To

change strip thicknesses, I just reset the guide and cut away.

*Doug Potts
Temecula, CA*

Congratulations to Doug Potts for submitting this issue's Featured Tip. In recognition of his tip, Doug will receive \$250 worth of tools from The Stanley Works.



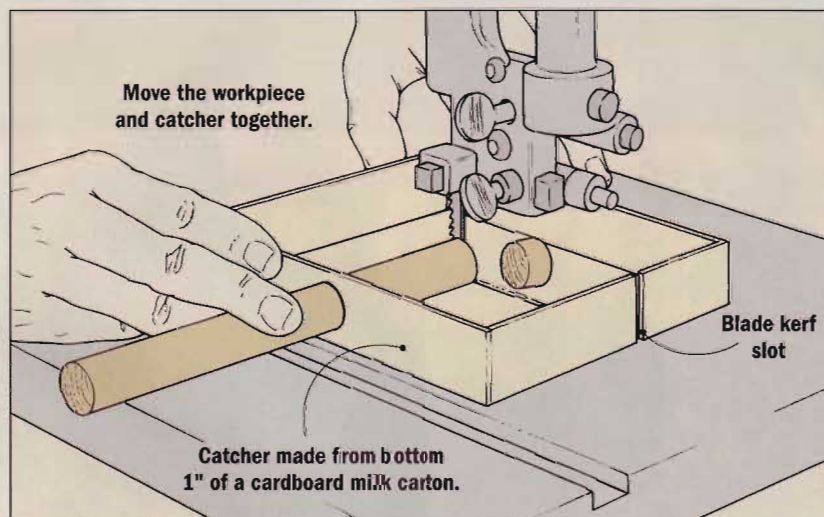
Emergency Trap Wrench

When I needed to remove the PVC plug from a clean-out trap, I realized I'd loaned my large pipe wrench to a friend (who still hasn't returned it). My slip joint pliers would fit the plug, but I couldn't get enough leverage to unscrew it.

So I made an "emergency" plug wrench from a 24"-long piece of 3/4"-thick plywood by cutting a square

hole in one end to fit over the plug. I left 3" of stock on each side of the hole and wrapped it with plumber's strap so it wouldn't break or split. The wrench's long handle gave me the added leverage I needed.

*R.B. Himes
Vienna, OH*



Band Saw Cut-off Catcher

When I cut small parts on the band saw, they usually pop off onto the floor and end up lost. Other times, they find their way into the opening in the throat plate.

I solved both problems with the bottom end of a half-gallon cardboard milk carton. First, I cut the carton off about 1" above the bottom end. Then I cut a notch or hole in the side just big enough to slip the workpiece through.

To use the "catcher," I slip the workpiece into place, then push the

carton and the workpiece through the blade, halting the cut once the workpiece is trimmed. The cutoff stays inside the carton and the cardboard bottom acts as a zero-clearance insert around the blade.

After the initial cut, I just follow the same kerf line for additional cuts. When I'm done cutting, I move the catcher to my bench where it keeps the parts corralled until I'm ready to glue them in place.

*Willis G. Howard
Rapid City, SD*

Paint Hides Wallpaper Seams

Hanging wallpaper isn't one of my favorite jobs, particularly getting seams to line up. Even when you think you've created an invisible seam, the wallpaper shrinks and the seams open up slightly, revealing the wall underneath.

To help hide these seams, I buy a small can of paint that matches the background color in the wallpaper. Then, before papering, I paint a 2"-wide band on the wall roughly where the wallpaper seams will fall. The wide band gives me some leeway when I actually hang the paper.

When the paint dries, I install the wallpaper and the seams stay hidden.

*Ben Lombardozzi
Erie, PA*

Share Your Tips, Jigs, and Ideas

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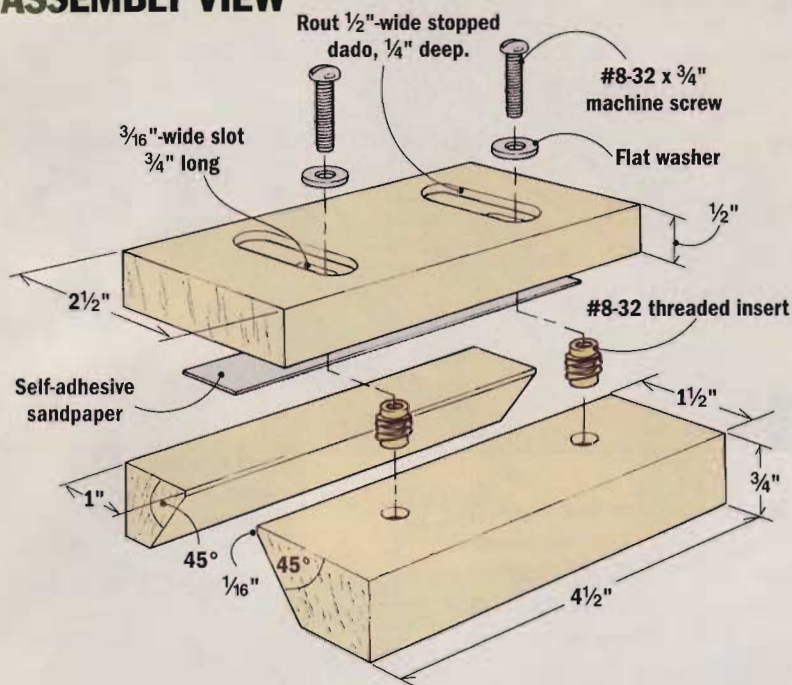
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ASSEMBLY VIEW



Chamfer Sander

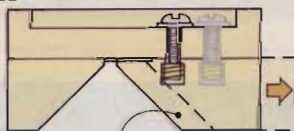
Sanding a chamfer is a quick way to soften the sharp edge of a workpiece, but it takes some careful sanding to keep the angle and width of the chamfer uniform.

To make the task easier, I built a chamfer sanding block that has two runners to guide it along the edge so the angle stays a consistent 45°. I made the runners by ripping a piece of hardwood stock with the blade tilted to 45°.

One of the runners is fixed in place but the other can be moved in and out to adjust the width of the chamfer. To make this runner adjustable, I routed stopped dados and slots in the body of the block and installed threaded inserts in the runner (*Assembly View*).

To use the block, I attach a strip of 180-grit, self-adhesive sandpaper about 1" wide to the block, butting it against the fixed runner. Then I install the adjustable runner — it helps hold the sandpaper in place (*Fig. a*). When I have the chamfer width set, I tighten down the screws and start sanding (*Fig. b*).

a.



Loosen screws and slide runner in or out to adjust chamfer width.

b.



You can add strips of felt to the beveled faces to make them slide easier against the workpiece's edges. Just be sure to keep the felt clean from wax, dust, and grit so it won't leave scratches on your work.

Robert Foss
Workbench Staff

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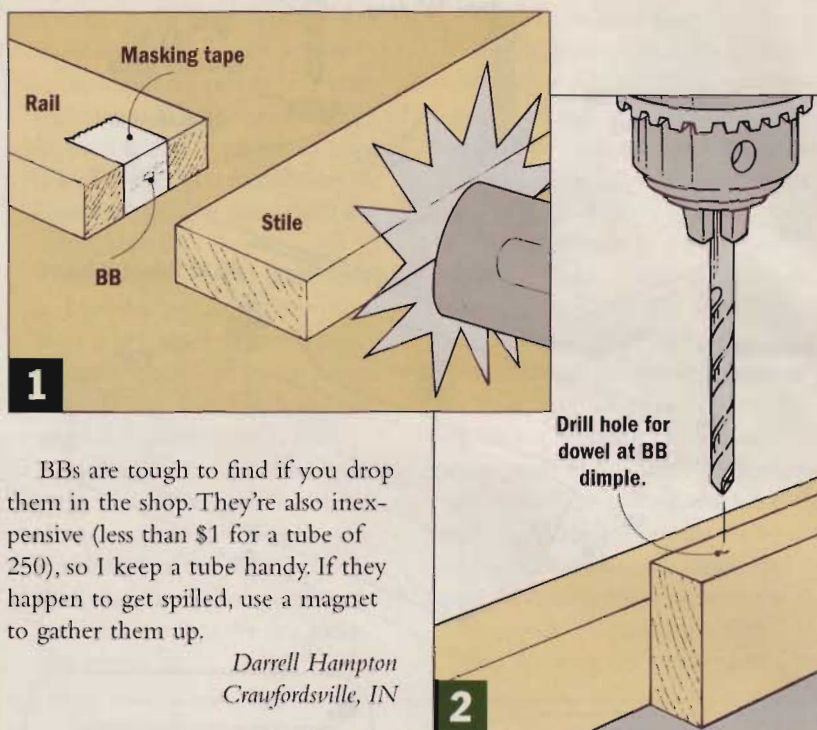
BB Puts Dowels on Target

If you don't own a doweling jig or have trouble keeping track of dowel centers like I do, this method will make sure your dowel holes line up.

I attach a BB — the kind you shoot in air rifles — to a piece of masking tape. Next, I position it on the end of the rail, folding the tape back over the faces of the rail.

Then I align the rail against the stile and give the stile a sharp rap with a hammer (Fig. 1). To help keep everything from shifting around during this procedure, you can clamp the rail to the workbench.

When I remove the tape, the BB has left a small indentation on each piece. Using these dimples as the centerpoints, drill the dowel holes in both pieces at the drill press (Fig. 2). When you glue up the rails and stiles, the dowel holes are perfectly aligned.



BBs are tough to find if you drop them in the shop. They're also inexpensive (less than \$1 for a tube of 250), so I keep a tube handy. If they happen to get spilled, use a magnet to gather them up.

*Darrell Hampton
Crawfordsville, IN*

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Workbench Interactive

www.WorkbenchMagazine.com

WoodCentral Has the Feel of an Online Community

Hot



Site

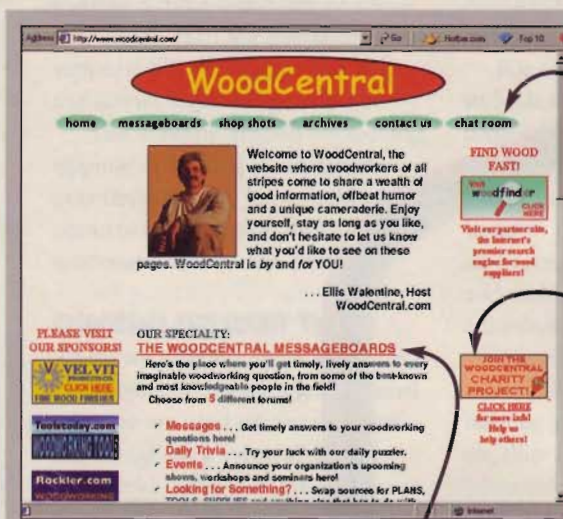
www.woodcentral.com

Think of WoodCentral as sort of a virtual hangout for woodworkers — the kind of place you'd spend an afternoon shooting the breeze with your buddies. For now, the site doesn't have as much "how-to" content as you might find on other popular woodworking sites, but the sense of community here makes this site a lot of fun. And that seems to be precisely what site host Ellis Valentine had in mind.

Valentine was formerly the Executive Editor (New Ventures) at *American Woodworker* magazine and struck out on his own when the magazine changed hands. Managing this site is more of a pastime than a vocation for Valentine. His goal was to create the same type of virtual community he built with readers during his years in print.

And if WoodCentral is a community, then the Messageboards are the town square. The messageboards are the five discussion forums on the site. There's quite a group of regulars that share ideas through the forums, including Valentine himself.

The most active discussion forum is simply titled "Messages." This is the area where woodworkers exchange viewpoints on just about every imaginable topic. Other forums include Daily Trivia, Events, and Classifieds.



SITE DETAILS:

Stop in anytime or join one of the scheduled chats on furniture making or wood finishing.

Woodworkers have always been a charitable bunch, and Woodcentral would like to organize that spirit to help underprivileged kids. Keep an eye on this area for updates on how you and your woodworking club can get involved.

Ellis Valentine calls the Message Boards the heart of this site, and he's right. The Q&A that goes on in here covers nearly every woodworking topic. Just be sure to scroll to the bottom for the latest posts.

WoodCentral is also one of the few woodworking sites that currently features real time chat. The chat room is always open, and there are a number of scheduled chat sessions with experts like fine-furniture maker Lee Grindinger and finishing expert Michael Dresdner.

Valentine admits that the chat feature is still developing, but he's confident that as more woodworkers go online and become aware of these types of features, the popularity of the chats will continue to grow.

Another fun area to visit is called Shop Shots. It's a lot like other photo galleries you've seen that are stocked with snap shots submitted by site visitors, but in here the photos are accompanied by comments from the craftsman. Not in-depth stuff, but at least some interesting insight as to how the project went together.

In the future, Valentine hopes to enhance WoodCentral by adding features like tool reviews, links to visitor web sites, and a mini mall for selected companies.

Have Your Woodworking Club, Group, or Guild Listed in Workbench

If you're a member of a woodworking organization of any kind and your group has a web page, we want to list your web address here.

E-mail the web site address to

editor@workbenchmag.com.

As we receive the submissions, we will provide a list of the groups here for others to visit. It's a great way to get your group recognized and pos-

sibly add some new members.

We also will personally visit each submitted site and from time-to-time, will feature the most unique and interesting sites on these pages.

Woodworker's Guide Indexes Back Issues

Software



Review

Developer: Woodworker's Indexing

Cost: CD-ROM \$35.00

Spiral-bound book \$39.00

Both \$69.00

Available versions: Windows only

Like most woodworkers, I've got a huge stack of woodworking magazines full of projects I'm going to get

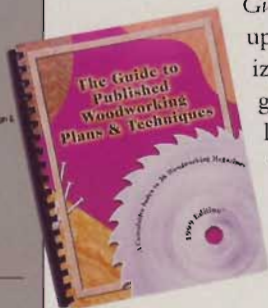
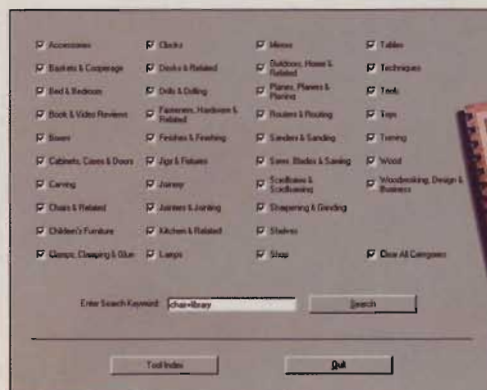
to "one of these days." Problem is, every time "one of these days" arrives, I spend most of it searching through back issues trying to find the project I want. But thanks to a new CD-ROM index of magazines from Woodworker's Indexing, I'm going to be able to spend less time rifling through magazines and more time ripping through boards.

The software is called *Woodworker's Guide*, and is actually the updated and computerized version of the guide previously published by Art Gumbus. The guide returns now under new ownership and includes 21,000 listings from 26 different magazine titles.

The printed version is pretty self-explanatory, so I concentrated on putting the CD-ROM version through its paces. It loaded quickly and was ready to search for articles in just a few minutes.

I wanted a plan for a library chair (the kind that folds from a small chair into a step ladder). So, following the instructions, I typed "chair+library" into the keyword search line. The program found no matches.

Next, I tried "chair+folding" and the program gave me a list of ten possible matches. None seemed like what I was looking for. Then I typed in "chair" and got 354 matches. I scrolled through the results and eventually found two entries for "convertible chairs." I checked the magazines listed and found them to have exactly what I wanted.



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A Familiar Name Gets a New Web Site

While I was at it, I tried the "Tool Index" feature, which is an index of tool review and technique articles from 1995 to present.

Here again, it took a couple tries to conduct a successful search. When I searched for "plate joiners," the program didn't find anything. But "biscuit joiners," turned up a list of 54 articles.

Despite these few quirks, the index is a good tool in either form. Updates will be available annually at a cost of \$15-\$20.

For more information, write to: Woodworker's Indexing, PO Box 336, Drexel Hill, PA 19026. Call (610)446-7231. Or visit www.woodworkersindexing.com.

OVERALL RATING:

On a scale of five discs, with five being the best.



Mining



The Web

www.titebond.com
Franklin International, maker of the popular Titebond wood glues, has remade the company's web site and added some features that make it more useful to woodworkers of all levels.

To enter the site, you click on one of four buttons that best describes your interest in Titebond products. The choices are Woodworker, Do-It-Yourself'er, Contractor and Installer, or Retailer and Distributor.

Once inside, there are several areas of interest to explore. The Products area is a complete list of the company's adhesives and their recommended uses. If you're looking for information on a specific Titebond glue, this is the place to go.

If you're not exactly sure which glue is best for your project, try the Product

Selector area. In this area, you select the qualities you want a glue to have for a particular project. For instance, if you want a glue that's invisible on darker woods and sands well, you simply choose those characteristics from a list and the site will recommend Liquid Hide Glue as the best choice.

Other areas on the site include the Glossary, Application Tips, Technical Support, and Frequently Asked Questions.



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rec.woodworking Still Has Woodworkers Talking

Mining



The Web

One of the most popular ways to exchange information on the Internet is through a news group — which is really just a public discussion forum where people exchange messages on a subject they're interested in.

Among the oldest and most popular groups is one called rec.woodworking, which as the name implies, is all about recreational woodworking. It's not unusual for more than 100 new messages to be posted in this forum in one day.

But before you run off to join the discussion, there are a couple things you should know.

First, an important difference between news groups and other discussion forums is that newsgroups are often completely unmoderated, or at best moderated by a volunteer. Which means the discussions can get a little off track in the newsgroups. So be careful which groups you wander into.

Second, these groups aren't really associated with a particular site, so you can't just type in a web address and jump right in. You need to find a site that provides access to the news groups and then follow the correct path through the site.

If you're an AOL user, you can get there through the Internet pulldown menu on the opening screen. Otherwise, most major search engines are a good way to get there. I like to use Alta Vista — it's the shortest route I've found so far.

Start by going to www.altavista.com. While you're on the main page, type "woodworking" in the query box and select the Discussion Groups button (See the Roadmap to rec.woodworking at right). Click on the "Search" button and the next screen will have a direct link to the forum. Click on it and choose a discussion thread to join in or just read.

There's always something interesting in here. For instance, according to a recent thread, Jimmy Carter, Andy Rooney, and Clint Eastwood are all known to be hobbyist woodworkers.

ROADMAP TO rec.woodworking

Start at
www.altavista.com

Type "woodworking" in the query box.

Select the Discussion Groups button.

Click on the Search button.

Click on the [rec.woodworking](#) link to enter the group.

Browse the topics to find a discussion of interest and then click on the link to join in the discussion.



ToolSeeker Delivers Bargains to Your E-mail

Mining



The Web

www.toolseeker.com

Okay, so shopping for new tools isn't exactly a burden. And online shopping couldn't be easier, right? Just point and click. But who has time to compare prices at all those online tool sources to make sure you're really

getting the best price? Toolseeker does, that's who.

ToolSeeker is an online shopping service that focuses entirely on tools. But unlike other online shopping services, ToolSeeker doesn't wait for you to ask for deals on a particular item — they go looking for them. Then they report their findings directly to your e-mail in the form of a monthly newsletter. Of course, you can always visit the site to see what deals they've uncovered recently.

The tools are listed on the site in six major categories that are each divided into several subcategories. For instance, say you're looking for a good price on a new router — routers are listed in the category "Assorted Power Tools," so click on that link to get started. Then on the next page, click on the "Routers" link to see a list of the current hot deals.

When you find a tool you like, simply click on the name of the tool and you'll go to a page that lists the site with the best price, how much they're asking for the tool, shipping costs, and tax.

There's also a monthly tool giveaway you can register for. In one recent month, for example, they gave away a 12V cordless drill. To sign up, click the "Free Tool Giveaway" link on the ToolSeeker homepage — you can't miss it. Signing up for the giveaway also registers you for the monthly newsletter.

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Product Information Number 192

You've Got E-Tips

Home



Page

Tips are like tools — you can't have too many. Sign up and we'll send you a free tip every

Friday in your e-mail. (And don't worry, we won't sell your name or address to other companies.)

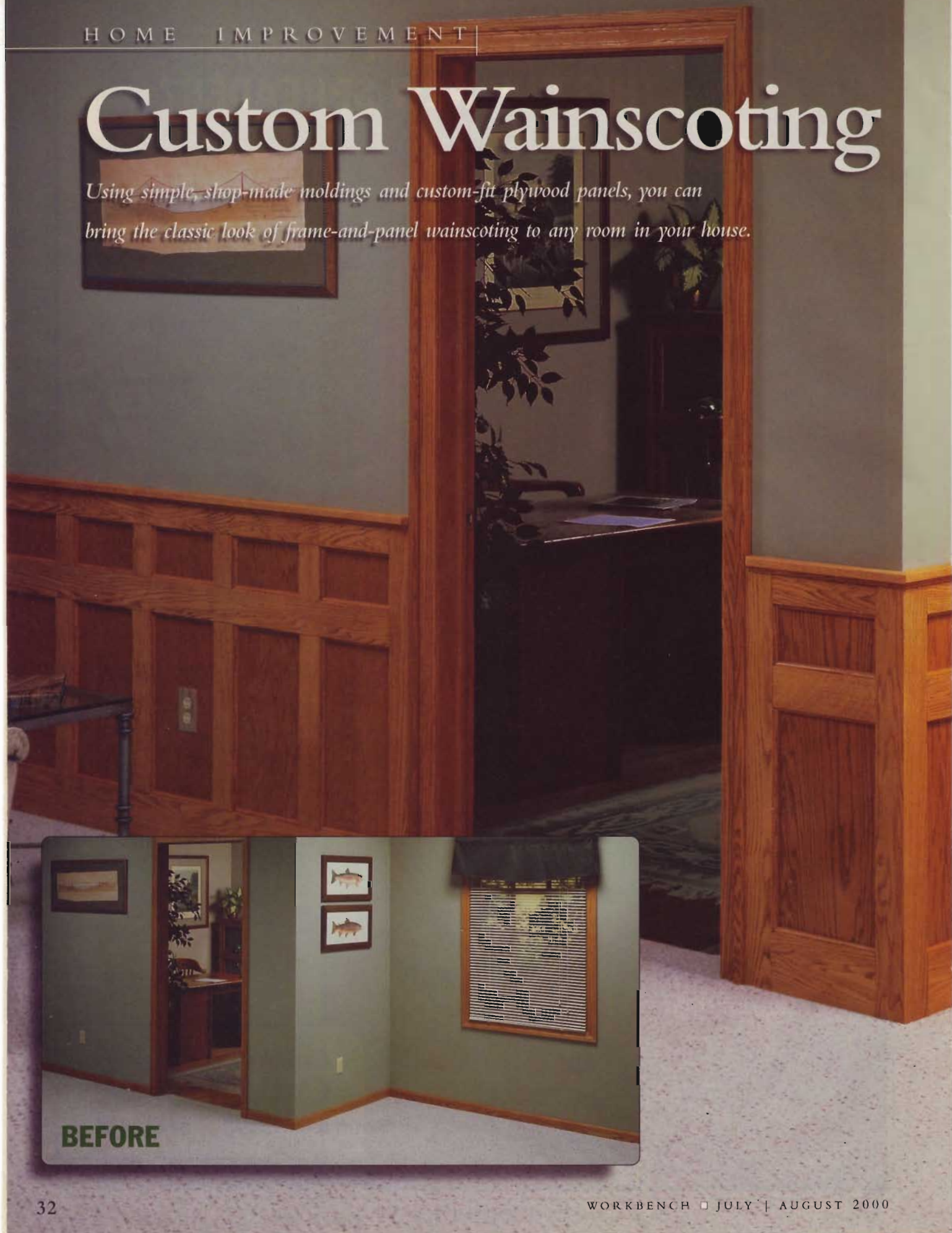


**FREE TIPS
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Custom Wainscoting

Using simple, shop-made moldings and custom-fit plywood panels, you can bring the classic look of frame-and-panel wainscoting to any room in your house.



BEFORE

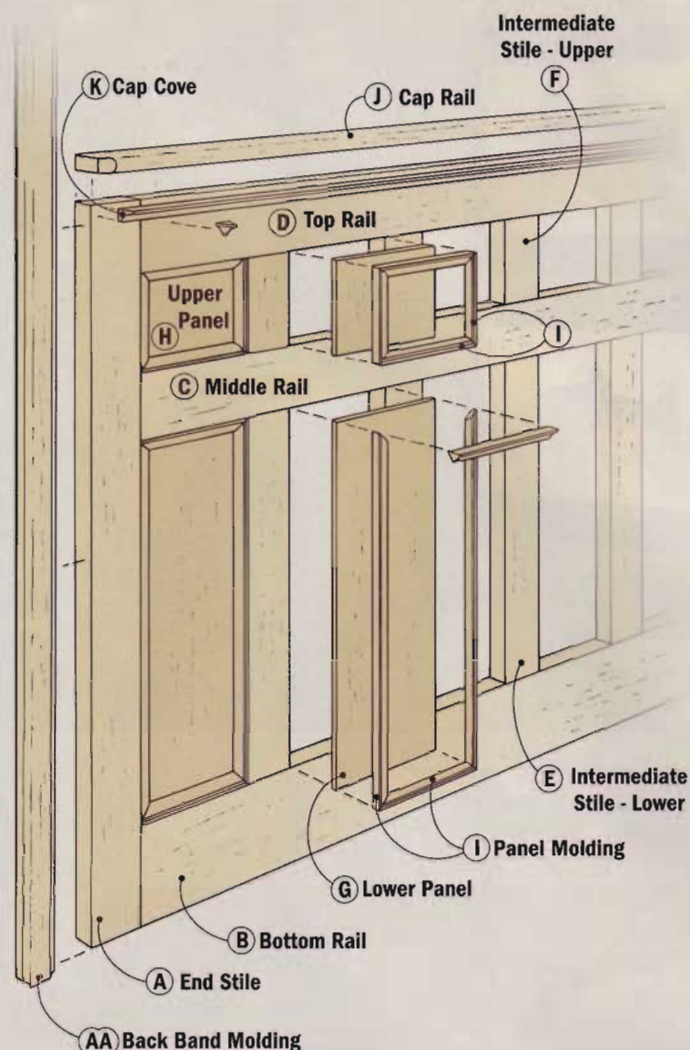
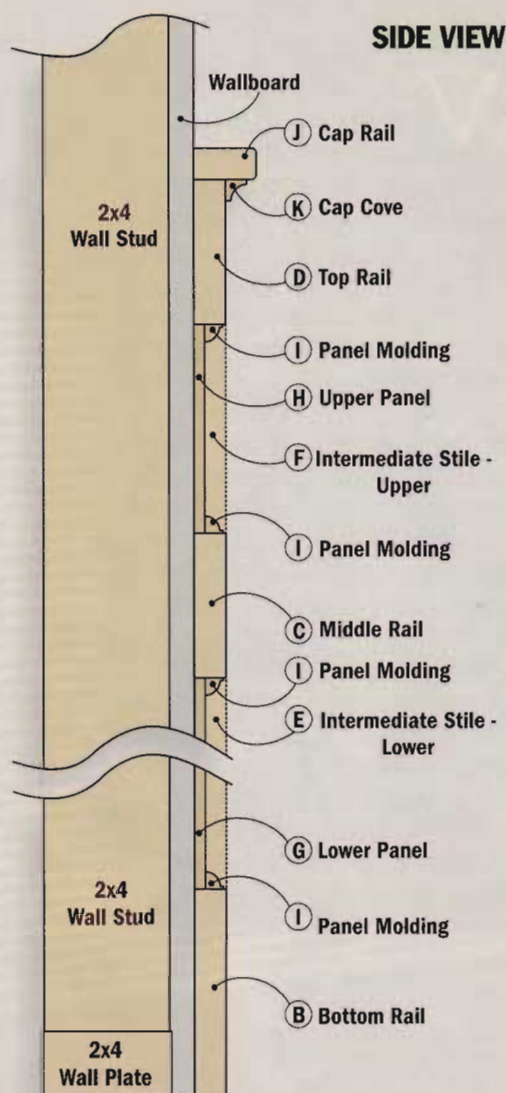


When you see a fancy law office on TV or an elegant dining room in the movies, chances are good the walls have frame-and-panel wainscoting. There's something about wrapping a room in real wood that gives it a warm, rich look. Or maybe it's just the way all the horizontal and vertical lines break up the expanses of blank wall space.

When I decided to install this classic wainscoting, I chose red oak to match the room's existing trim. While it may look complicated, all the moldings for this system were made in my shop using only a table saw, a router table, and four common router bits.

Making your own moldings gives you control over how the finished product looks, but the real advantage to this system is its flexibility. Because you can easily vary the width of the plywood panels, the system adapts to walls of any length.

ANATOMY OF WAINSCOTING



MATERIALS LIST

TRANSITIONAL MOLDING

AA Back Band Molding* 1" x 1 1/2"-wide

WAINSCOT RAILS AND STILES:

A End Stiles 3/4" x 3" x 36"
 B Bottom Rail* 3/4" x 5"-wide
 C Middle Rail* 3/4" x 3 1/2"-wide
 D Top Rail* 3/4" x 3 1/2"-wide
 E Intermediate Stile - Lower 3/4" x 3" x 19"
 F Intermediate Stile - Upper 3/4" x 3" x 5"

WAINSCOT PANELS:

G Lower Panel** 1/2" x 18 7/8"-long
 H Upper Panel** 1/2" x 4 7/8"-long

WAINSCOT MOLDING:

I Panel Molding* 1/16" x 7/16"-wide
 J Cap Rail* 3/4" x 1 1/2"-wide
 K Cap Cove Molding* 1/2" x 1/2"-wide

* Length will vary ** Width will vary

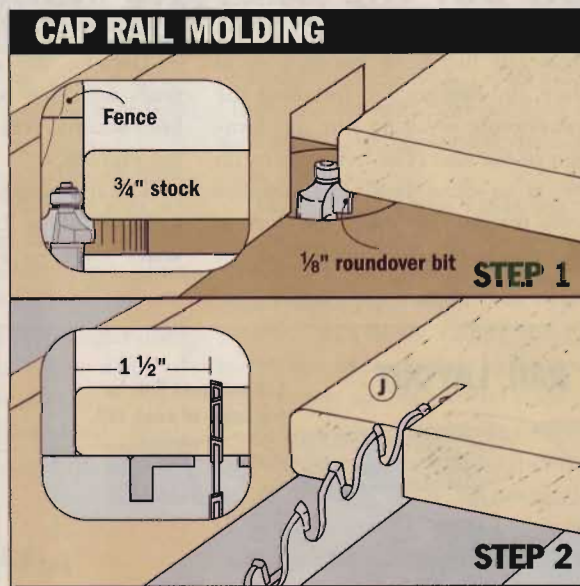
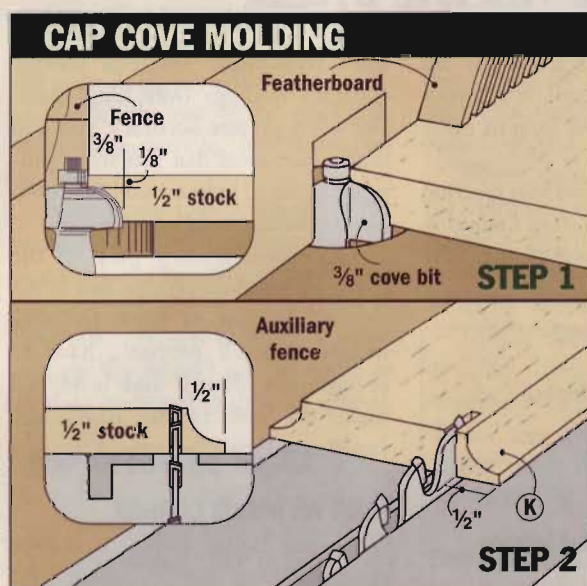
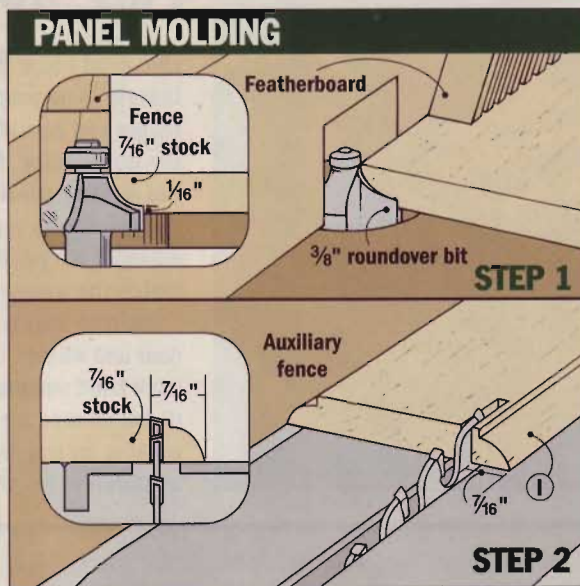
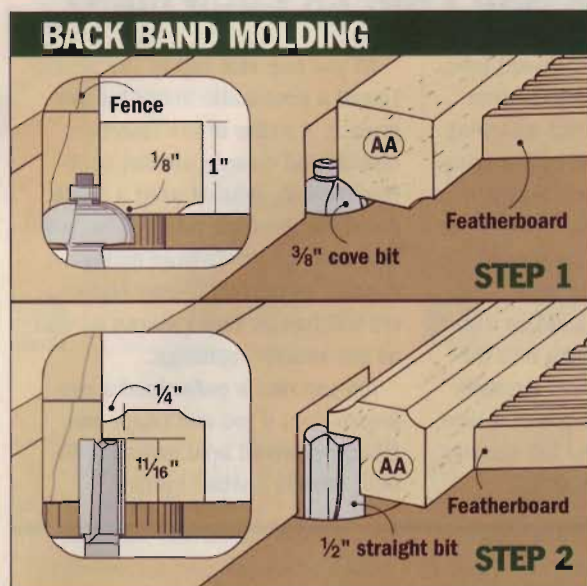
If you study the wainscoting illustrations above, you'll understand this system's flexibility. See how the bottom (B), middle (C) and top (D) rails run continuously from one end of the wall to the other? This lets you space out the two-piece intermediate stiles (E and F) so you can divide any length wall into uniform openings. With the openings "framed," 1/4"-thick plywood panels can be cut to fit the openings.

Okay, so maybe you're thinking, "Wouldn't it be easier to just cover the walls in plywood first, then add the stiles and rails?" It may be easier to do it that way, but I had a couple of reasons for choosing the method shown here.

First was the overall thickness of the wainscoting. If I had installed the 1/4"-thick plywood first, then added 3/4"-thick rails and stiles over the top, there'd be an inch of material butted up against the existing door and window casing. Unless you own an older home with built-up trim, your casing is probably like mine — only 5/8"-thick at its thickest point.

To solve the problem, I placed the rails and stiles directly against the wall to gain back that 1/4". Then I built up the casing's thickness with a back band molding (AA). The back band shown here is 1"-thick. Any thicker and it starts looking clunky. This back band is rabbeted to fit over a 5/8"-thick colonial style casing.

SHOP-MADE MOLDINGS



Another advantage of this system is that the small, individual panels are easier to work with when it comes to selecting and matching grain patterns. Even with some selective cutting around bad spots, you'll use less than half the plywood you would with continuous panels.

MILLING THE MOLDINGS

You don't need a shaper to produce the moldings used for this project. All it takes is a router table and four common bits: a $\frac{3}{8}$ "-radius cove, $\frac{3}{8}$ "- and $\frac{1}{8}$ "-radius roundovers, and a $\frac{1}{2}$ "-dia. straight bit (or a rabbeting

bit). Because the panel molding (I) is $\frac{7}{16}$ "-thick and the cap cove (K) is $\frac{1}{2}$ "-thick, a thickness planer comes in handy. If you don't own one, have your lumber supplier plane down the stock for you, or resaw the pieces on your table saw.

Rather than try to rout profiles in narrow pieces of stock, I used a technique that supports the stock as it passes over the bit and keeps your hands out of the way as well. As you can see in the *Panel Molding*, *Cap Cove Molding*, and *Cap Rail* drawings above, the profile is routed in both edges of a wide blank. Clamping a

featherboard on the fence helps hold the stock firmly against the table so the profile stays uniform. (To find out how to make and use a featherboard, turn to page 72.)

Once you've routed a profile in both edges, trim the molding pieces away from the blank using a table saw. Then repeat the process until the blank gets too narrow ($1\frac{1}{2}$ " to 2 " wide) to handle safely.

Because the back band (L) is a heftier piece, rip it to width first and rout the profiles. Once all the moldings are milled, apply stain and finish to all but the cap rail.



PREP WORK AND PROPER EQUIPMENT

Like most home improvement jobs, there's some prep work involved before you actually start installing the wainscoting. Start by removing the existing baseboard. Now is also a good time to replace the existing casing if it's painted or doesn't match the wainscoting style.

The next step is to build up the door and window casings with the back band molding (AA). I usually fit the mitered pieces one at a time, working my way around the opening, as shown in the photo at left.

As you can also tell by the photo, I used a pneumatic nailer for this project. A nailer drives fasteners quickly and cleanly without splitting the oak. While I used a finish nailer for the back band, rails, and stiles, an 18-gauge brad nailer capable of driving 2"-long fasteners will handle these pieces as well as the smaller moldings.

You can rent a nailer (and a compressor too) if you don't have one. Electric-powered brad nailers (\$50-\$60) provide another option.

LAY OUT THE RAILS AND INSTALL THE END STILES

Once all the back banding is in place, the first step to installing the wainscoting is laying out the location of the rails. The best way to do this is to draw level lines on the walls for the top edges of bottom (B), middle (C), and top (D) rails.

Because the end stiles (A) are flush with the top rail, the layout lines also tell you how long to make the end stiles.

Use the longest level you can find to lay out these lines (*Rail Layout*). A water level — a long plastic tube

filled with water — helps provide accurate readings over long spans. For even greater accuracy, you can rent a laser level that projects a pinpoint beam of light around the room like a rotating lighthouse beacon.

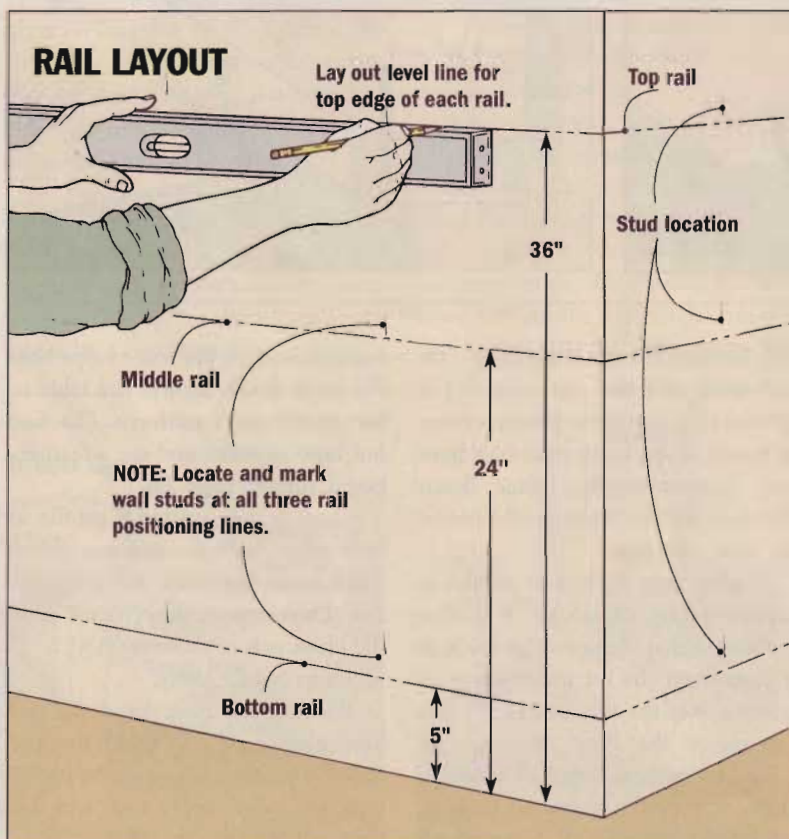
Occasionally, other parts of the room — windows, doors, and floors — will be out of level. In these instances, you'll probably have to compromise plumb and level and make the rails fit the room (see *Installation Pitfalls* on page 42).

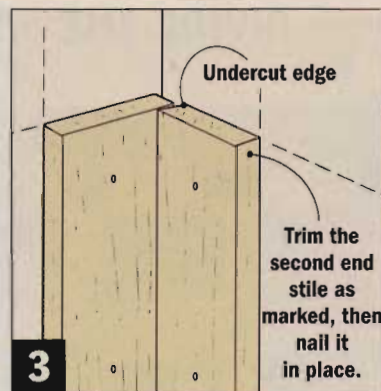
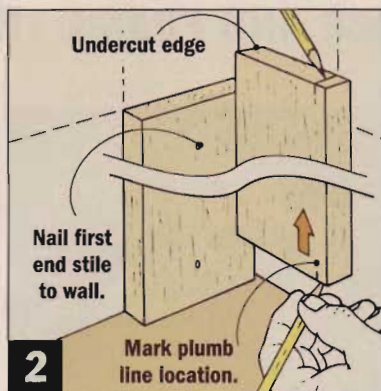
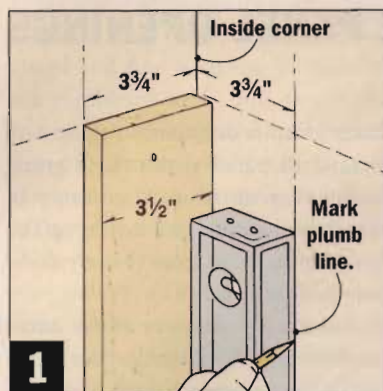
TURN AN INSIDE CORNER

Once the layout lines are drawn, start installing the $\frac{3}{4}$ "-thick end stiles (A). These go at the ends of each wall — the corners — and against each side of door openings.

In most rooms you'll have to deal with four inside corners. It may look like a natural place for a miter joint, but it's simpler to let the stiles overlap. To get started, use a level and mark plumb lines on both walls $3\frac{3}{4}$ " out from the corner (*Fig. 1*).

The first stile needs to be wider than normal (3") to give you the overlap. If you make it $3\frac{1}{2}$ " wide, you have enough for the overlap, without bumping into the intersecting wall. That $\frac{1}{4}$ " of breathing room comes in handy if the two walls aren't plumb with each other.





Align the first stile with the plumb line and nail it in place. (You may want to drive a few test nails first to locate the corner studs.)

The second stile should be a little wide too. Before ripping it to width, tilt the table saw blade 5°. This slight bevel, or undercut, lets the face of the edge fit tightly without interference from the rest of the stock. (To learn more, turn to *Trim Secrets*, on page 66.)

Now, fit the undercut edge of the second stile tightly against the first and mark the location of the plumb line on the stile as shown in Figure 2. Set your table saw blade back to 0° and rip the second stile to width as marked. Then nail it in place (Fig. 3).

WRAP AN OUTSIDE CORNER

So how do you handle an outside corner? It's done with some of the same techniques, but it requires a little more fitting because the joint is out in the open. For a clean-looking joint line where the two stiles meet, you'll have to undercut the mating edges of both stiles (Fig. 4).

Next, mark plumb lines on the wall 3" each way from the corner. I dry-fit the stiles, trying to keep them aligned with the plumb lines. It can be sort of a juggling act.

Since the walls probably aren't plumb with each other, I usually try to keep one stile flat against its wall, then shim the other stile, to keep everything plumb and the joint line tight (Fig. 5).

When things are adjusted, tack the shimmed side in place (Fig. 6). Apply a thin bead of glue to the beveled edge of the other stile, then tack that stile in place.

To help keep the joint tight until the glue dries, put a few strips of masking tape around the corner. When the glue has dried, finish nailing down the stiles and trim off the shims (Fig. 6b).

TIME FOR THE RAILS

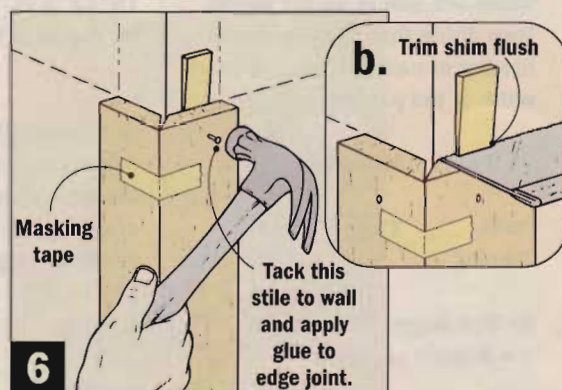
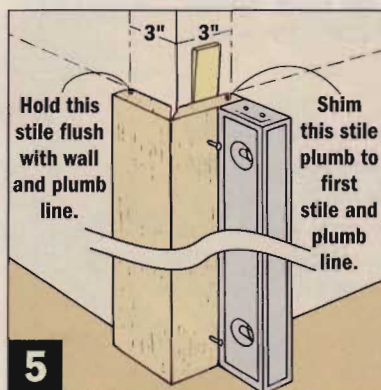
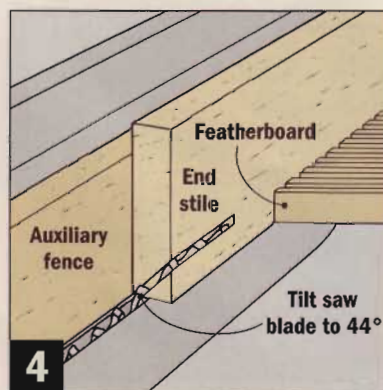
With just the end stiles in place, the room won't look much different. But add the rails — particularly the middle (C) and top (D) ones — and the project begins taking shape.

Using the level lines you drew earlier, measure between the pairs of end stiles and cut the rails to length. Whenever possible, cut each rail from one piece of stock. For long walls, you may have to use two pieces to get the required length. Choose pieces with similar grain and overlap them with a scarf joint. (Turn to page 74 to find out how to scarf rail pieces for a nearly invisible joint line.)

To get tight-fitting joints where the rails meet the end stiles, cut the rails just a "hair" long. When you install them, put a slight bow in the middle. Then begin nailing the rail to the wall in the middle so the ends push tightly against the end stiles.

Before driving any nails, I used a stud finder and marked the location of all the wall studs. To install the rails, apply some glue to each end, and drive 6d finish nails at the wall stud locations and to the stiles.

When attaching the rails to the end stiles, I toenailed the rails through their top and bottom edges so the nails will be covered by moldings.



DIVIDE THE SPACE AND FRAME THE PANEL OPENINGS



Each room is different, so there isn't a standard panel width that's going to fit every situation. The beauty of this system is that you divide up the space first, then trim the plywood panels to fit.

Since the placement of the intermediate stiles determines the panel width, experiment a little with the stile spacing. I did this by cutting some 3"-wide strips of cardboard (the same width as the intermediate stiles). Then I taped them up around the room, "eyeballing" their placement along each wall.

Generally, you want to achieve a "consistent" panel appearance throughout the room. In other words, you don't want a few wide panels on one wall and a bunch of narrow ones on another. In my situation, I tried to space the cardboard stiles somewhere between 8" and 12" apart.

HOW TO MAKE YOUR PANEL OPENINGS UNIFORM

So just how do you go about dividing up a wall into uniform panel openings? First, measure the wall length (X) between the end stiles. To divide up a space into a specific number of panels (n), it will take one less than that number of stiles (n - 1). Rough placement of the cardboard stiles can help you determine how many panels to use.

You also know that each stile is 3" wide. So by subtracting the combined width of the stiles, the space left over is for the panels. Then divide that distance by the number of panels to get the exact width of the panel openings.

PANEL OPENING FORMULA

$$\text{Panel Opening} = \frac{X - [3"(n - 1)]}{n}$$

X = Wall length between end stiles
n = Number of panels

EXAMPLE:

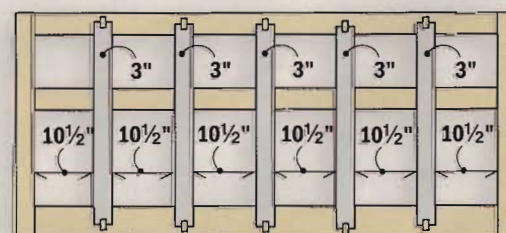
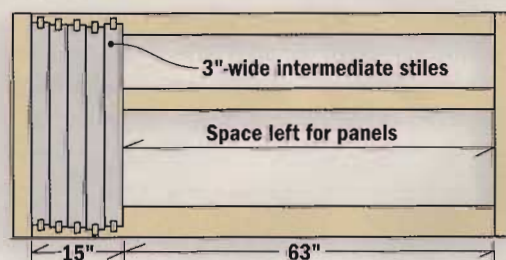
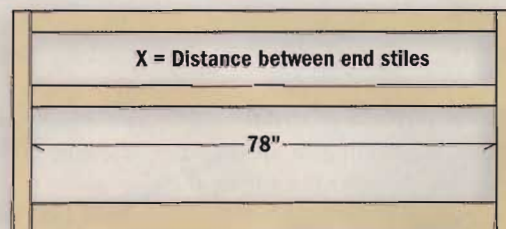
Measure the wall length (X) between the end stiles.

In this case, X = 78"

I've decided on 6 panels (n) for this wall. So it will take 5 stiles (n - 1) to create that many panels.

The combined width of the 5 stiles is 15" (3" x 5). So the space left over for panels is 63" (78" - 15" = 63").

To figure out how wide to make the individual panel openings, I divided the total panel space by the number of panels. So the exact width of the panel openings for this example is 10½" (63" ÷ 6 = 10.5")



From this point, you could go ahead and fine-tune the position of the cardboard strips. But to get the *exact* panel opening width, it's best to dust off your math skills and calculate the spacing with the formula shown at the bottom of the previous page.

A good way to double-check your math is to measure and tape up your cardboard stiles as shown in the photo at left. When you're satisfied with the stile spacing, use a level to mark plumb lines across all three rails at each stile location (see the photo at right).

INSTALL THE STILES

In theory, you should be able to cut all the intermediate stile pieces (E and F) to finished length at once and install them. But because of minor variations in rail width and how the rails are installed, I recommend marking and fitting each intermediate stile piece individually to get good, tight-fitting joints (Fig. 7).

While you can trim the stiles on your table saw, I used a 10" compound miter saw to make these cuts. It let me set up close to my work area — a real time saver — and I could easily put a slight back-cut on each piece. And with a good blade and a little practice, you can “shave” a piece down until it fits perfectly between the rails.

The intermediate stiles look best when the grain flows from the lower stile (E) to the upper stile (F). So, whenever possible, cut both stile pieces from the same piece of stock and keep the grain oriented the same way when you install them.

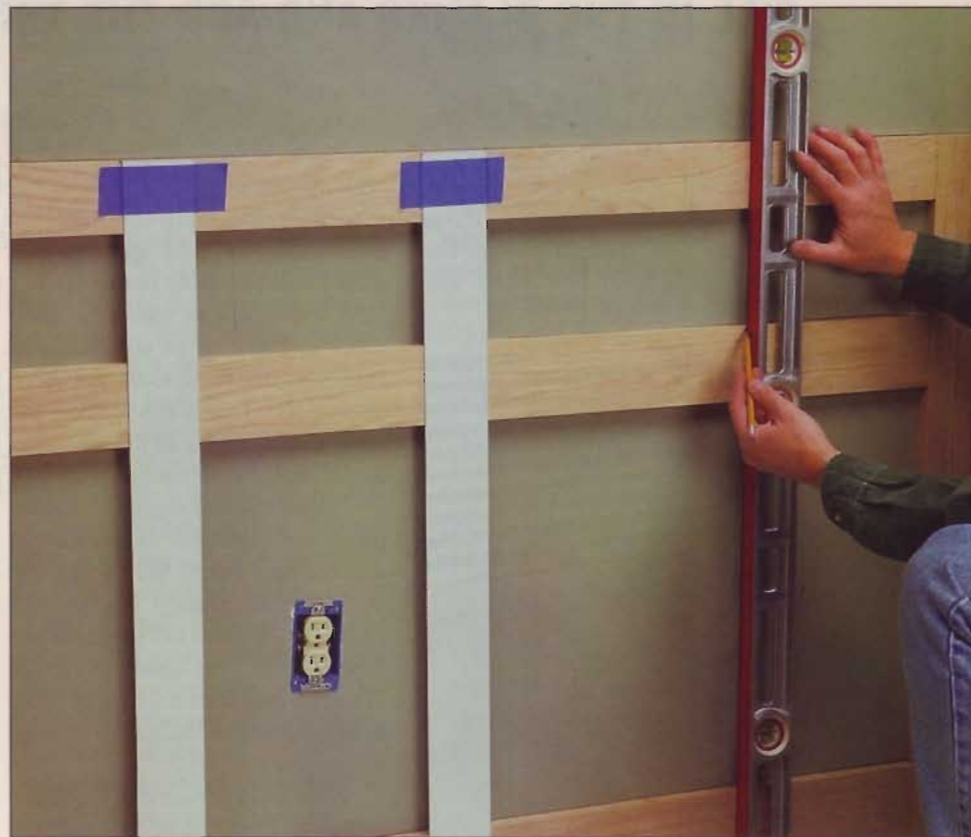
Install them in pairs — lower piece first — before moving onto the next set of stiles. They're glued and toenailed between the rails (Fig. 8).

I gave the completed rail and stile framework a light sanding with a random orbit sander to remove pencil marks and any glue dribbles. Then I hand sanded with the grain to clean up any swirl marks.

Now is also a good time to sink any protruding nail heads with a nail set and hammer. Then complete this phase of the project by applying a coat or two of finish (Fig. 9).

To get a warmer oak tone, I used a 50-50 blend of Sealacell Golden Oak and Sealacell Honey Maple from General Finishes (turn to *Sources and Resources* on page 80 for more information). It's a wipe-on, tung oil sealer and stain that builds a moderately tough finish with two coats. For extra protection, I'd recommend covering any stain with at least one coat of polyurethane.

You can leave the nail holes unfilled until the wainscoting is completely installed. Then fill the visible ones with colored wood putty.



FILL IN THE BLANKS AND ADD THE TRIM MOLDINGS

Once all the rails and stiles are installed, the tough part of this project is done. All that's left is filling in the framed openings with $\frac{1}{4}$ " plywood panels and trimming things out with shop-made moldings. The biggest thing to keep in mind with

the panels is grain pattern. When buying plywood, try to find sheets that have consistent grain pattern without obvious splice lines in the veneer. A few swirls are fine, but grain that's too "wild" overpowers a small panel and looks out of place.

A great way to make the grain easier to "read" is to go ahead and apply stain and finish to the full sheets of plywood. This is also quicker and easier than finishing all the individual panels after they're cut out.

Once the finish was dry, I cut the panels out in three steps as shown in the drawing below. When you cut the panels to finished size (Steps 2 and 3), make them $\frac{1}{8}$ " narrower and shorter than the panel openings. (The rails and stiles need some room to expand and contract with changes in humidity.)

After making each cut, I held the two panel pieces (G and H) together and numbered them so the numbers went across the joint line on the back of the panels. This helped me keep the grain oriented during installation.

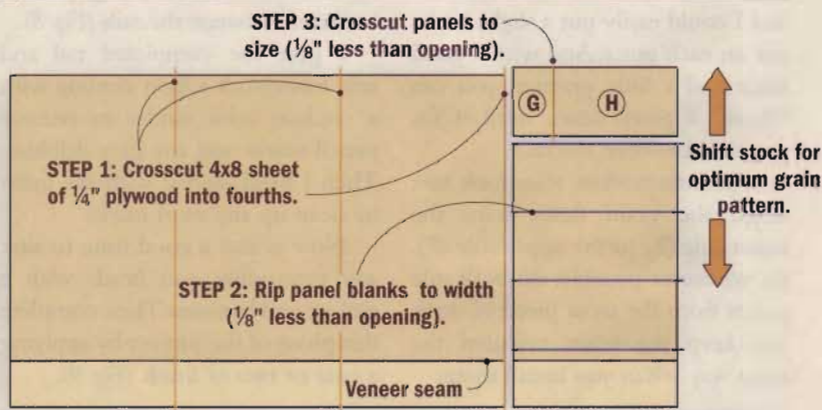
To check out how the panels looked around the room, I dry-fit all the panels first, then swapped a few (in matched pairs) around to get a better overall grain pattern distribution around the room. Once I was satisfied with the look, I began fastening the panels in place.

While the panel trim molding (I) will hold the panels in place, a little construction adhesive applied to the back of the panel keeps it centered in the opening. It also provides some insurance against having a panel bow out down the road.

FIT THE PANEL MOLDING

It wasn't until after installing the panel molding around the first panel that I realized how many miters I had left to cut — close to 500 for the 12-ft. $\times$ 16-ft. room I was working in! But I soon developed a rhythm and it went quicker than I'd expected.

One tip worth considering is borrowing a miter saw from a friend. With two saws, I set one at 45° left and the other at 45° right so I wasn't



constantly swinging a single saw back and forth to trim the opposite ends of each piece of molding.

The best way I found to install the panel molding (I) was to mark and fit the bottom piece first, then nail it down. Next, stand a piece of molding along the left side of the opening and mark it (Fig. 10). With that piece cut and installed, I repeated the process for the top piece (Fig. 11).

Finally, I cut and fit the right side piece, leaving it just a "hair" long so I had to bow it slightly to get it in place (Fig. 12). This wrap-around method helps ensure tight-fitting miters.

APPLY THE CAP RAIL AND COVE

After cutting 500 miters for the panel moldings, installing the cap rail (K) and the cap cove (L) was simple. To fit the cap rail, start with the longest sections first. It's easier to fine-tune the fit on the shorter sections once the longer pieces are in place.

If a long section starts in a corner, miter that end of the cap rail first, then trim the opposite end to fit. In Figure 13, see how I set the intersecting cap rail over the first

piece to mark the miter. This same method also works for an outside corner (Fig. 14).

Leaving the cap rails squared off where they meet the back bands (L) looked odd. So I mitered the ends. This way, they "tuck" in behind the small cove in the edge of the back band (Fig. 15). Sanding a roundover on the edges of the miter helps match the profile on the rest of the cap rail.

Once I had all the pieces fitted, I labeled them to keep them organized and applied stain and finish. Then I nailed them in place (Fig. 15, inset).

The cap cove (L) goes on in similar fashion, marking and mitering the pieces at the corners (Fig. 16). Where the cove meets the back band, I trimmed small triangular-shaped pieces (called returns) to hide the end grain. It takes some thought to set up the cuts, but the end results give the job a professional touch.

The *Return Detail*, shows how to set up the cuts. You'll also need to miter the end of the long piece of cove at $22\frac{1}{2}^\circ$. To attach the return, put a dab of glue on the $22\frac{1}{2}^\circ$ end and slide it into place (Fig. 17). It

SKILL BUILDER

Create A No-Fly Zone

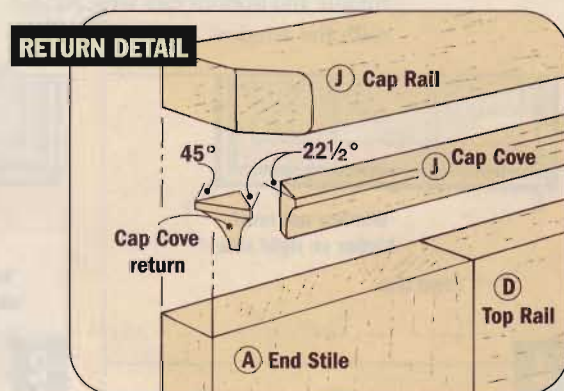
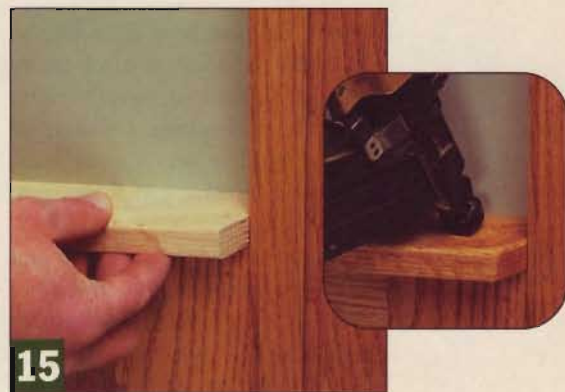
Try cutting small pieces (such as the cap cove return) on a miter saw, and they're likely to go flying off across the room. This problem can be solved by using double-faced tape to attach a short length of molding to a piece of hardboard.

Cut one end, swing the blade around and cut the second angle, but don't cut all the way through the hardboard. Also, let the saw blade come to a complete stop before raising it.



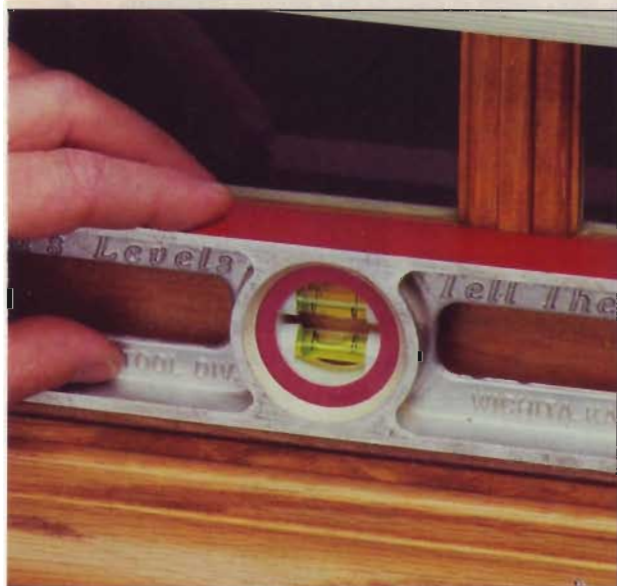
should stay put on its own, but a piece of masking tape guarantees that it won't move while the glue dries.

Project completed! If you think it looks good now, go back and look at the *Before* picture (page 32) to see the difference wainscoting makes.



Installation Solutions

Even in a new home, you can run into windows that aren't level, out-of-plumb doors, and sloping floors. Here are three great tricks to install wainscoting around these common problems.



Wouldn't it be great if walls were always plumb and square and floors were always flat and level? Unfortunately, that's rarely the case, and often you've got several of those problems all happening at once.

While there isn't room to cover all of the problems — and their solutions — here, I'd like to share a few tips that came in handy during the wainscoting installation.

In general, you want to fit the wainscoting to the existing room. That's because the human eye is good at picking up non-parallel lines. You may not be able to distinguish whether a casing is level or

plumb. But if two rails aren't parallel or if the stiles aren't installed square to the rails, it's going to really jump out at you visually.

To deal with such problems, you have to pull some tricks. These tips may not be magic, but they will trick the eye into seeing everything as level and square. Even when you know the real truth.

Note that the situations shown in the illustrations are all exaggerated to help demonstrate what's happening. (If your home actually looks like the illustrations, you should probably consider selling the house in a hurry or at least fix those problems before thinking about wainscoting.)

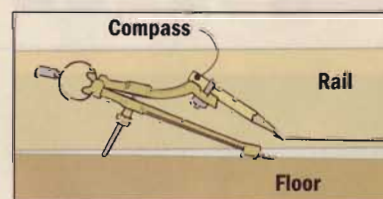
ALIGN WITH OUT-OF-LEVEL CASING

When I laid out level lines for the rails under the window, it was pretty apparent something wasn't right. After a little checking, I discovered that the window wasn't quite level, leaving a noticeable gap at the right side (Fig. 1).

Straightening up the window was out of the question. So instead of worrying about level, I measured down from the window casing the same distance on each side, so the middle and bottom rails were parallel with the window (Fig. 2).

Fortunately, the window was in a short wall and establishing parallel lines fixed the problem. If the window had been in a longer wall, I would have laid out two lines — level and parallel — then averaged them to lessen the overall impact.

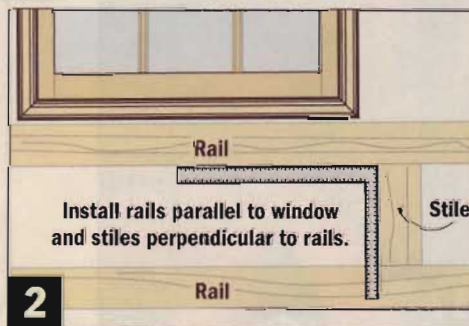
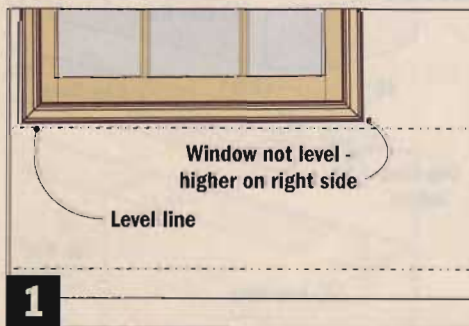
Remember to think in terms of the entire room. Adjustments you make on one wall will affect the other three. That's why it's a good idea to lay out everything in pencil and keep a large eraser handy in case you need to make adjustments.



SCRIBE TO MATCH A SLOPING FLOOR

There are a couple of ways to deal with a sloping floor. After laying out the level line for the bottom rail, measure down to the floor every foot or so to identify the highest spot. Rest the bottom rail on the high spot and shim it level. Next, scribe it to the floor with a compass (above). Then trim the rail to follow the contour of the floor (you'll trim the most off at the high spot).

If you don't want to scribe the rails, you can cover up small gaps with a base shoe molding or a combination of scribing and base shoe to deal with a badly sloping floor.



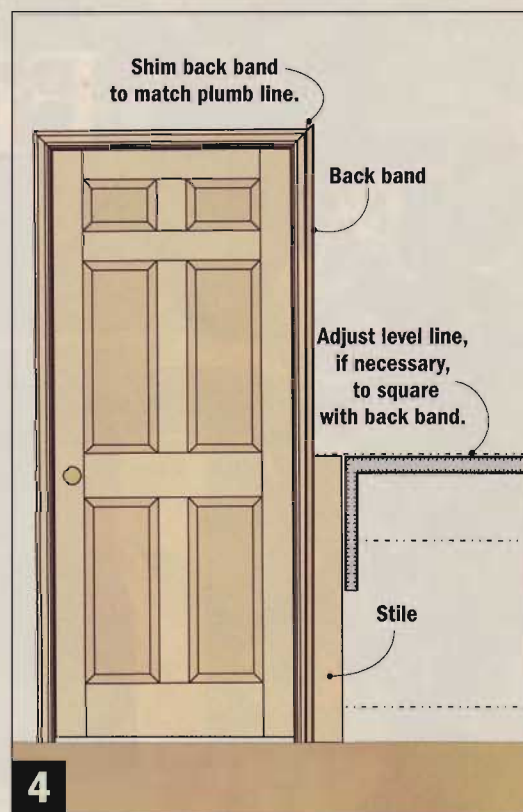
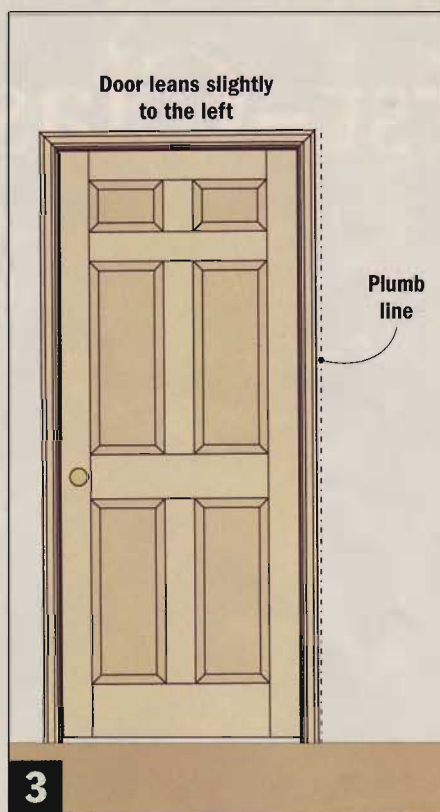
GET AN ANGLE ON OUT-OF-PLUMB CASING

For an out-of-plumb door casing, you could rehang the door, but there's an easier fix. Depending on how far the door is out, you can start by shimming the back band to gain a little bit (*Fig. 3*).

If you need to gain a little more, put a slight taper on the end stile that fits next to the doorway. To compensate a lot, the next couple of stiles may need to be tilted in lessening degrees, before getting back to plumb.

If you've tilted the stiles, you may need to also adjust the lines for the rails slightly off of level to help keep the panel openings looking square (*Fig. 4*). When adjusting the rail lines, just remember that those three lines need to remain parallel.

It's easier than it sounds, especially once you have the lines drawn on the walls. Like any good magician, you'll be tricking your audience into believing what they see. 



Store-Bought Wainscoting

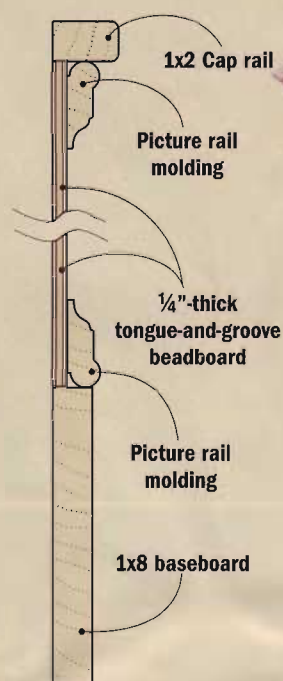
If milling your own moldings or fitting dozens of panels sounds like too much work, there's a simpler solution. Traditional beadboard wainscoting is available at most lumber yards or home centers. You can buy everything "ready-to-assemble" in both oak and pine.

The baseboard is just a 1x8 and gets nailed to the wall first. The tongue-and-groove sections of beadboard rest directly on top of the baseboard.

Covering up the edges of the beadboard are two identical pieces of picture rail molding. The lower piece is installed upside down and rests on top of the baseboard.

Just like the wainscoting described in the previous pages, this type can be stained and finished prior to installation.

BEADBOARD STYLE



Picture rail molding (top) and tongue-and-groove beadboard are available at most home centers or specialty lumber yards.



First-Class Mail

It's easy to see that this mailbox post is attractive.

What doesn't show is the sturdy joinery of the hollow post and arm, or the unique mounting system.

The job of a mailbox post couldn't be simpler. It just has to hold a standard size metal box in the air to collect your letters, bills, and all those "you may have already won" sweepstakes offers. This post certainly does that job, plus it offers more.

For starters, the post itself is hollow, as the *Construction View* at right shows. And this offers some real advantages over most store-bought models that are typically made of solid 4x4s.

The biggest advantage of the hollow design is the mounting system. It consists of a pole made of pressure-treated wood that gets sunk into the ground. The hollow post then simply slides over it. Also, the mounting pole is slightly smaller than the inside of the post, which means you can shim the mailbox post plumb, even if the mounting pole isn't.

The separate mounting pole also means you don't have to wrestle long, heavy workpieces around in the shop while you're building the post.

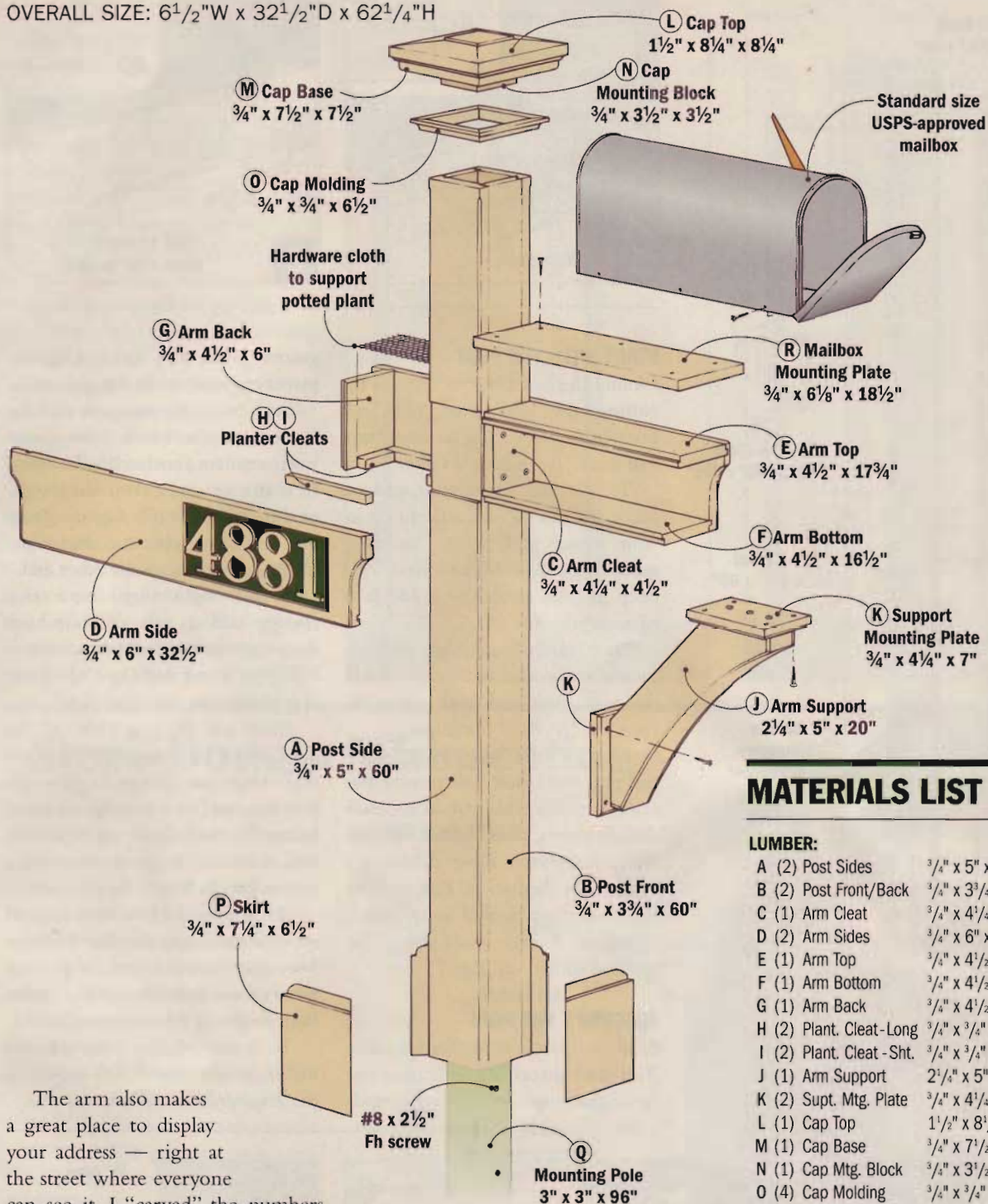
Even though the post is hollow, it's extremely strong. Both the post and the arm the mailbox rests on are constructed with sturdy tongue-and-groove joinery. And large overlapping dadoes lock the post and arm together.

The hollow arm also creates a pocket in front just perfect to receive a newspaper. Plus it allows an open area behind the post that holds a potted plant or flower.



MAILBOX POST CONSTRUCTION VIEW

OVERALL SIZE: 6 $\frac{1}{2}$ "W x 32 $\frac{1}{2}$ "D x 62 $\frac{1}{4}$ "H



The arm also makes a great place to display your address — right at the street where everyone can see it. I “carved” the numbers with a router, but attaching brass or painted numbers (shown in the inset photo at left) works great too.

And like all good projects, this one offers options. I built my mailbox post from 1x4 fir (3/4"-thick), then painted it to complement my house. But you could use redwood or cedar for a natural look. Just look for flat, straight boards. You'll need four 8-ft. 1x6s and

two 8-ft. 1x8s, plus one 8-ft. treated 2x8 for the mounting pole.

If you make any design changes, keep in mind the United States Postal Service dictates where a curbside mailbox goes. The box should sit between 42" and 48" up from the road surface, with the front of the box flush with the back edge of the curb.

MATERIALS LIST

LUMBER:

A (2) Post Sides	3/4" x 5" x 60"
B (2) Post Front/Back	3/4" x 3 3/4" x 60"
C (1) Arm Cleat	3/4" x 4 1/4" x 4 1/2"
D (2) Arm Sides	3/4" x 6" x 32 1/2"
E (1) Arm Top	3/4" x 4 1/2" x 17 3/4"
F (1) Arm Bottom	3/4" x 4 1/2" x 16 1/2"
G (1) Arm Back	3/4" x 4 1/2" x 6"
H (2) Plant. Cleat - Long	3/4" x 3/4" x 7 1/2"
I (2) Plant. Cleat - Sht.	3/4" x 3/4" x 2 3/4"
J (1) Arm Support	2 1/4" x 5" x 20"
K (2) Supt. Mtg. Plate	3/4" x 4 1/4" x 7"
L (1) Cap Top	1 1/2" x 8 1/4" x 8 1/4"
M (1) Cap Base	3/4" x 7 1/2" x 7 1/2"
N (1) Cap Mtg. Block	3/4" x 3 1/2" x 3 1/2"
O (4) Cap Molding	3/4" x 3/4" x 6 1/2"
P (4) Skirt	3/4" x 7 1/4" x 6 1/2"
Q (1) Mounting Pole	3" x 3" x 96"
R (1) Mailbox Mtg. Plate	3/4" x 6 1/8" x 18 1/2"

*These parts are glued up from multiple pieces.

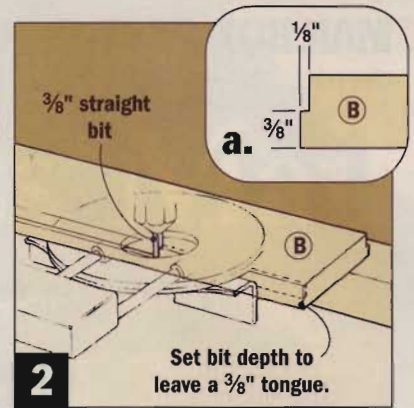
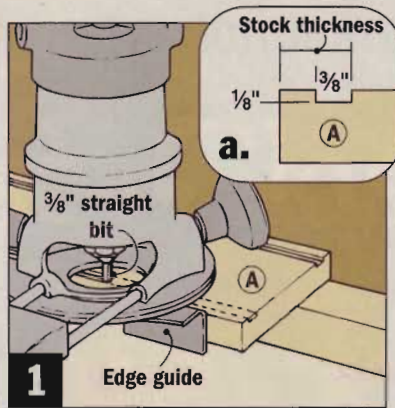
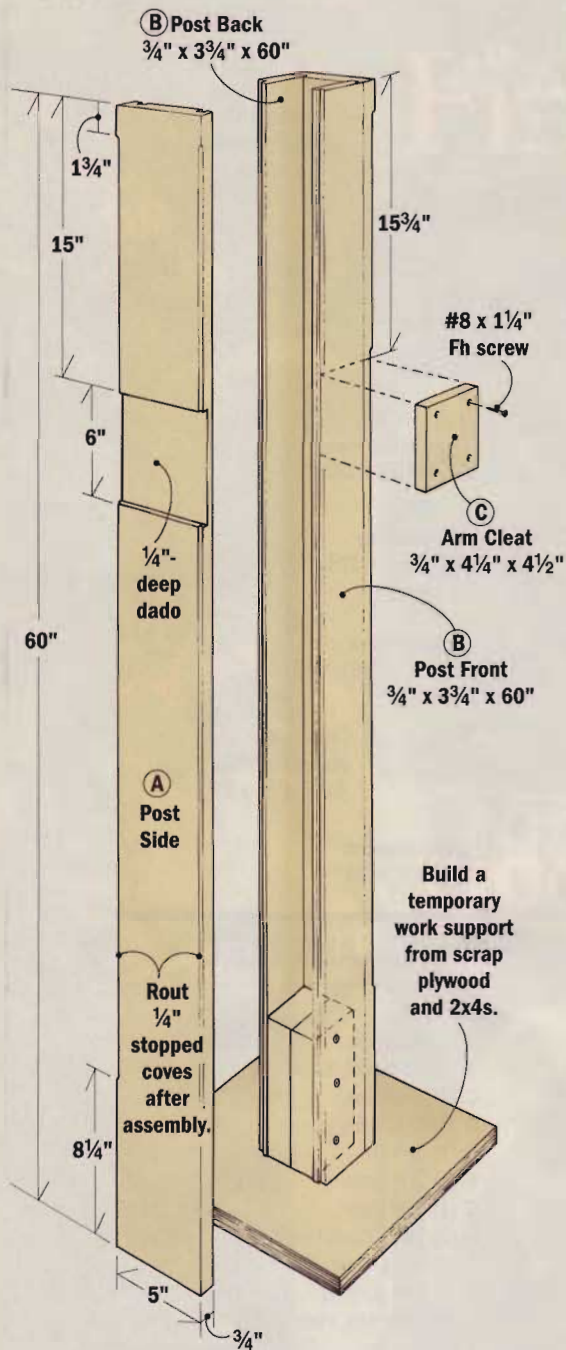
HARDWARE:

- (35) #8 x 1 1/4" Fh exterior woodscrews
- (20) #8 x 2 1/2" Fh ext. woodscrews
- (24) 1 1/4"-long wire brads
- (1) 4 1/2" x 7 5/8" hardware cloth (1/4" grid)

CUTTING DIAGRAMS:

Turn to page 80 for information about obtaining cutting diagrams for this project.

POST EXPLODED VIEW



START WITH THE POST

I found the best place to begin is by cutting the post sides (A) and front/back pieces (B) to size from 1x6 stock (*Post Exploded View*).

To cut the tongue-and-groove joints, install a $\frac{3}{8}$ "-dia. straight bit in your router and mount an edge guide (*Figs. 1, 1a*). Then rout $\frac{1}{8}$ "-deep grooves along the inside face of each post side (A).

Next, readjust the edge guide as shown in *Figures 2 and 2a* and rabbet the post front and back pieces to form the $\frac{1}{8}$ " $\times$ $\frac{3}{8}$ " tongues.

Now turn to the wide dados in the post sides that will receive the arms. I used a table saw to establish the shoulders, then routed out the waste, as shown in *Figure 3*, leaving a "ridge" for the base to ride on. The ridge can be trimmed away with a chisel or routed away using the method shown on page 72.

ASSEMBLE THE POST

Now the post is ready for assembly. And with pieces this long, that can be challenging. But the tongue-and-

groove joints help by locking the pieces together while the glue dries.

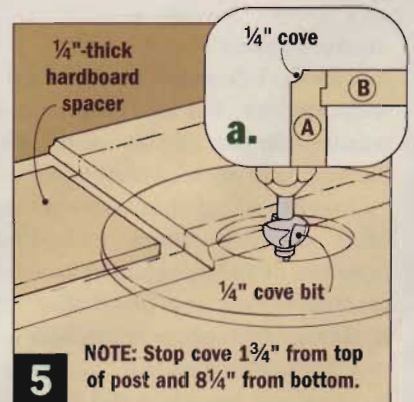
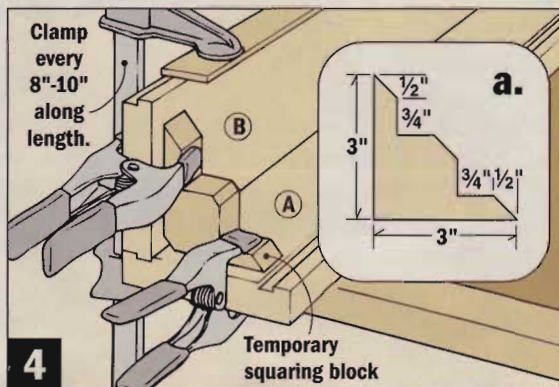
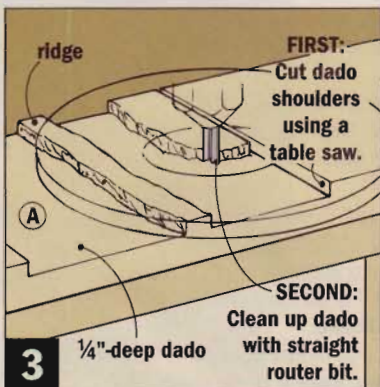
Start by laying one post side (A) face up on your bench. Now spread water-resistant glue (such as Titebond II) in one groove, and on one tongue of the post front (B). Lightly clamp one end, then work the rest of the tongue in and clamp the other end.

Before tightening these two clamps, add a pair of shop-built squaring blocks to hold the pieces at 90° (*Figs. 4 and 4a*). Then add more clamps to draw the joint tight.

Next, add the post back (B) the same way. If the tongues and grooves don't align, use clamps to draw the post front and back together, or insert spacers to push them apart. Just be sure to knock the spacers out using a broom handle before the glue sets.

To dress up the post, rout stopped coves as shown in the *Post Exploded View* and *Figures 5 and 5a*. A scrap piece of hardboard keeps the router from dropping into the wide dado.

To finish off the post, cut and install an arm cleat (C) as shown in the *Exploded View* at left.



The drawing at right shows that the arm for the mailbox is built about like the post, with two sides, a top, a bottom, plus a back. The biggest difference is the sequence of operations.

Next, lay out the wide dadoes that interlock with the post. Notice that they're half as deep as the post dadoes ($1/4$ " deep in my case), so be sure to readjust the router. And these dadoes are sized to match the width of the post sides (A). Once they're laid out, rout the dadoes.

To dress up the arm (and to echo the arm support that gets added later) I cut curves in the ends of each arm side (Figs. 6 and 6a). Shaping the curves exactly as shown isn't as critical as making all four the same. Using a cardboard pattern and cutting both arm sides (D) at the same time makes this easy. Cut the curves using a jigsaw, then sand them smooth.

If you plan to rout the address number like I did, now is the time. See the photo at right to learn more.

The arm top, bottom, and back come next, but not before test fitting



VIEW

(I) Planter Cleat - Short
 $\frac{3}{4}" \times \frac{3}{4}" \times 2\frac{3}{4}"$

(H) Planter Cleat - Long
 $\frac{3}{4}" \times \frac{3}{4}" \times 7\frac{5}{8}"$

(G) Arm Back
 $4\frac{1}{2}"$
 $6"$

(D) Arm Side
 $32\frac{1}{2}"$
 $17\frac{3}{4}"$
 $6"$
 $1\frac{3}{4}"$
 $\frac{3}{8}"$
 $5"$
 $\frac{1}{8}"$ -deep dado
 $\frac{3}{8}"$ -wide x $\frac{1}{8}"$ -deep grooves

(E) Arm Top
 $17\frac{3}{4}"$
 $4\frac{1}{2}"$

(F) Arm Bottom
 $16\frac{1}{2}"$
 $4\frac{1}{2}"$

Hardware cloth
 $\frac{1}{4}"$

(D) Arm Side
 $6"$
 $\frac{1}{4}"$ coves

Now cut these pieces to width and rough length. Then rout tongues on each piece, just like you did while making the post. Slip the top, bottom, and back in place to mark their lengths, then cut each to final size.

This is also a good time to make the planter cleats (H, I) to fit between the arm back (G) and the post. See *Detail a* at right. The cleats support a piece of hardware cloth that a potted plant can rest on.

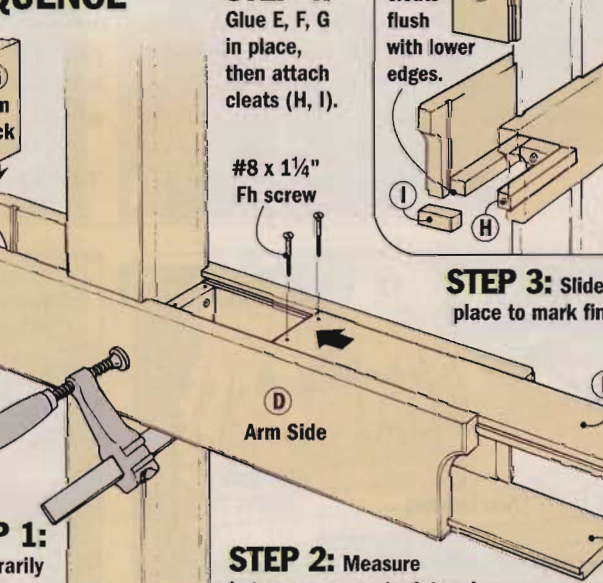
Finally, position the planter cleats using clamps to hold them in place until the glue sets.

Since the cleat that fits against the post is tough to clamp, it gets secured with a 1 1/4" exterior flathead screw.



Learn sign routing! Check out the FREE article on our Web site:
www.WorkbenchMagazine.com.

ARM ASSEMBLY SEQUENCE



STEP 1:
Temporarily clamp arm sides (D) to post.

STEP 2: Measure between grooves to determine width of E, F, G. Cut pieces to width, then form tongues.

STEP 3: Slide E, F, G in place to mark final length.

STEP 4: Glue E, F, G in place, then attach cleats (H, I).

Align cleats flush with lower edges.

#8 x 1 1/4" Fh screw

Arm Back

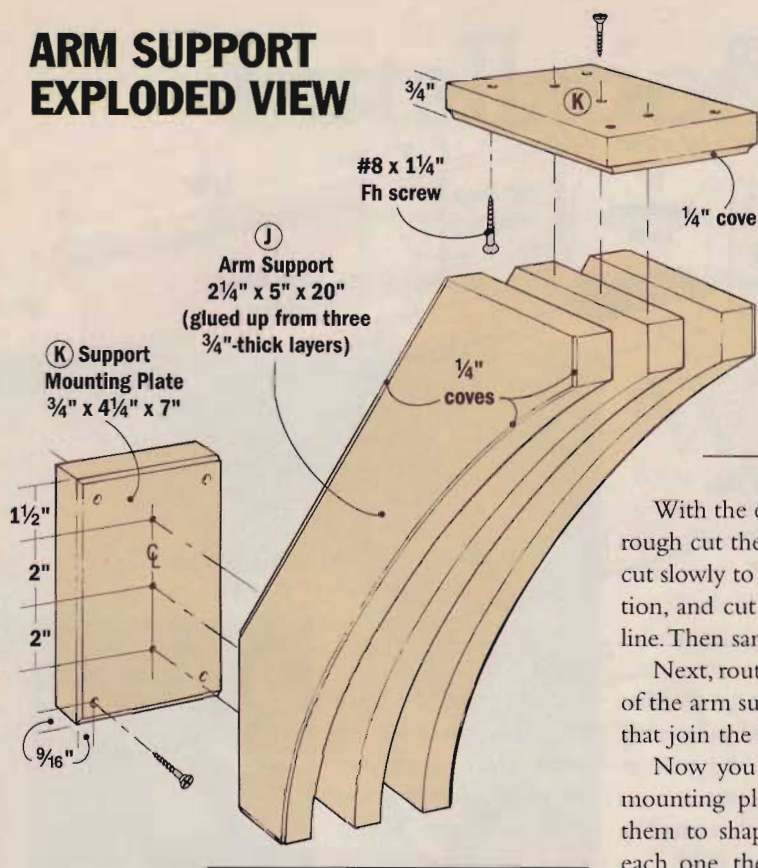
Arm Top

Arm Side

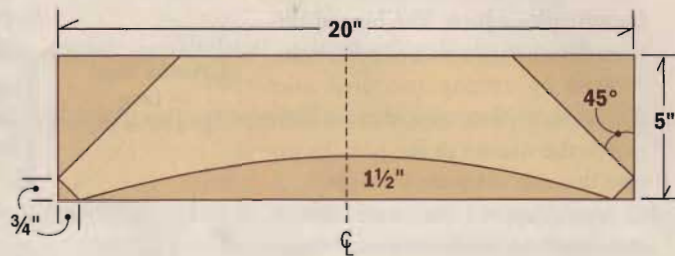
Arm Bottom

a.

ARM SUPPORT EXPLODED VIEW



ARM SUPPORT PATTERN



ADD THE SUPPORT

To help hold the arm in place, there's a support running between the arm and post. As seen in the drawing above, it's made by gluing up three layers of $\frac{3}{4}$ "-thick stock.

To make the support, first cut three pieces of 1x8 stock 22" long. Then face-glue the pieces to form a $2\frac{1}{4}$ "-thick block. When the glue sets, cut the block to 5"-wide $\times$ 20"-long.

Now use the *Arm Support Pattern* above to lay out the angled ends and the decorative arc. Next, cut the angled ends using the table saw and miter gauge, as shown in *Figure 7*.

With the ends cut, use a jigsaw to rough cut the arc (*Fig. 8*). Be sure to cut slowly to minimize blade deflection, and cut about $\frac{1}{16}$ " outside the line. Then sand the arc smooth.

Next, rout a $\frac{1}{4}$ " cove on all edges of the arm support except the edges that join the mounting plates.

Now you can make the support mounting plates (K). After cutting them to shape, rout a $\frac{1}{4}$ " cove on each one, then drill pilot holes for the mounting screws.

Once the holes are drilled, attach the plates to the arm. Then hold the arm support assembly on the post to layout and drill pilot holes in the post and arm (*Fig. 9*). Finally, secure the plates and arm with $1\frac{1}{4}$ "-long exterior flathead screws.

CAP AND TRIM FINISH IT OFF

Look at the *Cap and Skirt Overview* and the *Cap Cross Section* on the next page and you'll see that the cap is made up of three parts: the top, base, and the mounting block.

Start by making the cap top (L). To resist warping, it's made up of two

$\frac{3}{4}$ "-thick layers. Make each layer by edge gluing two pieces. Then face-glue the layers together (*Fig. 10a*).

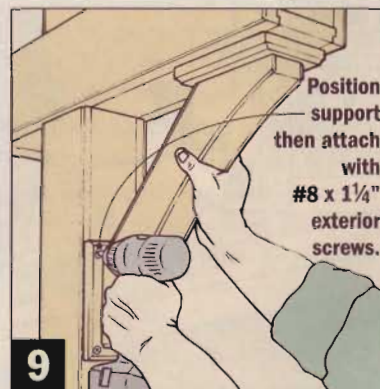
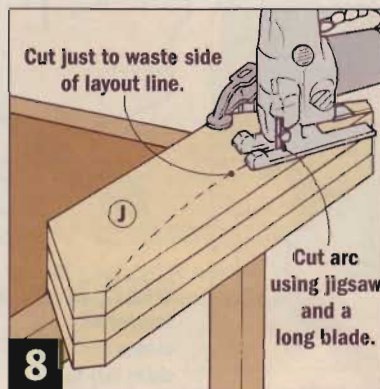
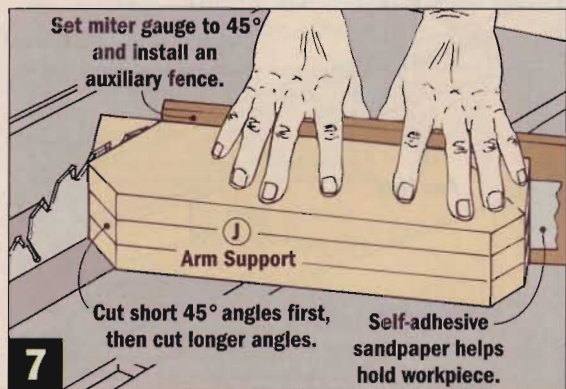
Once the glue sets, trim the cap top to final size. Now rout a $\frac{1}{4}$ " cove around the cap top's lower edge.

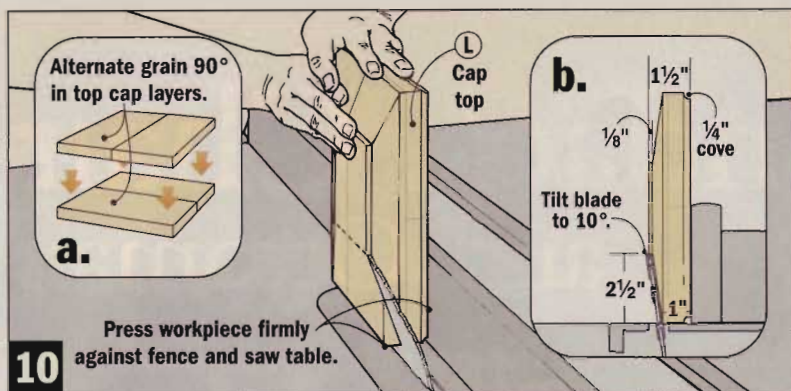
Cutting the bevel comes next (*Figs. 10 and 10b*). First, tilt your table saw blade, then raise it to $2\frac{1}{2}$ ". Next, set the fence 1" from the blade, measured at the table. Now make a pass on each edge to cut the bevels.

The cap base (M) is just a square piece (again made by edge gluing two pieces) with a $\frac{1}{2}$ " roundover routed on the bottom edge. When it's done, center the cap base on the cap top (L) and attach it with four screws.

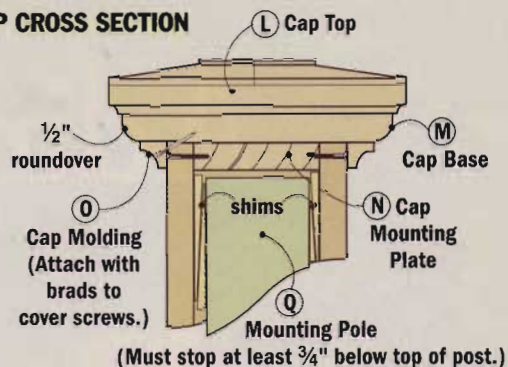
To complete the cap assembly, cut a cap mounting plate (N) and center it on the cap base. Now set the cap aside until the mailbox post is installed in its permanent location.

The last component to make is the post skirt. It's made up of four pieces that wrap around the base of the post. But rather than cutting four pieces to size now, start with a section of 1x8 about 30"-long.





CAP CROSS SECTION



Then use a $\frac{1}{2}$ " roundover bit to ease one edge of the 1x8, as shown in the *Skirt Detail* below. But this time lower the bit to leave a $\frac{1}{8}$ " bead.

The drawing below shows how to mark and miter the skirt pieces to wrap around the post. Go ahead and miter the pieces to size but don't attach the skirt. It goes on after the post is set on the mounting pole.

SET THE POST

To make the mounting pole (Q), rip an 8-ft. long, pressure treated 2x8 into two 3"-wide strips. Then glue and screw the strips together to make a 3" x 3" pole.

With the pole done, dig a 12"-dia. hole about 3-ft. deep and bury one end of the pole. Backfill around the pole with pea gravel, compacting it as you go, and keeping the pole plumb.

Now it's time to test fit the mailbox post onto the mounting pole. Rest the post on a couple of boards that span the hole (Fig. 11). Elevating the post above the soil helps prevent water absorption and rot.

Next, look at how high up the mailbox post extends above the mounting pole (Q). The pole needs to stop at least $\frac{3}{4}$ " shy of the top so the cap mounting block will fully nest later on. If necessary, remove the mailbox post and use a circular saw or hand saw to shorten the pole.

Next, reach in under the post and insert wooden shims between the post and mounting pole. Position the shims so the post sits fairly plumb, then drive screws through the post and shims, and into the mounting pole. Now remove the spacer boards.

Move to the top and drive shims between the mailbox post and the top end of the mounting pole. A little glue will keep them in position. Double check the post for plumb, then break the upper shims off flush with the top of the mounting pole.

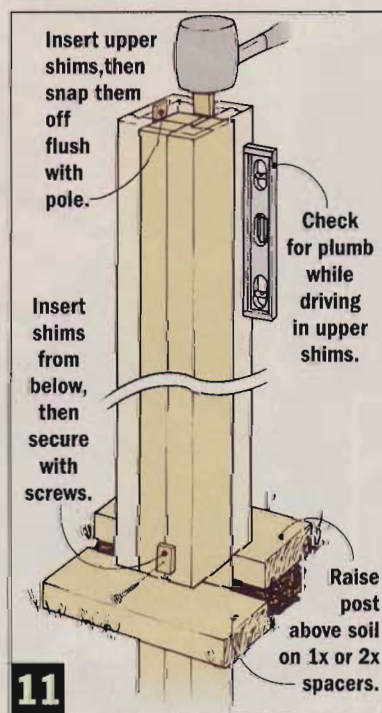
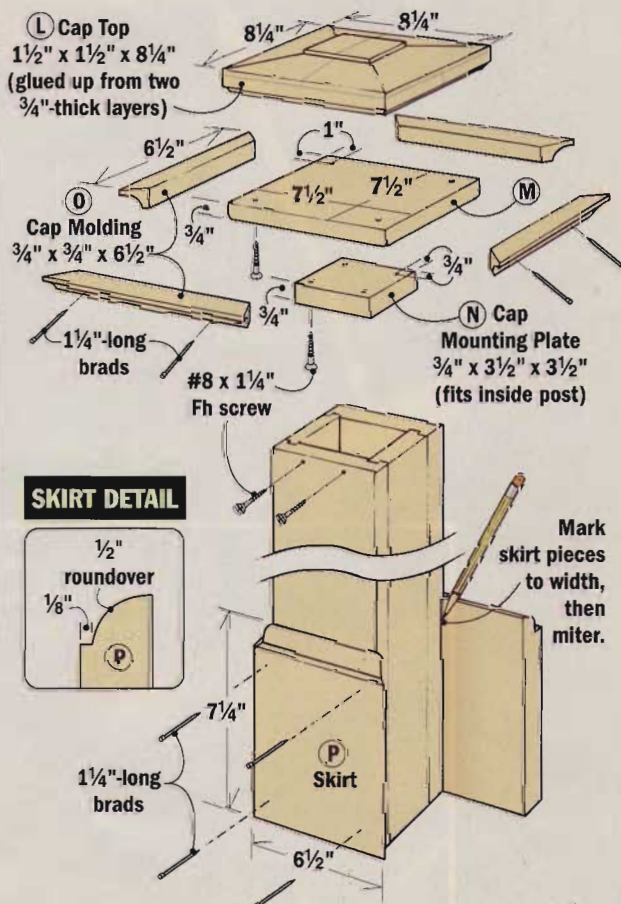
At this point you can screw on the post cap, as shown above. The cap molding (O) hides the screws. It's made by mitering store-bought $\frac{1}{2}$ " cove molding to fit, then gluing and nailing the pieces into place below the cap. Next, add the skirt by gluing the mitered corners and driving a few $1\frac{1}{4}$ "-long brads into each face of the post.

Finally, cut a mailbox mounting plate (R) to fit your mailbox (see the

Construction View on page 45), and screw it to the arm. Round-head brass screws can be used to attach the box (photo at right).

All that's left to do now is coat all the post pieces with a good exterior paint, and put a potted plant in the arm. With this great looking post in place, even retrieving your bills won't seem so bad. 

CAP AND SKIRT OVERVIEW



MATERIALS LIST

A (2) Post Sides	$\frac{3}{4}$ x 5 x 60	G (1) Arm Back	$\frac{3}{4}$ x 4 $\frac{1}{2}$ x 6	M (1) Cap Base	$\frac{3}{4}$ x 7 $\frac{1}{2}$ x 7 $\frac{1}{2}$ *
B (2) Post Frt/Back	$\frac{3}{4}$ x 3 $\frac{3}{4}$ x 60	H (2) Plant. Cleat-Lg	$\frac{3}{4}$ x $\frac{3}{4}$ x 7 $\frac{5}{8}$	N (1) Cap Mtg. Blk	$\frac{3}{4}$ x 3 $\frac{1}{2}$ x 3 $\frac{1}{2}$
C (1) Arm Cleat	$\frac{3}{4}$ x 4 $\frac{1}{4}$ x 4 $\frac{1}{2}$	I (2) Plant. Cleat-Sm	$\frac{3}{4}$ x $\frac{3}{4}$ x 2 $\frac{3}{4}$	O (4) Cap Molding	$\frac{3}{4}$ x $\frac{3}{4}$ x 6 $\frac{1}{2}$
D (2) Arm Sides	$\frac{3}{4}$ x 6 x 32 $\frac{1}{2}$	J (1) Arm Support	2 $\frac{1}{4}$ x 5 x 20*	P (4) Skirt	$\frac{3}{4}$ x 7 $\frac{1}{4}$ x 6 $\frac{1}{2}$
E (1) Arm Top	$\frac{3}{4}$ x 4 $\frac{1}{2}$ x 17 $\frac{3}{4}$	K (2) Supt. Mtg. Plt.	$\frac{3}{4}$ x 4 $\frac{1}{4}$ x 7	Q (1) Mounting Pole	3 x 3 x 96*
F (1) Arm Bottom	$\frac{3}{4}$ x 4 $\frac{1}{2}$ x 16 $\frac{1}{2}$	L (1) Cap Top	1 $\frac{1}{2}$ x 8 $\frac{1}{4}$ x 8 $\frac{1}{4}$ *	R (1) Box Mtg. Plate	$\frac{3}{4}$ x 6 $\frac{1}{8}$ x 18 $\frac{1}{2}$

*These parts are glued up from multiple pieces

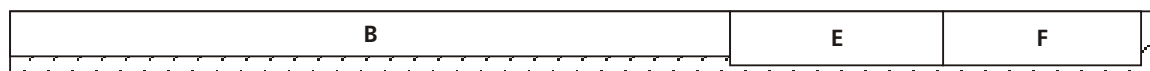
NOTE: The size of the Mailbox Mounting Plate (R) may vary depending on the mailbox used.
The Cap Molding (O) is made from store-bought $\frac{1}{2}$ " cove molding.
The Mounting Pole (Q) is made from pressure-treated lumber

CUTTING DIAGRAM

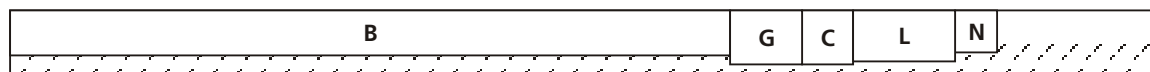
1 x 6 x 96 @ 4 BD. FT. (2 BOARDS)



1 x 6 x 96 @ 4 BD. FT.



1 x 6 x 96 @ 4 BD. FT.



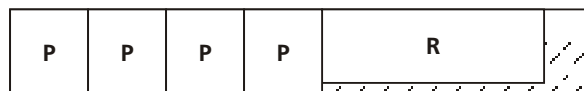
1 x 6 x 96 @ 4 BD. FT.



1 x 8 x 96 @ 5.33 BD. FT.



1 x 8 x 48 @ 5.33 BD. FT.



Adirondack Chair and Ottoman

A contoured back and seat make this Adirondack chair a more comfortable version of the summertime classic.

The Adirondack chair has been a favorite with woodworkers and summertime loungers for many years, and with good reason.

For woodworkers, this simple project can be built with basic tools and materials. The chair is constructed from dimensional, rough-sawn cedar, which has one smooth face and one rough face. It's built using only a jigsaw, a drill, some woodscrews, and a bit of construction adhesive.

For the summertime lounge, this chair is the perfect place to relax. A contoured seat and back make the chair more comfortable than most, and the ottoman lets you stretch your legs out and truly unwind.

To complete your cozy place in the sun, you may want to build the optional table on page 58.



Details for this matching table start on page 58.

ADIRONDACK CHAIR

OVERALL SIZE: 32"W x 35½"D x 40¾"H



MATERIALS LIST

CHAIR:

A (2) Front Legs	1½" x 3½" x 22"
B (2) Back Legs	¾" x 7¼" x 38"
C (1) Front Skirt	¾" x 5½" x 22"
D (1) Lower Back Support	1½" x 3½" x 20½"
E (2) Corner Blocks	1½" x 3½" x 3½"
F (2) Arms	¾" x 5½" x 28"
G (1) Middle Back Support	¾" x 5" x 30"
H (1) Upper Back Support	¾" x 3½" x 21"
I (1) Center Slat	¾" x 3½" x 33"
J (2) Inner Slats	¾" x 3½" x 32½"
K (2) Outer Slats	¾" x 3½" x 30¾"
L (2) Brackets	¾" x 3" x 8"
M (4) Seat Slats	¾" x 3½" x 22"
N (1) Back Seat Slat	¾" x 3¼" x 22"

HARDWARE:

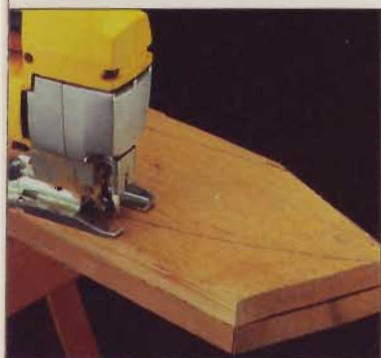
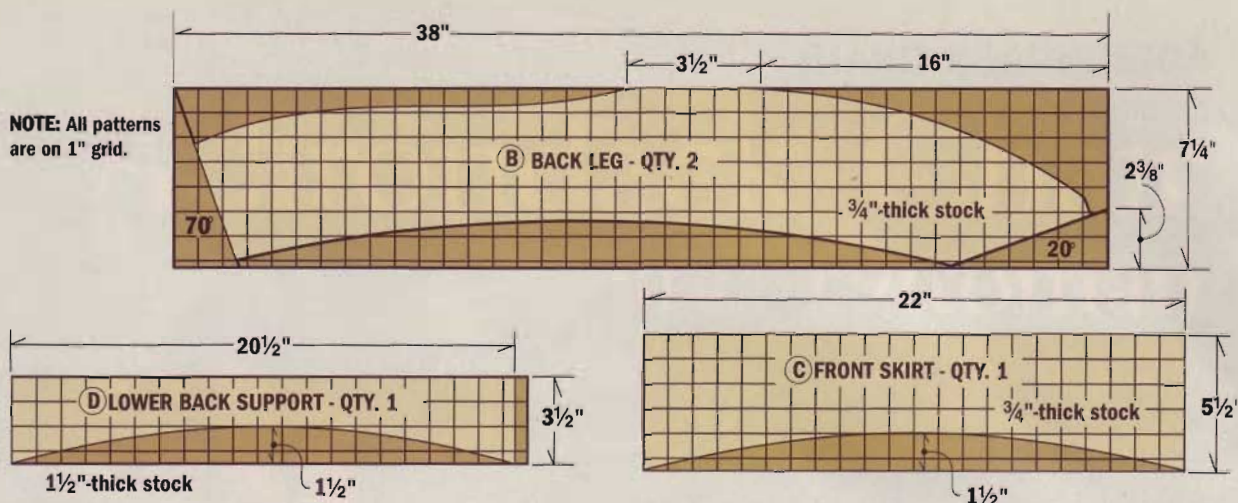
- (4) #8 x 1¼" Fh exterior woodscrews
- (57) #8 x 1½" Fh exterior woodscrews
- (10) #8 x 2" Fh exterior woodscrews

CUTTING DIAGRAMS:

Turn to page 80 for information about obtaining cutting diagrams for this project.

*Cut a blank to this size then cut the finished shape (according to the appropriate pattern) from the blank.

NOTE: All patterns are on 1" grid.



Lounging is best enjoyed with company. So if you build one Adirondack chair, you might as well build a couple. And in that case, you'll want the chairs to be perfectly matched. The best way to do that is to use patterns.

A PATTERNED APPROACH

The patterns included on the next few pages are laid out on 1"-square grids so you can transfer them onto pattern material easily. So your first decision might be to select the best material to use when making the patterns.

If you plan to build a couple chairs, paper patterns will work fine. But if you think the neighbors might want a set of chairs after they see yours, some 1/8"-thick hardboard might be a better choice.

I made all the patterns before getting started on any of the chair parts. Doing it that way makes the patterns seem like less of an interruption.

START WITH STEADY LEGS

All good chairs are built from the ground up. So I started with the front legs (A), which are cedar 2x4's cut 22" long.

Making the back legs (B) is a little more involved. The legs start out as rectangular blanks — 38"-long 1x8's to be exact — and then you cut them to the shape of the back leg pattern. Just remember that you're making a *mirrored* set of legs and not a *matched* set.

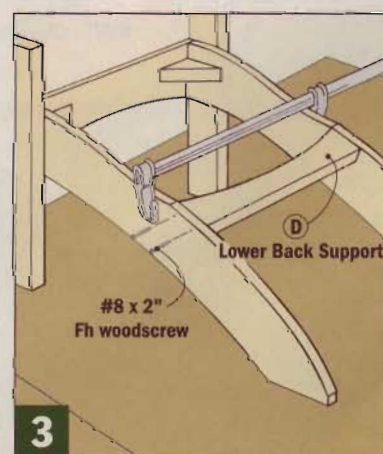
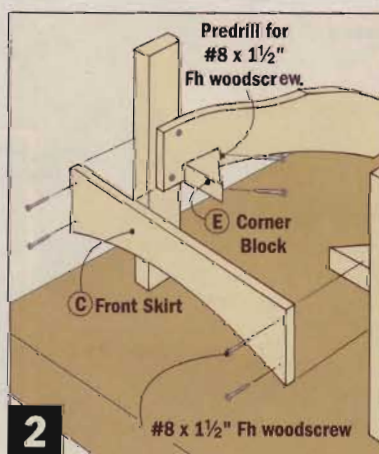
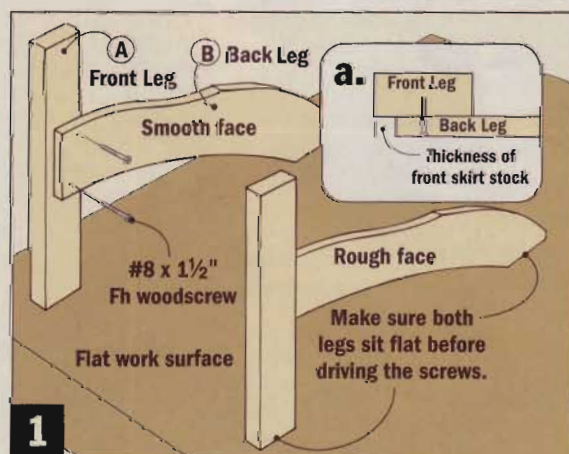
What that means is, when the legs are side-by-side, as in *Figure 1*, one leg should look like a reflection of the other. That's important not only when you assemble the front and back legs (as shown in the illustration), but also when you cut the legs out. It's important to lay out the pattern on the

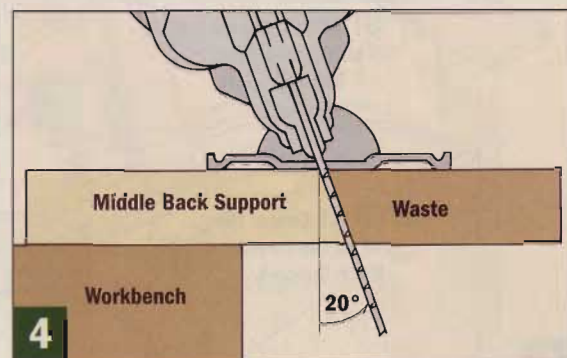
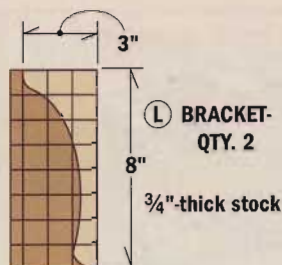
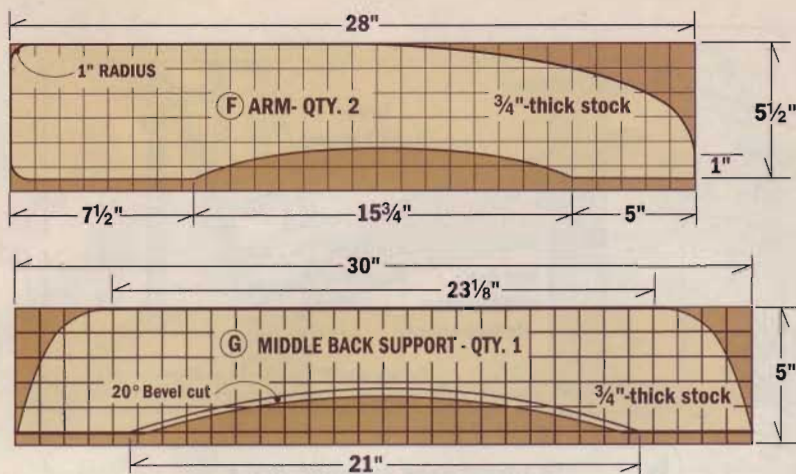
blanks so that when the legs are cut out and built into the chair, their rough sides will be facing *out*.

There are a couple ways to accomplish this. First, you could be very careful to orient the pattern the opposite way on each leg blank. But it would be easy to make a mistake doing it this way, so I used a little different approach.

First, I used double-sided carpet tape to stick the smooth faces of the boards together. Then I traced the pattern onto the rough face of one of the blanks and gang cut the legs as shown in the photo at left. When I separated the legs, they were oriented exactly as they would be in the chair.

As you're assembling the legs, you'll want to be sure that they'll make solid contact with the ground. One way to do this is to glue and clamp the legs while they're standing upright. That allows you to adjust the legs until they sit flat before screwing them together.





When both leg assemblies are done, you can start to work on the pieces that complete the chair's base.

First is the front skirt (C). Start with a 1x4 blank that is at least 20 1/2" long. Trace the front skirt pattern onto the blank and then cut it to shape. Make the lower back support (D) the same way, but this time start with a 2x4 blank.

ASSEMBLING THE BASE

Begin assembling the base at the front. First, attach the front skirt between the leg assemblies with glue and screws (Fig. 2). Then add the corner blocks inside the legs. And remember that on this part of the chair, the rough side of the boards should face out. You won't come in contact with the base, so there's little chance of picking up a splinter, and the rough face will also look nice when it's stained or painted. That will change when you get to the arms, seat, and back slats.

Now clamp the lower back support (D) between the legs as shown in Figure 3. Position the support so the leading edge aligns with the end of the arc on the back leg. Attach the support with glue and screws.

The arms (F) are next. They're attached to the chair as a sub-assembly along with the middle back support (G). Start by cutting 1x6 blanks 28" long for the arms.

Here again, you can tape these pieces together (smooth faces touching) and gang cut them. Set the arms aside for a moment and work on the middle (G) and upper

(H) back supports. (The pattern for the upper back support can be found on page 54.)

These pieces are cut from 3/4"-thick stock just like the others, except that the arc on the inside of the supports has a 20° bevel (Fig. 4). I cut the bevels with a jigsaw after using a small protractor to set the angle of the cut.

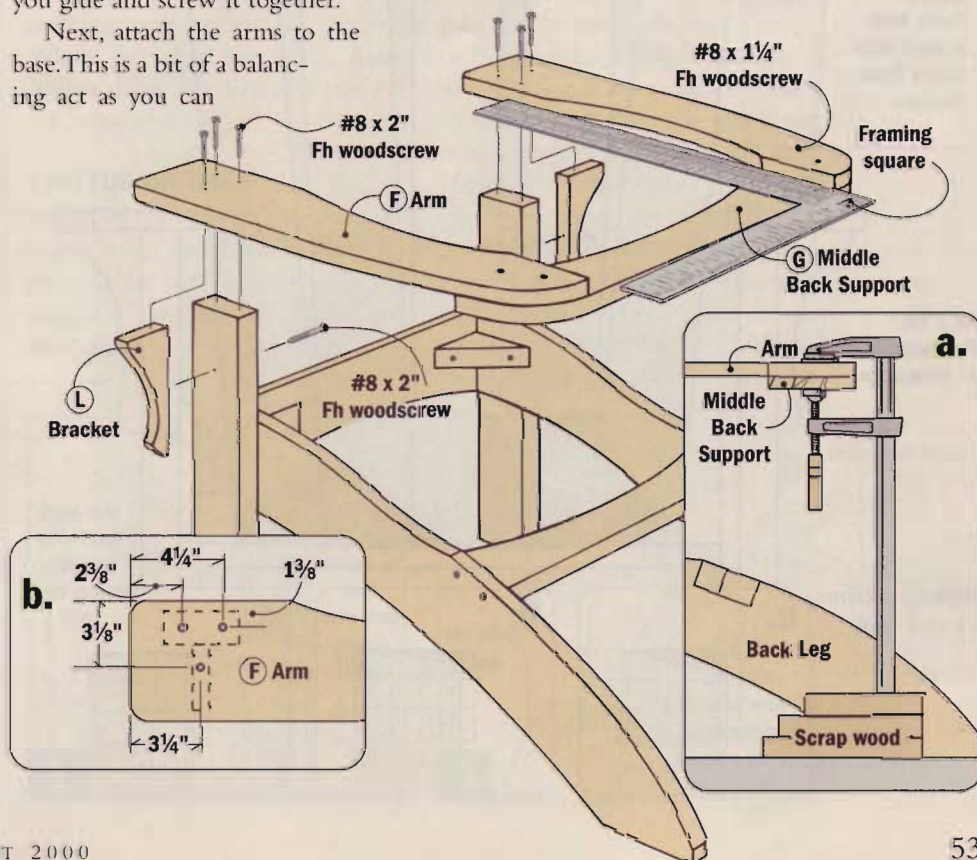
Now set the upper back support aside — you won't need it for a couple more steps, but it's easier to cut it now while your saw is set at the correct angle.

Use a framing square as shown below to square the arms and middle back support assembly while you glue and screw it together.

Next, attach the arms to the base. This is a bit of a balancing act as you can

see in Detail a, below. The trick is to support the assembly with a clamp and some scrap wood while the arms rest on the front legs. When the arms are positioned, lift them up in front and squirt some glue on the top of the 2x4 legs. Then screw the arms to the legs (Detail b).

Finally, cut brackets (L) from 3/4"-stock and glue and screw them on.

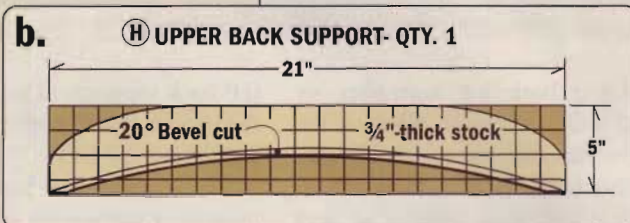
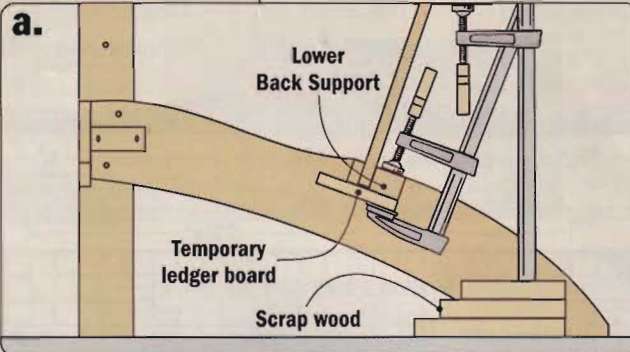


STEP 3: Attach the Upper Back Support to the Center Slat.

STEP 2: Center the slat on the Middle Back Support.

STEP 1: Center the slat on the Lower Back Support.

5



SPACING THE BACK SLATS

#8 x 1 1/2" Fh woodscrews centered on board

d.

Edge of Outer Slat is flush with Upper Back Support.

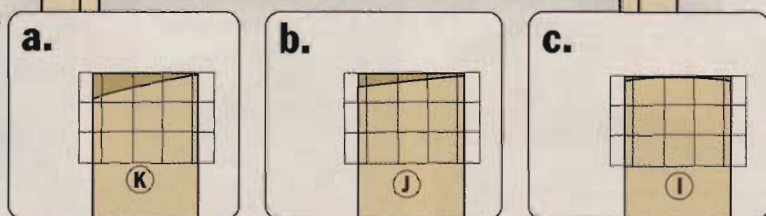
#8 x 1 1/2" Fh woodscrews 1" from edge

I Center Slat 3/4" x 3 1/2" x 33"

J Inner Slat 3/4" x 3 1/2" x 32 1/2"

K Outer Slat 3/4" x 3 1/2" x 30 3/4"

NOTE: All patterns are on 1" grid.



BACK SLATS

There are as many variations of the Adirondack chair as there are woodsmen's legends about the Adirondack mountains themselves. But one thing all Adirondack chairs have in common is their simple shapes. Typically, the straight lines of the chairs are broken only by simple arcs and curves. This chair is no exception.

The back slats (I, J, and K) are made from 1x4's and form a graceful arc on the top of the chair. The arc looks as though it was drawn on all the pieces at one time, but it's actually created by laying out a radius on the top of each individual slat. This may seem like extra work. But it really is safer and easier than trying to cut all the boards after they're attached to the chair.

The patterns for the slats are shown in Details a, b, and c, and you can see that you need to make one center slat and then a mirrored set of the inner and outer slats to complete the back. By the way, these same patterns are used to shape the top of the table on page 58, so keep them in good shape if you plan to build the table.

When all the back slats are cut and sanded to their final shape, they're about ready to be attached to the chair. But holding them in position and fastening them at the same

time would be pretty tricky. My solution was to add a temporary ledger board to support the slats while I drove the woodscrews. Clamp the ledger board to the lower back support as shown in *Figure 5a*.

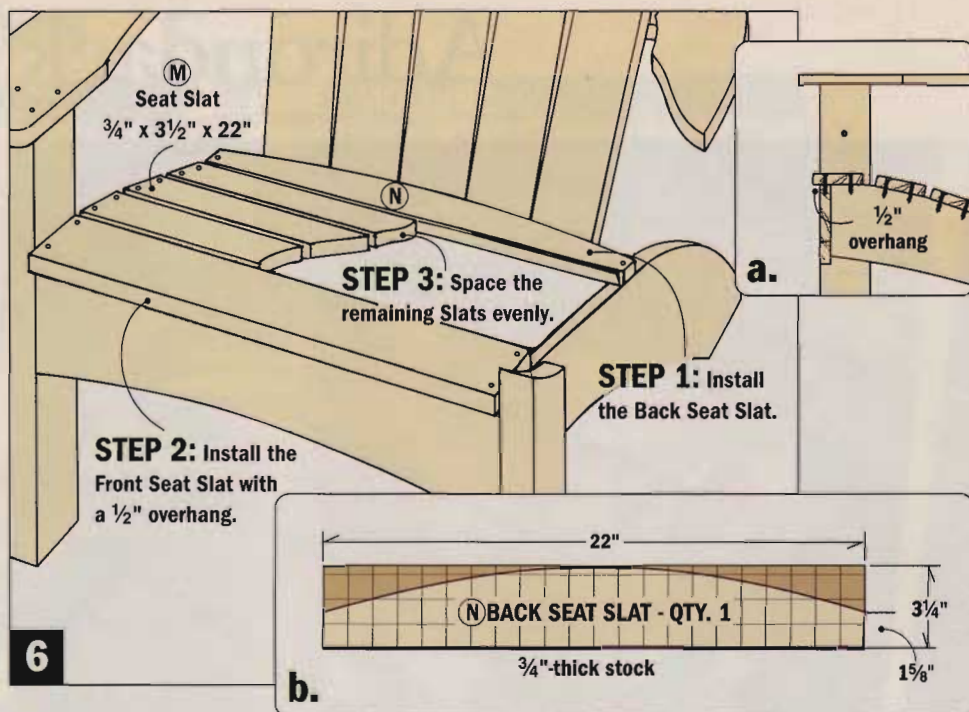
Now take a look at *Figure 5*. You can see that the place to begin is with the center slat (I). And there's a lot to do with that piece before the rest of the back slats can go on.

Start by centering the center slat on the lower back support and the middle back support (*Steps 1 and 2*). Fasten the slat to both supports with glue and screws. (This time, the smooth side of the board should face out when you position the slats — no one wants to sit in a splintery chair.)

Then glue and clamp the upper back support (the one you cut out at the same time as the middle back support) to the center slat as shown in *Step 3* of *Figure 5*. The upper back support may look a little strange hanging up there all by itself, but you'll need it to position the remaining slats in the chair. Make sure the support is level and drive a woodscrew through the slat and into the support.

Now lay the remaining slats into the chair but don't try to position them one at a time. Just set them all in at once and then you can worry about getting them spaced properly.

To position the slats, you could measure and lay out each slat location. But I found it was easier to use a couple visual references to fan out the back slats the way I wanted them. In the illustration at left you



can see that the slats are touching at the bottom and then fanned apart at the top.

Start by butting the bottom of the slats together edge-to-edge. Then position the outer slat (K) so its edge is flush with the end of the upper back support (*Detail d*). Glue and screw the slat to the back supports. Follow the same steps to attach the other outer slat. Now center each inner slat in the space remaining and glue and screw them to the supports.

SEAT SLATS

The seat of the Adirondack chair is made up of slats also, and they're even simpler to make and attach than the back slats. There are only

two shapes of seat slats. The back seat slat (N) is a 22"-long 1x4 that has an arc cut into it to follow the contour of the chair back (see the pattern above). The remaining seat slats (M) are 1x4's cut 22" long.

Start by cutting and positioning the back seat slat (*Fig. 6*). Leave a small gap (about 1/8" will do) between the slat and the chair back to avoid creating a water trap. Glue and screw the back seat slat to the back legs.

Now cut the rest of the seat slats. Then screw the front slat down making sure it overhangs the front skirt by 1/2" (*Fig. 6a*). Finally, spread the remaining three slats out evenly between the front and rear slats. Then, fasten all the slats with glue and screws.

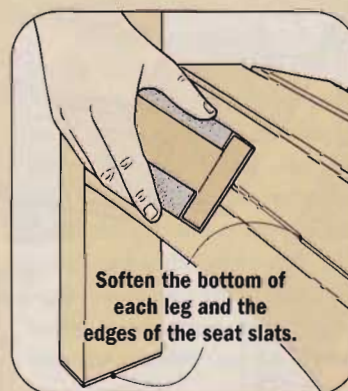
SIMPLE STEPS TO A SOFTER SEAT

Furniture that's built for outside use doesn't really require the same fine detail work that inside pieces do. Rounding every edge or sanding away every imperfection is just extra work.

On the other hand, furniture that's left too rough will be uncomfortable and could start suffering from wear and tear sooner.

The quick solution for comfort is to ease the edges of all the seat slats, back slats, and arms with a sanding block and some medium-grit sandpaper.

You should also ease the bottom of the chair legs where they touch the ground. If the edges are left square, they're more likely to snag and splinter when you shift the chair around.



Adirondack Ottoman



An Adirondack chair just isn't finished without an ottoman that lets you stretch your legs out for some serious leisure time. And the good news is that the design is so simple you can build the ottoman in the same afternoon as the chair.

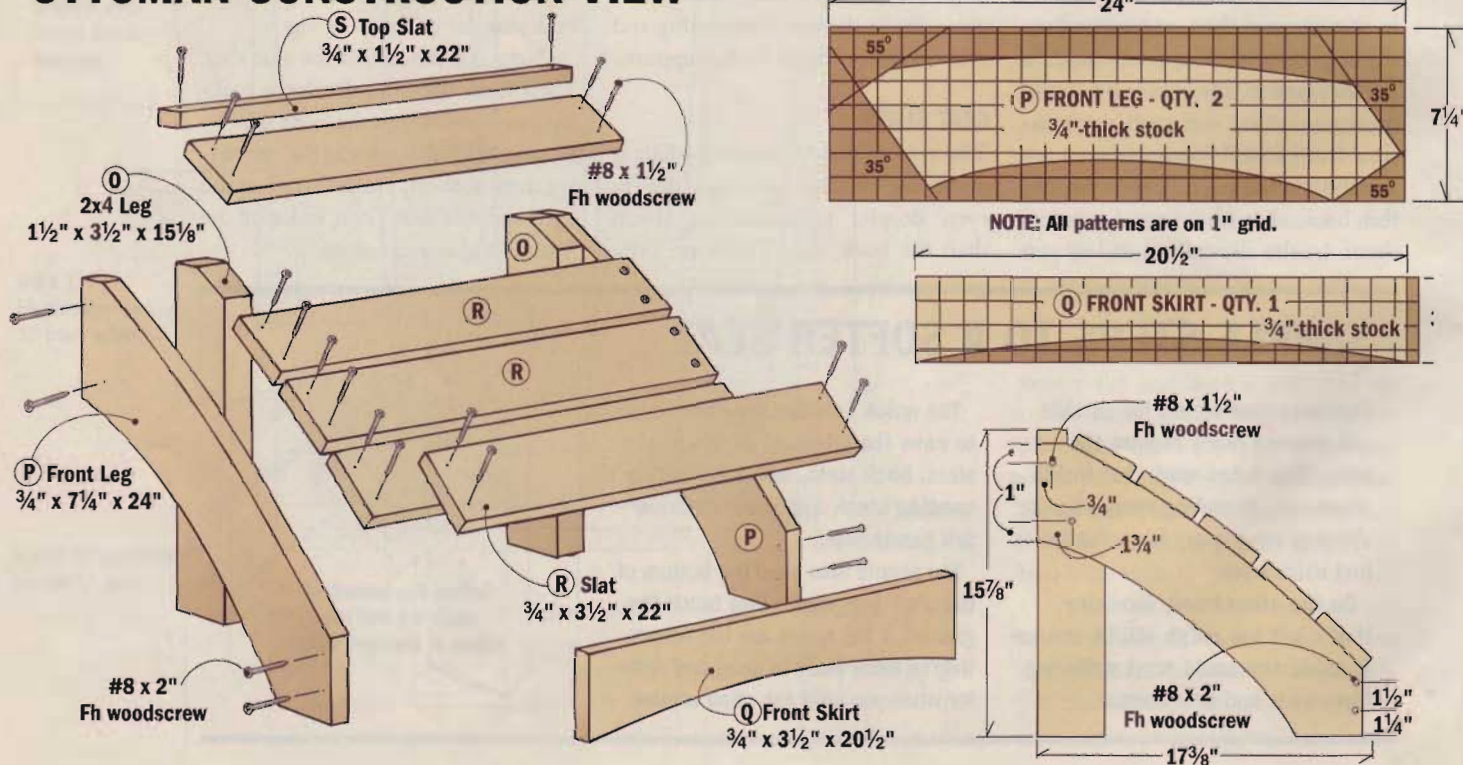
Just like the chair, we've included patterns to make laying out the pieces quick and easy. Which is especially important if you plan to build several copies of the ottoman. Once again, I made all my patterns before starting to work on the actual ottoman pieces.

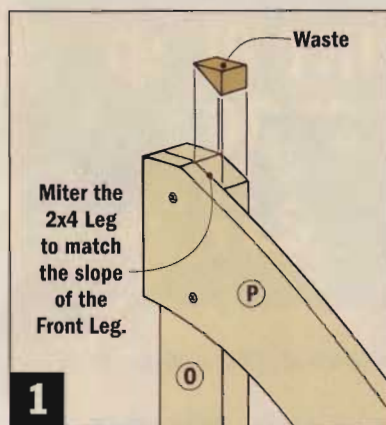
LEG ASSEMBLY

Start by cutting the 2x4 legs (O) to 15 $\frac{1}{8}$ " long, but don't cut the miter at the top of the leg yet.

Next, cut two 1x8 blanks 24" long for the front legs (P). Use some double-sided carpet tape to hold the blanks together with their smooth faces touching. Trace the front leg pattern onto one of the blanks and gang cut the legs with a jigsaw.

OTTOMAN CONSTRUCTION VIEW





To assemble the legs, spread some glue on the rough side of the front leg where it will contact the 2x4 leg. Then clamp the legs together and stand them up on a flat surface. Check to make sure both legs will rest evenly on the ground when the ottoman is complete. Adjust the leg assembly until it makes good contact and then screw it together.

Now cut the miter on the 2x4 leg as shown in Figure 1.

SKIRT AND SLATS

To make the front skirt (Q), start with a 1x4 blank that's 20½" long. Lay out the front skirt with the pattern and then cut the skirt out. Attach the skirt between the sets of legs with glue and screws.

Now you're ready to add the slats (R and S) to complete the ottoman. Start by cutting out six slats exactly the same size (¾" x 3½" x 22"). Then attach one slat (S) at the flat spot on the top of the ottoman.

Attach the Top Slat and then rip it flush with the back of the ottoman.

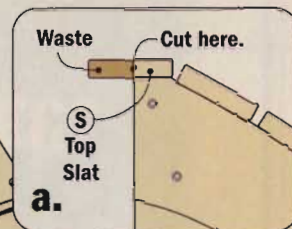
Position it so the excess width hangs over the backside of the ottoman (Detail a). Then glue and screw a slat at the bottom of the arc on the Front Leg. Spread the remaining slats out evenly in between. Finally, cut the Top Slat (S) as shown in the illustration above.

PAINT OR STAIN

Part of the Adirondack tradition has always been to paint the chairs with leftover house paint. And apparently white and green were popular house colors in that part of the country.

As for my chair, I opted for a penetrating oil finish to preserve the wood's natural color.

If you're a stickler for tradition, there are a few suggestions below for putting a good coat of paint on your new outdoor classic.



MATERIALS LIST

OTTOMAN:

O (2) 2x4 Legs	1½" x 3½" x 15½"
P (2) Front Legs	¾" x 7¼" x 24"
Q (1) Front Skirt	¾" x 3½" x 20½"
R (5) Slats	¾" x 3½" x 22"
S (1) Top Slat	¾" x 1½" x 22"

HARDWARE:

- (26) #8 x 1½" Fh exterior woodscrews
- (4) #8 x 2" Fh exterior woodscrews

CUTTING DIAGRAMS:

Turn to page 80 for information about obtaining cutting diagrams for this project.

*Cut a blank to this size then cut the finished shape (according to the appropriate pattern) from the blank.

PRIMING AND PAINTING

Simple materials and simple designs are what the Adirondack chair is all about. In fact the original chairs were often built from wood salvaged from old shipping crates and then painted with whatever color was at hand — usually white or green.

To paint the chair, start

with a liberal coat of oil-based primer. A good primer coat will help seal the wood and make your paint go a lot further on the paint-thirsty cedar.

After the primer is completely dry, brush on a couple coats of a quality exterior paint and your chair is ready for relaxing.



MATERIALS LIST FOR CHAIR & OTTOMAN



MATERIALS LIST

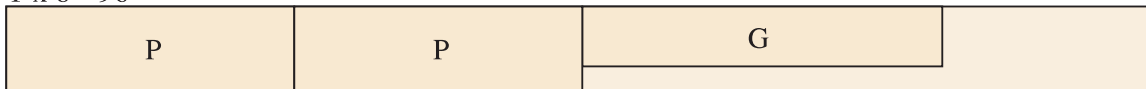
A (2) Front Legs	1½ x 3½ -22	M (1) Seat Slats	¾ x 3½ -22
B (2) Back Legs	¾ x 7¼ -38	N (1) Bk. Seat Slat	¾ x 3¼ -22
C (1) Front Skirt	3¼ x 5½ -22	O (2) 2x4 Legs	1½ x 3½ -15½
D (1) Lwr Bk Supt	1½ x 3½ -20½	P (2) Front Legs	¾ x 7¼ -24
E (2) Corner Blocks	1½ x 3½ -3½	Q (1) Front Skirt	¾ x 3½ -20½
F (2) Arms	¾ x 5½ -28	R (5) Slats	¾ x 3½ -22
G (1) Mid. Bk. Spt.	¾ x 5 -30	S (1) Top Slat	¾ x 1½ -22
H (1) Up. Bk. Spt.	¾ x 3½ -21		
I (1) Center Slat	¾ x 3½ -33		
J (2) Inner Slats	¾ x 3½ -32½		
K (2) Outer Slats	¾ x 3½ -30¾		
L (2) Brackets	¾ x 3 -8		

CUTTING DIAGRAM

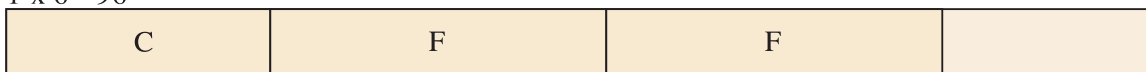
1 x 8 - 96



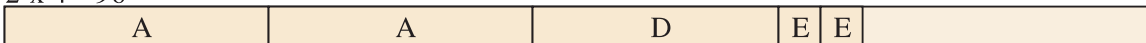
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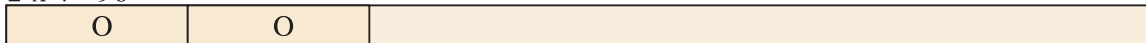
1 x 6 - 96



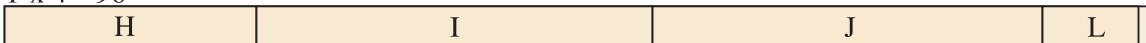
2 x 4 - 96



2 x 4 - 96



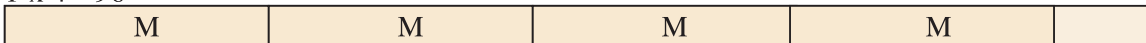
1 x 4 - 96



1 x 4 - 96



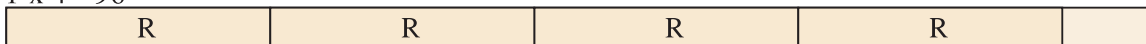
1 x 4 - 96



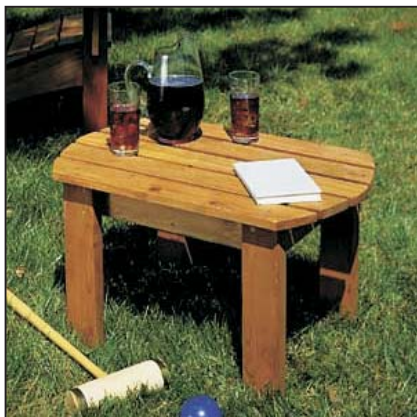
1 x 4 - 96



1 x 4 - 96



MATERIALS LIST FOR CHAIR & TABLE



MATERIALS LIST

- A (4) Legs $1\frac{1}{2}$ " x $3\frac{1}{2}$ " -16"
- B (2) Side Aprons $\frac{3}{4}$ " x $3\frac{1}{2}$ " -19"
- C (2) End Aprons $\frac{3}{4}$ " x $3\frac{1}{2}$ " -14 $\frac{1}{2}$ "
- D (1) Center Strrch. $\frac{3}{4}$ " x $3\frac{1}{2}$ " -13"
- E (2) Outer Slats $\frac{3}{4}$ " x $3\frac{1}{2}$ " -27"
- F (1) Center Slat $\frac{3}{4}$ " x $3\frac{1}{2}$ " -30"
- G (2) Inner Slats $\frac{3}{4}$ " x $3\frac{1}{2}$ " -29 $\frac{1}{4}$ "

CUTTING DIAGRAM

2 x 4 - 96

A	A	A	A	
---	---	---	---	--

1 x 4 - 96

B	B	C	C	D	
---	---	---	---	---	--

1 x 4 - 96

E	E	F	
---	---	---	--

1 x 4 - 96

G	G	
---	---	--

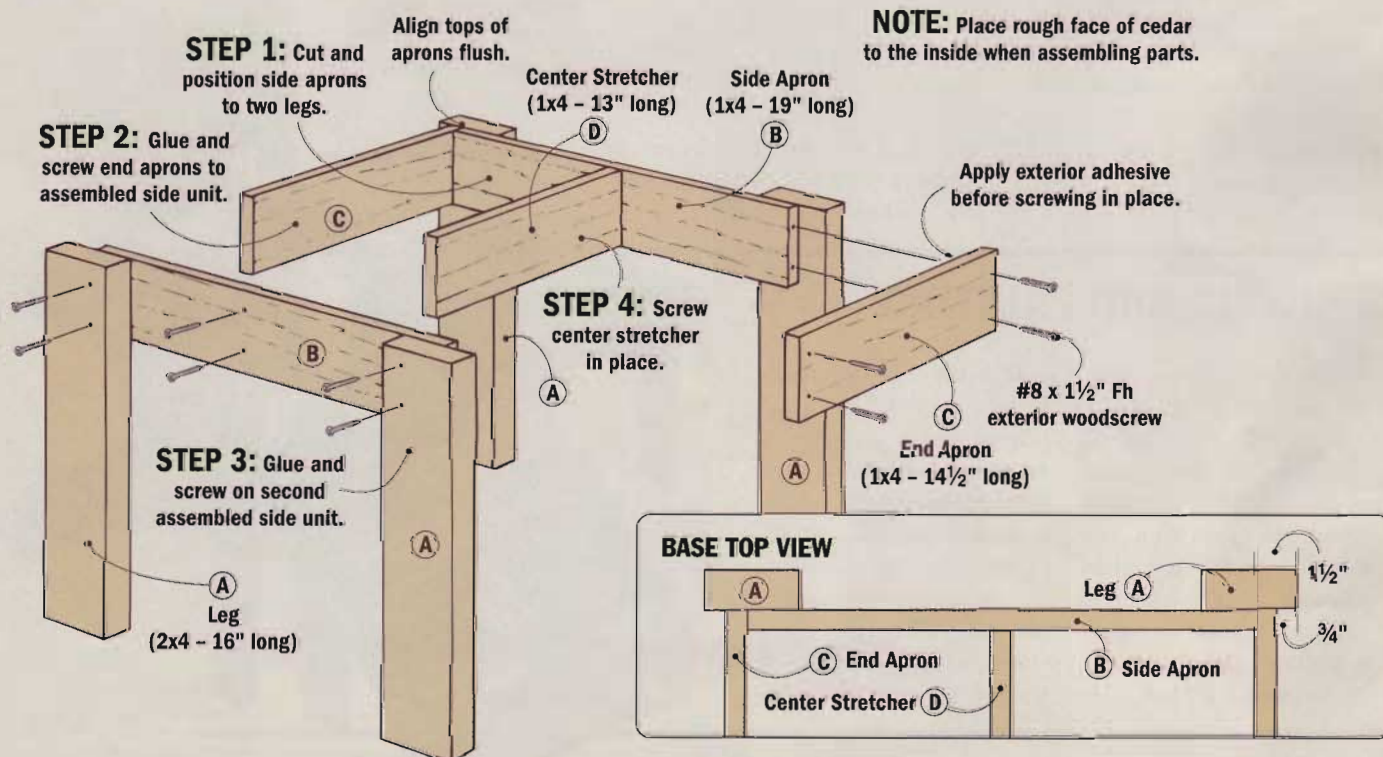
Summertime Table



This sturdy patio table makes a great companion piece to the Adirondack chair and ottoman, or just about any other outdoor furniture group. And it's easy to build using dimensional lumber.

You don't need a large formal deck to enjoy this attractive summertime table. Part of its charm is the fact it fits nicely on a small patio, in the backyard, or just about any place you want to set a pitcher of iced tea.

BASE ASSEMBLY VIEW



MAKE THE TABLE BASE

You'll be surprised how quickly this table goes together using simple glue and screw joinery. I started by making two side units.

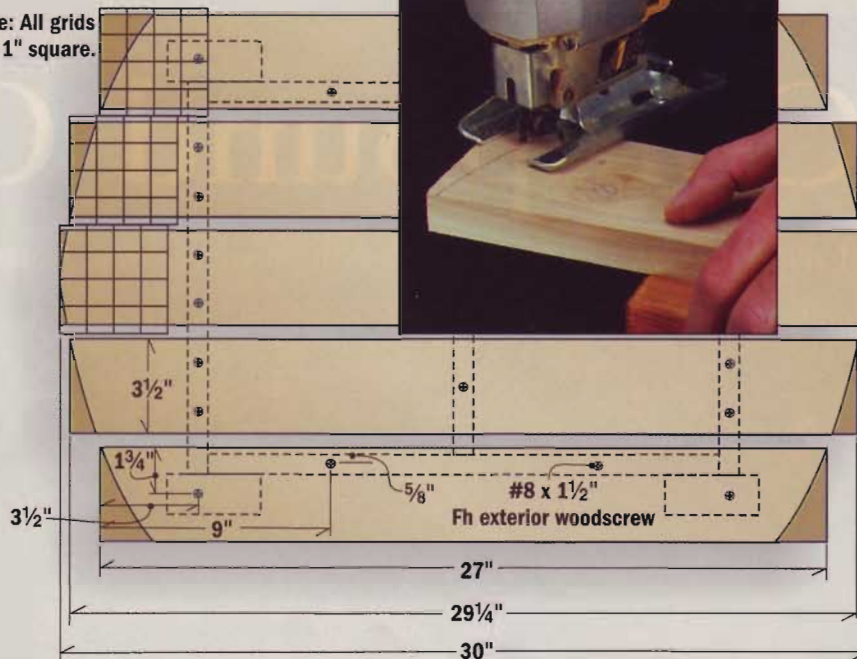
Notice in the *Base Assembly View* that each unit has two legs (A) connected with a side apron (B). A wobbly table isn't much use, so be sure to cut all the legs to a uniform length. Next, cut the side aprons and screw them in place $1\frac{1}{2}$ " from the outside edge of the legs (see *Base Top View*).

To assemble the base, first glue and screw together one end apron (C) to a side apron (B) with the pieces flush across the top. The second end apron can be attached the same way. Next, glue and screw on the other side unit. After checking that the base is square, measure and cut the center stretcher (D) to length. Then screw it in place.

CUT AND ATTACH THE TOP

There's nothing tricky about cutting the radius arcs on the slats (E-G) if you follow the patterns (see above).

Note: All grids are 1" square.



The same cutting procedure was used while making the back slats on the Adirondack chair.

If you take a look below, you'll see an easy way to position the slats without using a spacer. Start by attaching

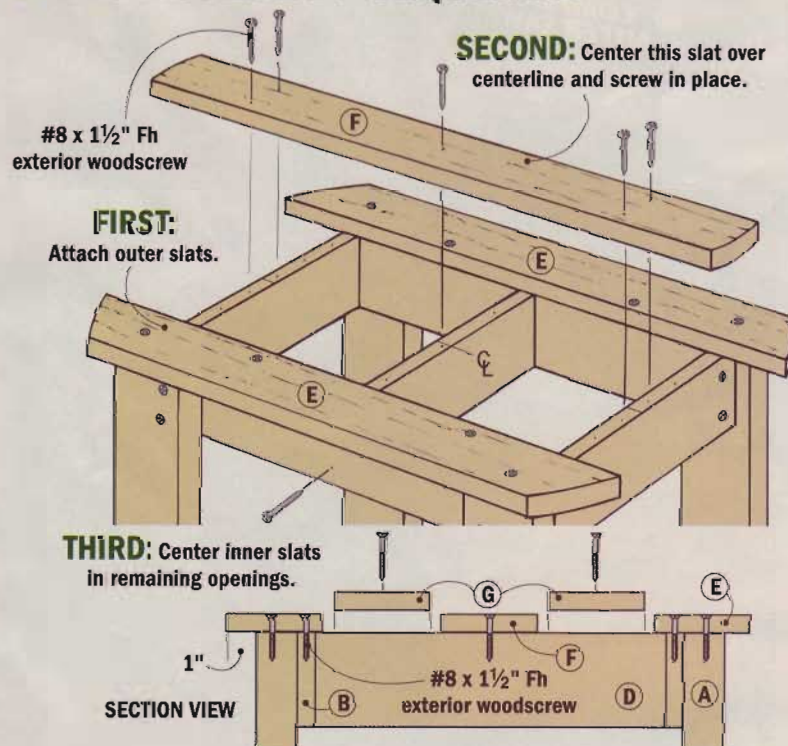
the outer slats (E), leaving a 1" overhang on both sides of the table (see *Section View*). Next, mount the center slat (F) over the centerline. Then position and screw down the inner slats (G) in the remaining openings.

Before staining or painting, it's a good idea to soften all the corners and relieve the bottom of the legs to help avoid splintering. A sanding block works great.

Now you're ready to grab a good book, fill a glass with something cold, and find a cozy spot in the sun to enjoy summertime lounging.

NOTE: The patterns for the slats on this table are the same as the back of the Adirondack chair.

SLATS ASSEMBLY SEQUENCE



MATERIALS LIST

OVERALL SIZE: 19 $\frac{1}{2}$ "W x 30"L x 16 $\frac{3}{4}$ "H

LUMBER:

A (4) Legs	1 $\frac{1}{2}$ " x 3 $\frac{1}{2}$ " x 16"
B (2) Side Aprons	$\frac{3}{4}$ " x 3 $\frac{1}{2}$ " x 19"
C (2) End Aprons	$\frac{3}{4}$ " x 3 $\frac{1}{2}$ " x 14 $\frac{1}{2}$ "
D (1) Center Stretcher	$\frac{3}{4}$ " x 3 $\frac{1}{2}$ " x 13"
E (2) Outer Slats	$\frac{3}{4}$ " x 3 $\frac{1}{2}$ " x 27"*
F (1) Center Slat	$\frac{3}{4}$ " x 3 $\frac{1}{2}$ " x 30"*
G (2) Inner Slats	$\frac{3}{4}$ " x 3 $\frac{1}{2}$ " x 29 $\frac{1}{4}$ "*

HARDWARE:

(43) #8 x 1 $\frac{1}{2}$ " Fh exterior woodscrews

CUTTING DIAGRAMS:

Turn to page 80 for information about obtaining cutting diagrams for this project.

*Cut a blank to this size then cut the finished shape (according to the appropriate pattern) from the blank.

Compound Cutters

A compound miter saw is tough to beat for cutting trim, molding, or dimensional lumber. We tested eight 10" models to see which one rates best.



A miter saw may be one of the most versatile tools in any home improvement and woodworking arsenal. This single tool will cut everything from trim and molding, to deck boards, siding, fence posts, and even hardwood stock. Plus miter saws are compact, portable, and accurate.

But walk through the tool department in any home center and it's easy to get confused about which saw to buy. There are models with 10" or 12" blades, ones that cut compound angles, and others that have sliding heads for increased capacity.

Most of us here at *Workbench* agree that for most do-it-yourself and in-shop use, a 10" compound model is tough to beat. Why?

First, 10" saws are less expensive than their larger and more complex cousins. The saws I tested are reasonably priced between \$150 and \$250.

Second, a 10" miter saw can crosscut a 2x6 or a 4x4 in a single pass. That's enough capacity for, say, building a deck. Obviously, smaller material is no problem at all.

And though sliding-head and 12" models will cut wider stock, they can be too big and heavy to carry around. And having one in the shop means giving up a big hunk of bench space.

Another reason we chose these models is compound cutting ability. You can get a decent 10" non-compound miter saw for maybe 25% less. But the first time you need to bevel a board, you'll be happy with

the small extra investment made in a compound saw.

Armed with this knowledge, I bought saws from eight well-known manufacturers: Craftsman, Delta, Hitachi, Makita, Powermatic, Pro-Tech, Ridgid, and Ryobi. Then I compared key features (a few are shown below) to give you an idea of what's important.

I also wanted to know how accurate each saw was "out of the box." They all needed adjustment, which I expected. But most were easy to set up. After getting familiar with each saw's controls, I started cutting to see which saws performed best.

On the next few pages, you can read more about each saw. The key test results are on page 64.

DETAILS THAT MAKE A DIFFERENCE — THE BEST AND WORST

The bottom line with any saw is whether it makes an accurate cut. Power and capacity are important, but less-obvious features can influence cutting quality. A few good and bad examples are shown below.

Handle Position: The Delta's D-shaped handle is easy to use and comfortable. Watch out for straight

bayonet handles like the Ryobi that require an uncomfortable bend of the wrist.

Miter Scale: Accurate miters require easy-to-read scales like the Craftsman's. Powermatic's pointer sits far from the hash marks.

Bevel Scale: Powermatic's dual bevel scale, on the other hand, is

easy to read from either side of the blade. Makita's bevel scale is hidden back on the left side of the saw.

Table Style: Small cutoffs tend to get kicked around by miter saw blades. A zero-clearance kerf plate like the Makita's helps. Ridgid's open kerf lets the blade chew up slender cutoffs.

HANDLE POSITION



Comfortable D-handle

Awkward Straight Handle

MITER SCALE



Clear, Easy-to-Read

Pointer Too Far From Scale

BEVEL SCALE



Easy-to-Read, Dual Scale

Hidden From View

KERF OPENING

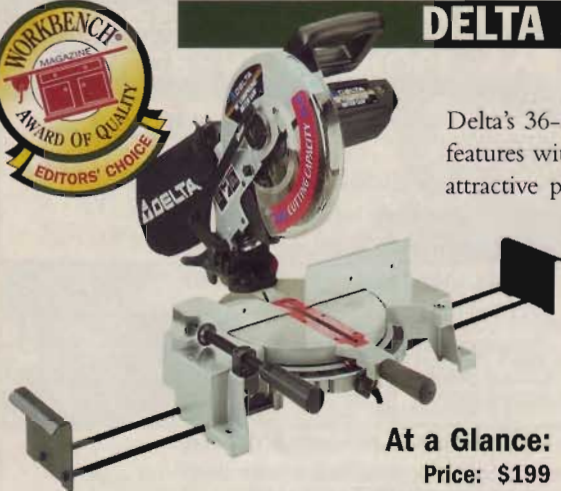


Zero-Clearance Kerf

Open Kerf



DELTA 36-225



Delta's 36-225 mixes an excellent array of features with solid performance and a very attractive price. The result is a compound miter saw that's tough to beat.

One of this saw's best features is the horizontal "D" handle. It's easy to grab and comfortable for most cuts.

Also nice are the saw's extension wings. They slide completely into the saw base when not needed and act as handles. The 40-tooth blade cuts smoothly, as well.

At a Glance:

Price: \$199

Capacities: Miter: 45°L/R, Bevel: 45°L

Weight: 33-lbs. **Warranty:** 2-Year

On the downside, the saw head does have a lot of play when loosened for setting bevel cuts, but it seems to tighten back down accurately. And the miter lock release lever has square edges that can scrape knuckles. Overall, though, the 36-225 is a bargain.

Virtues: Horizontal handle; 40-tooth blade; retractable wings; 1/2° marks on scales.

Vices: No zero-clearance kerf plate; initial settings off; knuckle-busting miter release.

Verdict: Even with a few shortcomings, the Delta offers a great combination of features and performance at a very reasonable price.

MAKITA LS1040



The biggest difference between the LS1040 and the other saws tested became apparent when I lifted it out of the box. At 24-lbs., this saw is 7- to 10-lbs. lighter than the other competitors.

The Makita also shines with a quiet, powerful motor, and silky-smooth adjustments. The handle is well-positioned, too.

And this saw has the tallest fence of any in the test — a real bonus for cutting crown molding. For workpiece support close to the blade, there's a flip up section in the fence.

At a Glance:

Price: \$239

Capacities: Miter: 48°L/49°R, Bevel: 45°L

Weight: 24-lbs. **Warranty:** 1-Year

Both the miter and bevel scales need refinement on this saw, though. The miter pointer is far from the hash marks, and the bevel scale is kind of hidden from view.

Price is also a factor here. The LS1040 is the most expensive saw tested, yet it doesn't include extension wings.

Virtues: Quiet, powerful; good handle position; smooth adjustments; large fence.

Vices: No wings; poorly positioned bevel scale; no crown molding angle indicators.

Verdict: This saw has great controls (except the miter scale), and it operates smoothly. But the price should include extension wings.

RIDGID MS1050



I saw an advertisement for the Ridgid that compares it to a dog — you know, loyal, dependable, predictable. And frankly, this ad isn't far off the mark.

This saw does its job well without fuss. And with a lifetime warranty, the Ridgid should serve faithfully for years to come.

Like many dogs, though, the MS1050 does have a couple bad habits. First, the wide kerf opening in the table tends to chew up small cutoffs when they drop in

and get caught by the blade. And these small pieces can come back to bite you.

Second, the miter angle indicator is positioned far to the left (see the photo), where it gets covered up by stock as narrow as a 2x4. That makes it tough to set a miter angle with a workpiece on the saw.

Virtues: Lifetime warranty; 40-T carbide blade; easy controls; on-board tool storage.

Vices: 1"-wide kerf opening; miter indicator gets covered up by workpiece.

Verdict: The Ridgid is a well-made, easy-to-use saw. Add a zero-clearance kerf plate, and there'd be little to complain about.

At a Glance:

Price: \$199

Capacities: Miter: 48°L/R, Bevel: 45°L

Weight: 35-lbs. **Warranty:** Lifetime



PRO-TECH 7208

If budget is a big concern, the Pro-Tech will immediately look attractive thanks to its \$159 price. That's the lowest of any saw in the test. But the 7208 backs up the price with solid performance.

In every cutting situation, the Pro-Tech

Virtues: Powerful motor; smooth cutting; includes stops and hold down; good handle.

Vices: Wings don't retract; open kerf plate; awkward blade change.

Verdict: This saw was the surprise of the test group. It's the least expensive, but performs very well — an excellent buy overall.

proved smooth and powerful, and it was even reasonably accurate out of the box.

Where the Pro-Tech's low price shows is in refinement. Compared to some higher-priced models, this saw's controls aren't quite as smooth, and the miter and bevel scales are harder to see. Some features, like the extension wings and stop block, are a bit clunky, as well.

But for a bottom-dollar tool, the Pro-Tech was a pleasant surprise. It proves that inexpensive can be good.



At a Glance:

Price: \$159

Capacities: Miter: 50°L/R, Bevel: 45°L

Weight: 35-lbs. **Warranty:** 2-Years



HITACHI C10FC2

Among professionals Hitachi tools are well-known and respected. But to most DIYers, the brand isn't as familiar. That made the C10FC2 a wild card in the test.

What I found are features a pro will appreciate, like miter stops at the correct angles for cutting crown molding, and an

Virtues: Great miter table release; ultra-thin kerf blade; miter 60° to right.

Vices: Straight handle; miter indicator obscures hash marks; no extension wings.

Verdict: An all-around good saw, but not as good of a value as some others tested.

ultra-thin blade ($1/16$ " kerf) that's also great for trim work. The saw's ability to miter 60° to the right is nice, while compact size makes the C10FC2 very portable.

Some of the features that make the Hitachi great for trim work, though, leave it less-suited to cutting dimensional lumber, decking, and larger stock — all common for a homeowner. The thin blade deflected when cutting a 4x4 post, for example.

So should a DIYer buy the Hitachi? Sure, it's a well-made tool with performance that just leans more toward fine work than toward the rough.



At a Glance:

Price: \$209

Capacities: Miter: 45°L/60°R, Bevel: 45°L

Weight: 32-lbs. **Warranty:** 1-Year



CRAFTSMAN 21210

When I pulled the Craftsman 21210 from its box, I was impressed with the large, legible miter and bevel scales. They're some of the best in the test. But when I dug deeper into the box, I was disappointed.

My disappointment came simply from not finding more stuff. At \$219, this is the

Virtues: Good miter and bevel scales; dual bevel scale; zero-clearance kerf plate.

Vices: No extension wings; no dust bag; steel-tipped blade; questionable trigger lock.

Verdict: The Craftsman comes close on many counts, but misses the mark on features for the price.

third most expensive saw tested, but comes with few accessories. There are no extension wings, and not even a dust bag. Plus, this is the only saw tested that uses a steel-tipped blade. The 104-tooth blade cuts smoothly when new, but it will dull more quickly than a carbide-tipped blade.

I'm also troubled by the handle-top trigger release. Its location means anytime your hand is on the handle, such as when lining up the blade to make a cut, the safety is off. Accidentally touch the trigger, and things could get interesting.



At a Glance:

Price: \$219

Capacities: Miter: 47°L/R, Bevel: 45°L

Weight: 34-lbs. **Warranty:** 1-Year



POWERMATIC 409



The prospect of a Powermatic miter saw intrigued me going into this test. I expected great things from a company known for top-quality industrial tools. Unfortunately, the model 409 left me disappointed.

It seems that Powermatic just put its label on an off-the-shelf Taiwanese saw, rather than designing one from scratch. This is, in fact, the same saw as the Ryobi I tested, except for the handle and the paint color.

One bright spot on the Powermatic is the dual bevel

scale that can be read from either side of the blade. And the \$229 price includes extension wings. The miter scale, though, is tough to read, and the pointer moves when tightening the locking handle.

The sheet metal blade guard is also noisy, and the trigger release is awkward.

Virtues: Dual bevel scale; retractable extension wings; zero-clearance kerf plate.

Vices: Noisy blade guard; inaccurate miter scale; tough trigger release; straight handle.

Verdict: The Powermatic works, but doesn't live up to the company's reputation for building industrial-quality tools.

At a Glance:

Price: \$229

Capacities: Miter: 47°L/R, Bevel: 45°L

Weight: 34-lbs. **Warranty:** 1-Year



RYOBI TS230



If you read the Powermatic overview above, the Ryobi's standing won't be surprising. Both companies sell the same saw with a few minor differences. But interestingly, the Ryobi suffered from ills that belong to it alone.

In the Ryobi's defense, it too has a handy dual bevel scale, and at \$199 its pricing is more in line with the other saws tested. Of course, that price doesn't include extension wings or a dust bag.

Problems for the TS230 start with the table. Releasing

the miter lock took two hands on this saw thanks to poorly-machined stop notches. The notches had to be enlarged with a file to work well at all. And the rotating portion of the table sticks up above the rest (which is painted rather than smooth), yielding little flat surface for resting stock.

Virtues: Dual bevel scale; hold-down clamp; zero-clearance kerf plate.

Vices: Tough miter adjustment; no extension wings; no dust bag; straight handle; awkward trigger release.

Verdict: To be competitive at all, this saw needs some serious refinement.

At a Glance:

Price: \$199

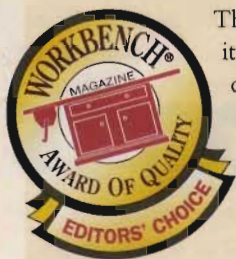
Capacities: Miter: 47°L/R, Bevel: 45°L

Weight: 32-lbs. **Warranty:** 2-Years

TESTING AT A GLANCE	Craftsman	Delta	Hitachi	Makita	Powermatic	Pro-Tech	Ridgid	Ryobi
Out-of-Box Accuracy	G	F	F	G	G	F	E	F
Ease of Initial Setup	G	G	F	E	F	G	G	F
Handle Comfort	F	E	F	E	P	G	E	P
Setting Miter Angles	G	E	G	G	F	G	G	P
Setting Bevel Angles	G	G	G	F	F	G	G	F
Cut Line Visibility	G	E	G	E	G	G	E	G
Cut Accuracy — Square	G	E	G	G	G	G	G	G
Cut Accuracy — Compound	F	E	F	G	G	G	G	G
Smoothness of Cut	F	G	G	E	F	G	F	F
Power	G	E	G	E	G	E	E	G
Ease of Blade Change	F	G	F	G	F	G	G	G

To contact the manufacturers of these saws, see *Sources & Resources* on page 30. P=Poor; F=Fair; G=Good; E=Excellent

FINAL RECOMMENDATIONS



The bottom line with a compound miter saw is whether it makes an accurate cut, and every saw in this group is capable of that. So winning this test takes more than a decent cut. It takes a saw that's easy to set up and use, has an array of useful features, offers good all-around performance, and does it at a reasonable price.

The one that comes closest to doing it all is the Delta 36-225, so it gets my Editor's Choice Award.

The Delta doesn't have every key feature noted earlier,

but neither does any other saw. Even so, I really like the horizontal D-shaped handle, and the retractable extension wings are handy when moving the saw. Delta also equips the saw with a 40-tooth carbide-tipped blade that cuts very smoothly. And it's the only saw tested with $\frac{1}{2}^\circ$ markings on the miter scale.

Are there things about this saw that can be improved? Sure. Three of four angle stops were slightly off when the saw came out of the box. But adjusting the stops was easy. Adding a zero-clearance kerf plate would help too, though the $\frac{1}{4}$ "-wide opening isn't bad.

Even with its shortcomings, the Delta is a solid performer with more going for it than against it. At a price of \$199, the 36-225 is tough to beat.

The rest of the field contained some surprises — most notable being the Pro-Tech. At \$159 it's the least expensive saw tested. But it outperforms what you may expect of a bargain-priced tool.

Hitachi's C10FC2 started the test as a wildcard, and ended much the same way. It didn't perform as well overall, but is a winner if your needs are centered around finish carpentry.

A less pleasant surprise came from the Powermatic. The saw can handle the basics, but it fell short of what I expect from a company with a reputation for industrial-quality tools.



SOUND OFF ON-LINE

Tell us how you feel about this test, or share your experience with compound miter saws. Just go to the **Tool Reviews** page at www.WorkbenchMagazine.com.



POINTS-OF-VIEW:

I'd choose the Delta because it makes precise cuts with minimal vibration. And I really like the retractable extension wings and the horizontal handle.

My next choice is the Pro-Tech. The handle isn't quite as comfortable as the Delta, and the 28-tooth blade doesn't cut as smoothly. But this saw is a close second in value.

Kevin Shoesmith
Workbench Assistant Editor

I chose the Delta because it's priced well and has loads of features. Plus I like the ergonomic miter and bevel adjustments.

Next for me is the Ridgid. It's comfortable to use and I can live with the kerf opening in the table.

Third place goes to the Hitachi. It has a large footprint for stability, and good miter adjustment.

Joel Hess
Workbench Assistant Editor

Miter Saw Station Plans

No matter how good a miter saw is, it can usually be improved by adding a nice stand. Since store-bought stands can cost more than these saws, though, I dug up a few designs we've featured in our magazines over the years. You can build any one of them yourself.

For information on these plans, or to place an order, call Workbench Project Supplies at (800) 311-3994. Use **KEY CODE B080** when ordering.



Simple to build, and the plan is **FREE!** Just go to www.WorkbenchMagazine.com and click on "101 TIPS."



This one has long wings and a tool tray. Find the plans in the Nov/Dec, 1997 *Workbench*. #WBDEC97—\$3.95 + S&H



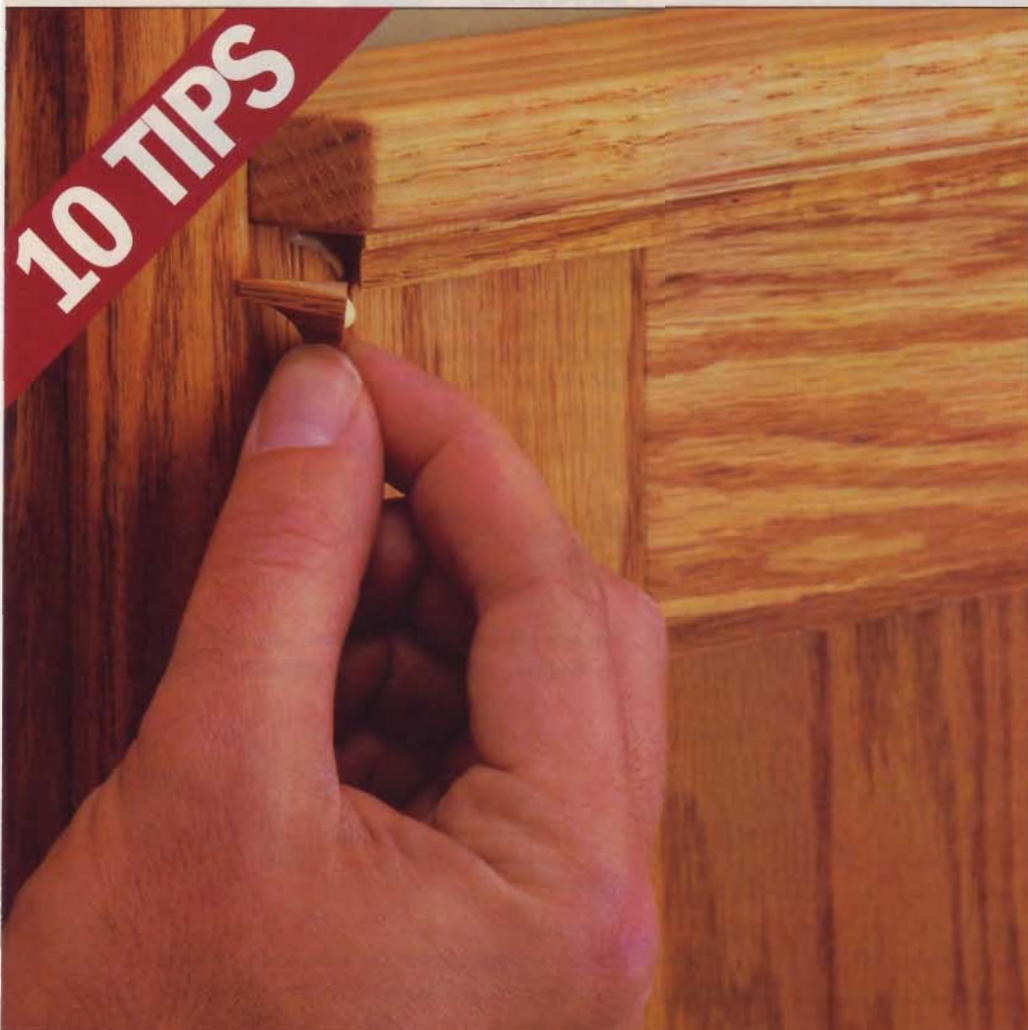
Extension wings store in the base, and a stop block gives accurate cuts. Hardware Kit & Plans #7512-126—\$27.95



Built-in storage, fold-down wings, and a stop block add versatility to this rolling miter saw stand.

Back Issue with Plans #SN31—\$4.99
Stop Block Kit & Levelers #6831-100—\$59.95

Trim Carpentry Secrets



A veteran finish carpenter shares some tricks for cutting precise miters, fixing sagging doors, and a host of other tips for your next home improvement project.

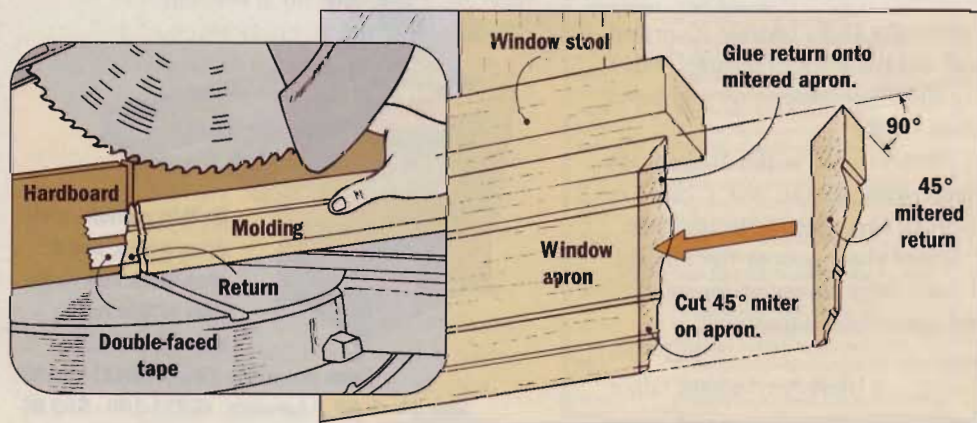
1 USE MITERED RETURNS AS CLEVER COVER-UPS

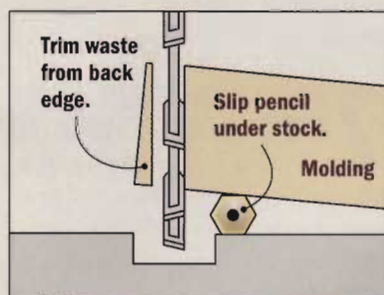
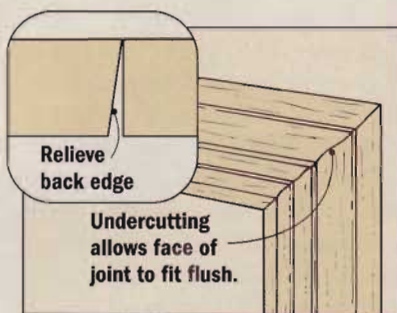
Staining or painting end grain can create problems because it almost always looks different than the rest of the wood. And when you're working with trim, exposed end grain really stands out in a room.

When you can't plan your installation to hide the exposed ends of molding, a clever solution to this problem is to cut mitered returns. A small return is formed by making mating 45° miters on a piece of trim and on another short length of molding as shown below. When you fit the two pieces together, you end up with a perfect 90° angle. Anywhere molding doesn't end in a corner is a good place to use a mitered return.

You can cut returns using a power miter saw, just be sure to secure a short length of molding to a piece of hardboard with double-faced tape (see far left). This keeps returns from flying across the room and getting lost. Also, let the saw blade come to a complete stop before raising it.

When attaching mitered returns, reach for the glue bottle. Because of their small size, the pieces are difficult to nail and have a tendency to split easily if you aren't careful.





2 UNDERCUT MITERS FOR BETTER-FITTING JOINTS

Whether you're casing a door or a window, it's important to get the faces of the mitered joints tight. One secret to tight casing joints is to put a slight back bevel on one of the two miters. This technique is referred to as either undercutting or sometimes backcutting.

What you're doing with undercutting is relieving the back edge of the miter joint by trimming a small amount of material from one of the pieces. This allows the two pieces to fit tighter along the face of the miter joint where a gap is more noticeable. Undercutting is especially important when the jamb protrudes beyond the drywall and you don't have the option of planing it.

An easy way to make undercuts is to slip a piece of casing stock or a pencil under the piece of molding on the table as you're cutting it (see above). This raises the stock just enough to form a slight back bevel.

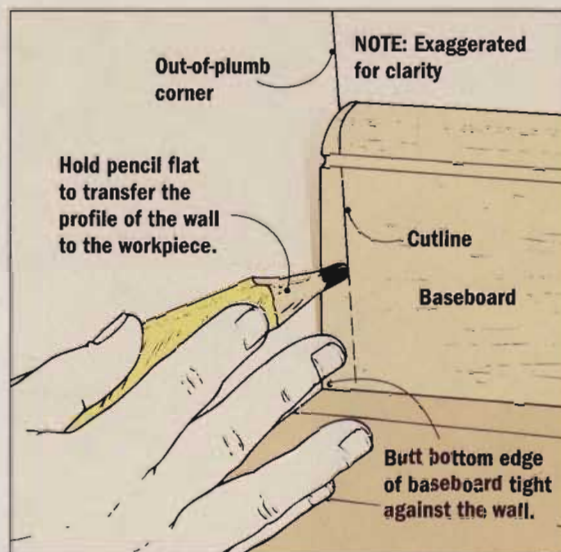
Another method is to use a block plane with the workpiece secured in a vise so the miter is positioned roughly parallel to the work surface. Hold the plane at an angle to the back edge of the miter and make a series of light cuts. With either method, keep cutting and checking the joint until it fits tight.

3 USE A CARPENTER'S PENCIL TO TRANSFER IRREGULAR PROFILES

If you've done any amount of finish carpentry, you know you end up spending a lot of time figuring out how to deal with minor imperfections. That's because nobody's house is perfect.

For example, at times you may have to fit a square end of a piece of trim against a wall that isn't vertical. When this happens, put your carpenter's pencil to the rescue as seen at right.

Simply hold the pencil flat against the wall as you transfer the wall's irregular profile onto the workpiece. By cutting along this line, you'll end up with a piece that fits in place tight against the wall.



4 TRIM DOORS PARALLEL TO A SLOPING FLOOR

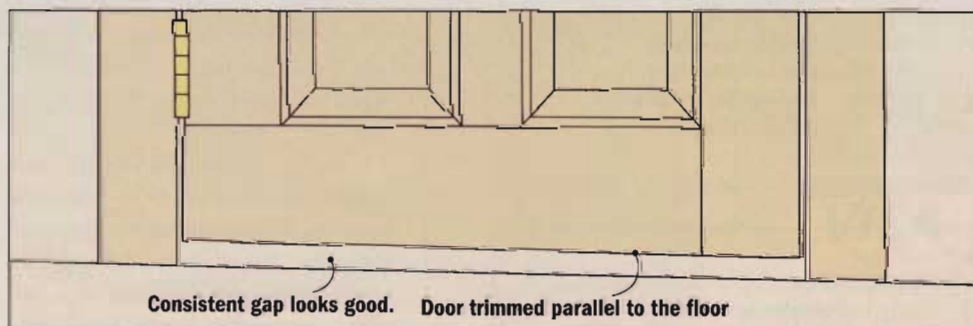
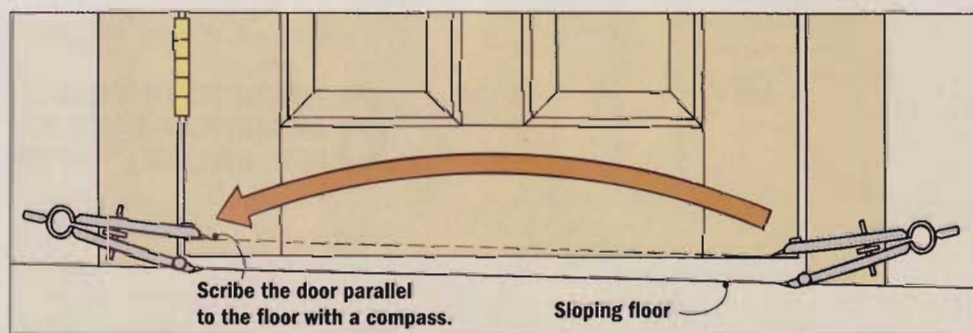
Dealing with imperfections also means sometimes having to forget about level and square. Instead, you'll need to concentrate on keeping materials parallel to the walls and floors.

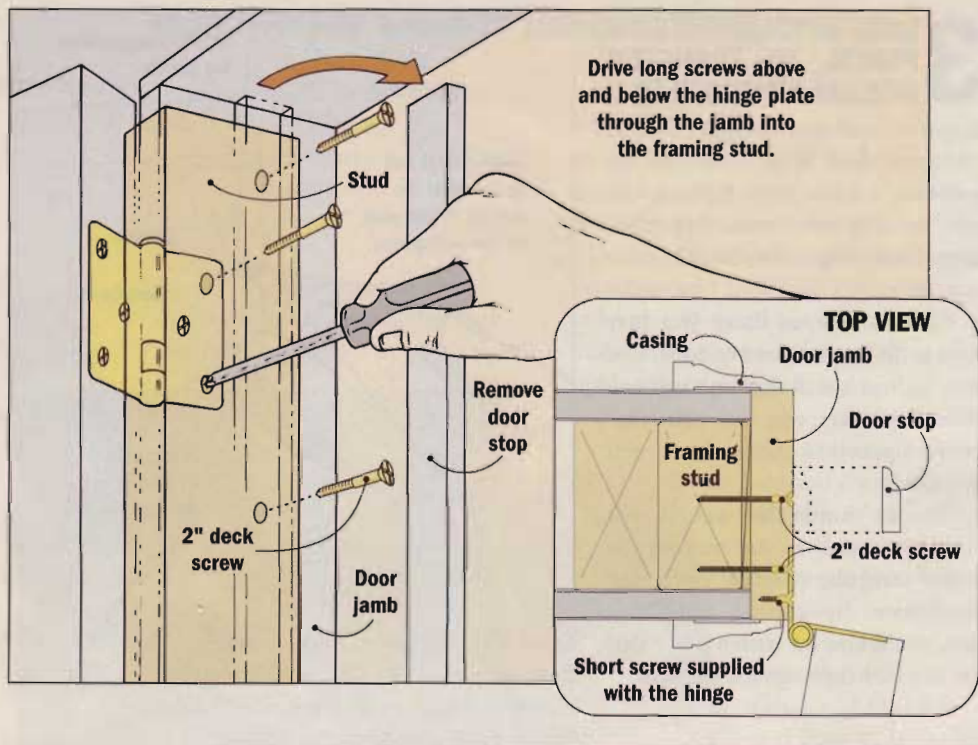
Why? Because your eyes will pick up diverging lines more readily than they see plumb and level sur-

faces. This is most evident when hanging doors. I'm sure you've seen doors that have a tapered gap at the bottom and wondered why. It's usually caused by a level door bottom over a sloping floor.

One way to fix this problem without redoing the floor is to trim the door. Using a compass as shown below, scribe the door bottom so that it's parallel to the floor.

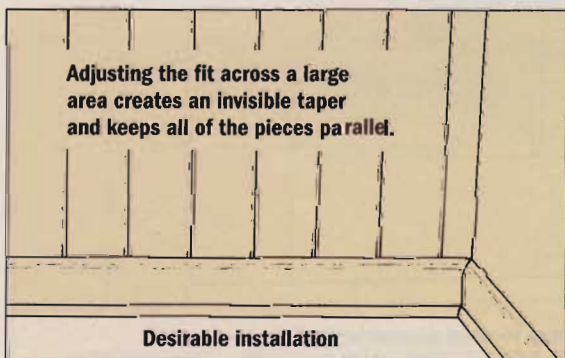
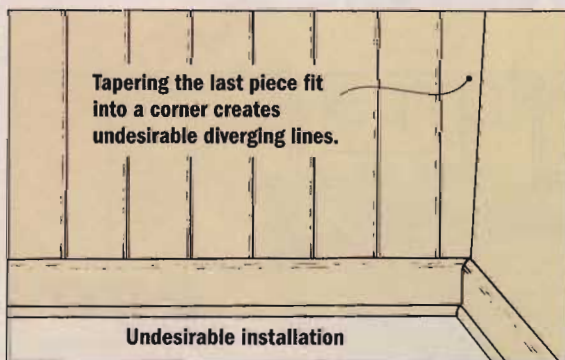
When you get done, your door may not be perfectly level along the bottom. But with a consistent gap all the way across, it'll look good.





5 FIX SAGGING DOORS WITH DECK SCREWS

Heavy doors can sag after they've been hanging for awhile. Their weight can also cause the door jamb to twist. Take a look above to see how you can compensate for these problems.



First remove two of the three short screws in the hinge and replace them with 2" deck screws. These longer screws will reach into the stud and help secure the door.

Another simple trick is to remove the door stop and drive 2" deck screws through the door jamb above and below the hinge plate. This will help keep the jamb from twisting as the casing and framing swell and shrink. The stop will hide the screw heads after it's reattached.

6 ADJUST FIT OF TONGUE-AND-GROOVE PANELING FOR INVISIBLE TAPER

If you're installing any type of tongue-and-groove paneling such as wainscoting, the best place to start and end is in a corner. There's a good chance, however, you'll end up with a wall that isn't quite plumb. Whenever you run into this problem, think parallel just like you did when scribing the door bottom (see Tip #4 on page 67).

Simply adjust the fit of the tongue and groove at the top or bottom of several pieces of paneling. This lets you spread out an invisible taper across a large area, but still keep all the pieces parallel to

each other. This type of installation is desirable because you don't see any diverging lines in the corners.

Take a look at the two drawings at the bottom lefthand of the page. Notice how the irregular corner really stands out in the top drawing. But the irregular corner goes unnoticed in the bottom drawing. This is what you're after by creating an invisible taper.

7 PAINT OR STAIN TRIM BEFORE ATTACHING IT

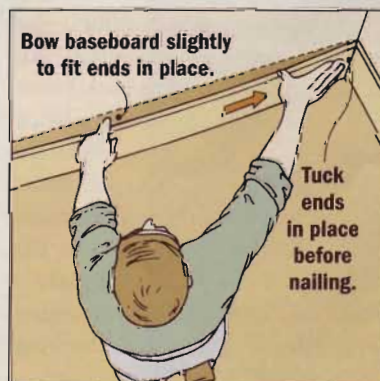
Finishing trim before installing it is much easier than trying to apply paint or stain after it's already in place. After the paint or stain dries, you can cut the pieces to size and attach them permanently. Then simply set the nail heads, fill the holes, and touch up around them.

For trim that's going to be painted, automotive body putty makes an excellent filler for nail holes. It dries quickly and sands easily. For stained trim, fill nail holes with a soft color putty that matches the color of your stain.

8 CUT BASEBOARDS TAD LONG FOR A SNUG FIT

Long baseboards will fit snug if you cut them a hair longer than needed. Since the baseboard will be a tad long, you'll have to bow it away from the wall slightly to fit it into place. It should bow about a finger's width away from the wall as shown below.

Then nail the center of the baseboard first. That should force the ends tight into the corners. Finally, nail both ends.



KEEP REVEALS CONSISTENT USING A SIMPLE SQUARE JIG

9 STEP CASING BACK TO CREATE SHADOW- LINES AND PLANES

When attaching casing around doors and windows, it's practically impossible to get flush edges to stay that way over time. A casing installed flush to the inside of a jamb may look out of place after a few years. This is because wood moves — as it dries out, as you cut it, while you're nailing it in place, and as a house settles. And the eye will pick up even a slight $\frac{1}{8}$ " variation from top to bottom.

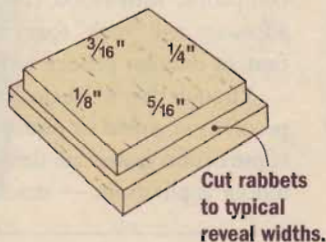
That's why many finish carpenters step casing back from the edges of door and window jambs, creating a narrow portion of the jamb that won't be covered with the casing. This exposed portion of the jambs — anywhere from $\frac{1}{8}$ " to $\frac{5}{16}$ " wide — is called the reveal. These reveals create shadowlines and form different planes that make it harder for the eye to

pick up discrepancies. That way the casing pieces can swell and shrink unnoticed.

Before attaching the casing, you'll want to be sure you have a consistent size reveal all the way along the edge of the jamb. The "Quick Jig" below makes it easy to keep the margins even.

To make this reveal gauge, cut a square piece of $\frac{3}{4}$ "-thick plywood or hardwood. Then cut a rabbet in each of the four edges to correspond with typical reveal widths (see below). For quick reference, write the widths on the gauge.

REVEAL GAUGE



10 HIDE NAILS IN THE GRAIN PATTERNS

One of the biggest problems you'll face when attaching molding or building furniture is how to hide the nails. There are different ways to approach this problem.

The easy solution is to drive in a brad, then simply fill the hole with putty. Although quick, getting an exact color match between the molding and putty may be difficult. And many woods change color as they age, but most plastic wood fillers don't. So what else can you do?

Another way you can hide nails when installing molding is to choose their placement carefully in the first place. Even small pieces of trim have noticeable grain patterns. Whenever possible, drive nails into

the darker grain where they won't be as noticeable. You can also hide nails in the profiles of some moldings where shadowlines are created.

And as a final suggestion, when using a power brad nailer, hold it perpendicular to the piece of mold-

ing you're attaching so the elongated hole follows the grain. 

Special thank you to Dave Fish, a veteran finish carpenter from Des Moines, Iowa, who shared his 15 years of professional experience for this article.



In The Shop

Consider Construction Adhesive for Flexible Bonding Power

Sometimes, the best “glue” for the job comes in a caulking tube. Construction adhesive is often overlooked by woodworkers, yet it’s a better choice than glue when you need a strong, flexible, waterproof bond. It also works when bonding wood with other materials such as metal, masonry, or glass.

STRENGTH AND FLEXIBILITY

Most glues bond mating surfaces together to form a rigid joint. To create this bond, the pieces being joined need to fit tightly together because the glue won’t bridge gaps and retain much strength.

Construction adhesive comes out thick so it bridges those gaps. That’s why we used it on the *Adirondack Chair* on page 50. Because the back slats aren’t curved to match back supports, they don’t fit tightly across their entire width.

Putting a dime-sized dab of adhesive where each slat meets the back supports fills those gaps and helps the screws hold things in place.

Also, moving around — rocking, tipping, or leaning — in a chair puts stresses on it. Joints held with construction adhesive flex with this movement rather than break.

CHOOSING THE RIGHT TYPE

There are different types for different projects. For example, the panel adhesive we used on the wainscoting is high-tack (very sticky). It takes hold quickly so the panels won’t slip. While most types are compatible with wood, certain adhesives will “melt” foam insulation, or discolor plastics and mirrors.

Though they’re labeled waterproof, most *general* or *multi-purpose* construction grades are designed for indoor applications — attaching fur-

ring strips to concrete block, installing tile, hanging drywall.

For exterior projects, you’ll want to look for a *heavy-duty* or a *polyurethane-based* adhesive. Polyurethanes may cost a little more, but they form a stronger bond so you can use less. They’re also compatible with most materials and, unlike many other construction adhesives, they’re nonflammable.

There are also *adhesive caulks* that provide light-duty (non-structural) holding power for lightweight panels, thin tiles, and applied moldings. Most are waterproof so they can be used outdoors.

When applying these adhesives on wide joints or panels, trim the nozzle to lay down a 1/4"-dia. bead. Apply it in a zig-zag pattern as shown in the photo, keeping about 1" from the edges.

To speed up bonding, press the two pieces firmly together, then open the joint back up to “breathe” for a few minutes before clamping the pieces firmly together. Working time varies from 10 minutes to an hour (for polyurethanes).

Besides the caulking-type tubes, you can buy construction adhesive in cans (applied with a trowel), or small squeeze tubes as shown in the photo at left.

CLEAN UP TIPS

No matter which type you use, this sticky stuff is hard to clean up, especially on skin, so wear gloves when using it. (Be sure to follow label warnings concerning skin contact and exposure to vapors).

To remove uncured adhesive from tools, use mineral spirits or WD40. Liquid Nails sells a product (in the foreground of the photo) designed to remove both hardened adhesive and cured caulking.



Use Scarf Joint to Create Long, Strong Pieces

It's sometimes tough to find moldings, or even hardwood stock, in lengths longer than 8 ft. That means having to splice two or more boards together to get the length you need when trimming out a long room.

Butting two pieces of trim together end-to-end is simple. But the joint will open up over time, leaving an unsightly gap. To join the two pieces cleanly and help hide the joint line, use a scarf joint.

Widely used by timber framers and boat builders, scarf joints are formed by overlapping the two pieces. Some scarf joints have elaborate, interlocking notches, but for trim work, a simple 45° bevel on each piece gets the job done.

Start by selecting two pieces of stock with similar grain patterns.

The closer the grain match, the more invisible the joint will be.

To install the pieces, you want the joint to fall on top of a wall stud location as shown in the drawings below. With a stud backing up the joint, the nails can draw the joint tightly together.

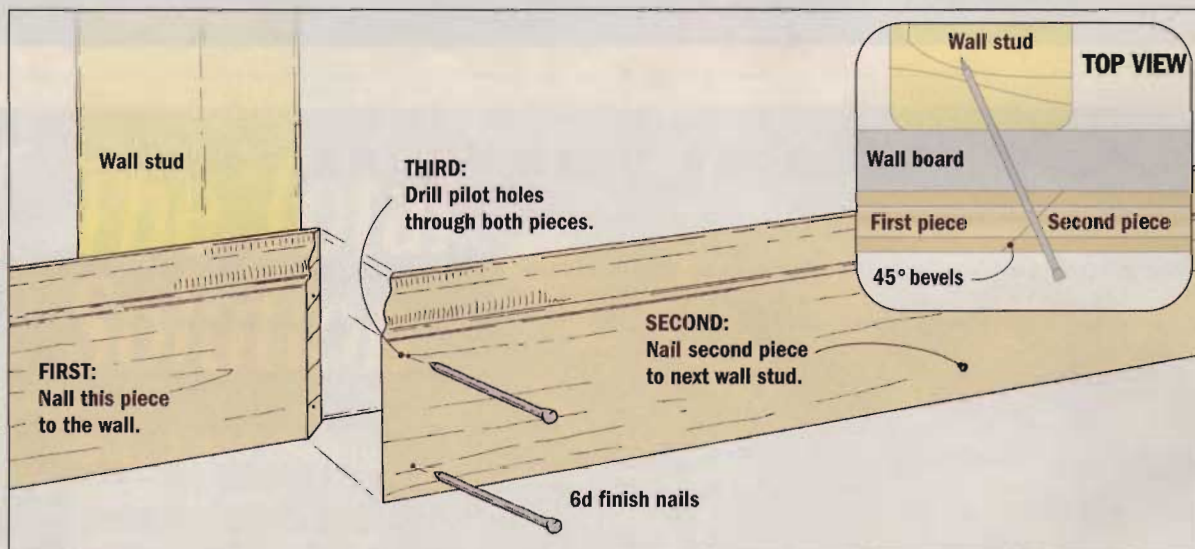
Choose the longer piece of stock and bevel it so it tapers from the front face toward the end. Next, trim the square end so the beveled end will land over a wall stud. Then nail this section to the wall.

Now, cut a bevel on the second piece so it tapers from the back face toward the end. Sneak up on the final length of the second piece by trimming the opposite end until the bevel just overlaps the first piece (*Top View*).

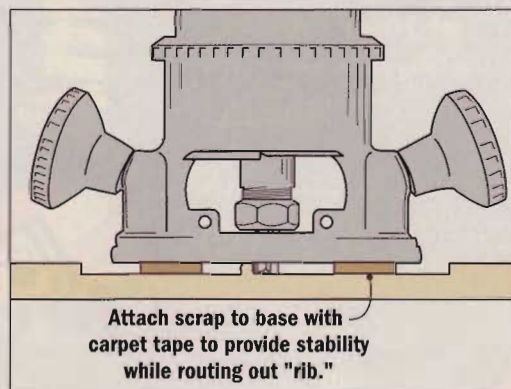
With the second piece trimmed to length, apply glue to the beveled end and set it in place. The overlapping bevel will want to slide apart, particularly with glue in the joint, so I use a couple of tricks to attach the second piece to the wall.

Instead of nailing at the joint, I drive the first nails one or two studs down the wall from the joint. This way, the trim won't shift when you drive the nails at the joint.

I also drill pilot holes for the finish nails at the joint, drilling at a slight angle to the face. This prevents the stock from splitting and lets the nails penetrate both pieces without excess force that could cause slippage. When the nail bites into the stud, it pulls the joint tight (*Top View*). Wipe up any excess glue.



Create a Standoff Router Base



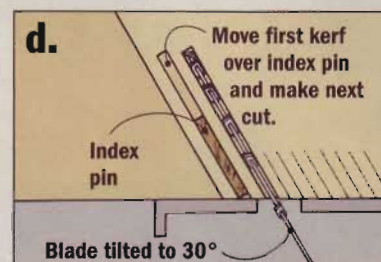
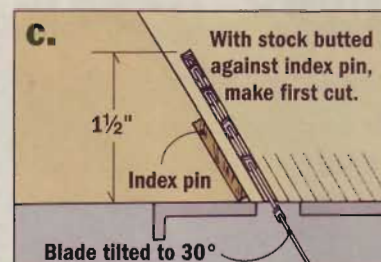
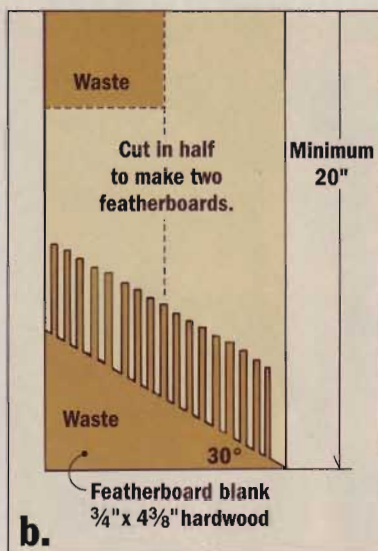
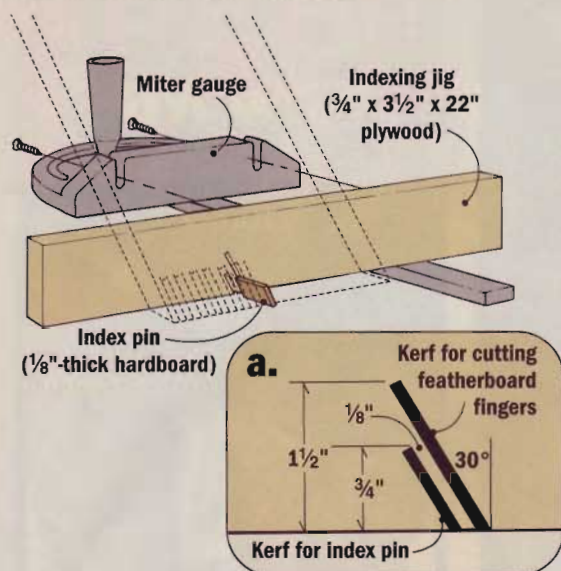
When we built the *First-Class Mail Box Post* (page 44) we cut the wide dadoes in the side pieces using a router. To do this, we left a strip of waste down the center of the dadoes to provide support for the router base. Once we'd routed out as much as we could, we set the router aside and cleaned up the remaining waste with a chisel.

Another solution that may not be faster, but leaves a smoother cut is to

add a standoff base to the router. After roughing out the dado, attach thin pieces of stock (their thickness should equal the dado depth) to the router base so it has something to ride on.

In our case, we used two strips of 1/4"-thick hardboard and attached them to the router base with double-faced carpet tape. After setting the bit flush with the bottom of the dado, move the router back and forth to nibble away the waste.

JIG ASSEMBLY VIEW



Make and Use a Simple Featherboard

A featherboard is a simple device that can make a big difference in the quality of a cut and the ability to make the cut safely. It works by applying constant pressure to the stock, holding it firmly against the table top or fence whether you're cutting rabbets on a table saw or routing coves on a router table. That lets you concentrate on providing a steady feed rate so the profile is uniform along the entire length of the stock.

Featherboards also help prevent kickbacks, in case the blade or bit grabs hold of the stock. They're kind of like the Chinese finger puzzles you played with as a kid — you could stick your finger (the stock) in, but couldn't pull it back out.

BUILD A FEATHERBOARD

The drawings above show how to create the narrow, springy fingers that make a featherboard work. The indexing jig (*Jig Assembly View* and *Fig. a.*) attaches to a table saw miter gauge. With the saw blade tilted to 30°, you make the initial pass to cut the index pin kerf in the jig.

Then you shift the jig on the miter gauge so the finger kerf is 1/8" from the pin kerf. This will give you fingers that are the same width (1/8") as the saw kerfs that separate them.

After you build the jig, cut a blank as shown in *Figure b.* Make the 30° angled crosscut first, then butt the blank against the index pin as shown in *Figure c.* Now, shift the blank with each successive kerf over

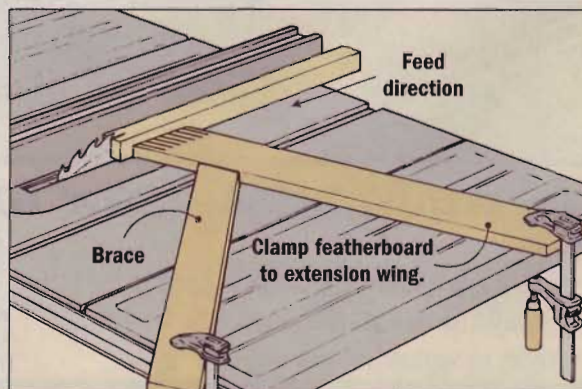
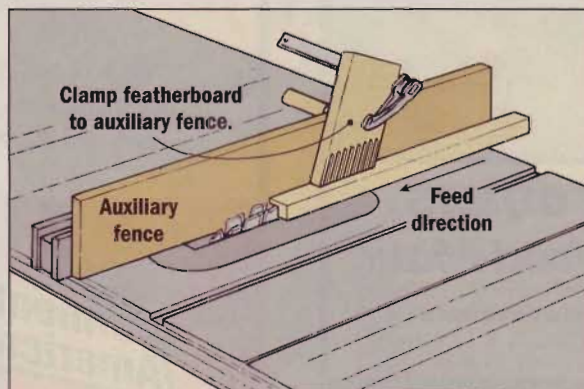
the index pin (*Fig. d.*). Then rip the blank in half to give you featherboards for the table and fence.

HOW TO USE IT

To set up a featherboard, you want the fingers to flex just slightly. That way it can hold the stock down and still let you easily feed the workpiece. The drawings below show you how to position it.

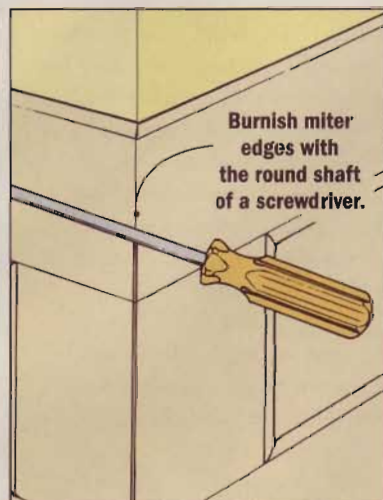
When using a featherboard with the fence, install an auxiliary face on the fence. To use it on the table, you may need to add a brace to keep it positioned. (Note: Never place a featherboard along side or behind the saw blade when ripping. It can pinch the kerf closed and cause the workpiece to bind.)

HOW TO USE A FEATHERBOARD



Quick Fix for Tighter Miters

It's not uncommon for the miter joints on baseboards or casing to open up, particularly on outside corners. The joint may have fit tight when you installed the trim, but shrinkage or settling can cause unsightly gaps.



An easy way to "tighten" these gaps is to burnish (roundover) the edge with the round shaft of a screwdriver. Start by holding the shaft at a 45° angle to the corner on the right-hand side of the joint (shown above). Use moderate pressure to "fold" the wood fibers along the corner point into the gap. Then repeat the process on the left-hand side. The resulting corner won't be as crisp, but the gap will be closed, and the appearance much improved.

Use Dowels for Drying Rack

We applied stain and finish to most of the wainscoting moldings before they were fitted and installed. To speed up the drying process in the shop, we set three 1/2"-dia. dowels (36" long) on the bench, spaced 3-ft. apart. The dowels held the moldings up so air could circulate and the finish could dry faster.



GROSS STABIL® PARALLEL CLAMPS VS. THE COMPETITION

	OURS	THEIRS
Clamping Depth	5-1/2"	5-1/8"
Clamping Width	1-3/4"	1-3/8"
Removeable Pads	Yes	No
15% Longer Spindle	Yes	No
Replaceable Pads	Yes	No
Metal Jaws	Yes	No
Nominal Throat Depth	4"	3.5"
Cast Iron Sliding Arm	Yes	No
Clamping Pressure	1100lbs.	1000lbs.
Tempered Steel Bar	Yes	Yes



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Product Information Number 182

Tool 2

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Product Information Number 204

Around The House



Relocating Electrical Outlets

Moving an outlet a short distance is easier than you might think. It just takes a little detective work, a few basic tools, and a high regard for safety.

During the wainscoting project on page 32, a stile covered up an existing outlet (see the photo). So I moved the outlet to the middle of the adjacent panel using a remodeler's box. It has small flaps that grab

onto the wallboard.

GETTING STARTED

Begin by shutting off the power at the breaker box, then double-check that it's off using an outlet tester.

Now, it's time to do the detective work. Start by removing the cover plate and the screws that hold the outlet in its box. Pull the outlet from the box and determine how

it's wired. If the wires lead both into and out of the existing box as shown in *Figure 1*, the outlet is in the middle of a circuit.

If the wiring only comes into the box and doesn't feed back out the other side as shown in *Figure 2*, the outlet is at the end of a circuit.

With a mid-circuit outlet, you can move the box either direction pretty easily. If it's at the end of the circuit, you're better off moving the outlet back in the direction the wire comes from. Moving the outlet beyond the reach of the wire means a lot of tear out and finish work.

Once you've determined where to locate the new box, mark around the outside, excluding any ears. Now take a keyhole saw and cut the mounting hole. This hole also allows access for finding the existing wire and running new wire.

MOVING THE WIRE

Whether the existing outlet is mid-circuit or at the end, start by disconnecting the wires from the outlet.

On a mid-circuit outlet, push the wires (on the side closest to the new outlet hole) through the knockout in the box and into the wall cavity (*Fig. 1*). Then feed a new piece of wiring through the same knockout hole. Now reach into the new outlet hole and pull both the old and new wires through the opening.

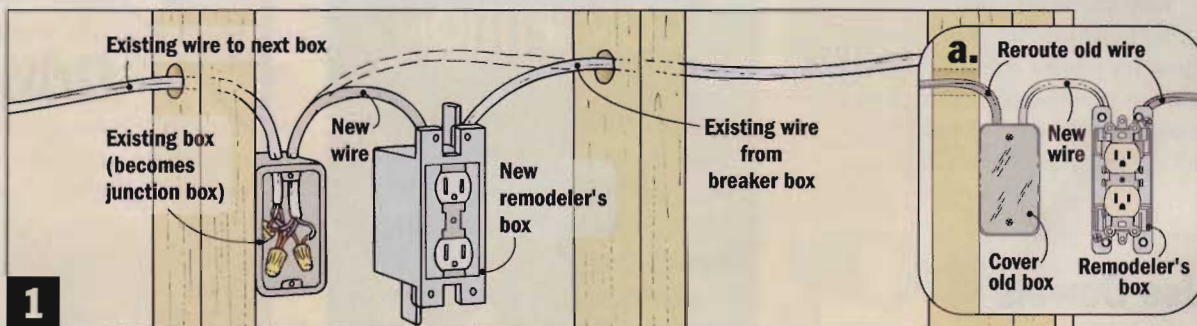
Next, feed the wires into the remodeler's box. Insert the box into the wall and tighten the screws to anchor the box. Then connect the wires to the outlet.

Now the old outlet box becomes a junction box, and the wires can be joined using wire nuts. This box needs to be covered with a plate (*Fig. 1a*).

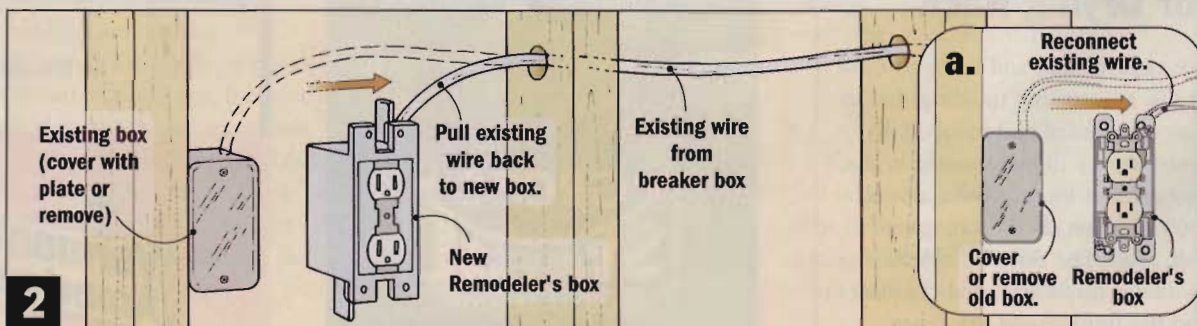
For an end-of-circuit outlet (*Figs. 2 and 2a*), the process is the same, except you don't need to run any new wires. Just disconnect the existing wires and fish them to the new box.

Note: As always, if you have questions about wiring, call in a licensed electrician.

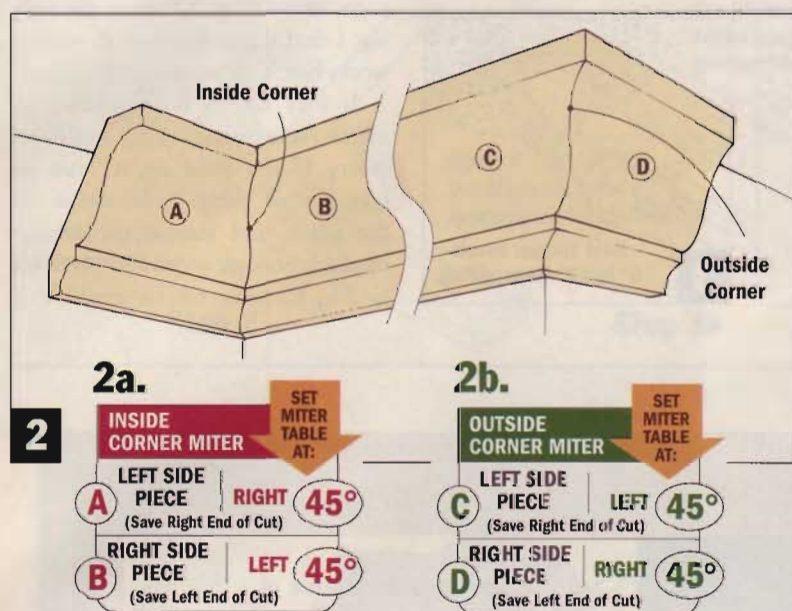
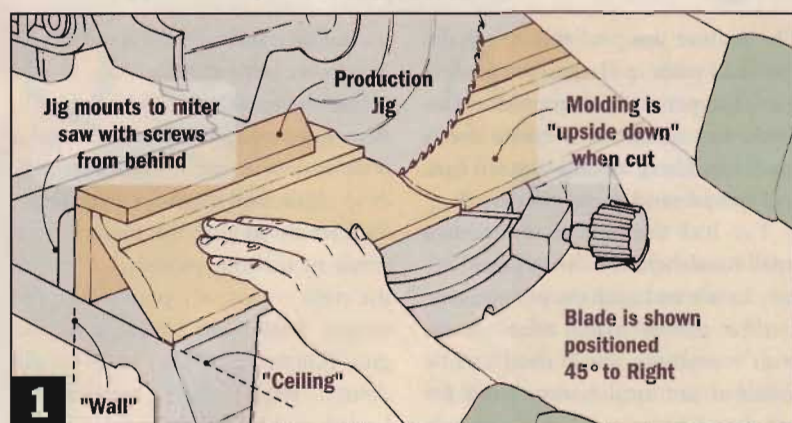
MID-CIRCUIT



END-OF-CIRCUIT



Cutting Compound Miters



Adding crown molding is a great way to dress up a room. But joining the corners often requires cutting compound angles. So you need to have a compound miter saw to make these cuts, right?

Not necessarily. A miter saw will do the job, if you stand the molding up on edge and tilt it, (Fig. 1).

When you cut the molding, position it upside down. In other words, imagine the miter saw table as the ceiling and the saw fence as the wall.

For big jobs, it's a good idea to make a jig to help hold the molding at the proper angle (Fig. 1). The jig is just a couple of pieces of scrap hardwood nailed together and then screwed to the saw fence.

I like to make test cuts on scrap

pieces before cutting the actual molding to length. This way I can get comfortable with the upside down idea. Plus, it lets me fine tune the angles, since most walls don't intersect at exactly 90°.

To cut an inside corner, refer to Figure 2 and Chart 2a. First, take piece (A) and lay it upside down on the right side of the saw. Then swing the miter table *right* to 45°, and make the cut. To cut piece (B), place it upside down on the left side of the saw, and swing the miter table 45° *left*, to make the cut.

For outside corners, refer to Figure 2 and Chart 2b, turn the miter table in the opposite direction. Cut piece (C) with the blade turned *left* 45° and cut piece (D) with the blade turned *right* 45°.

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Tool 3



Screw Guide

The magnetic bit holder secures the screw, then guides it for driving.

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Patching Textured Ceilings

Making a small repair on a smooth ceiling or wall is one thing, but patching a textured ceiling can get a little more involved. That's especially true if the ceiling is covered with tiny polystyrene chips that give it a "cottage cheese" look. Then it's not just a matter of smoothing off the repair. Instead you have to try to figure out how to match the texture.

Repairs on this kind of ceiling can be handled a number of ways.

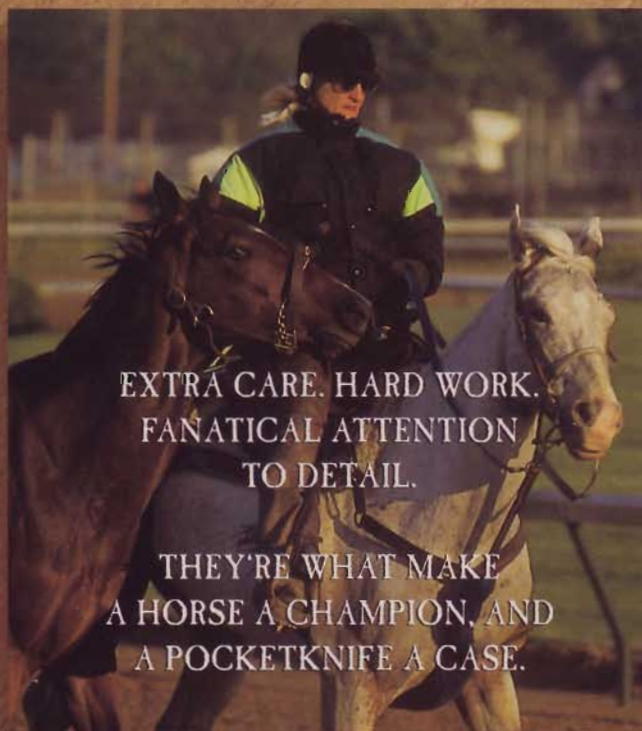
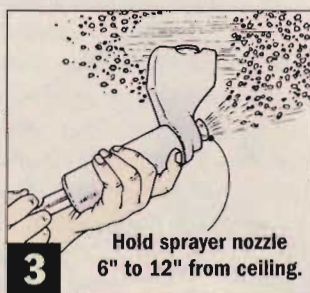
The texture was probably originally applied with a large pneumatic spray hopper and a compressor. But that's too much of a hassle for a small job. There are also aerosol cans and special sand paints that work.

I've had the best results with a small hand-held touch-up pump. It's easy to use and with proper cleanup, can be reused many times. A kit with everything you'll need can be found at the local home center for less than \$20.

Before repairing the texture, fill any holes with spackle (Fig. 1) and prime the area to be patched (Fig. 2). Also, since using the pump can get a little messy, cover everything with drop cloths and mask for overspray.

Start by mixing the texture with water in the cup provided. After it's the right consistency, pour it into the texture bottle and attach it to the gun. Rotate the pump body to the desired setting (light, medium or heavy), and hold the sprayer at a 40° angle, about 6" to 12" from the ceiling. I find that a first overall coating works best, then return to fill in gaps.

It may take a little practice to match the existing ceiling, but don't worry. If you mess up, it's easy to take a wide putty knife, scrape off the patch, and start over. The kit contains enough texture to patch up to 2 sq. ft., and refills are available.



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Sources & Resources

Construction Adhesives Provide Strength and Flexibility

Sometimes the best “glue” for a project won’t come in a squeeze bottle or a jar.

For example, when we built the *Adirondack Chair* on page 50, we needed a “glue” that would bridge gaps to hold individual pieces

together. The best glue turned out to be a polyurethane-based construction adhesive. It provided both strength and flexibility. And it came in a caulking tube. We also turned to a construction adhesive for attaching the plywood wainscoting panels (see page 32).

To remove uncured adhesive from tools, use mineral spirits or WD40. Liquid Nails sells a product (in the foreground of the photo) designed to remove both hardened adhesive and cured caulking. Most home

centers carry a variety of construction adhesives for different applications. Here’s a listing of some common brands and manufacturers: Liquid Nails (Macco Adhesives) (800) 634-0015 www.liquidnails.com

PL and Quickbond Adhesives (Ohio Sealants Inc.), (800) 321-3578 www.osisealants.com

Titebond (Franklin International) (800) 347-4583 www.titebond.com

DAP (DAP), (888) 327-8477 www.dap.com



Miter Saws

Craftsman (800) 377-7414 www.sears.com/craftsman

Delta (800) 438-2486 www.deltawoodworking.com

Hitachi (800) 546-1666 www.hitachi.com

Makita (800) 462-5482 www.makita.com

Powermatic (800) 248-0144 www.powermatic.com

Pro-Tech (800) 888-6603 www.protechpower.com

Ridgid (800) 474-3443 www.ridgidwoodworking.com

Ryobi (800) 525-2579 www.ryobi.com/powertools

Wainscoting Finish and Fruitwood Filler

Wrapping a room in red oak looks great. But to get an even warmer oak tone, I finished the plywood wainscoting panels (see page 32) with a 50-50 blend of Sealacell Golden Oak and Sealacell Honey Maple from General Finishes.

After wiping on just two coats, this combination tung oil sealer and stain created a moderately tough finish.

You can find out more about General Finishes by calling the manufacturer at (800) 783-6050, or by visiting the company’s Web site: www.generalfinishes.com.

To fill the visible nail holes, I used 110 Fruitwood Color Putty. If you can’t find it locally, it’s available from Color Putty Co., (608) 325-6033, or on the Web at www.colorputty.com.



More on Mailboxes

If you’re building a mailbox post or a mailbox, or if you’re just wondering where to mount the one you’ve got, check out the United States Postal Service Web site: www.new.usps.gov. The site contains just about everything you could want to know about mailbox size, location, and materials.

Click for Project Cutting Diagrams

Free Cutting Diagrams are available for the *Mailbox Post*, the *Adirondack Chair and Ottoman*, and the *Patio Table*. Just log on to: www.WorkbenchMagazine.com and click on:

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If you don’t have Internet access, send a self-addressed stamped envelope to:

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Write clearly on the envelope which diagram(s) you want.

Artistry in His 'Vanes'

Using the same relief hammering technique as colonial craftsmen, Travis Tuck has earned a reputation for dressing up America's rooftops.

It's a warm summer day on the island of Martha's Vineyard. The smell of heated metal fills the air inside a small workshop where metal sculptor Travis Tuck is assembling a copper eagle. When finished, the one-of-a-kind weathervane will stand atop a home in Cincinnati.

Tuck made his first weathervane in 1974, a three-foot shark used in the movie *Jaws*. "I charged a whole \$150 for it," he says.

Today, Tuck's sought-after weather instruments start at around \$12,000 and stand in 43 states and 13 foreign countries. He has crafted everything from family pets to authentic whaling ships. Once, he even made a snarling dinosaur weathervane for filmmaker Steven Spielberg.

While many other weathervane makers use wooden molds, Tuck's process is entirely freehand. First he cuts large copper sheets into patterns. "It's a lot like sewing a garment," Tuck says. "I have to decide where the seams will fall before I can braze all the pieces together."

To create different textures, Tuck uses a technique that dates back to when Egyptian jewelry was being made: "I heat the metal first, then use blunt chisels and different size wooden blocks to draw details onto the copper," he says. "Each hammer blow is an aesthetic decision, which makes every one of my weathervanes unique."

Travis Tuck can be reached at (888) 693-3914 or by checking out www.TravisTuck.com.



Photographs by Mark Alan Lovewell