

TOOL SHOW
HIGHLIGHTS

LAYING LAMINATE ■ USS CONSTITUTION SAILS ■ LAUNDRY STORAGE

WORKBENCH®

THE ORIGINAL HOME WOODWORKING AND IMPROVEMENT MAGAZINE



Swing-Up Shelf
Miter Saw Station
Prairie Treasure Box

December 1997/\$3.95
Canada and Foreign \$3.95



Display until December 29, 1997

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Our birch storage cabinet features straightforward plywood construction and low-maintenance plastic laminate work surfaces.



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It's ideal for gaining additional work area — in the laundry room, shop, or home office — and you can swing it out of the way whenever you need more floor space.

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Inspired by Arts and Crafts-era architecture, this elegant box will house your valuables in style. Make it for yourself, or get going on a small production run for holiday gift giving.



A classy home for your collectibles — the *Prairie Treasure Box*, page 30.

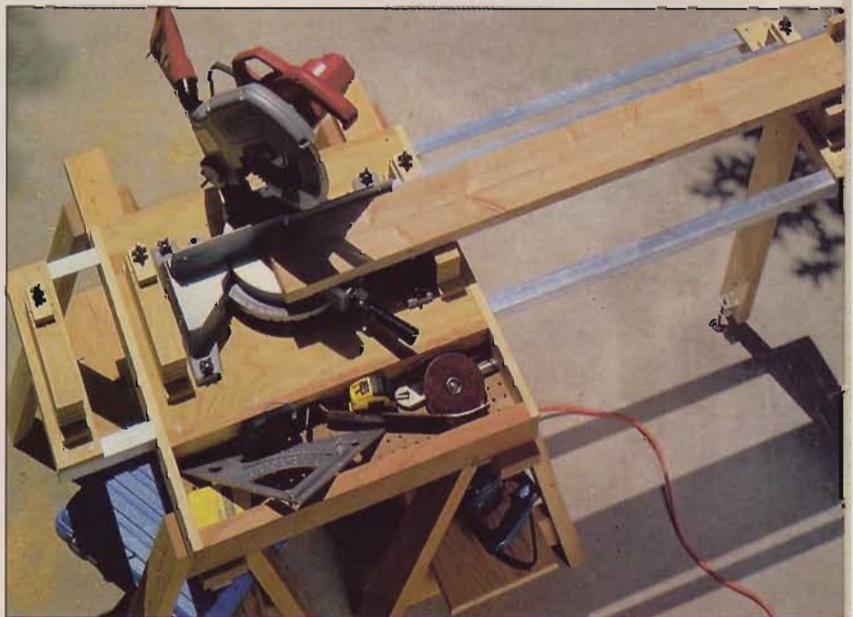
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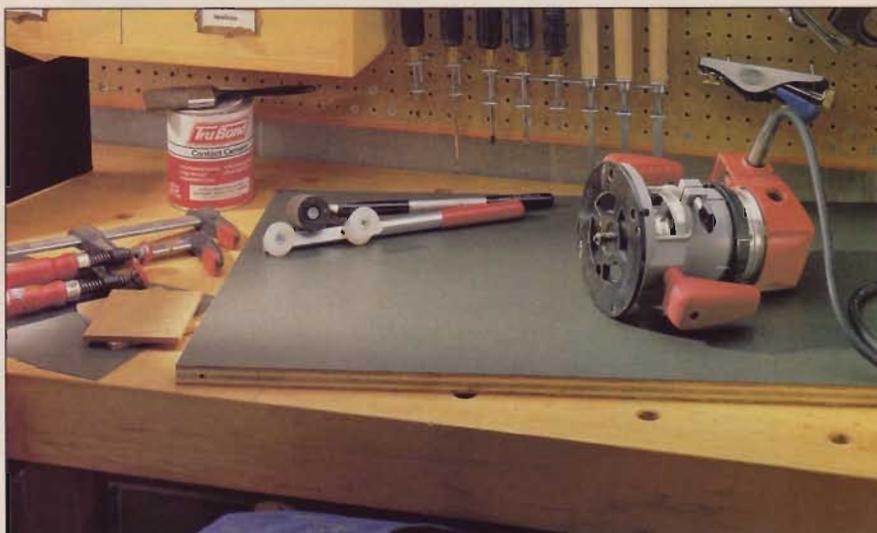
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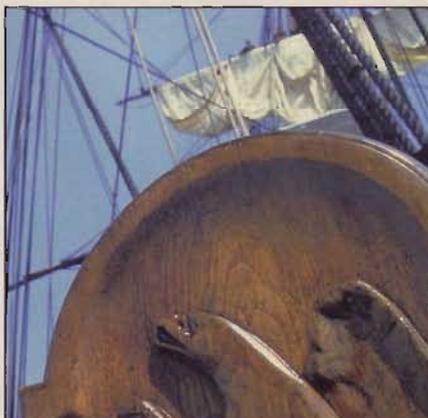
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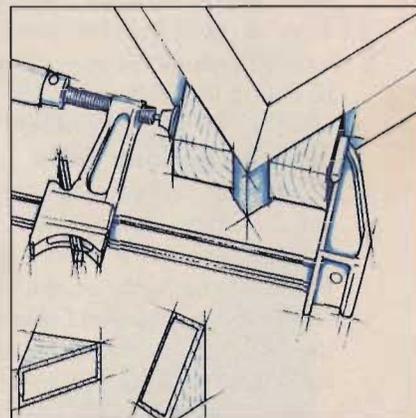
When furniture-making details are crafted into a home, you can get spectacular results. Thanks to the brothers Greene, the Gamble House is one of the finest examples.



Laying Laminates is easy once you know a few techniques, page 28.



The *USS Constitution Sails*, page 14.



Tips & Techniques, page 10.



In The Craftsman Style features an Arts and Crafts masterpiece, page 64.

Too Many Tools?

I admit it. I am a tool hound. I don't believe it's possible to have too many, and I'm always hunting for the next one that I can't live without.

So you can imagine the sweat I broke into when a group of us from *Workbench* attended this year's big tool and hardware shows, held in Anaheim, CA, and in Chicago. These shows featured most of the wood-working tools and supplies available on the planet, and in Chicago I also saw more home improvement products than I ever knew existed.

The immensity of the shows is difficult to describe — there are so many clever tools and products. Although choosing was difficult, we've pulled together a display of our favorites (see page 36), some of which we think will knock your socks off, and others that will make you wonder, "why didn't I think of that?" I'm sure you'll find at least a couple of things you, too, won't be able to live without.

Holiday Gifts

The timing of this cutting-edge tool and hardware article couldn't be better for those of us who need to drop a few gift-giving hints for the holidays. No ties for me, please. I plan to leave the issue open to the page with the tool I want to add to my shop.

While you're waiting for your new tools, you may want to get busy and

take care of some gift giving yourself.

For special names on your holiday list, consider building the *Prairie Treasure Box* on page 30. It was designed with production setups in mind, without sacrificing any of the craftsmanship of the results.

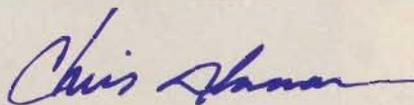
Also, take a look at the *Miter Saw Station* (page 42). For any home improvement enthusiast, this portable work center is a must-have addition.

40th Anniversary

This issue brings the *Workbench* 40th anniversary year to a close. Each of the past six issues has been an adventure, and we've already been working full throttle on many home improvement projects for 1998.

All of us here appreciate your support, and thank you for making our first year with this great magazine a success. Drop us a line anytime to tell us how we're doing, or to let us know what projects or articles you want to see in the future.

Until then, we wish you and your family a Happy Holiday.



Chris Inman, *Editor*

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EDITOR Christopher A. Inman
 ASSOCIATE EDITOR William LaHay
 ASSISTANT EDITOR David E. Stone
 ART DIRECTOR Robert L. Foss
 SR. ILLUSTRATOR Erich Lage
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 PROJECT DESIGNER Kevin Boyle
 ELEC. PUB. COORDINATOR Douglas M. Lidster
 PRE-PRESS IMAGE SPEC. Troy Clark

PRESIDENT & PUBLISHER Donald B. Peschke

ADVERTISING SALES MANAGERS

Richard R. Rainforth (515) 282-7000 ext. 2200
 George A. Clark (515) 282-7000 ext. 2201

MARKETING COMMUNICATIONS MANAGER

Tara Meier (515) 282-7000 ext. 2135

PUBLISHING CONSULTANT

Peter H. Miller (202) 362-9367

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WORKBENCH
 Customer Service
 P.O. Box 842

Des Moines, IA 50304-9961

Phone: (800) 311-3991

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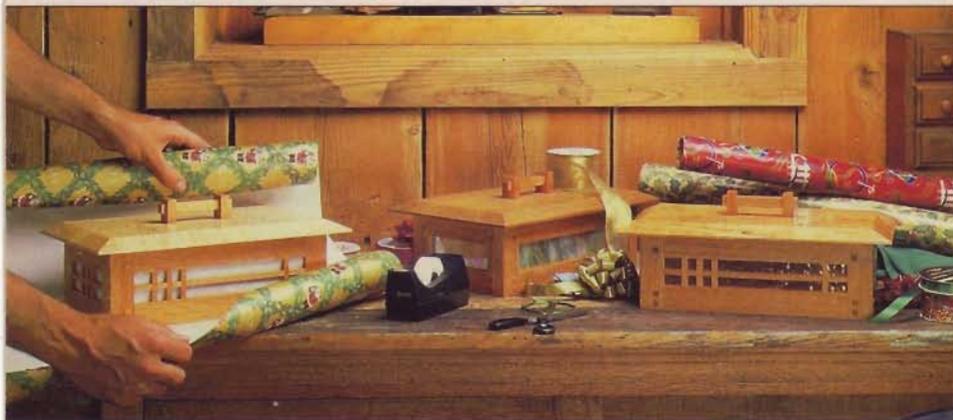


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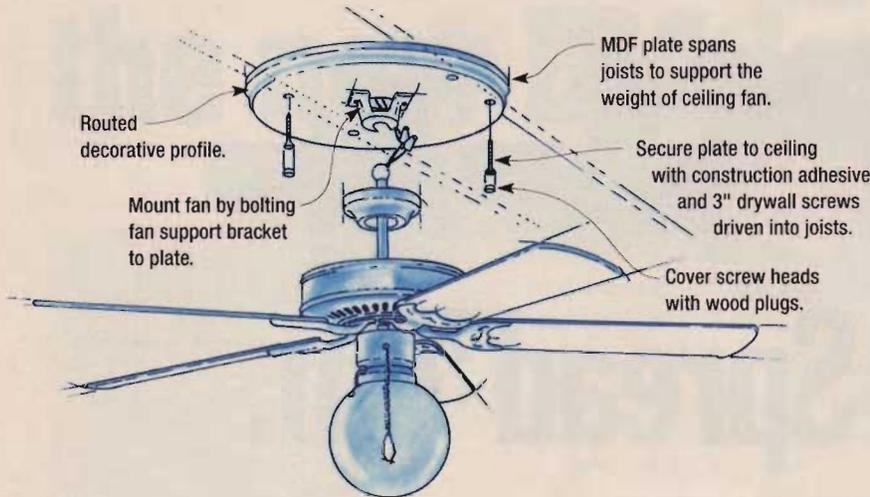
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Safety Reminder: Woodworking and home improvement are rewarding hobbies. But there is risk of injury. Use the guards and read the manuals that come with your tools and equipment. And if you're uncertain about a technique, find an alternative with which you are more comfortable. Please take safety seriously.

Questions & Answers

Support A Ceiling Fan Between Joists



Q I'd like to replace a ceiling light in my den with a fan. But the light sits between two joists, and isn't mounted solidly. How can I add support without tearing a hole in my ceiling?

Kurt Statton
Des Moines, IA

A You can add the support you'll need for the fan in a couple of different ways.

You could use an adjustable support bar (available in home centers) that slips through the existing hole and spans between the joists.

Or, rather than purchase a support, you can make a ceiling plate that will support your fan, plus add a decorative accent to your ceiling.

To make a plate, cut a round base from 3/4"-thick medium-density fiberboard (MDF) that's large enough to span across the joists. MDF has a smooth face so you'll get a good paint finish, and it machines easily.

To dress up the plate, rout a decorative profile in the edge. Drill a hole through the plate the same diameter as the ceiling box. Then paint the plate to match your ceiling.

If you have a textured ceiling, scrape away a flat area so the plate sits flush. Then spread construction adhesive on the back side of the plate, and drive screws through into the joists above.

Mount your fan support to the plate, and push the wiring back up through the hole into the box.

More Board Feet

Q In your October Questions & Answers you gave the formula for figuring board footage. My lumber dealer uses a device that looks like a yardstick, but has many more numbers on it, for calculating board footage. Can you explain how this works?

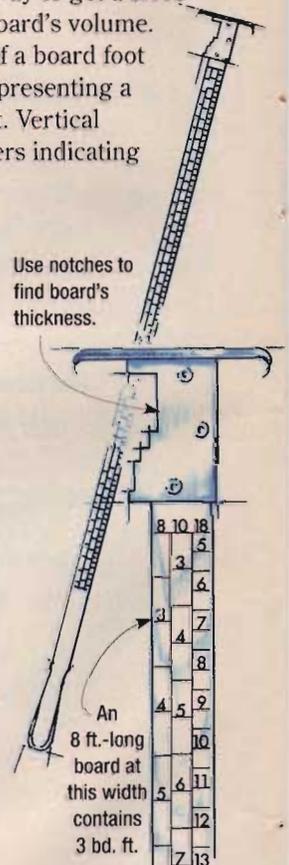
Wayne Cosgrove
Boston, MA

A Imagine how long it would take to get through the check-out line if your lumber dealer had to measure every board and calculate its board footage by hand. Using a board foot scale is a quick way to get a close approximation of a board's volume.

Across the width of a board foot scale are columns representing a board's length in feet. Vertical columns have numbers indicating board footage.

To use the scale, hold it across the board's width, with the head tight against one edge. Then sight to the appropriate column that shows the board's length. The number in that column closest to the edge of the board shows how many board feet the piece contains, assuming the board is 1"-thick.

If the board is thicker than 1", multiply the number on the scale by the board's thickness.



SHARE YOUR QUESTIONS

If you have a question about woodworking or home improvement, we'd like to see if we can answer it for you. Just write down your question and mail it to WORKBENCH Q&A, 2200 Grand Ave., Des Moines, IA 50312. Please include your name, address and daytime phone number in case we have any questions for you. If you like, Fax us at (515) 283-2003 or send a message to us at workbench@workbenchmag.com on the internet.

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Stop Your Tools From Rusting

Q I moved to Seattle from Denver, and the moisture has caused rust on my jointer and table saw. How do I stop the rust, and prevent its return?

Raymond Lundgren
Seattle, WA

A Bare metal surfaces like your cast iron saw and jointer tables

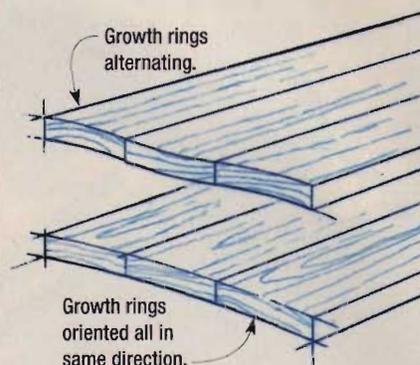
are very susceptible to rust. But getting rid of the rust isn't too tough.

Use a sanding block and 180-grit paper or a synthetic steel wool pad to scrub off the rust. To keep rust from returning, you can use a product like Boeshield T-9, or Bostik TopCote. Or use ordinary paste wax. Re-coating the top occasionally will keep rust at bay.

Avoiding Warp

Q I'm getting ready to build a table. A woodworker friend told me when I glue up the top, I should alternate the orientation of the boards. Another told me it doesn't matter which way I place the boards. Who's right?

Kevin Michaelson
Lawrence, KS



A Actually, neither of your friends is wrong. They're talking about orienting the boards so the growth rings visible in the end grain arc up on one board and down on the next, or all arc consistently in the same direction.

If you alternate the boards, your panel should remain flat across its overall width, as each board cups in the opposite direction. But the panel surface may feel wavy.

On the other hand, if you glue-up the boards with the growth rings all oriented in the same direction, the whole panel may cup in one direction. The surface remains smooth to the touch, but the entire panel may take on an arched shape.

I pay attention to the growth ring patterns, and try to alternate every other board. But I pay more attention to each board's face grain appearance. If I have to, I'll orient adjacent boards with the growth rings pointing the same way in order to get the best looking panel.

Also, make sure you apply an equal number of finish coats on both sides of the table top. This helps keep any moisture absorption or loss equal on both sides, further reducing the likelihood of warping or cupping.

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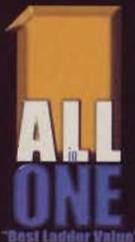
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Tips & Techniques

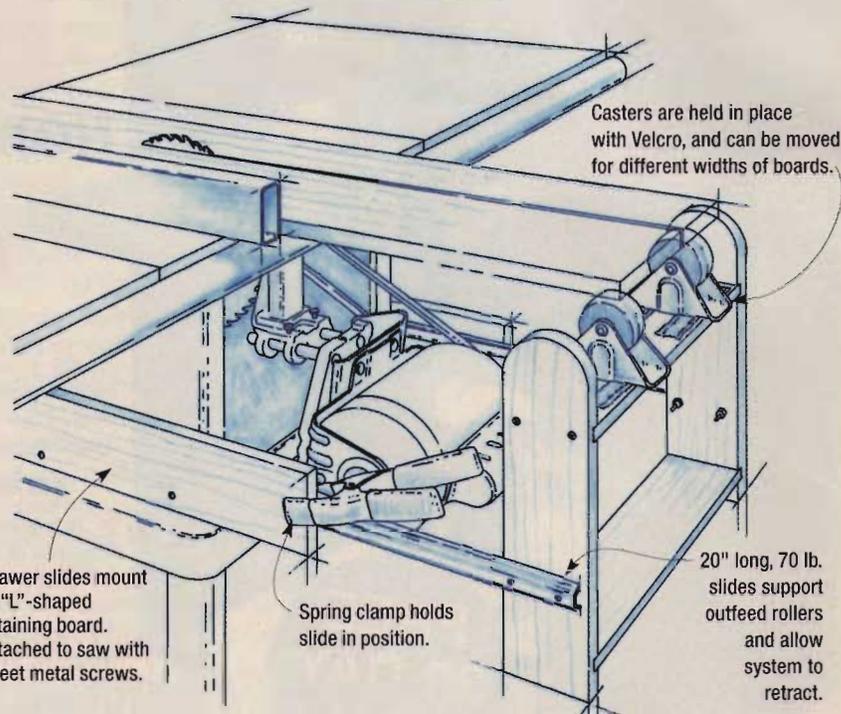
Outfeed Table Supports Stock, Tucks Away for Storage

Like most table saws, mine lacks any built-in outfeed system to support long stock on the far side of the table. So I built my own using inexpensive, readily available materials. Mine can also be pulled against the saw when not needed or for storage, and extended when I need to cut long pieces.

My system centers around a pair of ordinary drawer slides that allow the outfeed roller to extend away from the table to support long stock, or be pulled up close for shorter stock or compact storage. The slides I used are rated to hold up to 70 lbs.

To mount the drawer slides on my saw, I attached the cabinet-mount halves of the slides to two retaining boards. These are $\frac{3}{4}$ "-thick pieces, the same length as the drawer slides (20"-long in my case), with $\frac{1}{2}$ "-thick by 1"-wide spacers glued to their lower inside faces. I mounted these to my saw cabinet with sheet metal screws.

Then I made my outfeed support. It consists of two $\frac{3}{4}$ "-thick uprights with dadoes that receive upper and lower cross braces. The drawer-mount halves of the drawer slides are mounted to the uprights.



To support my stock, I used two casters mounted upside down on the upper cross brace. Rather than attach them permanently, I hold the casters to the upper cross brace with hook-and-loop fasteners (Velcro is one brand). This makes them adjustable.

When I need to support long stock, I extend my system and use a spring clamp to hold it in place. When not needed, I just tuck it against the saw. Best of all, I built it for around \$20.

*John T. Yates, Jr.
Allison Park, PA*



Two Cents Worth On Door Installation

I just finished updating my kitchen. In the process, I refaced all the cabinet carcasses and built new doors.

The doors I made sit flush with the cabinet face frames. And I designed them to fit with a $\frac{1}{16}$ " gap on all sides.

When the time came to position my doors and mark for hinges, I devised a way to get consistent gaps all around.

I found that a penny is almost exactly $\frac{1}{16}$ " thick. So with the hinges

mounted to the doors, I set each door into its opening and slid two pennies under the bottom edge.

With my gaps set, I marked lines to locate the hinge mortises in the face frames. I removed the hinges from the doors and mortised the hinges into the frames at my layout lines. Then I re-hung the doors.

*Jim Lutz
Salt Lake City, UT*

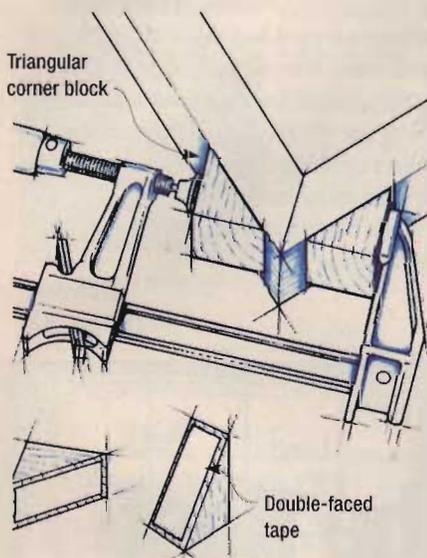
SHARE YOUR TIPS, JIGS, AND IDEAS

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Using Carpet Tape

I've found countless uses for double-faced cloth carpet tape over the years. Here are some of my favorites:

- Attach patterns made of plywood or hardboard to your workpiece with carpet tape. Rough-cut the board close to the pattern, then use your router and a pattern bit with a bearing that follows the template to rout the board to final shape.
- Stick carpet tape on the flaps of hinges to keep them from moving while you mark their location, drill screw holes, and position doors.



- Make triangular clamping blocks and stick them to the outside edges of mitered corners with carpet tape. Then use regular straight clamps across the blocks for the glue-up.
- To align false fronts on drawers, push the drawer carcass into its opening in the cabinet. Stick carpet tape to the back face of the drawer front. Then position the drawer front in the opening, making sure you have even gaps on all sides, and push the drawer front against the carcass. Pull out the drawer and screw on the front. You can leave the tape in place.
- Attach auxiliary fences to your table saw or router table fence with carpet tape. They hold tight, and there are no clamps to get in the way.

*Keith Hennessey
Des Moines, IA*

An Easy Way to Chamfer Dowels

In your October issue you ran an article on drawbore joinery. I found the article helpful, but I thought using a belt sander for chamfering the ends of the dowels was more complicated than necessary. For chamfering small diameter dowels I've got a simpler way.

I have an old wall-mounted pencil sharpener in my shop. It has a ring

on the front with holes ranging from about $\frac{3}{16}$ " to $\frac{7}{16}$ " in diameter.

I stick smaller dowels in the pencil sharpener and "sharpen" as much chamfer as I need. Rotating the dowel a couple of quarter turns while sharpening keeps long chamfers centered.

*James Larson
Ingleside, TX*



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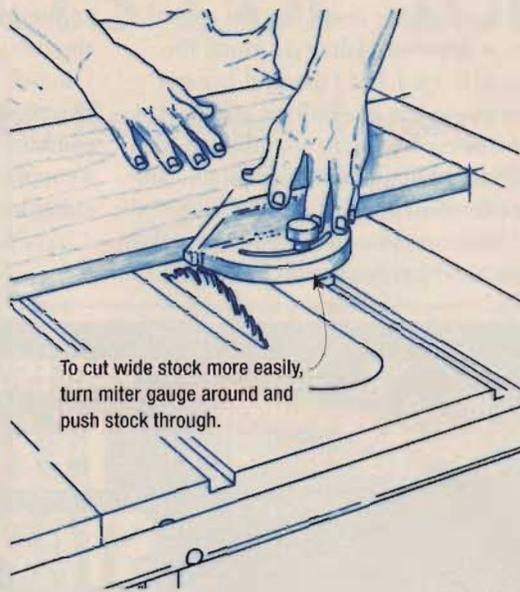

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Cutting Wide Boards on the Table Saw

Crosscutting wide boards on my table saw has always been a challenge. The pieces are awkward to handle, and it's hard to control my miter gauge when its head is off the table. I know some saws have a T-slot in the table and a miter gauge bar with a plate that catches in the slot. But mine isn't equipped this way.

That makes it difficult to hold everything and guide the board. I've had cuts come out crooked, and I got concerned that the blade might bind in the kerf, causing the board to kick back.

To make cutting wide boards easier, I turn my miter gauge around, so the miter gauge head is in front of my board, instead of behind. I hold the workpiece snug against the gauge with my left hand, and use my right to push the workpiece through.



On some boards, the miter gauge head may be off the saw table when you complete your cut, so make sure you keep a firm grip on the gauge.

*Pat Ericksen
San Francisco, CA*

Cordless Cure

I've decided that cordless tools do indeed have many advantages over corded tools. Unless the battery goes dead and won't take a charge, that is.

I have a cordless drill, and after using it for some time, the battery gave out, and wouldn't take a charge.

Since the battery was dead, I went out and bought a replacement, at a cost of about \$30. My drill came back to life, and I was able to use it again. But eventually that battery quit taking a charge also.

Not anxious to spend another \$30 for a second replacement battery, I decided to try a last ditch effort. I used some fine steel wool and cleaned up the contact points on both batteries (I'd never recycled the original one). Then I unplugged the charger and cleaned those contact points.

Both batteries work well again, taking a charge just fine.

*Ron Sitz
Tucson, AZ*

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USS Constitution Sails

Do your best to imagine restoring a 2,000-ton, 204-ft. piece of antique furniture — left out through two centuries of sun, snow, and salt air — and you'll begin to understand

what life has been like for the Naval Historical Center Detachment in Boston. With other craftspeople and support personnel, this group of over 60 ship restorers had the daunting but enviable task of bringing seaworthy status back to the USS Constitution for the historic ship's 200th birthday.

The oldest commissioned warship afloat in the world, Constitution set sail in July for the first time in 116 years, cruising the waters of the Atlantic just off the Massachusetts coast. The two voyages — a sea trial on July 8 and a bona fide sailing excursion on July 21, marked the culmination of a \$12 million restoration effort begun in 1992 at the Charlestown Navy Yard.

High-Tech Helps Rebuild Past

From fixing battle scars and shortsighted modifications done in years past, to repairing problems brought on by normal aging, undoing damage to the Constitution's woodwork has been

a never-ending process. Prior to this last effort, though, no restoration of the ship has been so extensive, nor used so many high-tech solutions.

Every square foot of the hull was X-rayed to diagnose the condition of over 150,000 metal spikes, pins, and rods, each of which helps secure planks and frame members together. The X-rays also revealed rotted timbers, a common problem on any large wooden vessel.

Testing the ship's structural wooden members for soundness had always been a problem. X-rays don't reveal every defect, and questionable beams sometimes prove healthy when cut open, ruining them unnecessarily.



On this score, the restoration team got help from the U.S. Forest Products Laboratory, which pioneered a nondestructive testing method using metal pins to introduce stress waves into the wood. Striking one pin sends the wave travelling, and the speed it travels to the other end of the beam is measured. Healthy wood tissue is a fast track, but voids and serious rot act as roadblocks, so slow wave travel indicates trouble spots. Bad beams get replaced, while good timbers aren't needlessly ruined.

Ahead of Her Time

The restoration crew also installed new wood braces, called diagonal riders, that had been removed when the Constitution was taken out of active service. The original placement of these curved timbers was an innovation by Joshua Humphreys, the ship's designer. The rider braces strengthen the hull and minimize its "hog," a dangerous distortion of the keel (the ship's long timber "backbone") that results from the unequal buoyancy of a ship's ends and midsection.

Humphreys' design gets much of the credit for making the Constitution such a formidable fighting ship. The strong and stable frame could carry up to 54 cannon on two decks, and the sleek hull profile gave the ship the speed to outrun what she couldn't outgun. And

with access to untapped forests full of huge white pines (for masts) and white and live oaks (for frame timbers and planking), the fledgling American navy enjoyed the best materials its shipwrights could ask for. The Constitution boasts a hull thickness of over two feet,



Cannon on both the spar (main) and gun decks gave the ship its firepower. The rammer and worm (inset) were used to load and clear them.



Crew members "man the halyard" to hoist a sail on the mizzen (rear) mast. One sailor at the end of the line coils the rope on the deck.



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The skylight hatch above the captain's quarters provided ventilation, but was also used as a depository for anonymous written complaints from the crew.



a massive shield that earned her the name "Old Ironsides" when cannon shot from the British frigate HMS Guerriere bounced off the hull and dropped harmlessly into the Atlantic. In all, the ship remained undefeated through over 30 engagements at sea, though not unscathed.

In an 1812 battle, cannon fire from the British HMS Java destroyed the Constitution's helm (ship's wheel), but the American crew prevailed. Before setting the defeated Java afire, they salvaged her helm and brought it on board. A replica (right) of that double-wheel helm now steers Constitution.

Back Home, In the Water

Today the USS Constitution is among our country's most historic icons, but not simply because of her age. She survives by virtue of a superior design that still inspires and deserves respect.

With her wood scrubbed clean and brass gleaming, the ship got a clear July morning for the first of her excursions, a sea trial that included safety drills, navigational exercises, and the rigging of the six sail complement used during sea battles. On board were her crew and officers and their guests, Navy officials, and a press entourage of television and print journalists.

We left dockside at 0800 (that's 8 a.m. to us civilians), with an escort of four tugboats to tow the ship safely out of the harbor. Through various announcements we got the vital statistics for this historic ship — Constitution's full complement of 36 sails totals almost an acre

in surface area and can propel the ship at speeds up to 13 knots (16 mph); there's over 7 miles of running rigging (the halyard ropes used to handle the sails), and 27 miles of standing rigging (ropes that support masts and yards).

The numbers were impressive, but the real show was the activity on the main deck. Officers and midshipmen signaled, shouting directives as the crew members took their stations, readying the halyards or climbing rope shrouds onto the yards (the cross spars to which sails are rigged). Then a burst of well-choreographed movement unfurled the sails, which billowed as they caught the wind.

The Navy brass, wanting to save the fanfare for the actual sailing on July 21, reminded us that the stern (rear) of the ship was still tethered to a tugboat, but nobody seemed to mind. We were under sail, pushed by the same steady winds that moved the Constitution when she was first launched 200 years ago. It was a reminder, not entirely nostalgic, that collective human effort sometimes performs magic with simple tools and against heavy odds.

The shipwrights and crew who first built and fought aboard the Constitution saw this firsthand. That the ship survives today is a testament to their sweat, skill, ingenuity, and ability to work together when it counted. It was great to see the same spirit alive in those who now sail and care for her. 



Linked via rope to the rudder, the helm keeps the ship steered on course. This helm replicates one salvaged from the British ship Java.



Clutching the yard, with only a rope for a perch, crew members work to gather the sail on the main mast. The platform is a "fighting top," once used by marine sharpshooters during battle.



Laundry Cabinet

I rank doing laundry right up there with paying taxes, and I've never done either with much enthusiasm. The only good thing I can say is, at least tax time comes around just

once a year. Although I have to face a simple fact — I could sooner get away with not paying taxes than I could get by without doing laundry.

While no one can eliminate the necessary evil of doing laundry, it's easy to make the working conditions more hospitable. With this in mind, I recently applied the same kind of organization and storage strategies to the laundry

room as I always have to my shop. The first phase of this home improvement project was building a utility cabinet.

Besides providing storage for all the bleach, detergent, and general laundry supplies, the cabinet features a convenient counter for sorting clothes. I covered the counter with plastic laminate so it's easy to clean and won't suffer damage if it gets wet. Adding a hanging rod to the cabinet relieved the laundry room door knob from doing double-duty.

Customizing the Cabinet

The width of this cabinet works well in my basement laundry room, where I have a long wall beside the

washer and dryer. This arrangement is ideal as it provides a handy place for setting soap and clothes while loading and unloading the washer and dryer. You may want to build a slimmer or wider version of the cabinet to fit better in your space. But if you do, be aware that changing the size of one part can affect several others.

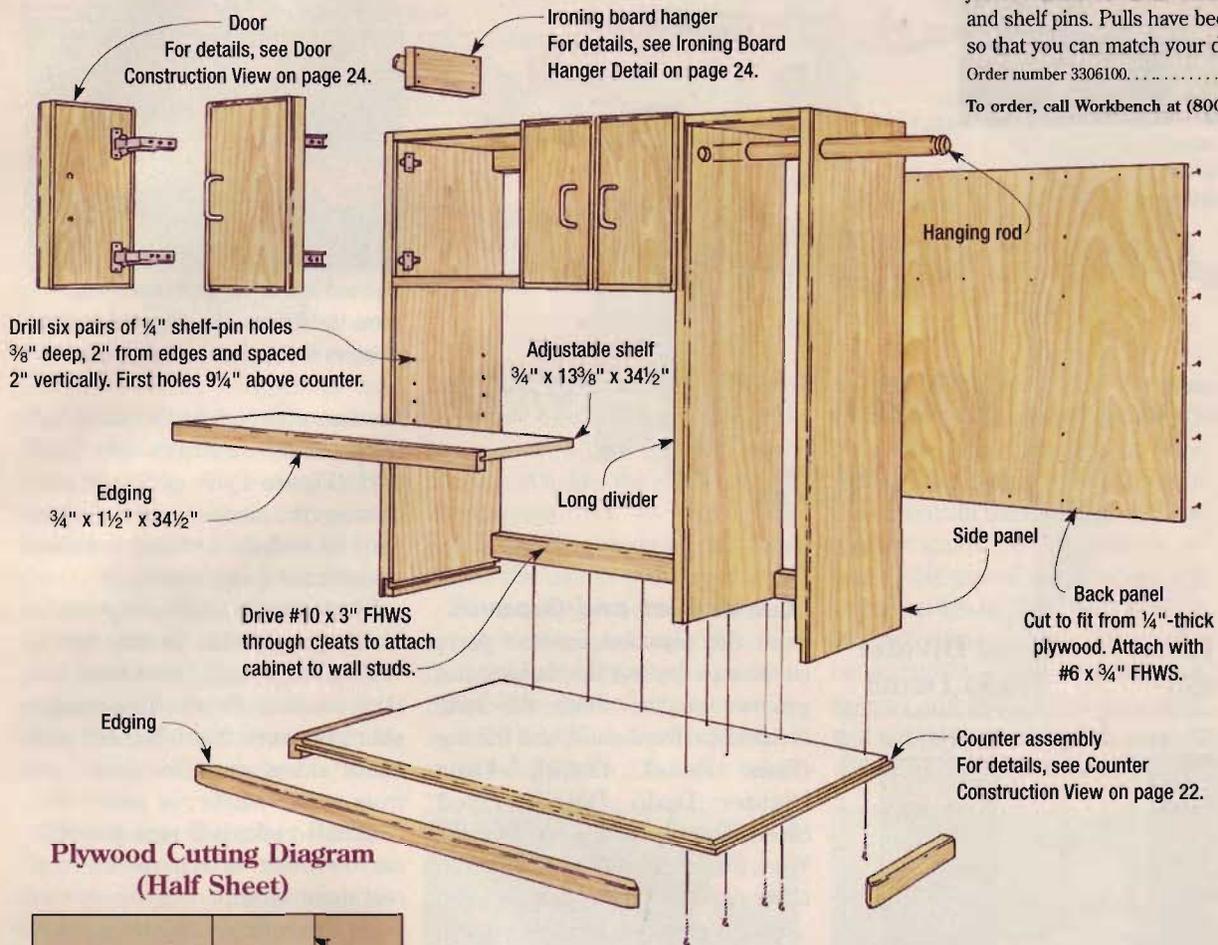
Start Cutting the Parts

Begin working on your laundry station by cutting $\frac{3}{4}$ "-thick plywood to size for the top, counter, sides, dividers, fixed shelf, and adjustable shelf (**Plywood Cutting Diagrams**). Don't cut the doors yet — I'll show you a tip later that will save you time banding the edges.

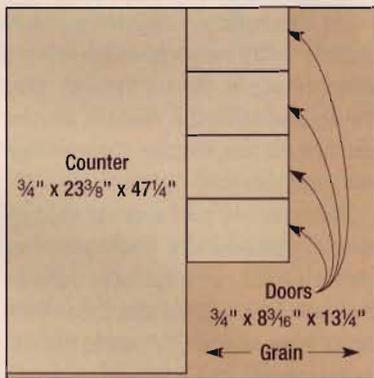
Laundry Cabinet Construction View

OVERALL SIZE: 42"H x 48"W x 24"D

LAUNDRY CABINET
 A kit has been assembled for this project that includes all the screws, hinges, and shelf pins. Pulls have been omitted so that you can match your decor.
 Order number 3306100..... \$41.95
 To order, call Workbench at (800)311-3994.



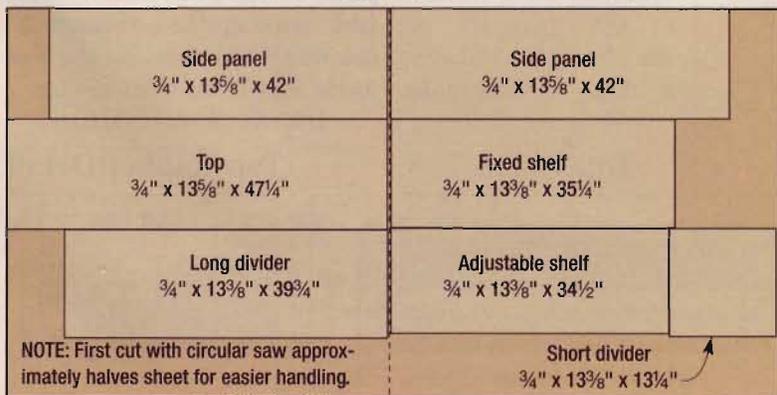
Plywood Cutting Diagram (Half Sheet)



Without an extensive supporting cast of infeed and outfeed gadgets, cutting full plywood sheets on the table saw is a challenging performance. To avoid that clumsy role on this project, I cut the full plywood sheets approximately in half with a circular saw. The half-sheets were then much easier to handle when I got to the table saw.

After cutting the plywood pieces to size (except the doors), rip solid birch to width for the cleats and counter edging. Leave all of these hardwood pieces a bit long for now, so you can cut them to fit later on.

Plywood Cutting Diagram (Full Sheet)



What You'll Need

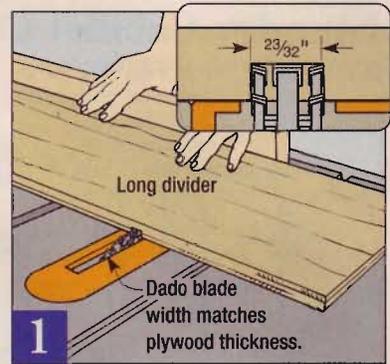
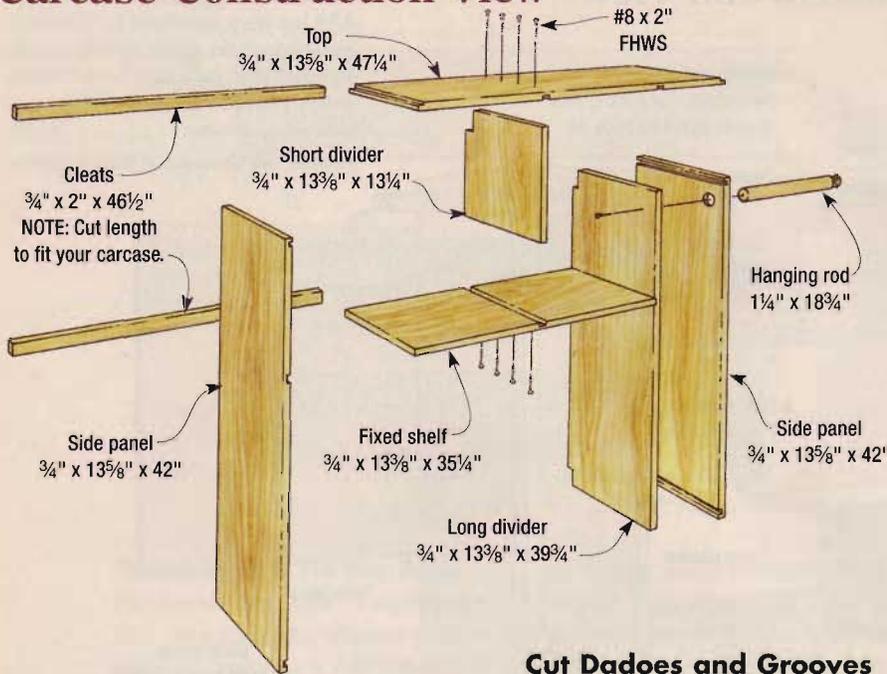
Lumber

- 1 1/2 Sheets of 3/4"-thick birch plywood
- 1/2 Sheet of 1/4"-thick birch plywood
- 3 lin. ft. of 1 1/4" birch dowel
- 4 bd. ft. of 3/4"-thick solid birch

Hardware

- (34) #6 x 3/4" Flat-head wood screws
- (32) #8 x 2" Flat-head wood screws
- (6) #8 x 1 1/4" Flat-head wood screws
- (1) #10 x 1 1/2" Round-head wood screw
- (4) Half-overlay Euro style hinges
- (4) Full-overlay Euro style hinges
- (4) Adjustable shelf pins
- (4) Door pulls

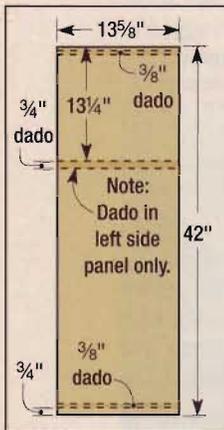
Carcase Construction View



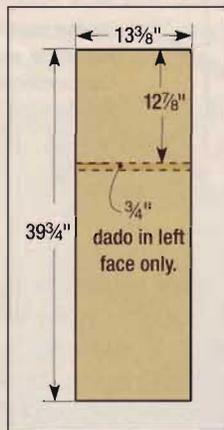
Plywood sold at $\frac{3}{4}$ " thick usually measures $\frac{1}{32}$ " thinner. Use shims between the chippers of your dado set for a perfect fit.

because plywood that's called $\frac{3}{4}$ " thick usually measures only $\frac{23}{32}$ " thick (Figure 1). To get a tight joint between the pieces of plywood, you need to cut dados exactly that size, or undersized *very* slightly.

Side Panel Detail



Long Divider Dado Detail



Cut Dados and Grooves

With the plywood carcass parts cut to size, lay out the dados and grooves on the sides, the long divider, the fixed shelf, and the top (Side Panel Detail, Long Divider Dado Detail, Fixed Shelf Detail, and Top Detail). Work on the sides first, and set the other parts in a safe place for now.

To get going on the side panels, put a $\frac{3}{8}$ " dado blade in your table saw and prepare to cut the dados near the upper and lower ends (Side Dado Detail). These dados will house the tongues from the top and counter.

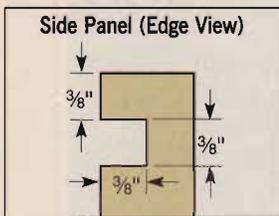
Next, prepare to cut dados in the left side and long divider for housing the fixed shelf (Side Panel Detail and Long Divider Dado Detail). Matching these dados to the thickness of the plywood introduces a slight complication,

If you own a wobble-type dado blade, simply dial in the width. With a stack dado, start with cutters totaling $\frac{11}{16}$ ", then insert shims between them. You can purchase shims or make your own from metal, plastic, or paper. You could also take two passes with a narrow blade to achieve the correct dado width.

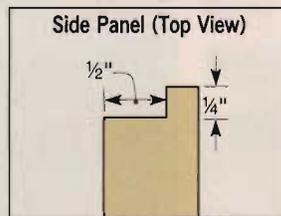
Set the cutting depth at $\frac{3}{8}$ " and test the setup on scrap stock to zero in on a snug fit. Be sure to note that the locations of the dados for the fixed shelf are not the same in the side and the long divider.

For strength and a clean appearance, I housed the back panel of my cabinet in rabbets (Side Rabbet Detail). To cut these rabbets, I used the $\frac{3}{4}$ " dado blade, but partially buried it in an auxiliary fence. That fence is simply a piece of scrap wood clamped to my table saw's rip fence (Figure 2). Cut these rabbets along the rear inside edge of the sides and top.

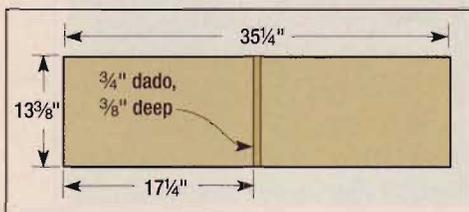
Side Dado Detail



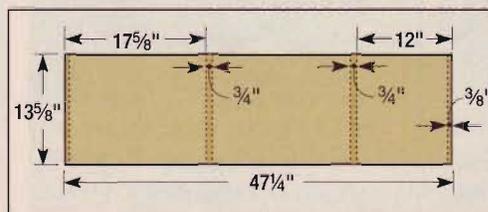
Side Rabbet Detail



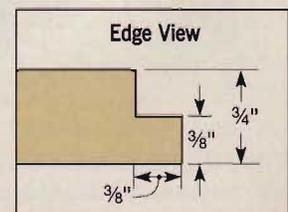
Fixed Shelf Detail



Top Detail



Top Rabbet Detail



Notching the Dividers

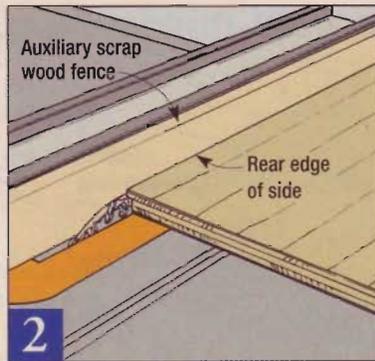
Lay out the notches in the dividers to match the thickness and width of the cleats that you made earlier (**Carcase Construction View**).

Although you could cut the notches at the table saw working with a wide dado blade, I felt more confident and comfortable doing this with a jig saw (**Figure 3**). Let the saw cut at a comfortable feed rate, and try to avoid putting side pressure on the blade — it will cause an out-of-square cut.

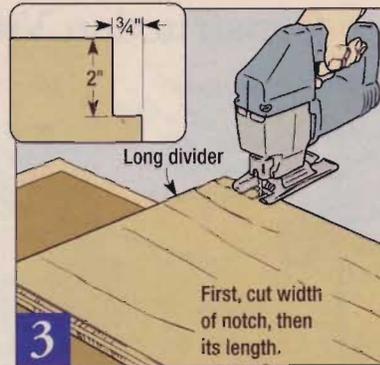
Drill Hanging Rod Holes

Drilling holes for the hanging rod is the next order of business (**Hole Location Detail** and **Hole Drilling Detail**). Drill a hole through the right side panel, but counterbore only halfway into the long divider. To make sure that the hole and counterbore line up, clamp the parts together with their front edges flush and their top ends offset by $\frac{3}{8}$ " while you're drilling.

I got a bit discouraged when I couldn't find my $1\frac{1}{4}$ " Forstner bit right away, but then I realized that a spade bit would work even better for this operation. Its point automatically drills the shank hole for



2 A scrap board protects your rip fence from damage while you cut the rabbets in the sides and top to house the carcass back.



3 Using a plywood-cutting blade in your jig saw is a fast way to notch the dividers. Size the notches to match the cleats.

the screw that secures the hanging rod to the long divider.

I was tempted to drill the holes for the shelf pins now. But since the ends of the long divider and side are not flush, the layout started to get complicated. So I took the safe route by postponing this task until after I had assembled the carcass.

Make the Hanging Rod

When I originally built this laundry center, I made the hanging rod by simply cutting a dowel to length and screwing it in place.

But the first time I used the cabinet, I accidentally brushed against some hanging clothes, and my freshly laundered shirts slid off the end of the rod. As I was replacing them, they fell again. I knew that I had to find a solution — gravity is too persistent to beat.

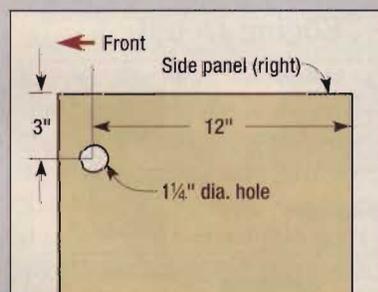
Fortunately, the answer was quick and easy — I simply cut a kerf near the end of the rod to

catch a hanger. After cutting a piece of $1\frac{1}{4}$ "-dia. closet pole stock $18\frac{3}{4}$ " long, screw a wood extension with a stop block to your table saw's miter gauge (**Figure 4**). Make repeated passes over the blade, rotating the pole slightly after each cut until you complete the kerf around the rod.

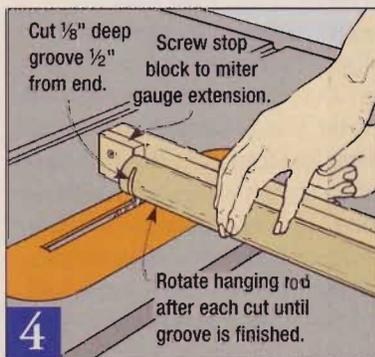
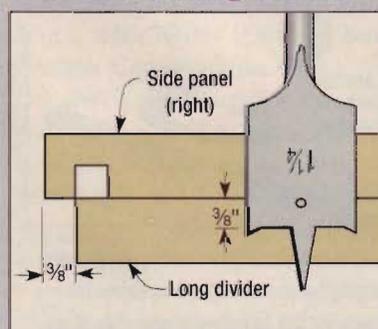
I also decided to add a decorative chamfer to the kerfed end of the rod. Clamping a piece of plywood to your table-mounted router will help you control the rod (**Figure 5**).

When all of the machining on the rod is completed, set it aside. The best time to install it is after you've assembled the cabinet and applied the finish.

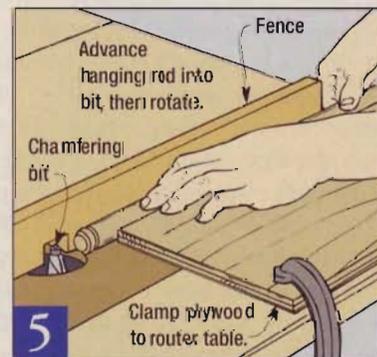
Hole Location Detail



Hole Drilling Detail

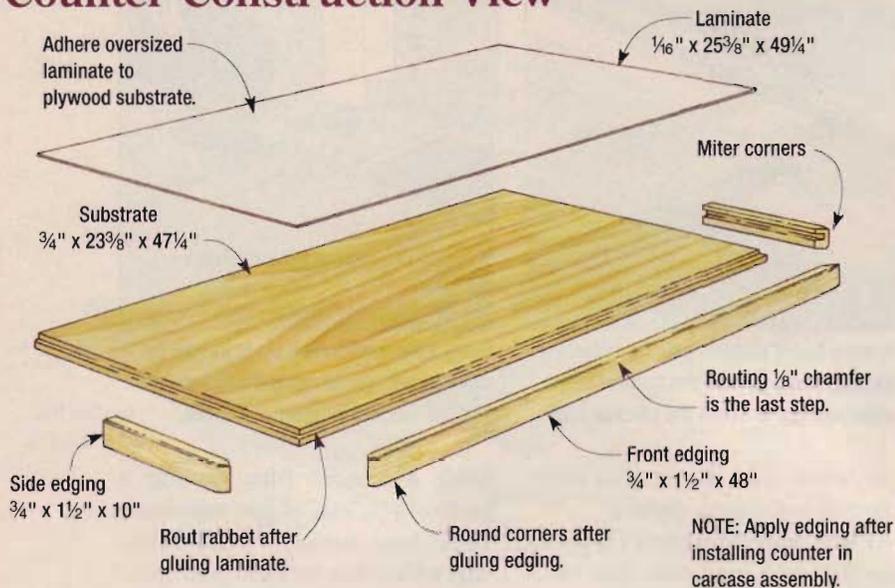


4 A groove cut into the rod will catch a hanger before it slides off the end. This simple setup lets you do the job quickly.



5 A parallel fence system safely controls the hanging rod during routing. Rotate the rod into the bit to chamfer its end.

Counter Construction View



The top and the counter need rabbets cut into their ends to form tongues that fit into the dados near the bottom ends of the sides (**Counter Construction View**). I decided to cut the rabbets in the top with the table saw, and those in the counter with a router. I chose not to use the table saw for the counter because the chopping motion of a dado blade can cause the laminate to chip. The sideways shearing motion of a router bit produces much smoother results.

You'll need to rout the edges of the shelf and counter prior to assembly of the carcass. For details, see *Edging Laminated Surfaces* below.

Your table saw still has the dado blade and auxiliary fence setup you used to cut the rabbets for the back. With the blade set to cut a rabbet $\frac{3}{8}''$ wide, adjust its height to produce a tongue $\frac{3}{8}''$ thick (**Top Rabbet Detail** on page 20).

To sneak up on a perfect fit for the rabbet in the top, I followed a multi-step procedure. I began by

intentionally setting the blade too low for the first pass. I then compared the size of the tongue to the dado, raised the blade slightly, and made another pass. I repeated this procedure until I got the fit I wanted. For me, this method works much better than trying to set my blade to a mark on a measuring tool. When I've tried that, I've always been frustrated by loose-fitting results.

Get It Together

The key to assembling this cabinet is organization. There aren't many parts, but each one is fairly large, so you need to rehearse with a dry assembly to make sure everything fits just right. And unless you follow the right assembly sequence, you may end up struggling to get parts into position (**Carcass Assembly Sequence**).

I used glue and screws to hold all the parts together. Before gluing, drill countersunk pilot holes for the screws. I found that I needed to put $\frac{1}{4}''$ -thick plywood shims under the back edge of some of the pieces to keep all the front edges of the carcass flush.

After drilling the pilot holes, take the pieces apart, then start

Edging Laminated Surfaces

You can use the following procedure to cover the edges of the adjustable shelf and counter for this project, as well as the work surface in the companion article *Swing-Up Shelf*.

The first step is to cut a rabbet along the laminate-covered edges, leaving a $\frac{3}{8}''$ -thick tongue (**Edging Detail**). To do this, use a rabbeting bit in your router. As always, several light passes are better than one heavy cut.

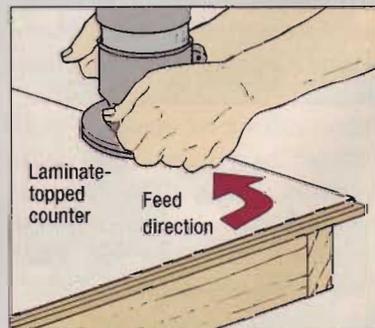
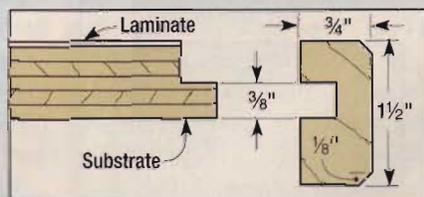
After sanding the top edge of the banding, I use a dado blade to cut the groove into its back surface. The groove's width, depth, and vertical alignment are each important. But I don't try to set all three of them at once. At first, I concentrate on getting the width and depth of the groove right where I want them.

The drawings show that the width and depth of the groove both measure $\frac{3}{8}''$. But I actually cut the groove slightly wider and deeper (a bit less than $\frac{1}{16}''$ in each direction). That gives me some room to adjust the fit when I glue and clamp the banding.

After the width and depth are locked in, it's a simple matter of tweaking the location of the rip fence to position the groove in the banding.

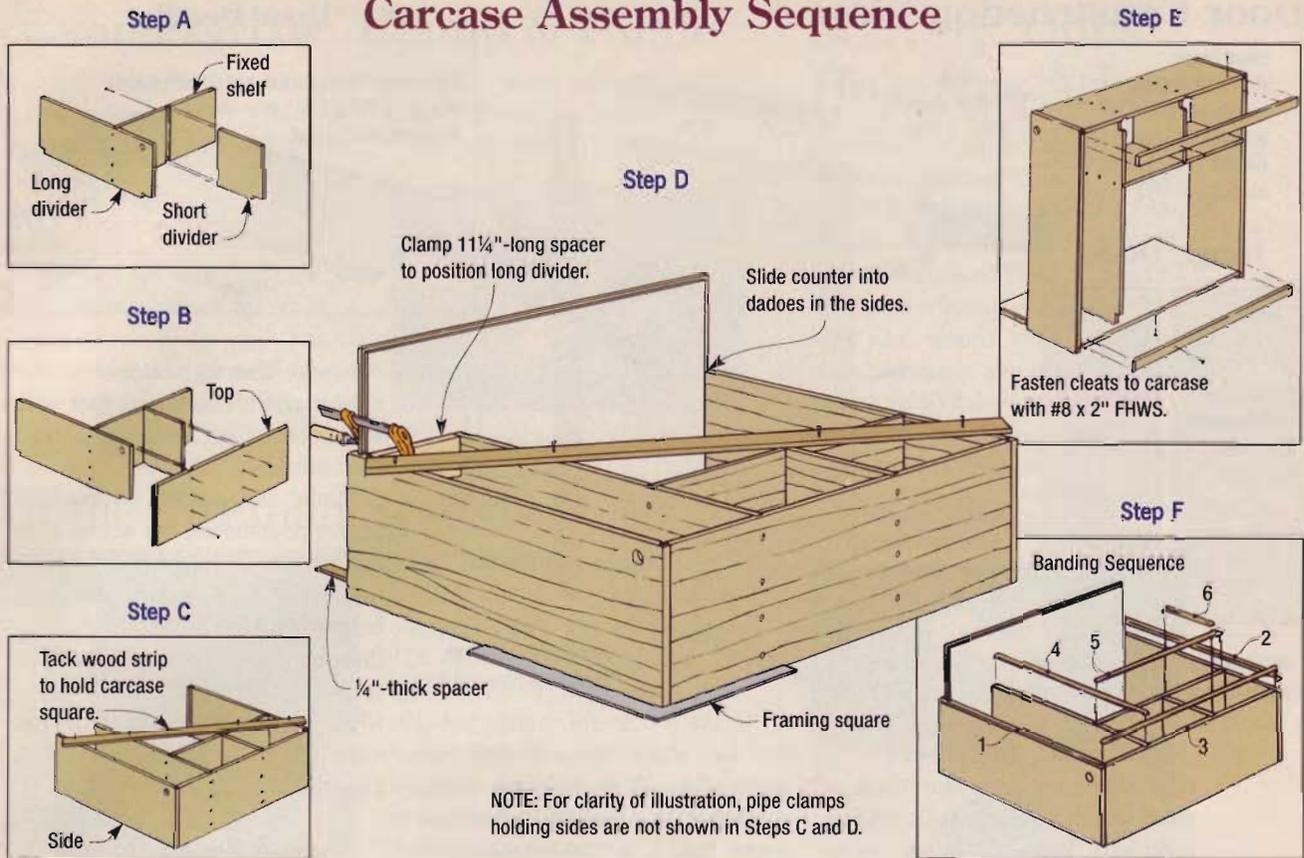
When I glue and clamp the banding into position, I like to set the strips a hair below the level of the laminated surface — just enough that my thumbnail barely catches on the edge of the laminate. Applying a couple coats of clear finish to the wood then makes up the difference.

Edging Detail



A rabbeting bit in your router trims overhanging laminate edges and forms the tongue for the banding in one easy step.

Carcase Assembly Sequence



the assembly by gluing and screwing the long divider to the fixed shelf (**Step A**). Then add the short divider. Now position the top on the short and long dividers, gluing and screwing it into place (**Step B**). Add the sides next and clamp them in place (**Step C**). Tacking a wood strip across the front will hold the assembly square.

Slide the counter into position (**Step D**). Since there's no dado in the counter to register the lower end of the long divider, clamp a spacer to the counter before driving the screws.

Check the entire assembly for square by measuring for equal diagonals. Correct any imperfection by clamping the carcase from corner to corner. After you unclamp the carcase, cut the cleats to finished length, then glue and screw them into place (**Step E**).

Band the Carcase Edges

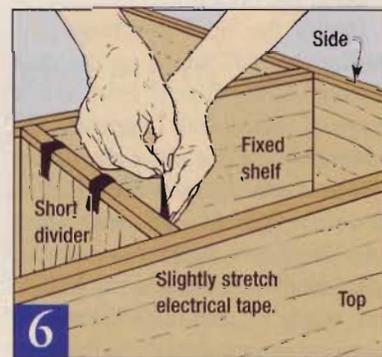
For the sake of appearance and durability, I banded all the front edges of the carcase. Here again,

following a specific sequence will ensure your success (**Step F**). Using tape instead of clamps to hold the banding in place will speed up this process (**Figure 6**).

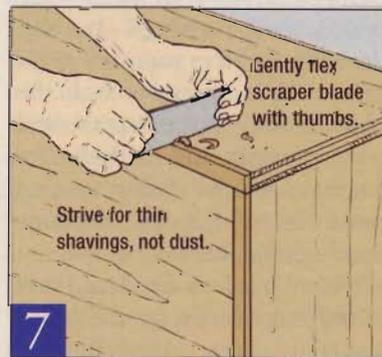
To smooth the banding flush with the plywood surfaces after the glue dries, I decided to use a sharp cabinet scraper (**Figure 7**). I didn't use a belt sander because it's just too difficult to avoid sanding through the thin plywood veneer. After scraping, I used a hand-held sanding block with 120-grit paper.

After you complete all the work on the banding, drill the series of $\frac{1}{4}$ " holes $\frac{3}{8}$ " deep for the support pins that hold up the adjustable shelf (**Laundry Cabinet Construction View**).

Double-check the size you need for the back, then cut it to size and screw it in place. Next, glue and clamp the edging to the adjustable shelf and counter. Sand a radius at the corners of the counter, then rout a chamfer along the upper and lower edges of the counter and the adjustable shelf.



Gently stretch vinyl electrical tape when you use it to secure banding to carcase edges. Follow banding sequence (above).



Use a cabinet scraper to smooth banding flush with the plywood. This tool lets you do the job quickly with maximum control.

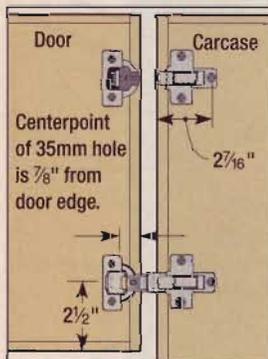
Door Construction View

Door Detail

Blum hinge
(Use half-overlay hinges on doors attached to short divider. Other hinges are full overlay.)

Door
3/4"-thick plywood,
8 3/16" x 13 1/4"

Hinge Detail

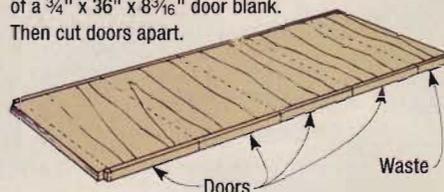


NOTE: Hinge mounting dimensions apply only to Blum hinges supplied in kit.

Rout 1/8" chamfer along front edges of banding after assembly.

Banding is 3/8" thick, flush with plywood door.

Apply banding to the top and bottom edges of a 3/4" x 36" x 8 3/16" door blank. Then cut doors apart.



cabinet a thorough once-over with a tack cloth. I followed that with four coats of Zar Wipe-On oil/varnish finish.

Mount the carcass to the wall before re-installing the doors. I put the carcass on a pair of sawhorses to hold it level and at the right height while I drilled pilot holes through the cleats into the wall studs. Positioning the counter anywhere in the range from 32" to 36" above the floor should work well. Finally, I drove the screws.

Making the Doors

Now that you have the shell of your laundry room work station complete, you can move on to making the doors.

Here's the tip I promised you earlier that will speed up the production of the doors. First, cut a piece of plywood to length that is wide enough for all four doors (**Door Detail**). Band the top and bottom edges of the panel, then slice the doors apart. Now all you have to do is band the remaining two edges of each door. When the banding is completed, rout a 1/8" chamfer around the outer face of each door.

For a neat appearance, I used European-style self-closing concealed hinges (**Hinge Detail**). Use a 35mm bit in your drill press to bore the hinge-cup holes in the doors. As long as you're at the drill press, you can drill the holes for the door handles. Using a scrap board under the door prevents tearout on the back of the door.

When I used my hand-held drill to drill pilot holes for the hinge mounting plates, I discovered a problem. The mounting plates are located directly behind each other on the short divider. That means

that the screw tips will run into each other. But you can easily solve this by grinding 1/8" off the screw tips. Use locking pliers to hold the screws while grinding, and give them time to cool off before touching them.

Finishing and Installation

The humidity generated by a washing machine and the heat coming from a dryer team up to create a hostile environment for a wood project. So I took extra care with the finishing.

After removing the hardware, I gave everything a final sanding with 220-grit sandpaper. I vacuumed off the dust, then gave the

Ironing Board Hanger

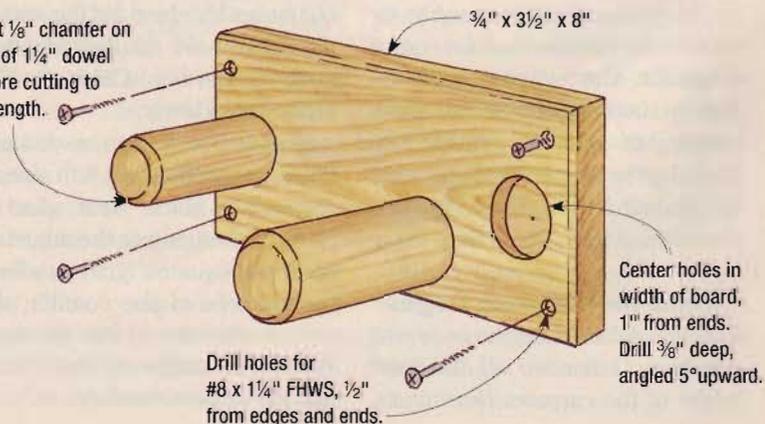
I know a few people who are so devoted to permanent press that they have completely renounced irons and ironing boards.

But if you do need a place to store an ironing board, here is an accessory for the side of your cabinet that's quick and easy to make and install (**Ironing Board Hanger Detail**).

And before you say that I'm behind the times for clinging to a belief in irons, let me point out that I'm not *that* old-fashioned. After all, it is an electric iron. 

Ironing Board Hanger Detail

Rout 1/8" chamfer on end of 1 1/4" dowel before cutting to 3" length.



Drill holes for #8 x 1 1/4" FHWS, 1/2" from edges and ends.

Center holes in width of board, 1" from ends. Drill 3/8" deep, angled 5° upward.



Swing-Up Shelf

Building the Laundry Center accomplished my primary goal — creating space for storing supplies. But it soon became apparent there still wasn't enough room for

folding clothes. Knowing the laundry room had no floor space to devote to a table, I built a swing-up shelf that's hinged to the wall. It swings quickly into position for use, or drops against the wall when not needed.

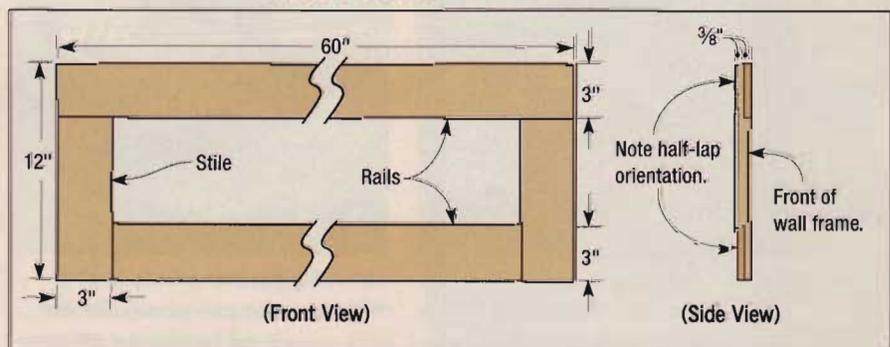
The shelf is built of plywood, and covered with plastic laminate (**Swing-up Shelf Construction View**) for easy clean-up and maintenance. To improve their appearance and durability, I banded all visible plywood edges with solid birch.

My laundry room arrangement allowed for a shelf 5 ft. long. Most likely, you'll have to size the shelf for your circumstances. Just be sure to check all the dimensions before modifying this plan. And by the way, this shelf could be useful for a lot of jobs outside of a laundry room, like in a cramped garage or basement shop.

Building The Frame

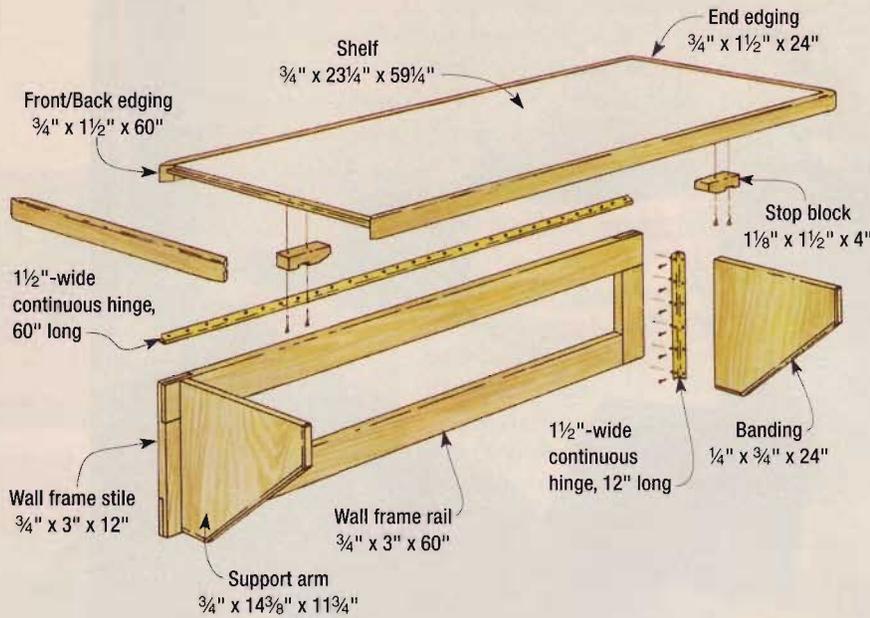
To help carry the weight of the shelf when it's covered with a load of clothes, I made a wall frame (**Wall Frame Detail**). The rails and stiles of the frame are joined together with half-lap joints and screws. It's important to point out that, on the stiles, the lower half-lap cutout is on the back face, and the

Wall Frame Detail



Swing-Up Shelf Construction View

OVERALL SIZE: 24"W x 60"L x 32"H



What You'll Need

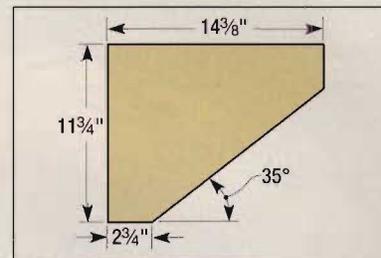
Lumber

8 bd. ft. of $\frac{3}{4}$ " birch
1 4x8 sheet. of $\frac{3}{4}$ " plywood

Hardware

8 ft. $1\frac{1}{2}$ "-wide continuous hinge
(8) #6 x $\frac{5}{8}$ " flat-head screws
(60) #4 x $\frac{1}{2}$ " flat-head screws
(12) #10 x 3" flat-head screws
10 sq. ft. plastic laminate

Support Arm Detail



upper half-lap cutout is on the front face. This joinery arrangement counteracts the force of the fully loaded shelf pulling on the frame.

Rip your rails and stiles to width and cut them to length. Then clamp a stop block to an extension on your miter gauge, and set up a $\frac{3}{4}$ " dado blade to cut the half-laps (Figure 1). But before cutting your frame material, I suggest you make test cuts in scrap wood of the same thickness.

After cutting the half-laps, spread glue on the joints and assemble the frame. Make sure the frame is square before drilling pilot holes and driving two #6 x $\frac{5}{8}$ " screws through the back of each joint.

Support Arms

Begin making the support arms by cutting a plywood rectangle for each arm and laying out the 35° angled edge (Support Arm Detail). Then cut the angles on your table saw. Again, use a long miter gauge extension and stop block to hold the pieces securely during the cuts (Figure 2).

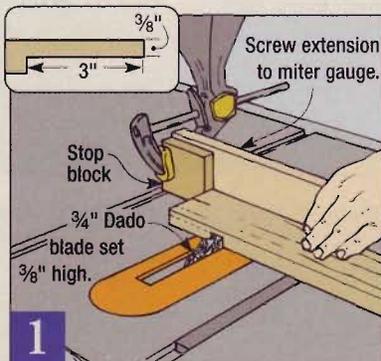
Solid wood banding on the forward-facing edges the support arms neatly conceals the edges of the plywood. Rip the banding from solid stock and glue it to the plywood. I found using clamps on the angled edges was awkward, so instead I used electrical tape, which stretches enough to pull the banding snug.

Following the gluing sequence I used will minimize the number of seams that show (Figure 3).

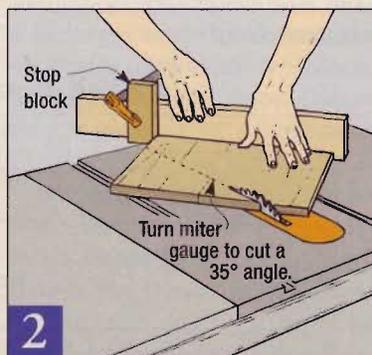
Machining the Stop Blocks

To properly position the support arms, I made two stop blocks and mounted them to the underside of the shelf. The notch in each block fits over the support arm, and the angled end helps ease the arm into position (Stop Block Detail).

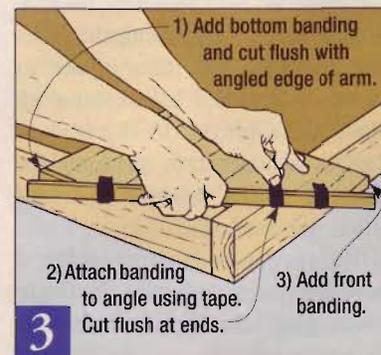
For safety, I machined the small blocks as one piece. Glue two $\frac{3}{4}$ "-thick pieces together to make a $1\frac{1}{2}$ "-thick blank. Then rip the blank to $1\frac{1}{8}$ " wide and crosscut it



1 Use a $\frac{3}{4}$ " dado blade to cut half-laps in the frame rails and stiles. Clamp a stop block to an extension screwed to your miter gauge.

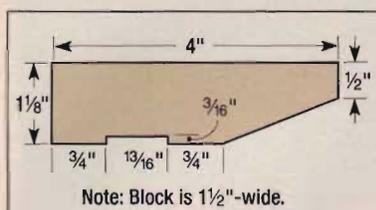


2 Use a long extension and stop block to hold the support arms securely. Set your miter gauge to cut the edge at a 35° angle.



3 Glue banding to the bottom edge of the arms first, then to the angled edge, and to the front edge last to cover the joints.

Stop Block Detail



10"-long, which is enough for both blocks plus a little extra.

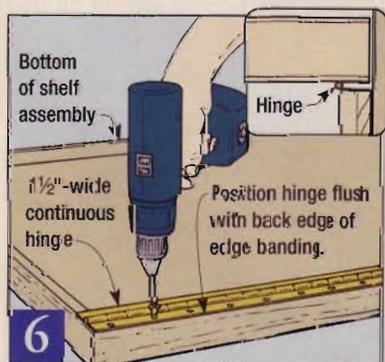
Once you have the over-long stock in hand, cut a $1\frac{3}{16}$ "-wide dado near each end (Figure 4). Next, cut the blocks to length and use a fine-toothed handsaw to cut the angled end of each piece (Figure 5).

Making the Shelf

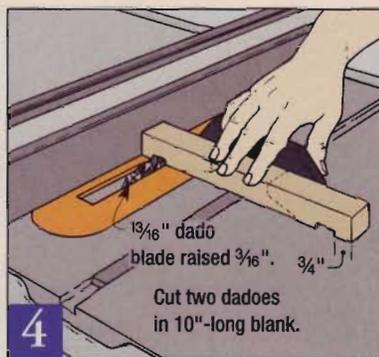
I made the shelf the same way I made the counter for the laundry center. Begin by cutting the plywood to size (**Swing-up Shelf Construction View**), then bond the plastic laminate to the top surface following the techniques described in *Laying Laminates* on page 28.

Once the laminate is secure, rout a tongue on all four edges of the shelf (see *Edging Laminated Surfaces* on page 22). The tongues provide a solid connection for the birch edging, which you can machine to fit now.

After ripping the edging to width, miter it to length. Then glue the edging to the shelf, and sand a $\frac{3}{4}$ " radius on the front corners. Routing $\frac{1}{8}$ " chamfers along the edges is a safety feature, and dresses up the edging.



Mount hinge to underside of shelf, flush with rear of back edging. Mount to frame so hinge knuckle overhangs front face of frame.



Install a $1\frac{3}{16}$ " dado blade in your table saw, and cut a $\frac{3}{16}$ "-deep dado near each end of the oversized piece.

Assembling the Shelf

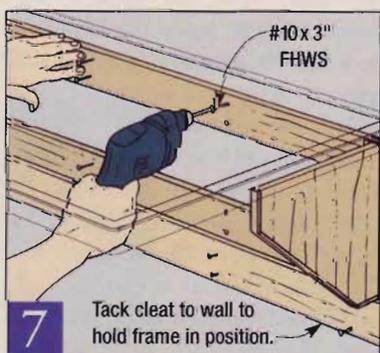
The backbones of this project are the continuous hinges used to mount the shelf and arms to the frame. Continuous hinges are very strong, and keep the shelf from sagging when it's loaded with clothes.

First cut two 12"-long hinges for mounting the arms to the frame. Hold each hinge in position (flush with the inside edge of each frame stile) and drill the pilot holes. Then screw the hinges to the frame. Repeat these steps and secure an arm to each hinge.

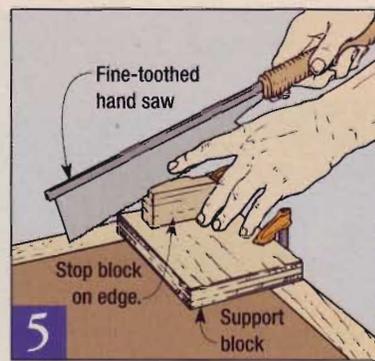
Now cut a 5 ft.-long section of hinge to attach the shelf to the frame. Screw the hinge to the underside of the back edging on the shelf (Figure 6). Mount the hinge to the frame so the knuckle overhangs the frame's face.

Installing the Shelf

I found that installing the shelf so the top surface is 32" off the floor provides a good working position



Measure down $13\frac{1}{2}$ " from desired shelf height and nail a cleat to wall. Set the frame on the cleat, and screw frame into studs.



Using a small hand saw, cut two stop blocks from the oversized piece. Then angle the leading edge of each block.

for me. You may want to alter this height for your needs.

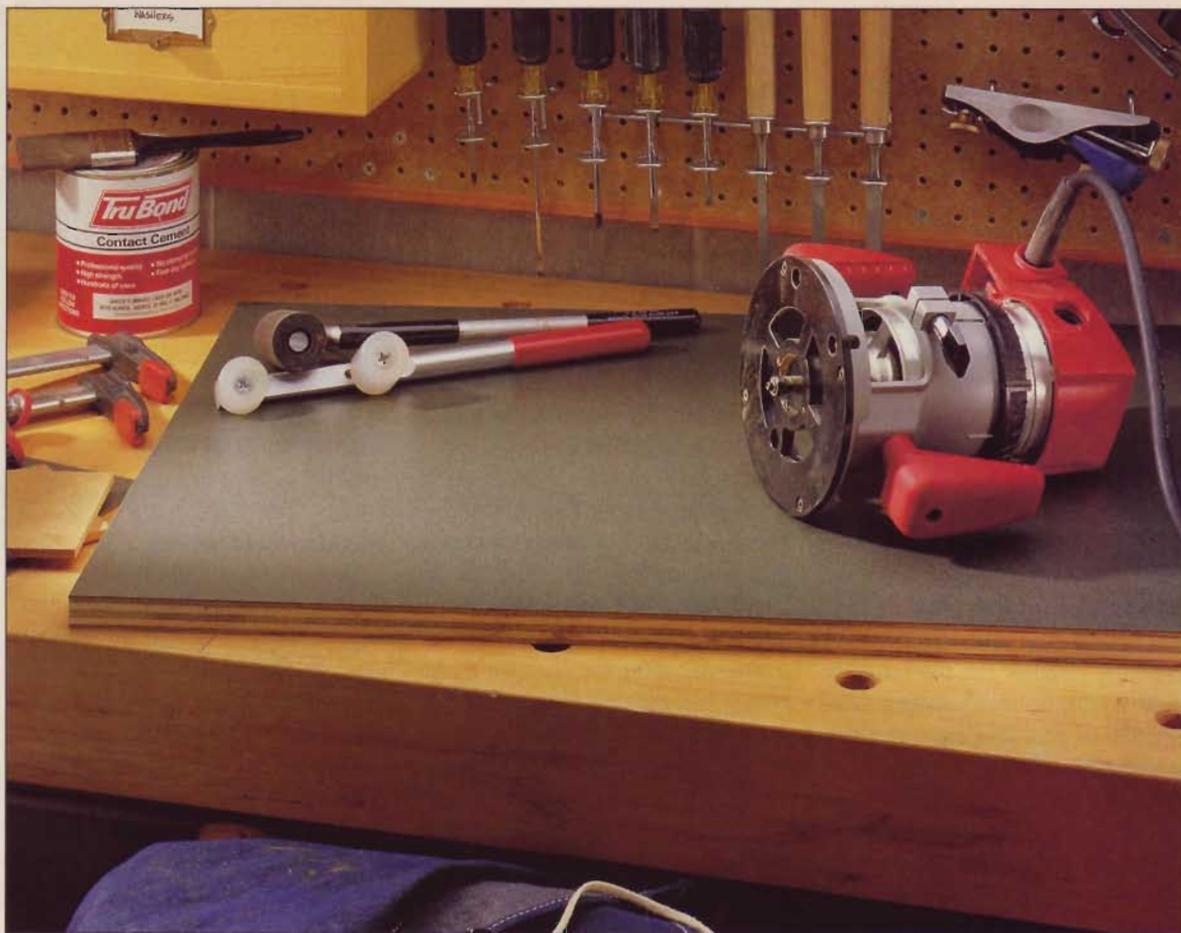
To position the shelf 32" off the floor, I marked a level line $13\frac{1}{2}$ " below that ideal height and nailed a cleat to the wall, keeping its top edge flush with the line (Figure 7). Since the shelf assembly is fairly heavy, I located three studs and secured the cleat to them.

Next, a friend and I lifted the shelf assembly and set the frame on the cleat. I drilled a pair of countersunk pilot holes through the frame at each stud location. Driving a screw through each hole secured the shelf assembly to the wall.

After removing the cleat, I swung the support arms straight out from the frame (using a framing square for accuracy), and screwed the stop blocks to the underside of the shelf.

Without a doubt, the addition of this shelf makes it easier than ever to keep the laundry room neat and organized, especially when combined with the laundry center. And it doesn't eat up valuable floor space.





Laying Laminates

Wood always ranks among my top material choices when it comes to projects, but I often add other ingredients — steel or brass hardware, maybe even ceramic tile, glass, or some nice

granite or marble. Working with most of these alternative materials requires tools and techniques that depart far from my normal wood-working routine, but plastics and high-pressure decorative laminates are an exception. They can be machined with normal carbide blades and cutters. The differences? Laminates are thinner and more brittle than wood. Cutting takes some care, and adhesives and gluing methods also vary.

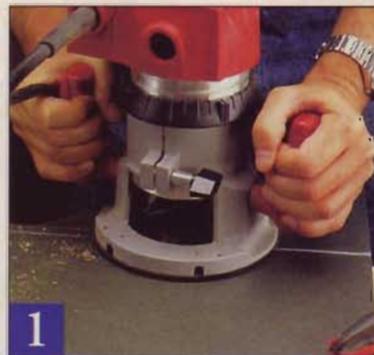
Learning the Basics

The first hurdle you'll encounter with decorative laminate is cutting the material to size. For most projects, you'll want to cut the piece oversize and trim it with a router once it's glued to the substrate (the panel you use as a gluing base). I like to leave the laminate at least 1" oversize along each edge to give me a comfortable margin for trimming.

You can cut the rough laminate blank freehand with a router, as long as you provide support to keep the laminate flat (**Figure 1**). The table saw also works fine, but you'll need a kerfed wood guide to keep the laminate from sliding under your rip fence (**Figure 2**).

Your next challenge will be making the stuff stick where you want.

Even though the core of "plastic" laminate is really layers of kraft paper (similar to brown shopping bags, and also made from wood fiber), conventional gluing methods don't work very well. That's because the kraft paper is impreg-



1 With the rough size marked on the face of the laminate, support the material near the line and rout it with a straight bit.

nated with phenolic plastic resin. Large furniture and cabinet shops with full-sheet presses can use ordinary white or yellow glue, but for the rest of us, contact cement works best.

Glue-up: One Shot

You'll find contact cements with either solvent-based or water-borne formulas, and application methods include brushing, rolling, and spraying. On really porous materials you may need two coats to provide adequate coverage.

The best substrates are engineered wood panels, such as particleboard, plywood, or medium-density fiberboard (MDF), that don't move as much as solid wood.

Apply the adhesive to both surfaces to be joined, but don't put them together right away. Allow the cement time to air-dry (the sheen will change from glossy to matte) and to develop a slight tack. Don't be fooled by the weak grab on your finger, though — contact cement is designed to cling tenaciously to itself, bonding instantly when the two coated surfaces make contact (hence the name). You don't need clamps, but you have to get it right the first time.

After the cement has set up on both the laminate and the panel, you can put the pieces together. I use thin wood strips as spacers to hold the material apart until I position the laminate (Figure 3). (Venetian blind slats and wood dowels are alternatives.)



4 Starting at the center of the panel, remove the spacers and press the laminate down. The contact cement will bond instantly.

Once the positioning is correct, remove the center spacers and press the laminate down, working toward each end and removing the spacers as you go (Figure 4). To ensure a good bond, I also use light hammer blows on a wood block, or pressure from a J-roller, to seat the laminate completely (Figure 5). Be careful not to crack the overhanging laminate at the edges — you want a clean trim.

Trimming and Edging

With most laminated panels, you'll want to trim the excess laminate flush with the edges of the substrate. A bearing-guided flush-trim router bit is the surest way to get a clean edge (Figure 6). The bit's carbide flutes shear the laminate from the edge so there's none of the tearout common with sawing through the face.

There's another technique I use when I don't have a flush-trim bit handy. I bond an oversize laminate

blank to an oversize substrate, then cut the panel to size on the table saw (always with the laminate side up to avoid chipping).

High pressure laminates offer a durable and easy-to-clean surface for a lot of projects, not to mention a wild variety of colors and textures. They're easy to apply, and you can opt for different edge treatments, including wood molding that matches your project.



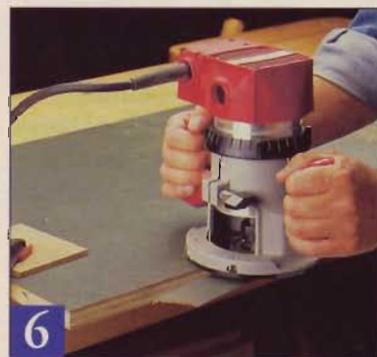
2 Laminates slide under most fences, so if you cut the material on the table saw, use a kerfed wood fence to guide the edge.



3 After you apply contact cement to both the laminate and substrate and let it dry, set clean spacers onto the substrate. Then position the laminate roughly in place.



5 A J-roller helps ensure a strong cement bond. A double-wheel roller (in background) can do the edges after trimming.



6 A flush-trim router bit, guided by a bearing, will shear the laminate off along the edges. Watch for voids in the substrate.



Prairie Treasure Box

Every year at this time I try to come up with a project that I can easily mass produce for holiday gifts. Since I usually end up building six or seven, it's important to keep the

machining setups simple and consistent so that parts for every unit can be made at the same time.

This year I made treasure boxes for storing jewelry, photos, letters, and other collectibles. As one friend pointed out, these boxes look like a house. I suppose that's natural since home designs are always on my mind. Inspiration for this design came from Prairie Style architecture, made well-known by Frank Lloyd Wright in the early part of this century.

Prairie Style was an offshoot of the Arts and Crafts movement.

Although crisscrossing grids are one hallmark of the Prairie Style, they're optional in this project — a box without them is still very handsome. Making the grids isn't difficult, but it does take time. Either

way you decide to go, you'll end up with beautiful results.

For the panels, I used three materials that are closely tied with Prairie Style traditions (**Panel Options**). These are just suggestions — I know there are other choices that will work just as well.



HAMMERED COPPER

STAINED GLASS

RICE PAPER

Panel Options

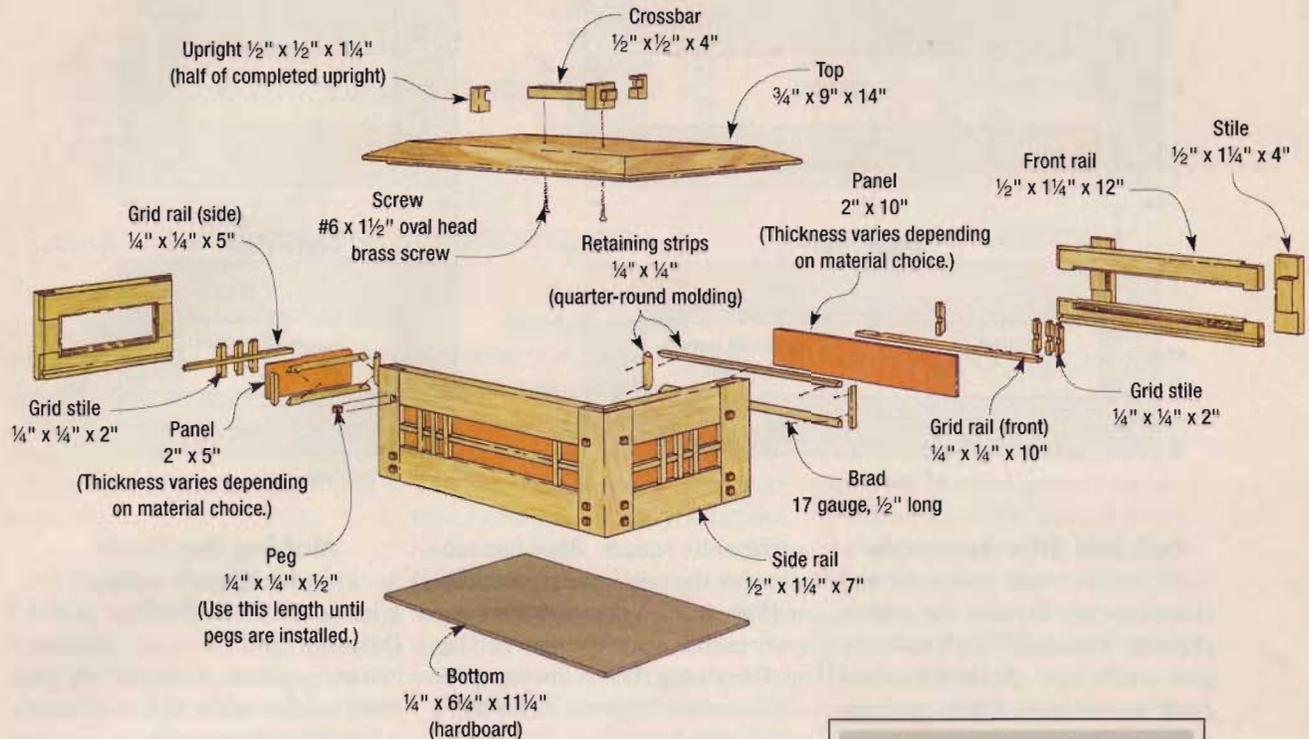
I experimented with three panel materials, and I know there are others that will create an appropriate look for this project.

Copper is available at many hardware stores. To imitate the traditional look of hammered metal, I tapped my panels with, of all things, a trailer ball hitch. Try striking your copper with different objects until you create a pattern that suits you.

As for stained glass, mine came from a local stained glass shop, and I found the rice paper at an art supply store.

Prairie Box Construction View

OVERALL SIZE: 9"W x 14"L x 5⁷/₈"H



Getting Framed

With simplicity of construction in mind, I designed each wall of the box as a frame (**Prairie Box Construction View**). The four pieces in each frame are held together with half-lap joints, which you can cut easily on your table saw with a dado blade.

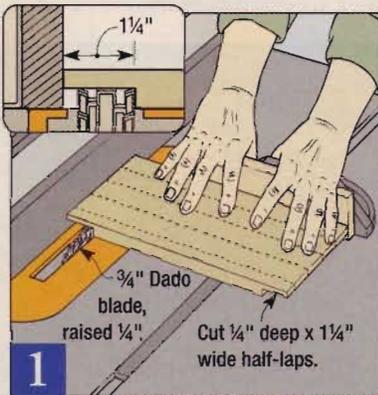
Because the joinery is identical in all the frame pieces, and the size of the pieces is rather small, I decided to machine extra-wide stock — a kind of gang-cutting operation. I machined the half-lap joints into 6"-wide stock, then ripped this stock into 1 1/4"-wide pieces for the rails and stiles. This practice increases safety and saves a lot of time.

So to begin, joint one edge of some 6"-wide, 1/2"-thick stock for the frames, then crosscut pieces to length for the rails and for the stiles. In addition, you'll want to cut some extra material to use for testing your half-lap setups.

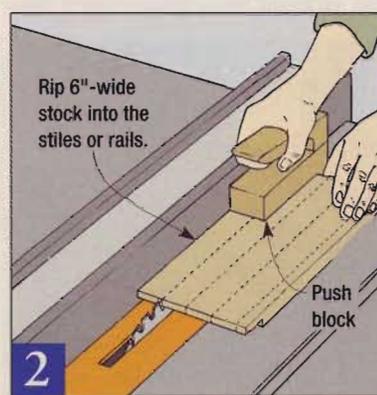
Now install a 3/4"-wide dado blade in your table saw and, using your miter gauge and a wood

extension, cut sample half-laps in pieces of the extra frame material (**Figure 1**). Once the blade height and fence setting are perfect, cut a half-lap in both ends of your rail and stile stock.

Once you're done cutting the half-laps, replace the dado blade with a standard saw blade and rip your rails and stiles to width (**Figure 2**). Be sure to use a push block so you can keep your hands well away from the blade while ripping these narrow pieces.



1 Make several passes to form a half-lap at each end of the 6"-wide pieces of stock you've cut to length for the rails and stiles.



2 After machining the half-laps, rip the wide stock into the rails and stiles. Test-fit the pieces together before gluing up the frames.

What You'll Need (per box)

Lumber

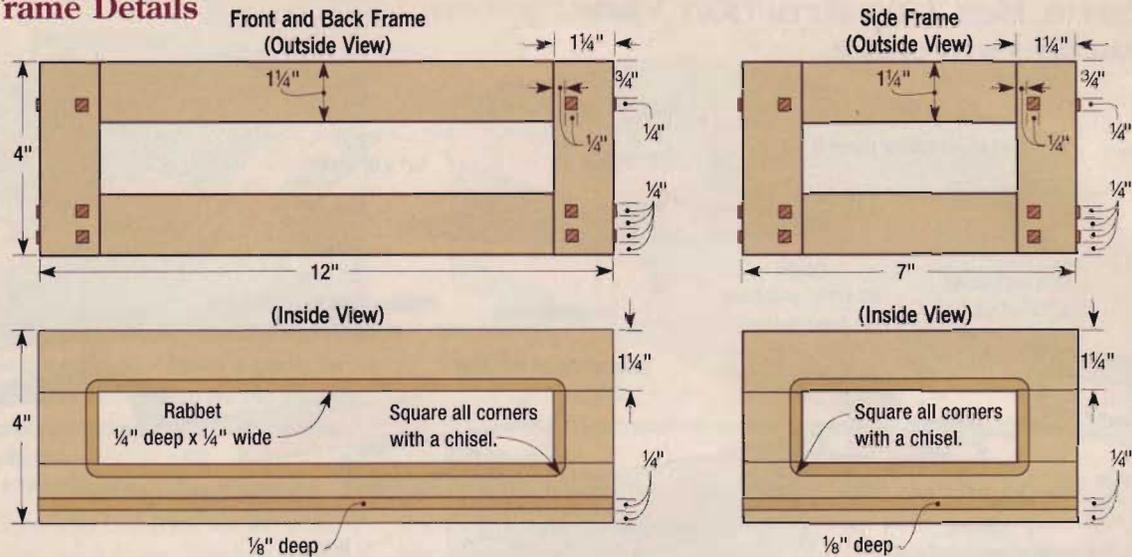
2 sq. ft. of 1/2"-thick hardwood
1 sq. ft. of 1/4"-thick hardwood
1 sq. ft. of 1/4"-thick hardboard
1 1/2 bd. ft. of 3/4"-thick hardwood

Hardware

(2) #6 x 1 1/2" brass oval head wood screws
(2) 2" x 10" panels*
(2) 2" x 5" panels*

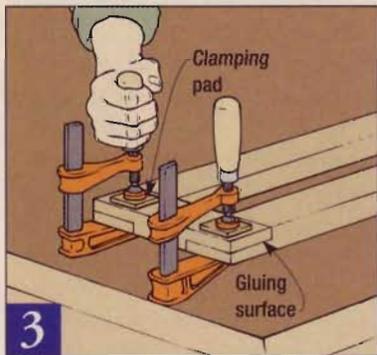
*material of your choice

Frame Details

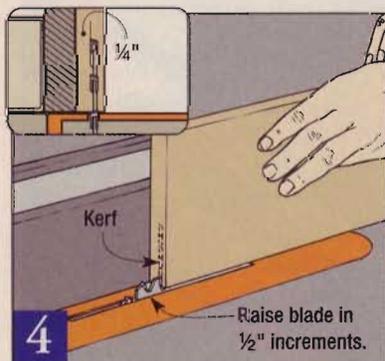


Rail and Stile Assembly
Now you can put the rails and stiles together to make the frames (**Frame Details**). Don't use any glue until you've checked the fit of each assembly—if the machine setups were accurate, the half-lap joints will be tight and the frames

ought to be square. After fine tuning, glue the rails and stiles together (**Figure 3**). You'll want to clamp each corner to press the half-lap surfaces snug. When the squeeze-out becomes rubbery, shear it off with a chisel.



Spread glue on each half-lap and clamp the joints together. Make sure the assemblies are square before leaving them to dry.

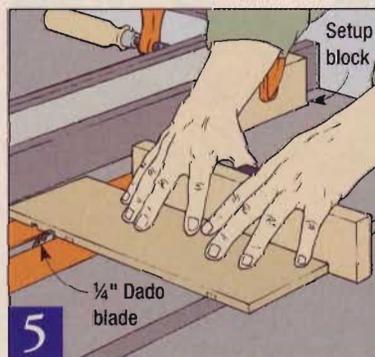


You can easily make 1/4"-thick stock from thicker material by ripping a deep kerf, then ripping the thin stock from the board.

Machining Small Stock

Since the fit of so many upcoming steps depends on the 1/4" strips used for the grids and pegs, I suggest you make this stock now.

First set the blade and the fence on your table saw, and rip into the edge of your 1/2"-thick stock (**Figure 4**). Continue raising the blade and making several more passes to cut the kerf deeper. When the kerf is about 2 3/4" deep, lower the blade, set the fence 2 3/4" from the blade, and cut the thin stock free of the board.



Working with the 1/4"-thick x 2 3/4"-wide stock, cut 1/8"-deep dadoes at the overlap locations on the grid pieces.

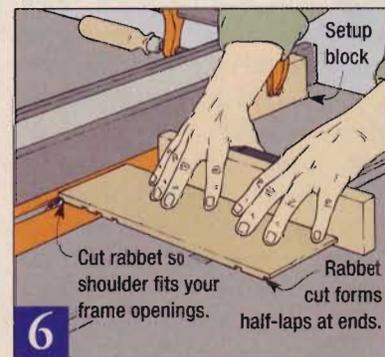
Making the Grids

As with the frames, making the grids is all about half-laps (**Grid Details**). And this is another instance when I preferred to machine the stock before ripping it into the narrow strips.

Measure your frame openings—in case your dimensions vary from mine—and cut your stock 1/2" longer to allow for the half-laps at the ends of the grid pieces.

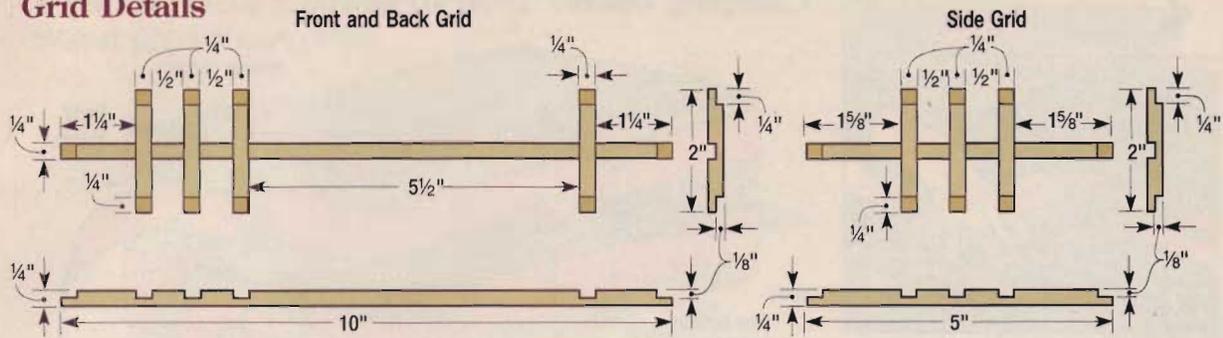
Next, install a 1/4" dado blade in your table saw and clamp a setup block to the fence. Cut 1/8"-deep dadoes in the stock at the appropriate locations (**Figure 5**). To check your setup, I suggest making cuts in scrap stock first. Cut a rabbet in both ends of each piece as well (**Figure 6**).

Replace the dado blade with a standard blade and rip 1/4"-wide



Once you've cut the dadoes, reset the fence and setup block to cut the rabbet at each end of the grid stock.

Grid Details



strips for the grid pieces and for the pegs (**Figure 7**). To ensure that these strips can't be kicked back, use a push block that passes through the blade with the strips.

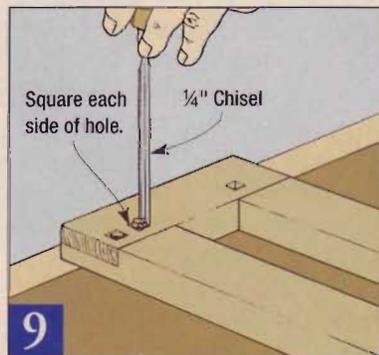
Now carefully glue each grid assembly together.

Square Peg Holes

Forming square holes for the pegs is a snap if you have a hollow chisel mortiser. This tool drills out most of the waste and squares the sides of a hole in one step. Fortunately, you can get the same results with a drill and sharp chisel.

Lay out the peg hole locations on the frames (**Frame Details**). Then draw lines from corner to corner to mark the center of each layout. Chuck a $\frac{1}{4}$ " bit in your drill and bore a $\frac{1}{4}$ "-deep hole at each layout (**Figure 8**). Square the holes with a very sharp $\frac{1}{4}$ " chisel, taking your time to keep everything crisp and even (**Figure 9**).

As you proceed, dry fit a peg strip in the holes — you want a snug fit, but not so tight that you need a mallet.



9 Square up the peg holes with a sharp chisel. As you work on each hole, test its size with a $\frac{1}{4}$ " peg strip.

Grid Mortises

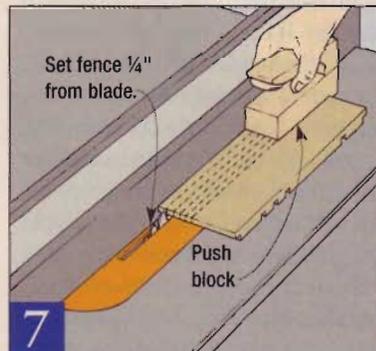
Now that you have the hang of forming square holes you can move on to forming mortises in the frames for the grid installation.

Before you can form these mortises, however, you must rabbet the back of each frame opening (**Frame Details**). Use your router table and a rabbeting bit, making sure the bit's bearing limits the width of the cut to $\frac{1}{4}$ " (**Figure 10**).

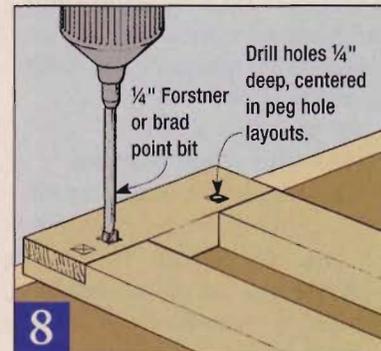
Rout the rabbets and square the corners with a chisel, then lay each grid into its frame and outline

the mortise locations (**Figure 11**). Drill out the mortise waste with a $\frac{1}{4}$ " bit, but this time drill only $\frac{1}{8}$ " deep. Square the holes with a chisel, making sure to check the fit of the grids as you go.

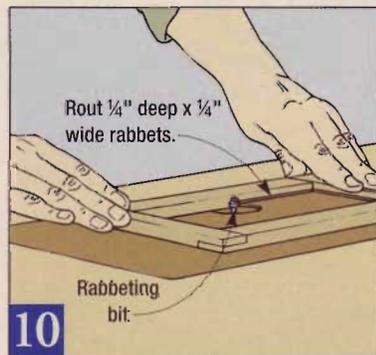
When everything fits, put a spot of glue in each mortise and press the grids into position. After the glue sets, rip $\frac{1}{8}$ "-deep grooves in the frames for holding the bottom (**Frame Details**). You'll need to make two passes with a standard blade to cut grooves wide enough for the $\frac{1}{4}$ "-thick hardboard.



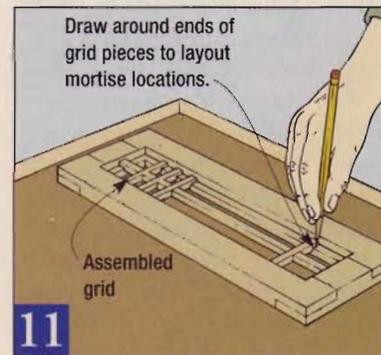
7 Use a push block that can travel through the blade while ripping the grid stock to width. This will prevent kickbacks.



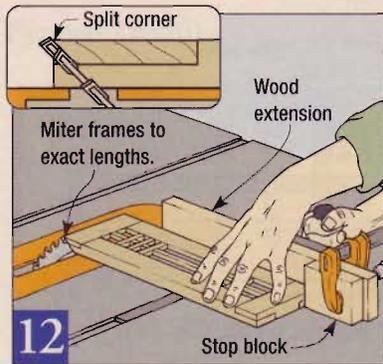
8 Begin forming square holes for the pegs by drilling with a $\frac{1}{4}$ " bit. Be sure to align the bit with the center of each layout.



10 Set up your router table with a rabbeting bit, then rout the rabbets around the opening on the back of each frame.



11 The easiest and most accurate way to locate the grid mortises is to position each grid and draw around the ends.



So that each pair of frames is exactly the same size, clamp a stop block to the wood extension before mitering the frame ends.

Mitering the Frames

Simplicity is the key to this project, and one of the simplest joints I know is the miter. That is how I joined the corners of the frames.

Even though mitering is simple, accuracy is essential. Set up the miter gauge with a wood extension and a stop block, then take plenty of time to tilt your blade precisely at 45°. Make test cuts in pairs of scrap pieces until you can set them together to form a 90° angle. Once you're satisfied, miter the frames (Figure 12). But don't glue them together just yet.

Installing the Panels

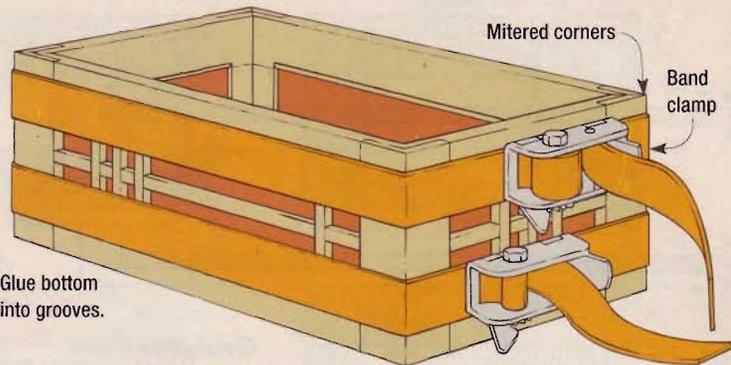
Because the box is rather small, installing the panels can be difficult after the frames are glued together. Instead, I recommend installing the panels now.

The method for installation depends on the panel material you choose. To hold in the copper and rice paper, I used 1/4" quarter-round purchased from The Woodworkers' Store (1-800-279-4441). Since stained glass is thicker than copper or rice paper, and doesn't leave room in the frame rabbets for retaining strips, I used very thin beads of clear silicone caulk to hold them into the frames.

If you do use quarter-round strips, miter the pieces to fit in the frames. Then set the panel and pieces into position and drill very small pilot holes for 1/2"-long brads — don't drive the brads just yet.

Since finishing will be difficult

Clamping Detail



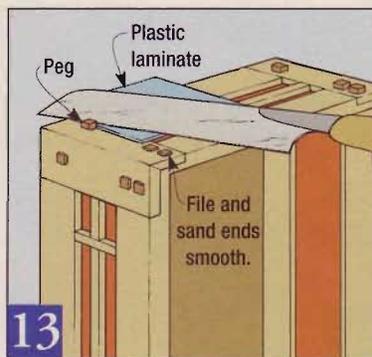
Be sure assembly remains square as you tighten the clamps.

once the brads are driven and the frames are assembled, apply a couple of coats of wiping oil varnish on all the parts now. But definitely avoid getting any finish on the miters or in the grooves for the bottom. Finish in these areas will prevent the glue from bonding well with the wood or hardboard.

Assembling the Frames

Install the panels and quarter-round molding, and cut the bottom to size. Then glue the frames together. I found that band clamps worked well for clamping the frames together (Clamping Detail). Spread glue on each miter and put a small amount in the grooves for the bottom, then apply pressure with the band clamps.

Shear off any glue before it hardens, then give the box a good sanding to 180-grit after the glue dries. Be careful sanding the grids — aggressive sanding can cause a depression in these fragile areas.



You'll have a perfect cutoff gauge if you protect the frames with plastic laminate while you cut the pegs to length.

Now you can fill the square holes with pegs. Cut 1/2"-long pegs, and glue them into position. Later, after the glue sets, use a fine-toothed handsaw to cut off the excess, leaving the top of each peg just proud of the frame surfaces. A piece of plastic laminate is ideal for positioning the saw for these cuts (Figure 13).

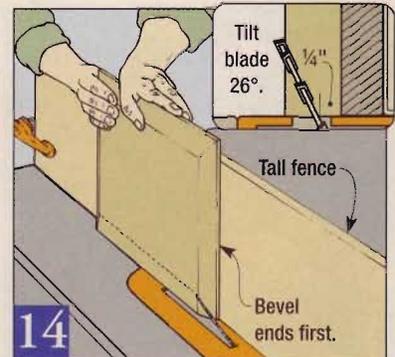
File and sand the ends of the pegs to remove the saw marks, then use a rag to apply several coats of finish to them.

Making the Top

Choosing stable wood for the top reduces the chance of warpage over time. Look for quartersawn or rift sawn (straight-grained) stock, and use material you know is dry.

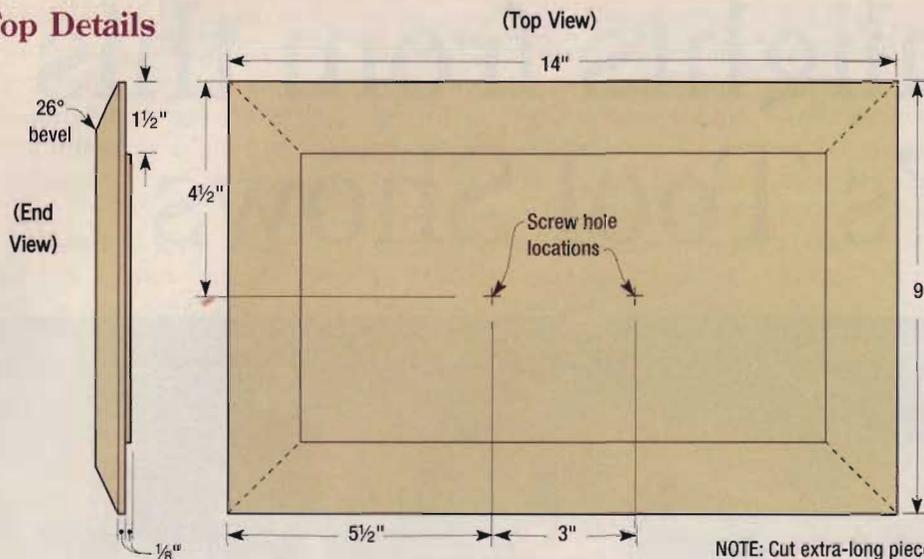
To further reduce the chance of warpage, make the top with two or more pieces glued edge-to-edge.

After sanding the glued-up panel and cutting it to size, tilt your saw blade 26° and bevel each edge

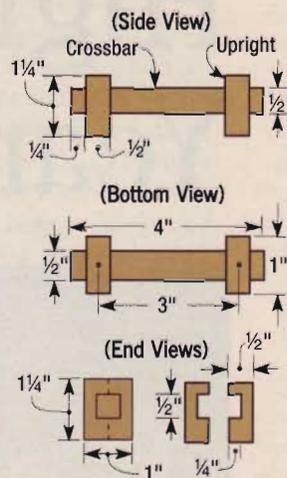


Clamp a tall extension to your table saw fence and rip the bevels, first on the ends, then on the edges of the top.

Top Details



Handle Details



NOTE: Cut extra-long pieces for uprights to do all machining.

(Top Details). Always cut bevels on the ends first, where tearout is most likely to occur (Figure 14). Following with the edge grain cuts should remove any tearout.

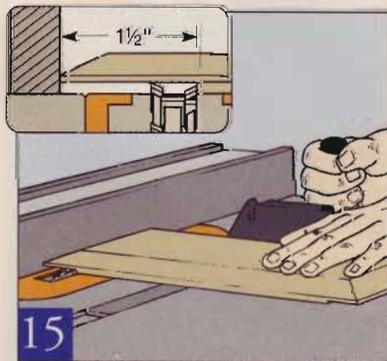
Sand the bevels, then use a dado blade to rabbet the underside of the top so it nests nicely into the box (Figure 15).

Making the Handle

Prairie Stylists drew inspiration from Oriental architecture and furniture. Although this box is not an authentic reproduction, the handle picks up on this traditional theme.

To make the handle, rip material to width for the crossbar and uprights, and leave all the pieces long for now (Handle Details). The extra length makes machining safer and easier.

Next, install a 1/2" dado blade



Use a 1/2" dado blade to cut the shallow rabbets on the underside of the top. Make sure the resulting lip fits inside your box.

and, using your miter gauge, a wood extension and a stop block, cut the dado in each upright. Fine-tune the fit of the uprights around the crossbar stock, then cut the uprights to length. Use the miter gauge setup for this operation too.

Cut the crossbar to length and glue the uprights into pairs around it. After the glue dries, mark X's on the bottom end of each upright, then carefully measure the distance from one center to the other (it should be 3"), and transfer these locations to the top (Top Details).

Now drill pilot holes for #6 screws in the uprights, and drill generously sized pilot holes in the top. Countersink the underside of the top for the screws.

Sand the handle to ease all the sharp edges, then apply several coats of finish to it and to the top.

Screw the top to the handle with #6 x 1 1/2" brass oval head screws (I used oval head screws because they are more attractive than flat-head screws). Since brass screws break so easily, I always follow a two-step procedure to drive them, as described in the Pro Tip above.

Final Thoughts

If you intend to keep delicate items in your box, you might want to add one more detail. I sometimes use black felt to cover a piece of stiff

PRO TIP

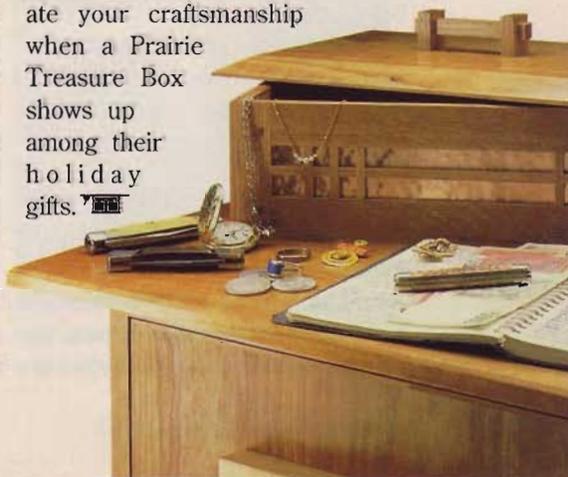
Installing Brass Screws

Brass screws are soft and break easily when being driven in hardwood. To avoid this problem, drill your pilot holes, then drive in and remove steel screws that match the size and thread count of your brass screws. The path cut by the steel screws makes it easy to install the brass screws.



cardboard that fits down into the box. The felt protects jewelry and other precious collectibles, and increases the "elegance factor" of the completed project.

Not that this project needs more elegance. Simple lines and a classic appearance are more than enough. And even more importantly, I know your family and friends will appreciate your craftsmanship when a Prairie Treasure Box shows up among their holiday gifts.



Highlights from this Year's Tool Shows



For a lot of Americans, the end of summer means squeezing in that long awaited vacation, scrambling to prepare for the coming school year, or maybe finishing outdoor projects

before the fall weather turns cold. But for a couple of long weekends in August, two of the biggest woodworking and tool trade shows in the country hosted over 50,000 people intent on getting down to business. The 1997 Woodworking Machinery and Furniture Supply Fair, held in Anaheim, CA, featured everything from dime-a-dozen dowel pins to computerized manufacturing

equipment costing upwards of half a million dollars — all there to see and sample in the flesh.

One week later, Chicago's newly expanded McCormick Place convention center hosted the National Hardware Show, where manufacturers from across North America showcased wares even more diverse — hand and power tools, building materials, electrical and plumbing supplies, paints and finishes, lawn and garden products, and more. If it goes into a home, or a home shop, odds are it was displayed somewhere amidst those miles of aisles.

Although these shows cater to industry professionals and retailers, both feature new tools and other products aimed at home-

owners and small-shop woodworkers like you and me. Trouble is, not every tool junkie gets a chance to see them. We knew we couldn't arrange for all of our deserving *Workbench* readers to attend the events (imagine the parking and name tags, for starters), but we did do the next best thing — we combed through several thousand exhibitor's booths, pens in hand and cameras poised, to round up the latest and greatest these companies have to offer.

Some of our favorites are featured in the following pages, but we'll be bringing you more details on these and other new tools from the shows in upcoming issues of *Workbench*, so stay tuned. For now, here are some newsmakers.

ReiTech Easy-Off Power Control Switch

Having a table saw blade bind or a workpiece jam against the fence is an unnerving experience, no matter how skilled you are. If you're fortunate enough to capture the workpiece with both hands before it becomes a missile, you still have to deal with a spinning saw blade or cutter that makes no distinction between flesh and fir.

The obvious solution is to turn the machine off, but do you want to let go of the wood now? This is the scenario that inspired ReiTech's Easy Off Power Control. The oversize panel houses a standard pushbutton start switch, but shutoff is accomplished by a knee bump to the large STOP sign.

For 120-volt machines up to 15 amps, the #CR (\$89.95) accepts the machine cord plug directly and plugs right into a wall outlet. This is a nice safety boost for both stationary and bench top tools.

Call ReiTech at (800) 385-6161.



Bessey PowerGrip

What is the sound of one hand clamping? Try out Bessey's new PowerGrip clamp and you'll know. Granted, one-handed clamps have been around a few years now, but earlier versions sacrificed some power for the convenience. Only recently have manufacturers thought to combine the one-handed adjustment with a screw jaw, and Bessey's versions (12" and 24" long) yield a hefty 1,000 lbs. pressure. Features include a quick-release sliding jaw, an adjustment lever you can operate from either the handle or rail side of the clamp, and a tempered one-piece steel rail. Retail cost? Around \$35-\$39. Call American Clamping Corp. at (800) 828-1004.



Freud Raised Panel Bits

Every savvy woodworker knows that table-mounting a router doubles its versatility, and new cutter profiles have really made an impact, too. Now Freud has adapted the patented design of its 2+2 shaper cutters into a line of raised panel router bits.

Freud developed the geometry of the 2+2 cutters to leave a clean, splinter-free edge where the panel's bevel and face meet. Two large up-cut wings remove most of the bevel, while the down-shear action of the small wings clips the fuzzy edges common on the end grain of raised panels. No more sanding! Offered in seven profiles, the 1/2"-shank bits list for \$100-\$125. Call Freud at (800) 472-7307.





Jacobs Hand-Tite RouterChuck

Changing router bits isn't a horrific ordeal, but most woodworkers can tell tales of pinched fingers, scraped knuckles, and missing collet wrenches. Won't it be awful to give all that up?

You'd better brace yourself for just that, because Jacobs Chuck Mfg. Co. debuted its new Hand-Tite RouterChuck in Chicago. Unlike a conventional threaded collet system, the RouterChuck features a snap-lock collet that requires just a firm push (toward the motor) to lock the bit in place.

To release, just pull the collet cap until you feel the lock snap open and relax the steel sleeve's grip.

According to Jacobs, the tool-free collets will arrive first as components on new routers (demos were done with Porter-Cable and DeWalt routers, but no brands have been specified yet), then later sold as retrofit accessories. We saw only a 1/4" collet, but 1/8" and 1/2" versions are in the works.

Cost and release date schedules are still being sorted out, we were told. Call Jacobs at (864) 654-5926.

Award-Winning Knife

Developed by a Canadian manufacturer, the Nack Knife is a new addition to the Tim Allen Signature Tools line, and it has to be the trickiest utility knife design alive. Inside the ergonomic handle lurks a retractable blade system that lets you get up to 30 fresh knife edges without ever touching a blade.

A rotary magazine stores 15 double-ended blades. You simply retract the dull blade and dial in a new one. Use up 15 edges, then reverse the magazine to get the other 15 blades.



The knife is \$20; a replacement magazine is \$5. For info, call (888) 245-5536.

New Porter-Cable Tools

Porter-Cable launched additions to several tool groups this year, including pneumatic fastening tools (a new medium-crown construction stapler and a roofing nailer), three new JetStream portable air compressors, new cordless drills and flashlights, and several router accessories. Among the latter are two dust collection fittings for Porter-Cable routers. These bases install on the routers and divert chips and dust into a vacuum hose. Retail cost is about \$39 for the smaller unit and about \$46 for the larger. For information call Porter-Cable at (800) 487-8665.



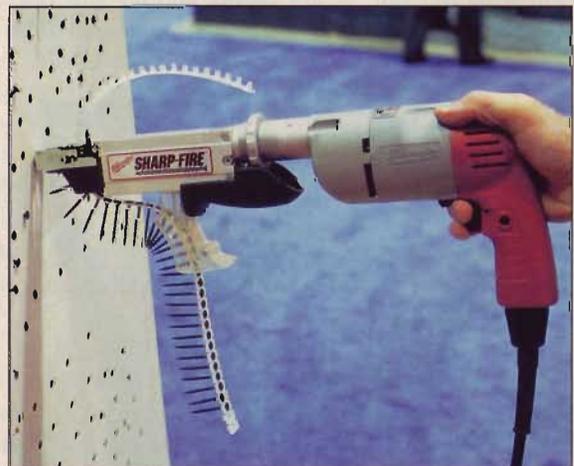
Milwaukee Sharp-Fire

Marketed almost exclusively to contractors, auto-feed power screwdrivers save a lot of hassle and time fastening drywall, assembling cabinets and furniture, and screwing down decking and subflooring. Home-shop woodworkers might consider them a luxury item only, but if you have projects going on year-round like we do, they really earn their keep.

Milwaukee unveiled four versions of its new Sharp-Fire system — with low rpm (0-2,500) and high rpm (0-4,000) driver motors, and with compact (shown) and extended driveshaft housings. Usable fasteners currently range from 1 1/4" to 2" in length, with longer sizes to be added later. The screws are collated in strips of 50. The nose of the gun has depth-of-drive control and lets you install a full plastic collation strip in just a few seconds. Cost for the systems will start at about \$300 retail.

The company also had new 18-volt cordless tools on hand — a 1/2" rotary hammer, and 1/2" D-handle and right-angle drills — and 12 other new tools.

For more info, call Milwaukee at (800) 414-6527.



New Quieter Shop Vacuums

Wet/dry vacuums can really help improve the breathing conditions in your shop, but the noise they make is almost as annoying as all that airborne sawdust. Enter two new machines to change that.

First is the German-made SQ from Wap International. The 10-gallon polyethylene tank features an offset intake port that creates a cyclonic effect, separating heavy dust and debris. Noise level from the 1.6-hp motor is only 58 decibels (dB), versus the more typical 75-80 dB. With hose, filter, and six attachments, the SQ sells for about \$500. Auto-start tool feature is optional. Call (800) 237-2368.



Hitachi also introduced a new 7.5-gal. industrial shop vacuum, rated at just 66 dB. The RP30SA features both wet and dry filters, a stainless steel tank, roller base, a 10.6-amp motor, plus a 10-ft. flex hose and eight attachments. Retail cost is expected to be around \$230.

Other newcomers at the Hitachi booth included a 10" bench-top table saw, a 12" portable planer, and a prototype cordless power plane. For info, call Hitachi/Koki U.S.A. at (800) 546-1666.

Help for the Home Plumber

Most people who tackle home plumbing jobs learn that these projects aren't difficult, but few of us feel confident soldering copper pipe joints. It's actually pretty easy, but we found a great idea at the Hardware Show that makes it just about foolproof.

SoldOmat Rapid Solder Rings give you a pre-measured amount of lead-free tin/silver alloy, formed into a ring that sticks to the flux-coated end of a copper pipe. You simply press the fitting on over the solder ring and heat the joint with a propane torch. The ring melts and solder flows through the joint, starting at the inside, where the seal is critical. It's simple, but oh-so clever.

The rings, sold in 1/2", 3/4", and 1" diameters, start at less than 10¢ each, depending on quantity.

Manufacturer Pace Machinery Group of Wasco, IL, also has other products designed to make life tolerable for the plumbing-impaired. To handle another concern about soldering copper pipe

— fire danger — the company offers the Flame-Gard, a 9" x 12" heat shield made from woven ceramic fiber (\$9.98).

Other favorites are the Pipe Slice(s), three self-adjusting tubing cutters (for 3/8", 1/2", or 3/4" copper pipe; \$18.95 each) with spring-loaded cutting wheels, and the Red Line 5-Function Level (\$15.95), which provides standard readings plus 1% and 2% slope for setting drain pipe.

For info, call (800) 327-3552.



Bosch Compact Belt Sander

The Skil-Bosch booth featured a number of new power tools, but the newsmakers were from one group especially — sanders. These included a line of palm-grip random-orbit sanders, a new half-sheet finishing sander, and one very different entry — a compact belt sander.

This new sander shares its size and basic shape with Bosch's corner detail sanders, and it's designed to get into the same kind of tight spaces. The belt sanding action makes stock removal a lot faster though.

Belt size is 1 1/2" x 12". Ten of them will come in a kit with the sander, a side handle, and a carrying case, for about \$150 retail.

The palm-grip sanders aren't a new category, but until now

Bosch has offered only larger models of random-orbit sanders. The full-featured model (\$90 retail) has two speeds, a soft-grip top, and through-the-pad dust extraction with a canister.

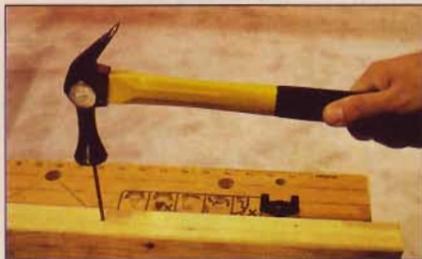
Also new? A digital protractor/anglefinder/level (\$99.95).

Call S-B at (800) 301-8255.



Well-balanced Hammers

With all the electronic-control power tools and other high-tech fare at these shows, it was nice to see there's still room for traditional hand tools that have been rethought or reinvented. Two new hammers were among those offerings this year.



Takagi Tools grew its line of Japanese-style woodworking tools (they make the Shark Saw line) to include several nail pullers and a hybrid hammer design.

The Homing hammer (top photo) has a fiberglass shaft and cushioned grip, but the business end is the traditional Japanese "duck's head" shape. The 23-oz. head feels much lighter, and has side faces for tight nail-

ing. List price is \$36. Call Takagi at (800) 777-5538.

The other newcomer is from Hart Tool Co., developer of the California Framer. Called the "Woody," their new hammer keeps their trademark hickory handle, but sports a stainless steel head with a square face (for a bigger "sweet spot") and an extended tang. The tang adds strength, plus has shoulders that protect the handle from overstrikes. They also added a side pull claw to the head. Cost is about \$60 for the 22-oz.; a 17-oz. version is planned.

For info, call Hart Tool Co. at (800) 331-4495.

Drill Sharpening System

If you suffer from chronic DTDS (Dull Twist Drill Syndrome), there's a cure for what ails you. It's a self-contained sharpening system called the Drill Doctor, and it tunes up drill bits without guesswork.

The system has its own motor and three separate ports that automatically index the bit, grind it with a diamond wheel, then "split" the point so it stays on center. The #500SP (\$129) handles bits from $\frac{3}{32}$ " to $\frac{1}{2}$ "; the #750SP (\$169) sharpens drills from $\frac{3}{32}$ " to $\frac{3}{4}$ " in diameter.

For info, call Darex Corp. at (800) 547-0222.



Talking Tape Measure

Digital tape rules offer high-tech help with measuring, but Zircon pushed the envelope further still to make one that actually talks back to you — or more accurately, lets you talk back to yourself.

The Repeater is a 25-ft. tape rule with a built-in digital voice recorder. You take a reading, but say the dimension out loud rather than memorize it.

Press a button and it plays back. You can also record/listen in a stop-and-start sequence (up to 20 seconds), and rewind to repeat the messages. Cost is under \$30. Call (800) 245-9265.



New Classic Edition Unisaw

Showgoers used to Delta's standard green-gray and black color scheme got an eyeful of something unusual at the company's Anaheim booth. A Classic Edition Unisaw, decked out in a coat of Biesemeyer white, drew a lot of stares.

The white Unisaw actually got a test debut last year at the International Woodworking Fair in Atlanta. But then it was just a teaser to get the crowd's reaction, and this year the color scheme will see daylight on production models.

Delta is promoting the saw with a package that includes a carbide-

tipped blade, Biesemeyer fence, and extension table. It sells for \$1,699 (minus a \$100 rebate).

Also new for the company is a 12" compound miter saw (retail around \$429) with a sliding fence and a base design that allows direct mounting to 2x lumber (such as a sawhorse rail).

Other new products carrying the Delta name are a compact variable-speed stock feeder, a 12 $\frac{1}{2}$ " portable planer with a cutterhead lock to control sniping, and a cart-mounted 1 $\frac{1}{2}$ -hp dust collector. Call Delta at (800) 438-2486.

“Cabinet Claw” Clamp & Guide

It's more than frustrating to have installation problems undo the work you put into making custom cabinets. Now Adjustable Clamp Co. offers help for this job — the Pony Cabinet Claw.

This tool not only clamps adjacent cabinet frames together, it aligns them flush and has a retractable guide for drilling the screw holes. The guide pivots to

let you drive the assembly screws. Retail cost is \$60 a pair.

For info, call (312) 666-0640.



Home Fireman System



When fires start, reaction time is critical, but most homes aren't equipped with real safeguards. The Home Fireman (\$199) features a between-the-studs cabinet, installation kit, and a valve that connects to a supply line. Inside is a 40-ft. hose and a 5-lb. extinguisher. Call SafeHome Industries at (888) 662-3473.

Micro-Fence Vacuum Circle Jig

As far as precision, engineering quality, and ease of setup, the Micro-Fence edge-guide system for routers still occupies a class by itself. This Vacuum Center accessory has the same genes.

Using the company's circle-routing guide, the vacuum center has a venturi valve and a suction-ring hold-down that leaves no mark on the workpiece. Cost

is \$399 with the 6" to 48" circle guide, or \$299 without. Call Micro-Fence at (800) 480-6427.



Makita Electric Chain Saws

If you use a chain saw around the yard more than out in the woods, nothing beats the convenience of



an electric model. There's no fuel to mix and no engine to keep tuned — just sharpen the chain.

Makita introduced gas chain saws last year, and now offers two electric versions (14" and 16"), also made by the same German subsidiary. Look for retail cost around \$199-\$219, with availability by year's end.

Call (800) 462-5482.

Starrett “Oops” Hole Saw Arbor

If you've ever goofed up by drilling too small a clearance hole for pipe, or had to enlarge an existing hole, you know how critical the pilot bit is for a hole saw. The L.S. Starrett Co. has a solution — an arbor that lets you mount two hole saws simultaneously and use the smaller saw to pilot the larger one.

The “Oops” arbor lists for \$6.98 and accepts Starrett hole saws from 7/8" through 6" in diameter.

Call Starrett at (508) 249-3551.



More to Come!

Much as we'd have liked to, we couldn't do justice in one issue to all of the new items featured at these shows, so we had to settle on a few of our favorites.

Don't panic, though. *Workbench* will continue to bring you news on the other tools and home improvement products we saw in Anaheim and in Chicago. Still to come: Jet's new ShopLine — seven affordable machines for the home shop; new hand tools from Veritas/Lee Valley; precision router table and table saw fences from JoinTech; DeWalt's new miter saw stand; cordless drills from Ryobi; Dutch Boy's new exterior house paints formulated for regional climates; an awesome heavy-duty lathe from Powermatic; Keller's 1500 single template dovetail-routing system, and much more.

For now, though, this should provide a good start on your wish list for the holidays! 



Miter Saw Station

When I'm getting started on a project, a trip to the local lumberyard is usually just part of the routine, a stop to pick up the materials I'll need. But sometimes I get more than

a truckload of wood — sometimes I get inspiration for ideas that might improve my project or even change the way I work in my shop.

One of those revelations came as I watched a yard-hand crosscut some framing stock for me. He threw a long 2x10 onto the radial

arm saw, slammed one end against the cutoff stop, and had the board trimmed to length in less time than it takes me to uncoil a tape measure. This is not exactly unappealing, I thought, but I knew a 16" industrial saw and a 20-ft. support table weren't in my budget.

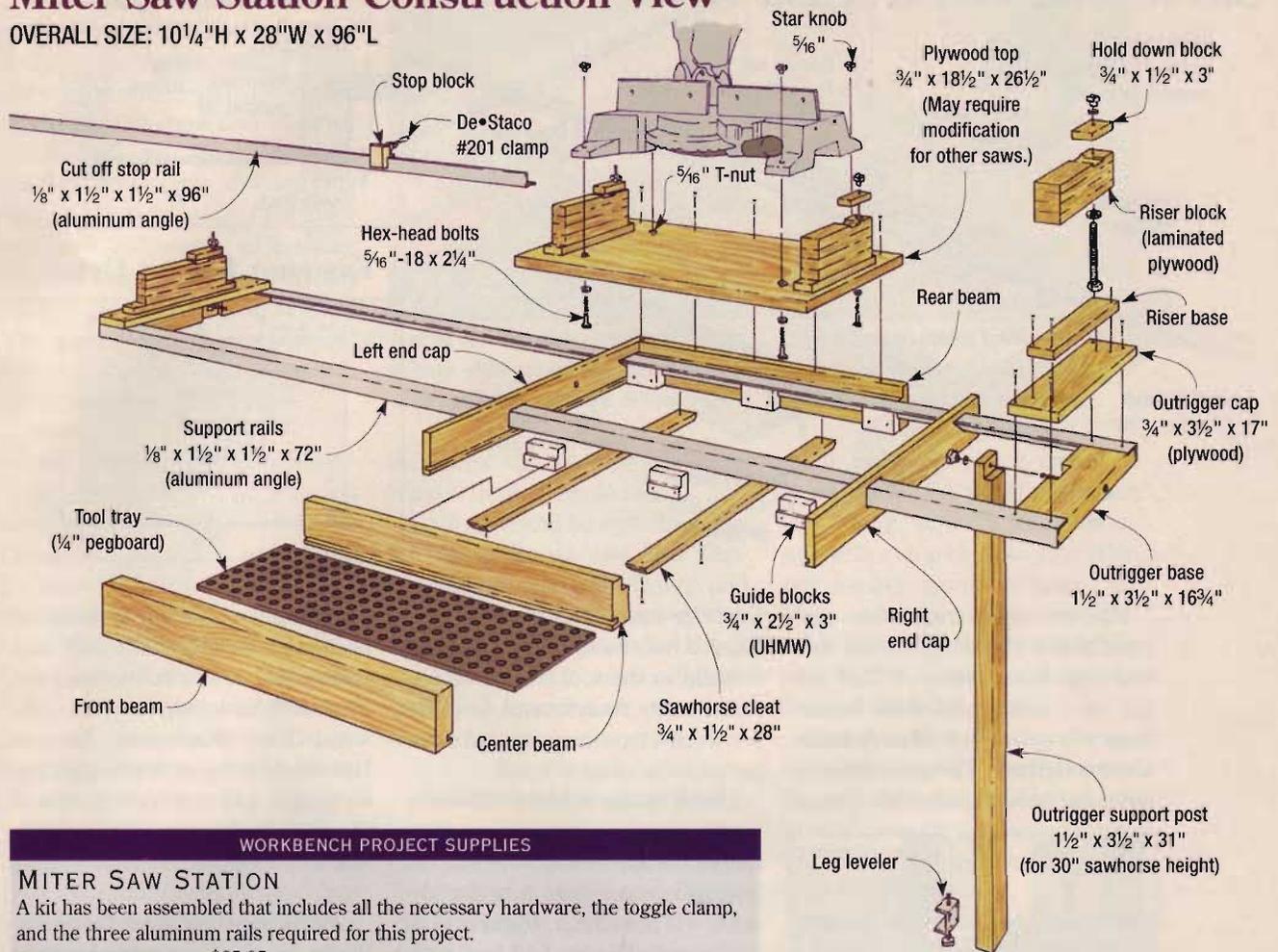
Still, I was a changed handyman. I knew that a modest upgrade in my tool arsenal would let me work faster and more accurately, so I went shopping for a power miter saw. With compound mitering capability and blade diameters up to 12", these machines can match some radial arm saws cut for cut,

especially if you splurge for one with a sliding head for wider cuts.

Because they're designed for portability, though, miter saws don't provide much support for long boards, and they don't have cutoff guide rails with adjustable stops. I've seen a number of aftermarket saw stands designed to give miter saws a little help with these features, but most of the good ones cost as much as the saw itself. I figured I could design something for less money, and maybe even add some features the store-bought units don't have, like a built-in tool tray.

Miter Saw Station Construction View

OVERALL SIZE: 10¹/₄"H x 28"W x 96"L



WORKBENCH PROJECT SUPPLIES

MITER SAW STATION

A kit has been assembled that includes all the necessary hardware, the toggle clamp, and the three aluminum rails required for this project.

Order number 3306200. . . . \$85.95 plus shipping and handling.

(Note: Due to the long rails, there is a shipping surcharge of \$8.00 over the normal shipping costs.)

To order, call Workbench at (800) 311-3994.

Build Around Your Saw

The features and basic layout of this portable miter saw station can work with virtually any saw, but the overall dimensions and mounting bolt locations may have to be adjusted for the make and model you own. (I designed this one for my Milwaukee #6490 saw.)

First, figure out a comfortable platform size, one that has room for at least the saw and two riser block assemblies (**Miter Saw Station Construction View**).

I chose aluminum for the support rails for the same reason most of the commercial miter saw stands use it — it's lightweight, strong, and rigid. At first I thought a telescoping rail system would be nice, but it's a bit impractical for a shop-built workstation. Extending

long rails through the platform (a cantilevered design) provides more support at the ends, anyway.

No Fancy Materials

The lumber list for this project is so short you can probably salvage all the materials from leftover stock in your shop. And you've probably noticed already that this saw station is just a work platform, designed to rest on sawhorses. I thought briefly about building in some folding legs, but didn't want to add the extra weight and bulk. (Plans for the sawhorses shown can be found in the August 1997 issue of *Workbench*.)

Start by cutting the 3/4" plywood for the top, making sure you get the corners square. Alignment of the other parts depends on it.

What You'll Need

Lumber

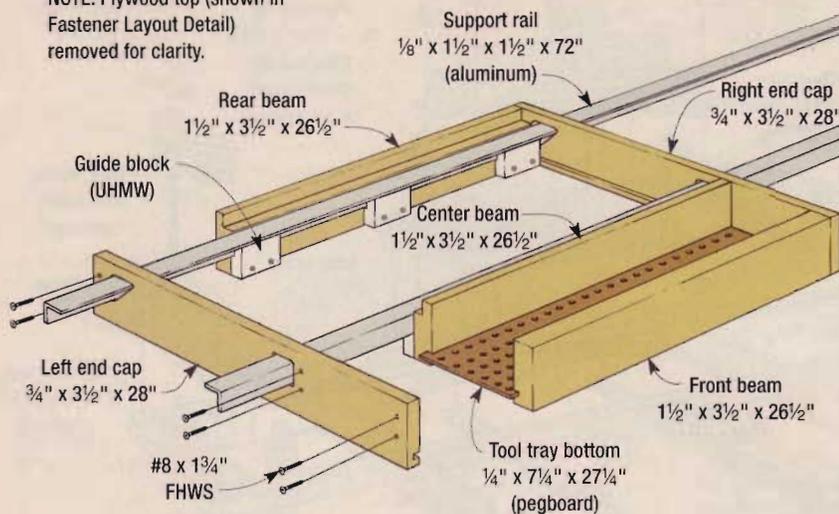
- (1) 3/4" x 48" x 32" piece of fir plywood
- 16 lin. ft. of 2x4 fir
- 10 lin. ft. of 1x4 pine
- (1) 1/4" x 8" x 28" pegboard

Hardware

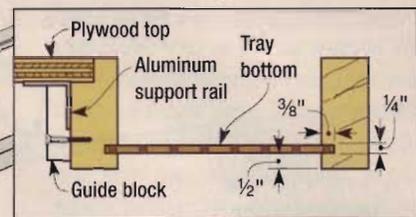
- (10) 5/16" Star knobs
- (10) 5/16" T-nuts
- (10) 5/16" Flat washers
- (1) DeStaco #201 hold-down clamp
- (4) #6 x 1/2" Pan-head sheet metal screws
- (1) Adjustable leg leveler
- (1) 3/4" x 2 1/2" x 24" UHMW plastic
- (3) 1/8" x 1 1/2" x 1 1/2" Aluminum angle (two 72" long; one 96" long)
- (10) 5/16" x 18tpi Hex-head bolts with full-thread shanks: (four 2 1/2" long; four 4" long; two 4 1/2" long)
- (88) #8 Flat-head wood screws: (eight 1 1/4" long; forty 1 1/2" long; forty 1 3/4" long)

Box & Rails Construction View

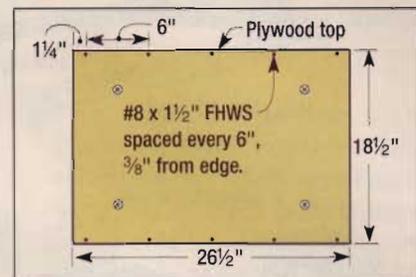
NOTE: Plywood top (shown in Fastener Layout Detail) removed for clarity.



Tool Tray Detail



Fastener Layout Detail



For the wood frame that surrounds the plywood, cut the two end caps from 1x4 stock, and cut the rear, center, and front beams from a length of 2x4 (**Box & Rails Construction View**). I should point out here that the front beam

(and the extra length on the end caps) is necessary only if you want to build in the tool tray. It's a feature I really recommend — it lets you keep a tape measure and other layout tools close at hand.

Cut all three beams to the same length as the plywood top, then rabbet the top inside edges of the rear and center beams so the plywood will nest flush (**Figure 1**). If you're including the tool tray, cut a groove in the center beam and the front beam to accept the tray bottom (**Figure 2**). Run the 1x4 stock for the end caps through the same setup while you're at it, since those pieces also need the groove for the tool tray (**Tool Tray Detail**). Don't worry that the groove runs the full length of the end caps — those inside faces won't show.

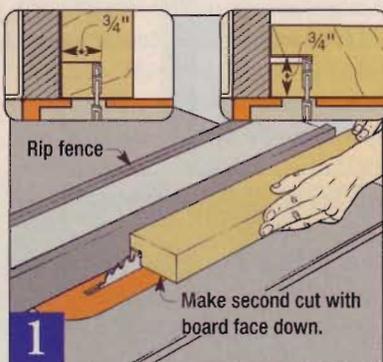
Before you glue the rabbeted beams to the plywood, drill and countersink screw holes along the front and back edges of the plywood face (**Fastener Layout Detail**). Making sure you align the ends, glue and clamp the beams to the plywood, then fasten with wood screws (**Figure 3**).

Making the End Caps

While the platform assembly is in the clamps, mark the 1x4 end caps for the guide rail cutouts (**End Cap Details**). These openings provide clearance for the support rails. Keep in mind that the right and left end caps are mirror images, not identical pieces.

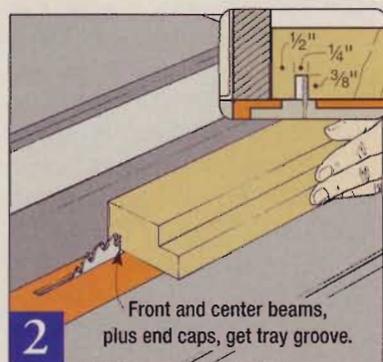
I found the aluminum angle at a local building supply center, and settled on 1/8" x 1 1/2" x 1 1/2" stock. I got two 6 ft. lengths for my support rails, plus an 8 ft. piece for the cutoff stop rail. (If these materials aren't available from retailers in your area, you can order a complete hardware kit for this project from *Workbench Project Supplies* (see page 43). Note: the dimensions shown work for this size bar stock. Adjust them if yours differs.

The easiest way to create each support rail cutout in the end caps is to drill three holes to form the corners of a triangle. Then use a jig saw or keyhole saw to cut from



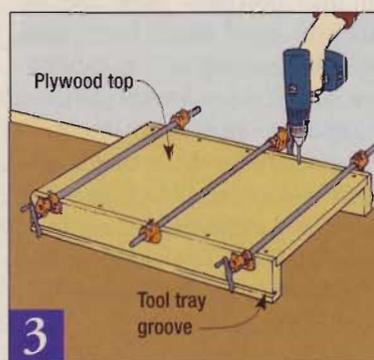
1

To rabbet the beams for the plywood top, make a cut with each beam on edge, then rotate them end for end for the face cut.



2

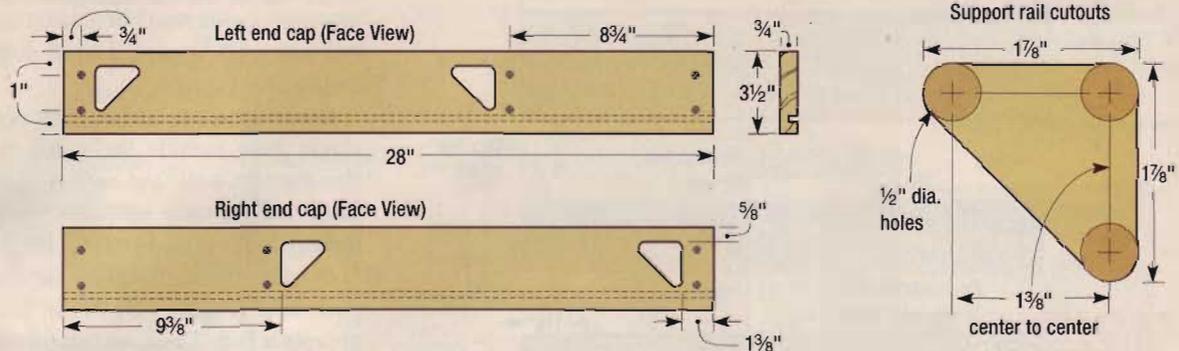
Two passes with a standard blade will cut the groove for the tool tray. Use the same blade and fence settings for the end caps.



3

Clamp the rear and center beams to the plywood top, check the ends for alignment, and fasten the top with wood screws.

End Cap Details



corner to corner and release the waste part (**Figure 4**). Remember, these cutouts allow the support rails to slide back and forth through the platform, so make sure there's plenty of clearance at those corners. Then drill and countersink the screw holes, spread glue on each end of the platform assembly, and fasten the end caps. Once they're secure, slide the pegboard tray bottom in and fasten the front beam in place.

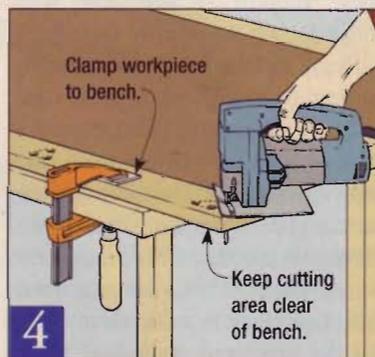
Fitting the Support Rails

At this stage you've still got the riser blocks and other accessories to make, but detour for a few minutes to cut and install the plastic guide blocks for the support rails (**Guide Block Detail**). I chose a high-density polyethylene called UHMW (for ultra-high molecular weight) because it slides so easily against other smooth surfaces. Though it's denser than most woods, it cuts well with regular carbide blades. Besides cutting the blocks to size, the only machining required is adding a shallow rabbet on one face, where the aluminum rail will nest. I felt safer machining this rabbet on a

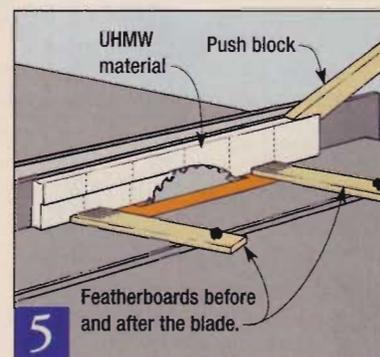
long blank first, then cutting it into individual blocks (**Figure 5**). Drill two screw holes through each block, just below the rabbet. Add a countersink, too — the screw heads won't compress the hard plastic the way they do wood.

Three guide blocks along each support rail turned out to be plenty, and I found it easier to position them with the rails in place. To install the blocks, flip the platform upside-down and rub some paraf-

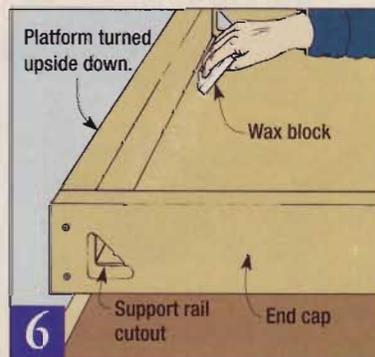
fin wax along the inside corners where the rails travel (**Figure 6**). This will help them slide a little easier. Then feed the rails through the cutouts in the end caps and fasten the guide blocks in place — one in the center and one at each corner (**Figure 7**). Don't apply a lot of pressure to the guide blocks or overtighten the screws — it doesn't add any critical precision, and anything more than a snug fit will make the rail travel stubborn.



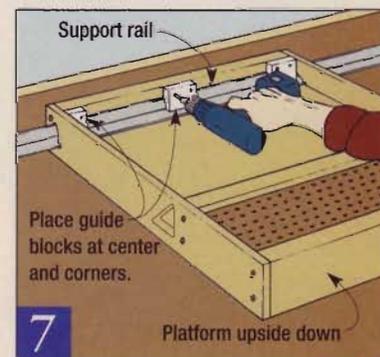
4 Use a jig saw to cut between the three holes and free the waste piece. Precision isn't critical — just leave clearance room.



5 Cut the shallow rabbet on a 20"+ piece of UHMW plastic first, then cut it into shorter lengths for the individual guide blocks.

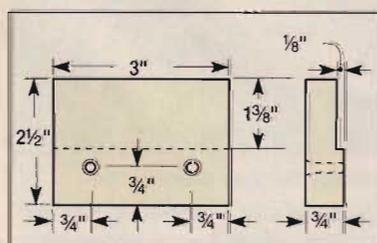


6 With the wood platform upside-down, rub some paraffin wax along the inside corners where the support rails will track.

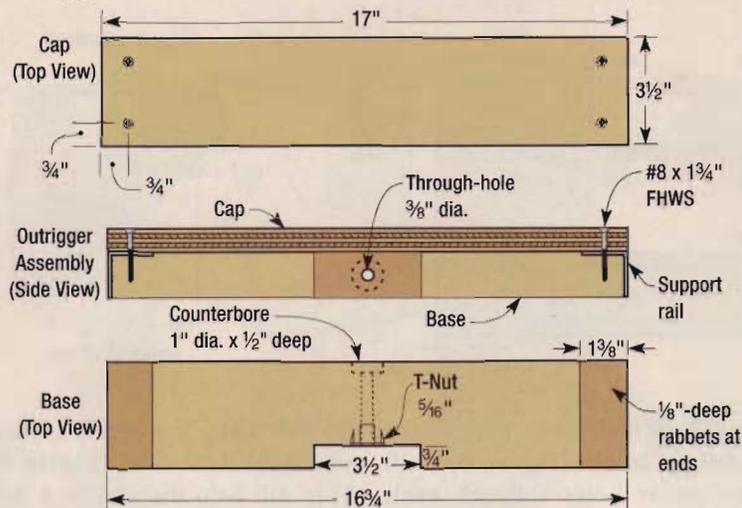


7 Let the guide blocks rest naturally in place as you fasten them to the beams. Too much pressure will bind the rail action.

Guide Block Detail

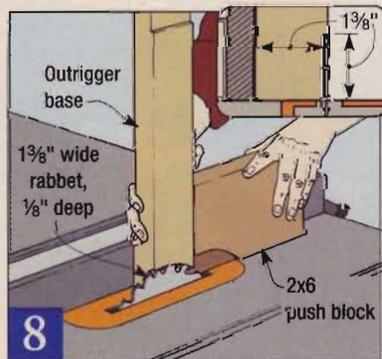


Outrigger Details

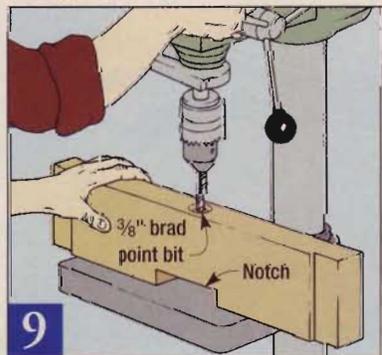


Outriggers Tie the Rails

For the support rails to work properly, they must stay aligned as they slide. To make sure this happens, I added outrigger platforms that help keep the ends square to each other. With riser blocks attached, these outriggers support the cutoff guide rail and any long stock you cut.



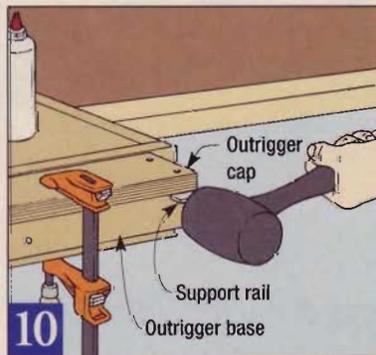
The outrigger bases need a shallow rabbet on each end where the aluminum support rails nest. Use a push block for support.



Modify each outrigger base to accept the support post: cut a notch for the post end, then counterbore and drill for the bolt.

By fitting each outrigger base flush with the support rails and capping it with 3/4" plywood, I kept the outriggers level with the main platform. This saved me some setup time later by keeping all the riser blocks the same height. (The two center riser blocks do require a longer bolt for the hold-down hardware, though — see note with **Riser Block Assembly Details**.)

Begin building the outriggers by cutting two sections of 2x4, each just long enough to fit between the rails where they exit the main platform (**Outrigger Details**). If your main platform assembly is accurate, these two pieces will be exactly the same length. Then, using a scrap 2x6 push block to guide them along the rip fence, cut a shallow rabbet on each end (**Figure 8**). This creates an offset so the tops of the outrigger bases will be flush with the



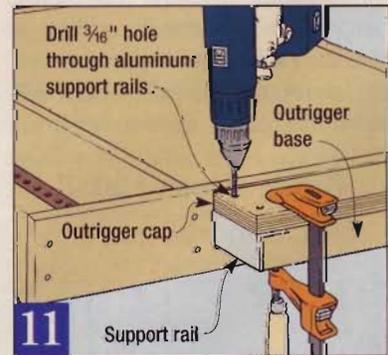
With glue and clamps holding one outrigger cap to its base, tap the aluminum support rails flush with the outside edge.

tops of the support rails. You can't afford a sloppy fit here, because the outrigger bases won't help keep the rail assembly square if they don't lock tightly in place.

Other details to add to each outrigger base include the notch for the support post (cut with a dado blade on the table saw), the counterbore in the outside edge, and the 3/8" hole drilled through for the post bolt (**Figure 9**). This hole accepts a bolt, T-nut, and star knob assembly for mounting the support post — an easy-to-add option that keeps the outriggers from deflecting under heavy boards.

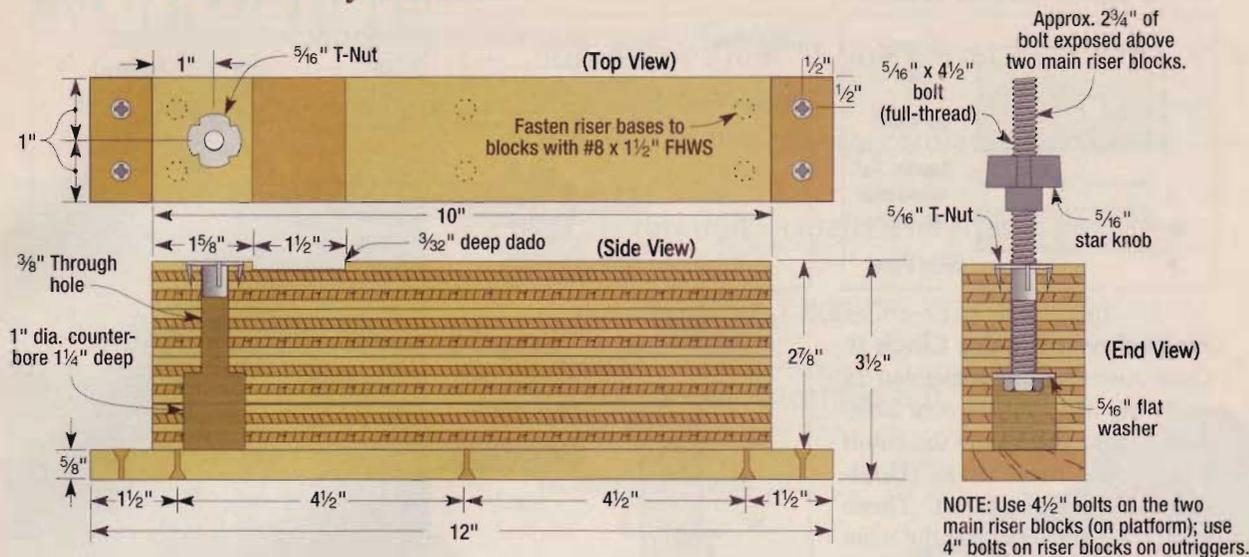
Once you have the outrigger bases machined, cut and drill the plywood caps for them. To install these, work on one end of the platform at a time. First, slide the rails so that just over 3 1/2" is exposed where you're working. Spread glue on the outrigger base, then clamp the cap on top of it. Now tap the rails in until they're flush with the side of the outrigger (**Figure 10**).

With the clamps still holding the assembly, extend the cap's 3/16"-diameter holes through the top of the aluminum rails (**Figure 11**). Then switch to a smaller (3/32" or less) bit for the pilot hole in the outrigger base. Even though I often drive screws into softwood without drilling a pilot hole, I can emphatically warn against taking that short-cut here. Fastening so close to the ends of the outrigger bases, you'll likely split the boards if you drive the screws without pre-drilling.



Continue the screw clearance holes through the rails, then switch to a smaller bit for the pilot holes in the outrigger base.

Riser Block Assembly Details



Build the Riser Blocks

Like the saw's mounting bolt locations and the platform size itself, the height of the riser blocks must be matched to the height of your miter saw table. The average seems to be between 3" to 4" (my Milwaukee measured in at 3 1/2"), and the stack-laminated construction of the riser blocks lets you tailor them to fit (**Riser Block Assembly Details**).

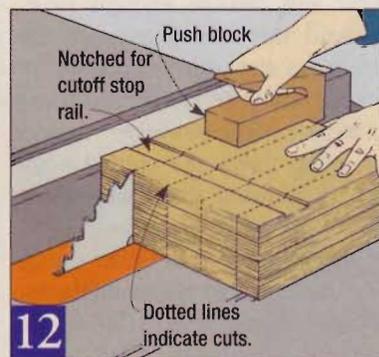
I started by gluing up a plywood sandwich (four layers of 3/4") into a 10"-square block. Then I set up the table saw to dado the shallow notch for the cutoff fence, and cut the block into individual sections afterward (**Figure 12**).

You'll also need to counterbore and drill each riser block for the cutoff fence's hold-down hardware (**Figure 13**). Install the bolts, flat washers, and T-nuts before you complete the assembly of the riser blocks, because the base plate will block access to the hole later.

Using solid wood base plates for the riser blocks allows you to fine-tune the height to match your saw table. Fasten them to the riser block laminations with screws only. If you ever want to mount a saw with a different table height, you can simply remove the base plate and substitute a thicker or thinner one. Before you install the

riser block assemblies, position the saw on the platform, then mark and drill for the mounting hardware. Bolt the saw down, and place the cutoff guide fence or a straightedge against the saw fence so you can align the front of the

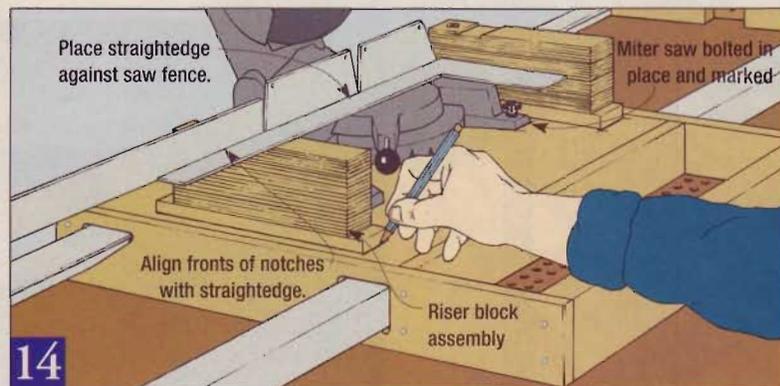
riser block notches (**Figure 14**). Mark the placement of each riser block base plate on the platform, then fasten the assemblies in place with screws. Follow the same procedure for installing the riser blocks on the outrigger supports.



Laminate a plywood sandwich for the riser blocks and dado a shallow notch for the cutoff rail. Then rip into individual sections.

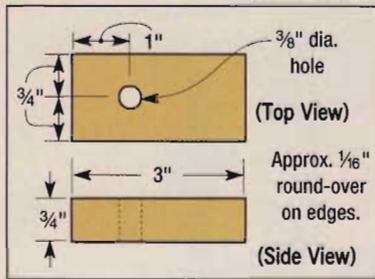


Counterbore and drill through the riser blocks for the hold-down hardware. The bolts lock in place with help from a T-nut.



After you mount the saw and mark its position, use a straightedge to align its fence with the notches in the riser blocks. Mark the riser base positions and screw them in place.

Hold-down Block Details



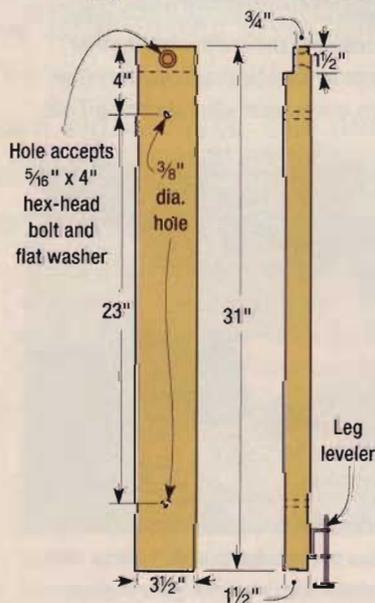
Hold-down Blocks Cinch It

Using some of your remaining 1x stock, cut and drill the four hold-down blocks that clamp the cutoff fence to the riser blocks (**Hold-Down Block Details**). These secure the fence to both the main platform and either outrigger support, giving you a repeatable stop setting of over 8 ft. in length. They'll also hold the fence in place if you're not using the workstation and want to store it out of the way or hang it on your shop wall (minus the saw, of course).

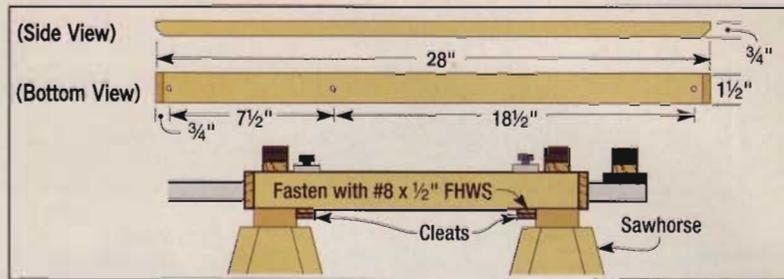
The last built-in components — the 1x2 cleats mounted under the platform — align the sawhorses so they'll both sit underneath the workstation with plenty of clearance for the legs (**Cleat Details**).

I also used some 1x stock and a small toggle hold-down clamp to make a stop block for the cutoff rail (**Stop Block Details**).

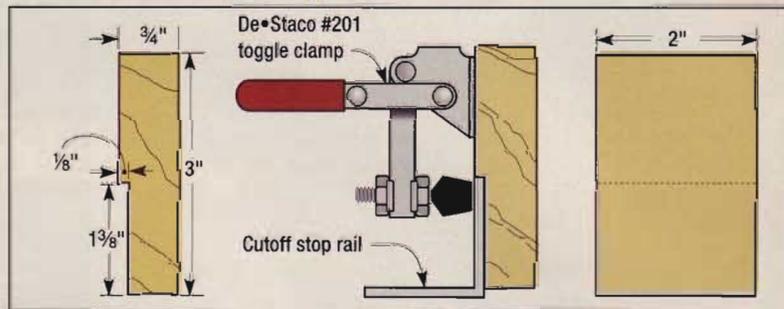
Support Post Details



Cleat Details



Stop Block Details



If I'm cutting framing lumber or other heavy stock, I use the 2x4 support post as a booster underneath the outrigger (**Support Post Details**). Thin moldings are light and flexible enough to do without this added support, but the extra strength helps keep the station accurate for cutting heavy materials. If the outriggers deflect, they can throw the cutting angle off by allowing the workpiece to lift off the miter saw table.

To fit the notch in either outrigger base, I cut a rabbet into the top end of the post, then drilled for the mounting hardware. A leg leveler adjusts the height, and two 3/8" holes make it easy to store on the platform riser blocks, once you've

removed the saw. This is why you need the slightly longer bolts in the main (center) riser blocks.

Compared to some of the anodized aluminum work stands I've seen on the market, my shop-built miter saw station is decidedly low-tech. Still, the basic function of all these workstations is a simple one, and I got a reliable system at a total cost of well under \$100. It's still portable enough to hang on the wall or toss into the back of my truck, and it gives me a little bench space when I'm working away from the shop. The miter saw may be the star when it comes to providing dead-on accuracy, but this workstation sure has a great supporting role.



New Tool Offerings

A New Look at Circular Saws

For 50 years, portable circular saws have been widely used by professionals and home improvement enthusiasts alike. Many small design changes have been made along the way, and the latest entry belongs to the folks at Black & Decker, who have introduced the WoodHawk Circular Saw.

According to Jeff Cooper, Black & Decker Product Manager, "market research revealed consumers want a saw that gives them greater control and confidence." He said many people find circular saws intimidating, loud, and hard to handle, making straight cutting difficult.

To make the saw easier to use, the WoodHawk has a window on the blade guard that lets you see the blade and cutting line while the saw is operating.

I recently had a chance to try out the saw, side-by-side with a traditional circu-

lar saw. I had to get used to using the window, but found it did make cutting easier. Instead of cocking my head to one side and watching the blade, I could look straight down on my cut and follow my layout line.

Other WoodHawk features intended to solve consumer frustrations include a 2-lb. weight reduction (compared to competitors' saws), and a 40% quieter motor. The large handle is designed to make the saw easier to hold. Each saw comes with a carbide-tipped blade. The blade also has an anti-stick coating.

The Woodhawk sells for under \$70, and comes with a hard plastic case. For more information contact Black & Decker at (800) 544-6986.



Television's Tool Man Introduces Line of Real World Tools

The first time I saw a Tim Allen Signature Tool, I was skeptical.

After all, on television Tim Taylor doesn't exactly come across as the man I'd most want tool advice from.

But like the character he plays, Tim Allen is a big fan of quality tools. So he has gathered tools from various manufacturers and brought them together under the Tim Allen Signature Tools name.

Two new items in Tim's line caught my eye — a new ratchet set called the Robotic Wrench, and the Mega Pro 15-in-1 Screwdriver.

The Robotic Wrench comes in a set with a $\frac{3}{8}$ " ratchet, extensions, a drill adapter, and a unique T-bar handle, all in a carrying pouch that can be attached to your belt.

In addition, the set includes a universal socket that

fits a variety of bolt and nut sizes. Unlike a standard socket, this one is filled with spring-loaded pins. When you push the socket onto a bolt, any or all of the pins retract as needed, leaving the remainder surrounding the bolt. Otherwise, it functions like any other socket. One limitation of the universal socket is that the pins retract only about $\frac{1}{4}$ ", so the socket can't be slipped over the end of a long bolt to reach the nut.

If you need to turn screws instead of bolts, you can use the Mega Pro 15-in-1 Screwdriver. Bits with straight-blades, Phillips, Torx, and square drives are all stored inside this driver's handle. The double-ended bits snap securely into the driver's tip.

You'll find the Robotic Wrench for around \$30 and the Mega Pro Screwdriver for about \$20 in hardware stores and home centers. A portion of profits from Tim Allen Signature Tools is donated to children's charities. Call (888) 862-5536 for more information.



Craftsman Wrenches Have a New Twist

It never fails. Whenever I'm working on my car, the nuts I need to loosen are the most difficult to see or reach. With a typical open-ended wrench, this kind of situation means I have to tediously slip the wrench on the nut, turn the nut a bit, then reposition the wrench again.

To make tasks like this easier, Sears has introduced the Craftsman Quick Wrench combination wrenches. Their special design on the open end allows them to "ratchet" around the nut. A recessed area in one lobe lets the whole wrench slide around the nut on the backstroke. Then the wrench grabs again on the power stroke.

The new design works well. But since the wrench has to be oriented differently for tightening than for loosening, I found myself sometimes starting out backwards, then having to flip the wrench over. After I learned to pay attention to how I held the wrenches, I found them easy to use.



The wrenches are designed to help reduce the likelihood of rounding off a nut or bolt head. Both the box and open ends of the wrenches grab more of the fastener's flat sides, instead of the corners. And, for increased leverage these wrenches are up to 30% longer than other wrenches.

Quick Wrenches come in standard and metric sizes. A 6-piece set is about \$20, an 8-piece set sells for around \$30. You'll find them in Sears stores or the Craftsman catalog. Call (800) 377-7414.

PowerGrip Knife

Fiskars Incorporated has introduced an improved version of their PowerGrip Utility Knife. It features an ergonomic design and the ability to change blades without using tools or disassembling the knife.

The PowerGrip's handle positions your hand at a natural angle, and the wraparound guard provides protection. The knife's tip flips out of the way for blade changes with the press of a release button, and extra blades can be kept in the handle.

The PowerGrip Utility Knife is widely available for around \$9. Call Fiskars Inc. at (800) 500-4849.



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Product Information Number 171

WindowShield

Painting windows is not one of my favorite chores. Keeping paint off the glass usually means masking beforehand, otherwise I end up scraping afterward.

The WindowShield is designed to make painting easy. By putting pressure on the tool's handle you flex its plastic blade to conform to the window's shape, even if the sash isn't perfectly square. A sharp edge keeps the blade against the glass.

The tool sells for around \$3.99 in paint and hardware stores. Or call WindowShield at (800) 468-7704.



V/A Master Blades

Vermont American has introduced a new line of Master Series blades, each designed to offer optimum performance in specific woodworking applications.

The engineers at Vermont American surveyed saw users and did extensive testing to determine what attributes are important in a good blade. They realized trim carpenters with circular saws have different requirements than cabinetmakers with table saws.

For example, a portable circular saw is often subjected to more abuse, so those blades have expansion slots to prevent warping and to speed cooling. Different tooth grinds and angles allow you to choose blades tailored to fast cutting or to smooth edges.

The blades all share a thin-kerf design that reduces drag and waste, and a "Gold Kote" finish to minimize friction and pitch build-up. The teeth



are made from a new patented carbide designed to stay sharp longer.

Master Series blade prices range from around \$12 to \$90 depending on the blade size and style. Call Vermont American at (704) 735-7464.

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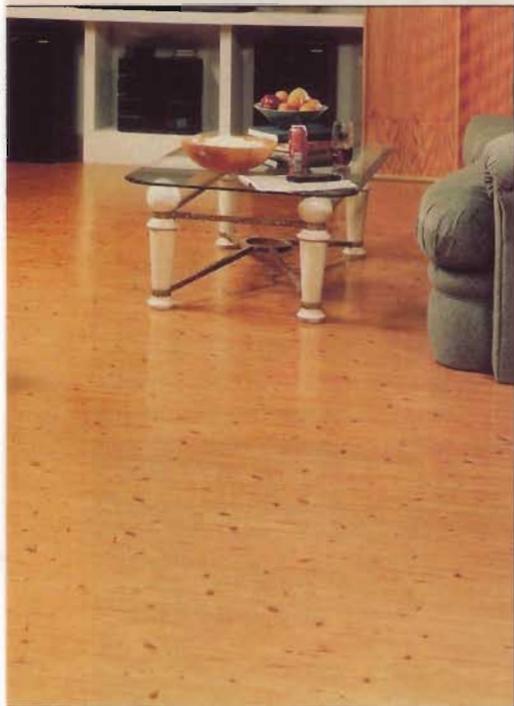
Lignomat :: 800-227-2105

Product Information Number 188

Products For Your Home

Vinyl Floors with Real Wood Look

If you'd like the look of real wood floors, but want the convenience and easy care of vinyl, Congoleum Corp. may have a solution for you. The company has added Colonial Cherry and American Pine to its Forum Vinyl Wood Plank flooring line.



Forum flooring is designed to look like real wood, and comes in 3" x 36" planks, rather than the large sheets that are typical of vinyl floors. Each wood type is available in a variety of "finish" colors. In cherry, for example, you'll find four colors ranging from deep red to bleached. The pine flooring has knots to give a natural, rustic appearance.

The synthetic planks are made with a variety of grain patterns, and they're cut randomly so the grain varies from plank to plank. Small tone variations are also allowed to further simulate natural wood.

Planks also allow more versatility in floor design than sheet flooring does. You can run planks in any direction and even cut mitered corners.

This flooring features a satin sheen finish, and is warranted for five years against permanent scuffs. The floors also carry a ten year warranty against manufacturing defects.

Forum Wood Plank flooring retails for around \$4 per sq. ft. For more information, or to find your closest Forum flooring retailer, call Congoleum Corp. at (800) 934-3567.

Watertight Outlets

To meet new National Electric Code requirements demanding that outdoor outlets be watertight while in use, Leviton Mfg. Co. has introduced Raintight While-In-Use Covers. They're available to fit single, duplex, and GFCI (Ground Fault Circuit Interrupter) outlets.



To make installing the covers simple, they can be mounted to standard boxes without removing the outlet.

Raintight While-In-Use covers are made of impact resistant polycarbonate in clear or gray. To ensure watertight installation, they have a gasket on the back of the cover. A cord plugged into the outlet passes through an opening in the cover's underside, where water can't enter.

The covers are available for around \$15 to \$20 at electrical supply stores. Call Leviton Manufacturing Co. at (800) 323-8920.

Real Wood Grid Covers Dress Up a Suspended Ceiling

A suspended ceiling is a suspended ceiling. There's not much more to say about it. Except that recently I ran across a system with a new twist.

Chicago Metallic Corp. has introduced its Executive Collection for creating dropped ceilings with real wood grids and panels.

With this system you don't have to remove your old metal grid. Each pre-cut wood strip slips directly over your existing metal grid. The wood strips come pre-coped to fit together at the joints. You can also purchase wood trim to cover the intersection of the ceiling with the walls.

Once the grid strips are in place, you can install standard fiber tiles, or Chicago Metallic's wood panels. There are two profiled wood panel styles available, and one plain flat panel style.

Currently, the Executive Collection is available in oak. All system components are pre-finished in one of three shades. Other woods can be custom-ordered at additional cost.

You can find Executive Collection



ceilings at home centers. Grid covers sell for \$1.30 per lineal. ft. Panels are \$29-\$79, depending on the style and size. Call Chicago Metallic at (800) 323-7164.

Sears Offers Home Security Systems

Like it or not, there seems to be an increasing need (or at least demand) for home security systems. Many home security systems, though, are hampered by complex installation and operation procedures, or expensive monthly monitoring fees.

Two new Honeywell Home Security Systems sold through Sears stores offer simplified installation and use. Plus, these "smart" systems can be programmed to notify the homeowner or authorities if the alarm is tripped.

Both systems have sensors and remote controls that send radio frequency signals to the control panel, so there's no wiring to run. The control panels feature an electronic voice that talks you through installation and system use, and notifies you of any sensor-equipped doors or windows left open when you activate the system.

The voice capability also enables the system to notify you or others if an alarm is set off. You can program

different phone numbers that the system dials automatically if a break-in, power failure, or other predetermined alarm triggering event occurs.

With the system's latch-key mode, you can also keep track of kids arriving home from school. If a sensor-equipped door hasn't been opened by a certain time of day, the system will call an assigned number.

For \$399, the basic unit comes with the control panel, two window/door sensors, and a keychain remote. You can arm and disarm the system, and control lights, from outside your home. This unit can dial up to four phone numbers for notification.

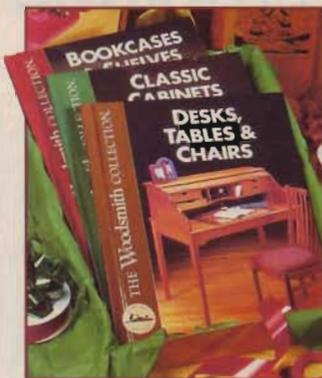
An even more sophisticated model shares all the features just mentioned, plus has a computer interface and software that allows the use of any Windows 95-equipped computer to automatically control lights and appliances, as well as manage a wider array of phone numbers. It sells for \$599.



You can purchase additional sensors and appliance control modules for both units, allowing you to protect more doors and windows.

Both systems are available in Sears stores. Check your local yellow pages to locate a store in your area.

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The Gamble House

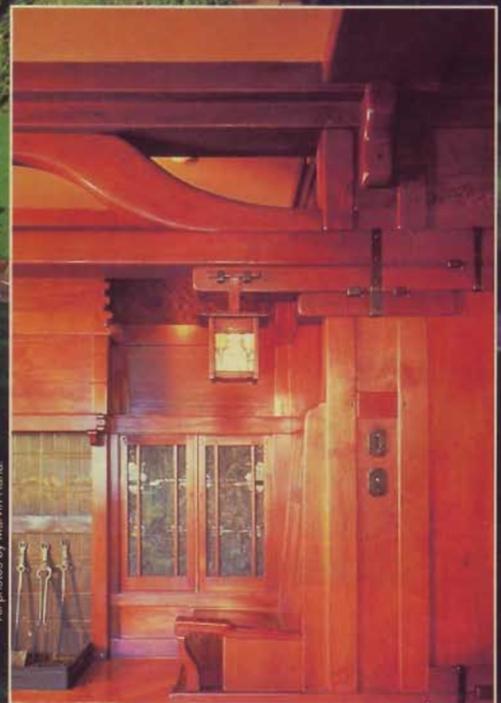
Architectural woodworking is always a bit more complicated than furniture-making — the scale is larger, and the demands of climate, setting, and structural integrity require an engineer's critical judgement as much as a designer's imagination. As a tradeoff, the detailed joinery common in fine furniture is often simplified or absent in buildings.

The Gamble House, a 1908 Arts and Crafts residence in Pasadena, CA, is the definitive exception. It offers a look at how two American architects — brothers Charles and Henry Greene — managed to blend both fine joinery and living space into one masterpiece.

Like their contemporaries, the Greene brothers departed from overly ornamental architecture, but their use of organic forms, and of design elements from Japan and Switzerland, softened the austere geometry

of Mission-style woodwork. The result is 8,100 sq. ft. filled with teak, mahogany, ebony, and other woods — all milled, sculpted, and joined with the precision of a master cabinetmaker. Built originally for David and Mary Gamble (of the Procter & Gamble Co.), the house also features Greene-designed furniture, hardware, light fixtures, and glasswork.

Though once offered for sale by family heirs, who nixed the deal upon hearing the would-be buyer voice intentions to "paint all of this [woodwork] white," the house was later deeded to a trust held jointly by the City of Pasadena and the University of Southern California's School of Architecture. Public tours — a must for any serious woodworker visiting the Los Angeles area — are offered year-round. For details, call the Gamble House at (818) 793-3334.



All photos by Marvin Rand.