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APRIL 2006

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EDITOR'S NOTES

The idea of having your own personal getaway certainly has its appeal. A remote beach in the Bahamas, a cabin in the North Woods, or a trout stream in the Rockies come to my mind. As relaxing as they might be, however, far-off retreats like these often suffer from the too-much, not-enough syndrome — too much money to get there, and not enough time to enjoy.

Perhaps that explains why so many people these days are beginning to retreat to refuges that are much closer to home. And in some cases, actually in their home.

Built-In Book Nook — The book nook featured on the cover of this issue is one of those escape-from-it-all places. It's a comfortable, well-lit spot where you can lose yourself in a good book, listen to music, or simply recharge your batteries.

Okay, so what about that time and money thing?

First of all, this book nook doesn't take much time to build. The bench seat and flanking bookcases are assembled with simple dado and rabbet joints. And the face frames applied to the fronts are pocket-screwed together. With such straightforward construction, you can "knock out" this book nook in a couple of weekends.

As for cost, it probably compares roughly with an airline ticket to your favorite resort. Not counting the cushions on the bench seat, we spent around \$500 on building materials (about one-fifth less than you'd spend if you had to hire a professional carpenter to build it). All in all, it's a small price to pay for having your very own getaway.

A New Look — And speaking of having a place of your own, we've updated the graphic look of *Workbench* to make it easier to find your favorite departments and features.

Now the articles are identified by color-coded tabs and letter blocks at the top of each page (see *Photo below*). So if the "Tips & Techniques" department is the first place you head to in every issue, all you have to do is fan the pages of the magazine and look for the light-blue visual cues to get to your first stopping place. I hope you enjoy that stop, and all the other ones along the way.





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This book nook transforms any room into a cozy retreat. The simple construction of the bench seat and flanking bookcases makes it easy to build in a couple of weekends.

52 Kitchen Utensil Rack

Finally, an elegant answer for keeping kitchen utensils handy above the counter. Built from hard maple and off-the-shelf aluminum, it's as stylish as it is functional.

60 Tool Test: 13" Portable Planers

A thickness planer may be a single-purpose tool, but these eight models differ in several important ways. See which planers produced the best results, left the least snipe, and effectively eliminated the mess.

68 4-in-1 Power Tool Station

Use this space-saving tool station as a router table, an edge sander, and a pocket-hole joinery center. It even lets you make intricate scroll cuts with a jig saw.

80 Building Better Built-Ins

Learn how to build a built-in cabinet that fits into its space like a hand in a glove. Just follow our four simple rules, and you'll end up with great results.





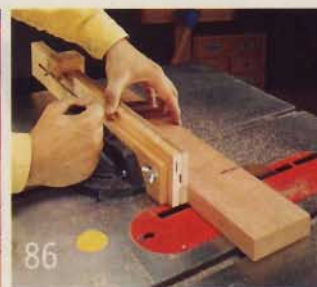
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- 15 Questions & Answers**
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How to prep a painted project for a gap-free, seamless look. Also, learn what makes prefinished flooring so durable.
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Two great storage solutions. Plus, see our readers’ tricks for snapping accurate chalk lines and drilling perfectly aligned holes.
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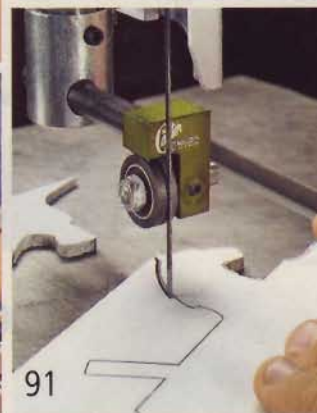
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91 Cutting Edge

Maximize Band Saw Performance. Pump up the performance of your band saw by installing one or more of these seven cutting-edge accessories.

COLOR THEORY

Hitachi Branding

In an extremely competitive tool market, it turns out consumer opinion can be quite colored.

Color is king when building a tool brand. If you doubt it, consider whether DeWalt would so easily hold the high ground in the cordless tool wars if they'd chosen a nondescript brown color for their products instead of the vibrant yellow that is instantly recognizable on job-sites and store shelves.

Another excellent example in color theory as it relates to power tools comes from Hitachi. After an "exhaustive study and analysis" on their position in the U.S. power tool

marketplace, Hitachi decided their tools needed a makeover.

"Hitachi understood the importance of color in the U.S. to identify brand," explains Abigail Bradford, marketing communications manager for Hitachi. "But the company felt it was time to make adjustments in order to differentiate Hitachi power tools from the rest of the pack while keeping true to our green color scheme."

After finding little in the way of design inspiration within the tool industry, Hitachi looked at other dynamic industries. Ultimately, the bold new look of Hitachi tools, which feature dramatic black accents in stark contrast to their trademark green,

found its genesis in the aesthetics of popular athletic shoes, watches, sports cars, and motorcycles.

An interesting aside is that Westerners aren't alone in their color-centric preferences. Hitachi set off a market explosion in Japan, where workers are often required to wear colored uniforms representative of their job function, by offering tools in colors that matched the most common uniform colors. Upon the immediate success of offering tools in colors such as the gold, metallic green, and pink impact drivers shown above, several other manufacturers followed suit with their own rainbow of tool colors.



Alan Lacer is a master of the skew chisel. He recently demonstrated his turning skills to Des Moines, Iowa, woodworkers.

ALAN LACER

"Tops" in Turning

Alan Lacer's take on turning is heavily skewed. You see, Alan is of the opinion that a skew chisel is the ultimate turning tool, limited only by the turner wielding it.

He made that point rather dramatically during an event hosted by the Des Moines Woodworkers Association and Des Moines Woodturners Club when he turned these tiny tops with a $1\frac{3}{8}$ "-wide skew chisel.

Alan used the tops to show the "fine touch" possible with the tool. He then went on to demonstrate the skew chisel's versatility for more practical turning projects.

Check out AlanLacer.com for more on skew turning, or visit DMWoodworkers.com to learn more about the sponsoring clubs.





Using only hand tools and an unsplit log, students will create this reproduction of a 17th century storage box, complete with ornate carving.

OLD-SCHOOL WOODWORKING

17th Century Style

The North Bennet Street School teaches students how to build an heirloom box using only 17th century hand tools.

Beginning with unsplit logs of red or white oak, students enrolled in the Green Woodworking workshop at the North Bennet Street School in Boston, Massachusetts, spend four weekends crafting a reproduction of a 17th century storage box using only tools and techniques from the same time.

The students learn to rive the project parts from a log, hand plane boards flat using a scrub plane and a smoothing plane, and then join the parts using

wooden pegs. Finally, they carve a typical 17th century design on the box.

Enrollment in the course is limited to 12 students, so instructor Brian Weldy, a 2001 graduate of the school's renowned Cabinet and Furniture Making program, has plenty of time with each student. The cost of the course is \$500.

For more information on the school and this course, visit nbss.org or call 617-227-0155.



Is this how Abe did it? Students in the Green Woodworking workshop split their own logs to get started.



So that's where boards come from? After splitting, students rive and plane boards from their log.

HURRIQUAKE NAIL

Dr. Ed Sutt may not know art, but he knows nails. And it seems some people think his revolutionary new nail is art.

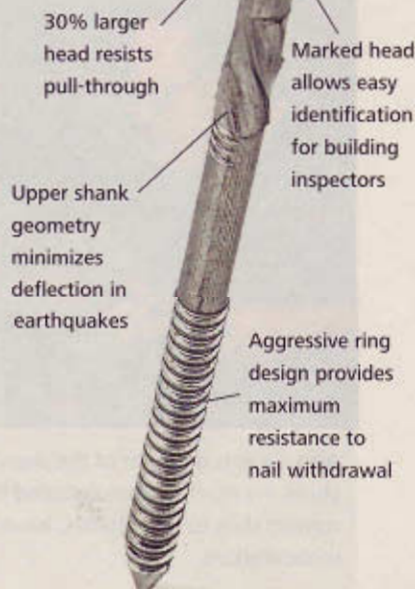
Dr. Sutt is the "mad scientist" behind the Hurriquake Nail from Bostitch. This nail so impressed the curators of the Museum of Modern Art (MOMA) that they included it in their recent exhibition titled *SAFE: Design Takes on Risk*.

What makes the Hurriquake so compelling is its capacity to withstand the destructive forces of hurricanes (nail withdrawal and pull-through) and earthquakes (shear-load failure).

Independent tests have confirmed the Hurriquake's ability to withstand uplift forces of over 271 pounds per square foot and bending forces of over 100,000 psi, more than doubling a home's resistance to the destructive forces of nature.

Perhaps most remarkable about this nail, though, is that it would only add about \$15 to the cost of building a 2,000-square-foot home.

For more information on the Hurriquake Nail, visit Bostitch.com or call 800-556-6696.





TECH STUDENTS COMPETE IN **SkillsUSA**

Aspiring tradespeople put their skills to the test in an annual competition called **TeamWorks**.

The SkillsUSA Championship showcases the best career and technical students in the nation. In 2005, there were over 4,600 contestants in 80 separate events. An important part of the SkillsUSA program is the building- and construction-oriented TeamWorks competition. Bosch sponsors this annual competition, in which teams demonstrate their skills in residential carpentry, plumbing, electricity, and masonry by building a portion of a house (Photo, above).

For 2005 results and the 2006 schedule, visit SkillsUSA.org



A SkillsUSA participant cuts a stair stringer that will lead to the second story of a partial home.



OUT OF THE OFFICE

Workbench senior editor by day, Cub Scout Den Leader by night, Dave Stone recently introduced his Scouts to the joy of woodworking by helping them build a toolbox. Shown above is Dave (he's the one without the hat) lending a helping hand to his son, Tyler.

Dave's advice to other Scout leaders? Pre-cut the pieces, pre-drill the holes, and keep your fingers out of the way!

RACE INTO WOODWORKING

Many Scouts get their first taste of woodworking by building a Pinewood Derby car. Currently, most of the 53,000 Cub Scout packs host an annual race, offering more than 1.8 million Scouts a chance to work with wood.



AMANA TOOL OFFERS

Q&A with Lonnie Bird

Amana Tool recently added a "Question and Answer" column to their website (AmanaTool.com). The column is hosted by Lonnie Bird, a respected woodworker, teacher, writer, and tool designer.

The focus of the column will be routing and shaping techniques. All that's required to ask Lonnie a question is to fill out a simple form with your name and email address. Or you can browse the archives to see if your question has already been asked and answered. Most of Lonnie's answers include an illustration, a photo, or a specific bit or blade recommendation.

Visit AmanaTool.com and click on the "Ask Lonnie Bird" link to participate. You can also visit LonnieBird.com to learn more about the host.

SWAP CHUCKS FOR A SIMPLE

Drill Upgrade

Step up to a top-quality chuck to get a good grip on your drill bits.

Q: I have a hard time getting the chuck on my cordless drill tight enough to get a good grip on the bits. Is it possible to upgrade the chuck to one that will work better?

Todd Sutphin
Winterset, IA

A: A bit that slips can be very frustrating. But rather than getting rid of the drill, you can replace the chuck. You'll find replacement chucks in home centers for \$25-\$35 that outperform the standard chuck on a "consumer" drill.

These replacement chucks are easier to tighten thanks to easy-to-grip surfaces. And some have a ratcheting mechanism to hold the bit tightly.

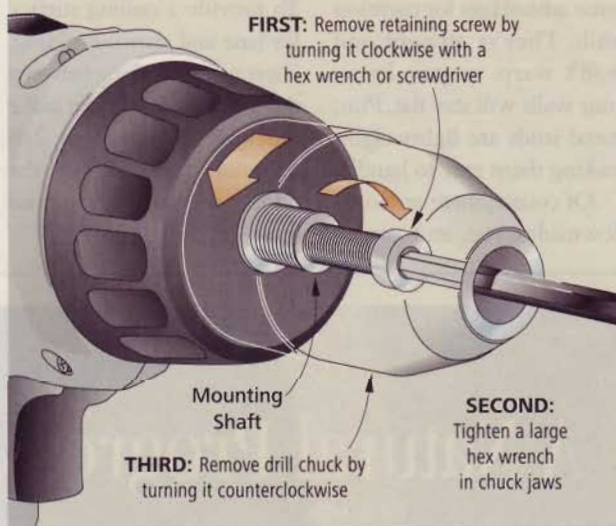
Or for a few dollars more, upgrade to the single-sleeve style chuck used on high-end drills. These can be tightened with one hand, and offer carbide jaws that are serrated for extra gripping power. You'll probably have to go to a tool repair shop or your drill manufacturer to find one.

Before buying a new chuck, you need to remove the old one. This lets you check the diameter of the mounting shaft, so you can select the correct replacement.

To remove the chuck, open up the jaws and remove the retaining screw that's inside (Drawing, right). Next, unscrew the chuck as shown in the Photo at top right.



After removing the retaining screw (below), put the drill in low range, and then tighten a large hex wrench into the chuck. Strike the wrench hard to break the chuck free.



DECIPHERING THE DIFFERENCES IN

Kitchen Cabinet Options

Q: I'm remodeling my kitchen, and I'm confused about the terms used to describe cabinets. Can you explain the differences in quality between stock, semi-custom, and custom cabinets?

Derek Miller
Milwaukee, WI

A: The terms stock, semi-custom, and custom don't describe cabinet quality. They indicate the choices you have in cabinet sizes and options.

Stock — These cabinets are mass-produced with standard features and sizes: 12" deep for wall units, 24" deep

for base units, and in 9" to 48" widths (in 3" increments).

Semi-Custom — At this level, you can modify a stock cabinet to change the wood species or add trim and features. You may be able to change cabinet depth, but widths remain the same.

Custom — With custom cabinets, you choose everything, including size, style, wood type, and features.

Prices vary widely with all three types, based on quality and features. But in general terms, stock cabinets cost the least, and custom the most.

GOT QUESTIONS? WE HAVE ANSWERS!

Include full name, address, and daytime phone number. You'll receive one of our handsome **Workbench** caps if we publish your question.

HOW TO SEND YOUR QUESTIONS:

Email: Q&A@workbenchmag.com

Forums: forums.woodnet.net

Mail: Workbench Q&A, 2200 Grand Ave., Des Moines, IA 50312



TWO TYPES OF STUDS

Simplify Trim Jobs

Q: I'm considering framing the partition walls of my basement with metal studs. I know they have to be screwed together, and that got me wondering; will I have to screw the trim and door frames to them, as well?

Brian Harper
Pella, IA

A: Metal studs do offer some advantages for partition walls. They're straight and won't warp, so you know your walls will stay flat. Plus, metal studs are lightweight, making them easy to handle.

Of course, there are some downsides, too, and you've

found one of the biggest: Metal studs don't hold nails well, so adding trim and casing can be challenging. I've seen recommendations to drive in two nails at crossing angles, but this is time-consuming and not very effective.

A better solution is to use both wood and metal studs (Illustration, right).

Blocking Holds Trim —

To provide a nailing surface for base and crown molding, insert wood blocking between the metal studs. You can make blocking from 2x4 or 2x6 material (depending on the width of your trim) and toenail it into place.



Add wood studs and blocking to metal-stud walls in order to provide a solid nailing surface for door framing and trim.

Use Wood for Doors — When framing around doors, stop the top and bottom plate short of the opening, then screw on wood studs to frame in the opening. That way, you

can nail the door frame, as well as the surrounding trim, to the wood studs. Just be sure to use straight studs to prevent bowing the metal studs they're attached to.

A Natural Progression to...



DOVETAILING

Drawer Boxes

Q: I'm building utility cabinets and don't know whether to make the drawers from solid wood or plywood. I plan to use dovetail joints. Any suggestions?

Paul Thompson
Denver, CO

A: Either solid wood or plywood will work. To decide which would be the best choice, consider the following.

Solid Wood — For solid-wood drawers, hardwoods are best. But you don't need to buy expensive lumber. I prefer poplar. It's economical and easy to machine for any type of joinery (see Photo, above).

If you're building deep drawers, though, you'll have to edge-glue narrow boards to get wide enough stock.

Plywood — With plywood, you can build deep drawers without having to deal with glue-ups.

But ordinary plywood won't work for dovetail joints. The plies tend to chip out as you rout the pins and tails. Even if chip-out doesn't occur, the pins break easily.

A better choice is Baltic birch plywood. It's made of very thin plies, so it's strong and won't tear apart when routed like standard plywood (Photo, top right).



Solid poplar and Baltic birch plywood both accept dovetail joinery. When routing the plywood, make a scoring pass (below) to prevent tearout of the thin outer veneer layer.

Having said that, the face veneer can still chip out. This won't weaken the dovetails, but it looks bad. To prevent it, make a scoring cut by back-routing (from right to left) across the face before routing the pins and tails (Photo, right).



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QUESTIONS & ANSWERS



TO GET THE BEST SEAL

Select the Correct Caulk

Q: There are so many types of caulk available that I have a hard time deciding which one to use. Can you help me figure it out?

George Martin
via email

A: The huge variety of caulks and sealants does mean you'll have to spend extra time in the store reading labels and studying products before you buy in order to make sure you get the correct product. That's the bad news. The good news is that you can find a caulk or sealant suitable for just about any type of project you can imagine.

Another piece of good news is that more manufacturers are labeling their

products according to the intended usage, instead of just by the material the caulk is made from. That means if you want to seal your exterior windows and doors, you grab the tube with that label. Likewise, the ones marked "roof and chimney sealer" or "tub and tile" will handle those chores with ease.

But not every caulk manufacturer provides such convenient labels. So it helps to understand the basics of caulks and sealants. As the *Chart* below shows, all of the various formulations of caulk fall into one of just four broad categories. The general usage information shown will help you decide which caulk to use when the label doesn't give a clear indication.

CAULK COMPARISON CHART

	Where To Use	Paintable	Ease Of Use	Flexibility	Surface Cleanup	Application Temp.	Odor/ Toxicity
Water-Based	Indoor/ Outdoor	Yes	Very Easy	Moderate	Soap/ Water	40°+	Low
Solvent-Based*	Indoor/ Outdoor	Yes	Fairly Easy	High	Solvent**	20°+	High
Silicone*	Indoor/ Outdoor	No	Fairly Easy	High	Solvent**	20°+	Moderate/ High
Polyurethane*	Outdoor	Yes	Fairly Easy	High	Solvent**	40°+	Moderate

*Wear latex or nitrile gloves when using to protect hands.

**Mineral spirits or acetone

BACK TO BASICS:

Beautiful Built-Ins

One of the secrets to a great looking built-in is actually simpler than you think.

Ideally, a built-in project should blend seamlessly with the walls and ceilings of a room. Painting is one way to accomplish that, which is what we did with the book nook on page 40. But that alone isn't enough.

No matter how carefully you plan, build, and scribe the cabinet to fit the space, paint won't cover the small gaps that are sure to exist.

If the project has a face frame, it's quite likely to have a few hairline gaps between frame members or between the frame and the case. Priming the project will make it easy to see these gaps. To make them disappear, fill the gaps with spackle (*Inset Photo*) and lightly sand the surface before applying the "color" coat of paint.

Other gaps, like those between the project and the walls and ceiling can be taken care of with a carefully applied bead of caulk (*below*).



It's the details that count to successfully integrate a built-in cabinet into a room. Though seemingly insignificant, spackling and caulking correctly make a huge difference.

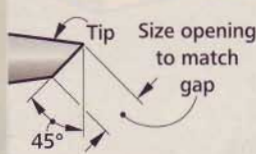


Caulking doesn't have to be a messy, imprecise job. To form a clean bead, hold the tube almost perpendicular to the gap. Then use a damp rag to tidy up imperfections.

HOW TO GET A BETTER BEAD OF CAULK

As simple as it seems, applying a smooth, tidy bead of caulk takes some finesse. Start by cutting the tip of the tube to match the largest gap (*Illustration, below left*). The angle you hold the tube in relation to the joint line also makes a difference. I hold it almost perpendicular to the joint, so the tip "knives" off any excess caulk (*Illustration, below right*). If necessary, use a damp rag to clean up small smears (*Inset Photo*).

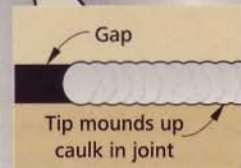
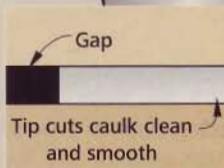
CUTTING THE TIP



APPLICATION ANGLE

CORRECT:
Tube held at a slight angle from perpendicular (approx. 5°)

INCORRECT:
Tube held at 45° to joint line



WHAT'S THE STORY WITH

Prefinished Flooring?

Q: While floor shopping the other day, I noticed that many prefinished floorboards have a 25-year warranty on the finish. What makes them so durable?

Tom Rasmussen
Waukegan, IL

A: Today's prefinished floorboards are so durable because most manufacturers now add aluminum-oxide powder to their factory urethane coatings. This powder strengthens the polyurethane finish, making it harder and more scratch-resistant than standard polyurethane.

Beyond what's in the coating, though, it's also the number of finish coats that makes prefinished flooring so durable. High-quality flooring (Photo, right) has as many as seven coats of finish. Thanks to ultraviolet lights that speed-cure the finish, all these coats can be applied in a matter of minutes.

It would take you several days to apply this many coats of ordinary polyurethane to the flooring in your home. And beyond that, you would never create a surface that's as hard as the "baked-on" finish of prefinished flooring.



PREFINISHED FLOORING SOURCES

Bruce Hardwood Floors

Bruce.com
800-722-4647

Hartco Quality Wood Flooring

HartcoFlooring.com
800-442-7826

Melrose Hardwood Floors

HardwoodFlooring.com
800-627-0698

Mirage Hardwood Floors

MirageFloors.com
800-463-1303

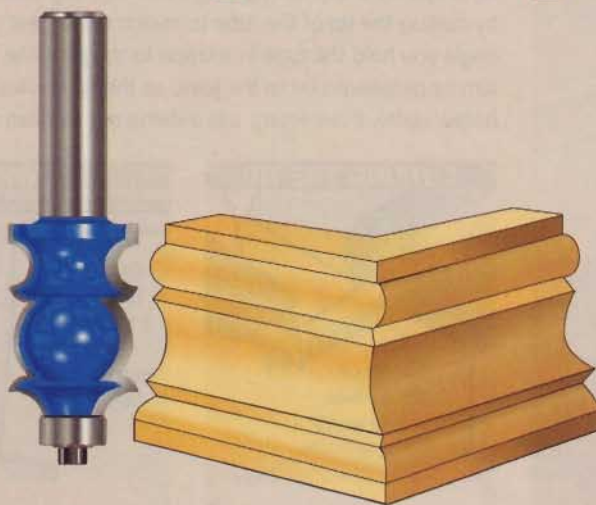
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Snappier Chalk Line?

A chalk box is indispensable for marking long, straight lines. But what a mess! The chalk dust ends up everywhere. And all too often, you end up with a smudged line that makes it difficult to get accurate cuts.

To eliminate the problem, I replaced the cotton string in my chalk box with braided polyester fishing line. I know, this sounds a bit “fishy,” but the chalk doesn’t build up on this line like it does on cotton string. Even though it doesn’t hold as much chalk, it still

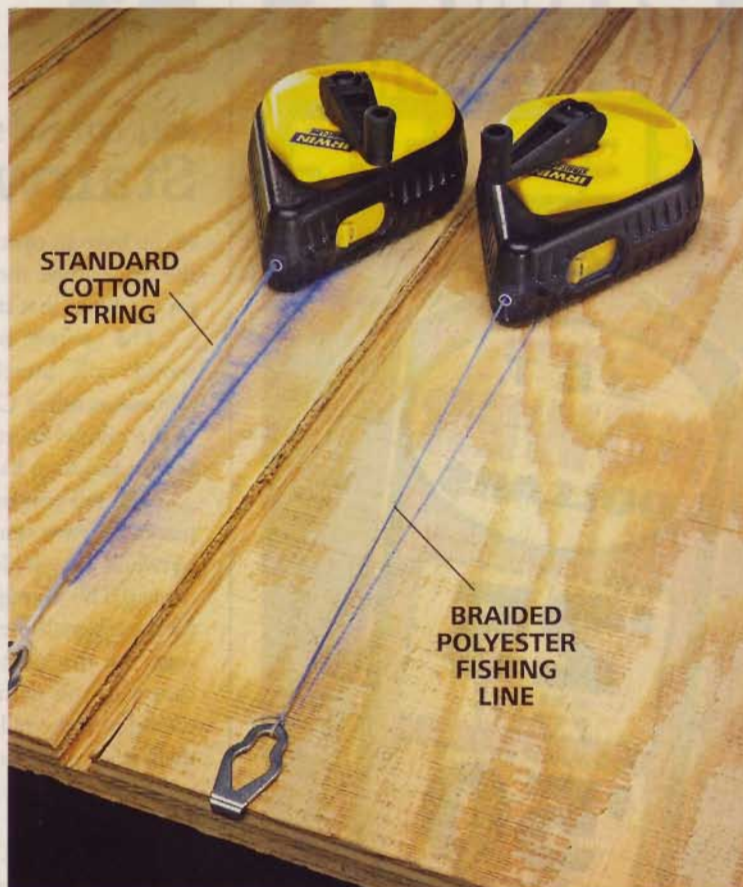
snaps a crisp, clear line that makes it easy to make accurate layouts (*Photo, right*).

Just a note here. If the line doesn’t hold enough chalk, rough it up with sandpaper.

Another advantage of this braided line is it doesn’t stretch like cotton string, so you can pull it tighter. The result is a more defined chalk mark, even when snapping an extremely long line.

Editor’s Note: We bought 50 yds. of 36-lb. test braided catfish line for \$3.50 at a local sporting goods store.

Scott Meier
Battlefield, MO



Replacing the cotton string in a chalk box with braided polyester fishing line produces a crisp, clear line. This chalk-box upgrade makes cutting to a line easier and more accurate.

SIMPLE HAND SAW

Blade Guard



To protect the blade of my hand saw from damage, I cover the teeth with a length of 1/4"-dia. flexible plastic tubing (*Photo*). (This tubing is available at most hardware and auto parts stores.)

You’ll need to cut the tubing lengthwise to fit onto the blade. To do that, slightly compress the tubing in a vise, and slit it with a utility knife (*Inset Photo*).



David Williams
Evansville, IN



CHIP-FREE CHISELS

Carrying chisels around in a toolbox is a surefire way to end up with a chipped blade. So I wrap the cutting edges with tape to protect them.

Larry Richards
Milwaukee, WI



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TIPS & TECHNIQUES

ROLL OUT THE STORAGE:

Stairwell Stowaway

If you have an open basement stairwell, the space above the stairs is ideal to use for a cabinet that stores seasonal items.

The cabinet is supported by two wood rails attached to the walls (*Illustration, below*). Casters on the bottom of the cabinet let you roll it forward for access, and then back out of the way.

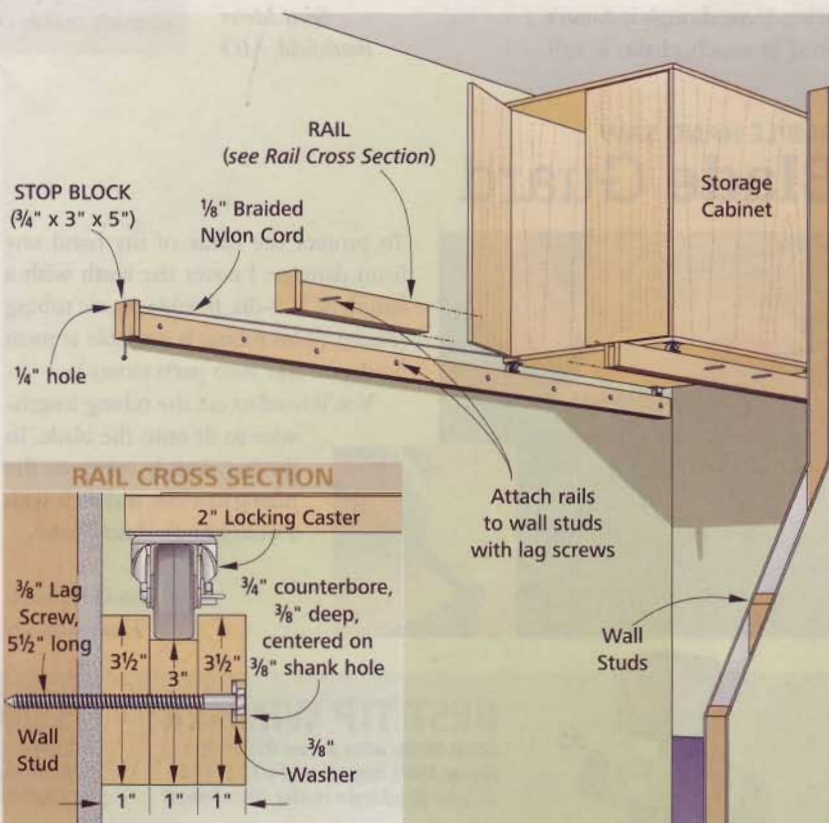
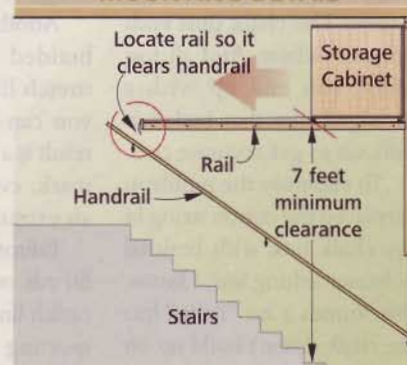
Each rail consists of three glued-up pieces: a narrow center piece sandwiched between two wider sides (*Rail Cross Section*). This arrangement forms a track for the casters. Note that the center piece must be thick enough to allow the casters to roll without binding against the sides of the rail. For my casters, 1"-thick stock provided adequate clearance.

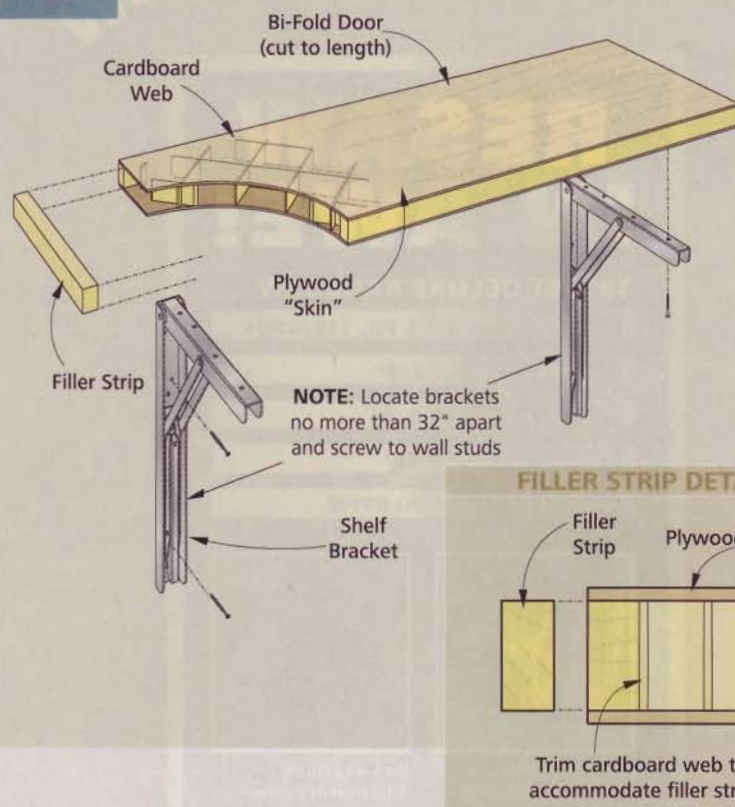
When mounting the rails, be sure to avoid interfering with the handrail (*Mounting Detail*). Also, leave at least seven feet of clearance to avoid bumping the cabinet as you walk down the stairs.

After screwing the rails to the wall studs, build (or buy) a cabinet to fit the space. Tack wood stops onto the open ends of the rails to keep the cabinet from rolling off. Then add a pull-cord between the cabinet and stops.

Robert Pace
Billings, MT

MOUNTING DETAIL





BI-FOLD DOORS MAKE Sturdy Shelving

During a recent remodeling project, I removed some old bi-fold closet doors. Rather than throw them out, I decided to use them as utility shelves. These bi-fold doors are incredibly lightweight and, unlike some other types of shelving, they're not as likely to sag when loaded down.

This is because a bi-fold door is actually a torsion box (Illustration, left). It gets its strength from a thin plywood "skin" that's glued to an inner web of cardboard.

The strength of a torsion box relies

on the glue bond between the web and the skin, so cutting into the skin will weaken the shelf. If you need to cut the shelf to fit a particular space, make a wood filler strip to fit into the open end, and then glue it in place (*Filler Strip Detail*).

Once that's done, mount brackets to the wall studs to support the shelf. Even though the shelf is sturdy, don't space the brackets more than 32" apart. Also, to ensure the shelf is attached securely to the brackets, drive screws into the solid-wood pieces around the edges and ends of the door.

David Taylor
Dayton, IA

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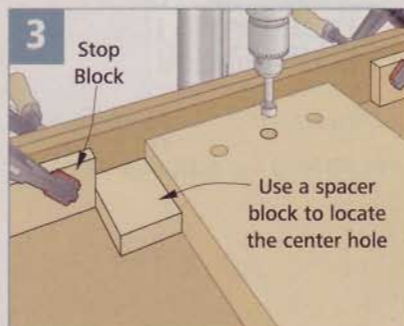
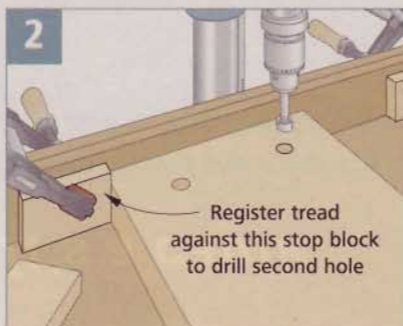
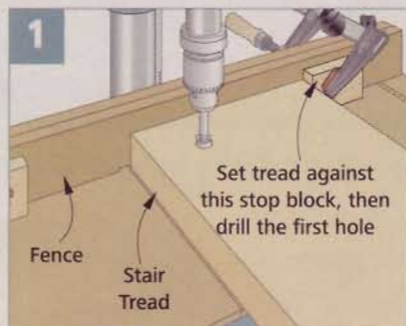
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ALIGN MULTIPLE HOLES WITH A Single Tool Setup

Whenever I have to drill multiple holes in a workpiece — and when those hole locations must be identical from one piece to the next — I use a simple fence and stop block arrangement on my drill press. This setup was especially handy when it came to drilling the spindle holes in the treads for the staircase

facelift in the February 2006 issue of *Workbench*.

The first step is to set up the fence, which determines how far each hole is located from the end of the tread. To do that, lay out the centerpoints of the holes on one of the treads. Align the tip of the bit with one centerpoint (it doesn't matter which one),

butt the fence against the tread, and then lock the fence.

Next, I clamped a pair of stop blocks to the fence to set the location of the two outer holes (Figs. 1 and 2). Again, align the bit with the centerpoints of the holes to position these stop blocks.

The last part of the setup is a spacer that's used to locate

the center hole (Fig. 3). Align the bit with the centerpoint of this hole. Then rip the spacer to width to fit between the tread and the stop block.

That done, drill the holes as shown above.

Frank Peterson
Kansas City, MO

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LITHIUM ION

Makita is Next

Lithium ion is emerging as the preferred power source for high-end cordless tools. Makita is the latest, but certainly not the last.

Lithium-ion batteries were on the leading edge last month. This month, they're old hat. Makita may be only the second manufacturer to get lithium-ion tools onto store shelves, but this was amid news that DeWalt and Bosch will offer similar kits this summer, and rumors that Panasonic will follow shortly after.

And while it's clear that manufacturers agree on the validity of lithium-ion batteries, there is some disparity as to which voltage is best. Milwaukee chose 28 volts; Makita is betting on 18. DeWalt will go with 36 volts, and Bosch will offer both 10.8- and 36-volt kits.

So far, we've had only a preliminary look at Makita's LXT kit, but we saw enough to feel like Makita is right on

with their "18-volt power, 14-volt weight" claim. We also like the enhancements that were unveiled for this line, including a 3-speed transmission on the drill, onboard LED lights with delayed shutoff, and a new 45-minute charger.

The four-piece kit shown here sells for around \$600. For more information on Makita's LXT series, visit Makita.com or call 714-522-8088.



Belt Sander

Ridgid's new 3" x 21" belt sander, the R2720, boasts a 10-amp motor, making it the most powerful sander in its class. Other noteworthy features include a three-position front handle for a custom fit and a flat front end that lets you sand all the way up against vertical surfaces. A soft-start, variable-speed motor offers excellent control for all types of sanding.

The sander costs about \$180 and comes with a dust bag, an 80-grit belt, and a wrench to adjust the front handle. To learn more, visit Ridgid.com or call 800-474-3443.



PUSH-LOC

Bench Dog's Push-Loc push stick has an offset handle that keeps your hand out of harm's way, improves your line of sight, and makes the push stick work with most blade guards in place. Expect to pay about \$20 for the Push-Loc. Visit BenchDog.com or call 800-786-8902 to learn more.

iPOD DOCK

Bosch's wildly popular jobsite radio, the Power Box, now features an iPod dock, so you can take your digital music library to the jobsite. The dock plugs directly into the 12-volt auxiliary outlet, so it works without extra wires or plugs. The dock sells for about \$40 at Amazon.com.





NEW TOOL LINE

Worx Power Tools

The new line of Worx power tools includes cordless tools in 12, 14.4, and 18 volts, as well as a full line of corded tools. Based on working with the models shown here, we consider the tools to be well-powered and solidly built. And many of the

tools defy conventional design to enhance user comfort and control. The tools are available online at Lowes.com and are priced to compete with premium brands. For more information, call 888-599-3711 or visit WorxPowerTools.com

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TIPS & TRICKS FOR

Working with Aluminum

Using aluminum with wood can give your projects a contemporary look. And you might be surprised that you can work with it much like you would with wood. Here's how.

T

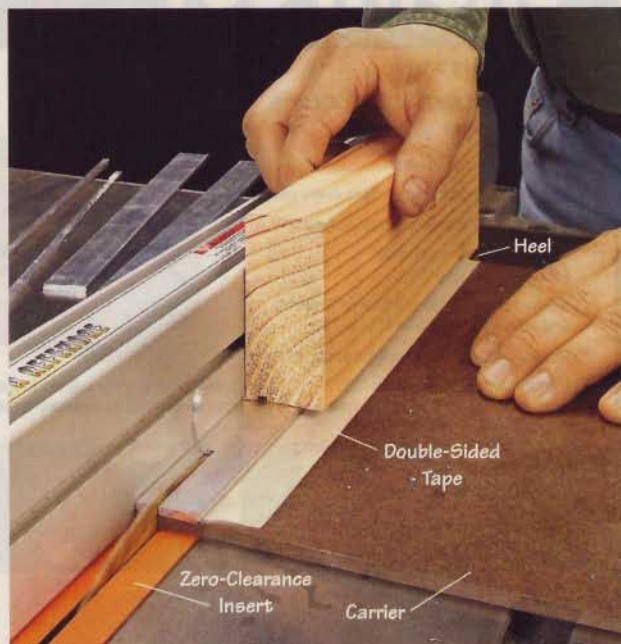
he kitchen utensil rack (see page 52) combines maple hardwood and aluminum strips to create a project with a contemporary flair. Part of the project requires ripping thin strips of aluminum bar stock on the table saw.

A carbide-tipped saw blade will cut the bar stock

easily. Still, you'll need to take several precautions to make a safe, controlled cut.

First of all, install a zero-clearance insert in the table saw. This will prevent the narrow aluminum cutoff from falling into the opening beside the blade.

Then, to make the operation more manageable, attach the aluminum bar stock to a "carrier" with double-sided tape. (I use a wide piece of 1/4" hardboard.) The carrier gives you



To rip thin strips of aluminum on the table saw, attach the bar stock to a hardboard "carrier," and use a push block to guide it past the blade.

plenty of material to hold onto when guiding the bar stock past the blade. Clamp the aluminum, tape, and hardboard assembly together in a vise to really make them stick together well.

Then, to hold the stock down securely as you make the cut, be sure to use a push block. In this instance, a scrap 2x4 with a narrow "heel" cut into it works just fine (see Photo, above).

ROUGH CUT



BRUSHED FINISH

Aluminum has a lot of scratches and mill marks when you first buy it (above). Sanding and buffing the strips will produce a "brushed" appearance (below).

SANDING ALUMINUM FOR A Brushed Surface

Right off the shelf, aluminum has a lot of scratches and mill marks on its surface. Luckily, it's easy to sand and polish these marks away.

Sanding aluminum produces a lot of black metal dust, which can stain the wood parts in the utensil rack. So it's best to sand the strips *after* cutting them to size (as explained above), but *before* assembling the wood and metal parts of the project.

Sanding these pieces is a straightforward process. Just affix the strips to a flat surface

with double-sided tape, and use a flat sanding block to sand each strip with a progression of finer grits (120, 180, and 220). One note here, though. Only sand the aluminum in one direction, rather than moving the sanding block back and forth. This will create straighter, more consistent "brush" marks on the surface.

After that, finish up by buffing the surface with 0000 steel wool. Then wipe the strips with mineral spirits to remove any excess dust.

FOR STRONG GLUE-UPS Scuff It Up

Wood and aluminum can be difficult to bond. To get a strong, durable joint, I use polyurethane glue.

As strong as polyurethane glue is, it can't overcome one of the physical properties of aluminum — it oxidizes, forming a film on the surface. When you glue it up, the film prevents a strong bond from forming. To prevent that, scuff the surface of the aluminum with 120-grit sandpaper. The aluminum will begin to oxidize quickly after sanding, so apply glue immediately.

SHOP-MADE

Metal Pegs

To form the hangers on the kitchen utensil rack (page 52), we made our own metal pegs. Each peg is made up of a stainless steel machine screw and a short length of $\frac{1}{4}$ "-diameter aluminum tubing that forms a sleeve around the screw.

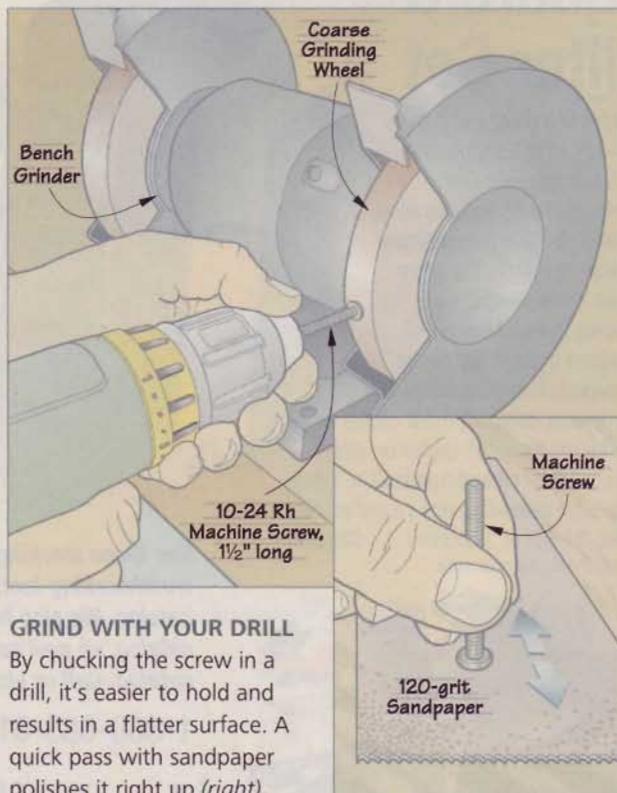
The inner portion of each peg starts as a roundhead machine screw. The trick is making the head of

the screw look more like a peg and less like a screw. To do that, I ground the slot off the head of the screw.

The quickest way to accomplish this is to use a bench grinder with a coarse grinding wheel. But simply holding the screw against the grinding wheel would result in an irregular surface and make the screw too hot to hold.

Use Your Drill — So before grinding, chuck the shank of the screw in a drill (Illustration, right). This makes it easier to hold onto the screw, and prevents the screw from burning your hands.

Pull the Trigger — As you begin grinding, pull the trigger on the drill to spin the screw. Spinning the screw this way not only makes the grinding go faster, but it will grind the head of the screw



GRIND WITH YOUR DRILL

By chucking the screw in a drill, it's easier to hold and results in a flatter surface. A quick pass with sandpaper polishes it right up (right).

consistently flat. Continue grinding until the slot disappears entirely (it should only take a few seconds).

Polish the End — Now simply rub the screw head

back and forth over a strip of 120-grit sandpaper attached to a flat surface (Illustration, above). This will get rid of the grinding marks and give the screw head a brushed look.



Grinding and polishing a roundhead screw makes it a decorative peg for our kitchen utensil rack (page 52).

CUTTING & SANDING

Aluminum Tubing

The second component of each peg on the utensil rack is a piece of $\frac{1}{4}$ "-diameter aluminum tubing that forms a sleeve over the screw.

Cutting Tubing — This tubing has very thin walls. If

you try to cut it with a hacksaw, it will crush the end of the tubing.

A simple solution is to use a utility knife. Just set the blade of the knife on the tubing. (Make the tubing a bit long, as you'll sand it to final length later.) Now roll the tubing gently back and forth underneath the blade to score the surface. Continue like this, applying firm, steady downward pressure with the knife to cut through the tubing (Illustration, right).

Sand the Ends — After cutting the tubing, the ends

will likely be rough. You'll need to sand the ends of the tubing to smooth them out. The same rule applies to sanding as to cutting the tubing — sand it too aggressively, and you can crush or bend the end.

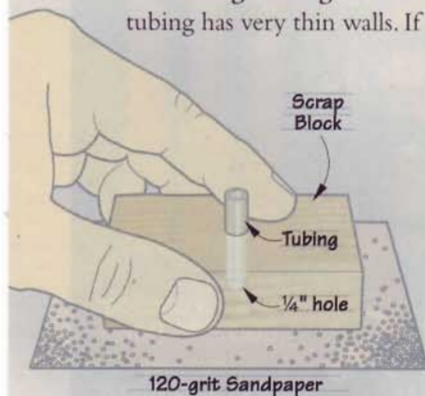
To prevent that, I took a small scrap block and drilled a $\frac{1}{4}$ " hole through the block to accept the tubing.

By inserting the tubing into the hole in the block, you can sand the end of the tube clean by sanding the block itself. The block supports the tube, preventing



it from deforming while you sand (see Illustration, left).

Here again, just stick a piece of self-adhesive 120-grit sandpaper to a flat surface (such as a table saw top) to serve as the sanding surface. Sand the tubing until the ends are flat and smooth.



ALUMINUM STOCK

Bending Jig

The paper towel holder accessory for the kitchen utensil rack (*page 58*) features three curved metal brackets that hold a paper towel roll. To make these brackets, I used a simple jig to bend 1/8"-thick



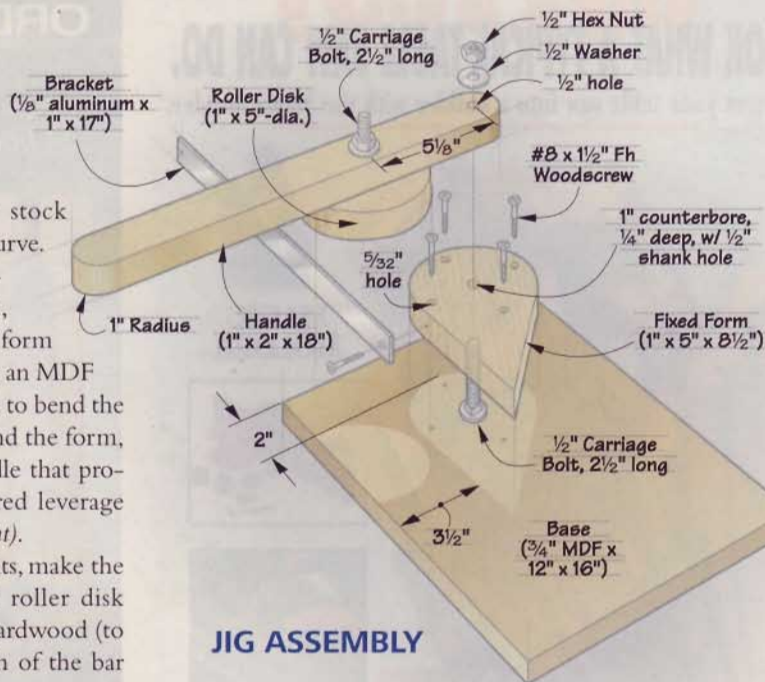
This three-part jig makes it easy to bend aluminum bar stock into graceful curved brackets.

aluminum bar stock
into a graceful curve.

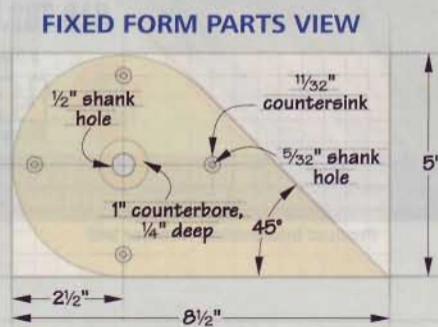
The jig consists of a fixed, teardrop-shaped form that's attached to an MDF base, a roller disk to bend the aluminum around the form, and a long handle that provides the required leverage (*Jig Assembly, right*).

For best results, make the fixed form and roller disk from 1"-thick hardwood (to match the width of the bar stock). Thinner material will roll the top edge of the bar stock as you bend the metal.

Lay out and cut the pieces to rough shape on a band saw. Then sand them to final shape (*Tip, below*). Drill holes for the bolts that secure the handle to the fixed form and the roller disk. Finally, you can assemble the jig. (To use the jig, see page 39.)



JIG ASSEMBLY



SANDING A

Perfect Circle

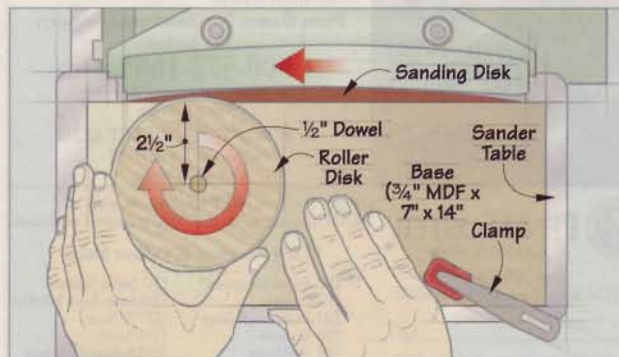
To bend the metal brackets of the paper towel holder (*Photo, above*), the roller disk and curved section of the form must be perfect circles. This jig makes sanding these parts to shape a snap. You just clamp it to the table on a disk sander. Then, after fitting a rough-cut workpiece over a dowel installed in the jig, you simply rotate the piece against the sanding disk to sand it round.

The jig is nothing more than a plywood base with a dowel glued into it. The important thing is to locate the dowel a distance from the

edge of the base that matches the radius of the desired circle (in our case, $2\frac{1}{2}$ "). This means the waste portion of the disk will overhang the edge of the base.

To remove the waste, butt the jig against the sanding disk, and clamp it snugly (*Photo*). Then pivot the base away from the sanding disk to create a slight gap. Start the sander, and slowly pivot the jig forward until the workpiece contacts the disk. Rotate the workpiece clockwise (against the sander's rotation) to sand it round.

After rough-cutting a workpiece on the band saw, this jig makes it easy to sand it round using a disk sander.



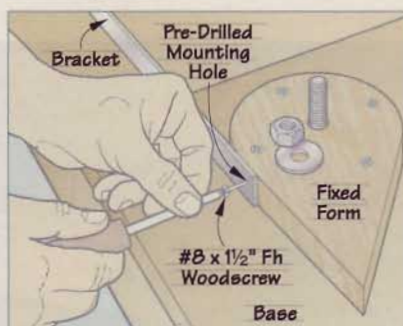
USING THE JIG

It only takes a few seconds to bend a piece of aluminum bar stock using this jig. Simply attach the bar stock to the fixed form, and then use the handle to roll the disk around the form.

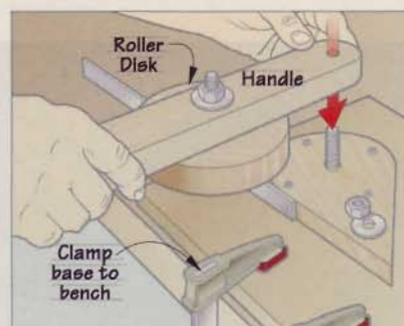
This requires first removing the handle and roller disk assembly. Then, using the pre-drilled mounting hole in the bar stock (see page 58), screw it in place (Fig. 1). Reattach the handle once the bar is screwed in place (Fig. 2).

Now it's just a matter of bending the bar into a curved shape. A smooth, continuous motion works best (Figs. 3 & 4).

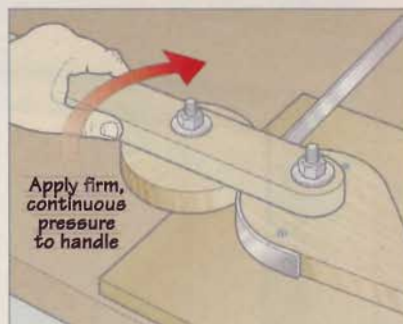
One thing to note here is that once you've rotated the handle and the disk around the fixed form, the bar stock will be bent in a tighter curve than what's called for in the plans for the bracket. That's okay, though, as the bracket will "spring back" to the desired curve once you remove it from the jig.



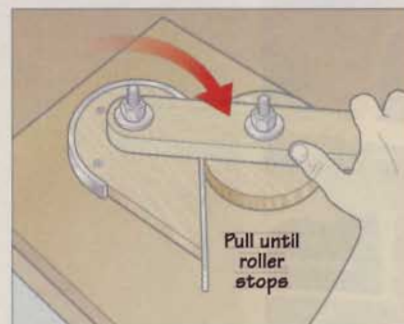
1] With the handle removed, screw the bar stock to the form to prevent the workpiece from slipping as you bend it.



2] Now attach the handle and the roller disk. Fit the handle over the bolt on the form and secure it with a nut.



3] To bend the bar stock, use the handle to roll the disk around the form in a smooth motion.



4] Rotate the handle and disk all the way around the fixed form to bend the bracket to shape.

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BUILT-IN BookNook

Open up a new chapter in the story of your home with this built-in window seat and bookcase. It brings stylish seating, storage, and display space to any room. Best of all, you can put it all together in a couple of weekends for about \$500.

Almost every home could benefit from additional storage, more seating, and an influx of extra style. This built-in book nook delivers all three.

The project starts with a broad bench seat that offers a comfortable place to kick back and relax while you read under the warm glow of built-in puck lights overhead. Underneath, you'll find a serious amount of storage space. Two tall bookcases that flank the bench are the perfect place for books, of course, but also for displaying your favorite collectibles.

The transformation this project brings to the style and feel of a room is nothing less than astonishing. And no less amazing is that the project is easy to build, a breeze to install, and remarkably affordable.

All you need are standard woodworking tools, some plywood and solid poplar stock, a couple weekends, and a few hundred dollars. Of course, you'll also want the solid advice offered in the upcoming pages that show you how to plan and build a book nook to fit your space.



Even a relatively bare room offered plenty of information about building the book nook. The painted woodwork and beaded paneling offered styling cues that help the book nook design blend in. An electrical outlet and cold-air return needed to be accommodated in the project design.

PLAN YOUR PROJECT

TO SUIT THE SPACE

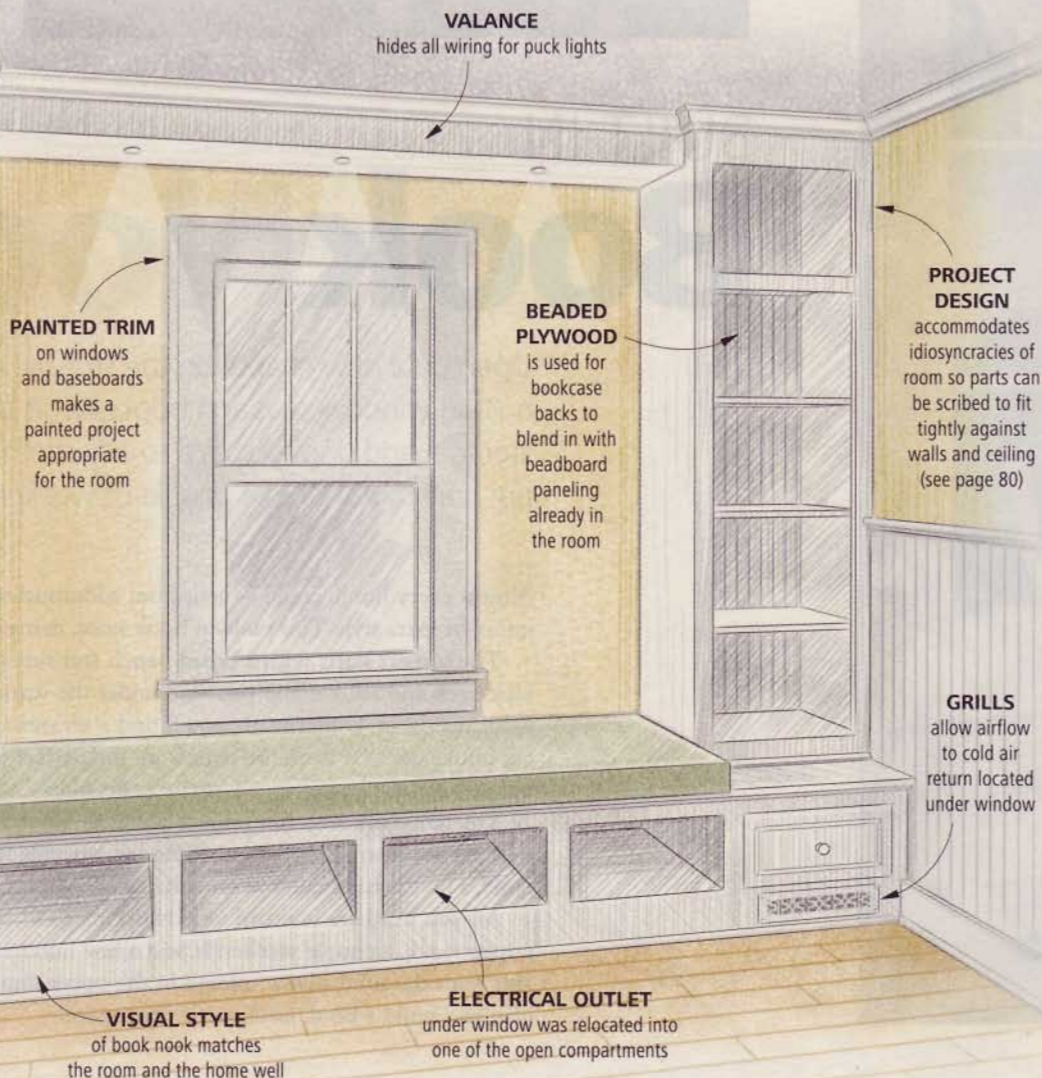
All projects require planning before getting underway. That's no secret. But to get an integrated, seamless look with a built-in, the planning process is especially important.

Build to Fit — Obviously, you need to make sure the project will *fit* the room where it will be installed. That means you'll need to thoroughly survey the location and record all the critical measurements, as shown on page 80.

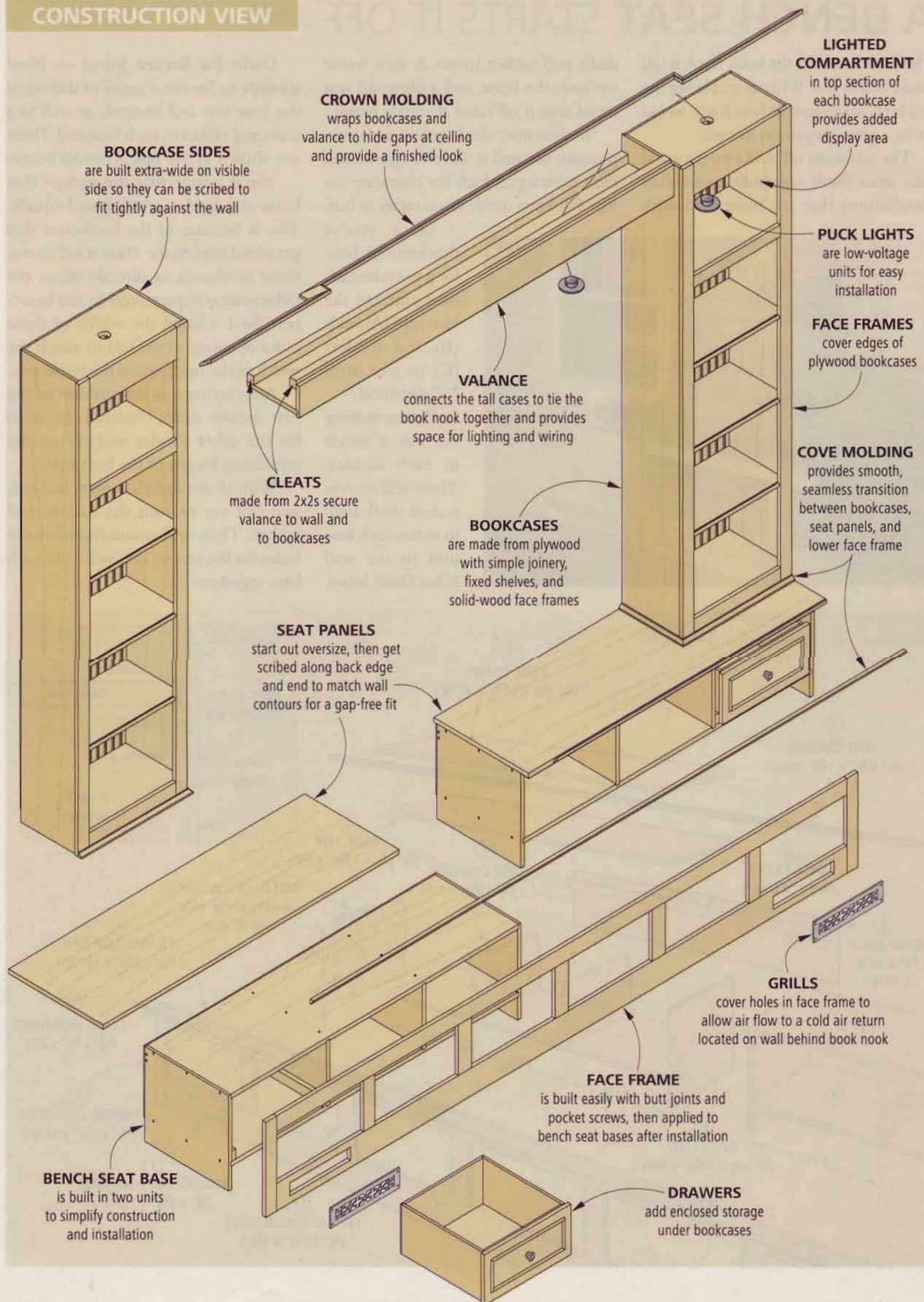
Build To Suit — Equally important with a built-in, though, is making the project *complement* the room. To do that, you need to pay close attention to the stylistic elements of the room (Photo, left, and Illustration, below).

In this room, the woodwork is painted, so we painted the project, as well. We also echoed the room's beadboard paneling by using beadboard for the backs of the bookcases. Plus, we removed paneling behind the book nook to make sure it would look built *in*, not tacked *on*.

Results May Vary — This all means you're likely to build your book nook differently than ours. The measurements will almost certainly be different (our wall was 11-feet, 3" wide and the ceiling, at 98", is higher than normal). And you may want to alter the style, as well. In spite of the inevitable changes, however, this project will remain simple to build (Construction View, right).



CONSTRUCTION VIEW



A BENCH SEAT STARTS IT OFF

The foundation for the book nook is this broad bench seat. With its ample seating and built-in storage, the bench seat would make a great project on its own.

The seat starts off with two plywood base units (built separately to simplify installation) that are assembled with

dado and rabbet joints. A face frame encloses the front, and a plywood seat panel tops it off (*Base Assembly, below*).

To determine the length of each unit, measure the wall it will rest against, and then subtract an inch for clearance (see page 80). Then divide this number in half.

Once you've determined how long to make each base unit, cut the base tops (A), ends (B), and dividers (C) to size from $\frac{3}{4}$ " plywood.

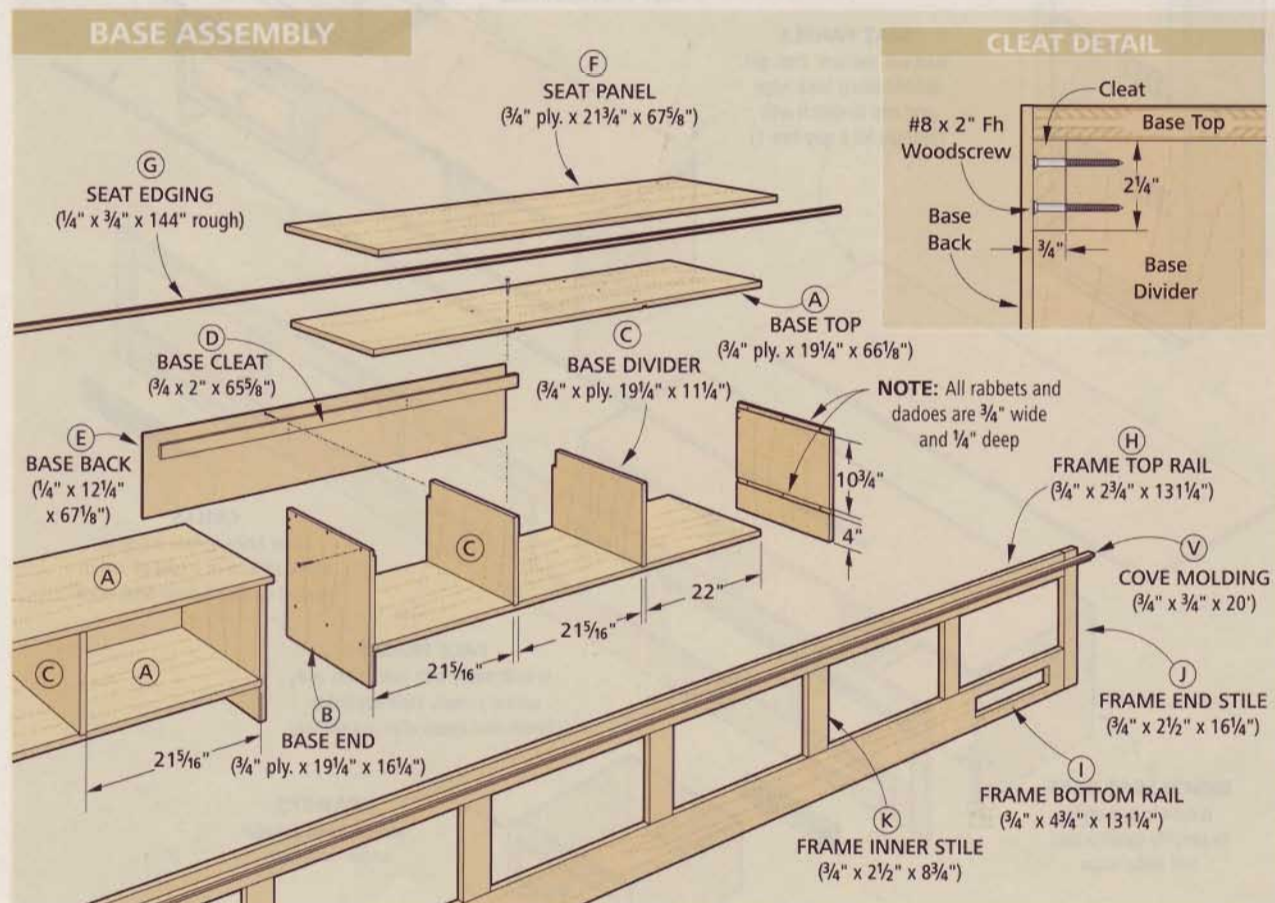
Before moving on, cut a notch in each divider. These will receive a cleat that's used to secure each base unit to the wall (*Cleat Detail, below*).

Dado for Secure Joints — Now it's time to lay out a series of dados in the base top and bottom, as well as a dado and rabbet in each base end. These are shown in the *Base Assembly* below.

You'll notice that the dados that house the dividers aren't spaced equally. This is because of the bookcases that get added later. As the *Photo* at left shows, those bookcases sit directly above the outermost compartments in the bench seat. So I wanted the width of these outer openings in the seat to match the width of the openings in the bookcases.

After laying out the position of the first divider dado, I located the dado for the other divider midway on the remaining length of the base unit.

With all the dado locations laid out, you can cut or rout the dados and rabbets. Then drill counterbored shank holes for the screws that will hold each base together.



Next, you can assemble the bases. As you do this, be sure to orient the pieces correctly — with the wider compartments at the *outer* ends, and the notches in the dividers toward the *back*.

Now, turn your attention to the backs of the base units. First, add base cleats (D). These get attached by screws driven in from the base ends, as well as through the cleats into the dividers. Finally, cut back panels (E) to fit from $\frac{1}{4}$ " hardboard, and then attach each back with 1" brads.

Seat Panels Top It Off — The base units are topped by a pair of plywood seat panels (F) made from $\frac{3}{4}$ " plywood. Each starts out $\frac{1}{2}$ " longer and $2\frac{1}{4}$ " wider than the assembled base unit it sits on.

At the front, this overhang allows the seat panel to extend past the face frame and molding that get added when the bench seat is installed. At the back and outside edges, it gives an extra $\frac{1}{2}$ " so you can scribe the seat to match the walls. For now, cut the seat panels to these oversize dimensions, and then set them aside.

You can also make the seat edging (G) now. It's just a length of $\frac{1}{4}$ "-thick solid stock that gets applied later to conceal the edge of the plywood seat panels. The *Sidebar* at right shows an easy way to make the edging.

I cut my edging from a single piece of 12-ft. long poplar. If you can't find a board long enough, you can make the edging in two pieces. That's one of the benefits of a painted project: You can simply fill the seam before painting, and nobody will ever know.

In either case, set the seat panel edging aside for now, too. It doesn't get applied until the book nook is installed.

Best Face Forward — The final element of the bench seat is a face frame that covers the front of both base units. This frame is made up of long rails connected by stiles that align with the dividers in the base units. When installed, these stiles will conceal the dividers in the base units.

The face frame couldn't be simpler to build. Butt joints and pocket screws hold it together (*Pocket Screw Detail*, below).

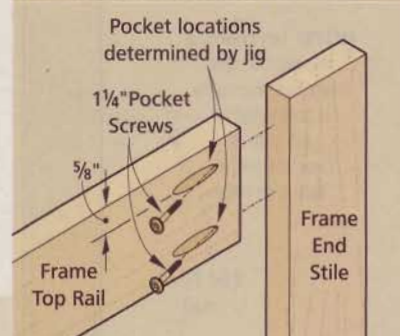
Like the seat panels, the face frame is also built longer than the distance between the walls it spans — $\frac{1}{2}$ ", in this case. The reason for oversizing remains the same here, too: You can scribe and trim the face frame to fit tightly against the walls on both ends.

After calculating how long to make your face frame, cut the top rail (H), bottom rail (I), end stiles (J), and middle stiles (K) to size.

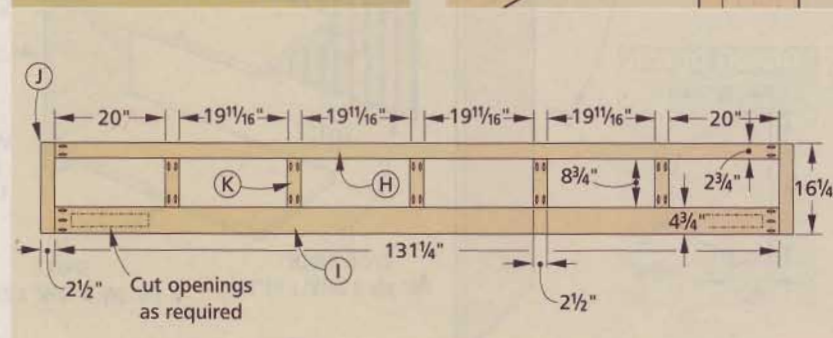
Once again, I was lucky enough to find 12-ft. long boards for my rails. If you can't find stock that's long enough, you can make two-piece rails and join them together with pocket screws.

Now bore the pocket holes in the stiles, align them with the rails, and then screw the face frame together. Set it aside until it's time for installation.

POCKET SCREW DETAIL



FACE FRAME



MOLDING MADE EASY

The long seat edging is just a simple $\frac{1}{4}$ " strip dressed up with rounded edges. That means the edging is simple to make, but one trick makes it even easier.

Rather than trying to round over the edges of a thin strip, you'll get better results by rounding the edges of a wide board first, and then ripping the $\frac{1}{4}$ "-thick edging free. It's a three-step process at the router table and table saw, as shown in the *Photos* below.



1] After ripping one edge of a long board straight, rout a $\frac{1}{8}$ " roundover along the edge.



2] Flip the board end-for-end, and round over the second edge using the same router-table setup.



3] To complete the seat edging, move to the table saw and rip the rounded edge free of the board.

BOOKCASES COME NEXT

The tall bookcases are built almost like the base units. Each has a plywood case made up of two sides that are connected by shelves that fit into shallow dadoes. A face frame covers the front of the plywood case, while edging covers the plies on the front edge of the shelves (*Case Assembly, below*).

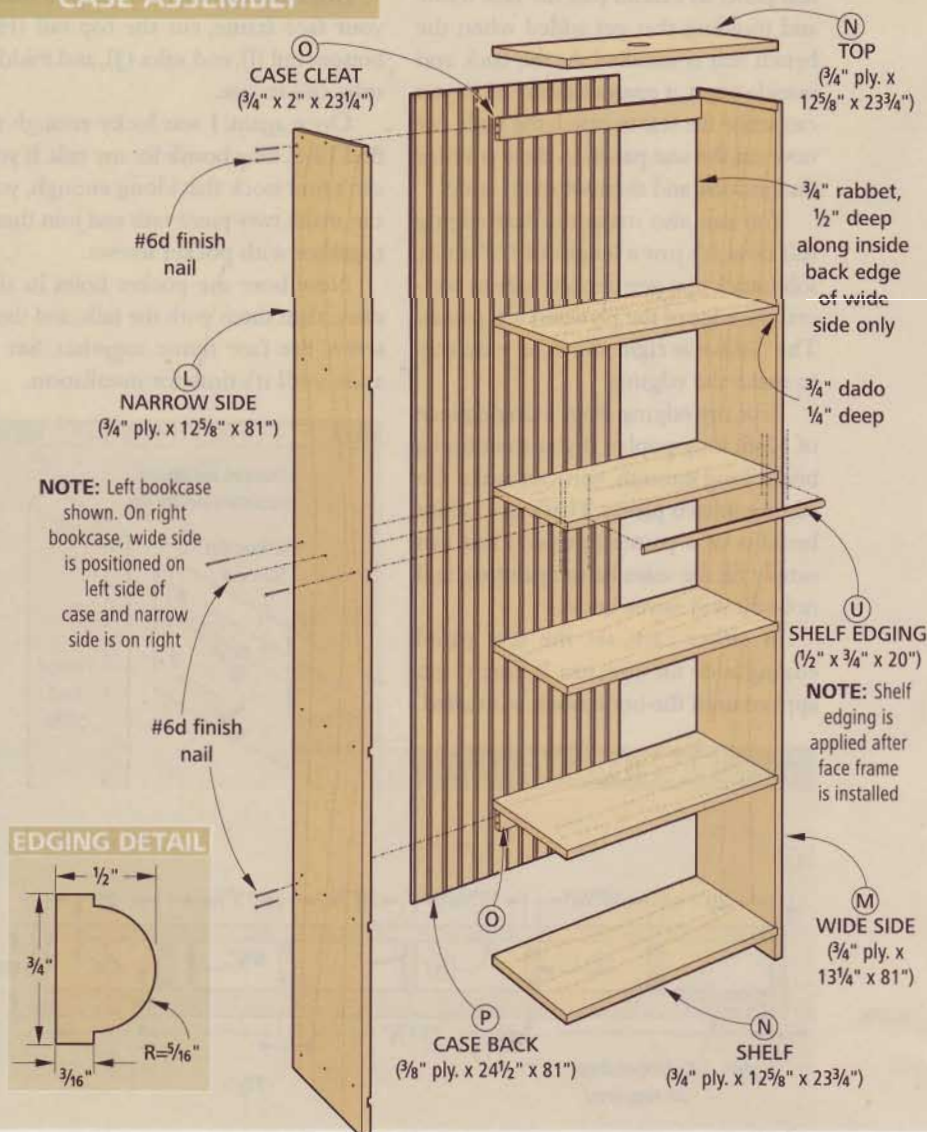
There is one very notable thing about the way the bookcases are built. Each has one side that's wider than the other, as shown in the *Case Parts View*, below right. You'll see why if you look at the *Photo* at left. One side of each cabinet is visible. That means it likely

will need to be scribed to fit tightly against the back wall. To allow for this, the side is extra-wide and extends beyond the back of the case (*Wide Side Rabbet Detail*). The other side of the cabinet is hidden. That means it doesn't have to be scribed or built extra-wide.

As you might guess by now, we also accounted for scribing with the face frames. Each is $\frac{1}{4}$ " wider than the case it attaches to. The overhang sits toward the outside of each case where it abuts the side wall of the room.

Build the Bookcases — With all this in mind, you can start construction.

CASE ASSEMBLY



Rather than cutting all the sides at once, I started with two 26" x 81" blanks made from 3/4" plywood. Each blank is wide enough to produce one narrow side (L) and one wide side (M).

The next step is to cut five dados and a rabbet across each blank (*Case Parts View*). These receive the shelves, and cutting them across a wide blank ensures that, when assembled, the shelves in each case will align exactly.

You can cut the dados and rabbit in a couple of ways. I used my table saw, which has a 52" rip fence — plenty of capacity to cut the dados. If your saw lacks that much capacity, use a router and straight bit guided by a straightedge.

That done, rip each blank to make a narrow side (L) that's $12\frac{5}{8}$ " wide, and a wide side (M) that measures $13\frac{1}{4}$ ".

Run the Rabbits—Now you need to lay out a rabbit along the back edge of each wide side. The rabbit serves two purposes. It decreases the amount of material you'll need to trim when scribing. And it provides a notch for the back panel to rest in (*Wide Side Rabbit Detail*).

As you lay out the rabbit, remember this: On the left-hand bookcase, the wide side will go on the *right*. On the right-hand bookcase, the wide side goes on the *left*. Mark each side, so you don't accidentally rabbit the wrong edge.

Bring on the Shelves — With the case sides complete, you can cut the shelves and tops (N) to size. In my bookcases, the upper compartment is a lighted display area. So before assembling the cases, I bored a 2 1/8" hole centered in the two tops for the puck lights to fit into.

After that, the bookcases can be assembled. I attached the shelves using glue and 6d finish nails instead of screws so that I didn't have large holes to fill in the visible (wide) sides before painting.

Next, cut two case cleats (O) for each case and nail them to the case sides. You'll drive screws through these cleats to secure the bookcases to the wall.

The case backs (P) come next. To echo the look of the beadboard paneling in the room, I made these backs from 3/8"-thick beaded plywood (I used Ply-Bead from Georgia Pacific; Plytanium.com). The backs get tacked on with 1" brads.

Fit the Face Frames — A solid-wood face frame comes next for each case (*Face Frame Assembly, below left*). To make them, cut frame stiles (Q), as well as top (R), middle (S), and bottom (T) rails to size from solid stock. Then assemble the frames with pocket screws.

You can glue and nail the face frames to the cases now. Make sure when doing so that each face frame sits flush with the wide side of each case and overhangs the side which will sit against the wall.

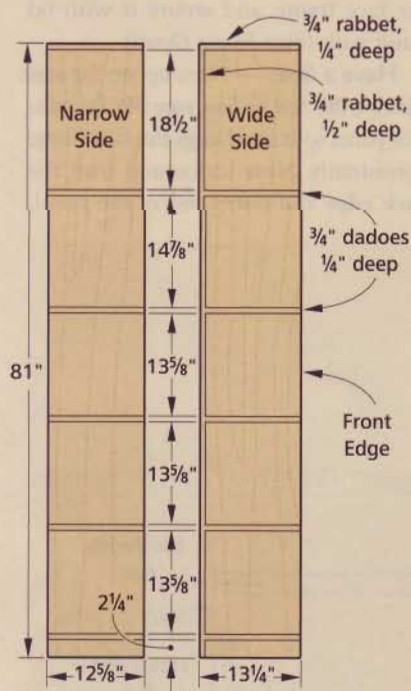
Add Shelf Edging — All that's left now is to add edging (U) to the three shelves that aren't covered by the face frame. This edging features a beaded roundover profile (*Edging Detail*) made using the same three-step technique that was used for the seat panel edging (*Molding Made Easy*, page 45). Start with extra-long edging pieces, then cut each to fit the shelves. Glue and nails hold the edging in place without clamps.

A Good Time to Paint — With the bookcases assembled, most of the major construction is complete for this project. But before you move on to installation, I advise painting most of the parts. That way, you can take your time without making a big mess in the room where the book nook will be installed. See page 21 for tips that will ensure a great paint job.

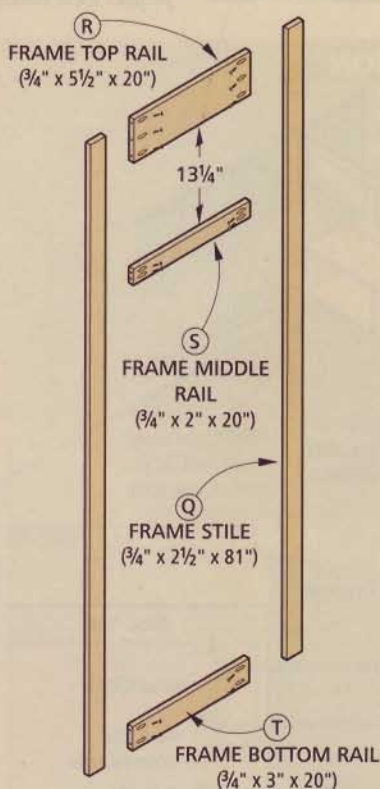
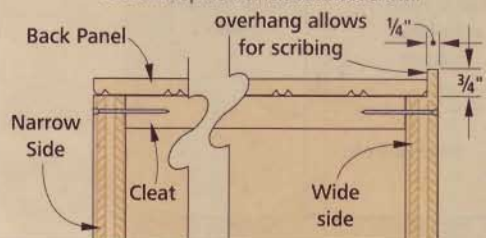
I primed and painted everything but the seat panels. Those were left bare because fitting the bookcases means sliding them in and out of place a few times, which could scratch up the paint.

CASE PARTS VIEW

(Left Bookcase Sides Shown)



NOTE: Top view of left bookcase shown





Screw the base units together and make sure they're straight across the front. Then level the assembly using shims as needed.



INSTALL THE BENCH SEAT AND BOOKCASES

Before you install the book nook, you may need to do a little prep work in the room. For example, I removed the baseboard behind and beside the bench seat to ensure that I could tuck the back of the base units tight against the wall.

At the same time, I stripped off the beadboard on the back wall where the project would go. To me, that made the book nook truly look built-in rather than tacked on. This, of course, led to a bit of plaster repair.

Then I decided to go ahead and repaint the room, so it would fully match the book nook. These types of tasks are often called "might-as-wells." They take time, but really do make a built-in project look better.

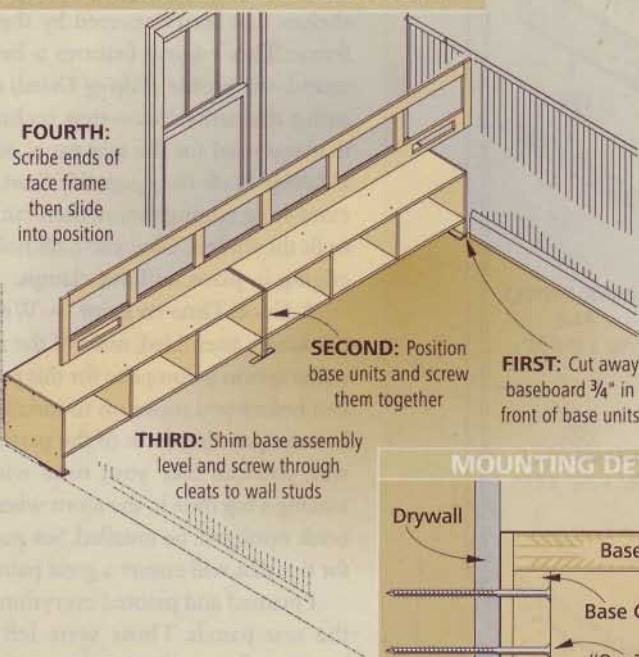
Bring in the Bench Seat — Start installation by positioning the seat bases (*Base & Frame Installation, below*). They should align without problem, but be sure to double-check that the tops are flush and that the front edge of the assembly is straight (*Photo, left*). That done, level the base units (*Inset*).

Next, shim between the back of the base units and wall if necessary, and then drive #10 × 3½" screws through the base cleat and into wall studs in at least four locations (two in each base unit).

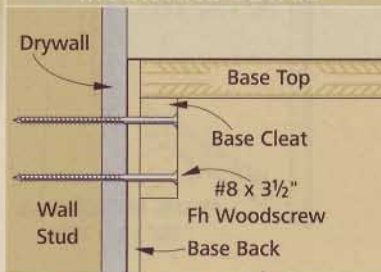
Get Framed — Before attaching the face frame, scribe and trim the end stiles to match the walls. Using a template simplifies this process (*see page 83*). Align the face frame, and secure it with 6d finish nails (*Face Frame Detail*).

Have a Seat — Next up are the seat panels (*Add Seat & Trim, page 49*). Position one panel so it overhangs the face frame consistently. Now scribe and trim the back edge and outer end of the panel,

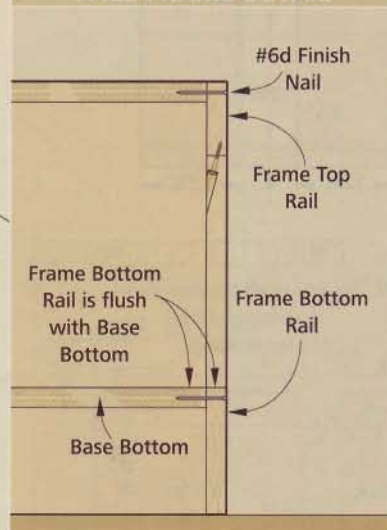
BASE & FRAME INSTALLATION



MOUNTING DETAIL



FACE FRAME DETAIL



using the techniques on page 82. Remember, once fitted, the panel should overhang the face frame by 1".

Once this first panel fits, clamp it in place. Then fit the second panel the same way (Photo, below). After that, nail the seat panels to the base units.

Slide In the Bookcases — Fitting the bookcases comes next (*Bookcases Top It Off*, right). Be prepared to test fit them a couple of times to get the best fit.

Start by making sure each case sits square on the bench seat (Photo, bottom). Then scribe the face frame, remove the case, and trim it to fit. Refit the case, and then scribe and trim the case side. Now install the bookcase (*Case Cleat Detail*).

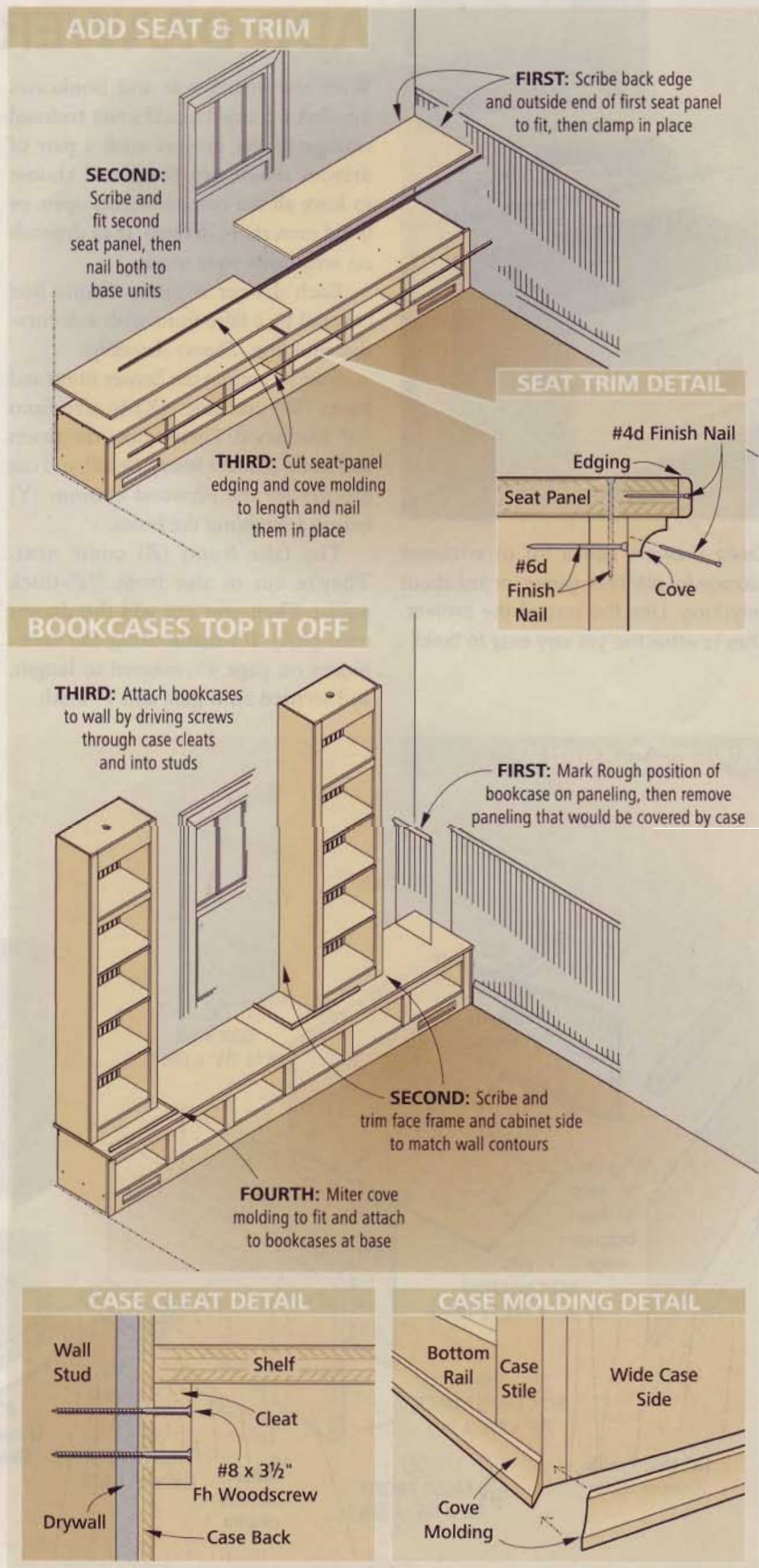
Finally, glue and nail on the seat edging (Seat Trim Detail). A piece of 3/4" cove molding (V) goes below. More cove wraps around the bookcases (*Case Molding Detail*). Now you can paint these parts.



Each seat panel gets trimmed to fit the wall on the back and outside end. The panels should meet tightly at the center.



Use a framing square to make sure each tall case is positioned properly before scribing it and before installing it.





Deep drawers add a lot of enclosed storage for blankets, games, or just about anything. Like the rest of the project, they're attractive yet very easy to build.

ADD DRAWERS & A VALANCE

With the bench seat and bookcases installed, I decided to add some enclosed storage to the project with a pair of drawers (*Photo, left*). You could choose to leave all the compartments open, or build even more drawers. It all depends on what suits your needs.

Each drawer is just a simple box covered by a false front with a decorative molding (*Drawer Assembly*).

Start by cutting the drawer fronts and backs (W) and sides (X) to size from $\frac{1}{2}$ " hardwood. Then rabbet the fronts and backs (*Drawer Joinery Detail*), and cut grooves for the plywood bottoms (Y) before assembling the boxes.

The false fronts (Z) come next. They're cut to size from $\frac{3}{4}$ "-thick poplar. Then you can add the drawer trim (AA). It's made using the techniques on page 45, mitered to length, and secured with glue and 1" brads.

Spacers Position the Slides — Before you can install the drawer slides, you'll need to "build out" the bench seat compartments so that the slides fit flush with the edges of the face-frame stiles. Spacers (BB) accomplish this (*Drawer Slide Detail*). Plane or rip each spacer to thickness, and then mount it to the divider.

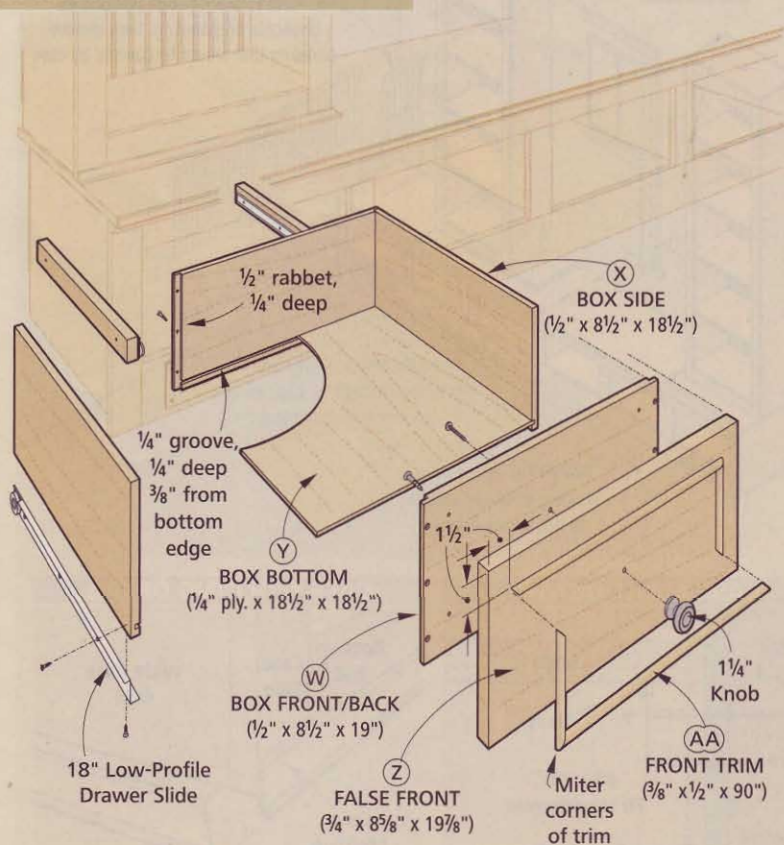
From there, you can install the drawer slides, and then slip the drawer boxes into position. Finally, align and mount the false fronts.

Top It Off with a Valance — The finishing touch for the book nook is a valance. It spans between the bookcases to tie the project together, and provides a place to mount lights and run wiring (*Valance Assembly, page 51*). Consisting of just two pieces, it's one of the easiest parts of this project to build.

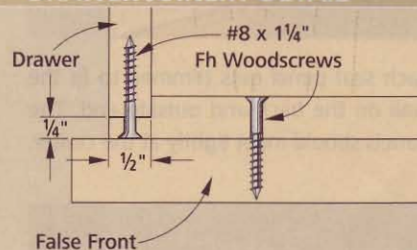
Construction begins by cutting the valance bottom (CC) from $\frac{3}{4}$ " plywood. It starts out oversize. If you want to add lighting, bore holes for puck lights.

The extra-long valance face (DD) comes next. It gets a full-length groove to receive the valance bottom, and roundovers on the lower edge (*Valance Mounting Detail, page 51*).

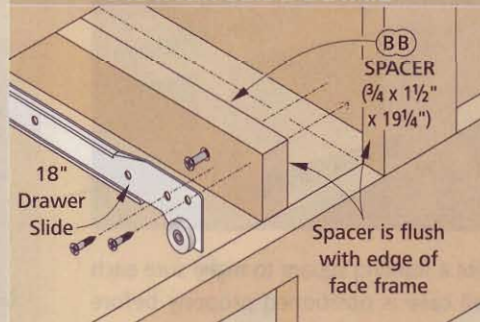
DRAWER ASSEMBLY



DRAWER JOINERY DETAIL



DRAWER SLIDE DETAIL



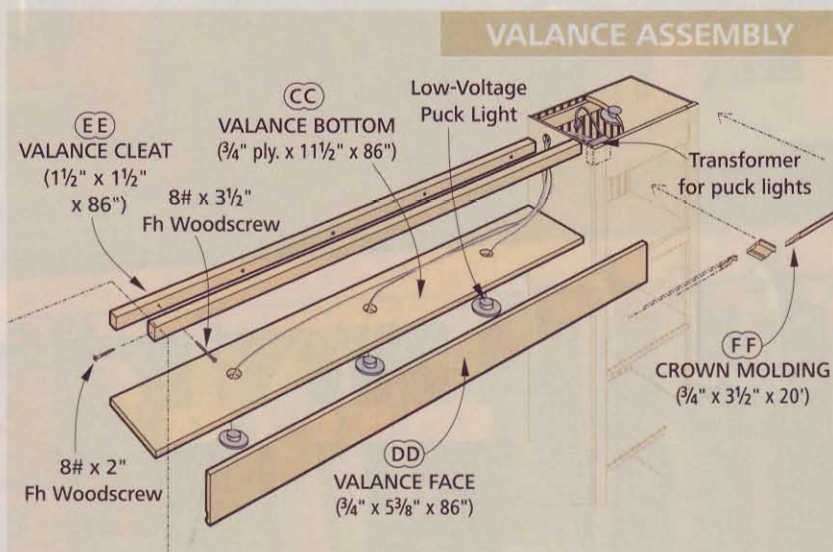
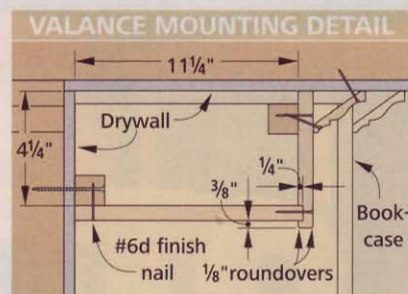
After making the valance parts, paint them, but don't assemble them yet.

Cleats Hold the Valance — A pair of simple cleats (EE) secure the valance. After cutting them to length from 2x2s, screw one to the wall, and the other to the bookcases (*Valance Mounting Detail*).

Finally, scribe the valance bottom and front to fit, nail them together, and then slip the assembly into place after routing all wires into the case (*Photo, above right*).

The Crowning Touch — To hide any gaps around the ceiling, wrap the valance and the bookcases with crown molding (FF). It just gets mitered to fit, and then nailed in place.

With the book nook complete, it's time to kick back and relax — with a good book, of course. 📖



MATERIAL LIST

Part	Qty	Size	Material
BENCH SEAT			
A BASE TOPS/BOTTOMS	4	3/4" x 19 1/4" x 66 1/8"	Birch Plywood
B BASE ENDS	4	3/4" x 19 1/4" x 16 1/4"	Birch Plywood
C BASE DIVIDERS	4	3/4" x 19 1/4" x 11 1/4"	Birch Plywood
D BASE CLEATS	2	3/4" x 2" x 65 5/8"	Poplar
E BASE BACKS	2	1/4" x 12 1/4" x 67 1/8"	Hardboard
F SEAT PANELS	2	3/4" x 21 3/4" x 67 5/8"	Birch Plywood
G SEAT EDGING	2	1/4" x 3/4" x 144"	Poplar
H FRAME TOP RAIL	1	3/4" x 23 1/4" x 131 1/4"	Poplar
I FRAME BOTTOM RAIL	1	3/4" x 43 1/4" x 131 1/4"	Poplar
J FRAME END STILES	2	3/4" x 2 1/2" x 16 1/4"	Poplar
K FRAME INNER STILES	5	3/4" x 2 1/2" x 8 3/4"	Poplar
BOOKCASES			
L NARROW SIDES	2	3/4" x 12 5/8" x 81"	Birch Plywood
M WIDE SIDES	2	3/4" x 13 1/4" x 81"	Birch Plywood
N SHELVES/TOPS	12	3/4" x 12 5/8" x 23 3/4"	Birch Plywood
O CASE CLEATS	4	3/4" x 2" x 23 1/4"	Poplar
P CASE BACKS	2	3/8" x 24 1/2" x 81"	Beaded Ply.
Q FRAME STILES	4	3/4" x 2 1/2" x 81"	Poplar
R FRAME TOP RAILS	2	3/4" x 5 1/2" x 20"	Poplar

Part	Qty	Size	Material
S FRAME MIDDLE RAILS	2	3/4" x 2" x 20"	Poplar
T FRAME BOTTOM RAILS	2	3/4" x 3" x 20"	Poplar
U SHELF EDGING	6	1/2" x 3/4" x 20"	Poplar
V COVE MOLDING	1	3/4" x 3/4" x 20'	Pine
DRAWERS			
W BOX FRONTS/BACKS	4	1/2" x 8 1/2" x 19"	Poplar
X BOX SIDES	4	1/2" x 8 1/2" x 18 1/2"	Poplar
Y BOX BOTTOMS	4	1/4" x 18 1/2" x 18 1/2"	Plywood
Z FALSE FRONTS	2	3/4" x 8 5/8" x 19 7/8"	Poplar
AA FRONT TRIM	1	3/8" x 1/2" x 90"	Poplar
BB DRAWER SPACERS	4	3/4" x 1 1/2" x 19 1/4"	Poplar
VALANCE/CROWN			
CC VALANCE BOTTOM	1	3/4" x 11 1/2" x 86"	Birch Plywood
DD VALANCE FACE	1	3/4" x 5 3/8" x 86"	Poplar
EE VALANCE CLEATS	2	1 1/2" x 1 1/2" x 86"	Pine
FF CROWN MOLDING	1	3/4" x 3 1/2" x 20'	Pine
• (64) #8 x 2" Fh Woodscrews • (66) #8 x 1 1/2" Pocket Screws • (2 lbs.) 6d Finish Nails • (1/2 lb.) 4d Finish Nails • (1 lb.) 1" Wire Brads • *(2) Pr. 18" Slides (#34580) • *(2) Puck Light Sets (#39748: 2-Light; #39705: 3-Light)			

*Items available from Rockler.com; 800/279-4441



about that in a minute) for now, it's time to make the first part of the rack assembly — the center band.

Start by preparing a 1/2"-thick hardwood blank that's wide enough to yield all the center bands you're going to need (one 1/2"-wide band for each hanger bar). Plus, some waste (for Assembly Diagram page 55). As for length, a 12"-long blank will give you plenty of

extra material to trim off when squaring up the ends of the hanger-bar assembly. The next step is to lay out the dovetail to hold the hanger. This is the first of two times when the hanger will be a bit

The real beauty of the utensil rack is that it can be easily customized to suit your kitchen. The key to this adaptability is the hanger bar, which, as I mentioned, can be configured either with pegs or one of the three accessories.

No matter how it's configured, each hanger bar consists of two main parts: an inset assembly and a bracket (see Assembly Diagram page 55).

Inset Assembly — The inset assembly consists of several narrow strips of wood and aluminum (see Inset Assembly page 55). There's a maple center band (A) with a series of holes that hold the aluminum

SIMPLE & STYLISH KITCHEN

UTENSIL RACKS

SPICE UP YOUR KITCHEN WITH THESE STYLISH UTENSIL RACKS. MAPLE AND METAL MAKE THEM ATTRACTIVE . . . A SIMPLE MODULAR DESIGN MAKES THEM VERSATILE & EASY TO BUILD.



It occurred to me recently that my shop was better organized than my kitchen. In my shop, my wood-working tools are in clear sight and easy to reach on shelves and pegs installed for their specific purposes. In the kitchen, the cooking tools were stuffed randomly into drawers or hidden in the back of cabinets.

To correct this domestic imbalance, I decided to apply the same storage concepts that have worked so well in my shop to my kitchen. Of course, in the kitchen the solution would have to be a bit more elegant.

For that reason, I built these utensil racks from hard maple and aluminum to give them a unique "flavor." As for the aluminum, don't let that throw you. The bar stock I used is available at hardware stores, and it works just as easily as wood using the very same tools.

One more thing I like about this project is its versatility, which comes from a two-part design. The first part is a "hanger bar" that you can outfit with pegs to hold utensils, a knife rack, spice rack, or paper towel holder. Part two is a wall-mounted cleat. The hanger bars simply "snap" into a dovetail groove in this cleat, using a special piece of hardware (*Inset*).

dadoes. The solution is to first rip a square edge on the bar stock. Then rip the aluminum to width. (See page 34 for tips on working with aluminum.)

Next, cut the strips to rough length (about $\frac{1}{8}$ " shorter than the width of the blank). This will give you a straight edge to ride against the rip fence. Now sand the backs of the strips to rough them up in preparation for gluing in place with polyurethane glue (page 34).

With the strips glued in, sand them flush with the face of the blank. Then rip the center bands from the blank.

All that's left to complete the inlay assembly is to add the top and bottom (C) and the caps (D). As you can see in the *Inlay Assembly Illustration*, the top and bottom are $\frac{1}{4}$ " x $\frac{1}{4}$ " strips of hardwood, and the caps are aluminum. What I found worked best was to apply these as a single unit. To do that, glue the cap pieces to an oversize blank (*Cap Detail*). Then rip off a couple of $\frac{3}{8}$ "-wide strips (the combined width of the top/bottom and a cap) and glue them in place.

Back It Up — With the inlay assembly completed, you can focus on the hardwood backer (E). A row of T-nuts in this backer lets you install pegs, and a

dovetail groove in the back accepts special mounting fasteners (*Klick Fasteners*).

To make the backer, start with an extra-long blank (13") that's ripped to final width (2"). Rout the groove with the dovetail bit highlighted in the *Sidebar* at right. Then lay out and drill counterbored shank holes for the T-nuts (again working from the center), and then glue in the T-nuts.

Now it's just a matter of gluing the backer to the inlay assembly. For appearance, make sure the T-nuts for the pegs are centered on the inlays.

Finally, cut the entire assembly to final length ($11\frac{7}{8}$ "), trimming an equal amount off each end. Then spray on two coats of polyurethane to protect the assembly against kitchen moisture.

Shop-Made Pegs — The metal pegs are fashioned from stainless steel round-head machine screws and aluminum tubing (see the *Construction View*, left, and page 36). To make the screws more "peg-like," I ground and polished the screw heads. The screw threads are covered by a short length of aluminum tubing. Cut the tubing to length and square the end. Then slip the sleeves over the screws and thread them into the T-nuts.

Klick Fasteners

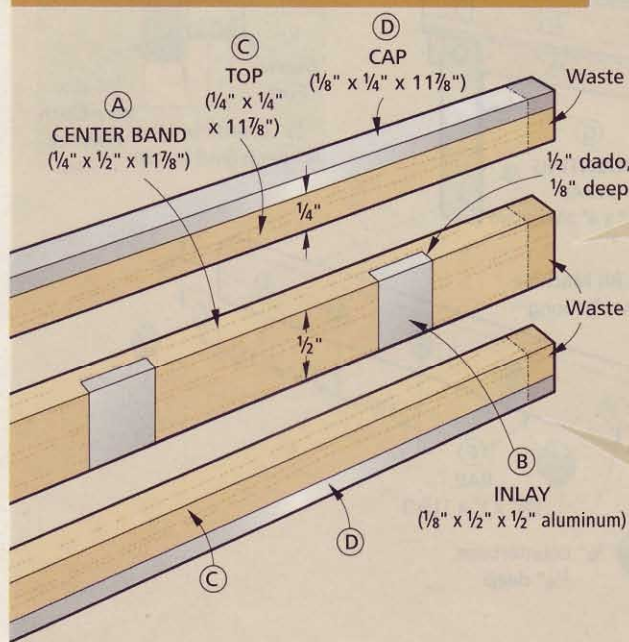


These Klick KD fasteners, along with a special dovetail bit, make it a snap, literally, to mount the hanger bars on the wall. As their name implies, the fasteners click into matching dovetail grooves, one that's routed in the hanger bar (shown above), and the other in a wall-mounted cleat.

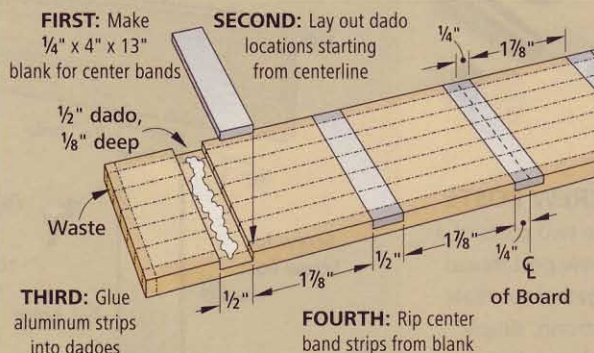
One thing to note about the groove is a slight bevel at the "neck" of the groove. This bevel creates a small relief that allows the fasteners to snap into place (hence the need for a special bit).

To rout a groove, adjust the bit for a full-depth cut and make a single pass. (Klick KD fasteners and the router bit are available at Rockler.com)

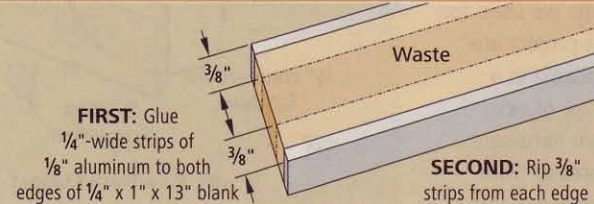
INLAY ASSEMBLY



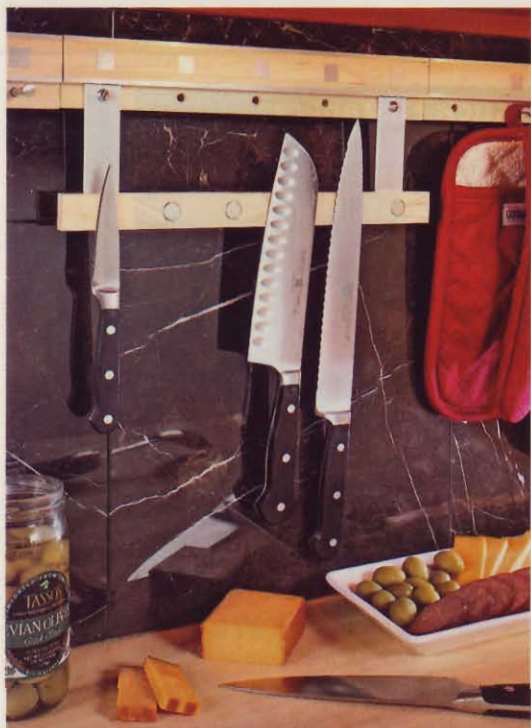
CENTER BAND DETAIL



CAP DETAIL



KNIFE RACK



Powerful magnets in this rack hold kitchen knives at the ready. Here again, maple and metal combine to create an elegant yet extremely functional rack that's easy to build.

Two of the design considerations for this project are to keep cooking utensils handy and in plain sight. This knife rack does both. The knives are secured by strong rare-earth magnets housed in a thin hardwood rail (Illustration, below). The rail is suspended by two aluminum mounting straps attached to a hanger bar.

Ready for the Rail — Start by cutting the rail (F) to size from $\frac{3}{8}$ "-thick stock. To hold the magnets, you'll need to drill a series of counterbores in the rail. There are a couple of things to be aware of before drilling these holes.

First, the magnets must sit a bit "proud" (about $\frac{1}{32}$ ") of the rail to hold the knives. This means experimenting a bit to get just the right depth.

Having said that, one complicating factor is that the two end counterbores also form a pocket for a special fastener called a screw post, which is used to attach the rail to the mounting straps (see Photo and Cross Section below). To

account for the thickness of the head on this screw post, the two end counterbores must be about $\frac{1}{16}$ " deeper than the rest.

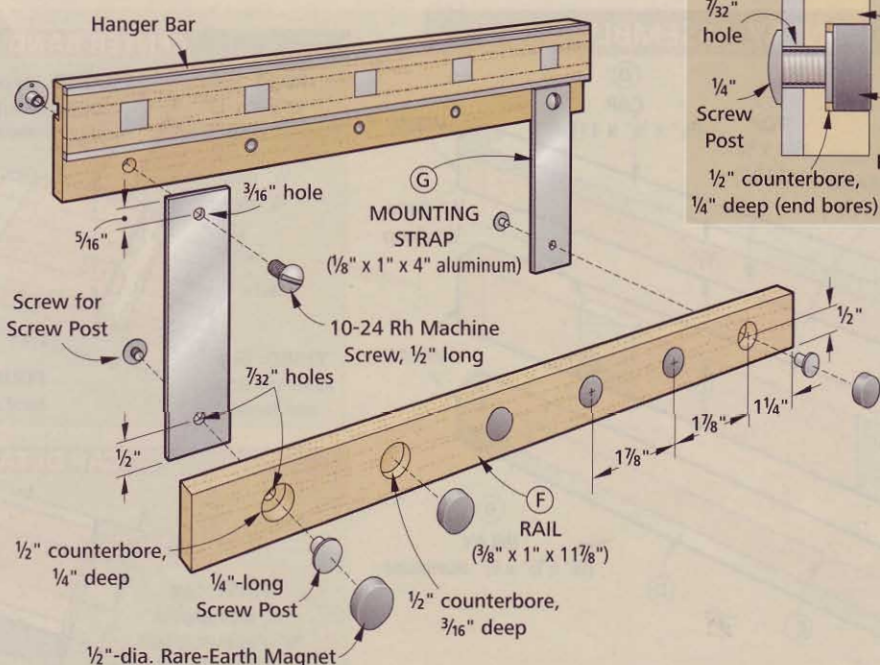
After drilling all the counterbores, the two end holes require one last step. To accept the screw posts, you'll need to drill shank holes centered on the two end counterbores for the screw posts.

All that's left to do in order to complete the rail is to spray on a couple coats of polyurethane finish.

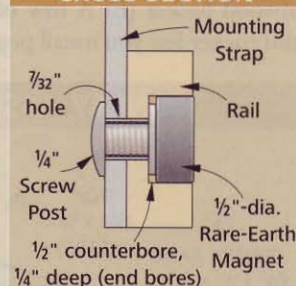
Make the Mounting Straps — After completing the rail, cut the mounting straps (G) to length from 1"-wide aluminum bar stock. Then drill two mounting holes, one for the screw posts and another for a machine screw that secures the strap to the hanger bar.

Before installing the straps, it's worth taking a few minutes to sand the aluminum to give it that "brushed" metal look (see page 34). Assemble the knife rack as shown, and then glue the magnets in place with epoxy.

KNIFE RACK ASSEMBLY



CROSS SECTION



SCREW POSTS

The two parts of a screw post thread together to create a strong, simple fastener. The aluminum screw posts we used for this project are available in a range of sizes from hardware stores or from Screwpost.com

SPICE RACK

The secret to good cooking is the spices (or so I'm told). So a spice rack was a must-have item on our accessory list (*Photo, right*). This particular spice rack is designed to hold a dozen 4-oz. glass spice jars, which are available from Fantes.com (Item #120380).

A look at the *Construction View* will familiarize you with this accessory's three main components. The spice jars fit into two aluminum-sided boxes. These boxes are connected to the hanger bar by a pair of aluminum mounting straps. And a filler block between the rack and the wall helps stabilize the rack when removing the jars.

Begin with the Boxes — Each box consists of a $\frac{1}{2}$ " plywood bottom (H) that's wrapped with $1\frac{1}{2}$ "-wide aluminum bar stock. Cut the aluminum ends (I) of the boxes to length so they match the width of the bottom, then apply

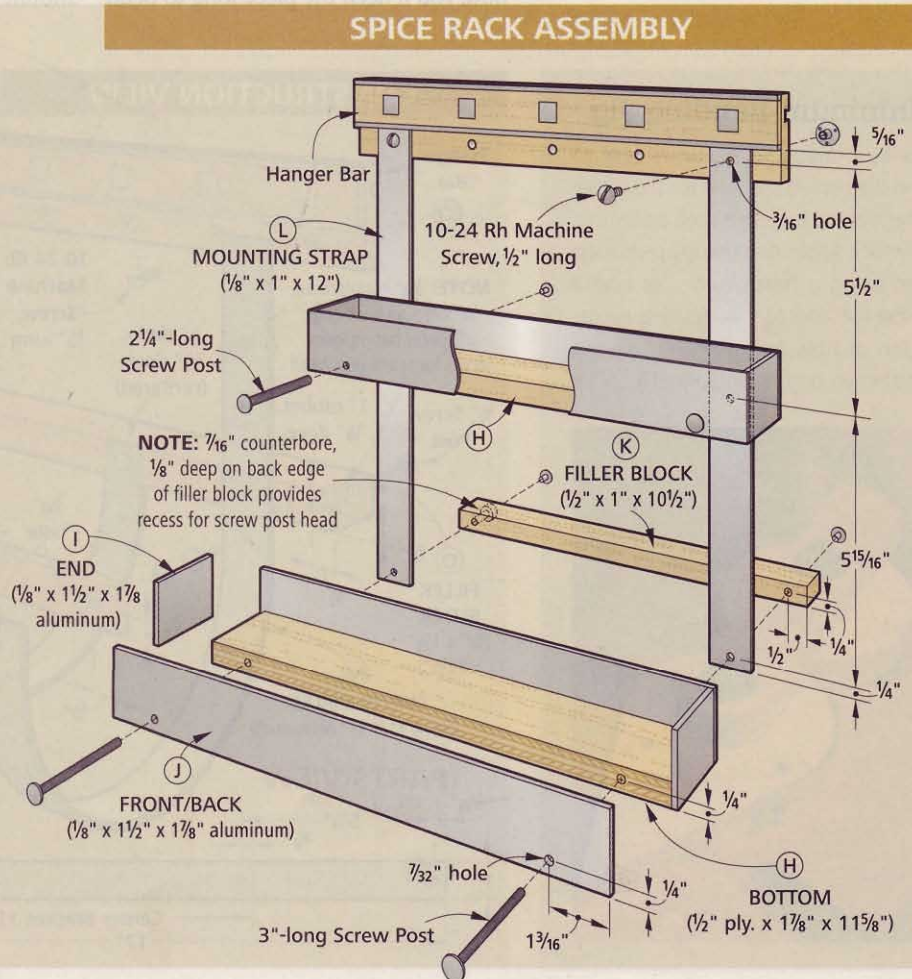
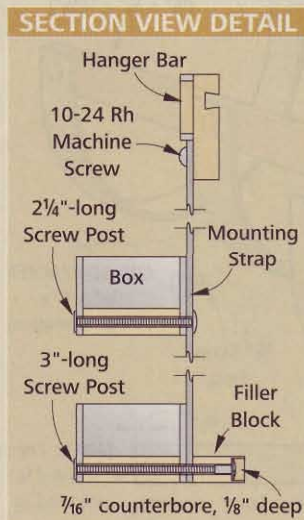
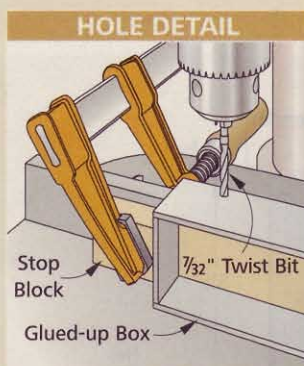
polyurethane glue and clamp the ends in place. Next, cut the front and back (J) a hair longer than necessary (about $\frac{1}{32}$ "). After gluing on these pieces, remove the excess material by sanding them flush with the ends of the boxes.

The boxes will be attached to the mounting straps with long screw posts, so hole alignment is critical. To drill these long through-holes accurately, set the drill press up with a fence and stop block, as shown (*Hole Detail*). After drilling the first hole, just flip the box end-for-end to drill the second one.

Assembly — All that's left to complete the spice rack is to add the filler block (K) and mounting straps (L). Drill mounting holes in these pieces, as shown, and then assemble the rack with screw posts and machine screws. Note that the lower box requires longer screw posts to account for the filler block.



With construction similar to the knife rack, this good-looking accessory lets you spice up your kitchen decor, as well as your meals.





Gracefully curved metal brackets cradle a roll of paper towels with this holder. Here again, the two outer brackets are used to attach the holder to the hanger bar.

PAPER TOWEL HOLDER

Paper towels certainly aren't the most attractive item in a kitchen, however they are a necessity. That's not to say you can't dress them up a bit with this stylish paper towel holder (Photo, left). It features three gracefully curved metal brackets that act as a cradle for the paper towel roll.

Bending the Brackets — One of the most intriguing parts of this project is bending the metal brackets (M) to a curved shape. Like the mounting straps on the other accessories, the brackets are made from 1"-wide aluminum bar stock. Though it's possible to bend it by hand, you can't produce a smooth graceful curve. To do that, I made a simple bending jig (Photo, below left).

Before using the jig, there are several things to do. For starters, cut a 17"-long piece of bar stock for each bracket (Parts View). Eventually, the middle bracket will get cut shorter than the other two, but for now, you'll need the piece long to bend

it in the bending jig. Next, drill three mounting holes in each piece. (One hole will also be used to secure the bar stock in the bending jig, as shown.) Now bend the brackets to shape, and then trim the middle bracket to length (Parts View).

Add the Rail — The curved ends of the brackets are connected with a thin hardwood rail (N). Here again, I used screw posts to fasten the rail to the brackets. Use the existing holes in the brackets to lay out the holes for the screw posts, then attach the rail to the brackets.

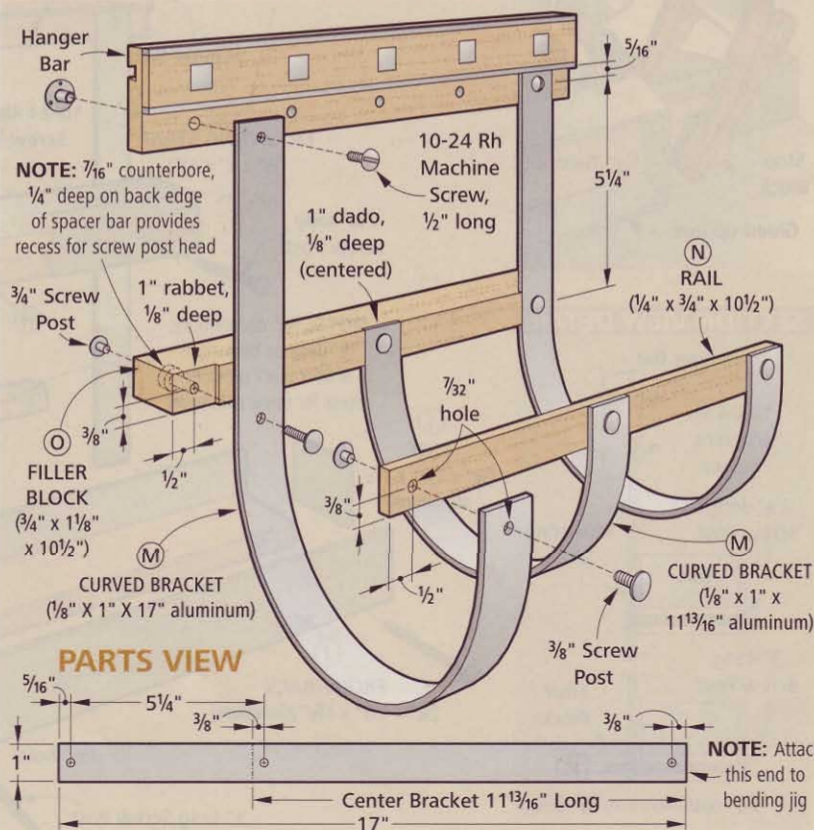
Filler Block — As on the spice rack, a filler block (O) adds rigidity to the paper towel holder by filling the space between the wall and the holder. Cutting shallow rabbets and a dado in this filler block keeps the brackets from racking or twisting. Once again, drill holes and counterbores for screw posts to attach the filler block to the brackets. Then mount the brackets to a hanger bar.

Aluminum-Bending Jig

This shop-made jig makes it easy to bend the curved brackets for the paper towel holder. It lets you roll aluminum bar stock around a teardrop-shaped form using a hardwood disk and a handle for leverage. A detailed explanation of how to build and use the bending jig begins on page 38.



CONSTRUCTION VIEW



QUICK & EASY INSTALLATION

The special Klick KD fasteners we used provide a foolproof way to mount the components of this project. You simply clip two fasteners into the dovetail groove in the back of each hanger bar (*Illustration, below*). Then snap the fasteners into a corresponding groove in a mounting cleat.

Mounting Cleat — The mounting cleat is a piece of $\frac{1}{2}$ "-thick hardwood that's ripped to width so it's $\frac{1}{4}$ " narrower than the hanger bar (*Cross Section, below*). Undersizing the cleat like this makes it less conspicuous.

For the same reason, the cleat is shorter in length than the hanger bars. Cutting it $\frac{1}{4}$ " shorter than the com-

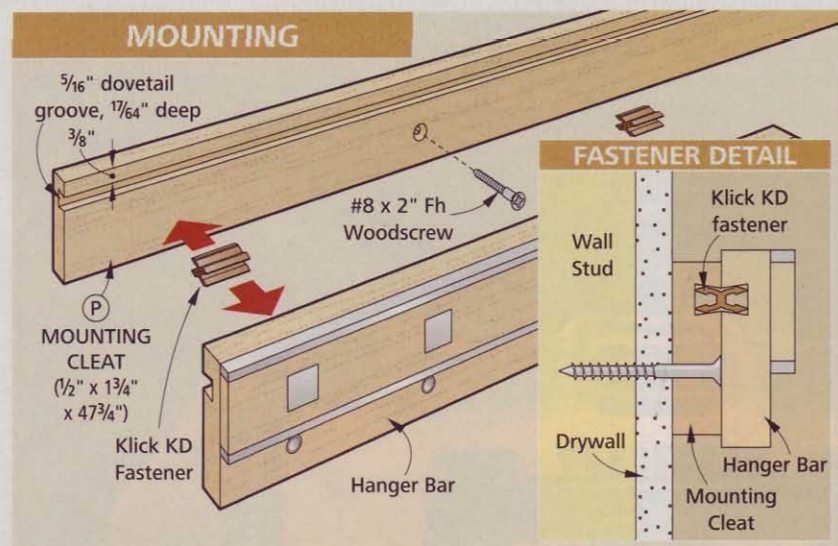
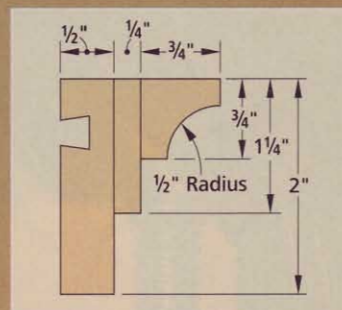
bined length of the bars hides the cleat at the ends.

The next step is to rout the dovetail groove near the top edge of the cleat. Use the same dovetail bit as before. Only this time, cut the groove $\frac{1}{16}$ " closer to the top edge of the cleat than you did on the hanger bar. This is so the cleat will sit below the top edge of the hanger bar once you install the utensil rack.

Installation — To complete the installation, screw the mounting cleat into wall studs, and snap the hanger bars into place. Attach the accessories or pegs as you want. A dab of Loctite will keep the pegs from loosening with use. 

Design Option

For a more traditional look, you may want to make the hanger bar entirely out of wood. This oak version has the same backer, dovetail groove for the Klick fasteners, and pegs. But here, a thin strip of hardwood with an attached cove molding replace the inlay assembly.



MATERIALS LIST

Part	Qty	Size	Material	Part	Qty	Size	Material
HANGER BAR (makes one)				L MOUNTING STRAPS	2	$\frac{1}{8}$ " x 1" x 12"	Aluminum
A CENTER BAND	1	$\frac{1}{4}$ " x $\frac{1}{2}$ " x $11\frac{7}{8}$ "	Maple	PAPER TOWEL HOLDER			
B INLAYS	5	$\frac{1}{8}$ " x $\frac{1}{2}$ " x $\frac{1}{2}$ "	Aluminum	M CURVED BRACKETS	3	$\frac{1}{8}$ " x 1" x 17"	Aluminum
C TOP/BOTTOM	2	$\frac{1}{4}$ " x $\frac{1}{4}$ " x $11\frac{7}{8}$ "	Maple	N RAIL	1	$\frac{1}{4}$ " x $\frac{3}{4}$ " x $10\frac{1}{2}$ "	Maple
D CAPS	2	$\frac{1}{8}$ " x $\frac{1}{4}$ " x $11\frac{7}{8}$ "	Aluminum	O FILLER BLOCK	1	$\frac{3}{4}$ " x $1\frac{1}{8}$ " x $10\frac{1}{2}$ "	Maple
E BACKER	1	$\frac{1}{2}$ " x 2" x $11\frac{7}{8}$ "	Maple	MOUNTING CLEAT (holds four hanger bars)			
KNIFE RACK				P MOUNTING CLEAT	1	$\frac{1}{2}$ " x $1\frac{3}{4}$ " x $47\frac{3}{4}$ "	Maple
F RAIL	1	$\frac{3}{8}$ " x 1" x $11\frac{7}{8}$ "	Maple	(5) 10-24 T-Nuts (per hanger bar) (2) 10-24 Rh Machine Screws, $\frac{1}{2}$" long (per accessory) (5) $1\frac{1}{4}$"-long pieces of $\frac{7}{32}$" (O.D.) aluminum tubing (K&S #105)			
G MOUNTING STRAPS	2	$\frac{1}{8}$ " x 1" x 4"	Aluminum	(6) $\frac{1}{2}$"-dia. Rare-Earth Magnets* (2) $\frac{1}{4}$" Screw Posts (2) 3" Screw Posts (2) 2$\frac{1}{4}$" Screw Posts (3) $\frac{3}{8}$" Screw Posts (3) $\frac{3}{4}$" Screw Posts			
SPICE RACK				*Available from K&J Magnetics (Item #D84); KJMagnetics.com			
H BOTTOMS	2	$\frac{1}{2}$ " x $1\frac{7}{8}$ " x $11\frac{5}{8}$ "	Maple ply				
I ENDS	4	$\frac{1}{8}$ " x $1\frac{1}{2}$ " x $1\frac{7}{8}$ "	Aluminum				
J FRONTS/BACKS	4	$\frac{1}{8}$ " x $1\frac{1}{2}$ " x $11\frac{7}{8}$ "	Aluminum				
K FILLER BLOCK	1	$\frac{1}{2}$ " x 1" x $10\frac{1}{2}$ "	Maple				

tool test: 13" planers

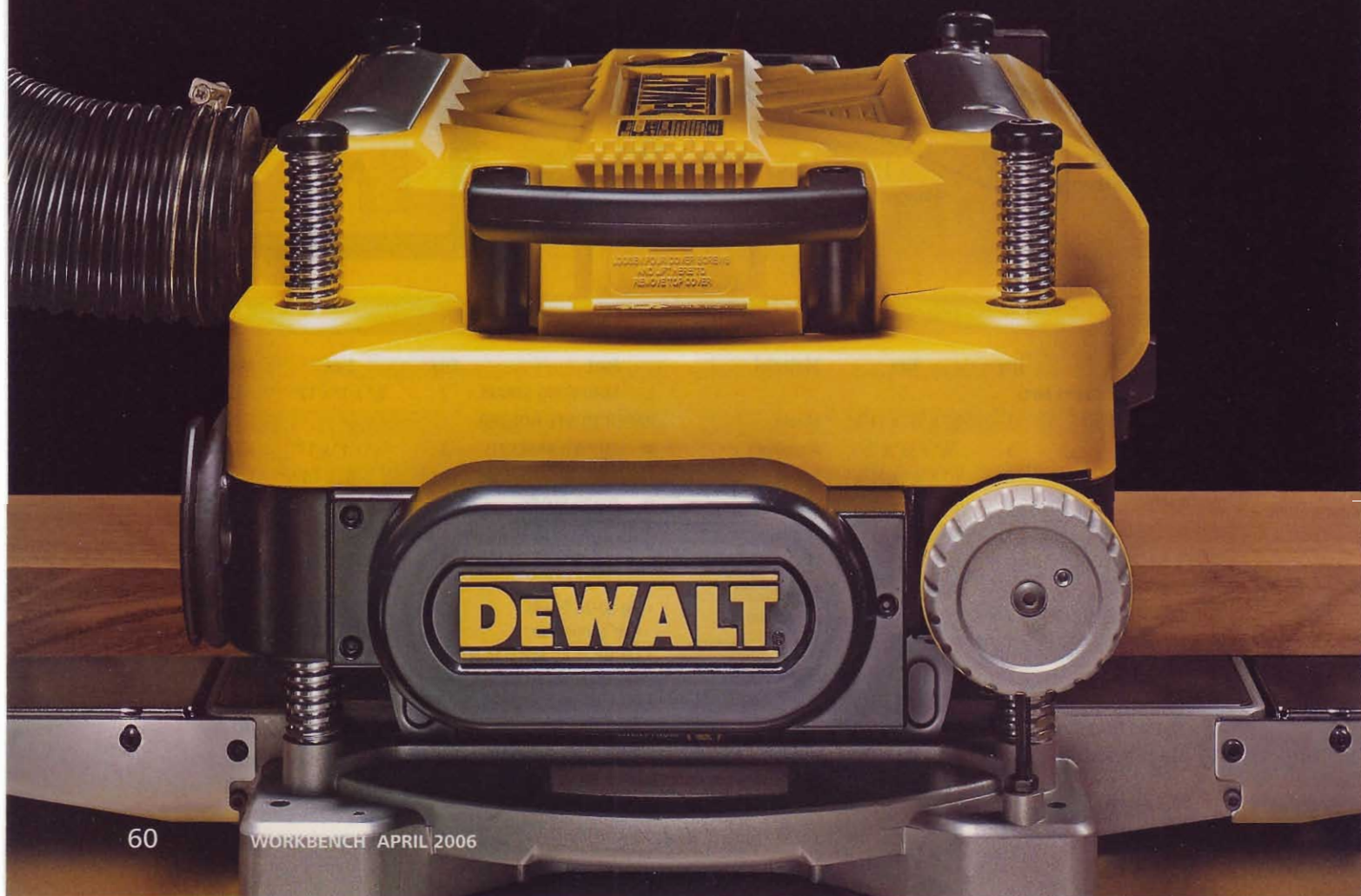
The role of a thickness planer in any woodshop is simple: turn thick boards into thinner boards.

But after testing eight benchtop models, we were surprised by how different these planers truly are.

Given the rather singular purpose of a thickness planer, it isn't immediately clear what distinguishes one model from another, apart from the obvious visual differences. And given that all of the 13" benchtop planers we tested can readily reduce a board from 6" to 1/8" in thickness, what makes one model better than another?

To answer that question, we fed a variety of stock through the planers shown on the bottom of the facing page. Thickness notwithstanding, the surface quality of the boards after planing varied significantly. Some planers suffered from snipe. Others produced boards with dimples or tearout. Interestingly, not a single planer was perfect right out of the box.

Over the next few pages we'll cover the common planer maladies, which planers suffer from them, their cause and effect, and even some solutions. Most importantly, we'll show you how these factors, along with others, such as ease of blade changing, simplicity of the controls, dependability of the depth stops, and the quality of the scales, influenced our final ranking of the planers.



Snipe & Stock Support

Snipe is the bane of thickness planing, and under certain circumstances, every planer will produce it.

Snipe is simply a deeper cut in one or both ends of the board. It occurs when a board is entering or exiting the machine and is only in contact with one feed roller. This causes the board to teeter-totter on the roller, which places uneven pressure on the cutterhead. That pressure can actually tip the cutterhead and drive the blades deeper into the board. With boards thicker than $\frac{1}{4}$ " this can be a real inconvenience. For stock thinner than that, it can be absolutely ruinous (Photo, above right).

Several of the planers in this test have a manual cutterhead lock that's supposed to keep the cutterhead from tipping. But these are marginally effective on their own. The bigger issue is stock support. If the extension tables are properly adjusted to support the board throughout the cut, then snipe can be virtually eliminated.

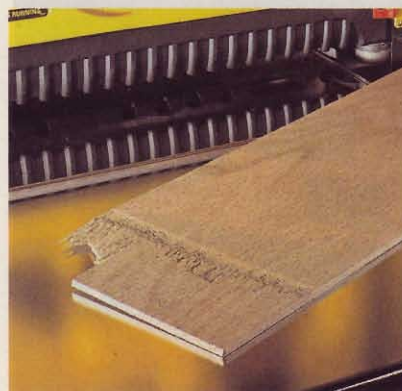
The extension tables on these planers varied somewhat. The Delta and Ridgid performed well with factory settings. The planers from Hitachi, Craftsman, Palmgren, Jet, and Woodtek all required some adjustment to eliminate snipe. The most troublesome was the DeWalt, since it doesn't come with extension tables.

As you might expect, snipe was a serious problem for this planer on both ends of a board. And we couldn't plane a board much thinner than $\frac{1}{4}$ " before the trailing end would be shredded.

Fortunately, the DeWalt can be cured of its board-eating ways with a set of accessory extension wings. At about \$42 a set, it's at least a simple, though not terribly cheap, solution. And sure enough, once we installed the tables and tuned them up (Photo, below right) the DeWalt produced boards that were snipe-free and planed boards to $\frac{1}{8}$ " thick with no trouble.

As pleased as we were to have fixed the problem, it does raise the question of why DeWalt expects us to pay even more for accessories that are clearly required to make this planer perform to its full potential.

One caveat to all of this is that, even with perfectly tuned extension tables, all planers will produce snipe under certain circumstances, such as when working with very long boards. But when planing more typical-length workpieces (say under 5-ft. for the sake of argument), it's reasonable to expect boards that are snipe-free.



SNIFE HAPPENS

This extreme case of snipe came from the DeWalt before we added extension tables to the planer.



THE TEN-CENT SOLUTION

Adjusting the outfeed table so it is tipped up just slightly (the thickness of a dime is usually adequate) often cures snipe on the trailing end of boards.

8 TOOLS REVIEWED:



DEWALT
DW735



CRAFTSMAN
21743



DELTA
22-580



HITACHI
P13F



JET
JWP-13DX



PALMGREN
84113



RIDGID
TP1300LS



WOODTEK
115-946



DUST? WHAT DUST?

The DeWalt planer is unbelievably dust-free when connected to an external dust collector.



Dimples & Dust Control

It's easy to think of dust control as simply a matter of convenience — the less you have to sweep up, the better. But lack of dust control on a planer can have a significant impact on cut quality, as well.

When a planer simply ejects the chips and dust from the back of the machine, a certain amount of that waste cycles back through the planer. And when the chips inevitably get pinched between the feed rollers and the workpiece, the

result is a bunch of small dimples on the machined surface of the board (*Photos, below left*). So planers with dust control have a decided advantage in terms of both convenience and performance.

But the distinctions go beyond simply "with" or "without" dust control. There are actually three varieties of dust control among these planers that have varying levels of effectiveness.

The undisputed champ of dust control is the DeWalt. This planer uses an



IT'S IN THE BAG

Palmgren and Craftsman use a unique "half-bag" to direct chips and dust into a trash bag or can.



OUT OF (DUST) CONTROL

Hitachi offers no way to control dust, so the quality of your workpiece and the cleanliness of your shop will suffer.

PLANERS



Craftsman 21743

Virtues: Self-contained dust-control solution; Passable cut quality; Unique powered cutterhead adjustment.

Vices: Can't be connected to an external dust collector; Stock-thickness gauge is difficult to read.

Verdict: A decent planer that offers a nice solution to dust control for those without a dust collector.

www.Craftsman.com
800-349-4358



Delta 22-580

Virtues: Good cut quality; Decent controls; Dual speeds.

Vices: Doesn't include a dust hood; Changing the blades is slightly awkward.

Verdict: This is an excellent planer with a couple of minor inconveniences that, once understood, are easy to work around.

www.DeltaMachinery.com
800-223-7278

internal blower that's powered by the same motor as the cutterhead. This produces a powerful vacuum that draws dust through a tightly sealed dust chute positioned directly above the knives. Interchangeable ports allow you to either tie the planer to a dust collector with a 4" hose, or simply eject the chips in a fan pattern (but beware the "dimple effect" with the latter). A third option is to buy another accessory from DeWalt that allows you to collect the waste in a garbage can without the need for an external collector.

The Palmgren and Craftsman planers also offer dust control that's driven by an internal blower. But these systems aren't intended to connect to an external dust collector. Rather, the planers come with a cloth hood that directs waste into either a 30-gallon garbage bag or can (Photo, page 62). While not as completely dust-free as the DeWalt, these planers provide reasonable dust control without the need for an external collector.

The third form of dust control is a shroud that attaches to the back of the planer and then connects to a 4" dust-collection hose. These, of course, require

an external dust collector to be of any use. Ridgid and Woodtek come standard with these, and both offer a good level of dust control. The Ridgid is especially effective because the excellent fit and finish of this planer makes for a "tighter" machine that won't let dust escape anywhere except through the shroud.

The Delta, Hitachi, and Jet came without any type of dust control, though accessory hoods are available for the Jet and Delta. The cut quality of both machines improved dramatically once we installed the hoods. Hitachi, unfortunately, doesn't offer a hood for its planer.

Tearout & Feed Speed

Highly figured woods like curly maple present a unique challenge for planers. All of that figure comes from grain that moves in every direction except straight. That means a planer is sometimes cutting with the grain, sometimes across it, and even sometimes cutting exposed end grain. That, along with the characteristic brittleness of most figured hardwoods, means that results like those shown in the *Dimensioning Cut Photo*, at right, are not uncommon.



DIMENSION, THEN FINISH

A high feed speed allows for quick dimensioning of a board. The lower feed speed improves the cut quality.



DeWalt DW735

Virtues: Exceptional cut quality; Flawless dust control; Easy blade changes; Easy-to-use controls; Dual speeds.

Vices: Doesn't include extension tables, which are a necessity to avoid snipe.

Verdict: Easily the best planer in the class thanks to its exceptional cut quality and ease of use.

www.DeWalt.com
800-433-9258



Hitachi P13F

Virtues: Decent controls; Comes with a stand; The large cutterhead lock lever is easy to operate.

Vices: No dust control; Difficult blade changing; Mediocre cut quality.

Verdict: This one is disappointing. Can't offer any arguments for choosing this planer.

www.HitachiPowerTools.com
800-706-7337



PLENTY OF HEADROOM

Unobstructed access to the DeWalt cutterhead is priceless for blade swaps.



NOT A SHARP SOLUTION

Poor access and a magnetic jig make the Hitachi blades difficult to change.

There are a few things you can do to minimize tearout with any planer, like having sharp blades installed and experimenting to find the best possible feed direction. But a few of these planers offer an extra measure of control with a slower feed rate.

DeWalt, Delta, Jet, and Palmgren all feature a "finishing" speed, which simply steps down the RPMs of the feed rollers so the knives are taking more cuts per inch as the board passes through the planer (*Photo, page 63*). Accordingly, we got slightly better results when using the finishing speed on these machines than with their single-speed counterparts.

DeWalt claims an even greater advantage with figured wood because its cutterhead has three knives while every other planer in this test has only two. The addition of the third knife means this planer takes even more cuts yet. In fact, even at its fastest feed rate, the DeWalt provides more cuts per inch than the Jet, Palmgren or Delta at their *slowest* feed rates.

The difference in cut quality between the DeWalt and the other two-speed machines was barely noticeable when

all three planers had fresh, sharp blades installed. But as testing progressed and the blades dulled, the DeWalt continued to produce consistently fine cuts while the others showed a greater tendency to tear the wood fibers, creating a rougher surface.

Blade Changing

And speaking of blades, another important measure of these tools is the ease with which blades can be changed. That is a product, first of all, of how easily you can get to them, and secondly, how easily you can align them.

Once again, the DeWalt sets the standard. The entire top of the planer lifts off (after loosening four screws) to allow access inside the planer (*Photo, above left*). Once inside, you need to remove the dust shroud, which is held in place with three long wing nuts, to expose the cutterhead. From there, simply remove the gib screws, and then lift the gib and blade off using the magnets built into the T-handle of the hex wrench. This wrench, by the way, fits virtually every bolt on the planer, so it's the only tool you'll need for routine maintenance.

PLANERS



JET JWP-13DX

Virtues: Relatively compact; Affordable; Dual-speed.

Vices: Doesn't include a dust hood; Tends to leave ridges on full-width boards; Cutterhead lock lever is too small to operate easily.

Verdict: Even with the addition of a dust hood, this planer has too many flaws for our tastes.

www.JetTools.com
800-274-6848



Palmgren 84113

Virtues: Decent controls; Reasonable cut quality; Self-contained dust collection; Digital display is a bonus for some; Dual-speed.

Vices: Conventional depth-of-cut indicator is poor.

Verdict: This is not a bad planer, but it seems overpriced, even with the digital display feature.

www.Palmgren.com
800-621-6145

To replace the blades on the DeWalt (or reverse the existing ones), simply place them over the alignment pins, and secure the gibs and screws.

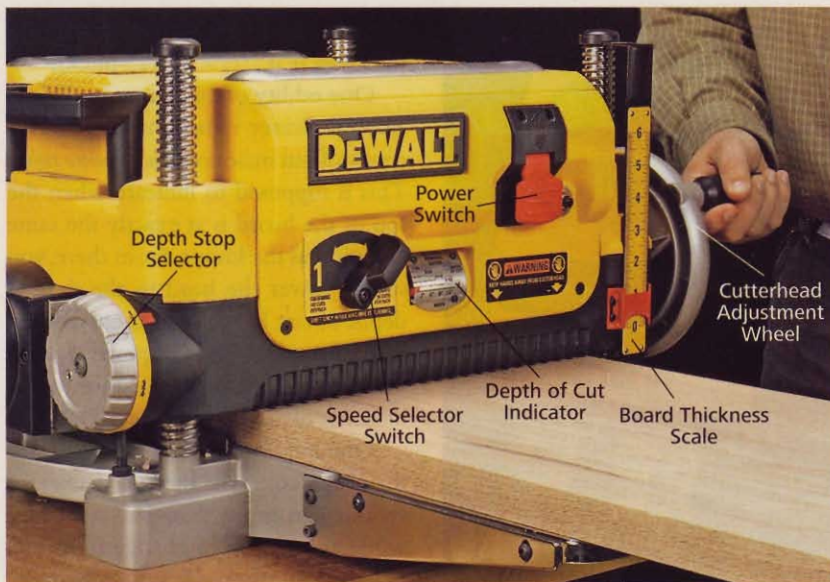
Most of the other planers use the same type of reversible blades with alignment pins to make blade positioning almost automatic. But they don't have nearly the unobstructed access to the blades that DeWalt does.

The Delta, Jet, Woodtek, Craftsman, and Palmgren models come close, but still require an extra measure of patience and dexterity to perform a blade change. The Ridgid is slightly more difficult because you have to fit a wrench into a narrow opening to reach the gib screws.

The planer that really disappointed on this score is the Hitachi. The cutterhead locks at an awkward angle, making it difficult to reach the gib screws. And this planer also uses the "old-fashioned" alignment jigs rather than pins machined into the cutterhead (*Lower Photo, page 64*).

Setup & Adjustment

While blade changing is an important setup and adjustment procedure, there is also the day-to-day operation of the



DEWALT HAS IT ALL UNDER CONTROL

The size and location of every control and gauge on the DeWalt is comfortable and convenient, making this planer a pleasure to work with.

machines to consider. And while planers are among the simplest of tools to set up and operate, we did find some meaningful differences in their controls and gauges.

The standard controls found on every one of these planers are a cutterhead adjustment, a depth-stop adjustment

wheel or lever, and a power switch. Some tools also have a manual cutterhead lock and speed-selector switch (*Photo, above*). Standard gauges include a board thickness scale and a depth of cut indicator, though these vary widely in design and effectiveness.



Ridgid TP1300LS

Virtues: Includes dust hood with two port sizes; Convenient controls; Attractively priced; Includes a stand.

Vices: Blade changing is relatively difficult.

Verdict: This tool requires no additional accessories and performs so well you may never miss the two-speed operation of pricier planers.

www.Ridgid.com
800-474-3443



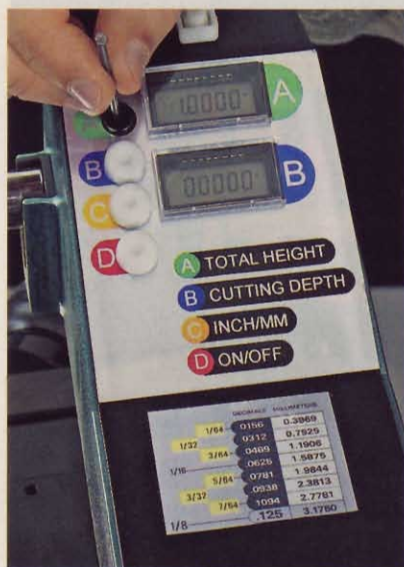
Woodtek 115-946

Virtues: Includes a dust hood; Relatively compact; Affordably priced.

Vices: Occasionally leaves ridges on full-width boards; Cutterhead lock is too small to operate easily.

Verdict: As a virtual twin to the Jet, this has most of the same weaknesses without the benefit of two speeds.

www.Woodworker.com
800-645-9292



DIGITAL

Once you know how to read it, Palmgren's digital display can be quite useful.



Overall, DeWalt has the best controls in this group. A large cutterhead-height wheel is mounted on the side of the tool, making it easy to reach and operate. Opposite the height wheel is another large wheel for setting the depth stop. This is also well-positioned and nicely sized for easy adjustments. The stock thickness scale is fairly typical in that it requires you to squat down to get a truly accurate reading. Perhaps the most impressive control on this planer is the depth-of-cut indicator (Photo, right). It's located in the center of the machine and oriented slightly upward so you can read it easily from a comfortable operating position. It's also accurate and responsive when compared to some others that indicate a much shallower cut than the machine is actually taking.

Delta did a nice job with their controls, as well. The height adjustment wheel and cutterhead lock each have large handles that offer a comfortable grip. The depth stop is different than most in that it doesn't have preset stops. Instead, it lets you set the stop for any height. It takes a bit of getting used to, but it can be handy when you're aiming

for something other than a standard thickness (e.g., $\frac{1}{2}$ "- or $\frac{3}{4}$ "-thick).

One oddity of this planer is a "blade zero" indicator rather than a standard depth-of-cut indicator (Photo, below right). This is supposed to indicate when the top of the board is at exactly the same elevation as the knives. From there, you simply lower the head to the desired depth of cut. It's good in theory, but in practice we found it to be prone to some inaccuracy. We'd prefer a conventional indicator of the same quality as DeWalt's.

One more small issue we have with the Delta concerns the speed-selector switch. On more than one occasion, while attempting to change from one speed to another, the switch actually hung up in the neutral position, but looked for all the world as though it were in gear. When the board failed to feed into the machine because the rollers weren't engaged, we realized that the lever needed another small push to put the machine in gear.

The Ridgid also has generally friendly controls. Like the DeWalt, the cutterhead-height wheel is mounted on the side. The cutterhead lock is a slide lever just above the height wheel. We found this a bit on the small side, but still usable. The depth stop is also a sliding lever, this time located below the height wheel. Although different in design than most other machines, it proved quite workable. Likewise, the depth-of-cut indicator on this planer

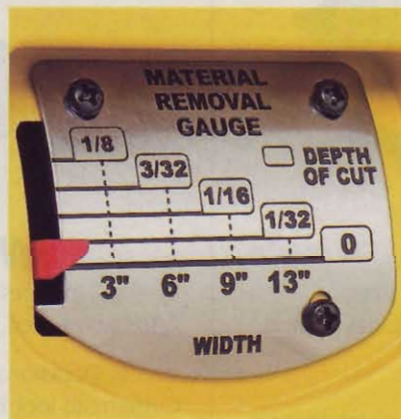
proved to be more accurate and effective than most.

Overall, what we really liked about the Ridgid was having the cutterhead-height adjustment, cutterhead lock, and depth stop all located in a single area. It's a simple efficiency that you'll come to appreciate when you have a lot of planing to do.

The Palmgren planer deserves special mention here for its digital display, which indicates both depth of cut and stock thickness (Photos, left). A quick survey of the *Workbench* staff showed that we are equally split as to whether this is a useful feature or an unnecessary gimmick. But even the skeptics were impressed by how accurate the readings were. And since the conventional depth-of-cut indicator on this tool is actually quite poor, it's probably a good thing Palmgren included this.

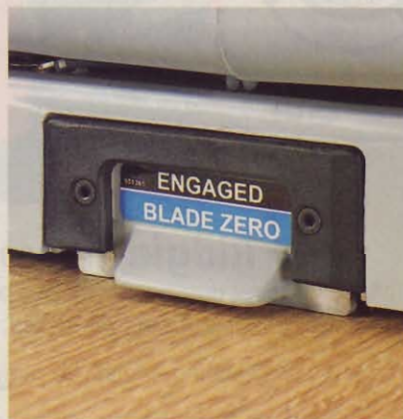
Another unique feature that bears mentioning is a powered cutterhead adjustment on the Craftsman planer. By simply lifting or depressing a lever, the planer motor raises or lowers the cutterhead. It's only good for making gross adjustments, and it's not particularly fast, but it will save you a lot of cranking if you've got a big adjustment to make.

Throughout the rest of the group, the controls ranged from unremarkable to slightly irritating. As an example, the cutterhead-locking levers on the Jet and Woodtek are too small to operate comfortably or effectively.



DEWALT HAS DEPTH

Accurate and easy to read, DeWalt's depth gauge makes setting up for the perfect cut quite simple.



THIS ONE'S A ZERO

Delta's "blade zero" indicator should disengage as soon as it contacts the board. It occasionally doesn't.

FINAL RECOMMENDATIONS

As I mentioned right up front, none of these tools came out of the box capable of flawless planing in all situations. In order to get the absolute best results from the DeWalt, you'll need to buy the accessory extension tables. Likewise, the Delta will need an aftermarket dust hood to reach its full potential.

However, once you make these simple additions, the DeWalt and Delta clearly set the standard for this class of planer. The DeWalt has a slight advantage over the Delta on the scores of dust collection, knife changing, and consistent cut quality.

So even with the inconvenience and additional expense of purchasing the extension tables

separately, the DeWalt DW735 is our "Editor's Choice" for 13" benchtop planers. The Delta 22-580 runs a close second and deserves recognition as an outstanding tool.

For "Top Value," the Ridgid TP1300LS was an easy choice. There's nothing more to buy for this machine, and its only meaningful limitation is that it's a single-speed planer, so figured woods will present a bit of a challenge

for this one. On all other counts, though, this is an excellent planer that will serve you well without breaking the bank.



SOURCES

The Woodsmith Store
WoodsmithStore.com
800-835-5084
Delta, DeWalt, Jet

Woodworker's Supply
Woodworking.com
800-645-9292
Delta, DeWalt, Woodtek

Amazon
Amazon.com
Delta, DeWalt, Palmgren

Planer Tips

It's easy to think of a planer as a "no-brainer" tool — you simply feed it a board and wait for the results. But as we were testing these planers, we were reminded of how many things a user can do to influence the quality of those results.

Here are a few of our best bits of planer wisdom.

- ✓ Treat your planer table with dry-coat lubricant to eliminate feed stalls.
- ✓ Always plane in the direction of the grain to minimize tearout.
- ✓ Plane both sides of a board to ensure parallel faces and allow the stock to dry consistently.
- ✓ Feed the board into the planer at a slight angle so the blades shear the wood fibers rather than chop them.



SPECIFICATIONS: 13" BENCHTOP PLANERS

	Price	Motor	Max. Stock Width	Max. Stock Thickness	Min. Stock Thickness	Cutterhead Speed	Feed Rates	Weight	Warranty
Craftsman	\$439	15 amp	13"	6"	1/8"	8,000 rpm	26 fpm	105 lbs.	1 year
Delta	\$429	15 amp	13"	6 1/2"	1/8"	10,000 rpm	20/30 fpm	97 lbs.	2 years
DeWalt	\$499	15 amp	13"	6"	1/8"	10,000 rpm	14/26 fpm	92 lbs.	1 year
Hitachi	\$349	15 amp	13"	6"	1/8"	8,000 rpm	24.08 fpm	101 lbs.	5 years
Jet	\$419	15 amp	13"	6"	1/4"	8,000 rpm	26.2 fpm	77 lbs.	1 year
Palmgren	\$529	15 amp	13"	6"	1/8"	8,000 rpm	11/22 fpm	106 lbs.	2 years
Ridgid	\$349	15 amp	13"	6"	1/8"	9,000 rpm	26 fpm	85 lbs.	3 years
Woodtek	\$379	15 amp	13"	6 1/8"	1/2"	8,000 rpm	26.25 fpm	77 lbs.	1 year



4in1

POWER TOOL STATION

Save space in your shop by transforming a table saw into a multi-purpose work station. All it takes is a new table extension and a few insert plates.

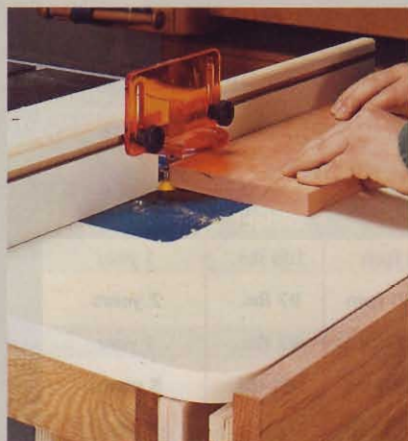
If you've ever worked in an office, chances are you have "multi-tasked" at some point. I know, it's a buzzword that gets tossed around a lot, but it actually has applications in the home shop. By making one work area in your shop "multi-task," you can save a lot of space. This tool station does exactly that.

The heart of this project is a router table extension that replaces the extension wing on your table saw. This table comes with a pre-cut opening that accepts a number of different insert plates. Using these plates, you can turn the side of your saw table into a scroll saw (above left), router table, sander, or pocket-hole joinery station (below). To change jobs, all you have to do is switch insert plates.

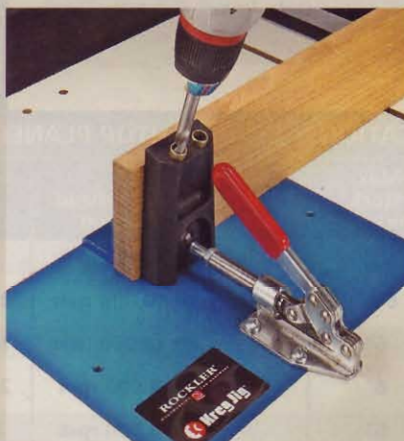
In addition to the different tool stations, this project has several more surprises. To make it even more useful, we added a sturdy mobile base, a blade guard (above), and a pull-out side support. The side support has clearance underneath, making it ideal for cutting with a hand-held jig saw (Photo, left). Or if you have to crosscut a long board on the table saw, it adds over 12" of support to the side of the saw (Photo, page 72).



ONE TABLE SAW EXTENSION — MANY USES



Convert the station into a precision router table by adding a fence and an insert plate designed for mounting a router.

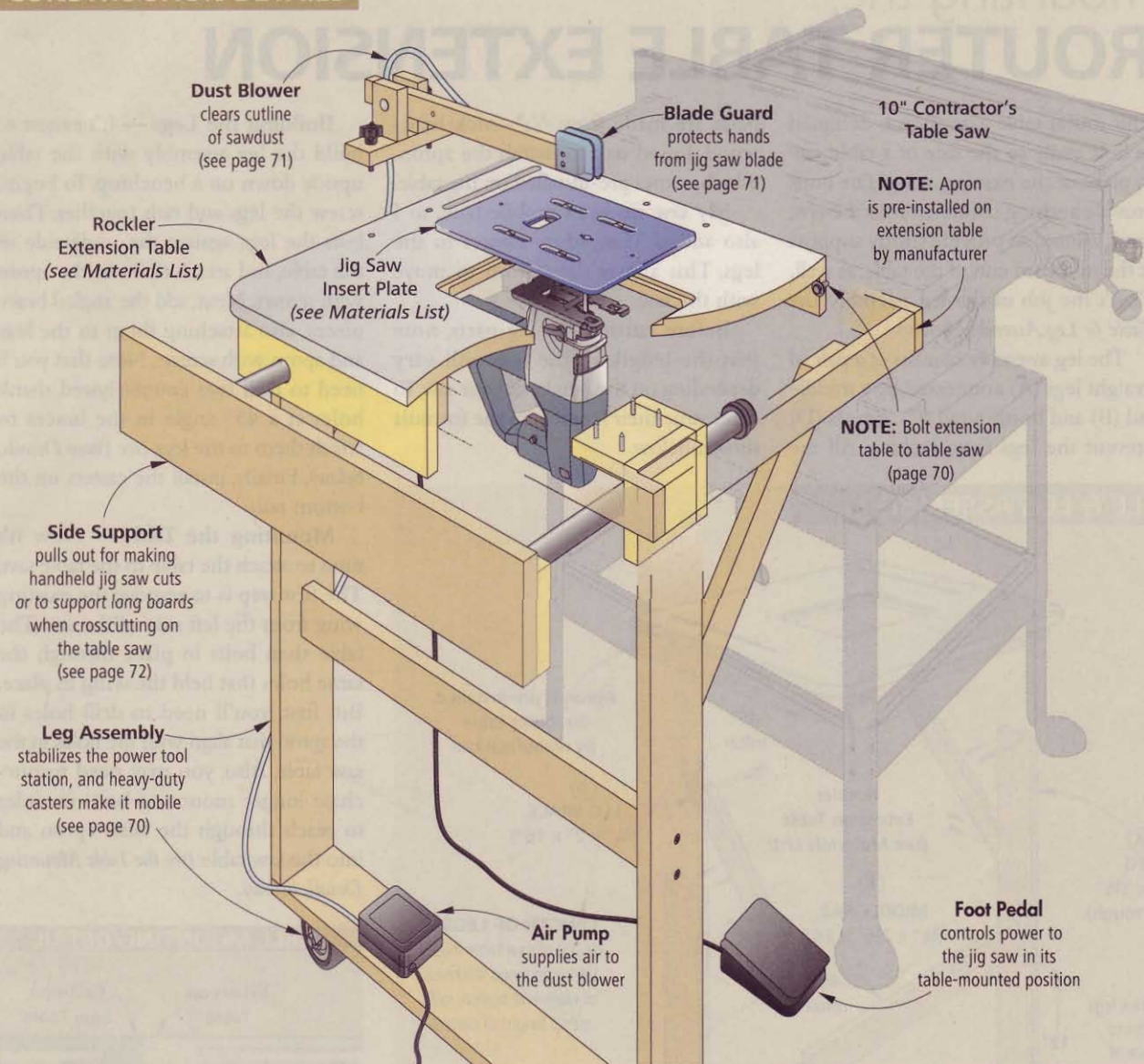


An insert with a pocket-hole jig and a clamp turns the station into a quick and easy joint-making machine.



Another insert plate accepts a Porter-Cable oscillating spindle sander for sanding the rough-sawn edge of a workpiece.

CONSTRUCTION DETAILS



MATERIALS LIST

Part	Qty.	Size	Material
LEG ASSEMBLY			
A LEGS	2	3/4" x 3 1/2" x 31" rgh.	Red Oak
B MIDDLE RAIL	1	3/4" x 2 1/2" x 24"	Red Oak
C BOTTOM RAIL	1	3/4" x 3 1/2" x 25 1/2"	Red Oak
D LEG BRACES	2	3/4" x 2" x 16"	Red Oak
BLADE GUARD			
E BASE	1	3/4" x 2" x 6 1/4"	Red Oak
F UPRIGHTS	2	3/4" x 2" x 2 3/4"	Red Oak
G ARM	1	3/4" x 1 1/4" x 15 1/2"	Red Oak
H SHIELDS	2	1/8" x 2" x 2 1/2"	Plexiglas
SIDE SUPPORT			
I FRONT FACEPLATE	1	3/4" x 4 3/4" x 27"	Red Oak
J BACK FACEPLATE	1	3/4" x 4" x 27"	Baltic Birch Ply.
K OUTER GUIDE	1	3/4" x 4" x 27"	Baltic Birch Ply.

Part	Qty.	Size	Material
L INNER GUIDE TOPS	2	3/4" x 3" x 4"	Baltic Birch Ply.
M INNER GUIDE SIDES	2	3/4" x 4" x 4"	Baltic Birch Ply.
N INNER GUIDE BACKS	2	3/4" x 3 3/4" x 4"	Baltic Birch Ply.

HARDWARE LIST:

- Router Table Ext. (#23384) *
 - Router Insert Plate (#s vary) *
 - Jig Saw Insert Plate (#31985) *
 - Pocket-Hole Station (#31995) *
 - Sander Insert Plate (#23988) *
 - Foot Pedal (#23706) *
 - (2) 3" Swivel Casters (#31870) *
 - (8) #14 x 5/8" Ph Woodscrews
 - (3) 1 1/2" Hx.Hd. Screws (7/16"-20)
 - (8) #8 x 1/2" Fh Woodscrews
 - (2) 3/4" I.D. Pipes, 18" long
 - (2) 3/4"-dia. Pipe Caps
 - (60) #8 x 1 1/4" Fh Woodscrews
 - (7) #8 x 3/8" Rh Woodscrews
 - (4) 1/4" T-Nuts
 - (2) 1/4"-20 Knobs w/ 1 1/2" Studs
 - (1) 2 3/4" Carriage Bolt (1/4"-20)
 - Aquarium Air Pump (50 gal. tank)
 - 3/16"-dia. Plastic Tubing, 48" long
 - 1/8"-dia. Copper Tube, 7" long
 - (5) Nylon Cable Hangers
- * Items available from Rockler (800-279-4441; Rockler.com) or the Woodsmith Store (800-835-5084).

mounting the ROUTER TABLE EXTENSION

This router table extension is designed to bolt easily to the side of a table saw in place of the existing wing. The bolts provide a strong connection to the saw, but I wanted to provide sturdy support at the outboard end of the table, as well. That's the job of the leg assembly (see *Table & Leg Assembly*, below).

The leg assembly consists of a pair of straight legs (A) connected by a middle rail (B) and bottom rail (C). Braces (D) prevent the legs from racking. All the

parts are made from $\frac{3}{4}$ "-thick hardwood. I used oak to match the apron, which comes pre-installed on the table.

My saw sits on a mobile base, so I also added heavy-duty casters to the legs. This allows the station to move with the saw.

Before cutting the leg parts, note that the length of the legs will vary depending on the height of your saw. To determine their length, use the formula shown below.

Building the Legs — It's easiest to build the leg assembly with the table upside down on a benchtop. To begin, screw the legs and rails together. Then butt the legs against the underside of the table, and attach them to the apron with screws. Next, add the angled brace pieces, also attaching them to the legs and apron with screws. Note that you'll need to drill two counterbored shank holes at a 45° angle in the braces to attach them to the legs (see *Brace Details*, below). Finally, install the casters on the bottom rail.

Mounting the Table — Now it's time to attach the table to the table saw. The first step is to remove the existing wing from the left side of the saw. The table then bolts in place through the same holes that held the wing in place. But first, you'll need to drill holes in the apron that align with the holes in the saw table. Also, you may need to purchase longer mounting bolts in order to reach through the table apron and into the saw table (see the *Table Mounting Detail*, below).

TABLE & LEG ASSEMBLY

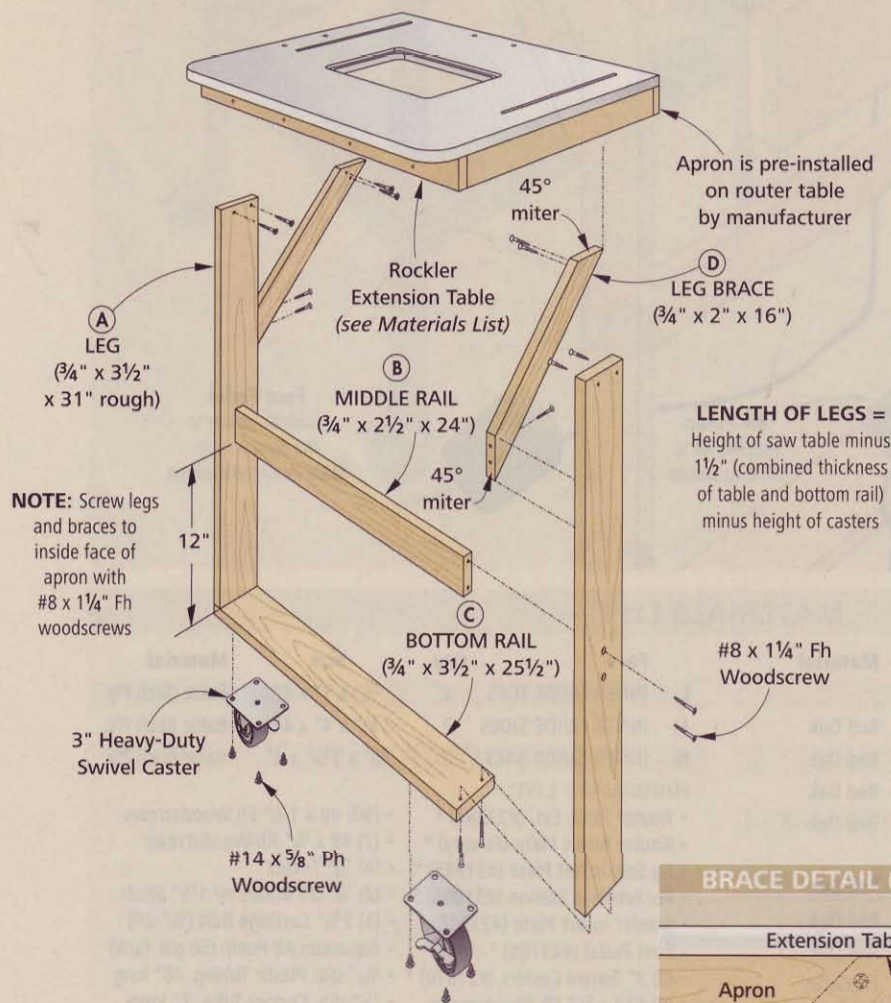
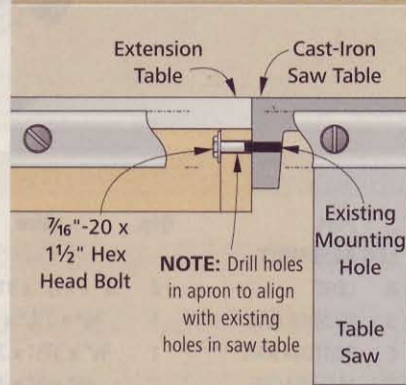
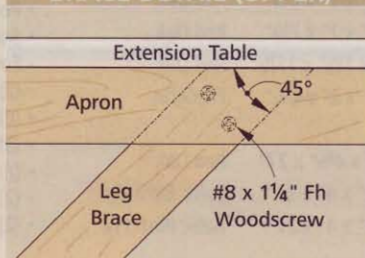


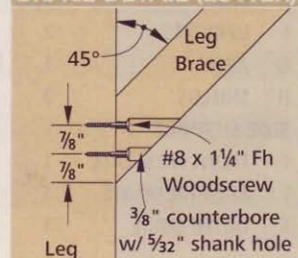
TABLE MOUNTING DETAIL



BRACE DETAIL (UPPER)



BRACE DETAIL (LOWER)



building the BLADE GUARD

One of the cool things about this power tool station is that it allows you to use a jig saw upside down like a scroll saw to make curved cuts (see *Photos, right*).

Of course, to use a jig saw in its table-mounted position, you need a blade guard. This guard keeps your fingers out of the way of the blade. And a built-in dust blower keeps the cutline clear as you work (see *Blade Guard, below*).

This guard is just a hardwood arm, sandwiched between two uprights, which are mounted to a base. A pair of Plexiglas shields protect your fingers as you cut. The guard can be mounted in two positions: at the end of the table for cutting small pieces, or at the side for longer stock (*Photos, right*).

To make and install the blade guard, cut the base (E), uprights (F), and arm (G) to size on the table saw. Then cut two rabbets in the end of the arm to accept the Plexiglas shields (H).

The arm is secured between the uprights by a bolt threaded into a T-knob. Drill a hole in each upright for the bolt. You'll also need to drill two mounting holes in the arm (one for each

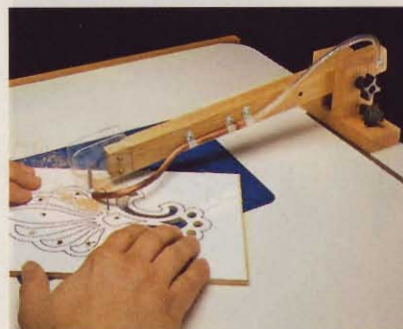
mounting position). That done, assemble the blade guard, and thread on the knob.

The next step is to mount the blade guard on the table. Position it so the shields are centered around the jig saw blade. Attach the guard in this position with double-sided tape, and drill mounting holes in the table, using the holes in the base to guide your drill bit. Repeat this process to drill mounting holes for the blade guard in the other position.

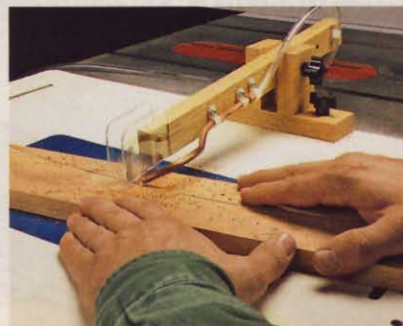
With the holes drilled, install T-nuts underneath the table. Then thread star knobs into these T-nuts to lock the guard in position (*Mounting Detail*).

Dust Blower — To clear dust from the cutline, I added a dust blower next. The air supply for the blower is an inexpensive air pump for an aquarium. Tubing runs from the pump to the arm of the blade guard, where it's attached with cable hangers. I inserted a short length of copper tubing into this hose, which I bent to direct it at the cutline.

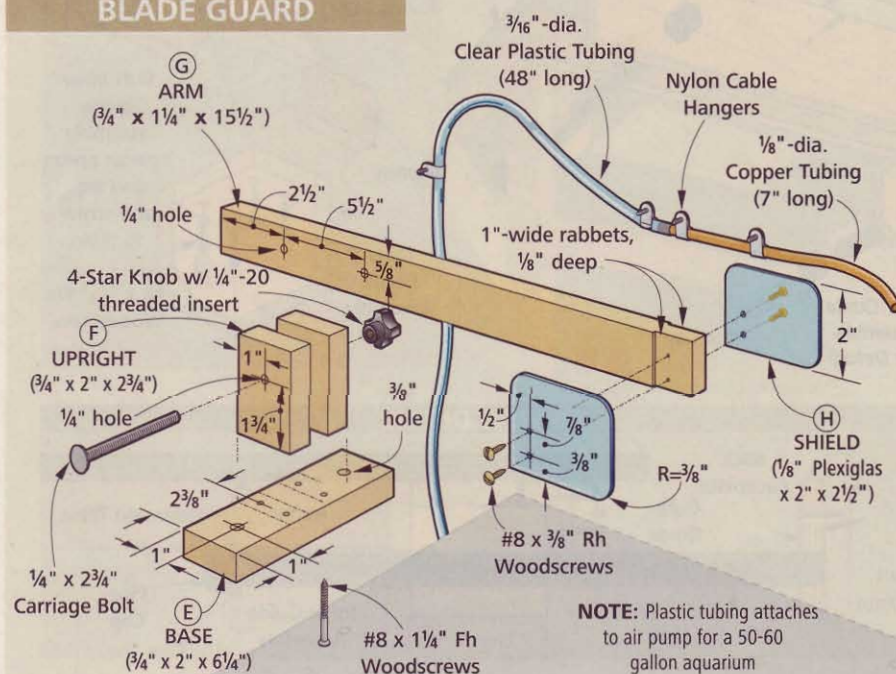
Instead of mounting the air pump, just set it on the bottom rail. This makes it easier to move when you reposition or remove the blade guard.



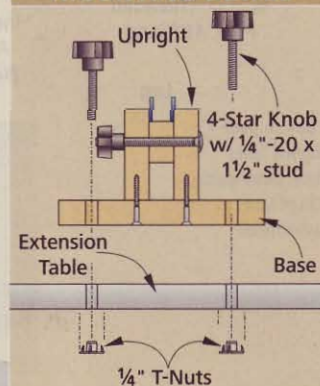
This blade guard protects your hands from the blade when using the jig saw station. It can be positioned behind the blade for making scroll cuts on small workpieces (*above*), or on the side of the blade for working with long pieces (*below*).



BLADE GUARD



MOUNTING DETAIL





If you have to crosscut a long board or a large panel, simply pull out this built-in side support. It increases the capacity of the table saw by 12".

add more utility with a PULL-OUT SUPPORT

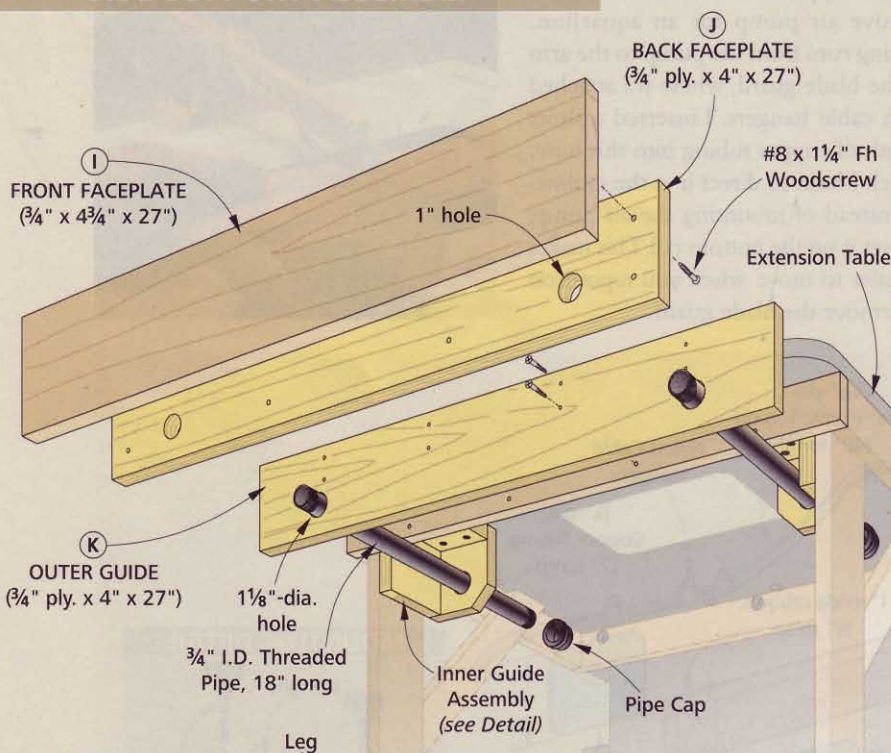
With the addition of a pull-out side support, you can make this power tool station even more versatile. When fully extended, it adds 12" of support to the side of the extension table, making it ideal for crosscutting long boards and panels (*Photo, left*).

The extended side support serves another purpose, as well. When using a jig saw in its handheld position, it supports the workpiece and provides plenty of clearance for the saw blade underneath (*Photo, page 68*). The top edge of the support aligns with the top of the table, so workpieces will lie flat on them.

Support Anatomy — As you can see in the main *Illustration* below, the side support consists of a front and back faceplate (I, J), an outer guide (K), two inner guide assemblies, and a couple of black-iron pipes, which are threaded on both ends. To prevent the side support from racking when you pull it out, the pipes slide in and out of holes in the inner and outer guides.

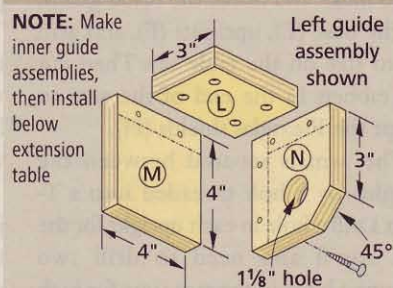
To make all this work properly, there are two important things to be aware of. First, the holes in the back faceplate are smaller than those in the guides, so the pipes will thread into them. Larger holes

SIDE SUPPORT ASSEMBLY

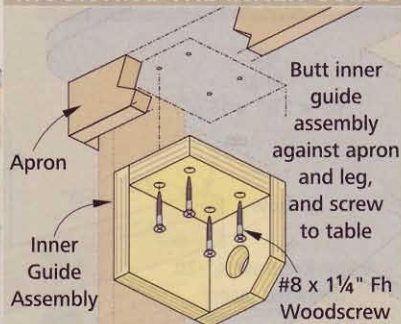


NOTE: See Box on page 73 to drill aligned holes in back faceplate, outer guide, and backs of inner guide assemblies

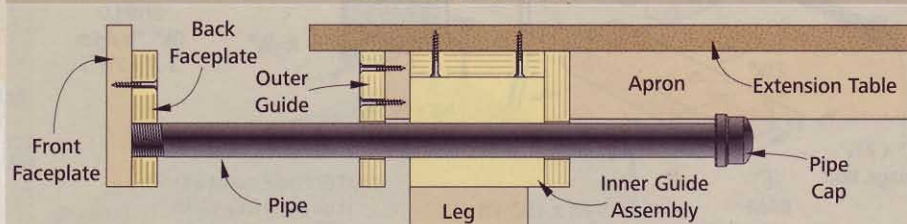
INNER GUIDE ASSEMBLY



MOUNTING THE INNER GUIDE



SIDE VIEW DETAIL



in the guides let the pipes slide smoothly through them.

The second consideration is that the holes in the inner guide assemblies, outer guide, and back faceplate must align to prevent the pipes from binding. The *Box* below shows an easy way to drill perfectly aligned holes.

With the holes drilled, you can begin assembling the side support. Start by screwing the front and back faceplates together, making sure the ends and bottom edges align. Next, center the outer guide on the length of the table apron, butt it against the underside of the table, and screw it in place.

The two inner guide assemblies are next. Each assembly consists of three pieces: a top (L), side (M), and back (N).

Screw the three pieces together as shown in the *Inner Guide Assembly*. Then butt each assembly into the corner formed by the table apron and leg, and screw it in place (*Mounting Inner Guide*).

Now it's time to thread the iron pipes into the holes in the faceplate. As I mentioned, the holes are sized so the threads will cut into them as you turn the pipe. But to make sure the pipes stay put, it's best to apply a bead of construction adhesive on the threads before you attach them (see *Photo, right*).

When the construction adhesive sets, apply paste wax to the pipes to help them slide smoothly. Then slip the pipes through the holes in the guides. Finally, thread a cap on the end of each pipe to prevent it from pulling out. 



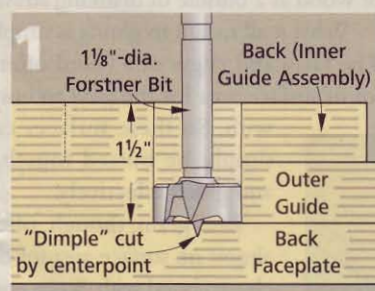
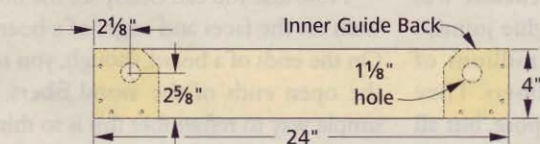
The holes in the back faceplate are sized so that these $\frac{3}{4}$ " (inside diameter) black-iron pipes will thread into them. Still, apply a bead of construction adhesive to the threads to ensure that the pipes will stay put once they're in place.

Shop Tip: Drilling Aligned Holes

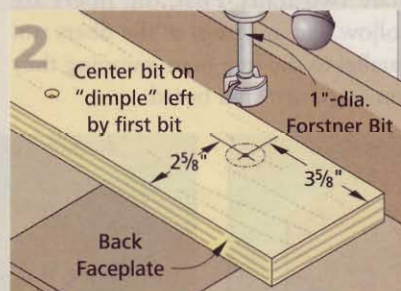
To prevent the pipes on the side support from binding, the holes they pass through must align precisely. The best way to do that is to stack the pieces together when drilling the holes.

There are two things to keep in mind. First, the backs for the inner guide assemblies are offset $1\frac{1}{2}$ " from the outer guide and back faceplate. This is due to the combined thickness of the leg and apron. To simplify the setup, start with one long blank for the backs of the inner guide assemblies (*Detail, below*). Then cut the backs to length after drilling the holes.

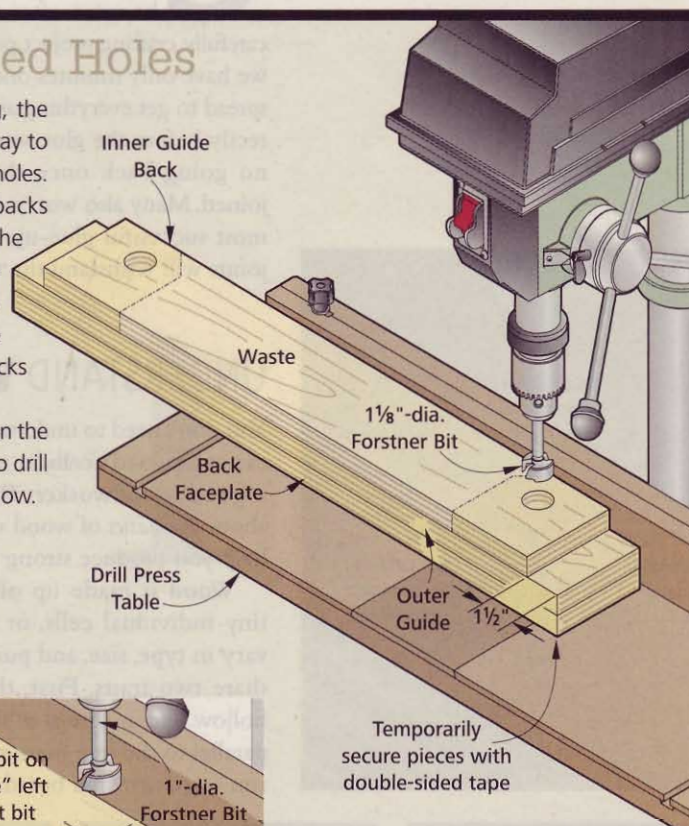
Second, the holes in the back faceplate are smaller than the other holes. This allows the pipes to thread into them. To drill different size holes, use the two-step process shown below.



1] Drill through the top two pieces with a $1\frac{1}{8}$ " Forstner bit, leaving a "dimple" in the bottom piece.



2] Remove the top two pieces, and use a 1" Forstner bit to drill the two holes in the back faceplate.





Gluing up anything, from a simple panel to a complex case, will go well if you plan ahead, dry fit and mark your parts, and have your supplies ready when you begin.

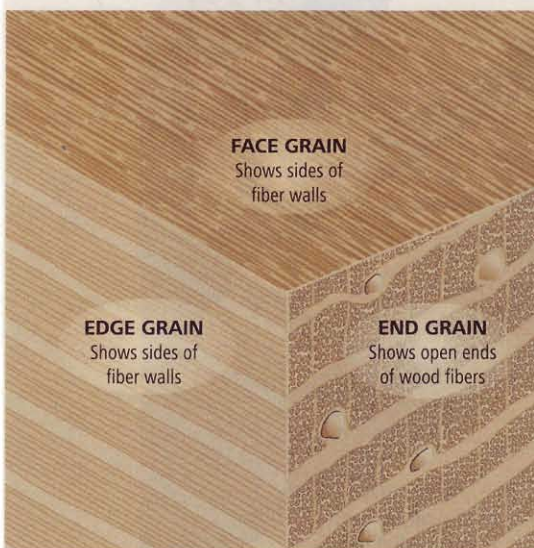
10 TIPS FOR SUPER-STRONG GLUE JOINTS

Learn the right techniques for gluing up joints, and your projects will go together quickly and easily — and stay together permanently.

Gluing up a project is an intimidating process for many woodworkers. That's because after many hours carefully crafting project parts, we know we have only minutes once the glue is spread to get everything assembled correctly before the glue sets. And there's no going back once the pieces are joined. Many also worry, even after the most successful glue-up, whether the joints will withstand the test of time.

But instead of being stressful, gluing can be one of the easiest parts of project construction. You just need an understanding of what makes a good glue joint, along with how to prepare, assemble, and clean up the project parts afterward.

That's precisely what we'll show you over the next few pages. Along the way, you'll also learn about the three most useful types of woodworking glues. But it all begins with a basic understanding of the material to be joined: the wood.



UNDERSTAND WOOD STRUCTURE

You don't need to understand the intricacies of wood's cellular makeup to be a good woodworker. But knowing about the *basics* of wood structure will help you produce strong glue joints.

Wood is made up of millions of tiny individual cells, or fibers. They vary in type, size, and purpose, but all share two traits. First, the fibers are hollow. Second, most of the fibers run parallel to the tree stem, meaning they run *lengthwise* in a board.

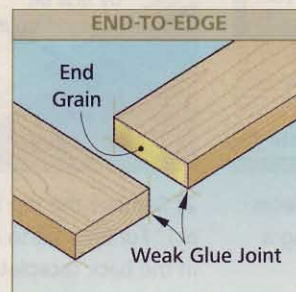
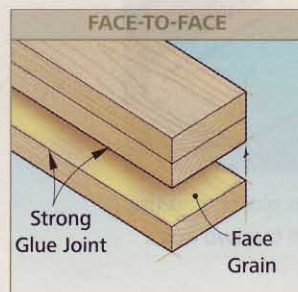
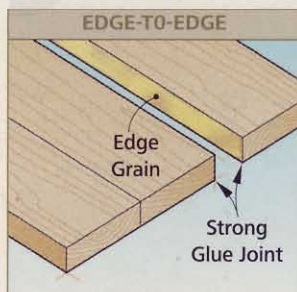
Take a close look at a board, then, and you'll see different parts of those fibers exposed (*Illustration, left*).

Note that you can clearly see the fiber walls on the faces and edges of a board. On the ends of a board, though, you see the open ends of the wood fibers. A simple way to remember this is to think of wood as a bundle of drinking straws.

What it all means to gluing is simple. The faces and edges of a board offer a lot of surface area for the glue to bond

with. So these surfaces can simply be butted together and glued effectively.

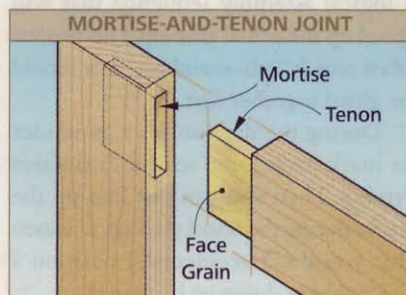
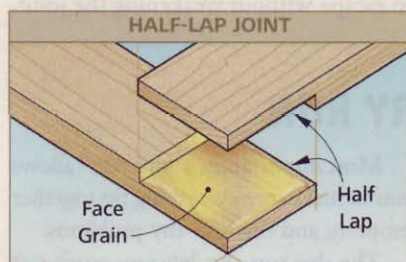
End grain, though, offers almost no surface area for the glue to bond with. So an end-grain joint needs more for a strong connection — either a mechanical fastener or some type of machined joinery.



MACHINE JOINTS TO ADD GLUE SURFACE

From *Tip 1*, we know that end-grain joints are weak. Yet many projects call for them. In a door frame, for example, the ends of the rails (horizontal members) mate with the edges of the stiles (vertical members). If the pieces are just butted together and glued, the joint will fail.

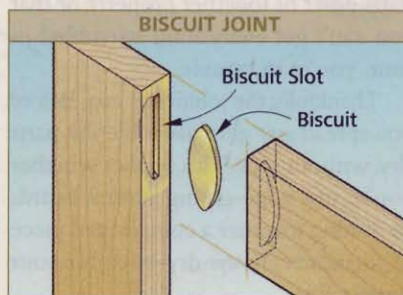
The secret to creating a strong glue joint is to add surface area. That's done by machining the mating pieces to add face-grain to the joints. Several types of joints can accomplish this. A few are shown in the *Illustrations* below.



Half-Lap — One of the simplest ways to add face grain is with the half-lap. In this joint, half the thickness of each mating piece is cut away where they overlap. This forms a strong joint and keeps the faces of both pieces flush.

Mortise-and-Tenon — A mortise-and-tenon is similar to a half-lap in many respects. In this case, a slot (known as a mortise) gets cut into one of the mating pieces. Then, the end of the other piece is cut on both faces and edges to form a tongue, or tenon. The mortise-and-tenon offers two advantages over the half-lap: The glue area is larger, and the joint is invisible from both sides.

Biscuits — A modern variation on the mortise-and-tenon is the biscuit joint. Here, the mortise and tenon are replaced by matching slots cut in each mating piece, and a plate (commonly called a biscuit) that fits into them.



START WITH SMOOTH SURFACES

One notion that's been around for years is that two surfaces that will be glued together should be slightly roughened up, so the two pieces can get a bit of "bite" on one another. Another misconception is that if those surfaces are too smooth, all the glue will just squeeze out of the joint when the pieces are clamped together.

As it turns out, both of these ideas are myths. For a strong glue joint, the two surfaces to be joined have to be as smooth as possible.

To really understand why, you'd have to dive further than necessary into the

science of how glues bond. But it's important to know that glue bonds at a molecular level, which means the glue and wood actually "fuse" together. If there are gaps between the pieces caused by rough surfaces, this bonding process can't happen efficiently.

What you need to do, then, is make the mating surfaces flat and perfectly smooth, especially when you're after a "seamless" joint, such as a glued-up panel for a tabletop.

To create these smooth surfaces, keep your saw blades, planer and jointer knives, hand planes, and chisels sharp.



"YELLOW" GLUES

By far the most common and useful glues in woodworking are polyvinyl acetate glues (PVAs), most often referred to simply as "yellow glues." These glues are similar to ordinary white glue (school glue) but in a more refined version. Manufacturers give them names like "wood glue" or "carpenter's glue."

When it comes to bonding wood, yellow glues are tough to beat. They bond with wood fibers on a molecular level to form glue joints stronger than the wood itself. And yellow glues are the "go-to" glue for about 90 percent of all woodworking projects.

You'll find yellow glue in a variety of formulations from standard glue for indoor projects to water-resistant, and even waterproof glue.

There are also slow-setting versions that give you extra time to get complex assemblies put together.

Best of all, yellow glues are inexpensive and easy to use.





POLYURETHANE ADHESIVES

Polyurethane glue is the relative new kid on the woodworking block. It works differently than standard yellow glue and can offer advantages in certain situations.

First of all, polyurethane glue is waterproof, meaning it can be used for projects that sit outdoors. This type of glue is also flexible to withstand climate extremes well.

Polyurethane glue bonds non-porous materials, as well, such as glass, metal, and plastic. So it's ideal for projects that include these materials.

Unlike yellow glue, which cures when exposed to air, polyurethane glue cures when exposed to moisture. That means you'll have to dampen the wood to ensure enough moisture.

Most of these glues foam up and expand a great deal as they cure, too. This causes a lot of squeeze-out and can push apart joints that aren't clamped properly.



A TIGHT FIT IS THE RIGHT FIT

Another debate that commonly arises about glue joints centers on how tightly the joints should fit together.

One side says the joint should have to be forcibly pounded together. The other says the joint should slip together easily, with just a little "play" to make room for glue.

Actually, neither side is right in this debate. If the joint is too tight, the glue can get pushed out during assembly resulting in a weak joint. If there are gaps between the mating surfaces, on

the other hand, the glue won't bond well. Again, this results in a weak joint.

When assembling a machined joint, it should go together with firm hand pressure or just a few taps from a mallet. Getting this perfect fit starts long before the glue-up begins, with "test joints" to ensure your setups are correct.

With mortise-and-tenon joints, one other tip helps ensure success. Make the tenon $\frac{1}{16}$ " shorter than the depth of the mortise. This provides space for glue to escape without weakening the joint.

PLAN AHEAD WITH A DRY RUN

Once you spread glue onto your project parts, you only have a few minutes to get everything together before the glue begins to set. So if you find out that parts don't fit together properly, or that you can't get everything assembled in time, you're in trouble.

Thankfully, the solution is easy. Before you spread any glue, assemble the parts dry, without glue. This applies whether you're just edge-gluing several boards or putting together a complicated piece of furniture. *Always* dry-assemble your project first.

Most importantly, a "dry run" allows you to make sure everything fits together properly, and then fix any problems.

The dry run also lets you work out a logical assembly sequence that will speed up the actual glue-up. This process often reveals "sub-assemblies" that should be glued together first.

During the dry run, it's a good idea to mark each joint with a distinctive symbol. Then you can just line up the marks during the actual glue-up to ensure that you don't accidentally position a piece upside down or backward.

USE FRESH GLUE

Most woodworking glues have a shelf life of just one to two years. Glue older than that *may* still work, but it won't have the holding power of fresh glue.

So, how do you know just how old your glue is? Glue manufacturers don't print expiration dates on the labels. But Titebond prints a coded manufacturing date on the bottle (Photo, right).

To make sure your glue is fresh, don't buy more than you can use before it expires. And write the month and date of purchase on the bottle.

Also, don't let glue freeze. This can ruin the glue or at least shorten its life.



DECODE THE DATE STAMP

Titebond bottles show the year the glue was made, followed by the month ("A" through "M;" the letter "I" isn't used).

A LITTLE TOO MUCH GLUE IS JUST ENOUGH

There's no exact formula for determining how much glue to use in a given joint. You can see this by the ambiguous statements on glue bottles like "coat both surfaces" or "apply liberally."

If there's a general rule, though, it's that too much glue is better than too little. Excess glue may squeeze out and make a mess when clamped, but that beats a "starved" glue joint.

When applying glue, spread an even layer just thick enough to obscure the wood grain, and make sure there are no gaps (*Photo, top right*). In most cases, coating one of the two mating surfaces should do the trick.

You're actually trying to apply just slightly more glue than the joint requires. That way, when you bring the pieces together and tighten the clamps, a small amount of glue will squeeze out and form a series of small beads along the joint line (*Photo, bottom right*). No beads means not enough glue, while glue dripping from the joint line means that you've applied too much.

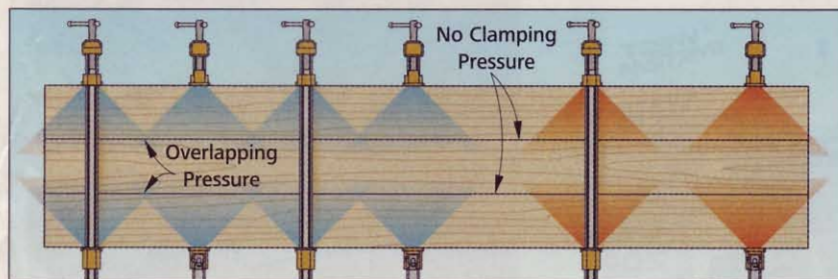
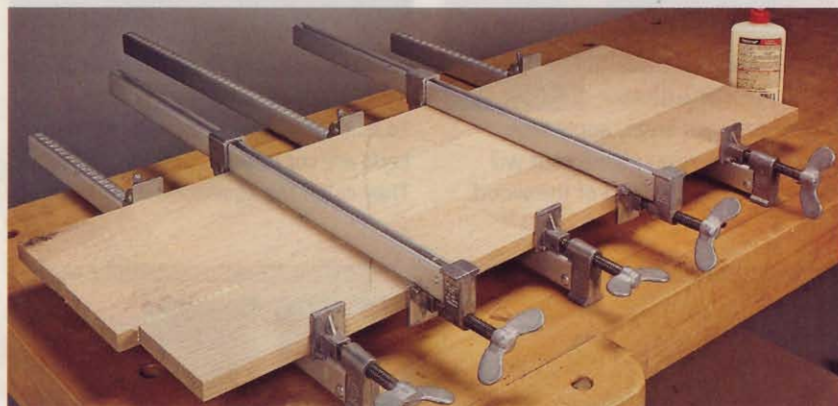
As important as it is to get an adequate amount of glue in a joint, it's also imperative that you don't spend too much time fussing around when spreading the glue. Woodworking glues have a limited amount of working time,

referred to as "open" time, before they begin to set. For most glues this usually averages about 10 minutes. So you need to work reasonably quickly (though not frantically) as you spread the glue and tighten the clamps.



VISUAL CUES SHOW THE RIGHT AMOUNT OF GLUE

Spread glue in a thin, even layer, making sure to coat the entire surface (*top*). When clamped, small "beads" of glue will squeeze out along the joint (*bottom*).



SPACE CLAMPS EVENLY

Gluing up a solid-wood panel seems simple. It's just a series of straight, square edge joints. Yet keeping a panel flat and free of gaps can be challenging. The key to success is in proper clamp positioning.

To prevent gaps, you need enough clamps to distribute pressure evenly. Clamp jaws exert pressure at roughly 45° angles, and you want the pressure to overlap slightly (*Illustration, left*). So for boards 4" to 8" wide, place a clamp about every 8" to 10". Narrower boards require even closer clamp spacing. Also, alternate the clamps over-and-under the panel (*Photo, left*) to keep the panel flat.

Finally, tighten the clamps by either starting at one end and working toward the other, or starting in the middle and working toward each end. Tighten them just enough to draw the joint together.

SCRAPE AWAY SQUEEZE-OUT

Squeeze-out is not only inevitable, it's an important part of a good glue-up. But that means it needs to be removed. Here again, we find two schools of thought on how to best remove this excess glue.

One advocates wiping the squeeze-out away immediately with a damp rag. Often, though, clamps prevent you from getting to all of the glue. And it's easy to push glue into the pores of the wood. This glue residue may not be visible until you apply a stain or finish.

A better way to remove squeeze-out is to scrape it off (*Photo, right*). Wait until the glue beads dry to a rubbery texture

and no longer ooze liquid when you press on them with a fingernail.

Most yellow woodworking glues will harden adequately in about 20 or 30 minutes. And, conveniently enough, this is about how long you need to wait before unclamping the assembly. That means the clamps won't get in your way when scraping the squeeze-out.

After scraping off squeeze-out, a small amount of residue may remain. Wait a few hours, and then sand this away.

If squeeze-out hardens completely, use caution to prevent tearing the wood fibers as you scrape off the glue.



SCRAPE ALONG THE GLUE LINE

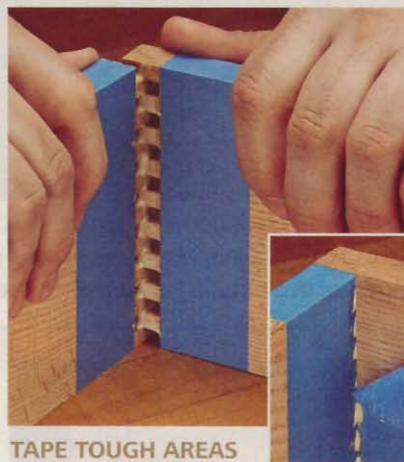
Allow squeezed-out glue to dry until rubbery (20 to 30 minutes), and then remove it with a chisel or scraper.

STOP SQUEEZE-OUT

Most of the time, cleaning up squeeze-out is no big deal. But in instances where the squeeze-out is hard to get to, you'll need to take a different approach.

One of the simplest methods is to place masking tape along the joint line before gluing and clamping (*Photo, near right*). Any squeeze-out will collect on the tape, which you can just peel away once the glue gets rubbery.

If you absolutely need to prevent squeeze-out, another option that works in some situations is to cut relief kerfs in one of the mating pieces to catch it (*Photo, far right*).



TAPE TOUGH AREAS

In hard-to-reach areas, apply tape before gluing. Any squeeze-out will stick to the tape instead of the wood.



KERFS TRAP GLUE

To stop squeeze-out completely, two kerfs are cut into this applied molding. They catch the squeeze-out and stop it.

EPOXY ADHESIVES

Epoxy has long been the adhesive of choice for bonding dissimilar materials and making waterproof joints and coatings.

Epoxy is made up of two parts: a resin and a hardener. When mixed together, they form an adhesive that is rock hard, waterproof, and won't shrink. By varying the type or quantity of hardener, manufacturers can manipulate everything from working time to strength to spreadability.



HOW TO BUILD BETTER BUILT-INS

The secret to great-looking built-ins is getting a perfect fit in a less-than-perfect space. These simple tips show you how.



Built-in cabinets can transform a room. In fact, they often become the focal point of the entire space (as the book nook on page 40 proves). So to look their best, built-ins have to fit into the space perfectly — like a hand in a glove.

But getting that perfect fit can be frustrating. After all, no matter how carefully you build the project, it will likely

have to fit into a less-than-perfect room. That's because floors and ceilings aren't always level, walls may not be plumb, and corners aren't exactly square.

Actually, building a built-in that fits isn't as tough as you'd think. You just have to know how built-in cabinets are designed, as well as how to survey the space the cabinet will occupy so you can come up with correct cabinet sizing.

BUILT-IN DESIGN BASICS

Built-in cabinets have something to hide: Behind the form-fitting facade, they aren't built to exactly fit the space at all.

Start Small — That's right, a built-in cabinet actually starts out *smaller* than the space it will occupy (*Built-In Cabinet Design*, left). That allows the cabinet to slip easily into its space. Of course, this means there will be gaps around the cabinet that will have to be filled in.

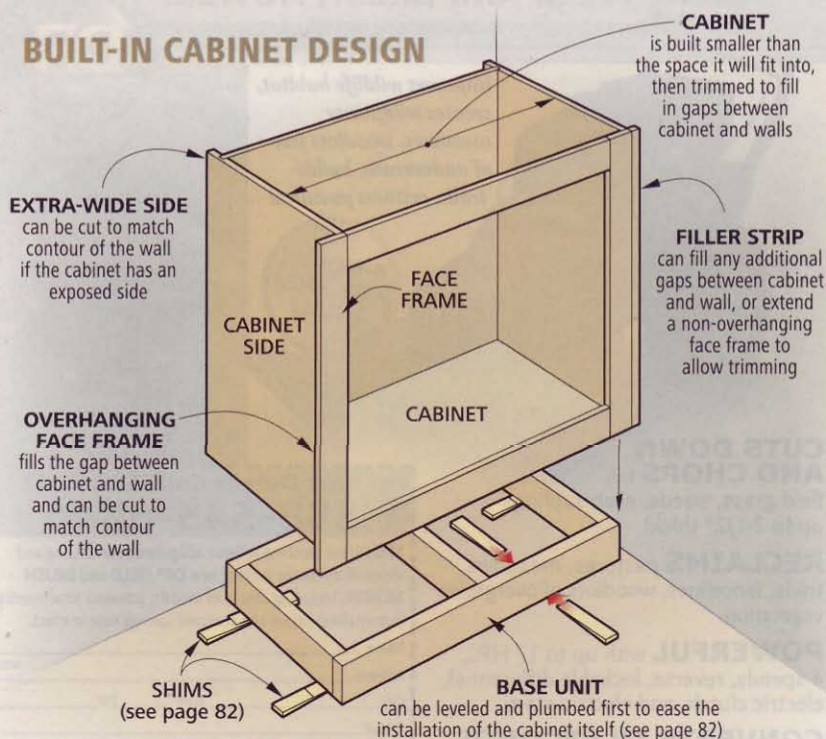
Overhangs Fill the Gaps — The solution for concealing those gaps is to add pieces that overhang the cabinet and span the gaps. Later, these pieces get trimmed to fit tightly against the surfaces they abut. (This is called scribing, and is discussed starting on page 82.)

Face Frames & Filler Strips — At the front of the cabinet, a common way to hide the gaps is with a face frame. You can also extend a face frame to make it overhang by gluing on filler strips.

Wide Sides also Hide — If the sides of the cabinet will show, build them extra wide, so they extend beyond the back panel. Again, the excess will span any gap between the cabinet and wall.

Add On to Fill In — Sometimes it's impractical to build the gap fillers into the cabinet. In those cases, add filler strips or molding. In the book nook on page 40, for example, we used crown molding to cover the gap at the ceiling.

BUILT-IN CABINET DESIGN



TAKE A SITE SURVEY

Before you can build your cabinet, you'll have to figure out what size to make it. This is done with a site survey.

Measurements are an important part of a site survey, of course, but the process also reveals the "problem" areas in a room. The process is explained below, and in the *Illustrations* at right.

As you work through the site survey, you'll want to record all the results so you can use them later to help size the cabinet. For the most accurate survey, draw a simple room diagram.

Measure First — Start by measuring the area where the built-in will be located (Fig. 1, right). To do this right, you'll need to check the distances from wall to wall and floor to ceiling in several places.

Check Level & Plumb — Next, use a long level (4' or longer is ideal), and check to see if the walls are plumb and the floor and ceiling are level (Fig. 2). This will show whether the gaps between the cabinet and walls will be consistent from top to bottom, or tapered.

See if It's Square — Next, check the corners of the room with a framing square. This shows whether the cabinet can be tucked into a corner, or whether it will need to be pushed out a bit to fit.

Look for Bows — The last step in the site survey is checking the flatness of the walls (Fig. 3). Even if they appear flat, they may bow in or out or be rippled. Knowing this will give an indication of how easy or complicated your scribing cuts later will be.

SIZE THE CABINET

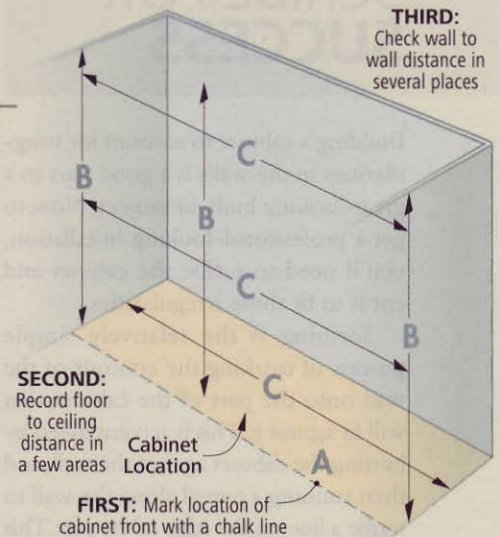
With the site survey complete, you can size the cabinet. First, find the *smallest* width and height measurements, and subtract about 1". Build your cabinet to these undersize dimensions.

Once you know how large the cabinet will be, compare its size to the *largest* width and height measurements. The differences tell you where you'll need to add overhangs, as well as how wide they will need to be. And you'll know whether those overhangs are consistent or if they vary by examining if and where the walls are out of plumb.

SURVEY THE SITE

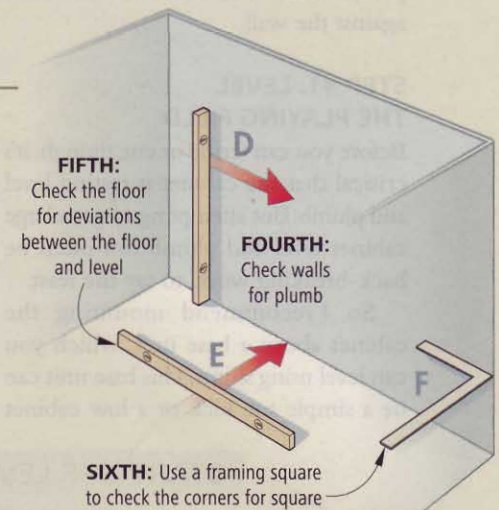
1] MEASURE SPACE

- A** Determine the rough location of the cabinet in relation to the walls by snapping a chalk line.
- B** Measure from floor to ceiling on both ends of the room. Record the measurements as you go.
- C** Next, measure from wall to wall in several areas, and write down any differences in your numbers.



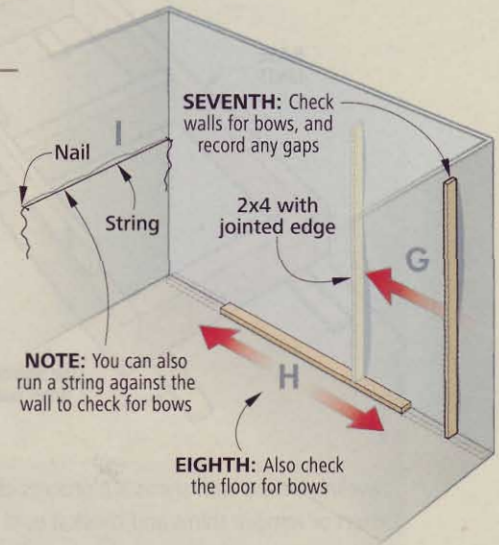
2] PLUMB & LEVEL

- D** Use a long level to check the walls for plumb. Measure and record any deviations.
- E** Check the floor with the level in a similar fashion. Again, write down deviations.
- F** In the corners, hold a framing square against the walls to check for square.



3] CHECK FOR BOWS

- G** Last, check the flatness of the walls using a long straightedge. A jointed 2x4 works well.
- H** Also check the ceiling and floor as necessary, and write down any discrepancies you find.
- I** Another way to check for bows is to run a string along the wall and look for gaps.



SCRIBE FOR SUCCESS

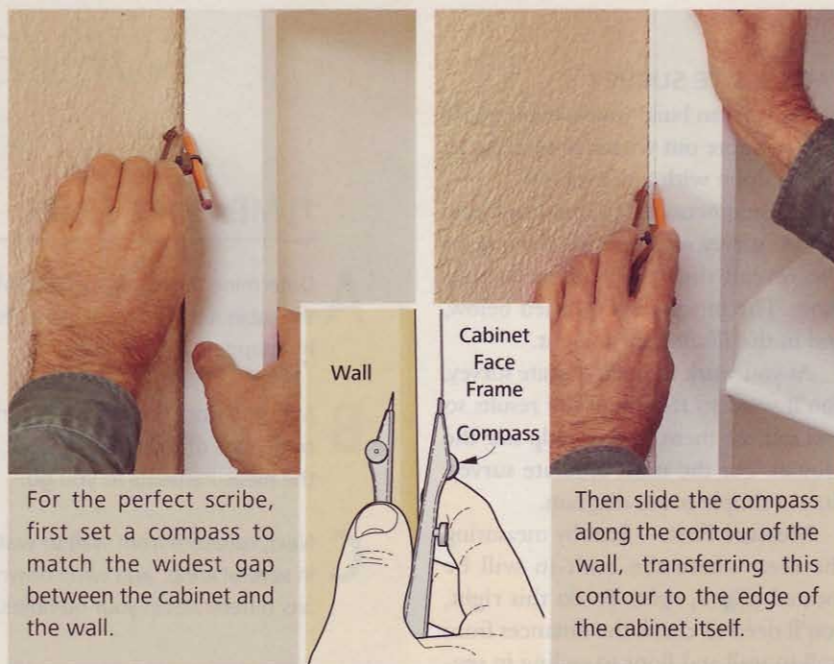
Building a cabinet to account for irregularities in the walls is a good start to a great-looking built-in project. Now, to get a professional-looking installation, you'll need to scribe the cabinet and cut it to fit those irregularities.

Scribing is the relatively simple process of marking the contour of the wall onto the part of the cabinet that will fit against it. This is accomplished by butting the cabinet against the wall, and then running a pencil along the wall to scribe a line on the edge of the part. This part is then cut to the scribe line to fit against the wall.

STEP #1: LEVEL THE PLAYING FIELD

Before you can scribe or cut, though, it's critical that the cabinet is resting level and plumb. But attempting to get a large cabinet level and plumb can often be back-breaking work, to say the least.

So I recommend mounting the cabinet above a base unit, which you can level using shims. This base unit can be a simple toe kick or a low cabinet



For the perfect scribe, first set a compass to match the widest gap between the cabinet and the wall.

Wall
Cabinet Face Frame
Compass

Then slide the compass along the contour of the wall, transferring this contour to the edge of the cabinet itself.

like we used in the built-in book nook (see page 40).

An overview of how to level a base unit is shown in *Start Off Level* below left. First, set the base on the floor, and check to see if it sits level. Then, insert shims, and check it for level again. Make adjustments until it's resting level. Once it is, secure the base unit to the wall. Then, trim off the exposed portion of the shims.

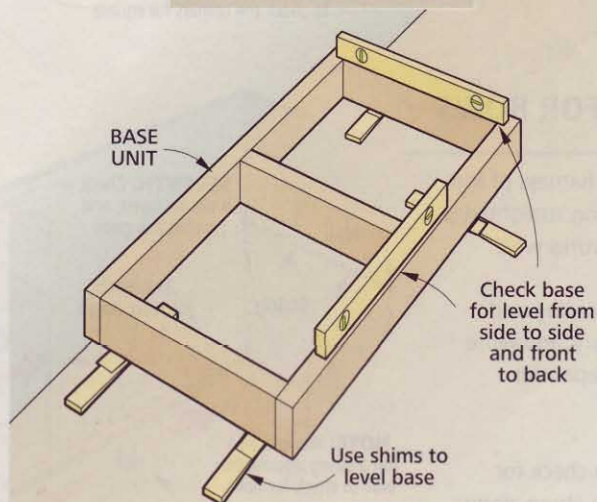
Double-Check the Cabinet — With the base installed, you can set your

cabinet in place above it. But before you begin to scribe lines onto the cabinet, it's a good idea to do a quick double-check on the cabinet itself (*Illustration, below right*).

STEP #2: SCRIBE FOR SUCCESS

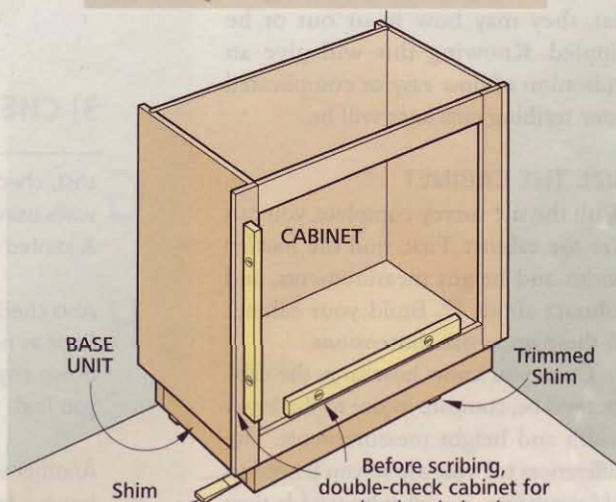
You're now ready to scribe the lines on the cabinet. As simple as scribing is, there are a few tips that will make it easier and more accurate. One tip is to scribe using a compass. The nice thing about a compass is that it's easily adjustable, so

START OFF LEVEL



Leveling a base with shims is a process of trial and error. Insert or remove shims and check it until it sits just right.

DO A QUICK DOUBLE-CHECK



Before you scribe, make sure the cabinet is sitting plumb and level. A quick double-check is all that it takes.

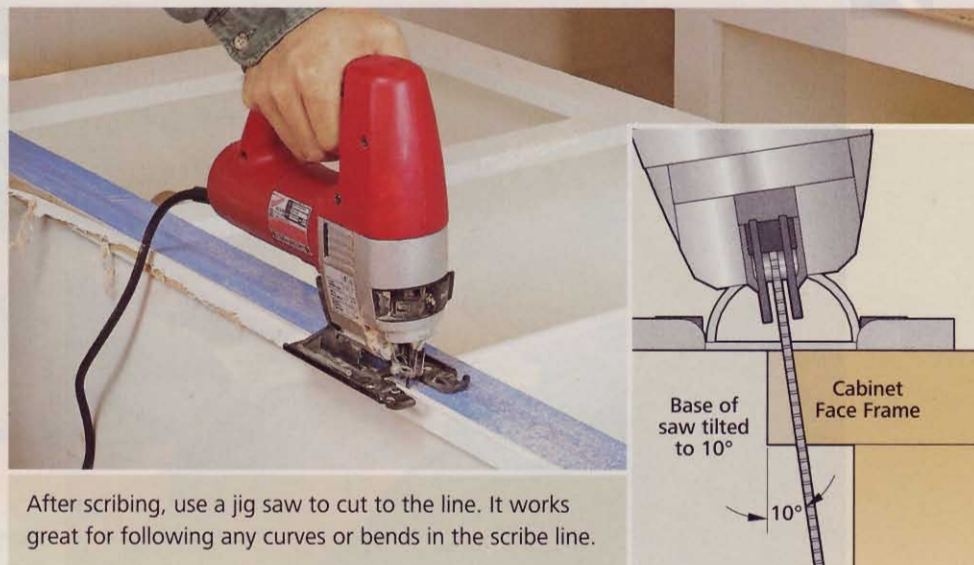
you can set it to the widest gap between the cabinet and the wall (*Photo, far left*). Then, place one side of the compass against the wall, and the other on the part to be scribed. Now run the compass along the wall, making sure to hold the compass at the same angle throughout the marking process (*Photo and Illustration, near left*).

If the cabinet has a visible side, chances are good that you'll have to scribe and cut both the face frame and side of the cabinet. To keep things simple, a good approach is to scribe and cut one area at a time. Start with either the most visible area, or the one with the largest gaps. Then move on to the next area.

STEP #3: SNEAK UP ON THE CUT LINE

Once you scribe your lines, it's time to trim off the excess material up to the marks. I've found that a two-step approach yields great results:

Use the Jig Saw First — For following the curves and contours of the scribe line accurately, it's hard to beat a jig saw. But don't cut the edge perfectly



After scribing, use a jig saw to cut to the line. It works great for following any curves or bends in the scribe line.

square. Instead, tilt the base of the saw to 10° and then “back bevel” the edge (*Photo & Illustration, above*). This extra step ensures a tight fit against the wall, and makes it easier to remove any additional material from the edge. Use tape to protect the surface as you cut.

Sneak up to the Line — Keeping this in mind, you can begin cutting to the scribe line. But I recommend cut-

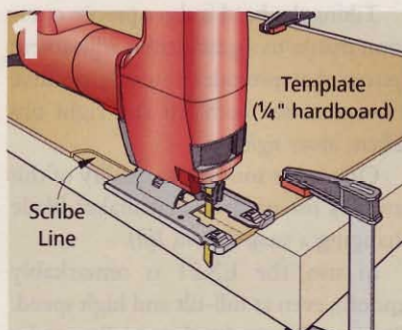
ting slightly *outside* the line first. Then, you can easily “sneak up” on the line using a sanding block or a block plane to get a perfect fit.

Once you have reached the scribe line, check the fit against the wall. If you still see any gaps, use the sander or plane to fine-tune the edge. Continue checking and tweaking this edge until it fits just right. 

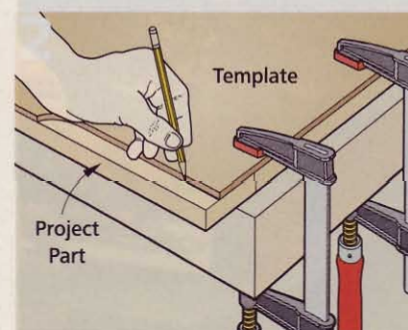
When (and How) to Use a Template



Cut the template to match the project part to be scribed. Set it in place, plumb and level it, and scribe it just like the project part itself.



1] Clamp the template to the edge of a work surface, and use your jig saw (or belt sander) to cut the template to match this scribe line.



2] Finally, clamp the template in place on the project part itself. Transfer the line from the template to the part, and then cut to the scribe line.



A large adjustment knob and two drive gears (front shown) make adjustments smooth. A locking lever holds the arm at the desired angle.

SCROLLING ROYALTY

Excalibur Scrollsaw

Not just for scrolling kings, even the common woodworker can wield this Excalibur to create princely pieces.

It's tempting to think of a scroll saw that sells for nearly \$900 as only for the most advanced scrollers. And it's true that the Excalibur brand has long been the bailiwick of the most discerning scroll saw aficionados. But this new EX21 scroll saw from

Excalibur is so feature-laden and user-friendly that anyone with even a slight inclination to embark on serious scroll work should give it serious consideration.

The most distinguishing feature of this scroll saw is its tilting head (*Photo, above*). This differs from conventional saws that require you to tilt the table for bevel cuts. The Excalibur design offers greater control because the table and, consequently, the workpiece remain level at all times.

Tilting the head is also a precise operation thanks to a gear-driven adjustment system that provides smooth, positive movement for both left and right tilts (*Photo, above right*).

One more innovative quality of this saw is a lift-up arm that makes blade changing a snap (*Photo, left*).

In use, the EX21 is remarkably smooth, even at full-tilt and high speed. This can be credited partially to the weight of the machine (much of which is contained in the massive steel table) and also to a V-belt drive system that dampens vibration from the motor.



Pierce cuts are simple with the arm lifted out of the way and the blade secure in the lower clamp.

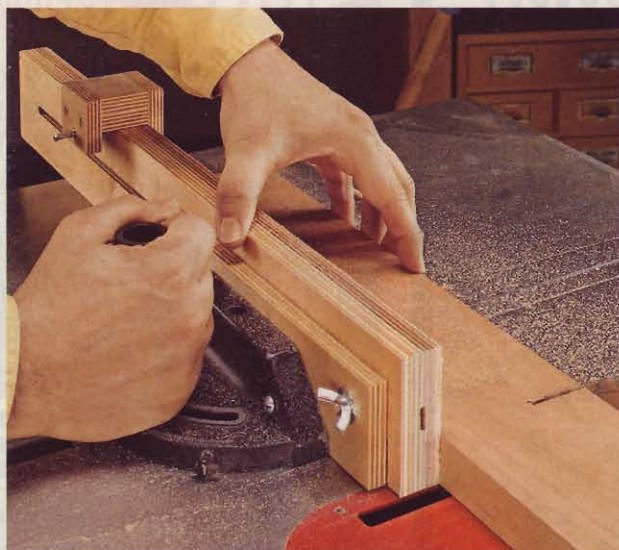
AT A GLANCE

Model: EX21
Price: \$870
Max. Thickness: 2"
Throat Capacity: 21"
Speed: 250 to 1,720 spm
Stroke Length: $\frac{3}{4}$ "
Blade Type: Plain-end only
Weight: 62 lbs.
Warranty: 5 years

Excalibur-Tools.com
800-357-4118

I also like having the on/off switch, speed control, and blade-tension lever located together just above the blade. Other features include a highly effective dust blower for keeping the cut line clear and onboard storage for blade tubes. The saw also boasts an impressive five-year warranty.

Visit Excalibur-Tools.com or call 800-357-4118 for more information.



Whether you're crosscutting or mitering, this sliding fence can tuck right against or even straddle the blade to offer maximum workpiece support for clean cuts.

AN ADJUSTABLE FENCE FOR YOUR

Miter Gauge

Get better results with crosscuts and miters by building this blade-hugging fence and adjustable stop block.

Adding a fence to a miter gauge is routine for most woodworkers. It provides more support for a workpiece than the miter gauge by itself.

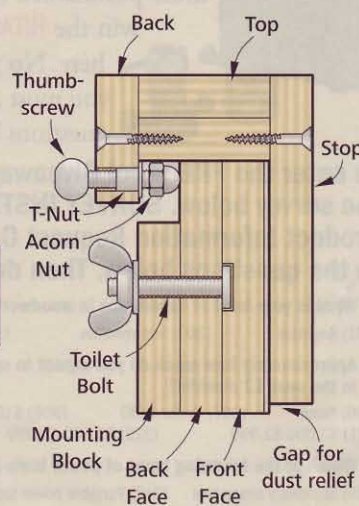
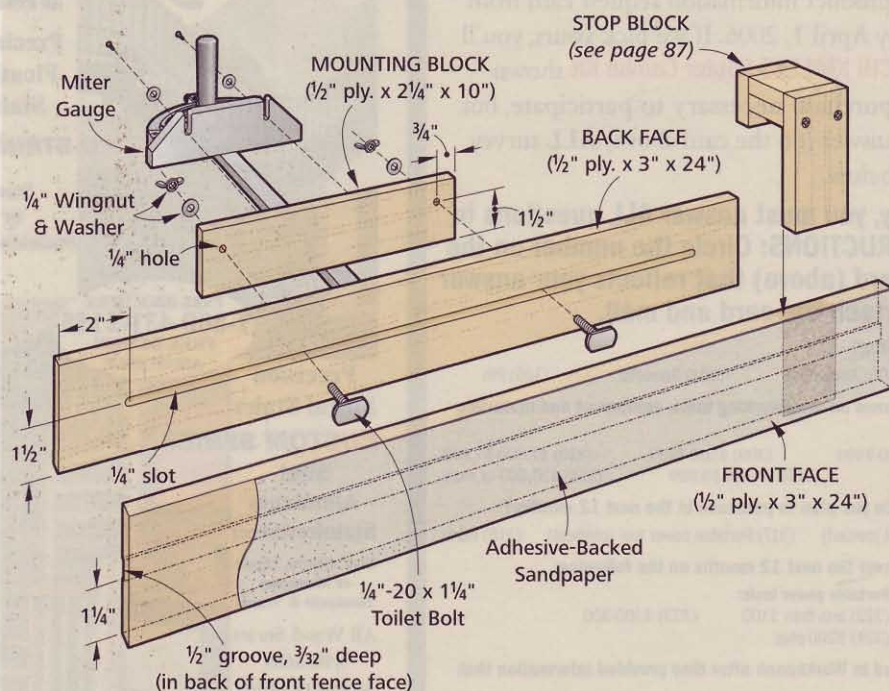
To make this good idea even better, Ray White of Bedford, OH, made an adjustable sliding fence for his miter gauge. This way, when he's making a crosscut (on either side of the blade) he

can tuck the end of the fence tight against the blade to put workpiece support where it's needed most (*Upper Photo*). And once in position, the fence locks securely in place. This sliding feature is a real plus when cutting miters, as well (*Lower Photo*).

For greater versatility, Ray added a simple stop block to the fence. It's easy to adjust and lock down for making repetitive cuts accurately.

Two-Piece Fence — The fence consists of two pieces: a front face and a back face, both made from 1/2" plywood. To

EXPLODED VIEW



SECTION VIEW

make the fence adjustable, the front face has a groove in the back to accept the head of a toilet bolt. The back face has a slot that the shanks of the bolts pass through. Gluing the two faces together forms a channel for the bolts. And this channel is what makes the fence adjustable.

To build the fence, first cut the front and back faces to size. Then use the table saw and a dado blade, or a router table and straight bit, to cut the groove in the front face.

To make the adjustment slot in the back face, drill a couple of end holes, and then remove the remaining waste with a straight bit in the router table.

The next step is to glue the two fence faces together, capturing the toilet bolts between them. To do this, first spread glue on the front face. Be sure to keep the glue

about $\frac{1}{4}$ " from the groove to prevent any squeeze-out from migrating into the groove. (Dried glue would interfere with the movement of the toilet bolts.) Next, insert the heads of the bolts in the groove. Then fit the back face over the bolts, and clamp the pieces together.

Mounting Block — Now that you've built the fence, you'll need a way to attach it to your miter gauge. This is done with a mounting block between the fence and the miter gauge.

The mounting block is a piece of $\frac{1}{2}$ " plywood with holes to accept the bolts in the fence. You want the mounting block as wide as possible to offer maximum support to the fence. But you don't want the block to interfere with the blade. The Box, below right, explains how to size the block to your saw.

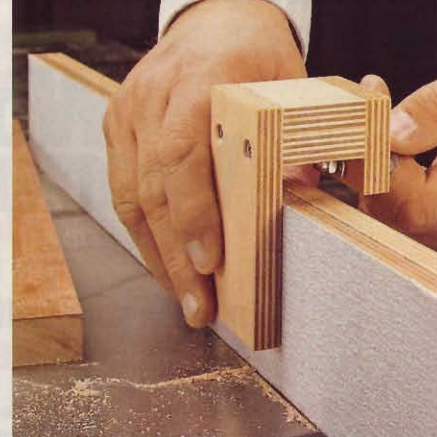
With the block cut to size, screw it to the miter gauge. Then attach the fence and secure it with wing nuts.

Stop Block — To make multiple cuts quickly and accurately, this fence has an L-shaped stop block (Photo, right). It slips over the top of the fence, and "locks" in place by tightening a thumbscrew.

Notice that the stop block is made up of the stop itself, a two-layer top, and a back (Illustration, below). To allow for dust relief, size the stop so it's $\frac{1}{8}$ " shorter than the width (height) of the fence.

To make the stop block, start by cutting all these pieces to size from $\frac{1}{2}$ " plywood. Then drill a hole in the back piece, and install a T-nut for the thumbscrew. Then glue the top pieces together.

When the glue dries, assemble the stop block with screws, as shown. All that's



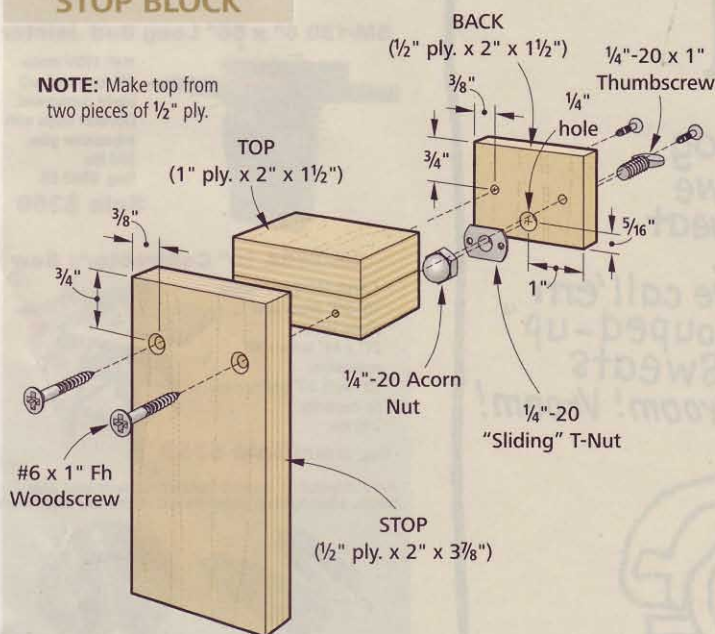
For quick setups and accurate repeat cuts, tighten the stop block on the fence.

left is to thread the thumbscrew through the T-nut and cap it with an acorn nut. The nut prevents the thumbscrew from digging into the fence.

Get a Grip — Once the fence and stop block are complete, apply a strip of adhesive-backed sandpaper to the front face of the fence. The sandpaper will keep a firm grip on the workpiece to prevent it from "creeping" as you cut. 

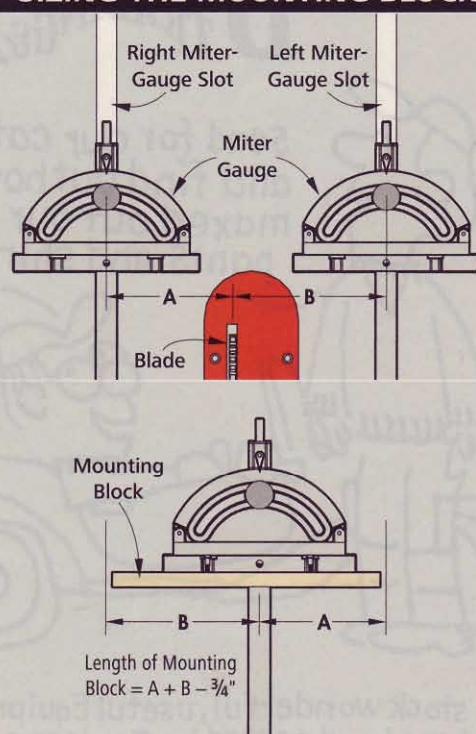
STOP BLOCK

NOTE: Make top from two pieces of $\frac{1}{2}$ " ply.



NOTE: "Sliding" T-nut available from Woodcraft.com (item #130440). Or grind flats on flange of ordinary $\frac{1}{4}$ "-20 T-nut.

SIZING THE MOUNTING BLOCK



7 GREAT UPGRADES TO MAXIMIZE

Band Saw Performance

Turn your band saw into the precision cutting tool you've always wanted.

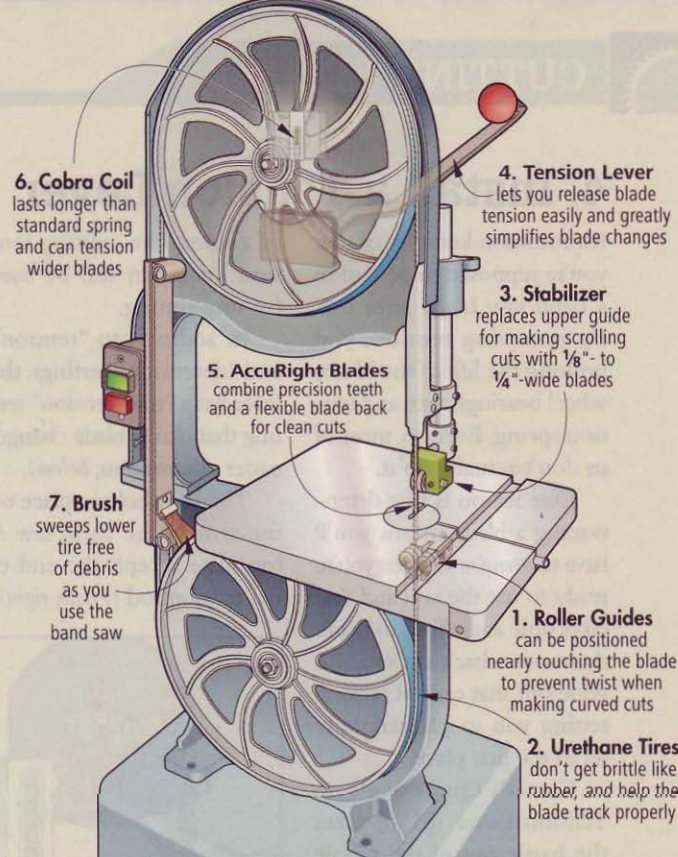
For more than 15 years now, Steve Curtis, *Workbench* craftsman, has used the same band saw to build many of our projects.

This saw has always been very reliable, but recently it became increasingly difficult to make accurate cuts. Not only that, the blade ten-

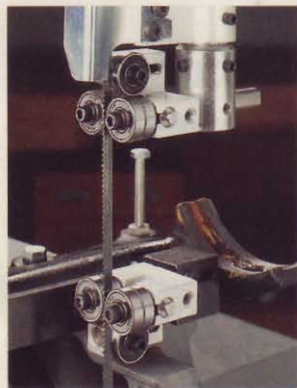
sioning and tracking adjustments just didn't work as well as they used to.

Being an experienced band saw user, though, Steve knew his saw had life in it yet. To revive his saw, he installed the seven accessories shown at right and got it running like new again.

Of course, these accessories aren't just for old saws. They'll also boost the performance of a brand new band saw.



These seven accessories will breathe new life into an old band saw or improve the performance of a new saw right out of the box. Sources for all accessories are listed on page 92.



1. Install Roller Guides

To produce an accurate cut, the guides on a band saw are designed to keep the blade from twisting. Some do that better than others.

Take these roller bearings from Carter Products, for instance. The round bearings can be set much closer to the side of the blade than the

standard guide blocks on many saws. This limits blade twist, especially when cutting a tight curve, producing a much more accurate cut.

Installing upper and lower roller bearings (sold as a kit for \$50) takes only minutes. They just bolt on in place of the existing guides.

2. Change Tires

On a properly tuned band saw, the blade "tracks," or rides, in the middle of the wheels. If it runs erratically, many people fiddle with the tracking adjustment but overlook the tires on the wheels. But the fact is, the rubber tires on most saws get brittle, so it's hard to maintain the tracking adjustment.

For about \$50, you can replace the rubber tires with urethane tires from Carter Products. These tires are soft and pliable, which improves tracking. Better yet, they retain this flexibility over time.

To change tires, just pry off the old ones and slip on the new. No adhesive is required.



3. Control Scroll Cuts

Sometimes even the best guide systems fall short when making intricate scroll cuts with a narrow blade ($\frac{1}{8}$ " to $\frac{1}{4}$ ").

The Stabilizer (\$75), also from Carter Products, has a grooved wheel that fully supports the back of the blade. Just replace the upper guides with the Stabilizer when scrolling.



4. Install a Tension Lever

It's common knowledge that you're supposed to detension a band saw blade after use. By removing tension, you prolong the life of the blade, wheel bearings, tires, and tension spring. Even so, most of us don't actually do it.

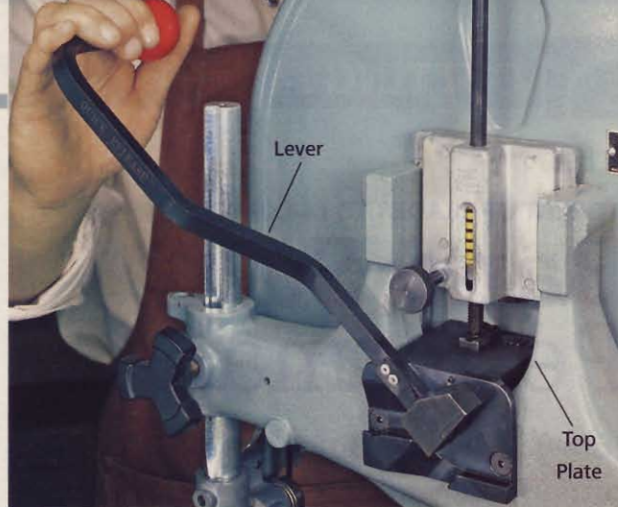
One reason is that detensioning a blade means you'll have to *retension* it when you're ready to use the saw, and that takes time and effort to crank the tension back up. You also wipe out that critical tension setting you so painstakingly set in the first place.

Carter's Quick-Release Tension Lever (\$150) takes the hassle out of the whole business. It allows you to detension the blade when you're done using the saw, and then return to the same tension setting with the flip

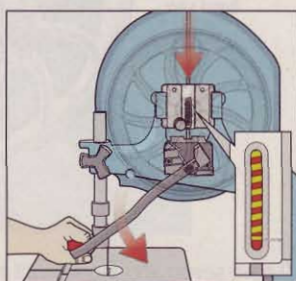
of a lever. The existing tension knob can still be used for fine-tuning.

In addition to "tension" and "detension" settings, the lever has a "mid-tension" setting that makes blade changes easier (*Illustrations, below*).

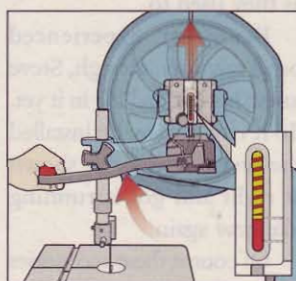
The lever bolts in place on the arm of the band saw. A top plate accepts the end of the tension rod (*Photo, right*).



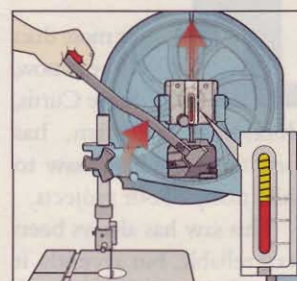
This Quick-Release Tension Lever makes it easier to detension the band saw blade when you're done using the saw.



1] The "detension" setting takes pressure off the blade when it's not in use.



2] Positioning the lever at the "mid-tension" setting is handy for adjusting blade tracking.



3] Finally, shift the lever to its "tension" setting to restore the preset tension.

5. Buy a Better Blade

Recently, we had the opportunity to try out some new band saw blades from Carter Products, called "AccuRight."

These blades have precision-milled teeth for clean cuts and a flexible back for longer blade life. We haven't used the blades long enough to confirm their longevity. But the crisp, clean cuts they deliver are outstanding.

You can get AccuRight band saw blades in widths ranging from 1/8" to 1" and in lengths from 82" to 136" for \$20 to \$30.



6. Replace Tension Spring

As a complement to its tension lever, Carter also makes this yellow "Cobra Coil" tension spring (\$19).

This spring is made of stronger steel than a standard spring. As a result, it's not as prone to "fatigue," so over

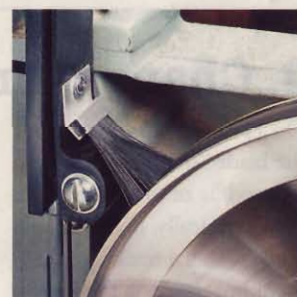
time, it will maintain its ability to hold the proper tension.

The Cobra Coil can also better tension wider blades than the spring that comes with many saws. So if you frequently use 1/2" or 3/4" blades, it's a good investment.

7. Make a Clean Sweep

It's often overlooked, but dust and debris on your band saw's lower tire can shorten its life. Not only that, but as the pitch builds up on the tire, it can affect the tracking of the blade, as well.

To prevent that, simply install this handy wheel brush (\$6) so that the bristles press against the tire. As you make a cut, the brush sweeps off the tire to keep it clean.



**BAND SAW
ACCESSORIES
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888-622-7837
CarterProducts.com

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MAKING FURNITURE WITH

Curve Appeal

Craftsman Jonathan Benson builds furniture that goes beyond straight lines and flat surfaces. Here, he shares a few tricks for bent lamination and working with veneers.

Flat, straight, and square. Those are the hallmarks of success for most woodworkers. But furniture builder Jonathan Benson takes things a step further.

The furniture he builds, such as the coffee table above, usually incorporates curved and irregular shapes. To add even more interest, he often adds exotic and figured woods, as well as lathe-turned parts.

Forming a Style — To create his unusually shaped pieces, Jonathan doesn't rely on solid-wood stock. Instead, he builds a substrate from

layers of $\frac{1}{8}$ " plywood and MDF that are glued together and clamped in a form using a process called bent lamination. This substrate then gets covered with veneer.

Jonathan does much of this using a large shop-made press, visible behind him in the *Photo* at right. But he's quick to point out that a press isn't mandatory. "Anyone can build a simple form, and clamps will apply enough pressure to mold the piece to shape," he says.

Skin-Deep Beauty — When it comes to applying the veneer, Jonathan believes too many woodworkers are intimidated by the process. "It's not as hard as people think. Plus, it's often the only way to get rare and highly



The hourglass shape on this tabletop is made of Brazilian rosewood veneer from Jonathan's decades-old stash. Ebony veneer laid in a radial pattern forms the center circle.

figured wood," he says. To that end, he simplifies the process.

When applying veneer to a rounded edge, for example,

he doesn't use special veneer glue or a complicated and expensive vacuum press. Instead, he coats the edge with ordinary yellow wood glue and then lets the glue dry. Next, he lays on the veneer and heats it with an iron to reactivate the glue (*Photo, far left*). He presses the veneer into the glue by rubbing it with a veneer hammer. Then he trims the veneer to fit (*Photo, near left*).

To see more of Jonathan's intriguing furniture, visit BensonFurniture.com



Jonathan uses an iron to reactivate dried glue while he presses veneer onto a rounded edge using a veneer hammer (*left*). He trims the veneer with a knife following the grain (*right*).