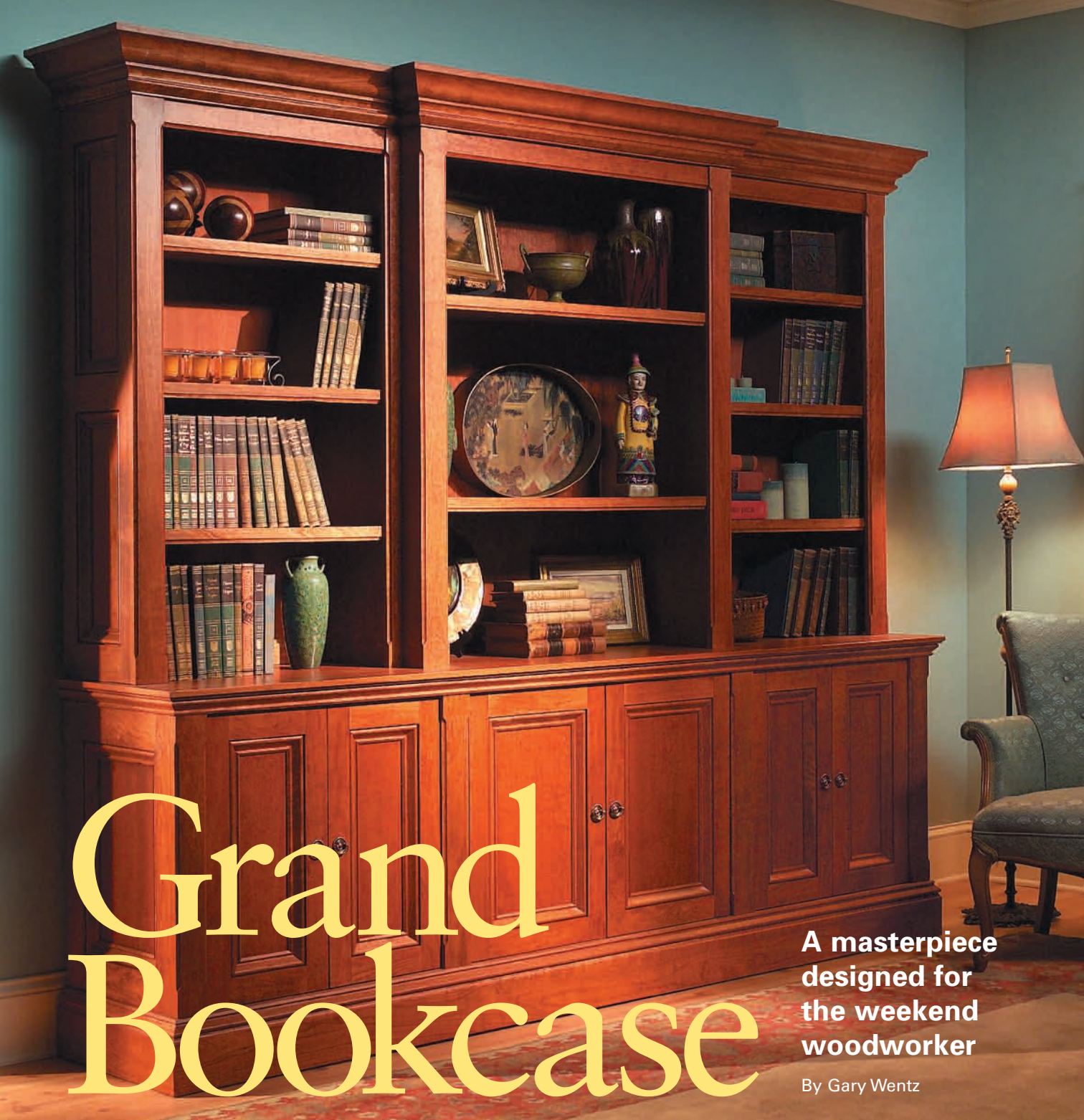




Grand bookcase

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Grand Bookcase

**A masterpiece
designed for
the weekend
woodworker**

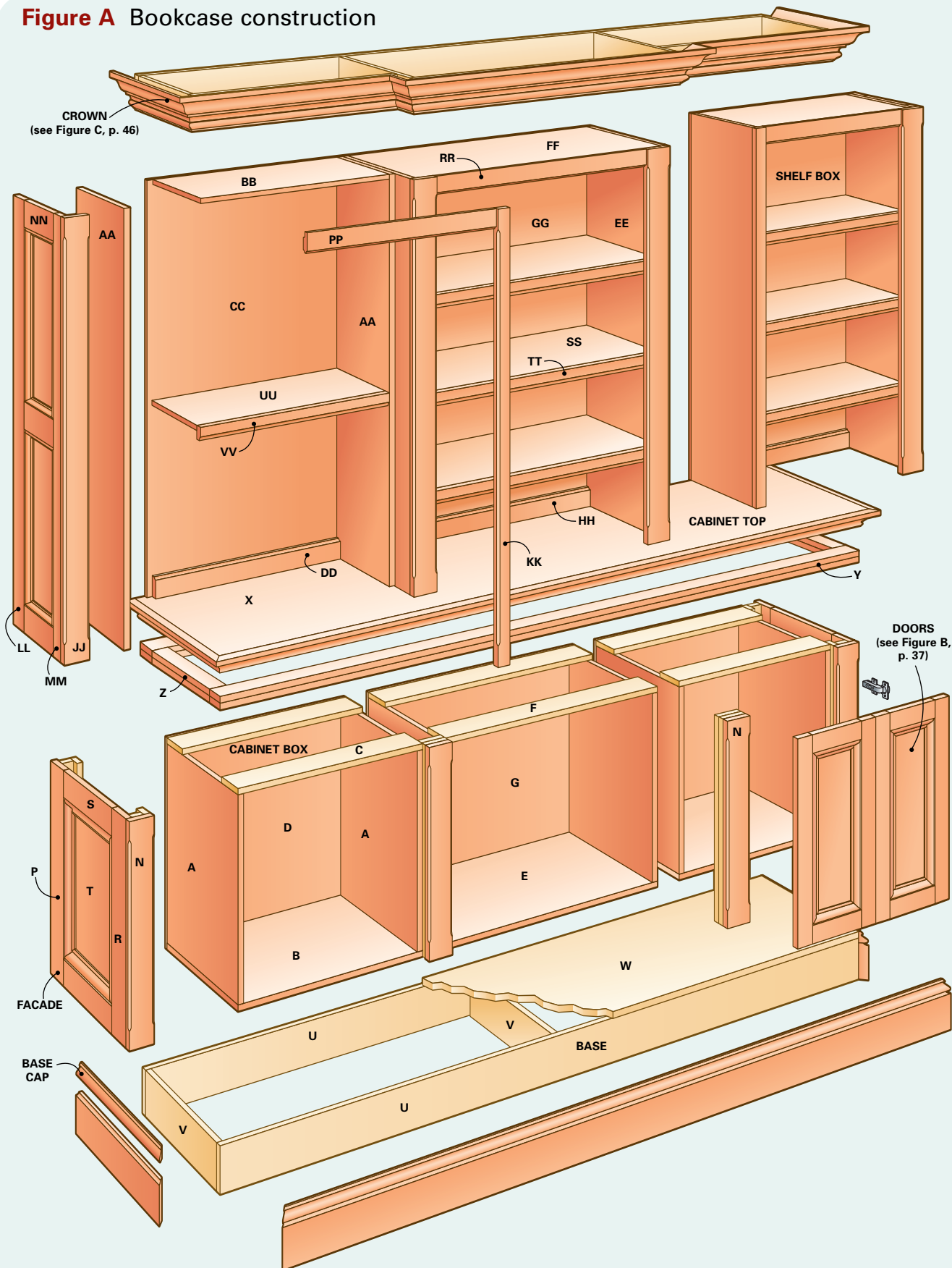
By Gary Wentz

When you're ready to part with the discount store bookshelves you bought when you were 22, consider building this grown-up version. For handsome looks, we built it from cherry and designed it with paneled doors, crown molding and tall, open shelves. For practical use, it has two depths of shelves to hold books and treasures and three large cabinets to hide an assortment of stuff.

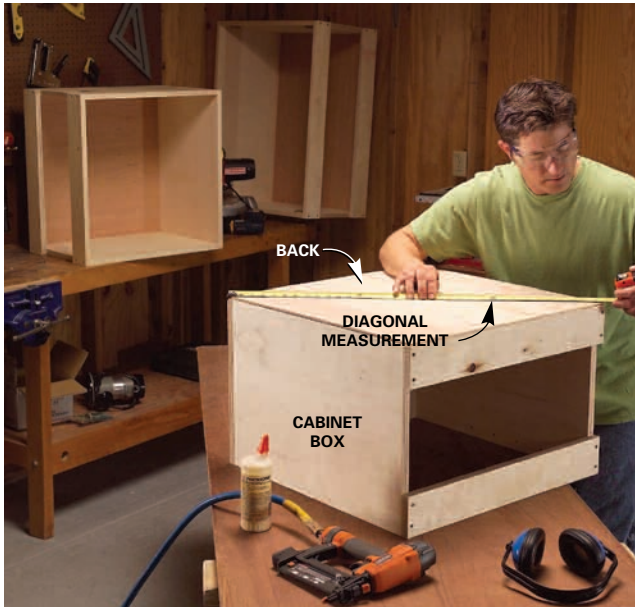
This article will show everything you need to know to build this

bookcase from the bottom up. The size and elegance of this piece are deceptive; don't assume it's too big or difficult for you—you may be pleasantly surprised when you look over the following pages. You'll see how the modular construction makes it buildable in a small workshop and easy to disassemble and reassemble in your living room or great room. You'll also see that there are lots of steps involved, but none of them require special skills. There are no interlocking parts, no complex joinery.

Figure A Bookcase construction



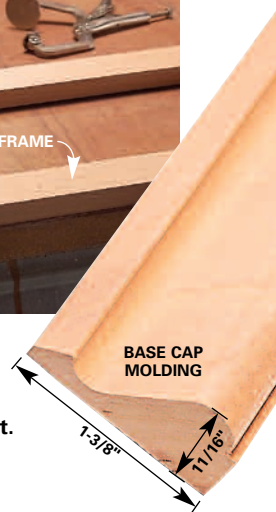
Overall dimensions: 84-1/2" tall x 99-1/2" wide (at crown) x 18-1/2" deep (at cabinet top)



1 Glue and nail together three plywood cabinet boxes (Figure A). Square each box by taking diagonal measurements, then attach the back. Equal measurements means the box is square. Edge-band the front with iron-on birch.



2 Assemble the door frames with glue and pocket screws. Glue and nail a plywood panel to the back of each frame. Miter, glue and nail molding to the panel front.



Tools, money and time

This project consists mostly of quickly assembled plywood boxes and solid-wood frames. The only fussy steps are cutting and installing the mitered moldings that trim the doors, panels, base and crown. If you have experience with a table saw, a miter saw and a router, you can build this bookcase. You'll also need one special tool—a pocket screw jig (\$60; **Photo 2**). If you haven't used pocket screws before, don't worry. You can learn to use them in minutes. We strongly suggest you use a brad nailer rather than clamps to tack glued parts together. A brad nailer is faster and actually cheaper than the assortment of clamps you would need for this project.

The total materials bill for our cherry bookcase was for \$1,200. Built from a less expensive species like oak, this bookcase would have a total cost of about \$800. A similar piece of comparable quality would cost three times that much, or more, at a furniture store. Expect to spend at least 20 hours building this bookcase and another 10 hours finishing it.

Build basic cabinet boxes

The three cabinets are simply boxes made from 3/4-in. plywood with 1/4-in. plywood backs (**Photo 1**). Cut the plywood

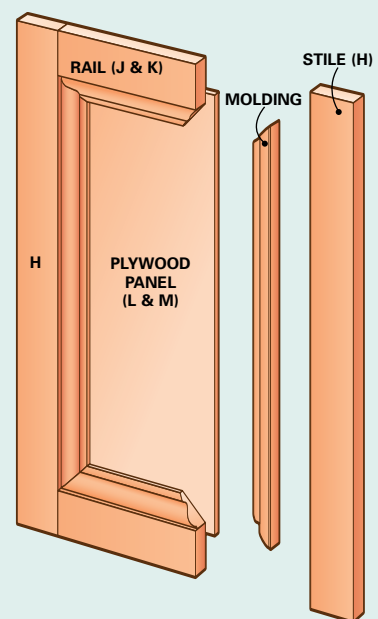
parts to the dimensions given in the Cutting List on p. 47. Before you assemble the boxes, cover the front edges of the 3/4-in. plywood with iron-on wood edge band. Also drill 1/4-in. holes in the cabinet sides for adjustable shelf supports. For some tips on edge banding and drilling shelf support holes, see "Storage Galore," Sept. '05, p. 47. (To order a copy, see p. 7.) To assemble the boxes fast, tack them together with a brad nailer. Then drill 3/16-in. pilot holes and drive four 2-in. screws along each joint for strength. Fasten the backs with 1/2-in. brad nails.

Easy, elegant doors

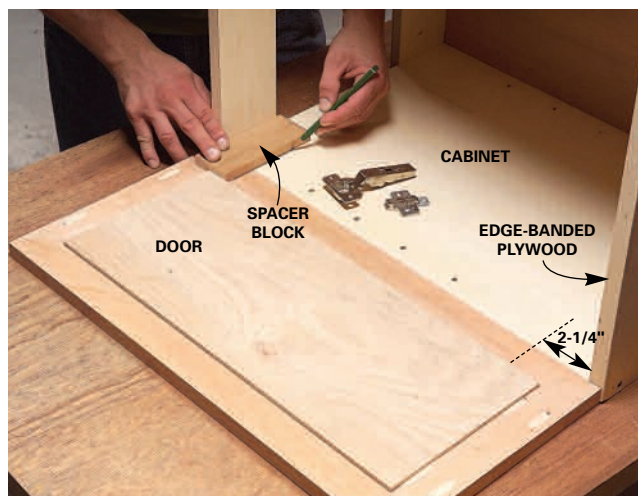
The cabinet doors may look fancy, but they're just solid wood frames with a plywood panel slapped on the back. The base cap moldings surrounding the panel give these simple doors a rich look. Cut the solid wood rails and stiles following the Cutting List and assemble them with pocket screws (**Photo 2**). If you haven't used a pocket screw jig before, see "Using Tools," Feb. '03, p. 23. (To order a copy, see p. 7.) The pocket screw holes will be visible on the back of each door, so fill them with a solvent-based wood filler such as Plastic Wood (water-based fillers dry slowly and can swell wood when used to

fill large, deep holes). The filler will shrink as it dries, so you'll have to apply a second, skim coat after four hours. Sand the joints flush on both sides of the doors and lightly sand the plywood panels before assembly with 180-grit sandpaper. Fasten the panels with 1/2-in. brads.

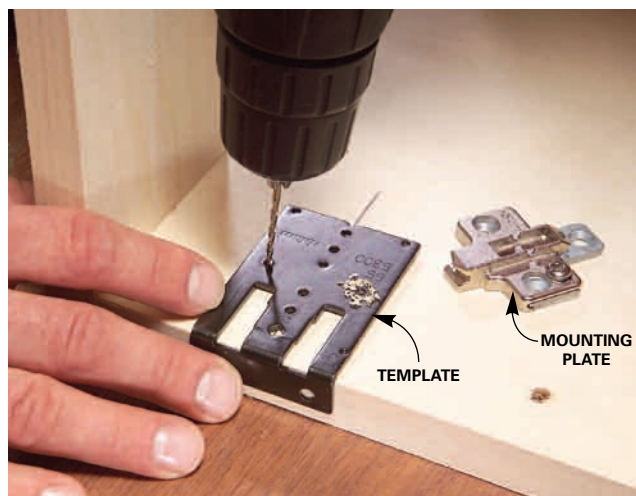
Figure B
Door construction



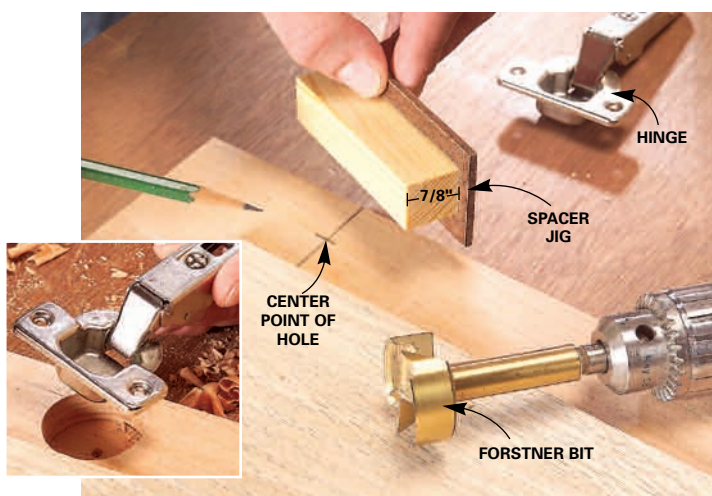
[Note: There are two door sizes.]



3 Lay the cabinet box on its side and center the door against it. Mark hinge guidelines on the door and cabinet using a 2-1/4-in.-wide spacer block.



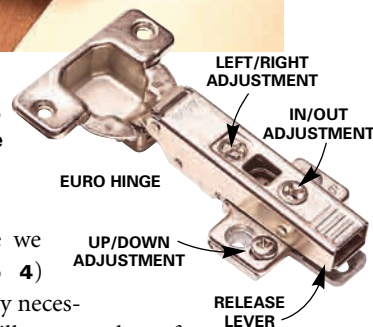
4 Center the mounting plate template on the cabinet guideline and drill two 3/32-in. pilot holes for the mounting plate. Screw the mounting plate to the cabinet.



5 Mark the center point of the hinge hole 7/8 in. from the door's edge using a homemade spacer jig. Drill the hinge hole with a 1-3/8-in. Forstner bit. Insert the hinge and screw it to the door.



6 Snap the hinges onto the mounting plates to make sure they fit correctly. Then remove the doors by pulling the release lever.



Carefully center the panels so they're 1-3/4 in. from the edges of the door frames; this leaves ample space for mounting the hinges. Miter the moldings and install them with glue and 1-1/4-in. brads. Throughout this project, use brads sparingly. Drive only as many as it takes to draw glue joints tight. Fewer brads means less time spent filling holes later. For some tips on installing mitered moldings, see the Editor's Note, p. 44.

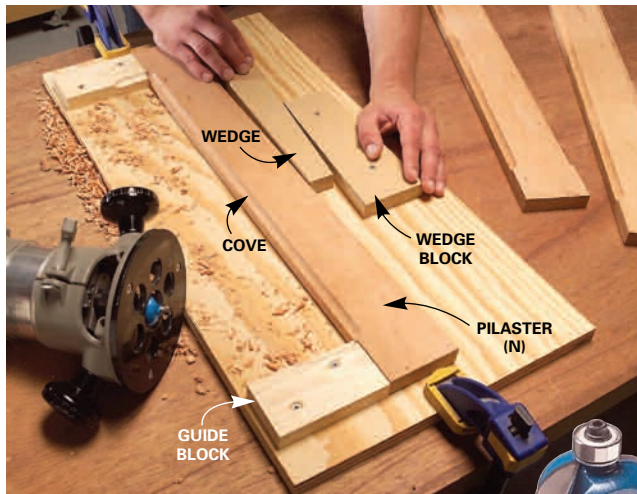
Hi-tech hinges simplified

European hinges—also called “cup” or “euro” hinges—cost less than good-quality traditional hinges and make cabinet door

installation much easier. The best feature of euro hinges is that they're adjustable: To move the door up and down, left or right or in and out, you just turn adjustment screws. That means you don't have to spend hours sanding or planing doors to get a perfect fit. The hinges we chose let you hang and remove doors in seconds by releasing a lever.

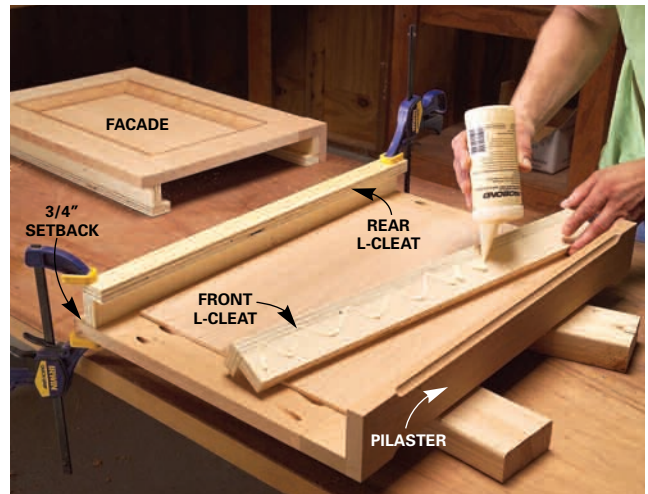
Choosing the right type of euro hinge for the job and positioning the parts correctly can be confusing. But we've done all the calculating for you. If you use the model we recommend (see the Materials List, p. 47) and follow the steps shown here, you'll find the process foolproof.

The template we used (**Photo 4**) isn't absolutely necessary, but it will save you lots of fussy measuring and costs only \$6. Our spacer jig (**Photo 5**) is simply a block of wood glued to a scrap of hardboard. You'll have to buy a 1-3/8-in. Forstner bit (\$18). Use a corded drill to bore the hinge holes; most cordless models don't have enough power. Clamp down the door and hang on tight to the drill; the bit might bind and twist the drill or the door. Stop drilling occasionally and insert the hinge to check the depth of the hole—if you bore too deep, you'll ruin the door.



7 Screw 2-1/4-in.-wide guide blocks to plywood to make a pilaster jig. Screw on a wedge block and lock each pilaster in place with a wedge. Rout coves in the pilasters with a 3/8-in. cove bit.

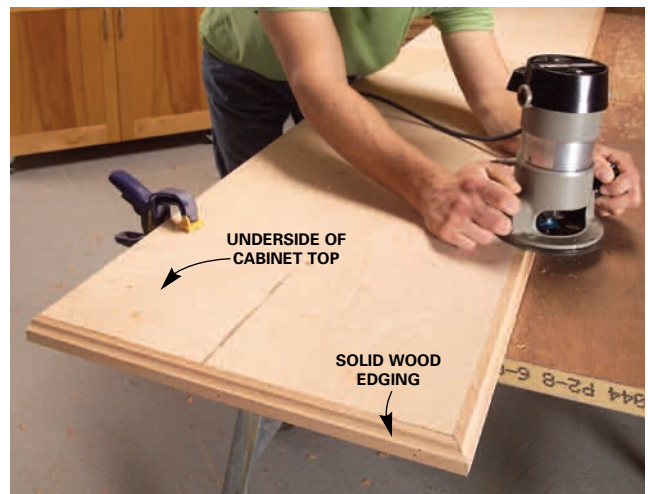
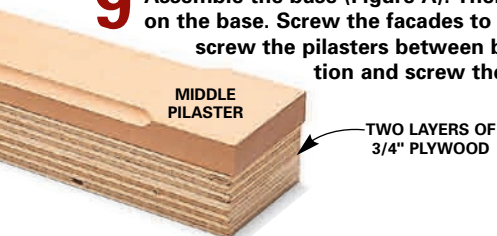
3/8" COVE BIT



8 Build the facades just as you built the doors. Glue the pilasters to the facades. Glue 1-1/2-in.-wide strips of plywood together to make L-cleats, and attach the cleats to the facades.



9 Assemble the base (Figure A). Then set the cabinet boxes on the base. Screw the facades to the side boxes and screw the pilasters between boxes. Carefully position and screw the boxes to the base.



10 Band three sides of the plywood cabinet top with 3/4 x 3/4-in. solid wood. Cut a cove in the underside of the banding with a router.

Pilasters give a classic look

The three cabinet boxes are divided and flanked by four flat, protruding columns, or "pilasters." Make the pilasters using a 3/8-in. cove bit and simple jig that guides your router bit at the beginning and end of each cut (**Photo 7**). To get perfect, splinter-free coves, rout the edges of each pilaster in two passes. Set the bit to a

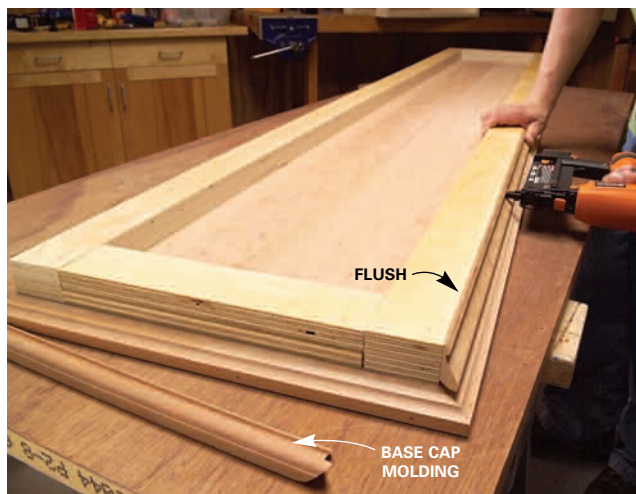
depth of about 3/16 in. Rout all the pilaster edges once, then set the bit to a 1/4-in. depth and make a final pass along each edge.

Next, build two facades to cover the sides of the left and right cabinet boxes. The facades are constructed just like the doors, with frames, a plywood panel and mitered moldings. Glue a pilaster to the front edge of each facade. Also add L-cleats to the backs of the facades (**Photo 8**). Space the rear cleat 3/4 in. from the back edge of the facade. These cleats allow you to attach the facades with screws driv-

en from inside the cabinet boxes (**Photo 9**). Glue two layers of 3/4-in. plywood to the backsides of the two middle pilasters that fit between cabinet boxes.

Set the cabinets on the base

The base is simply a plywood platform covered on three sides with mitered baseboard and base cap molding (**Figure A**). Assemble the platform parts with brad nails and then add 2-in. screws for strength. You can use construction-grade



11 Frame on the underside of the cabinet top with two layers of 3/4-in. plywood. Then wrap three sides of the frame with mitered base cap molding.



12 Assemble shelf boxes and side frames following Figure A. Glue side frames to both end shelf boxes. Then install base cap molding inside the frames.

CAUTION:
You have to remove the blade guard to make these cuts. Keep hands and clothing away from the blade.



13 Rout 1/4-in.-deep coves into both sides of the top rails. Then cut a rabbet on the back by making two cuts with your table saw.



14 Cut the top rail to length so that the half pilaster protrudes about 1/32 in. beyond the side of the shelf box. Glue and nail the top rail into place followed by the half pilaster.

plywood for the sides of the platform, but use finish-grade plywood for the lid, since the perimeter of the lid will be visible. Make the baseboard from a 4-5/8-in.-wide board using the same cove bit you used on the pilasters, and use the same base cap molding that you used on the doors. Attach the base cap to the platform first, making it flush with the lid. Then add the baseboard.

Set the base on furniture dollies (\$20 each at home centers) or make your own dollies from plywood and casters (\$3 each). Set the cabinet boxes on the base. Screw on the facades and join the boxes by screwing into the two other pilasters (**Photo 9**). All four pilasters protrude

1-1/4 in. from the cabinet boxes; cut a spacer block to help you position them. Gently shift the whole cabinet assembly to center it on the base and then fasten each box to the base with four 1-5/8-in. screws.

The cabinet top is a slab of plywood banded with solid wood edging. Be sure to drive brads at the center of the banding. If you drive them too close to the underside of the banding, you might hit them with your router bit when you cove the banding (**Photo 10**). Next, glue and nail two layers of 3/4-in. plywood strips to the underside of the top to form a frame. The back of the frame is flush with the back of the top. The other three sides are inset 1/2 in. from the edge of the plywood.

The frame acts as a cleat, allowing you to screw the top in place from inside the cabinet boxes, and provides backing for the base cap (**Photo 11**). This is the same kind of molding that was used on the doors.

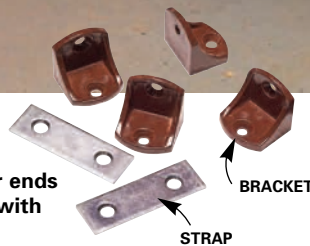
With the entire cabinet unit assembled, snap the doors onto their mounting plates and adjust the hinges. If any doors fit badly, trim them with a belt sander or shave them down slightly on the table saw. Label each door with its location and set them aside to avoid damage.

Shelf units

To build the shelf units, you'll repeat the techniques you used on the cabinets. The shelf units begin as plywood boxes (**Photo**



15 Set the shelf units on the cabinet top and position them. Fasten them to the cabinet unit on the backside using metal straps. Position the lower ends of the pilasters with a tape measure and fasten them with small brackets hidden inside the shelf units.



12 and Figure A). Before assembly, drill holes for adjustable shelf supports just as you did with the cabinet boxes. There's no need to edge-band the shelf parts. They'll be covered. When you assemble the center shelf box, keep screws at least 3-1/2 in. from the front of the box; that protruding part of the box will be exposed. Square the shelf boxes just as you did the cabinet boxes.

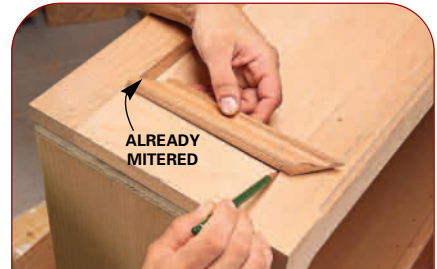
To make the pilasters for the shelf units, build a 47-1/2-in.-long version of the jig shown in **Photo 7**. You'll need four full pilasters and two half pilasters. The sides of the shelf units are covered with frames. These frames are like the facades used on the cabinets, but without the 1/4-in. plywood panels. Instead, the shelf box sides act as panels. When you add the top rail and half pilaster (**Photos 13 and 14**), allow the half pilaster to protrude slightly from the shelf unit's side. This makes it easier to create a tight joint between the side units and the middle shelf unit. The

middle shelf unit has no frame; cover the front plywood edges with two pilasters and a top rail.

When the shelf units are complete, set them in place and fasten them to the cabinets below by screwing metal straps to the backs of the shelf units and cabinets. The sides of the shelf units may angle inward or outward slightly, so check the positions of the pilasters with a tape measure (**Photo 15**). Then anchor the shelf unit to the cabinet top with small brackets hidden behind each pilaster (**photo above**).

Top it all off with a crown

The crown begins as a solid wood frame joined with pocket screws (**Figure C**). Glue a board to the front of this frame to cover the protruding middle shelf unit (you'll need three clamps that open at least 6 in. to attach this part). Then build a plywood parapet around the perimeter of the frame to support the crown mold-



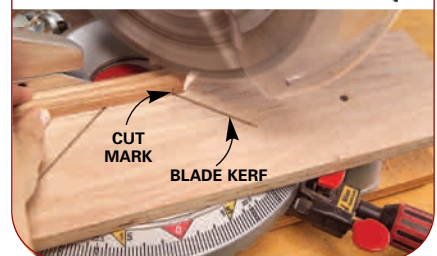
Editor's note

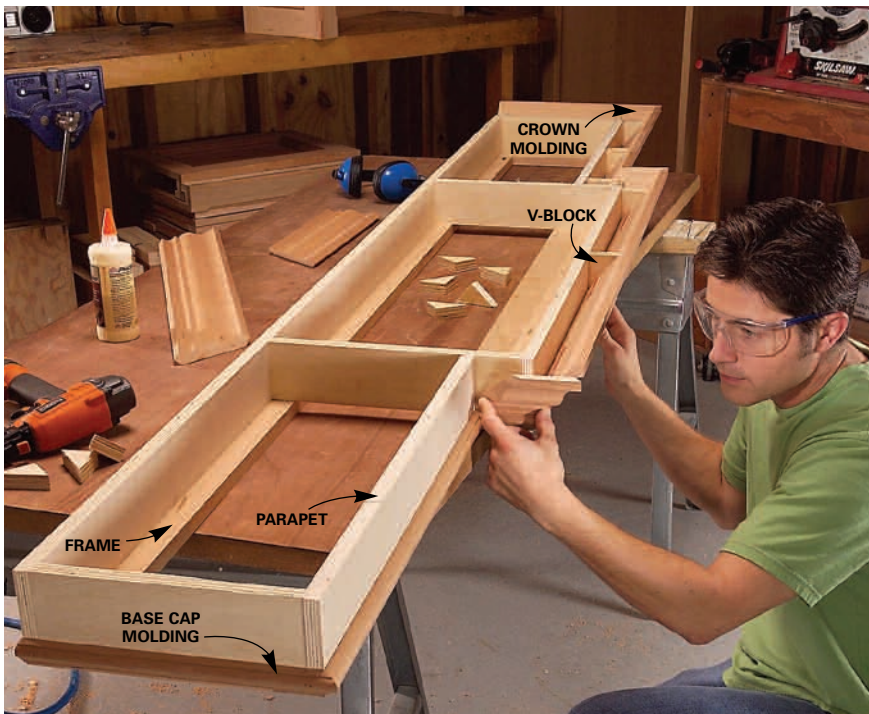
More-efficient miters

This bookcase has a dozen door and side panels that are lined with molding. Fitting moldings inside a frame is slow work: You miter one end, then miter the other end so the piece is a hair too long, then shave that end again and again until the molding fits just right. The process is painstaking, but I have learned a few tricks to speed up the job:

- Don't swing your saw from left to right a hundred times. Set your saw 45 degrees to the left and rough-cut all the pieces, making them 1/4 in. too long. Then set your saw to the right and cut them to length.
- Don't bother with a tape measure. To mark the length of each piece, hold the mitered end in place and mark the other end with a *sharp* pencil (**photo above**).
- Eliminate miter saw guesswork. Attach a flat scrap of plywood to the bed of your saw and cut kerfs in it. When you position a marked piece for cutting, you'll know exactly where the blade will land—no guessing. To attach the plywood, you can drill holes into the metal bed or preserve the bed and use double-faced carpet tape.

Gary



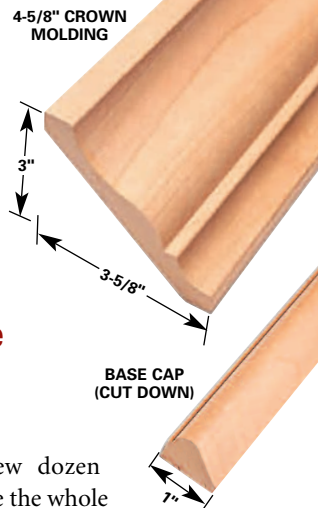


16 Build the crown's frame and add the parapet. Wrap the frame with base cap molding and install crown molding. Glue and nail in V-blocks to strengthen the crown molding.

ing. Run mitered base cap molding around the front and sides of the frame. We couldn't find a narrower version of base cap in cherry, so we cut it down on the table saw (**photo, above right**).

If you haven't worked with crown molding before, see "Crowning Touch," Nov. '04, p. 40. (To order a copy, see p. 7.) Crown molding in rooms is usually coped at inside corners to account for out-of-square walls. Since the frame has perfectly square corners, we mitered the two inside

corner joints (**Photo 16**). When you cut the two short pieces of crown that flank the middle protruding section, do it safely: Cut them from a piece at least 12 in. long while holding on to the waste side. Don't hold on to the short piece. When the crown molding is in place, glue in V-blocks to support it. If you want to display items on top of the crown, cut a sheet of 3/4-in. plywood to fit. The parapet is 3/4 in. lower than the crown molding, so a plywood top will fit down inside it.

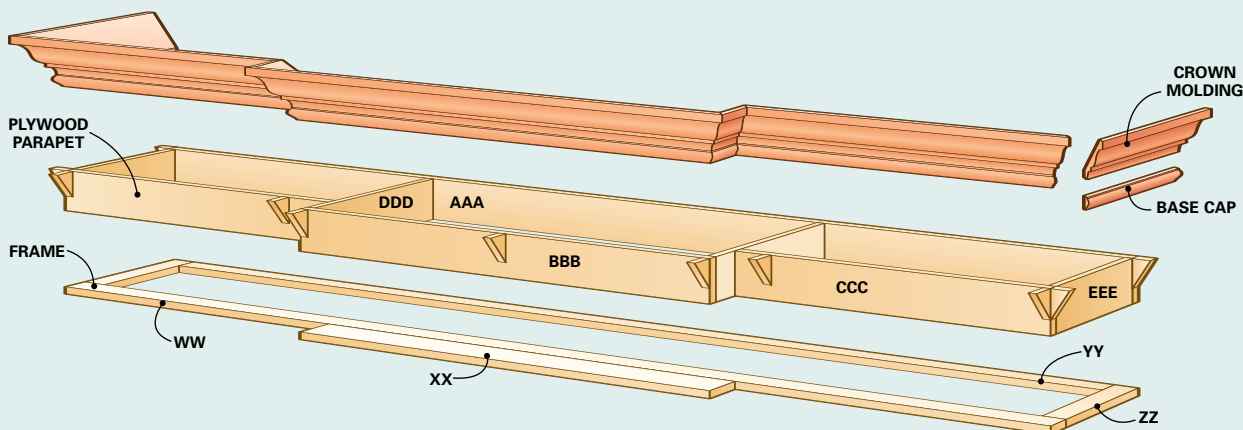


Disassemble for easier finishing

By removing a few dozen screws, you can take the whole bookcase apart in about 10 minutes. Label the parts to make reassembly easier. Cherry can absorb stain unevenly for a blotchy appearance, so we first applied Minwax Prefinish Wood Conditioner. Then we wiped on two coats of Watco cherry oil finish. After three days, we lightly sanded the finish with 320-grit sandpaper and applied three light coats of satin lacquer (from spray cans). Think twice before you choose a brush-on finish for this project; the intricate doors and side panels will require careful brushwork. We let the finish dry overnight and spent about 30 minutes reassembled the parts in the bookcase's new home. A tall, heavy piece of furniture like this can tip forward and badly injure someone, so drive two 3-in. screws through the back of the parapet into wall studs.

Art Direction • MARCIA WRIGHT ROEPKE
Photography • BILL ZUEHLKE and RAMON MORENO
Illustrations • FRANK ROHRBACH III

Figure C
Crown construction



Materials List

For a wider selection of wood species and molding profiles, visit a traditional lumberyard rather than a home center. Molding profiles vary, so you may not find the exact profiles we used.

ITEM	QTY.
4' x 8' 3/4" hardwood plywood	3
4' x 8' 1/4" hardwood plywood	2
4' x 8' 3/4" construction plywood or MDF	1
1x4 boards	40'
1x6 boards	60'
Crown molding	12'
Base cap molding	116'
1/2", 1-1/4" and 1-3/4" brads	
1-1/4", 1-5/8" and 2" screws	
2" metal straps	4
Wood glue	
Spray cans of satin lacquer	8

The following specialty items are available by mail order from Woodworker's Hardware, (800) 383-0130. www.wwhardware.com

Kreg Rocket pocket hole system No. KTR 2. \$53

1-1/4" fine-thread pocket screws No. KTSPS F125. \$3.20/100 screws

Two 25' rolls of iron-on birch edge band No. ET078 PB25. \$7 each

12 Blum 107 Clip Top straight hinges No. B075T1550. \$2.12 each

12 Blum Omm. Mounting plates No. B175H710. \$1.03 each

Mounting plate template No. B065.5300. \$6

Plastic brackets No. H260.24.117PM. \$7 (bag of 20)

Shelf supports No. G111BR. \$3.20/20 brackets

Cutting List

Moldings are not included. Cut all to fit.

KEY	PCS.	SIZE & DESCRIPTION	BB	2	10-1/2" x 24-3/4" box top
A	6	15-3/4" x 22-1/2" box sides	CC	2	26" x 47-1/4" back
B	2	15-3/4" x 24" box floor	DD	2	2-1/4" x 24-3/4" back rail
C	4	3-1/2" x 24" box top slats	EE	2	13-1/2" x 47-1/2" box sides
D	2	23-3/4" x 23-3/4" back	FF	1	13-1/2" x 37-1/2" box top
E	1	15-3/4" x 33" middle box floor	GG	1	38-3/4" x 47-1/4" back
F	2	3-1/2" x 33" middle box top slats	HH	1	2-1/4" x 37-1/2" back rail
G	1	23-3/4" x 32-3/4" middle box back	JJ	4	3" x 47-1/2" shelf pilasters
H	12	2-1/4" x 23-3/4" door stiles	KK	2	1-1/2" x 47-1/2" half pilasters
J	8	2-1/4" x 7-3/8" door rails	LL	2	2-1/4" x 47-1/2" rear stiles
K	4	2-1/4" x 11-7/8" door rails	MM	2	1-1/2" x 47-1/2" front stiles
L	4	8-3/8" x 20-1/4" door panel	NN	6	3" x 7" side rails
M	2	12-7/8" x 20-1/4" door panel	PP	2	2-1/4" x 22-1/2" top rail (cut to fit)
N	4	3" x 24" cabinet pilasters	RR	1	2-1/4" x 33" top rail (cut to fit)
P	2	3" x 24" rear stiles	SS	3	12-1/2" x 37-1/4" middle shelves
R	2	2-1/4" x 24" front stiles	TT	3	1-1/4" x 37-1/4" shelf nosing
S	4	3" x 11-1/4" rails	UU	6	9-1/2" x 24-1/2" side shelves
T	2	13" x 19-1/2" side panels	VV	6	1-1/4" x 24-1/2" shelf nosing
U	2	5-1/4" x 93-1/4" base frame	WW	1	2" x 93-1/2" front rail
V	3	5-1/4" x 16" base frame	XX	1	3" x 39-1/2" front rail extension
W	1	17-1/2" x 93-1/4" base lid	YY	1	2" x 89-1/2" back rail
X	1	17-3/4" x 94" cabinet top	ZZ	2	2" x 9-3/4" stiles
Y	4	2-1/2" x 93" cabinet top frame (assemble from scrap plywood)	AAA	1	3-3/8" x 93-1/2" back parapet
Z	4	2-1/2" x 12-1/4" cabinet top frame	BBB	1	3-3/8" x 39-1/2" front-center parapet
AA	4	10-1/2" x 47-1/2" box sides	CCC	2	3-3/8" x 27" front-side parapets
			DDD	2	3-3/8" x 13-1/4" through parapets
			EEE	2	3-3/8" x 10-1/4" side parapets

Color key: The part letters in **red** indicate 3/4-in. plywood, **blue** are 1/4-in. plywood and black are 3/4-in. solid cherry.

Plywood Cutting Diagrams

We used "utility-grade" plywood for most of the hidden parts (Sheet 1). You could use AC plywood or MDF. For the exposed parts, we used more expensive cherry plywood (Sheets 2 - 6).

