

■ 6 Surefire Plate Joinery Techniques ■ GFCI: Is Your Home Protected? ■

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Special Storage Issue

Organize Every Room!

Modular Wall Unit

Shop Hardware Organizer

Stackable Storage For:

Laundry Room – Kid's Room

Closets – Garage – Office

Jan./Feb. 2000/\$3.95
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Modular Wall Unit

Learn a few techniques and you'll be ready to build a cabinet for your audio/visual gear or tackle an entire wall unit. Whatever your needs, you'll appreciate the straightforward construction of this elegant maple project.

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Storage Made Simple

Clean up clutter in a weekend with these simple melamine boxes. Great for the garage, closets, kid's room, office, or laundry area, this modular system can be adapted for just about any storage situation.

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Simple Division

Don't know what to do with those "junk" drawers in your house? For a few bucks and a couple hours in the shop, you can keep them under control with this clever interlocking drawer divider system.

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Hardware Organizer

Give screws, nails, and bolts a new home in this pine and hardboard shop storage center. Built like an old-fashioned apothecary cabinet, this project makes good use of mass production techniques and interchangeable parts.



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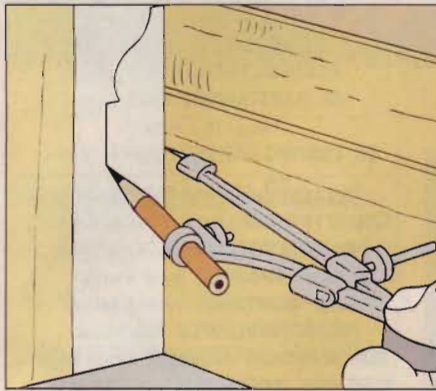
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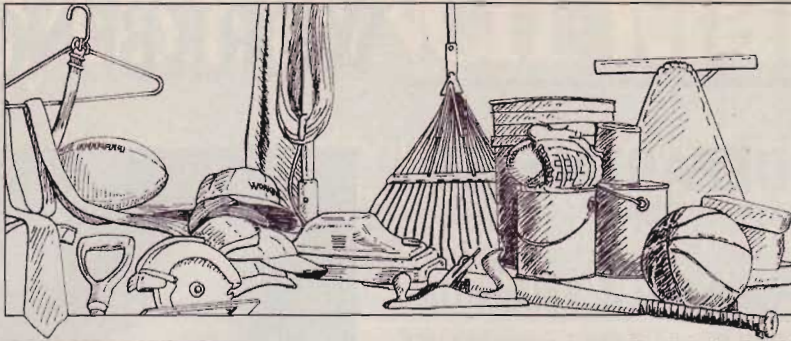
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LETTER FROM THE EDITOR

A PLACE FOR EVERYTHING ...

Without a doubt, storage is one topic *Workbench* readers can't seem to get enough of. I guess it's our natural tendency to squirrel stuff away. We buy and collect until we reach the point where all of a sudden everything has to be stashed somewhere.

That problem created the challenge for this issue: come up with some storage projects that not only hide things, but look good doing it. The maple wall unit on the cover is a great example of this. It's both beautiful and functional.

But it was just as challenging to design the simple drawer divider system on page 48. These dividers are made out of inexpensive "hobby wood" and can be built in a Saturday afternoon. This interlocking grid system will fit just about any drawer and can be easily switched around if your storage needs change.

Though the maple wall unit is impressive and the drawer dividers are simple, I think my favorite project is the modular storage system

shown on pages 42-47. It's made from melamine, a white, resin-covered particleboard that's becoming very common at lumberyards and home centers. I found this material surprisingly easy to work with. You can dress it up, too. All you need is some special edging tape and an ordinary clothes iron.

What I like most about the melamine storage system, though, is that it starts out very simple. It's just a box with a hardboard back. But when you stack a number of these boxes together, they become a nice-looking closet organizer, a kid's toy cabinet, or a tool storage unit in the garage. Adding a countertop and base to a couple of the boxes creates a work station for the laundry room. Finally, you can use the same boxes to make a small, practical computer desk or study desk for the kid's room.

What we ended up with was a number of creative answers to the classic problem: Where am I ever going to put all this stuff so "... everything's *neatly* in its place?"

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WORKBENCH

VOLUME 56

NUMBER 1

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WORKBENCH (ISSN 0043-8057) is published bimonthly (Jan., Mar., May, July, Sept., Nov.) by August Home Publishing Company, 2200 Grand Ave., Des Moines, Iowa, 50312. *Workbench* is a registered trademark of August Home Publishing. Copyright ©2000 August Home Publishing Company.

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Subscription rates: Single copy, \$3.99. One year subscription (6 issues), \$15.94; two year sub., \$27.95; three year sub., \$39.95. Canadian/Int., add \$10.00 per year. Periodicals postage paid at Des Moines, IA and at additional offices.

"USPS/Perry Judd's -Heartland Div. Automatable Poly."

Postmaster: Send address changes to *Workbench*,

PO Box 37272, Boone, IA 50037-0272.

Printed in U.S.A.

Feedback & Follow-Up

Survey Says: Melamine is Versatile, Affordable, and Easy to Use

When we chose to build the storage system in this issue (see *Storage Made Simple* on page 42) from melamine, we were curious to find out what *Workbench* readers know and think about this material. To find out, we put a short survey on our web site (www.workbenchmag.com).

Surprisingly, 85% of people responding to the survey were familiar with melamine. And close to half have used it on projects before.



We also asked about people's experiences working with melamine. Here's what some folks had to say:

PROs

- "Good for kitchen projects."
- "It's great for storage and cabinets, and it's relatively inexpensive."
- "I like it for shop cabinets and jigs."
- "Quite versatile."
- "The white surface has a clean, bright appearance."
- "Melamine is great stuff, if you know how to handle it."
- "With a minimum of precaution, it cuts easily with carbide-tipped tools."

CONs

- "It's not my first choice, I prefer to use real wood."
- "It's sometimes tough to find in small, local lumberyards."
- "Cutting melamine takes sharp tools, but it dulls them quickly."
- "No matter how it's dressed up, it's still particleboard."

As you can see from the table below, far more people give melamine a thumbs up. Despite a few shortcomings, it's still a great material for many projects. It takes more care to work with, but the payoff is a lasting, easy-to-clean project.

Melamine: Reader Reaction



■ Have you heard of melamine?

Yes **85%**
No **15%**

■ Have you used melamine?

Yes **46%**
No **54%**

■ How do you rate melamine?

 **86%** **14%** 

Personal Touches Customize a *Workbench* Project

When we design and build *Workbench* projects, we know you'll probably end up modifying them to meet your specific needs. That's why we spend a lot of time telling you *why* we do things, not just *how*.

In a recent letter, subscribers Deborah and Philip Sims showed us how they changed the Classic Cedar Fence (May/June 1999) to fit their yard and their budget.

The Sims needed 28-ft. of fence to enclose their yard. With the magazine in hand, they talked to contractors about having the fence built. Bids ran about \$3,000. So the Sims did it themselves.

They built their fence from green-treated lumber, and painted it to match their house. The project took a week of spare time, and cost \$400. It looks great, and shows how you can make a project work for you.

If you've customized a *Workbench* project, send us photos (see page 6).



Rather than pay a contractor \$3,000 to build a fence, Deborah and Philip Sims modified our Classic Cedar Fence (May/June 1999). Their cost: \$400.

Plate Joiner: Woodworker's Best Friend, or an Overrated Tool?

The modular wall unit on page 24 is assembled with plate joinery — also known as biscuit joinery. This technique is nothing new, but we wanted to know just how familiar *Workbench* readers are with it, and what you think about the tools. To find out, we did an on-line survey at www.workbenchmag.com.

As we expected, over 90% of those who responded knew about



biscuit joiners. Around 60% have used one before and plan to again. Almost half own one of the tools.

But those numbers don't tell us what the folks responding to the survey really think. For that, we turned to the comments:

PROs

- "Outstanding tool."
- "Couldn't do without one in my shop."
- "1000% easier than any other means of joining wood."
- "One of the simplest, strongest joints."

CONs

- "Don't see the need. Dowels will do."
- "I prefer mortise and tenon or more traditional methods."
- "Why buy the tool, use your router."
- "It's cheating. Thanks to Norm the biscuit joiner is one of the most overrated tools of our generation."

In the end, the overwhelming majority like biscuit joiners. And we agree. It may not be the greatest tool ever, but it does have its place.

Plate Joiner: Reader Reaction

■ Have you heard of plate joinery?

Yes **93%**

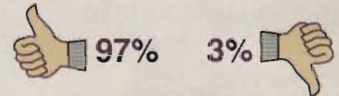
No **7%**

■ Have you used a plate joiner?

Yes **60%**

No **40%**

■ How do you rate plate joiners?



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Questions & Answers

Scribe the Base Cabinet or Trim the Baseboard Molding

Q I'm building some storage cabinets for my family room, and I want the base cabinets to sit tightly against the wall. What's the best way to deal with the base molding?

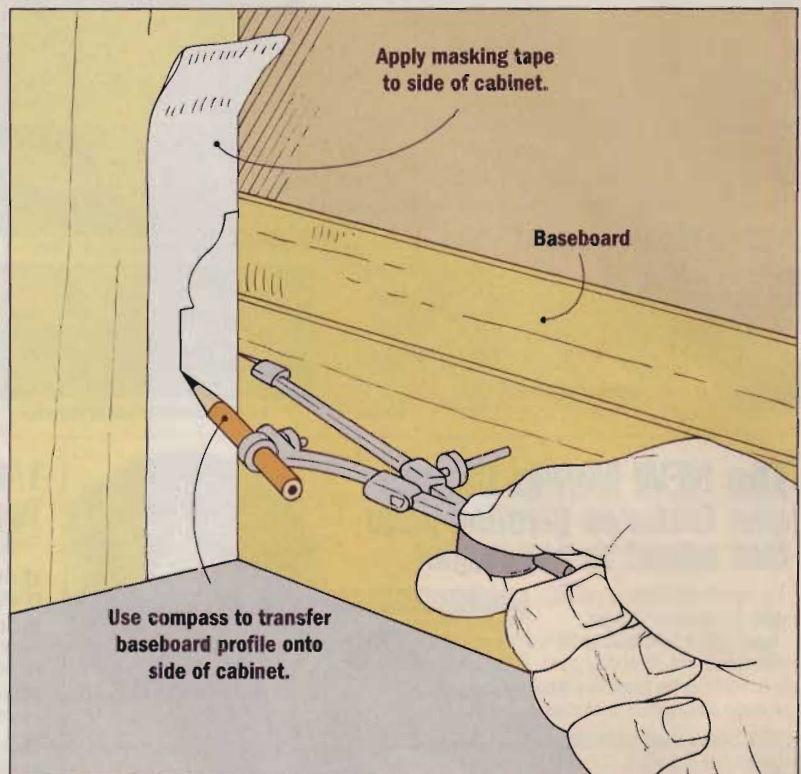
Doug Wicks
Elmhurst, IL

A We faced the same problem when we built the modular wall unit (see page 24). To achieve this built-in look, it comes down to whether you cut the base molding to fit the cabinet, or cut the cabinet to fit the base molding.

The simpler option is to cut the base molding, removing the section where the cabinet will sit. Because it's nearly impossible to cut the baseboard in place on the wall, it's best to remove the entire piece, trim it to length and reinstall it. The molding should butt squarely against the side of the cabinet.

Cutting the molding makes sense if your type of baseboard is readily available — you can just tear off the old stuff and install new molding to fit. I also recommend this method if you might someday reuse the cabinets in another location.

Some cabinets are designed with the back panel inset an inch or so.



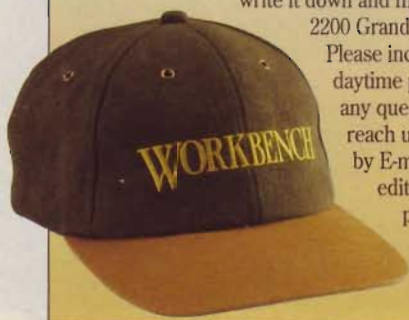
This allows you room to scribe the cabinet sides to the wall and base molding for a custom fit. Using a compass, transfer the profile of the base molding and wall onto the side of the cabinet (see drawing above). Then trim the cabinet with a jig saw or coping saw to the line.

Use this method if the baseboard can't be removed without damaging the molding or wall. This is especially true for decorative, old molding that would be hard to replace. If the back panel of the cabinet isn't inset, however, cutting the baseboard may be your only option.

SHARE YOUR QUESTIONS!

If you have a question about woodworking or home improvement, write it down and mail it to WORKBENCH Q&A, 2200 Grand Ave., Des Moines, IA 50312.

Please include your name, address and daytime phone number in case we have any questions for you. You can also reach us via Fax at (515) 283-2003 or by E-mail message at editor@workbenchmag.com. If we publish your question, we'll send you one of our handsome and fashionable *Workbench* caps.



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Offset String Line Helps Keep Fence Posts Aligned

Q What's the best method for laying out fence posts in a straight line? I've had trouble with this, especially when replacing posts in an existing fence.

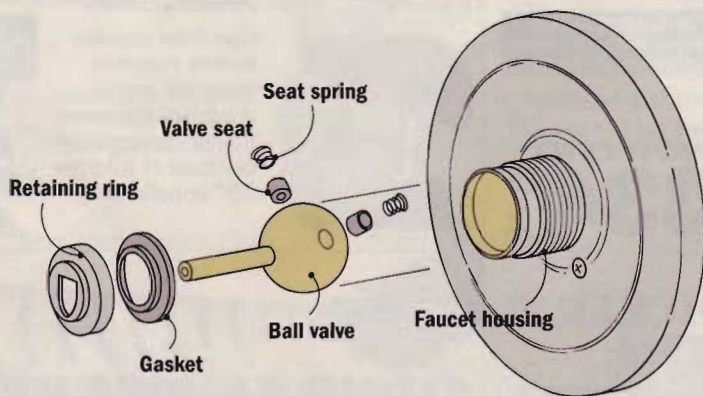
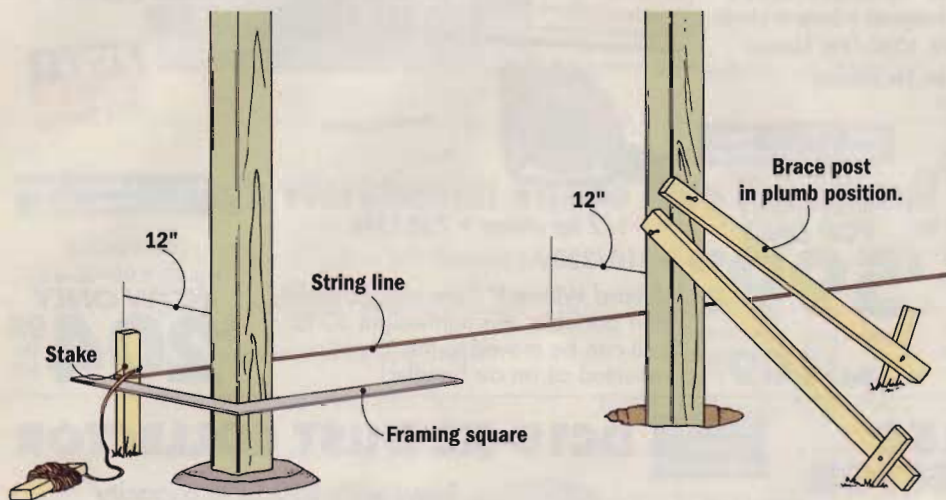
Allen Olson
Cottage Grove, MN

A Stretching a string is the simplest way to establish a straight line. Start at a corner post or one end of the straight run of the fence. Drive a stake in the ground 12" away from the post location. To position the stake at

the proper distance from the fence, align the long leg of a framing square with the existing fence. Then drive the stake at the 12" mark along the square's short leg. Repeat this staking process at the other end and tie a string line between the stakes.

By offsetting the string line, you give yourself room to work without having the string get in your way. Measure over from the string to dig the post holes. Place gravel in the bottom of the holes and set the posts in place. Use the string line to adjust the posts' position as you plumb them in the holes. Stake the posts plumb, then carefully backfill the holes around the posts, tamping the soil as you go.

To learn more about setting fence posts, check out the article on page 34 in the May/June 1999 issue of *Workbench*.



Clogged Valve Seats Leave Shower Cold

Q The hot water pressure in my bathroom shower is almost nonexistent, but the bathroom sink is fine. The shower faucet has a ball-type mixing knob. Is it just a problem with the valve or is it corrosion in the pipe?

Dave Gaumer
Des Moines, IA

A Because there's hot water to the sink, I think the supply line is probably fine. So I'd start with the shower faucet valve.

Most single-handle mixers have a ball that fits over a pair of inlets. These hot and cold inlets have valve seats (cup-shaped gaskets) that seal against the round ball.

As you turn the knob, dimples in the ball move over the seats and let water pass. If a seat gets clogged or the dimple in the ball gets corroded, it slows or stops the flow of water. Install new valve seats and replace the ball, too, if it has lime or scale deposits.

Prep Surface Before Recoating with Polyurethane

Q What prep work should I do before giving a table a new coat of polyurethane?

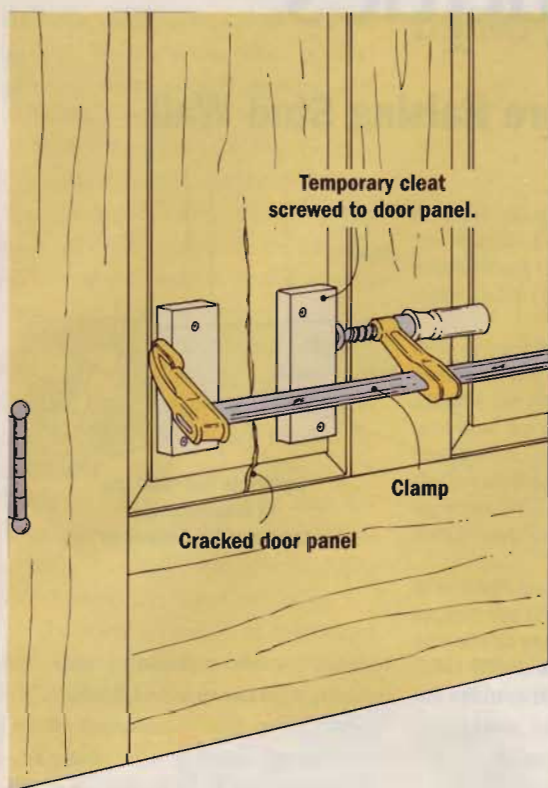
Dave Rock
Omaha, NE

A Start by stripping any accumulated wax, oil, and dirt. Scrub the entire table well with soapy water and a soft-bristled brush, then wipe it dry.

Next, sand it lightly with 220-grit sandpaper. Be sure to sand with the grain. Sanding not only removes deep scratches, it gives the new finish a way to form a mechanical bond with the old finish.

Wipe the surface down using a rag dampened with mineral spirits to remove dust and any remaining wax. Then reapply polyurethane, sanding between coats.

Fixing a Door Panel Cracked by Seasonal Wood Movement



Q My house has a two-panel front door. One of the panels has a crack that opens in the winter and closes in the summer. I know it's the change in humidity that causes this, but is there a way to fix or replace the panel.

Bruce Finney
via the internet

A You're right about the humidity, but that's only part of the problem. I would imagine the door has probably been painted, maybe several times. The paint has seeped into the grooves in the door's rails and stiles so the panel is no longer free to expand and contract on its own. Because the edges are "glued" in the groove, the panel cracked when it shrank during the winter.

The first step is to free the panel. Use a thin-bladed putty knife to break the paint seal along the groove around the perimeter of the panel on both the front and back sides of the door. To close the crack, screw a wooden cleat on either side of the crack on the back of the door panel. Apply glue to the crack then draw the crack closed with a clamp across the cleats.

When the glue dries, remove the cleats and patch up the screw holes with filler.

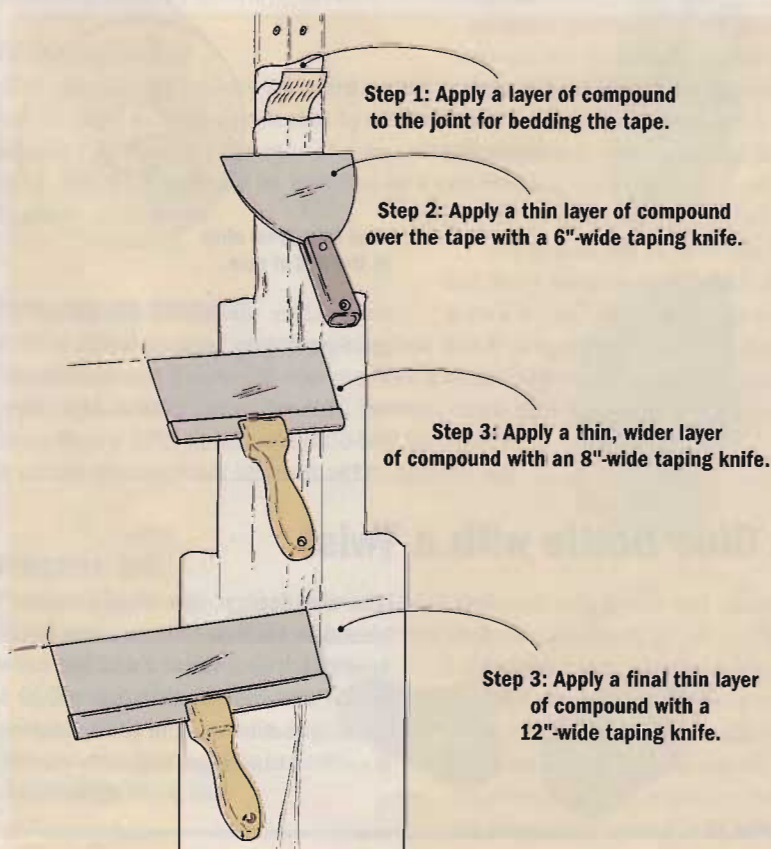
Thin Coats and Wide Knives Best for Finishing Drywall Joints

Q What's the best way to finish drywall joints? And should I smooth them out by sanding them or use a wet sponge?

Bob Bowman
via the internet

A Sanding drywall joints stirs up clouds of noxious dust, so the best way to finish joints is to limit the need for sanding in the first place. To do this, you want to lay down the joint compound in thin layers using progressively wider taping knives. Use long, smooth strokes to keep from leaving edge marks and ridges that you'll have to remove later.

If you wind up with small ridges, sanding screens made specifically for drywall make quick work of them. Sponges will work and do keep the dust down, but they aren't as aggressive. Rewetting the compound also adds drying time between coats.

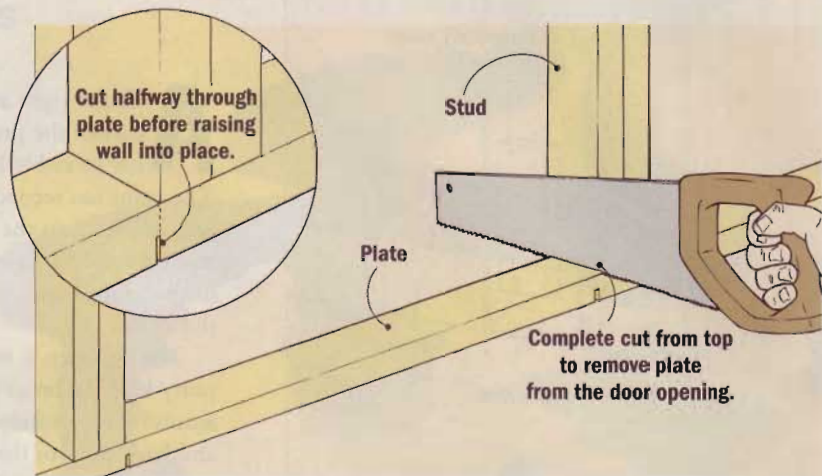


Tips & Techniques

Precut Doorway Bottom Plate Before Raising Stud Wall

Your article on *Wall Framing Know-How* in the Sept/Oct issue had lots of good information. In it, you showed cutting out the bottom plate in a doorway after the stud wall is raised and nailed in place. I thought I'd share a trick an old carpenter showed me that makes it easier to do this.

Lay out the stud locations on the plate. Now make a cut $\frac{1}{4}$ "-deep in the lower face of the bottom plate at each side of the door opening. Then nail the stud wall together. That way, the plate still stabilizes the door opening when you raise the wall. But when you make the cut to remove the plate, your saw stays well above the floor.



You wind up with a cleaner cut in less time without sawing into the subfloor. This method works particularly well when you're

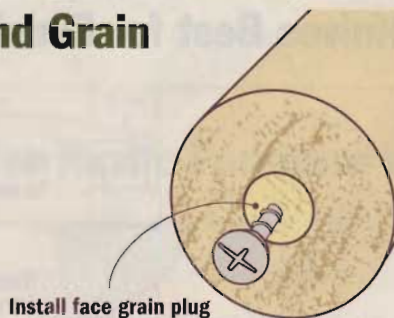
remodeling and installing a wall over an existing finished floor.

*Robert Major
Pace, FL*

Plugs Add Grip to End Grain

I work for a decorating company and we hang most of our window coverings on wood poles. To dress up the poles, we add finials to the ends, but the screws don't hold well in the end grain of the poles.

I solved this problem by drilling a $\frac{1}{2}$ "-dia. hole in the ends of the pole. Using a plug cutter, I cut face grain plugs from the face of a scrap board, then glue the plugs in the ends of the pole. When the glue dries, I screw the finials into the



plugs where the screws' threads can get a good grip on the wood.

*Tom Vullo
Brooklyn, NY*

A Glue Bottle with a Twist

I usually buy wood glue in gallon jugs and fill up smaller bottles for regular use. Most glue bottles don't have a cut off valve in the lid so the tips often clog up with dried glue.

To get around this problem, I saved a couple of 12-oz. mustard bottles that have a twist-open tip.

The tips don't plug with glue and you can even use them to control how much glue flows out. The bottles also have a wider mouth so refilling them from the gallon jug is easier than a regular glue bottle.

*William Lacy
Marion, IA*

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Pipe and Rod Simplify Driving Nails in Close Quarters

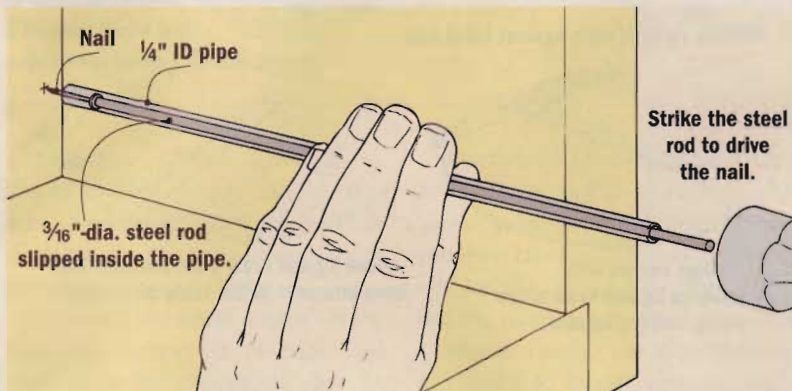
There are times when you don't have much room to drive a nail. For example, recently I needed to drive a nail in the back corner of a cabinet, but didn't have room to swing the hammer.

I solved the problem with a piece of 1/4" ID pipe and a 3/16"-dia.

steel rod. First, I slipped the nail in one end of the pipe, then slid the rod in the other end. Holding onto the pipe, I moved the end with the nail into position in the cabinet. Still holding the pipe, I tapped the end of the rod to get the nail started and a few heavier blows drove it

home. To make my close-quarters driver work even better, I used a magnet to magnetize the end of the rod. Now the rod holds the nail inside the pipe while you get the driver in position.

*Bernard Lutnes
Plentywood, MT*



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

The Stanley Works
New Britain, CT
www.stanleyworks.com



Use J-Brackets for an Extra Hand When Installing Siding

When I re-sided my house, I had to work alone much of the time. Trying to hold a 16-ft. length of hardboard siding in place and nail it by myself was nearly impossible.

To make things easier, I made a couple of J-shaped brackets out of some metal strapping left over from another project. The long leg of each J is about 3" longer than the width of the siding (12" in my case).

I nail the top end of the brackets to the sheathing so the bottom of

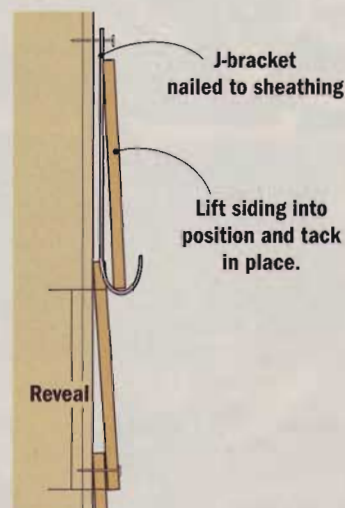
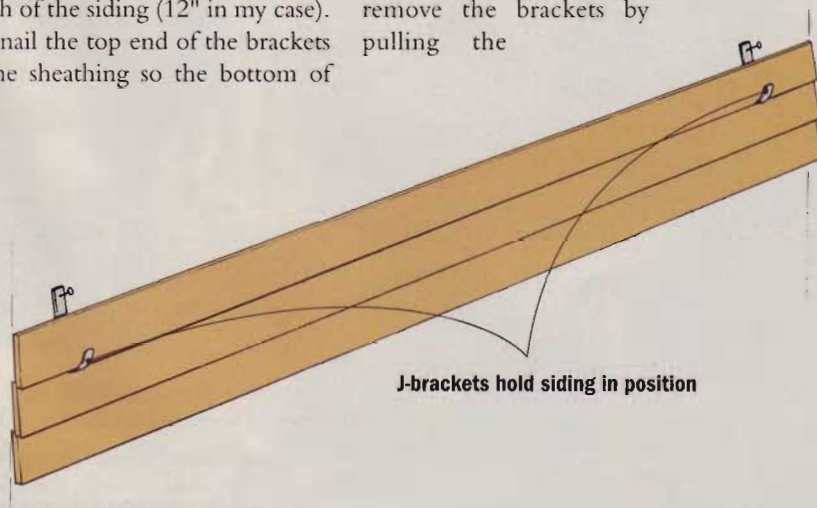
the hook extends a little below the top of the last piece of siding nailed to the wall. When I place the siding on the brackets, they hold it roughly in position. Starting at one end, I slide the siding up into position and tack that end down. Then I move to the opposite end and tack that end of the siding in position.

With the siding tacked in place, I remove the brackets by pulling the

nails holding them to the sheathing. The brackets can then be slid down and out from under the siding.

Finally, I go back to the first end and begin nailing the siding down at the remaining stud locations, leaving a uniform reveal on the board below.

*Allen Olson
Cottage Grove, MN*



Use A Framing Square to Locate Center of Circle

I recently bought a round-topped dining table at an auction that had some dings along the edge of the top. I figured I could rout a clean edge using a trammel base on my router, but first needed to find the table's center.

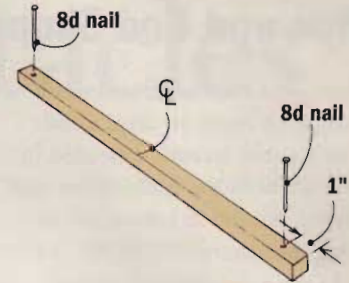
I was able to do this using a framing square and a simple scrap-wood jig. To make the jig, I cut a strip of wood that was a little shorter than the table's diameter.

Next, I drilled a hole 1" from each end and centered on the jig's width. Then I measured and marked the centerline of the jig's length between the holes.

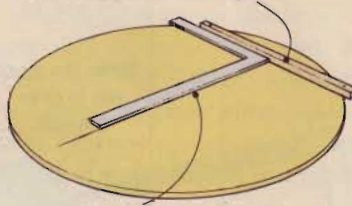
Slipping a nail in each hole, I placed the jig against the table. Then I laid the framing square against the jig, lined it up with the centerline mark, and drew a line along the edge of the square.

After moving the jig about a quarter of the way around the tabletop, I drew a second line with the square. Where the two lines intersect is the center of the table. I used this point to mount the trammel base and proceeded to give the table a new edge treatment.

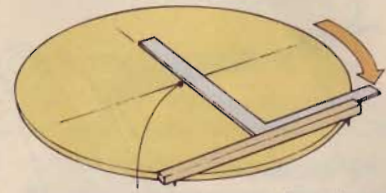
*Craig Glowacki
Brevard, NC*



Position jig with nails against table top.



Align square with centerline on jig and draw a line along framing square.



Move jig and draw a second line. The lines intersect at the table top's center.



Coast to Coast.

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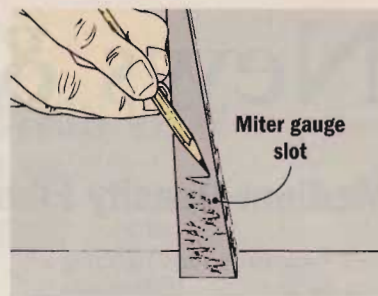
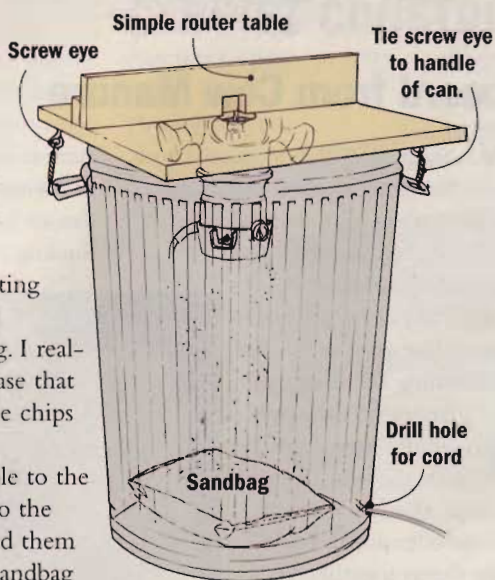
Trash Can Makes Clean Router Base

My shop is small and I don't really have room for a freestanding router table. Like the one you showed in the Nov/Dec issue, my router table just clamped to the top of my bench. But chips and sawdust went everywhere.

Cleaning up after a routing session, I got an idea that I thought I would pass along. I realized I had a ready-made base that was perfect for catching the chips — a 30-gallon trash can.

To secure the router table to the can, I fastened screw eyes to the bottom of the table and tied them off to the can's handles. A sandbag in the bottom of the can helps stabilize the base.

*Charles Mak
via the internet*



Pencil Keeps Miter Gauge Sliding

While I seldom have a can of dry lubricant close at hand, I always have a pencil in my apron pocket. If I notice the miter gauge in my table saw sticking a little, I blow out the sawdust and "scribble" on sides and bottom of the miter gauge slot with the pencil. The graphite keeps things sliding freely.

*R. B. Himes
Vienna, OH*

There's over a century of craftsmanship in each can of **Cabot** **OIL-BASED WOOD STAIN**

*Pike Noyes
20 years of custom woodworking.*

*To locate the retailer nearest you, call 1-800-US-STAIN ext. 346.
Product Information Number 174*

The advertisement features a man, Pike Noyes, in a workshop setting, holding a can of Cabot's Oil-Based Wood Stain. The background shows various woodworking tools and equipment. The text is overlaid on the image, with the brand name 'Cabot' in a large, bold font. The overall tone is professional and emphasizes craftsmanship.

News & Events

Medium-Density Fiberboard from Cow Manure

Next time you're driving along a country highway, take a minute to stop and smell the MDF.

That's right, cow manure is no longer just for fertilizing lawns. It's now being explored as a possible source of core material in medium-density fiberboard.

According to the Iowa State University scientists conducting the study, cow manure makes sense for several reasons. First, high fiber content is a part of cattle's natural diet. Second, because the fiber has already been refined by the cows, less adhesive is needed to bond the material. Third, as a rapidly renewed resource, it can help ease pressure on conventional wood sources.

And, apart from the occasional cow chip throwing contest, the stuff really isn't in high demand.

Yeah, but won't it stink? Not according to the scientists. They claim a sweet, straw-like odor even after machining the material.

Manure isn't the only agricultural ingredient in the mix, though. The scientists also use a soy-based adhesive to bond the sheets together. It's a more environmentally friendly option than petroleum-based binders.

When the "poop board" may land in home

centers isn't certain. There's still a lot of testing to be done, and the scientists are currently trying to find funding to keep the project alive.



Fair Exhibitors Build Furniture for Charity

Exhibitors at the 1999 Woodworking Machinery and Furniture Supply Fair teamed up for a good cause this year — to build 100 sets of bedroom furni-

ture for children. The furniture sets were donated to a center for at-risk girls in California.

The idea came from Doug Kemp, former president of the Association of Woodworking and Furniture Suppliers, which hosts the fair. Kemp organized the fair participants to make components for the bedroom sets while they demonstrated their machines at the fair. In past years, materials were made randomly and often thrown away.

The project is called Woodworks for Children and is the first such program at any major woodworking fair.



World Record Pour

In Fayetteville, AR, earlier this year, concrete workers set a new world record for the largest place-and-finish concrete floor. The project was a 556,000 sq.-ft. warehouse floor.

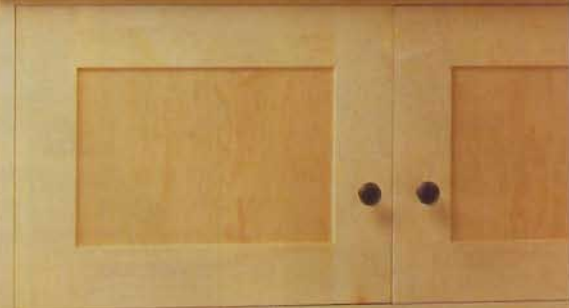
Suppliers delivered concrete at the rate of nearly 39 trucks per hour (9 cubic yards every 90 seconds). The crew worked continuously for 30 hours.

The new warehouse will be home to Hanna's Potpourri Company. Now that's a lot of dried flowers.



Woodworks for Children founder Doug Kemp pictured with one of 100 sets of furniture built by woodworking fair exhibitors. The furniture went to an at-risk youth shelter.

Modular Wall Unit





These cabinets bring great looks and modular construction together in one versatile package. Build one cabinet or build them all to fit any space or need.

One-size-fits-all may be fine with hats or gloves, but the idea rarely works with furniture. That's because everyone's homes, not to mention their needs, are a little bit different.

A great way to solve this problem is to build furniture in individual units, or modules. Then you can combine them together in a way that works for you.

That's what I did with this maple wall unit. It's five separate cabinets combined to suit a number of needs. In my case that meant housing a TV and stereo, plus storing and displaying items in the family room.

And don't think that modular means all the units have to look the same. This unit uses three distinct-looking cabinets. But each shares materials, joinery, and even many of the same measurements. A lot of the setups are the same too, which helps streamline construction.

Building a wall unit is still a big project. But modular design breaks it into manageable pieces, leaving you free to concentrate on building cabinets that really fit your needs.

Wall Cabinets

Building cabinets isn't as tough as you may think, and these wall-mounted and base units prove it. Their good looks disguise the straightforward techniques that keep construction simple.



When you build cabinets, you're basically building boxes. Sure, cabinets are larger, but their construction is about the same — four sides and a back, but with doors instead of a lid.

Maybe that's oversimplifying, but not by much. These wall-mounted and base cabinets are really just butt-jointed boxes (WALL-MOUNTED and BASE CABINET CONSTRUCTION VIEWS). To strengthen the joints, I added biscuits. For more on this see *Plate Joinery Basics* on page 36.

Other parts of the cabinets are easy to build too, even the beveled molding and frame-and-panel doors.

Materials for this project are also straightforward. Sheet goods make up the carcasses, backs, and door panels. The door frames, edging, and molding are all cut from solid stock.

I built the carcasses from maple-veneered medium density fiberboard (MDF). You could use cabinet-grade plywood, but I chose MDF since it's very stable and flat. Plus, in my area anyway, MDF is less expensive. I also had some trouble finding maple-veneered plywood.

One of the problems with MDF, though, is its weight. A full sheet tips the scales at close to 90-lbs. That makes the material tough to handle. If you decide to use MDF, you'll need a friend to help carry full sheets and the completed cabinets.

MDF can also kick up pretty nasty sawdust. So I recommend a dust mask while cutting it.

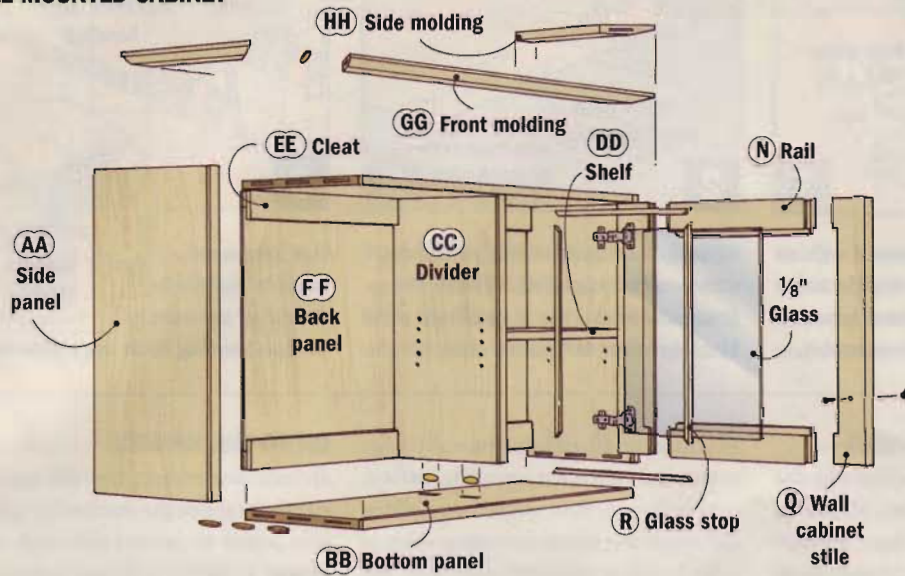
The steps in building either cabinet are about the same. I'll guide you through the base unit.

CABINET CONSTRUCTION VIEWS

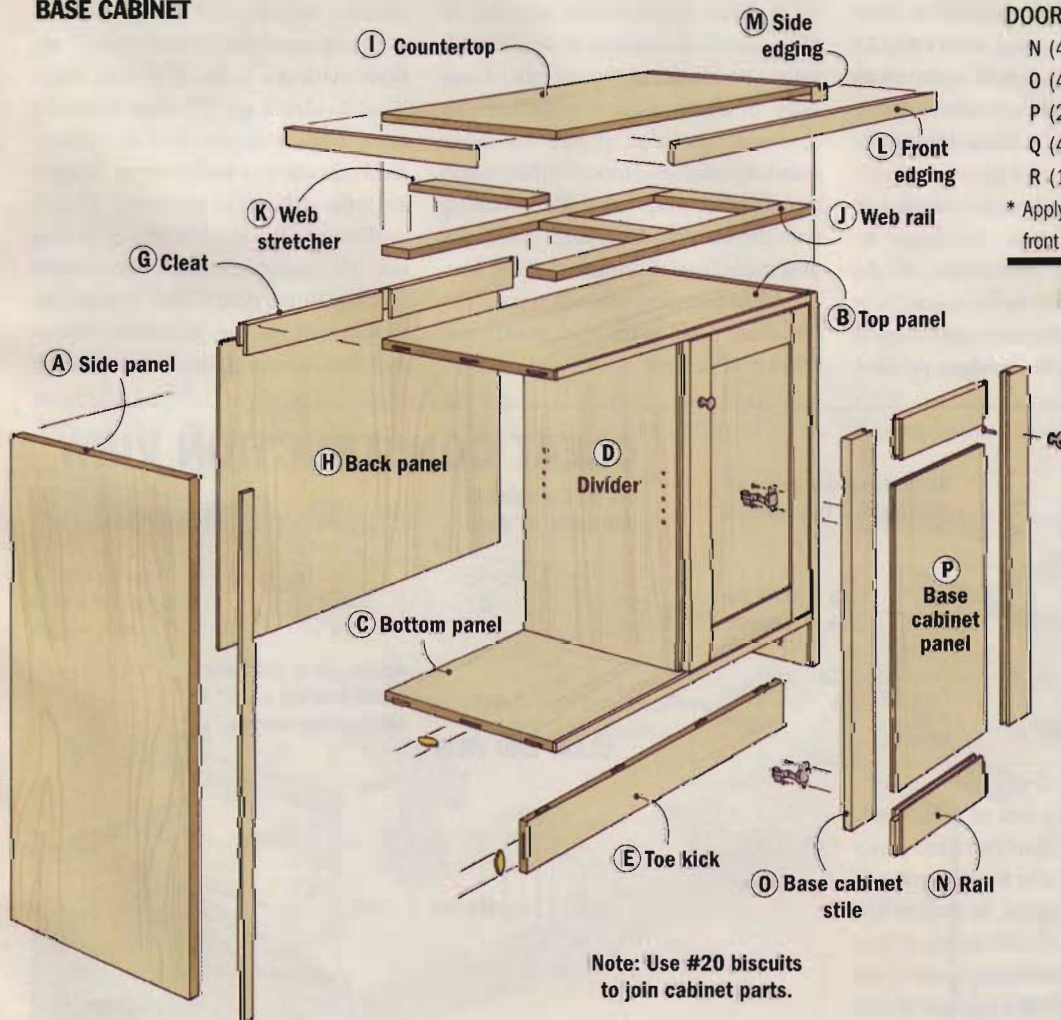
OVERALL SIZE — Wall-Mounted Cabinet: 43"W x 24³/₄"H x 13¹/₂"D

OVERALL SIZE — Base Cabinet: 43"W x 34"H x 18³/₄"D

WALL-MOUNTED CABINET



BASE CABINET



Note: Use #20 biscuits to join cabinet parts.

MATERIALS LIST

WALL-MOUNTED CABINET

| | |
|--------------------------|----------------------------------------------------------------------------|
| AA (2) Side Panels* | 3/4" x 11 ³ / ₄ " x 24" |
| BB (2) Top/Bott. Panels* | 3/4" x 11 ³ / ₄ " x 38 ¹ / ₂ " |
| CC (1) Divider* | 3/4" x 10 ³ / ₄ " x 22 ¹ / ₂ " |
| DD (2) Shelves* | 3/4" x 10 ¹ / ₂ " x 18 ³ / ₄ " |
| EE (2) Cleats | 3/4" x 2 ¹ / ₂ " x 39 ¹ / ₂ " |
| FF (2) Back Panel (ply) | 1/4" x 19 ¹ / ₂ " x 39 ¹ / ₂ " |
| GG (1) Front Molding | 3/4" x 3 ¹ / ₂ " x 43" |
| HH (2) Side Molding | 3/4" x 3 ¹ / ₂ " x 13 ¹ / ₂ " |

BASE CABINET

| | |
|------------------------|----------------------------------------------------------------------------|
| A (2) Side Panels* | 3/4" x 17 ³ / ₄ " x 32 ¹ / ₂ " |
| B (2) Top Panel* | 3/4" x 17 ³ / ₄ " x 38 ¹ / ₂ " |
| C (2) Bottom Panel* | 3/4" x 17 ¹ / ₂ " x 38 ¹ / ₂ " |
| D (1) Divider* | 3/4" x 16 ³ / ₄ " x 27" |
| E (1) Toe Kick | 3/4" x 4" x 38 ¹ / ₂ " |
| F (2) Shelves* | 3/4" x 16 ¹ / ₂ " x 18 ³ / ₄ " |
| G (1) Cleat | 3/4" x 2 ¹ / ₄ " x 39 ¹ / ₂ " |
| H (2) Back Panel (ply) | 1/4" x 26 ¹ / ₄ " x 39 ¹ / ₂ " |
| I (2) Countertop | 3/4" x 18" x 38 ¹ / ₂ " |
| J (2) Web Rails | 3/4" x 3" x 38 ¹ / ₂ " |
| K (3) Web Stretchers | 3/4" x 3" x 12" |
| L (1) Front Edging | 3/4" x 1 ¹ / ₂ " x 40" |
| M (2) Side Edging | 3/4" x 1 ¹ / ₂ " x 18 ³ / ₄ " |

DOORS (per cabinet)

| | |
|------------------------|----------------------------------------------------------------------------|
| N (4) Rails | 3/4" x 3" x 14 ¹ / ₈ " |
| O (4) Base Cab. Stiles | 3/4" x 3" x 26 ⁷ / ₈ " |
| P (2) Base Cab. Panels | 1/2" x 14 ¹ / ₈ " x 21 ⁷ / ₈ " |
| Q (4) Wall Cab. Stiles | 3/4" x 3" x 22 ³ / ₈ " |
| R (1) Glass Stops | 1/4" x 3/8" x 156" — cut to fit |

* Apply 3/4"-thick x 3/4"-wide edge banding to the front edges of these pieces.

HARDWARE (for both cabinets)

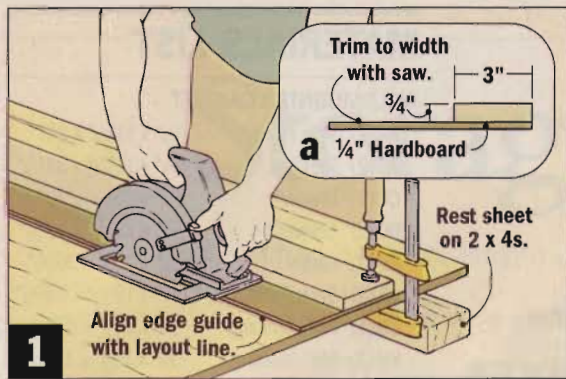
- (8) 35mm Euro "Clip" Hinges
- (4) 1¹/₄"-Dia. Round Knobs w/Screws
- (50) #8 x 1¹/₂" Fh Sheet Metal Screws

NOTE: You can download cutting diagrams for this project FREE from our web site. Go to www.workbenchmag.com and click on

**CUTTING
DIAGRAMS**

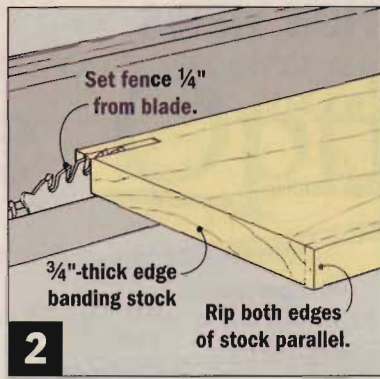
If you don't have web access, send a stamped, self-addressed envelope to:

Workbench Cutting Diagrams
Attn: Wall Unit
2200 Grand Ave.
Des Moines, IA 50312

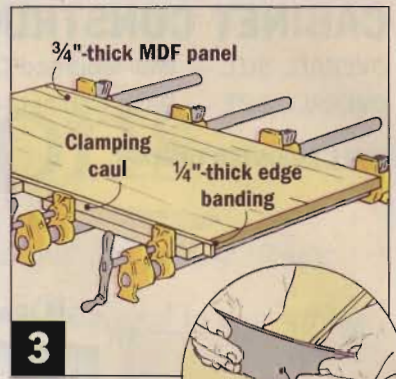


1 Align edge guide with layout line.

Cutting sheets to size is easiest with an edge guide. Mine's just a straight strip of scrap wood on a hardboard base. Cut the base to width after assembly.



2 Ripping the edging means you'll have narrow strips captured between the fence and blade. Use a sacrificial push block to keep your hands clear.



3 Use long wood cauls to distribute clamping pressure. Scrape banding flush once glue sets.

CUT AND EDGE THE PANELS

The first thing to do is lay out the cuts on the MDF. With planning, you can get an entire base cabinet and a wall-mounted cabinet from two full MDF sheets.

After laying out the panels, cut them to size (BASE CABINET ELEVATIONS at right, MATERIALS LIST on page 27). I find it easiest to cut sheet goods on sawhorses, using a circular saw and a shop-built edge guide (FIGS. 1 and 1a).

With the panels sized, work can begin on the edge banding. It's made by ripping thin strips off the edges of a piece of solid stock.

To do this, prepare your edging stock by ripping both edges parallel.

If you have a jointer, run each edge across it to get a flat, smooth surface.

Next, set your table saw fence 1/4" from the blade, and rip a strip of edge banding free (FIG. 2). Then flip the board edge-for-edge and make another pass.

Repeat this process, starting at the jointer, until you have enough edge banding to cover the front edge of all the cabinet panels.

Now crosscut pieces of edge banding slightly longer than each panel. Glue them in place making sure the banding overhangs both ends and each face of the panel (FIG. 3).

After the glue sets up, scrape the banding flush with the panel, and trim it to length.

ON TO THE JOINERY

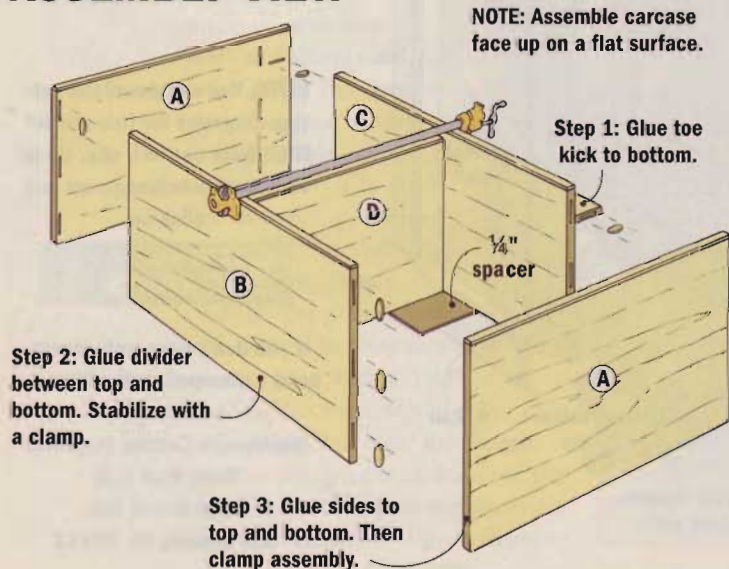
Before assembling the cabinet, you need to rabbet the back edge of each side panel to accept the back panel (BASE CABINET ELEVATIONS).

Now cut slots for the biscuits in the cabinet sides, top and bottom, divider, and toe kick.

Note that the bottom panel sits flush with the cabinet's front edge. The divider is set 1/4" back from the front edge and acts as a door stop. Both the divider and bottom sit flush with the side panel rabbets.

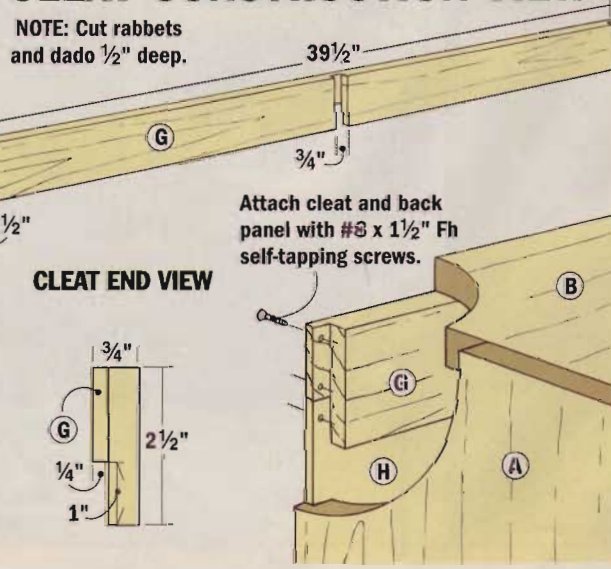
Finally, the hard work is paying off. It's time to assemble the cabinet (ASSEMBLY VIEW). This step is easy if you follow the sequence shown and dry-fit everything before gluing.

ASSEMBLY VIEW



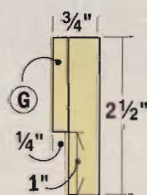
NOTE: Assemble carcass face up on a flat surface.

CLEAT CONSTRUCTION VIEW



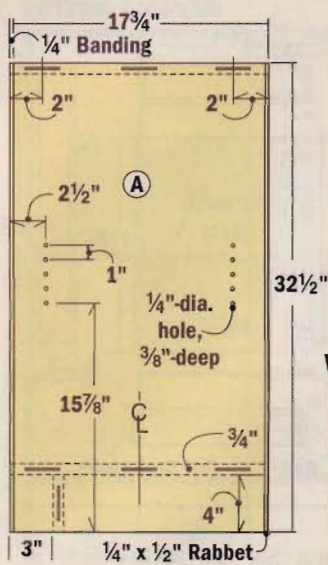
NOTE: Cut rabbets and dado 1/2" deep.

CLEAT END VIEW

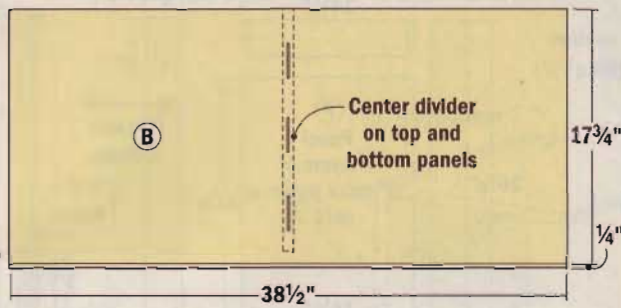


Attach cleat and back panel with #8 x 1 1/2" Fh self-tapping screws.

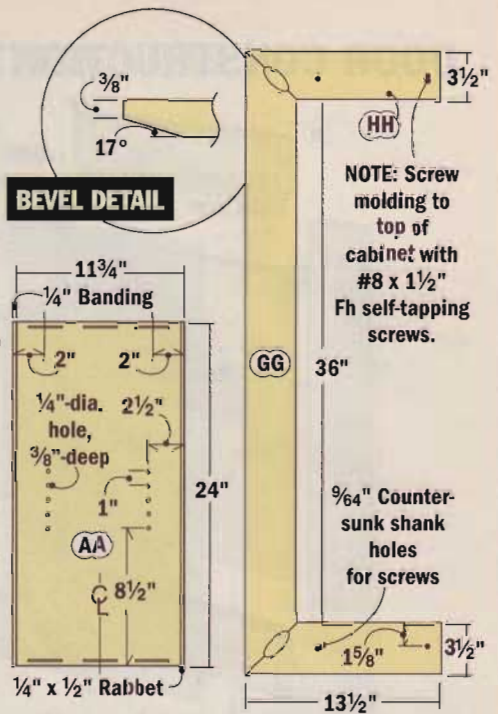
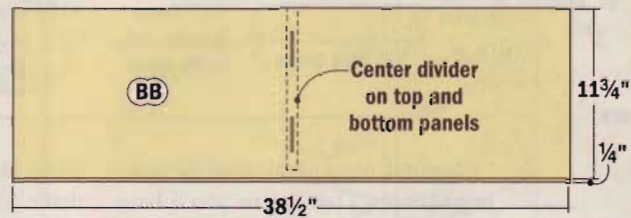
BASE CABINET ELEVATIONS



NOTE: Bottom panel (C) is 1/4" narrower than top panel (B)



WALL-MOUNTED CABINET ELEVATIONS



BEVEL DETAIL

NOTE: Screw molding to top of cabinet with #8 x 1 1/2" Fh self-tapping screws.

MAKE THE CLEAT AND BACK

The back of the cabinet is made up of a cleat and a plywood panel. The cleat gives you something to screw through when you mount the cabinet. The panel helps prevent racking.

Start by cutting the cleat to size (CLEAT CONSTRUCTION VIEW and CLEAT END VIEW). Then cut tongues on both ends to fit in the side panel rabbets. Also rabbet the bottom edge for the back panel. Finally, cut a centered dado to receive the divider.

Then you can screw the cleat in place, and cut a back to fit. I use self-

tapping sheet metal screws in MDF rather than woodscrews. The sheet metal screws have more aggressive threads that hold better.

Next, drill holes for shelf supports (DRILLING SHELF PIN HOLES).

ADD A COUNTERTOP

A countertop finishes off the cabinet (COUNTERTOP CONSTRUCTION VIEW). You make it by gluing a web frame (made from scrap MDF) to an MDF panel (COUNTERTOP and WEB TOP VIEWS). Then cut and fit the edge banding.

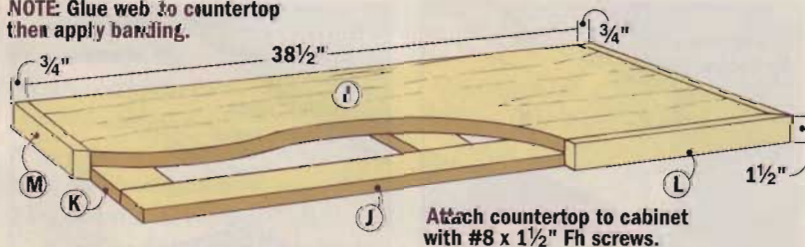
To mount the countertop, drill holes through the cabinet top panel aligned with the locations of the web rails. Then drive screws into the web from below.

MOLDING FOR THE TOP CABINET

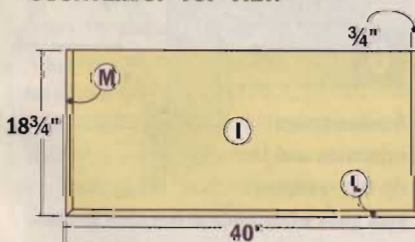
With the base cabinet done, I built a wall-mounted unit. It goes together just about like the base cabinet (WALL-MOUNTED CABINET ELEVATIONS). You do need to make a top molding, though. Each molding piece gets a 17° bevel (BEVEL DETAIL), and mitered corners.

COUNTERTOP CONSTRUCTION VIEW

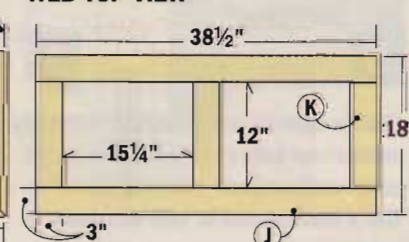
NOTE: Glue web to countertop then apply banding.



COUNTERTOP TOP VIEW

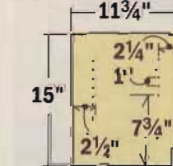


WEB TOP VIEW

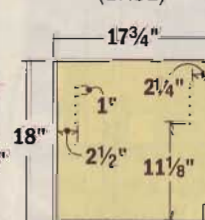


DRILLING SHELF PIN HOLES

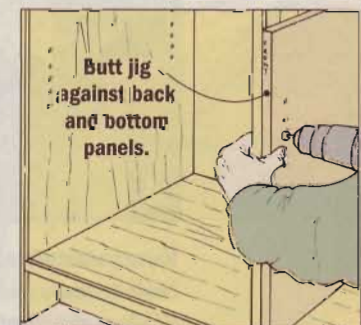
(WALL-MOUNTED)



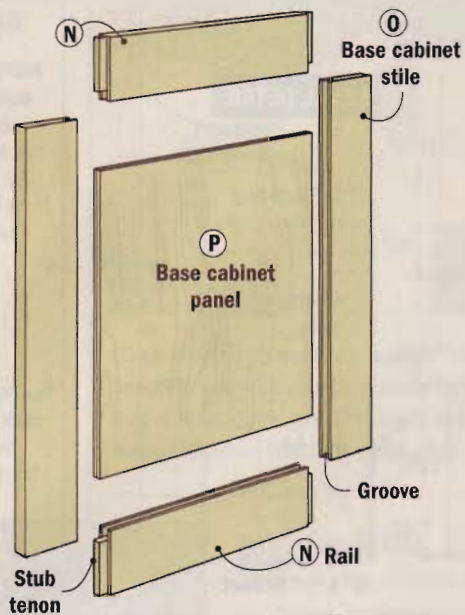
(BASE)



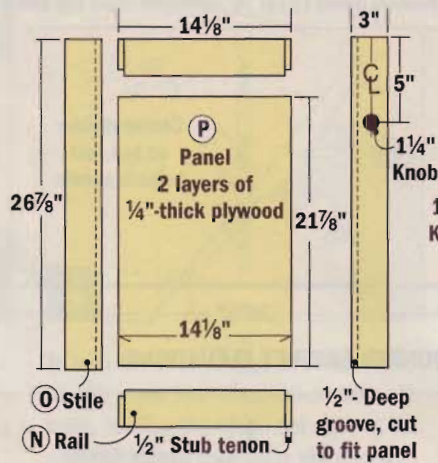
Make plywood jigs to position the shelf pin holes. Then use a bit and stop collar to drill holes in the cabinet sides and divider.



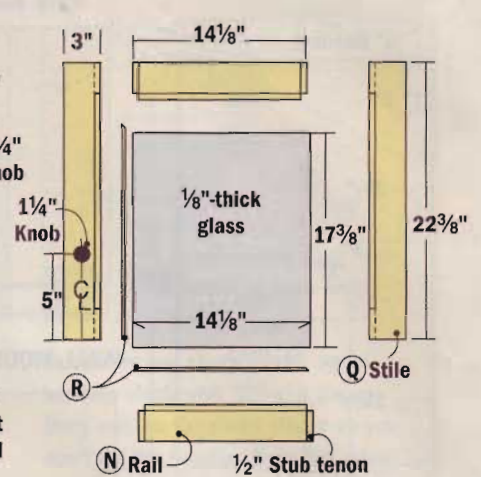
DOOR CONSTRUCTION VIEW



BASE CABINET DOOR FRONT VIEW



WALL-MOUNTED DOOR FRONT VIEW



BUILD THE DOORS

With the cabinet built, work can start on the doors (DOOR CONSTRUCTION VIEW). They have solid wood rails and stiles with grooves that capture plywood panels. The grooves also mate with stub tenons in the rails to join the frames.

The rest of this project is assembled with biscuit joints. Why not the door frames? Biscuits would work, but I prefer stub tenon and groove joints for a couple reasons.

First, each rail and stile needs a groove to receive the door panels. And since you've got to cut a groove anyway, why not take advantage of it.

MAKE THE PANELS AND FRAMES

The first step is cutting the rails and stiles (BASE and WALL-MOUNTED CABINET DOOR FRONT VIEWS).

Next, cut a centered groove in each piece to receive the plywood panel. It's easy to do this at the table saw if you keep two things in mind.

First, 1/4" plywood usually has veneer on just one face. I wanted two good faces on the panels, so I glued two pieces back-to-back.

And 1/4" plywood isn't quite a full 1/4" thick. So cutting a 1/2"-wide groove means a loose-fitting panel.

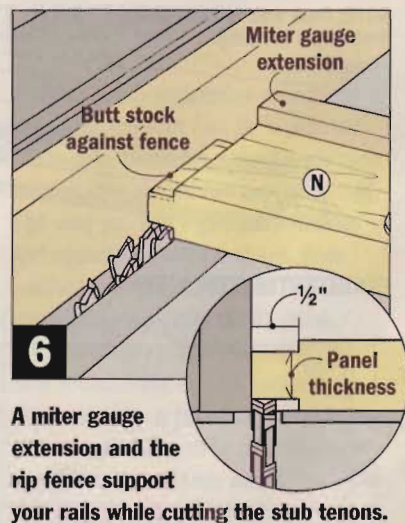
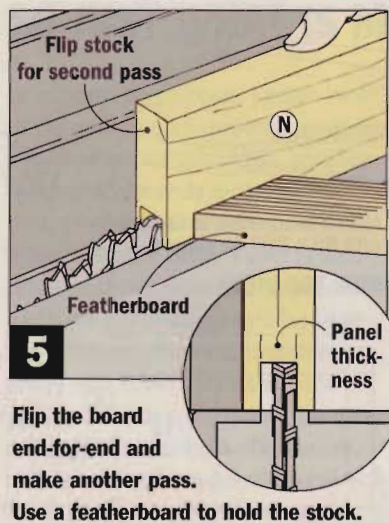
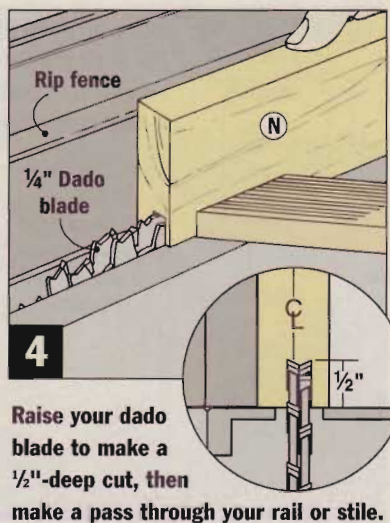
It's easiest to cut the groove in two passes using a 1/4" dado blade in

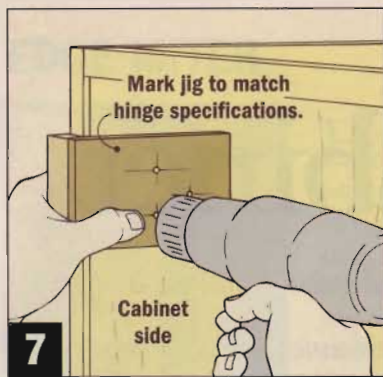
your saw. Set the dado blade to make a 1/2"-deep cut.

Now grab some scrap stock the same thickness as your rail and stile material. Next, adjust the rip fence so the blade is slightly off center on the edge of your stock. Then make the first cutting pass (FIG. 4). Now flip the board end-for-end and make another pass (FIG. 5).

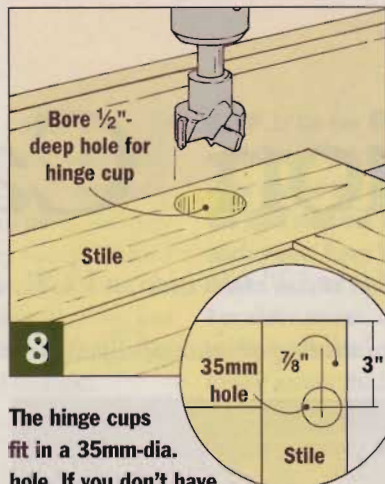
Test fit a panel in the groove. If the groove is too narrow, nudge the fence away from the blade and make two more passes. When the panel fits snug without binding, you're ready to machine the rails and stiles.

With the grooves done, the stub tenons can be cut on each rail. Though the tenons are 1/2"-long, the 1/4" dado blade can still be used to cut them.

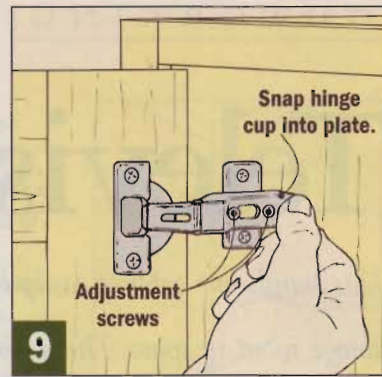




Check the specifications that come with your hinges, then build a simple jig to lay out the plate mounting holes. It lets you drill each hole consistently.



The hinge cups fit in a 35mm-dia. hole. If you don't have a 35mm bit, a 1 1/4"-dia. Forstner works.



Once the hinge cup and plates are installed, joining them together is a snap — literally. Then use the adjustment screws to fine tune the door.

To set up to cut the tenons, first adjust the rip fence as a stop that will establish the length of the tongues. Now adjust the blade height to set the tenon thickness. To get a snug-fitting tenon, start with the blade low and sneak up on the correct height.

Again, test your setups in scrap stock. Using an extension on your miter gauge for support, butt one end of the test piece against the fence. Then make the first pass (FIG. 6). Slide the piece away from the fence, and make another pass to complete that face of the tongue. Next, turn the stock over and repeat the process

to complete the tongue. Now test fit the tenon in one of the door stiles. If the tenon fits, machine your rails.

ASSEMBLE THE DOORS

Before gluing up a door, it's a good idea to dry assemble the rails, stiles, and panel to check the fit. Then apply glue to the tenons and mating spots on the stiles. Slip the panel in, and clamp the assembly.

For the wall-mounted cabinet doors that have glass, go ahead and glue up the frame. Then see *Installing Glass in the Doors* below. You can also install the door knobs.

INSTALL THE HINGES

European cup hinges keep the look of the cabinet uncluttered. Installing them is a straightforward process.

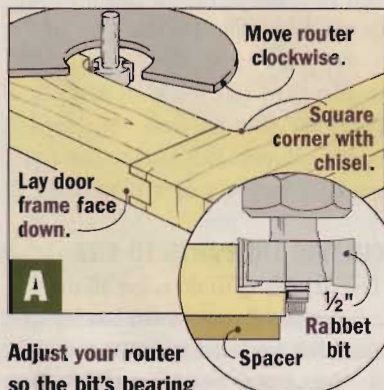
Start by drilling holes in the cabinet for the hinge plates (FIG. 7). A shop-built jig simplifies this process.

Now bore 35mm-dia. holes in the door stiles (FIG. 8). Then screw the hinge cup and plate in place and snap them together (FIG. 9).

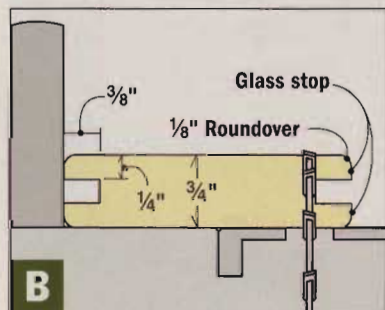
INSTALLING GLASS IN THE DOORS

To install glass in a door, cut away the back shoulder of the panel groove in the frame. Wood stops will hold the glass. First, install a 1/2" bearing-guided rabbet bit in your router. Then

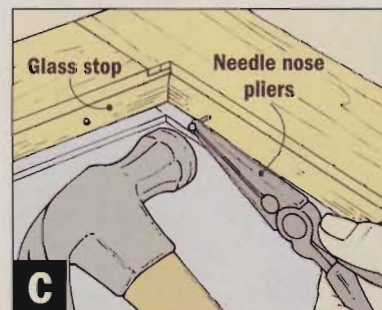
route away the back shoulder in the frame (FIG. A). Make simple glass stops by ripping small pieces from larger stock (FIG. B), then fit the stops and nail them in place (FIG. C).



Adjust your router so the bit's bearing rides on the groove's front shoulder.



Round over all four edges of a board, then kerf each edge. Next, lay the board flat, and rip the glass stops free.



Cut the stops to fit, mitering each corner as you go. Pre-drill the stops, and tack them in place with brads.



Television Cabinet

This handsome cabinet easily holds a 32" television, a VCR, and stereo gear. Plus it offers storage room to spare. The key to building it successfully is a well-planned assembly process.



Now that you've got the hang of building cabinets, this TV cabinet shouldn't look too intimidating. It's big, but it's built very similar to the wall-mounted and base cabinets.

Though it's deeper than the other cabinets, it's the same width and uses the same materials and joinery (see *Plate Joinery Basics* on page 36). This really simplifies layout, since a lot of the measurements are the same.

There are a few structural differences that help this cabinet bear the weight of a TV (TV CABINET CONSTRUCTION VIEW). They include a second toe kick and a pair of aluminum angle brackets, plus more cleats than the wall-mounted and base units to help resist racking.

On the functional side, the TV cabinet gets drawers (mounted on full-extension slides) for videos and compact discs. Adjustable shelves below hold more audio/visual gear.

DESIGN CONSIDERATIONS

I have a 32" TV, and I'm told that's currently the best selling size. So I designed this cabinet around those dimensions. Most 32" sets I checked will fit with plenty of room for air to circulate and cool the TV.

Of course, if you have a TV smaller than 32", it will fit fine. For a larger set, though, you may need a larger cabinet. Be sure to measure your TV before you start to build.

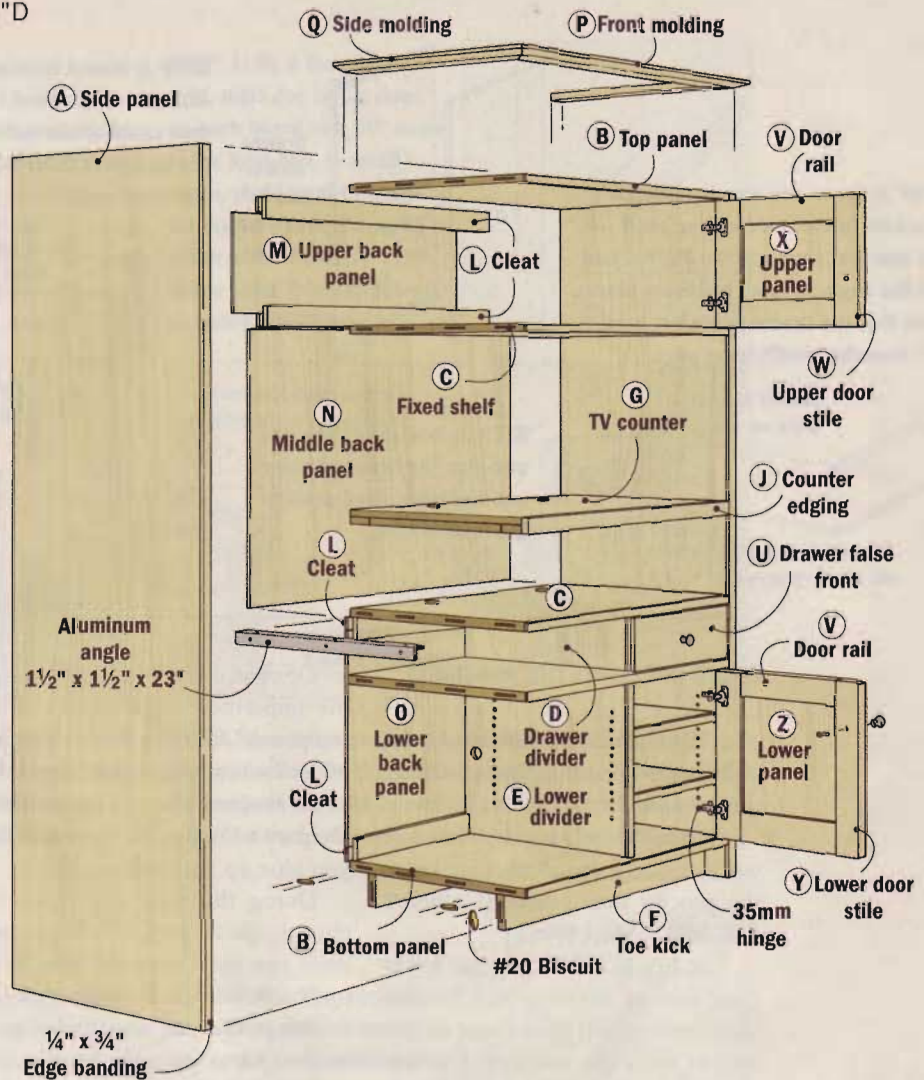
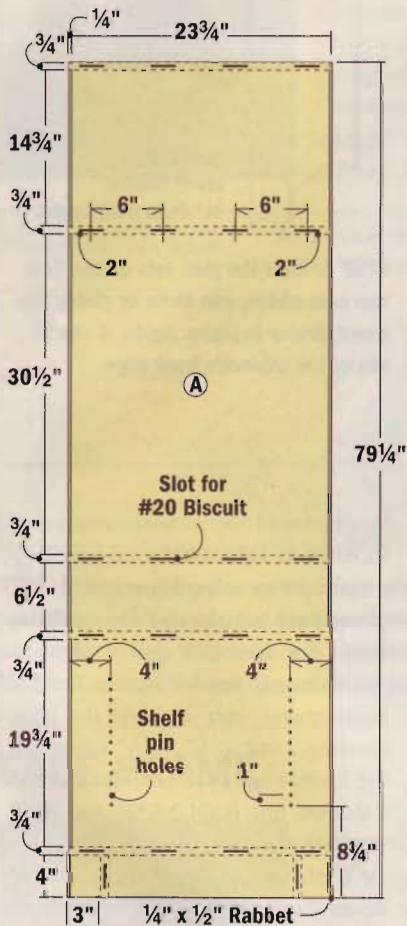
CUTTING THE PARTS TO SIZE

The first thing to do is get all the TV cabinet panels cut to size and edge-banded. Check the MATERIALS LIST at right, and use the procedures shown on pages 28 and 29.

TELEVISION CABINET CONSTRUCTION VIEW

OVERALL SIZE: 43"W x 80"H x 25¹/₂"D

SHELF LOCATIONS



MATERIALS

LUMBER

| | |
|------------------------------|----------------------------------------------------------------------------|
| A (2) Side Panels* | 3/4" x 23 ³ / ₄ " x 79 ¹ / ₄ " |
| B (2) Top/Bottom Panels* | 3/4" x 23 ³ / ₄ " x 38 ¹ / ₂ " |
| C (3) Fixed Shelves* | 3/4" x 23 ¹ / ₂ " x 38 ¹ / ₂ " |
| D (1) Drawer Divider* | 3/4" x 22 ³ / ₄ " x 6 ¹ / ₂ " |
| E (1) Lower Divider* | 3/4" x 22 ³ / ₄ " x 19 ³ / ₄ " |
| F (2) Toe Kicks | 3/4" x 4" x 38 ¹ / ₂ " |
| G (1) TV Counter | 3/4" x 23" x 38 ¹ / ₂ " |
| H (2) Counter Web Rails | 3/4" x 3" x 38 ¹ / ₂ " |
| I (3) Counter Web Stretchers | 3/4" x 3" x 17" |
| J (1) Counter Edge Banding | 3/4" x 1 ¹ / ₂ " x 38 ¹ / ₂ " |
| K (4) Adjustable Shelves* | 3/4" x 22 ¹ / ₄ " x 18 ³ / ₄ " |
| L (4) Cleats | 3/4" x 2 ¹ / ₂ " x 39 ¹ / ₂ " |
| M (1) Upper Back Panel | 1/4" x 39 ¹ / ₂ " x 11 ³ / ₄ " |
| N (1) Middle Back Panel | 1/4" x 39 ¹ / ₂ " x 32" |
| O (1) Lower Back Panel | 1/4" x 39 ¹ / ₂ " x 24" |
| P (1) Front Molding | 3/4" x 3 ¹ / ₂ " x 43" |
| Q (2) Side Molding | 3/4" x 3 ¹ / ₂ " x 25 ¹ / ₂ " |

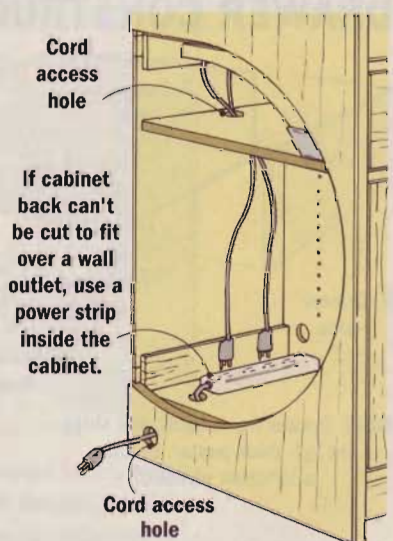
| | |
|----------------------------|----------------------------------------------------------------------------|
| R (4) Drawer Fronts/Backs | 1/2" x 6 ¹ / ₄ " x 17 ³ / ₈ " |
| S (4) Drawer Sides | 1/2" x 6 ¹ / ₄ " x 20" |
| T (2) Drawer Bottoms (ply) | 1/4" x 17 ³ / ₈ " x 19 ¹ / ₂ " |
| U (2) Drawer False Fronts | 3/4" x 6 ³ / ₈ " x 19 ¹ / ₈ " |
| V (8) Door Rails | 3/4" x 3" x 14 ¹ / ₈ " |
| W (4) Upper Door Stiles | 3/4" x 3" x 14 ⁵ / ₈ " |
| X (2) Upper Door Panels | 1/2" x 14 ¹ / ₈ " x 9 ⁵ / ₈ " |
| Y (4) Lower Door Stiles | 3/4" x 3" x 19 ⁵ / ₈ " |
| Z (2) Lower Door Panels | 1/2" x 14 ¹ / ₈ " x 14 ⁵ / ₈ " |

*Apply 1/8"-thick x 3/4"-wide edge banding to these pieces.

HARDWARE

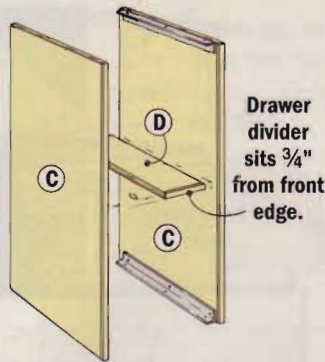
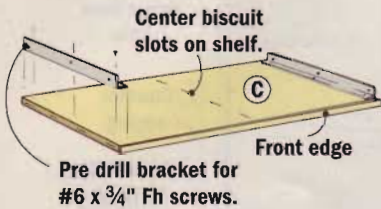
- (8) 35mm European Clip Hinges
- (2) Pairs 20" Full Extension Drawer Slides
- (62) #8 x 1¹/₂" Fh Sheet Metal Screws
- (2) 1¹/₂" x 1¹/₂" x 23" Aluminum Angle Brackets
- (6) 1¹/₄"-Dia. Round Knobs with Screws
- (12) #6 x 3/4" Fh Wood Screws
- (8) #6 x 1" Fh Wood Screws

ROUTING THE WIRES



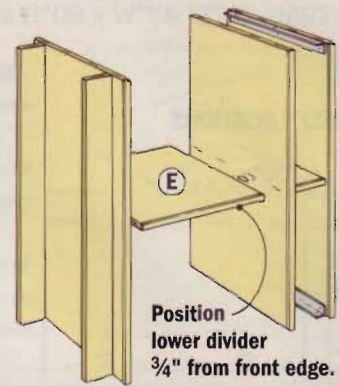
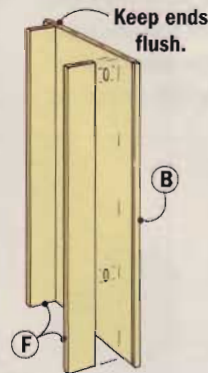
CABINET ASSEMBLY SEQUENCE

STEP 1: Screw the aluminum angle brackets to the middle fixed shelf — the one that supports the TV. You can get the angle at most hardware stores. Note that the brackets are set back $\frac{3}{4}$ " from the shelf's front edge.



STEP 2: Now insert biscuits and glue the drawer divider and the lower fixed shelf to the middle shelf.

STEP 3: Install both toe kicks on the cabinet bottom panel. Make sure the toe kicks are flush with the shelf ends.



STEP 4: After the glue sets on the first two assemblies, join them by gluing the lower divider in place. Again, it sits $\frac{3}{4}$ " shy of the cabinet's front edge.

BRING ORDER TO THE ASSEMBLY

Once you've got the carcass pieces cut, edge banded, and slotted for biscuits, you can turn to assembling the cabinet.

Since I don't have three hands, I worked out a sequence that keeps the process manageable (CABINET ASSEMBLY SEQUENCE).

The key is assembling the lower fixed shelves, dividers, and bottom panel before you join them to the cabinet sides. You can then join this assembly to the sides with far less juggling of parts.

Of course, you'll still have to add the uppermost fixed shelf and the top panel. One person can do it, but it's easier if you recruit a friend.

As always, it's best to dry assemble the parts to make sure they fit before you glue up the cabinet.

Doing this will also make the glue-up go faster. That's important, since you don't want the glue to set up before you get the pieces joined.

While the glue sets up is a good time to screw the angle brackets into the sides. And you can bore holes that allow electrical cords and cables to

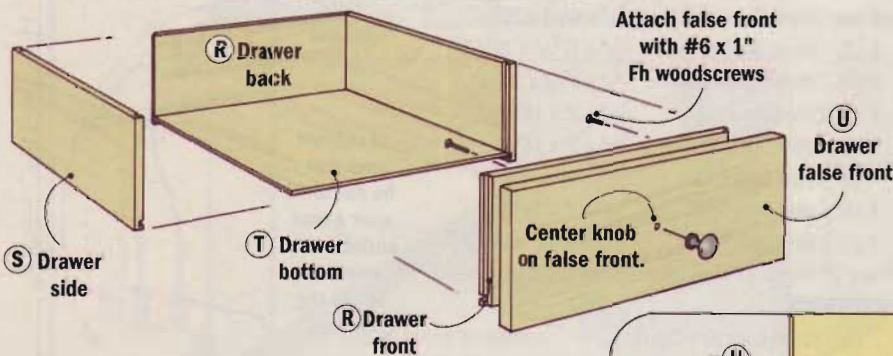
run between the compartments (see ROUTING THE WIRES on page 33).

Next, go ahead and add the cleats, back panels, and top molding while the cabinet is on its side.

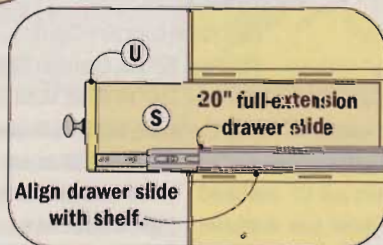
Now you need to make the TV counter and web, and add the edge banding. I cut a $\frac{1}{8}$ " \times $\frac{1}{8}$ " rabbet on the lower edge of the banding to add a shadow line (COUNTER and WEB TOP VIEWS, BANDING DETAIL).

With the base cabinet done the doors can be built, but leave them off until you've got the TV cabinet in its final location.

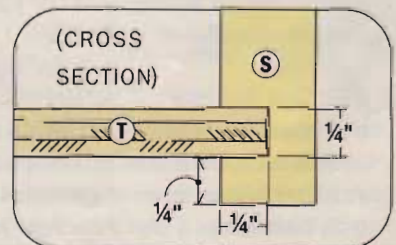
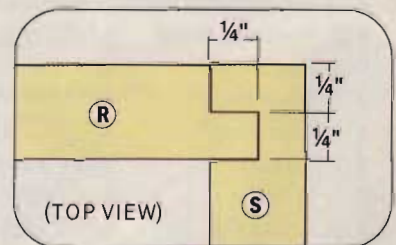
DRAWER CONSTRUCTION VIEW



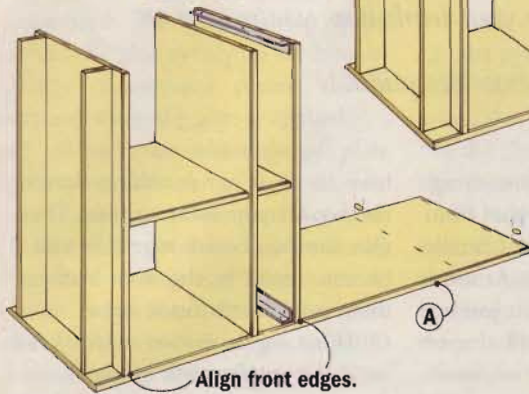
NOTE: Drawer front, back, and sides are $\frac{1}{2}$ "-thick poplar. Bottom is $\frac{1}{4}$ "-thick plywood.



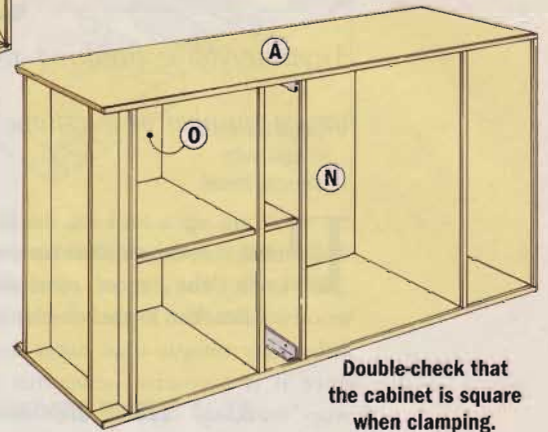
DRAWER JOINERY DETAILS



STEP 5: Now rest the right cabinet side on sawhorses (support it lengthwise with 2x4s) and install the lower assembly. Make sure the front edges line up flush.



STEP 6: Adding the upper fixed shelf and top is a bit trickier, since you need to hold them upright. Clamp a support block to each one, or have someone hold them.



STEP 7: Now drop the other cabinet side in place. You'll have to work quickly to get glue on all the mating surfaces and get the biscuits in place. Clamp the assembly and check for square. You can now add the cleats and back panels.

BUILD THE DRAWERS

Now that you've gotten through building the cabinet, building the drawers should be fairly easy. They're just simple boxes made out of 1/2"-thick poplar. Maple false fronts match the cabinet (DRAWER CONSTRUCTION VIEW).

To join the drawer boxes I used locking rabbet joints (DRAWER JOINERY DETAILS). They're easy to cut using a 1/4" dado blade in the table saw. After you dado the drawer sides, you can cut grooves for the drawer bottoms.

Once the drawer boxes are complete, install drawer slides according to the manufacturer's instructions. Check the *Skill Builder* below for an easy way to install the false fronts.


WRAPPING IT ALL UP

After building the doors, what are the final steps?

First, let's talk finish. I gave this and the other cabinets three coats of a tung oil and urethane finish. It adds a warm amber glow to the maple.

Finally, you can turn your attention to installation. Though the cab-

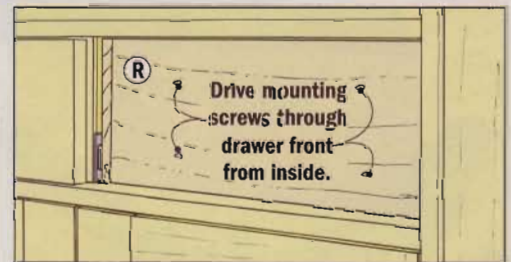
inet is quite stable, you may want to secure one or two of the cleats to wall studs with 2 1/2"-long screws.

With that done, set in your TV and stereo gear. Then sit back and relax. You've earned it. 

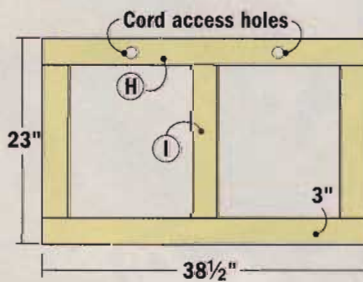
SKILL-BUILDER

Installing False Fronts

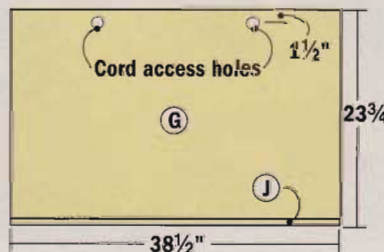
Start by driving mounting screws through the drawer box from the inside so their tips stick out. Now put the drawer box in the cabinet. Align the false front with even gaps, and press it onto the screws. Remove the front, and drill pilot holes on the marks.



WEB TOP VIEW

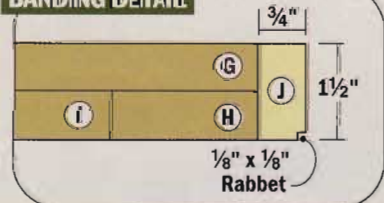


TV COUNTER TOP VIEW



NOTE: Drill 1/2"-dia. cord access holes through the TV counter and web assembly, then slip it into the cabinet. Transfer these holes to the shelf below the counter. Now remove the counter and drill holes through the shelf.

BANDING DETAIL



Workbench Cutting Diagrams — Modular Wall Unit

MATERIALS LIST — WALL-MOUNTED AND BASE CABINET

WALL-MOUNTED CABINET

| | |
|---------------------------------|--------------------------|
| AA (2) Side Panels* | 3/4" x 11 3/4" x 24" |
| BB (2) Top/Bott. Panels* | 3/4" x 11 3/4" x 38 1/2" |
| CC (1) Divider* | 3/4" x 10 3/4" x 22 1/2" |
| DD (2) Shelves* | 3/4" x 10 1/2" x 18 3/4" |
| EE (2) Cleats | 3/4" x 2 1/2" x 39 1/2" |
| FF (2) Back Panel (ply) | 1/4" x 19 1/2" x 39 1/2" |
| GG (1) Front Molding | 3/4" x 3 1/2" x 43" |
| HH (2) Side Molding | 3/4" x 3 1/2" x 13 1/2" |

BASE CABINET

| | |
|-------------------------------|--------------------------|
| A (2) Side Panels* | 3/4" x 17 3/4" x 32 1/2" |
| B (1) Top Panel* | 3/4" x 17 3/4" x 38 1/2" |
| C (1) Bottom Panel* | 3/4" x 17 1/2" x 38 1/2" |
| D (1) Divider* | 3/4" x 16 3/4" x 27" |
| E (1) Toe Kick | 3/4" x 4" x 38 1/2" |
| F (2) Shelves* | 3/4" x 16 1/2" x 18 3/4" |
| G (1) Cleat | 3/4" x 2 1/4" x 39 1/2" |
| H (2) Back Panel (ply) | 1/4" x 26 1/4" x 39 1/2" |
| I (1) Countertop | 3/4" x 18" x 38 1/2" |
| J (2) Web Rails | 3/4" x 3" x 38 1/2" |

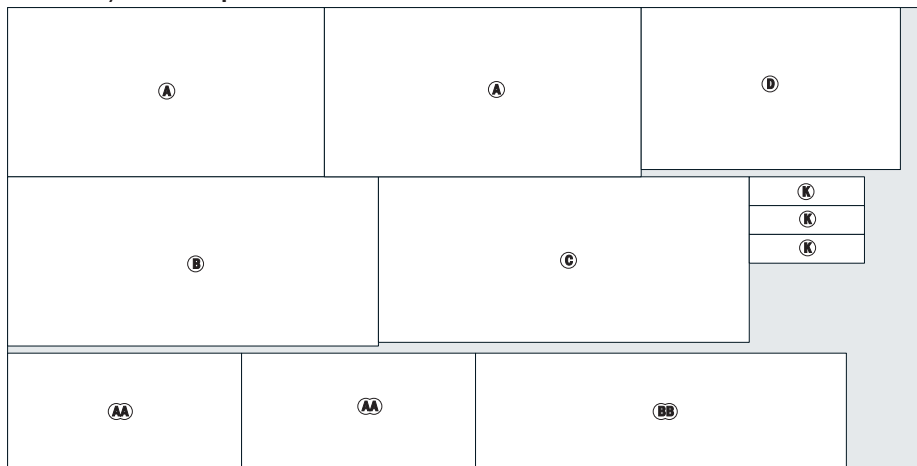
| | |
|-----------------------------|-------------------------|
| K (3) Web Stretchers | 3/4" x 3" x 12" |
| L (1) Front Edging | 3/4" x 1 1/2" x 40" |
| M (2) Side Edging | 3/4" x 1 1/2" x 18 3/4" |

DOORS (per cabinet)

| | |
|-------------------------------|-----------------------------------|
| N (4) Rails | 3/4" x 3" x 14 1/8" |
| O (4) Base Cab. Stiles | 3/4" x 3" x 26 7/8" |
| P (2) Base Cab. Panels | 1/2" x 14 1/8" x 21 7/8" |
| Q (4) Wall Cab. Stiles | 3/4" x 3" x 22 3/8" |
| R (1) Glass Stops | 1/4" x 3 3/8" x 156" — cut to fit |

* Apply 1/4"-thick x 3/4"-wide edge banding to the front edges of these pieces.

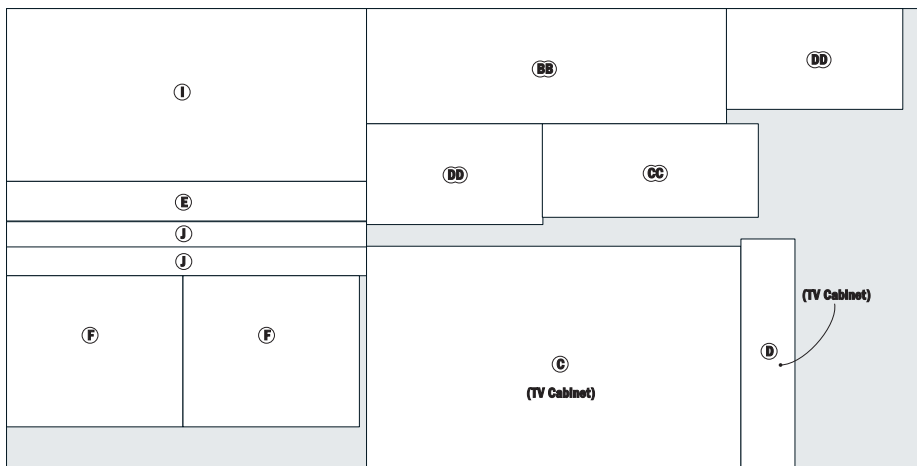
Full sheet 3/4"-thick maple veneered MDF



Correction:

• In the magazine, the materials list for the base and wall-mounted cabinet shows a few incorrect quantities. That list shows two (2) each for the top panel (B), the bottom panel (C) and the countertop (I). You only need one of each of these per cabinet, as shown above.

Full sheet 3/4"-thick maple veneered MDF



Note:

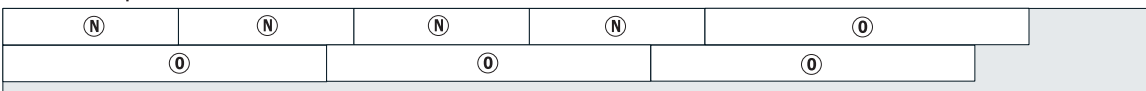
You will also need one 4x8 sheet of 1/4"-thick plywood to make the the following parts:

- back panel (FF) for the wall-mounted cabinet
- back panel (H) for the base cabinet
- door panels (P) for the base cabinet

3/4" x 7" x 96" Maple



3/4" x 7" x 96" Maple



3/4" x 7" x 96" Maple



Note: One more piece of 3/4" x 7" x 96" maple needed to make glass stops (R) and 1/4"-thick edge banding.

MATERIALS LIST – TV CABINET

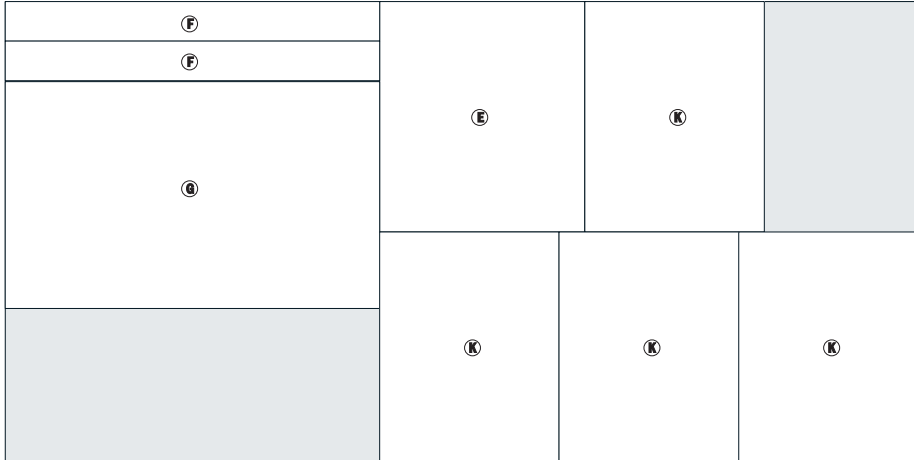
LUMBER

| | | | | | |
|-------------------------------------|---------------------------------------------------------|-----------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------------------------|
| A (2) Side Panels* | $\frac{3}{4}$ " x $23\frac{3}{4}$ " x $79\frac{1}{4}$ " | J (1) Counter Edge Banding | $\frac{3}{4}$ " x $1\frac{1}{2}$ " x $38\frac{1}{2}$ " | T (2) Drawer Bottoms (ply) | $\frac{1}{4}$ " x $17\frac{3}{8}$ " x $19\frac{1}{2}$ " |
| B (2) Top/Bottom Panels* | $\frac{3}{4}$ " x $23\frac{3}{4}$ " x $38\frac{1}{2}$ " | K (4) Adjustable Shelves* | $\frac{3}{4}$ " x $22\frac{1}{4}$ " x $18\frac{3}{4}$ " | U (2) Drawer False Fronts | $\frac{3}{4}$ " x $6\frac{3}{8}$ " x $19\frac{1}{8}$ " |
| C (3) Fixed Shelves* | $\frac{3}{4}$ " x $23\frac{1}{2}$ " x $38\frac{1}{2}$ " | L (4) Cleats | $\frac{3}{4}$ " x $2\frac{1}{2}$ " x $39\frac{1}{2}$ " | V (8) Door Rails | $\frac{3}{4}$ " x 3 " x $14\frac{1}{8}$ " |
| D (1) Drawer Divider* | $\frac{3}{4}$ " x $22\frac{3}{4}$ " x $6\frac{1}{2}$ " | M (1) Upper Back Panel | $\frac{1}{4}$ " x $39\frac{1}{2}$ " x $11\frac{3}{4}$ " | W (4) Upper Door Stiles | $\frac{3}{4}$ " x 3 " x $14\frac{5}{8}$ " |
| E (1) Lower Divider* | $\frac{3}{4}$ " x $22\frac{3}{4}$ " x $19\frac{3}{4}$ " | N (1) Middle Back Panel | $\frac{1}{4}$ " x $39\frac{1}{2}$ " x 32 " | X (2) Upper Door Panels | $\frac{1}{2}$ " x $14\frac{1}{8}$ " x $9\frac{5}{8}$ " |
| F (2) Toe Kicks | $\frac{3}{4}$ " x 4 " x $38\frac{1}{2}$ " | O (1) Lower Back Panel | $\frac{1}{4}$ " x $39\frac{1}{2}$ " x 24 " | Y (4) Lower Door Stiles | $\frac{3}{4}$ " x 3 " x $19\frac{5}{8}$ " |
| G (1) TV Counter | $\frac{3}{4}$ " x 23 " x $38\frac{1}{2}$ " | P (1) Front Molding | $\frac{3}{4}$ " x $3\frac{1}{2}$ " x 43 " | Z (2) Lower Door Panels | $\frac{1}{2}$ " x $14\frac{1}{8}$ " x $14\frac{5}{8}$ " |
| H (2) Counter Web Rails | $\frac{3}{4}$ " x 3 " x $38\frac{1}{2}$ " | Q (2) Side Molding | $\frac{3}{4}$ " x $3\frac{1}{2}$ " x $25\frac{1}{2}$ " | *Apply $\frac{1}{4}$ "-thick x $\frac{3}{4}$ "-wide edge banding to these pieces. | |
| I (3) Counter Web Stretchers | $\frac{3}{4}$ " x 3 " x 17 " | R (4) Drawer Fronts/Backs | $\frac{1}{2}$ " x $6\frac{1}{4}$ " x $17\frac{3}{8}$ " | | |
| | | S (4) Drawer Sides | $\frac{1}{2}$ " x $6\frac{1}{4}$ " x 20 " | | |

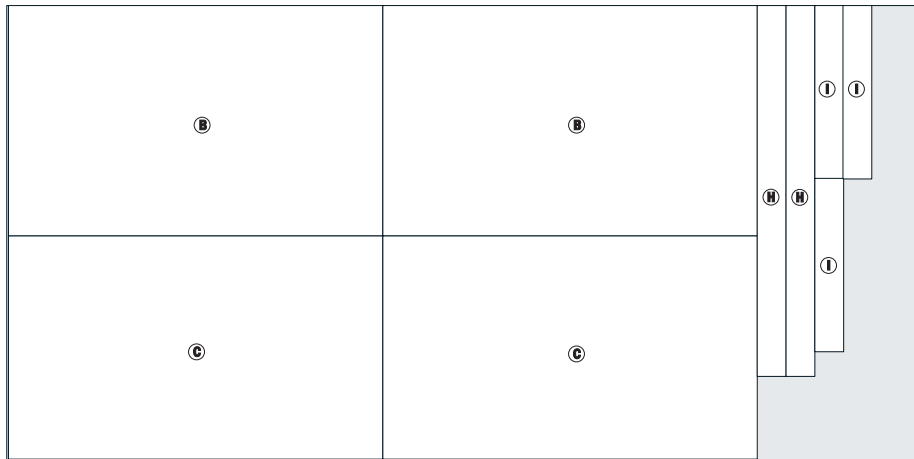
Full sheet $\frac{3}{4}$ "-thick maple veneered MDF



Full sheet $\frac{3}{4}$ "-thick maple veneered MDF



Full sheet $\frac{3}{4}$ "-thick maple veneered MDF



3/4" x 7" x 96" Maple



3/4" x 7" x 96" Maple



3/4" x 5" x 96" Maple

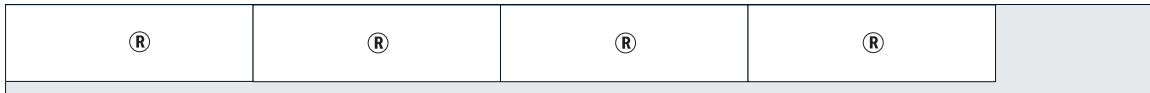


3/4" x 7" x 48" Maple



Note: One more piece of 3/4" x 7" x 96" maple needed to make 1/4"-thick edge banding.

1/2" x 7" x 96" Maple



1/2" x 7" x 96" Maple



Note:

You will also need two 4x8 sheets of 1/4"-thick plywood to make the the following parts:

- upper back panel (M), middle back panel (N), and lower back panel (O) for the TV cabinet
- upper door panels (X), and lower door panels (Z) for the TV cabinet
- door bottoms (T) for the TV cabinet

Plate Joinery Basics

Anytime you're thinking about buying a new tool for your workshop, you're sure to have a number of questions. A plate joiner is certainly no exception.

Picking up a tool for the first time can raise questions with even the most seasoned woodworker. And a plate joiner is a little more unique than other tools since it is a relative newcomer to woodworking. Here are some answers to the most common questions I've heard about plate joinery.

Q. What's the difference between plate joinery and biscuit joinery?

A. Actually, they're the same thing. The name plate joinery comes from its original German name, *Lamelle* — which means thin plate. At some point, it was dubbed biscuit joinery because those little football-shaped splines look like biscuits. The names have since become interchangeable.

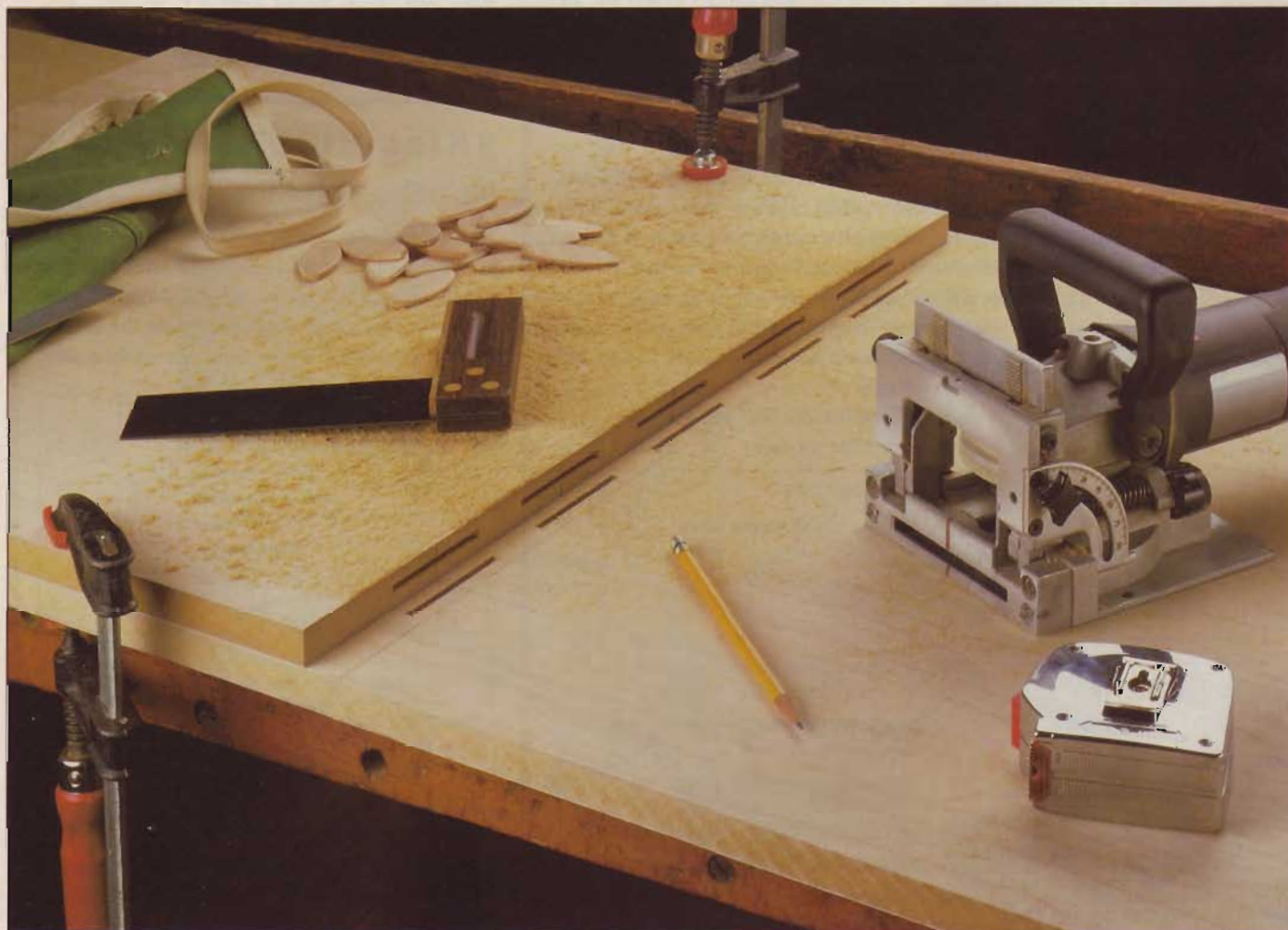
Q. What's the basic idea behind plate joinery?

A. It's pretty simple really. All you

have to do is cut matching slots in the boards you want to join. Then glue the two boards together with a biscuit nested in the slots between them (see illustration at right).

Q. What are the biscuits made of and can I just cut them out of wood?

A. The biscuits are die-cut from solid wood, most commonly beech. While you probably could make pretty good biscuit replicas



in your shop, you wouldn't be able to stamp a grid pattern into them and compress them the way the manufacturers do.

Both of those things are pretty important. The grid pattern helps spread the glue evenly on the biscuit. Being compressed means they'll expand when the glue is applied.

Q. What's the advantage of plate joinery over dowels?

A. With dowels, alignment is critical. If the holes don't line up perfectly, you have to start over. With biscuits, on the other hand, the machine cuts the slots just a little larger than the biscuit itself. That means even if alignment isn't dead on, you can move your workpieces around just a little before the glue sets and know that the biscuit is in place.

Q. How small can pieces be and still be joined with a plate joint?

A. One common criticism of plate joinery has been that you're limited to how small you can make the mating pieces. Traditionally that was true. Even with a #0 biscuit, the workpieces couldn't be smaller than 2¹/₄" wide.

But now Porter-Cable and Ryobi both offer small versions of

biscuits that can be used for jobs like face frames and detail work. The Porter-Cable machine allows you to use biscuits in workpieces as narrow as 1¹/₂". The Ryobi will work in 3/4"-wide stock.

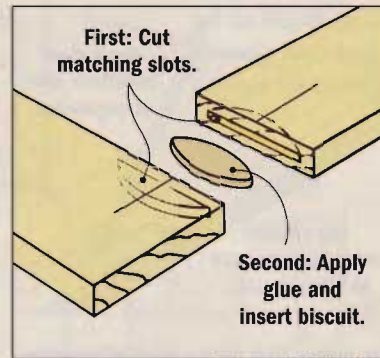
Q. Are plate joiners hard to use?

A. Well, they're easier to understand when you've got one in your hands, but the illustrations at the bottom of this page should help.

In FIG. A, you can see the joiner butted against the wood just before the cut is made. Then, in FIG. B, the machine is plunged forward making the cut. Finally, in FIG. C, the cut is complete and the blade is retracted.

Q. Are there any tricks to laying out and cutting the two mating pieces so they join together?

A. Plate joiners seem to have been designed with 3/4"-thick stock in mind. By simply setting the workpiece and the joiner on the same level surface, the blade will automatically be aligned to cut the slot in the center of the stock. But don't think for a minute that plate joinery is limited to 3/4"-thick stock or straight-on joints. As you'll see in the next few pages, this is one of the most flexible, easy-to-use joinery techniques available.



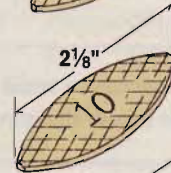
First, cut matching slots in the mating workpieces. Second, apply glue inside the slots and insert a biscuit.

STANDARD BISCUIT SIZES

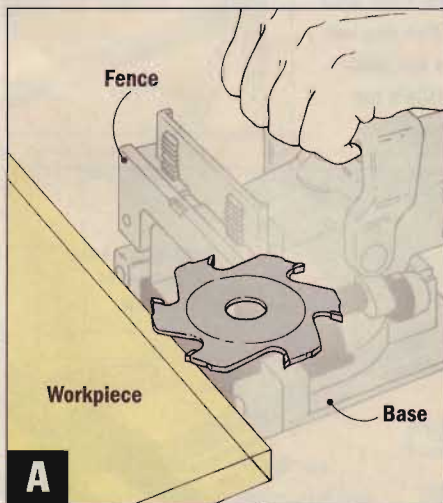
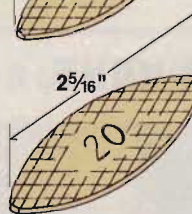
#0 biscuit
requires stock at
least 2¹/₄" wide.



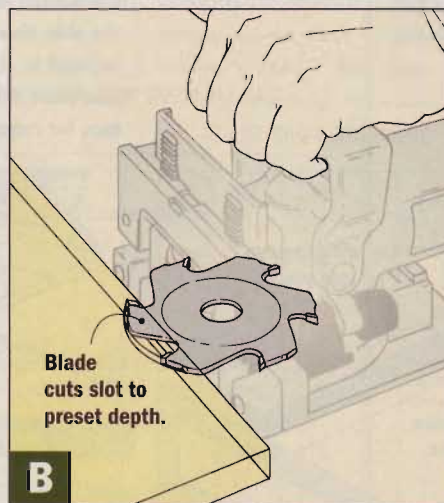
#10 biscuit
requires stock at
least 2³/₈" wide.



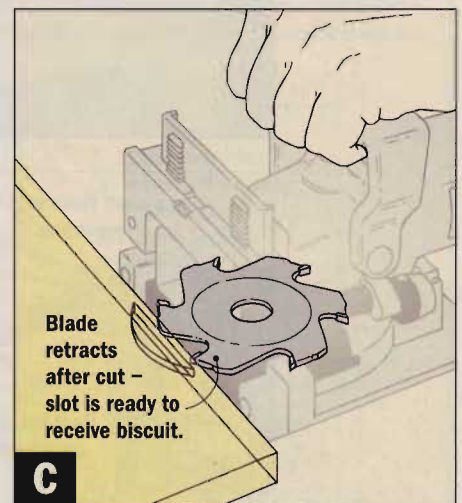
#20 biscuit
requires stock at
least 2¹³/₁₆" wide.



A Before cutting, the blade nests safely inside the joiner base. Since the joiner base rests on the same surface when cutting both workpieces, the slots should align.

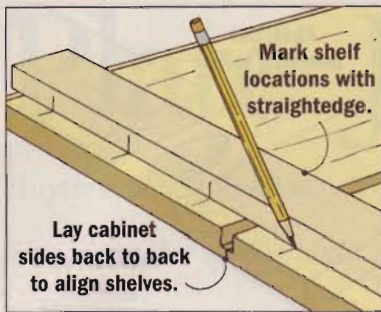


B To cut the slot, plunge the joiner forward and the blade emerges from the base into the stock. A preset depth stop on the joiner ensures the slot will be the perfect size.

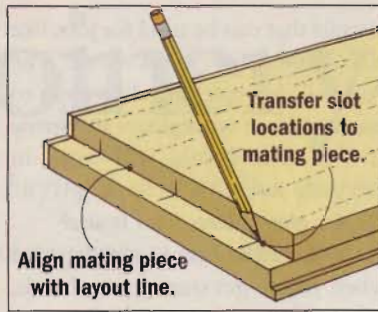


C When the cut is complete, pull the joiner away from the workpiece. All that remains is to cut a matching slot, add some glue and a biscuit, and clamp it up.

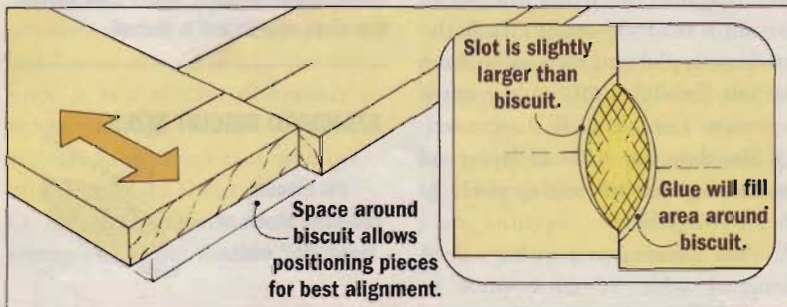
LAYOUT CONSIDERATIONS



Lay pieces that mirror each other edge-to-edge during layout for consistency.



After marking one piece, lay the mating piece on it and transfer the layout lines.



Though careful layout is important, plate joinery allows a little margin for

error. The slots are longer than the biscuit, allowing you to align the pieces.

Laying out plate joints isn't difficult. Just line up the mating pieces, and mark a line across the joint. The key is having all the pieces correctly positioned during layout.

In other words, know which end, edge, or face of one piece meets the end, edge, or face of the next. And make sure you've got the best face of each piece aligned so it shows where you want it.

It also helps to lay out similar pieces at the same time. For example, lay cabinet sides that mirror each other with their back edges aligned. Then lay out locations for all the shelves on both pieces at the same time using a straightedge.

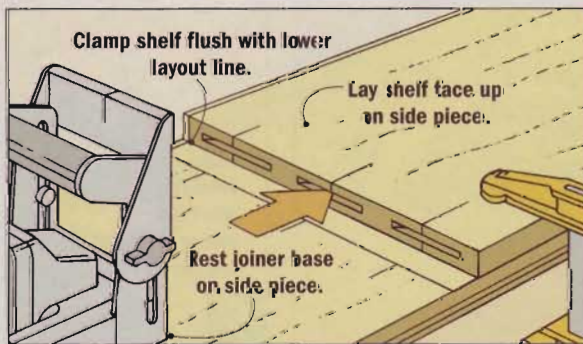
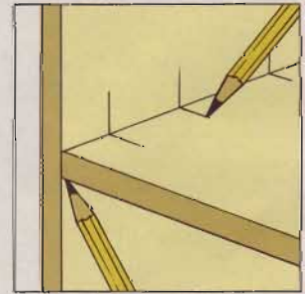
Whenever it's possible, use the actual pieces to be joined for your layout, rather than a tape measure or guide board. And on complicated assemblies, label all pieces so you can see which ones mate and how they fit together.

T-JOINT

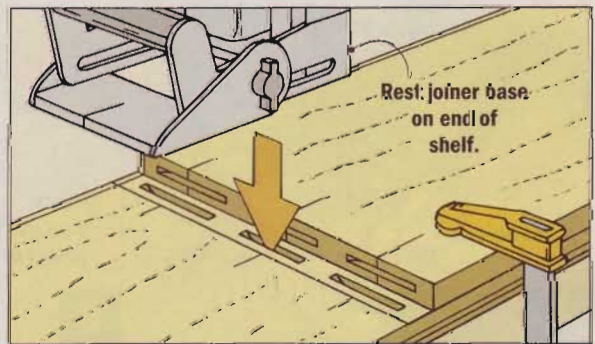


Use the T-joint anywhere the end or edge of one piece intersects the face of another piece, such as when joining a shelf to a cabinet side. The T-joint is similar to a tongue-and-groove joint, but easier to cut.

STEP 1: Align the mating pieces and mark the biscuit locations. Before moving the pieces, mark the position of the bottom of the shelf onto the side piece. This line will be used to align the slots. Also mark the shelf's top face for reference.



STEP 2: Clamp the shelf on top of the side piece. Align the shelf with the lower layout line on the side piece, making sure you've got the top of the shelf facing up. Rest the joiner's base on the side piece and cut slots in the end of the shelf.



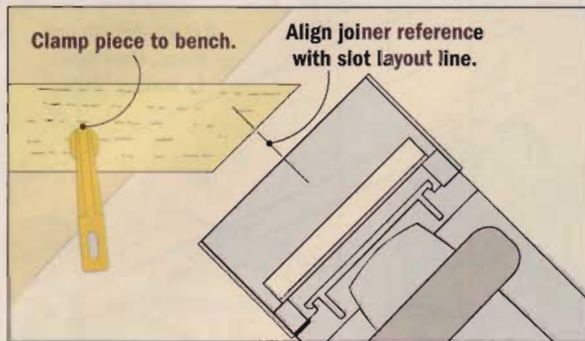
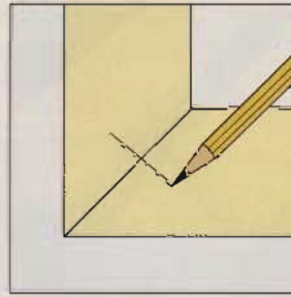
STEP 3: Leave the pieces clamped together, and position the base of the joiner against the end of the shelf. Plunge the blade into the side piece. Even if the slots aren't centered on the stock thickness, the shelf will line up right.

FACE MITER

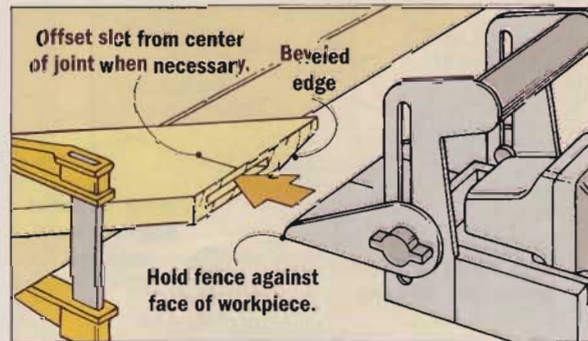


Plate joints are also great for mitered picture frames. Biscuits make alignment and clamping easier, and they add a lot of strength to the joint. Note: The frame stock must be at least $1\frac{1}{16}$ "-wide to use a standard #0 biscuit.

STEP 1: On a face-miter joint, mark the layout lines on each board at a 90° angle to the joint line. In most cases, you'll want to center the layout line on the width of the joint. Remember, the slot is wider than the biscuit, so watch the alignment.



STEP 2: Clamp one piece on the bench with the mitered end extending past the edge. Set the joiner's fence to center the slot on the stock's thickness. Now press the joiner against the piece and cut the slot. Repeat to cut the mating piece.



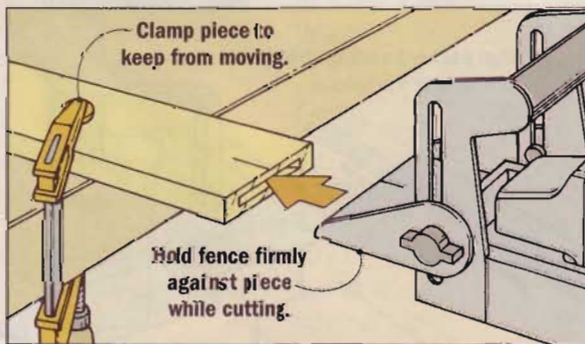
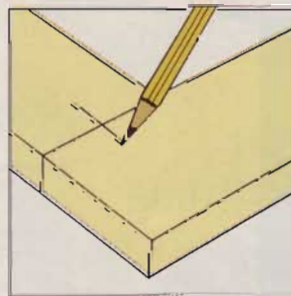
NOTE: Sometimes you need to position biscuit slots off the joint centerline. On this beveled molding, the slot is toward the inside of the joint to prevent cutting through the beveled edge. You could also use a smaller biscuit in this case.

FACE FRAME

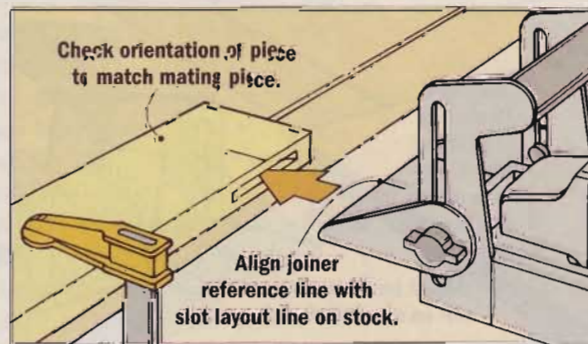


With a face-frame joint, the slots are cut in the end grain of one piece, and the edge grain of another. It works great on cabinet face frames and doors. Again, the slot is centered on the width of the joint.

STEP 1: Start by aligning the pieces, making sure you've got them in the correct positions. You want to cut slots in the ends of each rail and the edge of each stile. You can also use this joint to attach dividers in frames.



STEP 2: Cut the end grain slot first. Clamp the piece to your bench so it extends past the edge. Then set the joiner's fence to center the slot on the stock's thickness. Line up the reference line on the tool and push in to make the cut.



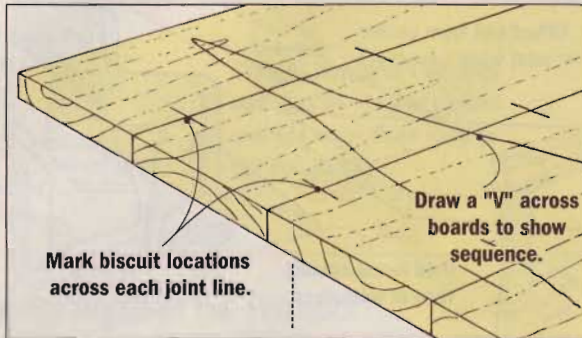
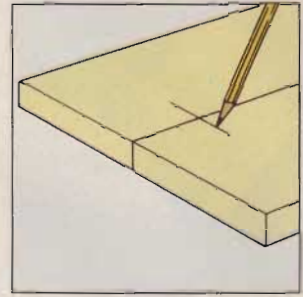
STEP 3: Next, clamp the mating piece to your bench, match up the layout and reference lines, and cut the slot. Double-check how the piece joins its mating piece to ensure you're working at the correct end and have the proper face up.

EDGE-TO-EDGE JOINT



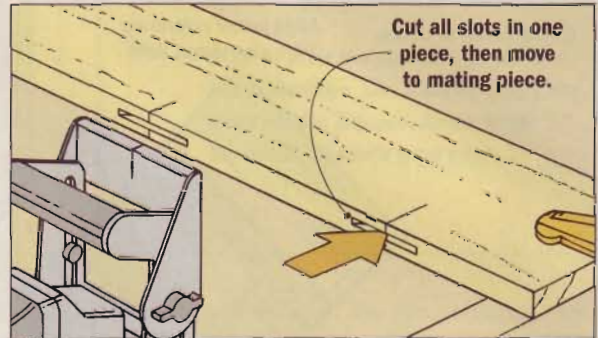
Plate joints can be used to align the faces of boards in a glued-up panel. The biscuits don't strengthen the joint, but they really help to align boards that are bowed or warped. This can greatly simplify glue-up.

STEP 1: Start by laying out the boards and examining each one for any bowing or warping. Try to place these boards alongside flat boards in the panel. Placing biscuits at the bad spots will help pull the boards into alignment.



Mark biscuit locations across each joint line.

Draw a "V" across boards to show sequence.

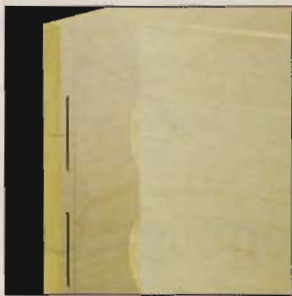


Cut all slots in one piece, then move to mating piece.

STEP 2: Once you've got your boards arranged, mark across them to show what order they go in (a large "V" works well). Mark slot layout lines on the surface of the panel about 8" to 12" apart. Stay 2" in from the ends of the boards.

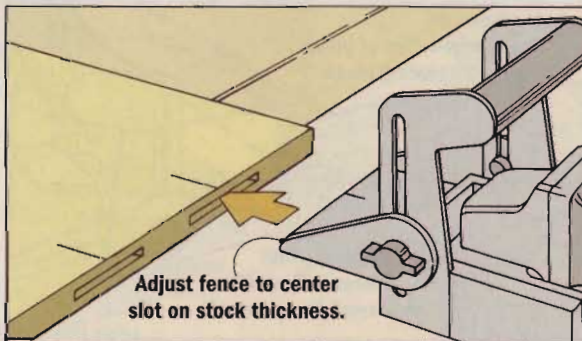
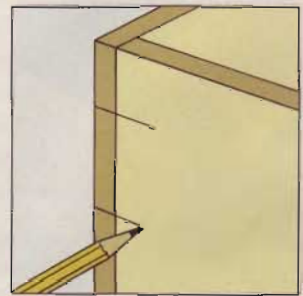
STEP 3: Clamp one of the boards to your bench so the layout lines face you. Cut the slots the same as on a face frame joint. Repeat the process for all the boards. Then glue and clamp the panel together.

CORNER JOINT

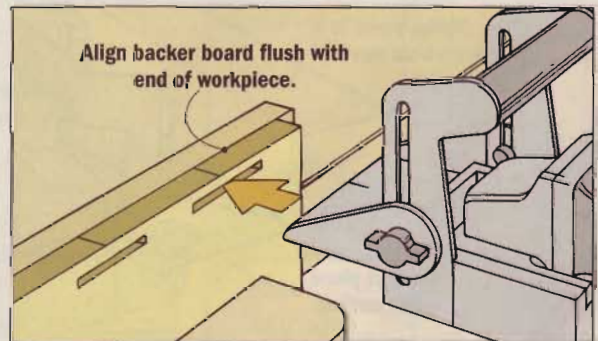


Biscuits help reinforce corner joints. This joint can be used to assemble a box, a set of drawers, even a cabinet. The corner joint is similar to a T-joint, but you align the joiner using the fence instead of the base.

STEP 1: First, mark slot layout lines across the end grain of one piece and onto the outside face of the mating piece. Keep the lines square to the stock. (For drawers, the pieces marked on the end grain are the drawer sides.)



Adjust fence to center slot on stock thickness.

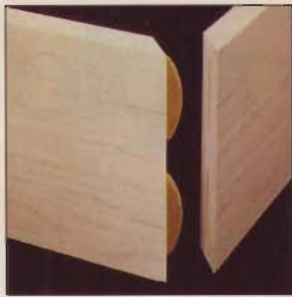


Align backer board flush with end of workpiece.

STEP 2: Cut the slots in the end grain first. Clamp the piece to your bench so it extends a bit past the edge. Then hold the fence of the plate joiner tightly against the face of the piece and cut the slots. Make sure to plunge in completely.

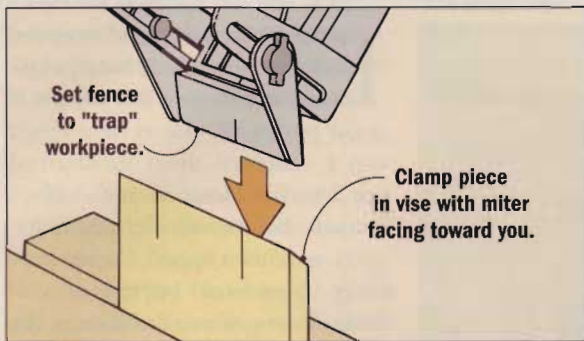
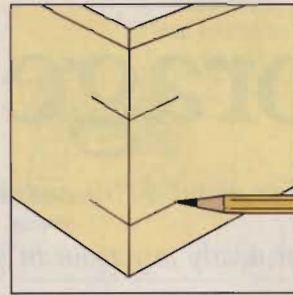
STEP 3: Clamp the mating piece upright against your bench. To provide extra support for the joiner's fence, use a backer board. (If the piece is too long to clamp upright, set it on your bench and bring the joiner down onto it as with the T-joint.)

EDGE MITER



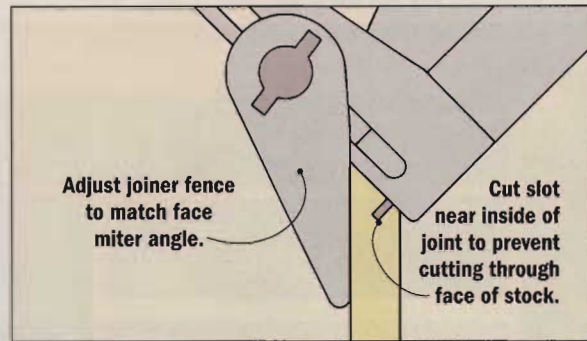
Edge miters, like you might use on a cabinet base, are essentially end grain joints, so they aren't very strong. Biscuits help align miters, hold the joint during glue up, and provide more gluing area for added strength.

STEP 1: On the edge-
miter, mark slot layout
lines around the outside of
the joint onto the face of
each piece. Keep the
marks parallel to the edge.
For wider pieces, use
multiple biscuits spaced
evenly across the joint line.



Set fence
to "trap"
workpiece.

Clamp piece
in vise with miter
facing toward you.



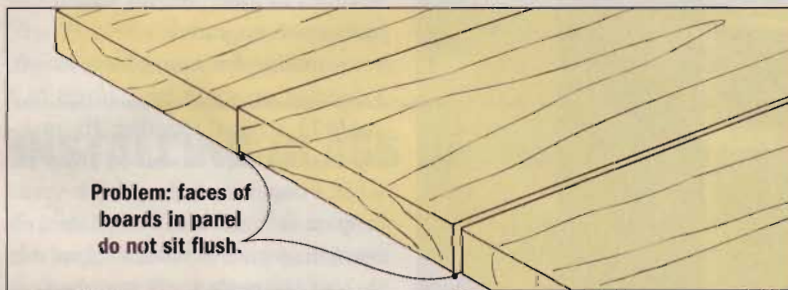
Adjust joiner fence
to match face
miter angle.

Cut slot
near inside of
joint to prevent
cutting through
face of stock.

STEP 2: Clamp each piece on end in a vise with the miter facing up. (If the piece is too long, clamp it to the bench top with the mitered end extending past the edge of the bench.) Tilt the fence to match the angle of the miter.

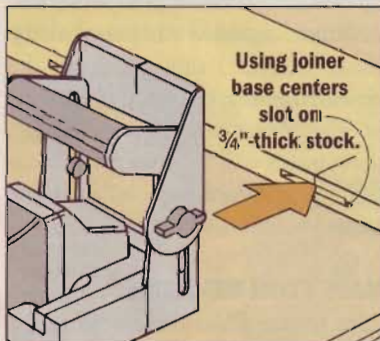
STEP 3: Adjust the fence to position the slot toward the inside of the joint. This allows you to use a larger biscuit without worrying about cutting through the face of the piece. You may want to experiment with scrap stock first.

TROUBLESHOOTING

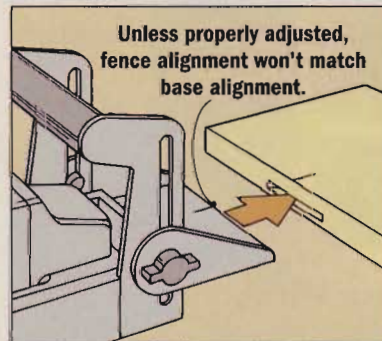


Problem: faces of
boards in panel
do not sit flush.

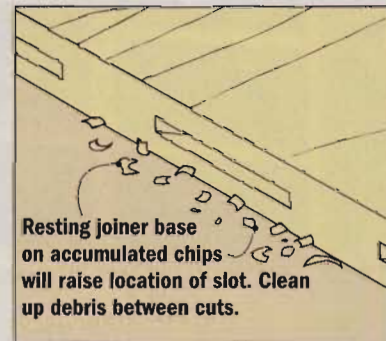
Most plate joint alignment problems come from not aligning each slot at the same spot on the pieces' thickness. One cause is not consistently orienting the faces of the mating pieces. Switching between the fence and base causes problems, too. Stay consistent. Sawdust under the joiner can also raise the slot.



Using joiner
base centers
slot on
3/4"-thick stock.



Unless properly adjusted,
fence alignment won't match
base alignment.



Resting joiner base
on accumulated chips
will raise location of slot. Clean
up debris between cuts.

The base and fence on a plate joiner can both be used to determine slot location. This may tempt you to use both on a single joint, but you're better

off not to. With every joint shown here you can cut both mating slots using just the base or just the fence. Only use one. It's simpler and more dependable.

Keep sawdust and chips away from the area where you'll be positioning the joiner. The tool makes a lot of chips, so blow off the pieces between cuts.

Storage Made Simple

For about \$100 and a weekend in the shop, you can organize a closet, laundry room, or nearly any room in your house with these simple, stackable melamine storage units.



I can't count the times I stopped in front of the closet storage systems on display at my local home center. My closets were a mess and I imagined them transformed just like the closet in the display's dramatic before and after photos.

Despite their appeal, I never seriously considered buying one of these closet systems. For starters, the standard configurations wouldn't fit my closets, so I had to pick and choose from a long checklist of separate components.

To make matters worse, the checklists don't include the cost of each piece. You have to track down the price for each piece to know what it's all going to cost you. It was just too complicated.

Searching for a simpler solution, I decided on some basic boxes that could be stacked together. By making them twice as tall as they are wide, I could stack them both vertically and horizontally, in various combinations. And with adjustable shelves to fit either orientation, they offered loads of storage options.

After I installed the boxes in the closet at left, I thought about the potential of this system. Unlike most of the dedicated closet systems, these boxes will work in other locations as well (see page 46 for some other possibilities).

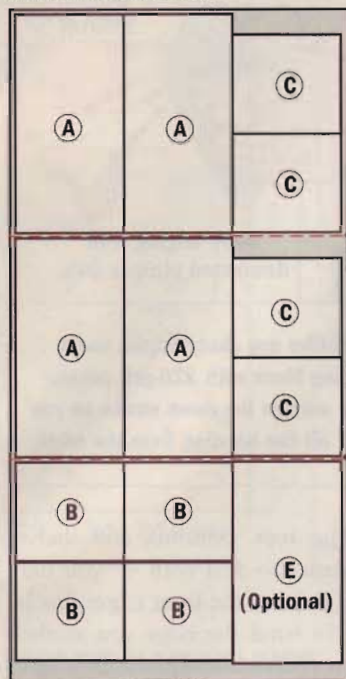
MADE FROM MELAMINE

One feature I did borrow from the commercial systems was the choice of material. Melamine, a resin-coated particleboard, is easy to keep clean and relatively inexpensive. The first time I worked with this material, I

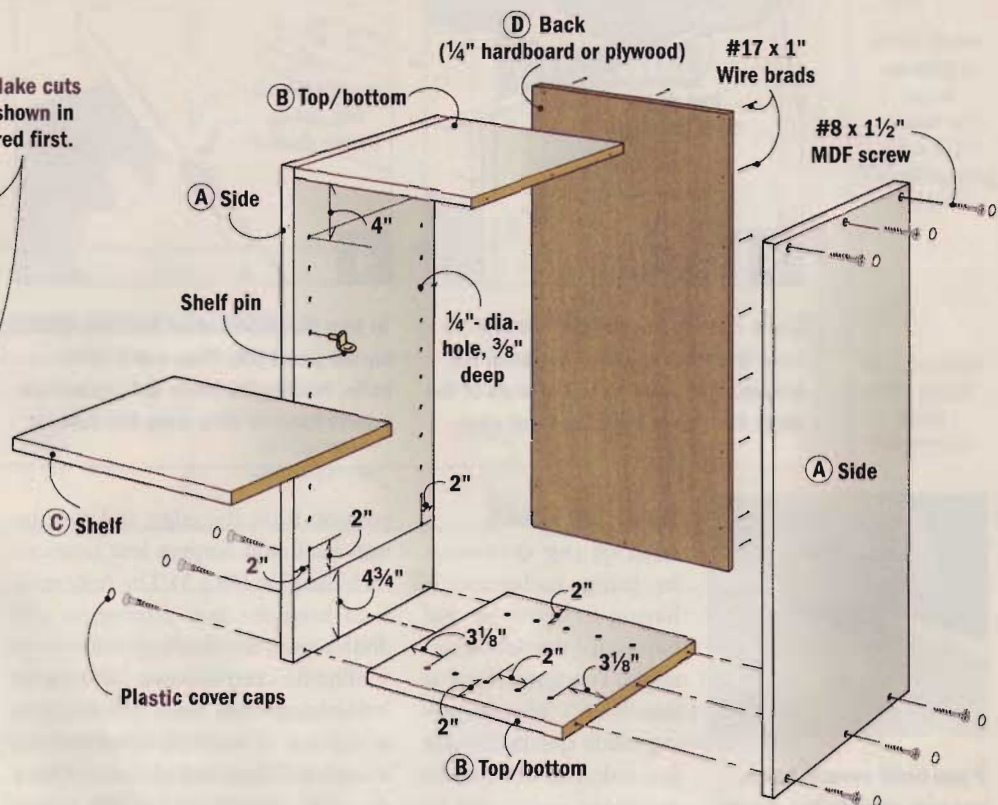
STORAGE BOX CONSTRUCTION VIEW

OVERALL SIZE: 15³/₄"W x 16"D x 31¹/₂"H

CUTTING DIAGRAM



Make cuts shown in red first.



Note: One 49" x 97" sheet of melamine yields two boxes. If you can't find full sheets, you can buy pre-edged panels in 16" nominal widths.

quickly found out that melamine is quite a bit heavier than regular plywood and comes in slightly larger sheets (49" x 97"). It's sold this way because the edges typically get chipped in shipping. These raw edges are also sharp so consider wearing gloves when handling it and have someone help you move full sheets. (To learn more about melamine and how to cut it, turn to page 44.)

The added weight and lack of a crisp factory edge mean you have to do a little prep work. First, I used my portable circular saw and an edge guide to divide the heavy sheet into easier-to-handle thirds (CUTTING DIAGRAM and FIG. 1).

Next, each of the three panels can be squared up on the table saw. Start by slicing off about 1/2" to get a clean edge. With this newly cut edge against the rip fence, rip all the side, top, bottom, and shelf panels to finished width. Then square one end of each piece and crosscut them to finished length (FIG. 2).

MATERIALS LIST

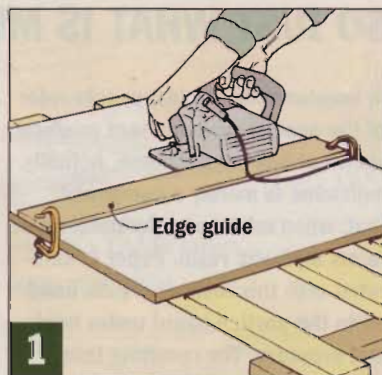
LUMBER: (FOR ONE BOX)

| | |
|---------------------------|----------------------------------------------------------------------------|
| A (2) Sides | 3/4" x 15 ³ / ₄ " x 31 ¹ / ₂ " |
| B (2) Top/Bottom | 3/4" x 14 ¹ / ₄ " x 15 ³ / ₄ " |
| C (2) Shelves - Vertical | 3/4" x 14" x 15 ³ / ₄ " |
| D (1) Back Panel (hdbd) | 1/4" x 15 ³ / ₄ " x 31 ¹ / ₂ " |
| E (1) Shelf* - Horizontal | 3/4" x 15 ³ / ₄ " x 29 ³ / ₄ " |

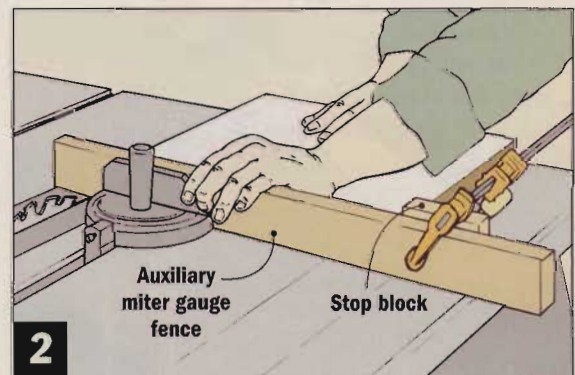
*Optional (Horizontal box orientation not shown in drawing)

HARDWARE: (FOR ONE BOX)

| |
|----------------------------------------------------------------------------|
| (12) #8 x 1 ¹ / ₂ " MDF screws w/ plastic cover caps |
| (8) Shelf pins to fit 1/4"-dia. hole |
| (18) #17 x 1" wire brads |



1 Use a circular saw and an edge guide to cut a sheet of melamine into thirds. Switch to the table saw to rip the box pieces to width.



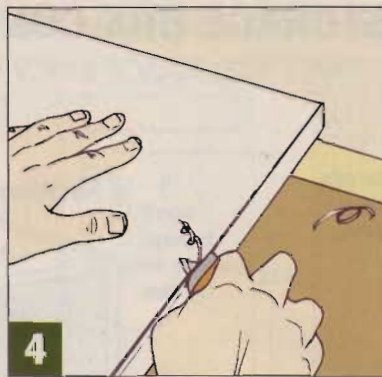
2 Crosscut the box pieces to uniform length using a stop block. You can turn your miter gauge backwards to make it easier to support the wide panels.



Iron down edge banding.

3

Use a clothes iron set for “cotton” to bond the edge banding, but keep the iron moving. Edge band the ends of the sides first, then band the front edge.



4

To trim the excess edge banding, first lay the panel flat. Then use a utility knife, holding the blade flat against the panel’s face, to slice away the excess.



Sand edging with downward strokes only.

5

To remove any sharp edges, use a sanding block with 220-grit paper. Sand only on the down stroke so you don’t lift the banding from the edge.



If you build several boxes, you may want to buy a trimmer that trims excess edge banding from both sides at the same time.

BAND THE EDGES

One of the drawbacks to using melamine is having to cover up the exposed particleboard edges. The good news is that there’s edge banding made specifically for this task. You don’t need any fancy equipment to install it — just a regular clothes iron and a sharp utility knife.

Edge banding often can be found in 50- and 250-ft. rolls at the same place you bought the melamine. What makes this stuff so easy to work with is that it has a thin layer of hot-melt glue already applied to the back side. To attach it to the particleboard, trim a piece extra long,

position it on the edge, and run the iron back and forth a few times to melt the glue (FIG. 3). The only trick is to keep the iron moving so you don’t scorch the banding.

The banding is about $\frac{3}{8}$ " wide so it overhangs both faces. (If it happens to slip out of position, simply reheat it with the iron and move it.) Once the glue cools, trim off the excess (FIG. 4 and FIG. 5).

Start by banding and trimming the ends of the side panels first. To trim the banding to length, fold the banding back over the front edge. Once it’s sharply creased, it should snap off cleanly.

With the ends completed, repeat the process on the front edge. That way the front banding overlaps the banding on the end.

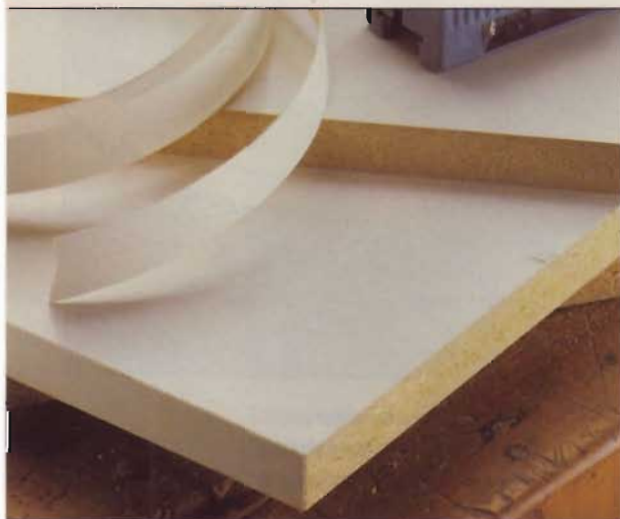
The tops, bottoms, and shelves are easier to deal with — you only need to band the front edges. Just be sure to band the edge you marked when you cut these pieces to length.

DRILL THE SHELF PIN HOLES

What gives these boxes much of their flexibility are the adjustable shelves. Because you can use the boxes vertically or horizontally, they get shelf pin holes in the tops and bottoms as well as the sides.

Each box has 34 holes. That sounds worse than it is, even if you’re building half a dozen boxes. And it’s easiest to drill the holes before the boxes are assembled so you can lay the panels down flat.

Alignment and spacing of the holes is fairly critical — you don’t



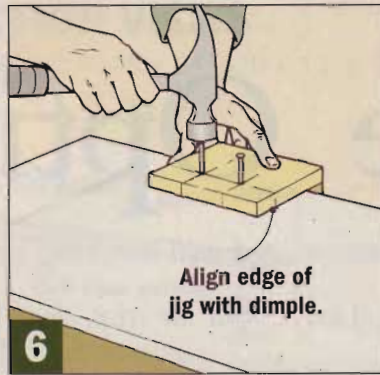
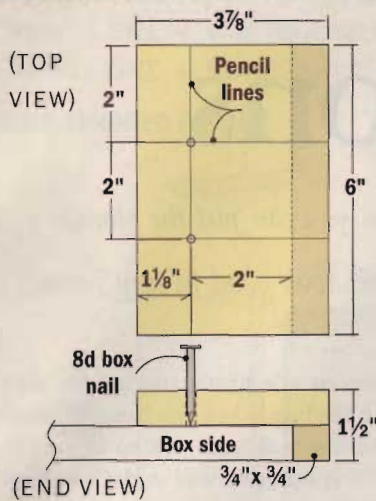
SO JUST WHAT IS MELAMINE?

In woodworking circles, people refer to the coated particleboard product shown at left as melamine. Actually, melamine is merely a compound that, when mixed with formaldehyde, forms a plastic resin. Paper is saturated with this resin and then bonded to the particleboard under heat and pressure. The resulting thin, tough skin resists scratches and stains, and gives the particleboard much greater strength. That’s why melamine is such a popular material for cabinets and kid’s furniture.

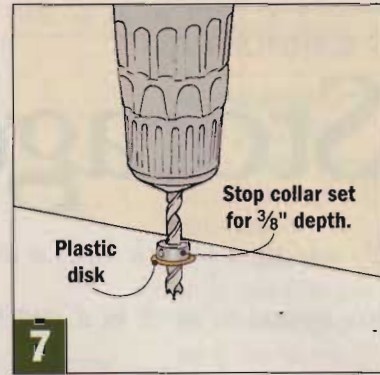
Those same properties also make it brittle, so chipout can be a problem. Triple-chip, carbide-toothed melamine cutting saw blades are available for \$80 and up. You’ll get good results and spend less with a sharp, fine-toothed carbide blade that has an alternating-top-bevel (ATB) grind.

Besides coatings, melamine is also molded for use as dinnerware (Melmac was a familiar brand in the 1960’s) and added in powder form to paints, insulation, and other plastics as a flame retardant.

SHELF PIN JIG ELEVATIONS



6 Mark the location of the first hole. Line up the jig and lightly tap the two nails. Slide the jig so its end is over the second dimple, and tap the nails again.



7 Using a drill equipped with a 1/4 inch bit, drill the shelf pin holes. A stop collar helps keep drilling depth consistent and prevents through holes.

want shelves that are crooked or wobbly. Nothing works better to achieve uniform spacing for the holes than a layout jig.

For this project, I built a simple jig that leaves a starter dimple at each hole (FIG. 6 and SHELF PIN JIG ELEVATIONS). You simply position the jig, give each of the nails a tap, then slide it down to mark the next pair of holes.

The dimples help keep even a regular twist-style bit from wandering. If you've got a bradpoint bit, you'll probably get a little less chipout around the holes. I'd also recommend investing in a stop collar. As careful as you may try to be, it's easy to have an attention lapse after 200 holes and blow right through the cabinet side.

To keep the collar from marking up the melamine, I cut a disk out of a plastic milk jug and slipped it over the bit so it rides between the collar and the melamine (FIG. 7).

ASSEMBLE THE BOXES

Now that the shelf pin holes are completed, this project goes together quickly. Because glue won't bond to the slick surface of the melamine, the boxes are simply held together with screws. But because particleboard is prone to chip and split, you need to use screws with deep, coarse threads and drill the screw holes correctly.

Begin by marking the locations for the screws 3/8 inch from each end of the side panels. The outer holes are inset 1 1/2 inches from the front and back edges and the other hole is

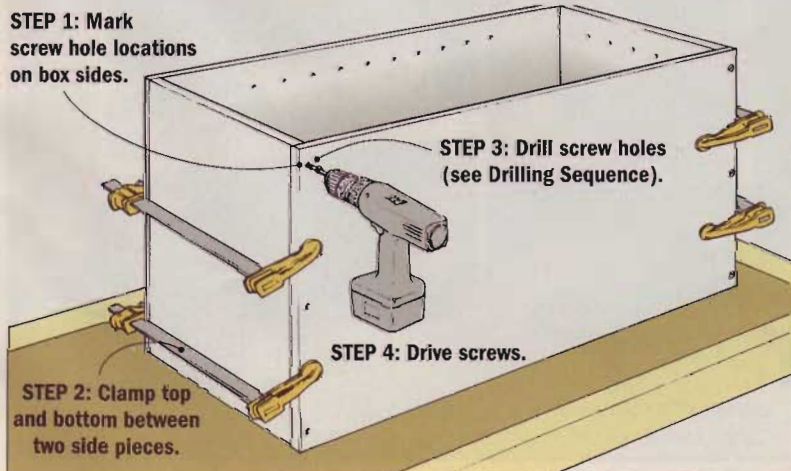
centered. Then clamp a top and bottom panel between two sides (BOX ASSEMBLY STEPS).

You want the screw threads to draw the sides tightly against the top and bottom. The screw head also needs to be just below the melamine surface. The DRILLING SEQUENCE below shows how to make that happen. Once you have the holes drilled, drive the screws.

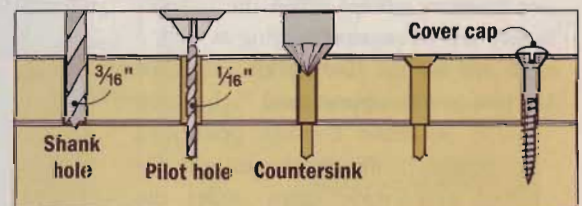
Finally, add a 1/4 inch hardboard back. Apply a bead of glue along the particleboard edges, then tack the back in place with wire brads.

If you made multiple boxes, they're now ready to fasten together. This keeps them from shifting and possibly toppling. We used connector bolts for the various configurations shown on the following pages.

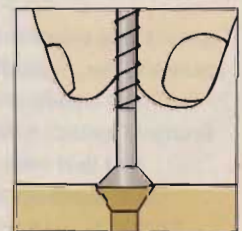
Box Assembly Steps



Drilling Sequence



If you plan to use screw cover caps, countersink the holes so the screw head sits just below the melamine surface. A good way to check this is to turn the screw upside down and check the head with the hole.



Storage Options

By adding a toekick base, a countertop, and wall mounting cleats you can put the storage box system to work in a variety of ways. And the crisp, clean lines look good in any setting.

Now I'll be the first to admit that the melamine storage boxes (pages 42-45) are easy to build. But that's also the beauty of them. You don't have to invest much time or money to get a big return. And these boxes become even more versatile with a few enhancements and in different configurations.

ADD A BASE AND COUNTERTOP

Adding a simple base (see the laundry center on the opposite page) creates a toekick space along the front so you won't stub your toes. It also lifts the boxes up to work counter height. Construction is simple — two side pieces are screwed between a front and back (BASE/COUNTER CONSTRUCTION VIEW). The 3"-high base is built to be flush with the box sides. Metal L-brackets hold the base to the boxes.


Melamine's easy-to-clean surface also makes it a natural for counter material. A 3"-wide piece of melamine creates a backsplash and helps stiffen the counter against sagging as well.

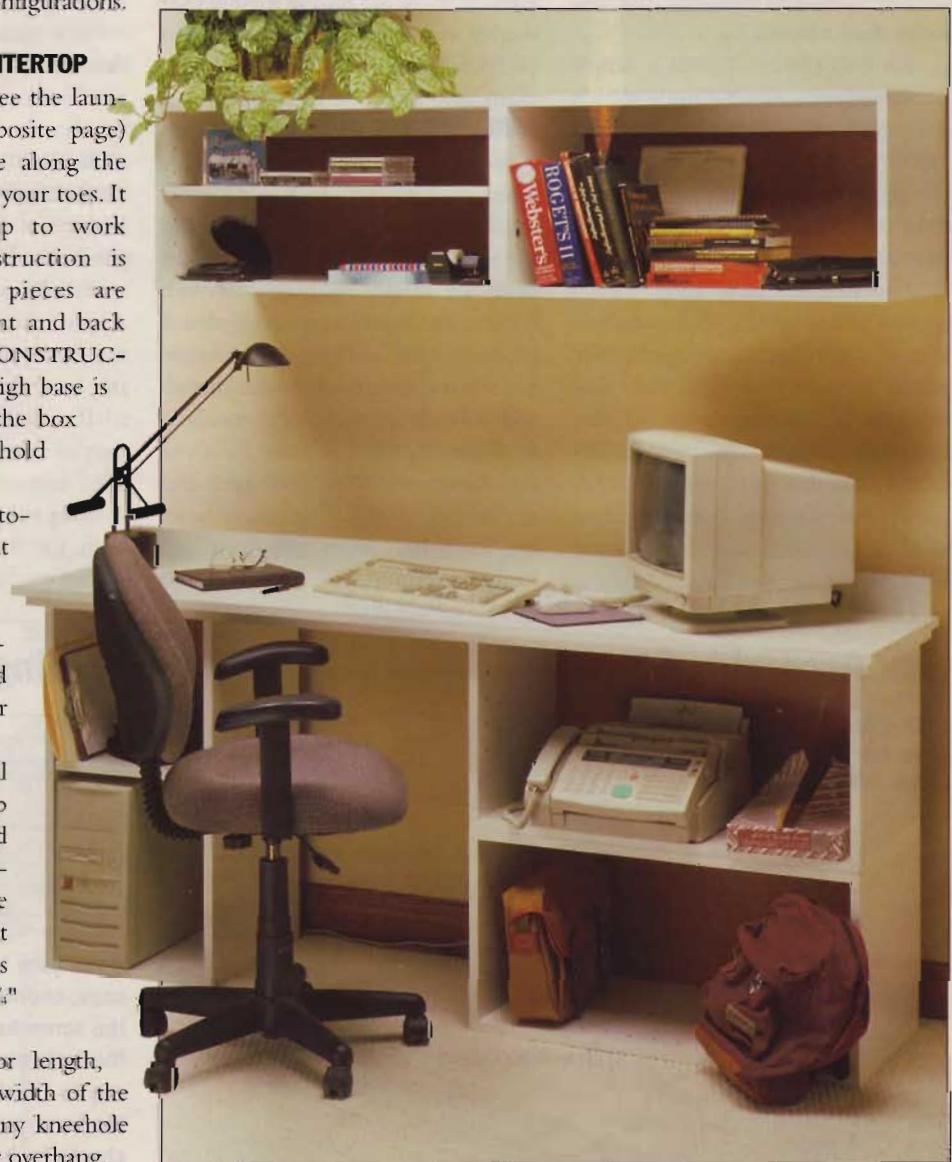
To provide additional support and help keep the counter positioned atop the boxes, add 1"-wide cleats under the counter along the front and sides. The counters are 18" deep with a 1/4" lip along the front edge.

To size the tops for length, measure the combined width of the supporting boxes, plus any knee-hole openings, and add 3" for overhang.

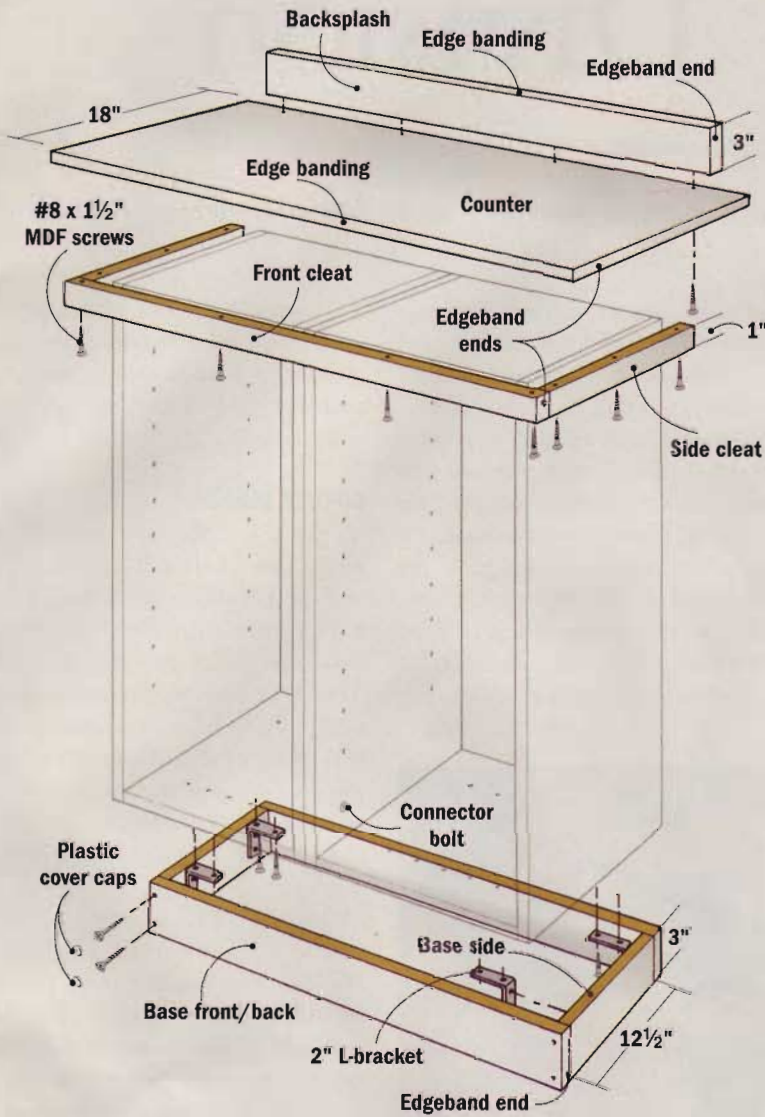
CLEATS ALLOW WALL MOUNTING

You can't always stack the boxes to get shelf space where you need it. Screwing a cleat beneath the boxes' upper surface lets you mount them to a wall (WALL CLEAT DETAIL). Driving a few screws through the

top or side firmly attaches the cleat to the box. When you hang the boxes on the wall, you want to be sure to hit at least one wall stud. Connector bolts hold the boxes together in all the configurations shown here (SPECIAL HARDWARE). 



BASE/COUNTER CONSTRUCTION VIEW



WALL CLEAT DETAIL



SPECIAL HARDWARE

You can screw or bolt the boxes together, but I used connector bolts like the one shown at right (available from Rockler Woodworking and Hardware, 1-800-279-4441).



Once you have the boxes positioned, clamp them together, drill a hole through both panels and install the bolt before removing the clamp. The bolt's low-profile, washer-type head and matching nut let you draw the boxes tightly together with an Allen wrench.



Simple Division

Simple shop techniques and interchangeable parts make this the perfect divider to end cluttered drawers. Best of all, it will cost you just a few bucks and a few hours in the shop.

For years now I've been using one of those cheap plastic trays to "organize" the utensil drawer in my kitchen. The problem is they never fit the drawer. They always leave a lot of space beside them and behind them. If you try to store anything in those spaces it winds up wedged underneath the tray and you can't open the drawer. I knew I could build something better.

The challenge was coming up with an easy-to-build system that

could be adapted to just about any drawer. This divider does that and can be built almost entirely with a few pieces of thin "hobby" wood.

You can pick up this pre-sanded wood at most home centers. The widths and thicknesses you need for this project are pretty common. Of course, you could cut and plane the pieces out of stock you already have. But that's an awful lot of time to spend on a small project, especially when the hobby wood is so affordable.

Besides the hobby wood, you'll need a little bit of $\frac{3}{4}$ "-thick stock to make the keeper strips. You can probably find what you need in your scrap bin.

DIVIDER DESIGN

To get a feel for how this divider works, take a look at the photo at left and the DRAWER DIVIDER CONSTRUCTION VIEW. The divider has two side pieces that are $\frac{1}{2}$ " thick. There's a rabbet in one end of each side piece to hold a partition at the very front of the drawer. Both side pieces also have dadoes spaced 3" on-center along their length. The dadoes are cut to match the thickness of the partitions.

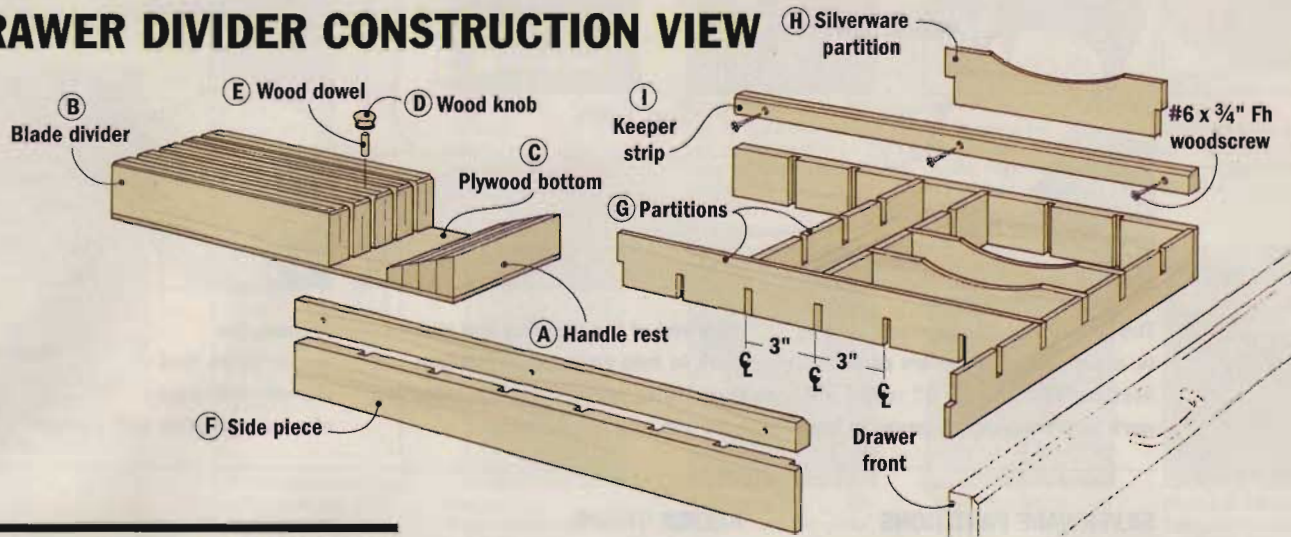
The $\frac{1}{4}$ "-thick partitions have notches cut in them at regular intervals, too. The notches allow you to lock the partitions together in a grid.

Some of the partitions have an arc cut into them, that makes it easier to get your hand into the narrow silverware compartments.



In the kitchen or in the shop, this divider can help keep even the most cluttered drawers under control.

DRAWER DIVIDER CONSTRUCTION VIEW



KNIFE BLOCK MATERIALS

LUMBER:

| | |
|----------------------|-------------------------|
| A (1) Handle Rest | 17/16" x 3" x 5 3/4" |
| B (5) Blade Dividers | 1" x 3" x 11 7/8" |
| C (1) Plywood Bottom | 1/4" x 5 3/4" x 17 5/8" |
| D (1) Wood Knob | 3/4" - dia. |
| E (1) Wood Dowel | 3/16" - dia. |

Note: Lengths are not listed for most drawer divider pieces because drawer size will determine their final length.

DIVIDER MATERIALS

LUMBER:

| | |
|---------------------------|--------------------|
| F (2) Side Pieces | 1/2" x 2" |
| G Partitions | 1/4" x 2" |
| H (3) Slvrwre. Partitions | 1/4" x 2" x 9 1/4" |
| I (2) Keeper Strips | 3/4" x 9/16" |

The divider isn't glued together. Just six woodscrews hold the whole assembly into the drawer. And since it's a dry assembly, you can reconfigure the divider anytime you want.

BUILDING THE DIVIDER

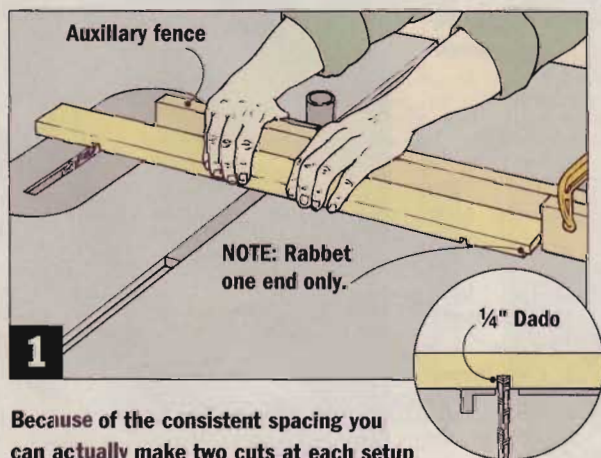
Start by making the side pieces. Work with wood that is a little longer than the drawer (you'll custom fit it later). After the pieces are cut to size, set up

to cut the row of dados in each piece. Make some test cuts in scrap wood and adjust the thickness of the blade until the partitions slide easily into the dados.

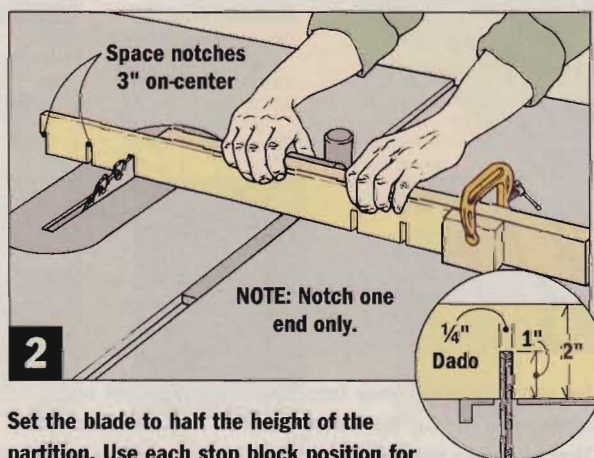
Now you can get going on the actual side pieces (FIG. 1). First, cut the rabbets. Set the table saw up to make the first cut, and use a stop block to mark the position. That way you can just put the second side

piece in place and make an identical cut. Now reposition the stop block to cut the remaining dados.

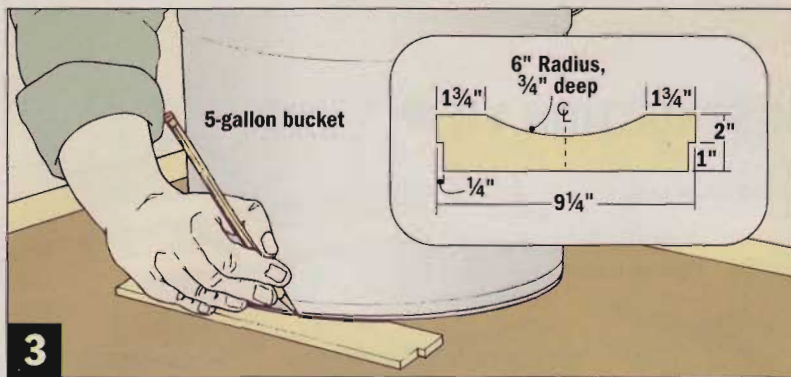
You can use the same stop block technique to cut the notches in the partitions (FIG. 2). You'll have to raise the blade in the table saw to cut halfway through the partition. Notch a couple pieces and test fit them together. The top edges of the partitions should be flush with each other.



1 Because of the consistent spacing you can actually make two cuts at each setup block position. Rabbet only the front end, though.

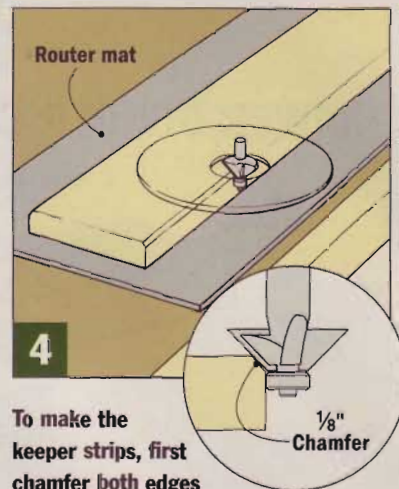


2 Set the blade to half the height of the partition. Use each stop block position for two notches by flipping the wood end-for-end after one cut.



3 The radius of the arc doesn't have to be exact on the silverware partitions. Anything with about a 6" radius will work as a template. Measure in from

each end of the partition and make a mark to help you position the template. After you've cut and sanded one partition, use it as a pattern.



4 To make the keeper strips, first chamfer both edges of a piece of stock with a router.

SILVERWARE PARTITIONS

The silverware partitions are made from 1/4"-thick stock, just like the regular partitions. But you'll have to cut them to length before notching the ends.

Lay out about a 6" radius arc on one of the silverware partitions. You can do this by tracing the bottom of a five-gallon bucket or a wastebasket (FIG. 3). Another option is to make a cardboard pattern for the arc. Use a compass to draw a 12"-diameter circle on the cardboard. Now cut it out and trace it onto the partition blank.

Cut the arc out of the partition with a jigsaw or bandsaw and sand it to its final shape. Now use this partition as a pattern to lay out the rest of the silverware partitions.

KEEPER STRIPS

The last pieces you need to make are the keeper strips. They're pretty simple, but they take a few steps.

Start with a piece of 3/4"-thick stock that is slightly longer than your drawer. This blank should also be wide enough that you can safely rip at least two strips that are 7/16"-wide from it.

Chamfer both edges of the blank (FIG. 4). I cut the chamfer with a router and a chamfer bit, but you could do it pretty easily on the table saw as well. Once that's done, rip the chamfered edges off the blank to make the strips (FIG. 5).

INSTALLING THE DIVIDER

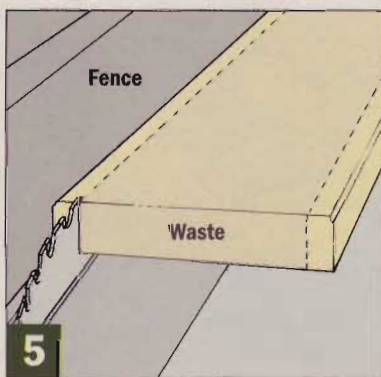
Putting the divider together is easier to do than it is to explain. The best

place to start is with the side pieces. Cut them to length and fit them in the drawer.

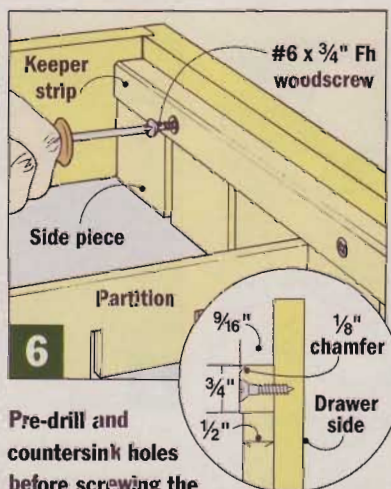
Next, cut some partitions to fit the length and width of the drawer. The size of the drawer may mean cutting the partitions in between notches. If so, cut new notches at the ends of the partitions so they will still lock into the grid.

Try the divider in different configurations. With some experimentation, you'll find the setup you're looking for. Finally, cut the keeper strips to length and set them in place. Fasten them to the sides of the drawer with #6 x 1/4" woodscrews (FIG. 6).

Now you may want to build a knife block. The divider is complete without it, but adding one helps protect your knives from damage.



5 Set your fence 1/16" away from the blade when ripping the keeper strips. That will make the strips slightly wider than the side pieces.



6 Pre-drill and countersink holes before screwing the keeper strips to the drawer sides.



Optional Knife Block

Whether built to fit in the drawer divider or to stand alone, this knife block's unique design makes it a worthwhile project for your kitchen.



The blade dividers on this knife block space the knives so they're easy to grasp by any size hand. A sloping handle rest accommodates a variety of different length knives and keeps them from sliding back and forth every time the drawer opens and closes. Since the block isn't fastened to the drawer or the divider, it can be removed for cleaning. A simple wood knob makes it easy to lift out of the drawer.

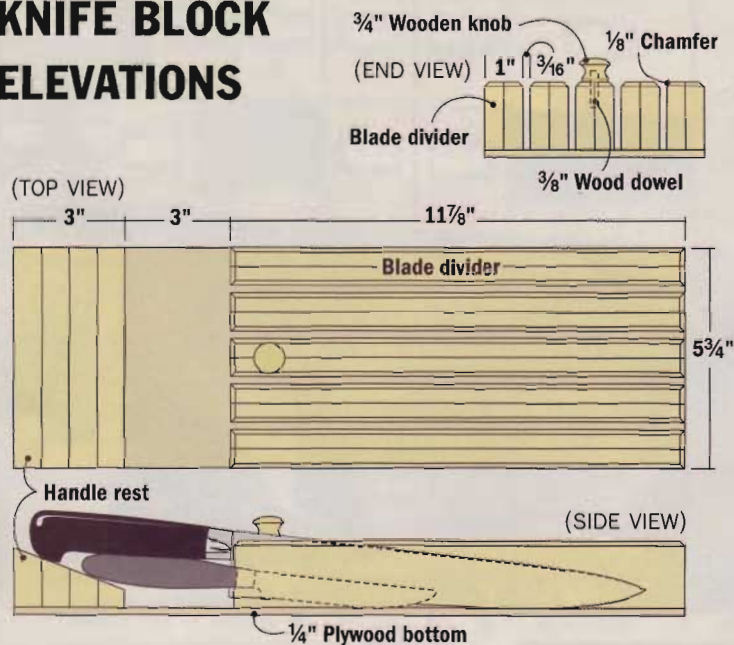
Get started on the knife block by ripping and gluing together $\frac{1}{2}$ "-thick pieces of wood for the blade dividers (KNIFE BLOCK ELEVATIONS). Leave these pieces a little long until the glue has set and then cut them to length. Chamfering the ends and edges adds a finished look and makes it easier to insert the blades (FIG. A).

Now glue up a blank for the handle rest. Make the blank a little larger than necessary so you can cut matching angles in two passes instead of trying to make one perfect cut (FIG. B). Glue and clamp the angled pieces together (FIG. C).

Cut a plywood bottom to size and glue and clamp the handle rest in place. Now add the blade dividers. Spread glue on each divider and then space them evenly across the plywood bottom. Fasten the wood knob onto the divider

with a $\frac{3}{4}$ " wooden knob and glue to complete this "sharp" storage solution.

KNIFE BLOCK ELEVATIONS



A Chamfer across the end grain first.

Clamp the blade dividers together and chamfer the ends. Separate the pieces and rout the edges.

1/8" Chamfer

B Set the table saw blade to 20° and cut the handle rest in two passes to make mating pieces.

Waste

2 1/2" 1 1/2" 1" 1"

C Glue and clamp the handle rest together. There may be a small ridge where the pieces meet (blue line). Sanding or planing will remove the ridge quickly.

A B

Hardware Organizer

Even though it has lots of handy drawers, this sturdy pine shop storage center is easy to build, thanks to some mass production techniques and interchangeable parts.



On a recent trip to the hardware store, it took less than a minute to locate a bolt I needed. This impressed me since I'd just wasted the previous hour in my shop, digging through boxes and cans of assorted fasteners searching for the same size bolt.

The difference was organization. A rack with rows and rows of small drawers held the store's entire inventory of fasteners, yet the bolt was easy to find because each drawer was clearly labeled. I decided a smaller version of this hardware storage rack was just what I needed to bring some order to my shop.

If you look at the completed project, you'll notice that four of the 16 drawers are wider. This gives you more room to store commonly used items you buy in bulk, like drywall screws. Other than width, however, the drawers are all identical so building them is easy. It's simply a matter of mass producing parts.

MATERIALS LIST

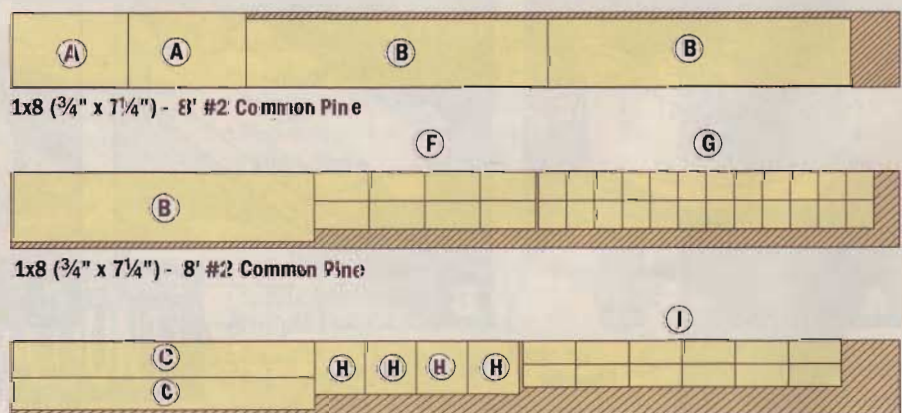
LUMBER:

| | |
|------------------------------|--------------------------------------------------------|
| A (2) Ends | $\frac{3}{4}$ " x $7\frac{1}{4}$ " x $12\frac{1}{2}$ " |
| B (3) Shelves | $\frac{3}{4}$ " x $6\frac{1}{2}$ " x $32\frac{1}{4}$ " |
| C (2) Rails | $\frac{3}{4}$ " x $2\frac{3}{4}$ " x $32\frac{1}{4}$ " |
| D (1) Back Panel (hdbd) | $\frac{1}{4}$ " x 8" x $32\frac{1}{4}$ " |
| E (1) Dividers (hdbd) | $\frac{1}{4}$ " x $3\frac{5}{8}$ " x $6\frac{1}{2}$ " |
| F (8) Lg. Drawer Frt./Backs | $\frac{3}{4}$ " x 3" x $5\frac{7}{8}$ " |
| G (24) Sm. Drawer Frt./Backs | $\frac{3}{4}$ " x 3" x $2\frac{7}{8}$ " |
| H (4) Lg. Drawer Bottoms | $\frac{3}{4}$ " x $5\frac{3}{8}$ " x $5\frac{3}{4}$ " |
| I (12) Sm. Drawer Bottoms | $\frac{3}{4}$ " x $2\frac{3}{8}$ " x $5\frac{3}{4}$ " |
| J (32) Drawer Sides (hdbd) | $\frac{1}{4}$ " x 3" x $5\frac{3}{4}$ " |

HARDWARE:

- (24) #8 x $1\frac{5}{8}$ " Fh woodscrews
- (16) Brass card holder pulls with screws
- (192) #17 x $\frac{3}{4}$ " wire brads (12 per drawer)

CUTTING DIAGRAM



1x8 ($\frac{3}{4}$ " x $7\frac{1}{4}$ ") - 8' #2 Common Pine

Also needed: One half-sheet (48" x 48") of $\frac{1}{4}$ " hardboard

BUILD THE CABINET

The cabinet consists of three shelves captured between dadoes cut in the two ends. The spacing between the shelves is uniform so the drawers will be interchangeable between rows.

To do this, the two end pieces need to be mirror images of each other. Begin by cutting them to length from 1x8 stock. To make both pieces exactly the same size, I used a stop block on the table saw (FIG. 1).

Before switching to a dado blade, go ahead and rip the three shelves, two rails, and the hardboard back to width. Then use a stop block to cut all these pieces to a uniform length of 32 1/4" (FIG. 2).

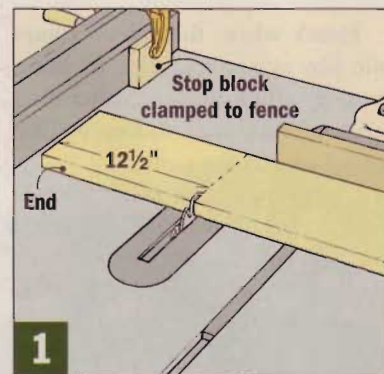
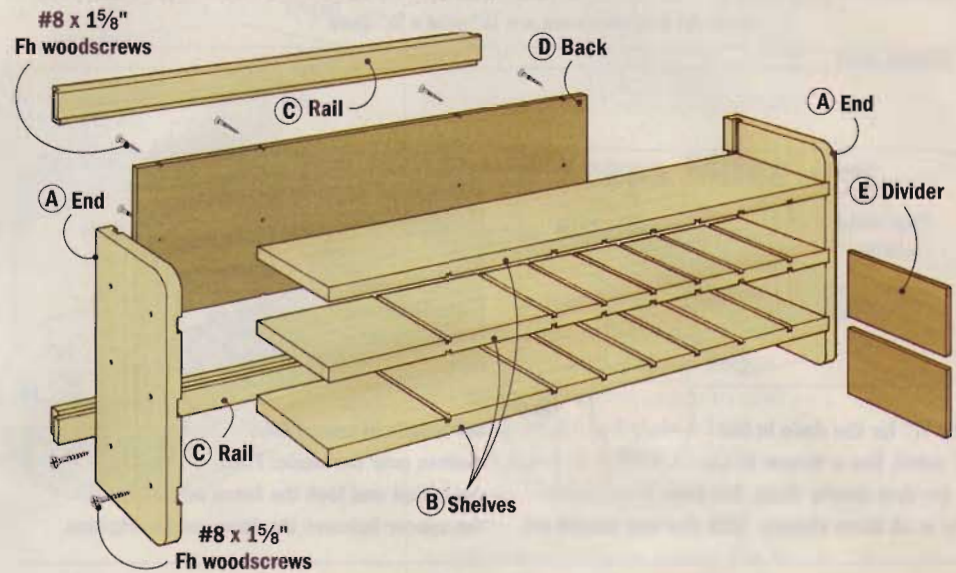
Now you're ready to cut the shelf dadoes in the end pieces. Start by laying out the top dado on one end piece (DADO LAYOUT and FIG. 3). Set up your dado blade to match the thickness of your 3/4" stock. (I like to test this with a piece of scrap first.)

To position the dadoes the exact same distance from the top and bottom of the workpiece, use the rip fence as a stop (FIG. 4). Once these dadoes are cut, lay out and cut a third dado for the center shelf halfway between the first two.

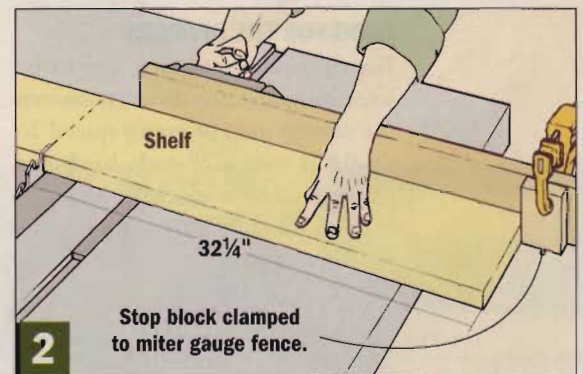
After shaping a radius on the front corners of each end piece, the last step on these pieces is to cut a groove for the rails and back panel (FIG. 5).

CABINET CONSTRUCTION VIEW

OVERALL SIZE: 7 1/4"D x 12 1/2"H x 33 1/4"L



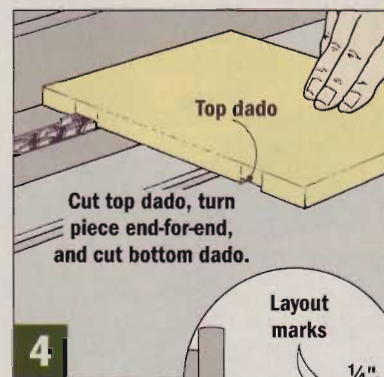
1 Clamp a stop block to the rip fence. Set the fence so the block's face is 12 1/2" from the blade. Butt the stock against the stop to cut the ends to length.



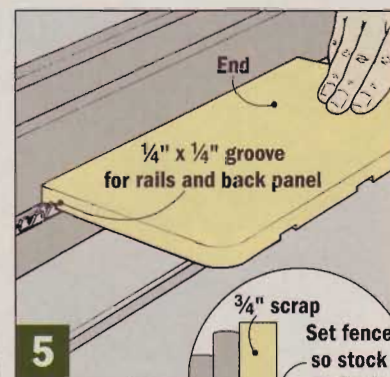
2 To cut the shelves, rails, and back all to the same length, clamp a stop block to an auxiliary fence attached to your miter gauge. Then cut each piece.



3 Carefully lay out the location of the top dado on the face and edge of one of the end pieces. You'll align the dado blade with these lines in the next step.

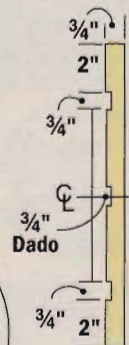


4 Using the fence as a stop, cut the top and bottom dadoes. Then lay out the center dado.

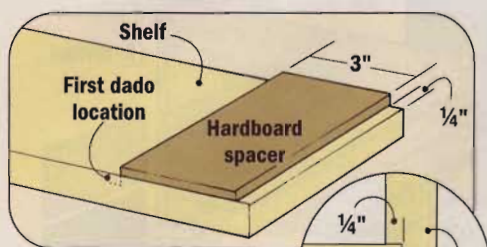
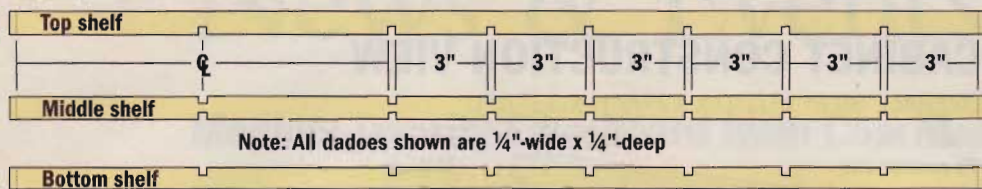


5 Use scrap to set the fence (inset), then cut a groove for the back and rails in each end piece.

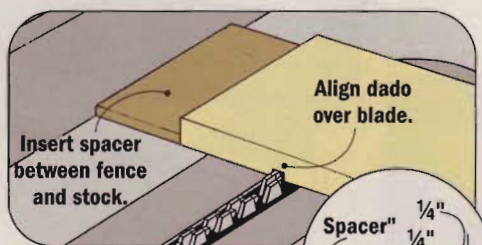
DADO LAYOUT



SHELF ELEVATIONS AND CUTTING DETAILS



Allow $\frac{1}{4}$ " for the dado in the end panel. Use a spacer to lay out the first divider dado. Cut this dado in all three shelves. With the saw turned off,



set a dado in one of the shelves over the blade. Then reposition and lock the fence with the spacer between the fence and workpiece.

DADO FOR THE DIVIDERS

For the drawers of each size to be interchangeable, the dividers between the drawers must be evenly spaced. To do this, I used a 3"-wide hardboard spacer as a layout and setup gauge.

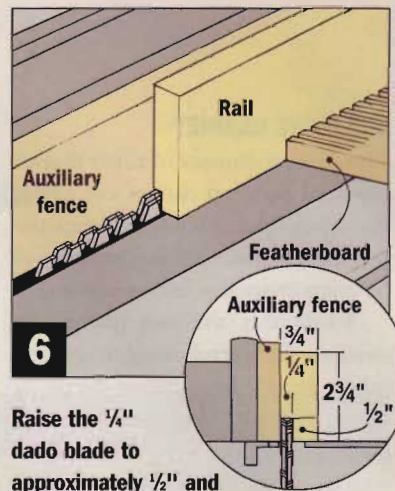
First, use the spacer to lay out the dado closest to the right-hand end of one shelf (SHELF ELEVATIONS and CUTTING DETAILS). Then align the layout lines with the dado blade and butt the rip fence against the end of the shelf. With the fence set, cut the "first" dado in all three shelves (dado both faces of the middle shelf).

Here's where the spacer comes into play as a setup gauge. By using it to reposition the fence after each series of cuts, your dados will be spaced exactly the same.

Once you've cut dados for the small drawer dividers, lay out and cut the dado between the large drawers. To lay out this dado, allow for the $\frac{1}{4}$ " that fits into the end panel. Then split the remaining space in half.

WORK ON THE RAILS

Now work can shift over to the rails. Begin by rabbeting one edge of each



6 Raise the $\frac{1}{4}$ " dado blade to approximately $\frac{1}{2}$ " and cut a rabbet in one edge of each rail.

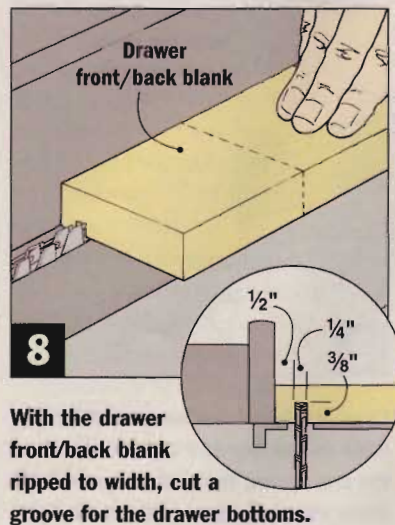
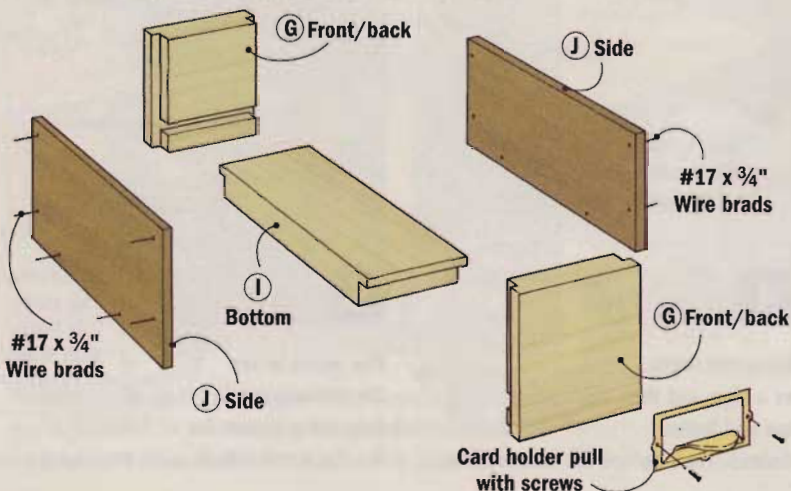
rail for the back panel (FIG. 6). Then create a tongue on both ends of each rail to fit into the groove in the end pieces (FIG. 7).

ASSEMBLE THE CABINET

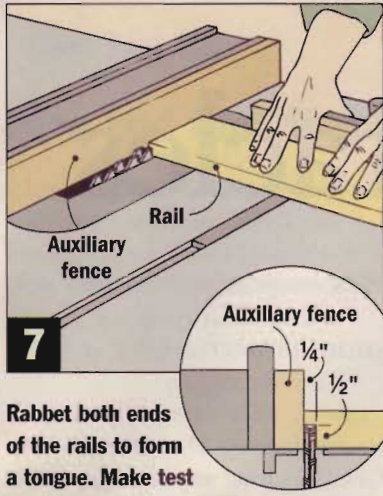
It's easiest to assemble the cabinet in a specific order (CARCASE ASSEMBLY VIEW). First, apply glue to the dados in the end panels and clamp the shelves in place between them.

Next, apply glue to the grooves in the end panels and slide the bottom rail in from below. Then slide the back and top rail into place from above. (You may need to loosen the clamps slightly to get the back pieces into place.) With the clamps still in place, drill countersunk screw holes and screw the back and end panels to the shelves.

DRAWER CONSTRUCTION VIEW

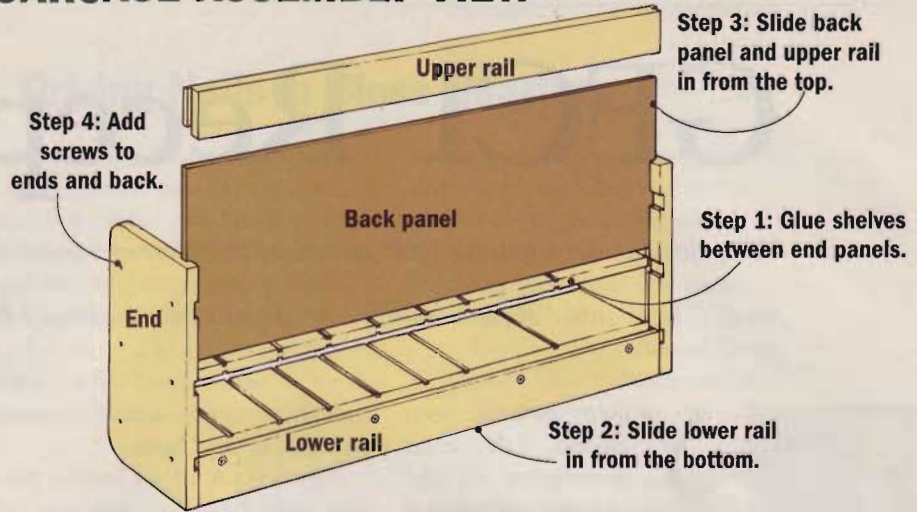


8 With the drawer front/back blank ripped to width, cut a groove for the drawer bottoms.



7
Rabbet both ends of the rails to form a tongue. Make test cuts so the tongue fits the groove.

CARCASE ASSEMBLY VIEW



The final step is to install the dividers. Chances are the shelves will have bowed slightly, so measure the height of the outermost divider and cut them all to this size.

To install the hardboard dividers, turn the carcase on its back and apply a small amount of glue to each dado. Then slide the dividers into place, leaving them flush with the front edge of the shelves. If necessary, you can clamp the shelves together to close up any gaps that appear above or below the dividers.

MASS PRODUCE THE DRAWERS

With the cabinet completed, it's time to turn your attention to the drawers. And here's where it really pays off to move into a mass production mode.

For me, the key to mass producing small parts is to start by ripping long blanks to width. From these blanks, you then crosscut the parts to consistent lengths using a stop block setup and the miter gauge.

Before cutting the drawer fronts and backs to length, though, you'll want to cut a groove for the bottoms down the lengths of these blanks (FIG. 8). That's a lot easier than cutting a groove in the 32 smaller pieces. Once you've grooved the blanks, cut the pieces to length (FIG. 9).

There are a couple more cuts to make before the drawers can be assembled. First, cut a rabbet on both ends of the front and back pieces (FIG. 10). Then create a tongue on each end of the drawer bottoms by cutting a $\frac{3}{8}$ " \times $\frac{1}{2}$ " rabbet (FIG. 11).

Finally, assemble the drawers with glue. I used wire brads to hold the sides to the ends and bottoms while the glue dried. That eliminated the need to clamp up each drawer.

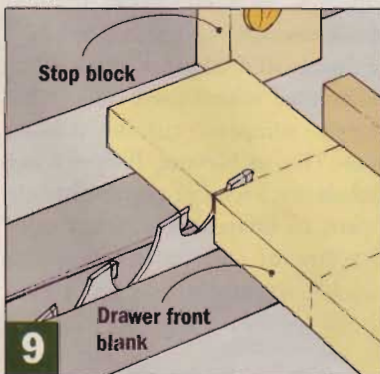
FINAL STEPS

To protect the organizer from shop grime, I applied two coats of oil finish. After the finish dries, card holder pulls can be screwed to the front of each drawer. Once again, I used a simple jig (at right) to position all the pulls uniformly.

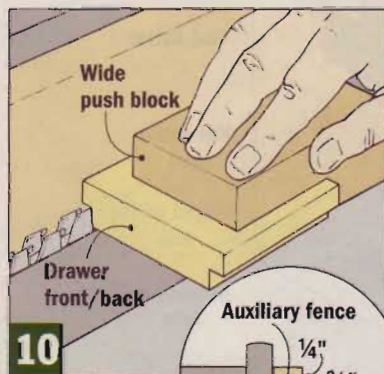
Like most organizers, this one only works if you use it. But with valuable shop time at stake, you shouldn't need much incentive.



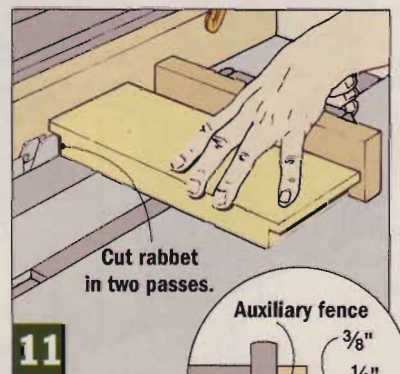
A simple jig centers the card holder pulls. Install the pulls with screws to keep them firmly fastened to the front of the drawer.



9
Use a stop block on your rip fence to crosscut the drawer ends to uniform length. Use the same technique for the bottoms and sides.



10
Use a wide push block to firmly hold the front/back when you cut the rabbet for the sides.



11
Rabbet each end of the drawer bottoms in two passes. The tongues should be $\frac{1}{4}$ " thick.

GFCI Receptacles

Why do you need ground fault circuit interrupters — those electrical receptacles with the small “Test” and “Reset” buttons — if your house already has circuit breakers?



You’ve probably seen ground fault circuit interrupters (GFCIs) in the bathrooms and kitchens of newer houses. You might have also wondered why they’re necessary. After all, don’t circuit breakers provide

enough protection against electrical problems in your home?

Not really. A circuit breaker protects your house — not you. It’s designed to trip if there’s too much electricity flowing through the wires. This may prevent an electrical fire, but it won’t protect you against

electrical shock. That’s the job of a GFCI. To truly appreciate a GFCI, you first need to know how it works.

ELECTRICAL WATCHDOG

Electricity travels throughout a house in a giant loop called a circuit, similar to how water flows through pipes. Current enters the outlets, switches, and lights through “Hot” wires. Then it returns to a breaker box through “Neutral” wires, before flowing into the ground.

Sometimes a frayed cord or poorly insulated wires provides a place for electricity to travel outside its normal path. If you touch an appliance that’s been energized by stray current, you become part of the electrical circuit.

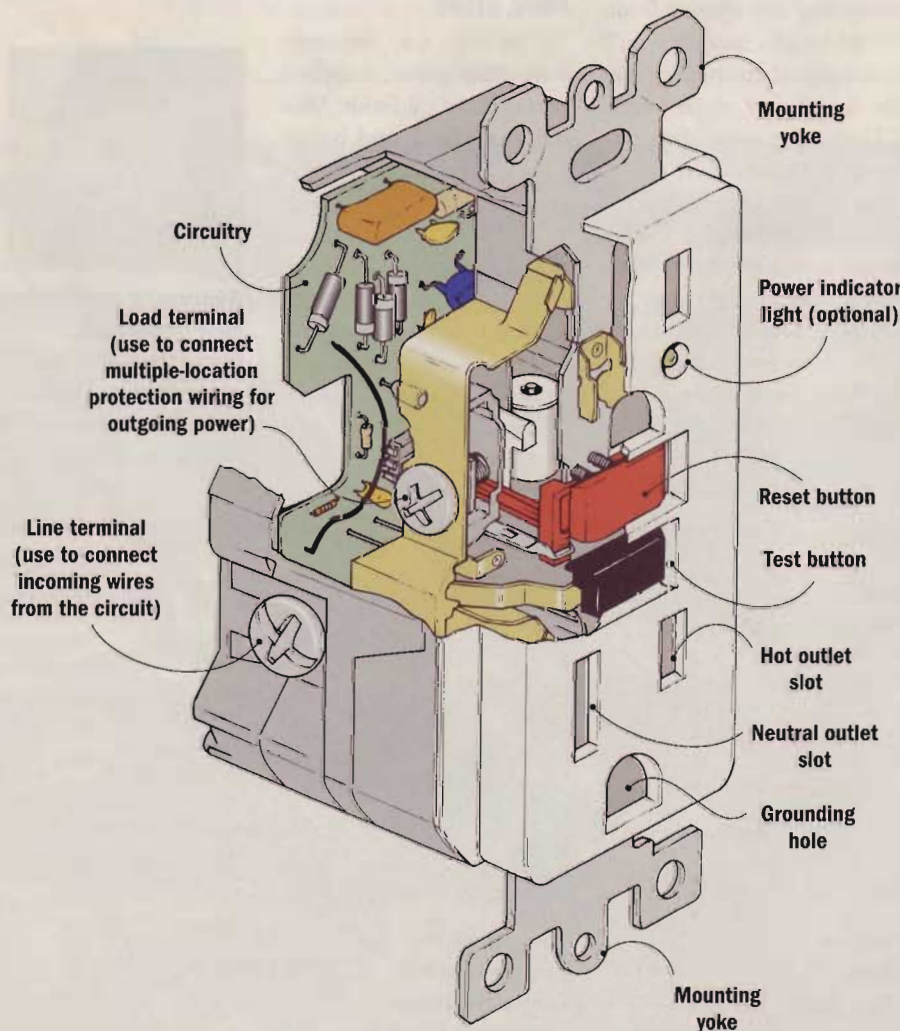
Ordinarily your body is a poor conductor of electricity. But if you’re standing on a wet surface, current can zap through your heart on its way to ground. All it takes is 1/5-amp — enough current to light a 25-watt bulb — to cause serious injury. Only a GFCI can respond quick enough.

Inside a GFCI is a device called a differential transformer that constantly compares current flowing from Hot to Neutral. If there’s any imbalance, a sensing circuit instantly opens an internal switch and stops the flow of current. It happens so quickly, you might only feel a mild shock — like a pin prick.

WHERE GFCIS ARE NEEDED

In new construction, GFCI receptacles are required by electrical code in areas that are damp or that have plumbing fixtures. This includes

ANATOMY OF A GFCI RECEPTACLE



kitchens, bathrooms, and all outdoor outlets. You should also protect garages, shops, crawl spaces, and unfinished basements.

When it comes to GFCI protection, you basically have two options. You can replace an ordinary outlet with a GFCI receptacle, or install a GFCI circuit breaker in the service panel (see *Different Types of GFCIs*).

For outside outlets, I suggest GFCI circuit breakers. They last longer than outdoor receptacles because they're located inside the house, away from the weather.

GFCI receptacles work fine for inside locations. They can be wired to protect a single outlet or multiple locations on the same circuit.

There are a couple of important things to remember about how a GFCI should be used in a circuit. A GFCI receptacle will only offer protection *downstream* from the GFCI to the end of the circuit. It won't protect outlets that are located *between* itself and the circuit breaker box (see drawing at right).

Plus, the more outlets a GFCI protects, the more susceptible it is to "phantom tripping" — shutting off power because of tiny, normal fluctuations in current flow.

REGULAR CHECKUPS


GFCIs should be tested at least once a month. You don't need any special equipment, and it's simple to do:

1. Press the "Test" button on the receptacle. This will cut power, and the "Reset" button will pop out.

2. Plug an appliance into the receptacle to check for power. If the appliance doesn't come on, the GFCI is working fine.

3. After the test, press the "Reset" button to ready the GFCI.

Replace any faulty GFCIs right away. GFCI circuit breakers also have "Test" buttons, which should be checked regularly.

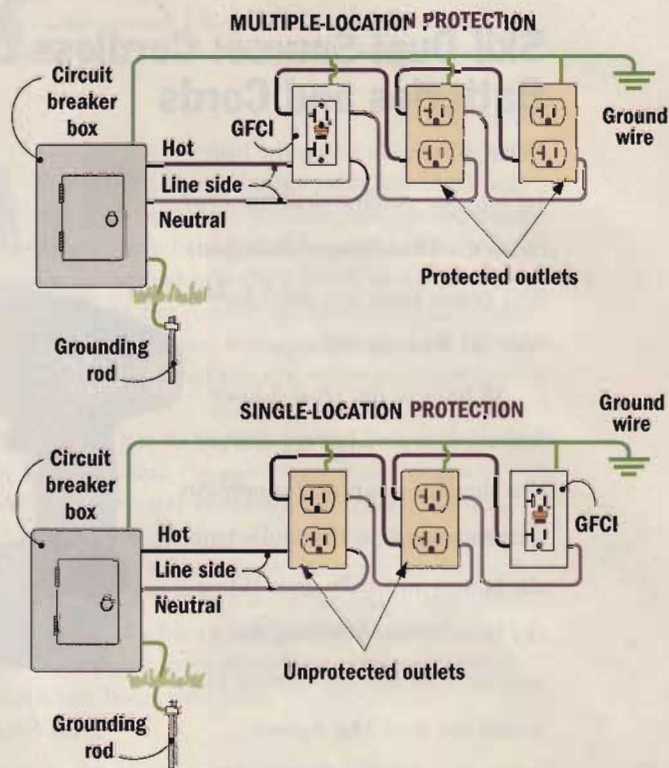
If your home isn't protected by GFCIs, a licensed electrician who's familiar with your local electrical codes can add them for you. 

USING A GFCI IN A CIRCUIT

■ GFCIs can be located and wired to protect an entire circuit (top) or a single outlet (bottom).

■ To protect an entire branch circuit, the GFCI must be the first receptacle from the circuit breaker box. Outlets on the circuit downstream from the GFCI will also have protection.

■ In single-location setup, only the GFCI receptacle will be protected. Other outlets upstream will not have protection.



DIFFERENT TYPES OF GFCIS

GFCI RECEPTACLE

GFCI receptacles replace standard duplex outlets and can be used in homes protected by either circuit breakers or fuses (in the case of many older homes). GFCI receptacles should be installed by a qualified, licensed electrician.



GFCI CIRCUIT BREAKER

A GFCI circuit breaker protects wiring just like a standard circuit breaker. It also provides ground fault protection. A GFCI circuit breaker, however, costs more than a GFCI receptacle (\$50-\$60 vs. \$8-\$10). A circuit breaker must be reset at the breaker box.



PORTABLE GFCI

Portable plug-in and cordset (shown) GFCIs are handy when working outside with electrical tools or when you can't connect directly to a GFCI receptacle. Never use a portable GFCI in place of a permanent one. And be sure to test them before every use.



Tools & Shop Gear

Skil Dual-Source: Cordless Drills with Batteries and Cords

What do you do when the batteries on your cordless drill run low? With the Dual-Source drills from Skil Power Tools you don't have to wait for them to recharge.

All tools in the Dual-Source line come with a battery charger that doubles as a power supply. An adapter plugs into the tool where the battery normally goes. When the battery runs low, plug the adapter cord into the charger to power the tool. The battery recharges while you're using the corded backup.



Dual-Source Drills are available in 9.6-, 12-, and 14.4-volt models. Prices range from around \$90 to

\$130. Contact Skil Power Tools at (877) 754-5999 or check out www.skiltools.com on-line.

Cut Round Tenons for Rustic Furniture Without a Lathe

Rustic furniture is both beautiful and functional. And making it can be a lot of fun. Not many people attempt it, though, because of the

joinery problem. After all, how do you make tree branches and twigs look like you just pulled them out of a pencil sharpener?

One way is by using Power Tenon Cutters from Lee Valley Tools. These cutters will turn the ends of various-size branches into smooth tenons with radiused shoulders. Simply chuck a cutter in your drill, clamp a branch to your bench, and pull the trigger.

The cutter body is made from aluminum, and the cutter blade is adjustable so you can fine-tune the

size of the tenon for a perfect fit in your mortises.

Small cutters ($\frac{5}{8}$ "- to 1"-dia.) make tenons up to $2\frac{3}{4}$ " long for most rustic furniture projects. Larger cutters (1 $\frac{1}{2}$ "- to 2"-dia.) produce 4 $\frac{1}{4}$ "-long tenons and can be used for larger connections such as rustic bed frames.

Prices range from \$52.75 for the smaller cutters to \$61.75 for the larger ones. Contact Lee Valley Tools at (800) 267-8735 or check out the company's web site at www.veritastools.com.





Wider is Better When Talking Tapes

Stanley has introduced the Fat Max ruler, which should make measuring longer distances easier. The 25-ft. tape has a 1 1/4" extra-wide blade that will extend to 11 feet without collapsing. The Fat Max also features a heavy spring inside for smooth

blade recoil and a unique blade hook that catches objects from the top, bottom or side.

Suggested retail price is \$21.99. Contact Stanley at (800) 782-6539 or visit the company's web site at www.stanleyworks.com.

Tough Workbench That's Also Functional

Looking for a workbench that can stand up to tough environments but is still practical? Well, you might want to consider the two-drawer steel-frame bench from Waterloo Industries. With built-in drawers and shelves to keep tools within reach, this workbench is as functional as it is durable.

The workbench has a 36" work height, and measures 23" x 54" overall. It includes a 1 1/4"-thick, extra-large work surface. Plastic side

trays come in handy for holding small parts, tools, and even beverages next to the work area.

Power tools along with other bulky supplies can be stored on the full-depth bottom shelf. The steel frame is good for clamping or mounting a vise.

Suggested retail price for the workbench is around \$280. Contact Waterloo at (800) 833-8851 or check out the company's web site at www.waterlooindustries.com.



DIY Drywall Kits

Got a small drywall job to complete around the home, but don't want to invest a lot of money in tools you won't use often? Then take a look at two new Drywall Tool Kits from Nu-Pride Hand Tools, part of Marshalltown Trowel Company.

Each kit contains a 10" mudpan, a triple edge knife, a corner tool, and a flat knife. You can also choose from either a drywall sanding sponge or a traditional hand sander. When you're done, store the tools in the mudpan until next time.

Retail price is around \$6 for either kit. Contact Marshalltown at (800) 987-6935 or visit the company on-line: www.marshalltown.com.



OXO Gets a Good Grip on the Hand Tool Market

Unless you do a lot of cooking, you may not be familiar with a company called OXO (pronounced ox-oh) International. Until now, the company was best known for its Good Grips line of kitchen and cleaning tools.

Now OXO is expanding with a line of hand tools based on the concept of universal design — the idea that products should be easy to use for a wide spectrum of the population. That's why you'll see padded, ergonomic handles on OXO's screwdrivers, hammers, tape measures, utility knives, and pliers.

Great handles alone, however, aren't enough to make a good tool.



So OXO added other features to the line of tools such as chrome vanadium steel in the pliers and screwdrivers, tool-free utility knife blade changing, anti-vibration

hammer handles, and nylon-coated tape measure blades. Prices range from \$3 to \$24. You can contact OXO at (800) 545-4411 or go to www.oxo.com on-line.

Porter-Cable Takes a Cut at the Saw Blade Market

Porter-Cable's Riptide blades can tackle a variety of tasks ranging from general purpose wood cutting to metal cutting for steel studs.

According to Porter-Cable, the blades are manufactured and designed to provide smooth cuts

without loading your machine. Each blade features a thin kerf that helps minimize waste. This also produces a cleaner, faster, and cooler cut.

Another thing you'll notice about the Riptide blades is that the alternating top-bevel configuration

of the teeth causes the blades to enter materials as if they're slicing rather than chopping. Because of the aggressive bite, a chip limiter behind each tooth prevents the blade from bogging down while you're cutting. This feature also helps eliminate dangerous kickbacks.

Riptide blades are available in the following sizes: 7 $\frac{1}{4}$ " ($\frac{5}{8}$ " arbor), 6" ($\frac{1}{2}$ " arbor), and 4 $\frac{1}{2}$ " ($\frac{3}{8}$ " arbor). Expect to pay between \$9 and \$40, depending on the type of blade you purchase. Call (800) 487-8665 or check out Porter-Cable's web site at www.porter-cable.com.



Home & Yard Products

Hide the Electronic Gear and Still Use Your Remote

When we designed the Wall Unit on the cover, we used wood doors instead of glass for the TV cabinet.

We chose these doors to hide the VCR and stereo from view and provide a nice, clean look. But what

happens when you want to use your remote control? Well, we've found a way to hide the electronic gear out of sight and still be able to use the remote control.

Rockler Woodworking and Hardware, a mail-order retailer, sells two small infrared receivers that read a normal signal from any remote control. The commands are then retransmitted to your VCR or stereo components inside the cabinet.

The Hidden Link (\$74.99) is about the size of a garage door opener. The Micro Link in the inset photo (\$139.99) can be concealed in a 1/2"-dia. hole in the cabinet. Call Rockler at (800)279-4441 or go to www.rockler.com on-line.



Quick Mask Products Speed Painting Preparation

Painting isn't high on my list of "fun-things-to-do." I guess it's all the prep work I really don't like. That's why painting products such as Quick Mask from HomeRight make a lot of sense to me.

The idea behind Quick Mask is really pretty simple — protective paper or poly drop cloth and masking tape rolled into one.

The tape is attached along one edge of the paper or cloth. Simply

unroll Quick Mask to cover the surface you want protected, adhere the tape to the trim, and you're ready to paint away. When you're done painting, peel off the tape and throw the Quick Mask away.

You can get Quick Mask products in six different combinations. Prices range from \$4-\$10. Contact HomeRight at (800)264-5442 or visit the company's web site at www.homeright.com.



Rope Maker

Rope making machines like this one are indelibly linked to turn-of-the-century American farms. But you might be surprised to learn who first thought of the design.

Labor-saving machines like the cotton gin and the mechanical reaper were hallmarks of the industrial revolution. These machines not only eased the workload of the American farmer, they often spawned smaller, but equally clever innovations.

This rope making machine, for instance, was sure to be found on any farm that had a McCormick Mechanical Reaper. With a tool like this, the farmer could twist his own rope using the same type of binder twine the reaper used to tie bales. Quite a convenience in a time when rope was scarcely available, or affordable, outside the shipping industry.

In fact, these hand-crank machines were actually adaptations of much larger versions used to turn out rope for

maritime use. The operation differed only in scale. Both sizes used reciprocal gearing to twist the rope strands in one direction while braiding them in the opposite direction. The rope could be made to the perfect length and thickness for its intended purpose.

It's interesting to note that today's industrial rope making machines are strikingly similar to the machines of this period. Perhaps most amazing, though, is that a design for a machine used precisely this way and functioning in much the same manner, can be found among the countless sketches drawn by Leonardo da Vinci some 400 years earlier.

