



Classic built-in book case

**This article originally appeared in The Family Handyman magazine.
For subscription information, visit www.familyhandyman.com**

Please note that pages that appeared in the magazine as advertisements will not be included with this pdf. Page numbering may be interrupted if an advertisement ran within the original story. Addresses, phone numbers, prices, part numbers and other information may have changed since original publication.

Classic built-in book

No complex wood joints, no tricky techniques—you simply glue, screw and nail all the parts together

by **David Radtke**

You would have loved the library in my old hometown. Its beautifully paneled wood bookshelves were as inspirational as the books they held. This handsome bookcase features those same classic elements—the curved brackets, column-like partitions and crown molding. Now you can add them to your living room or study with this simply designed bookcase project.

You can build the project as shown from our clear drawings and step-by-step photos, or use these techniques to modify the dimensions for your own space.

The partitions shown in **Photos 8 and 9** can be placed wall to wall as shown or can stop halfway into a room and then finish off on the open side. Or you can extend the length by building additional partitions and shelves.

This project is made from hardwood plywood, 2x6s, hardwood boards and standard moldings available at home centers and lumberyards. We chose birch boards and plywood along with maple moldings and then used a gel stain (p. 44) to give the project a cherry wood appearance. You'll notice we've also rubbed away stain to create highlights for an antique look. The materials we used are listed in the Shopping List and illustrated in the drawing on p. 34. You can preassemble nearly all the parts of this modular-type project in your garage or shop and carry them into your room for assembly.

Project facts

Time

25 to 30 hours

Cost

\$420

Special Tools

Table saw, 18-gauge air nailer, power miter saw

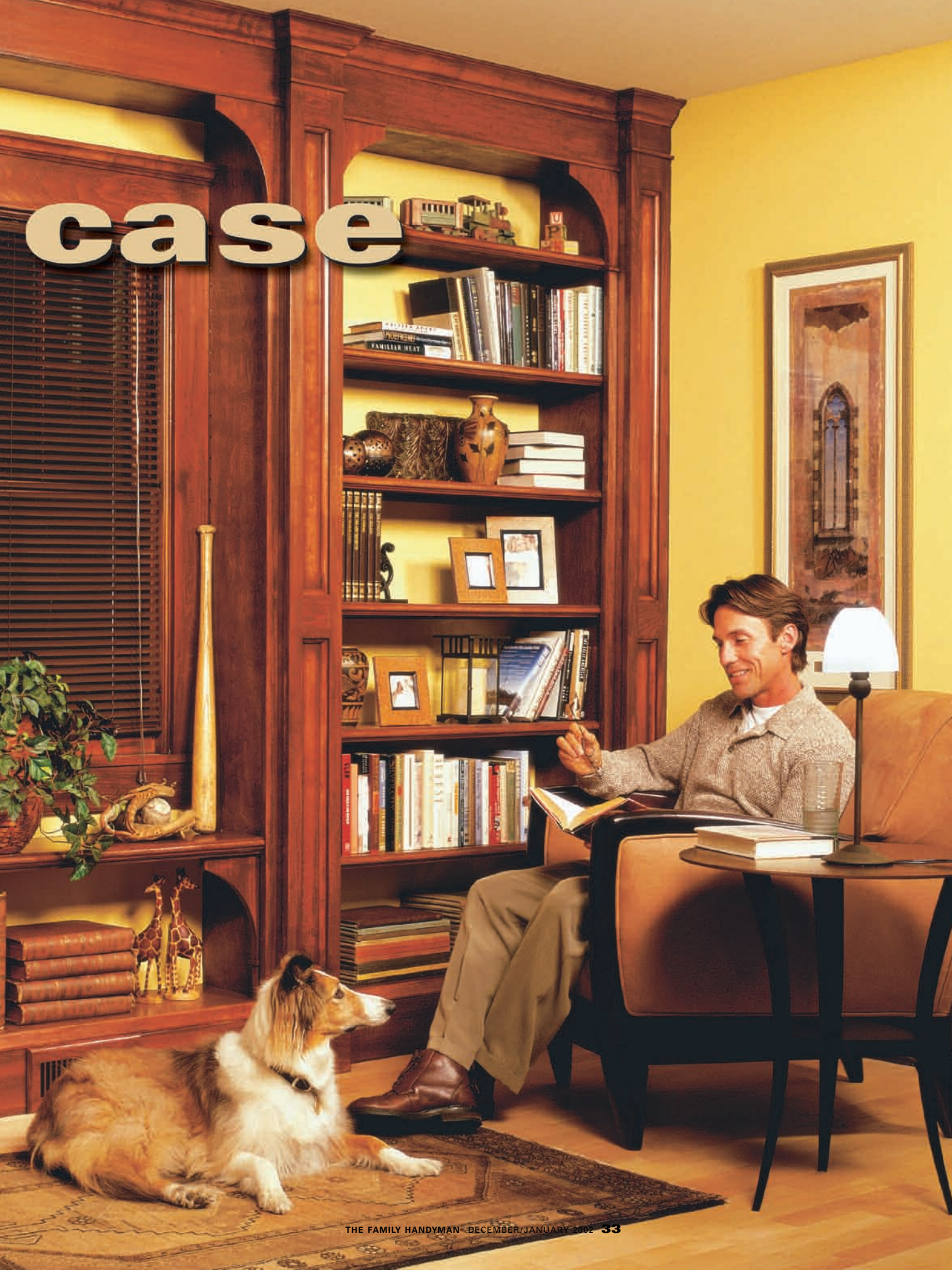
Skill Level

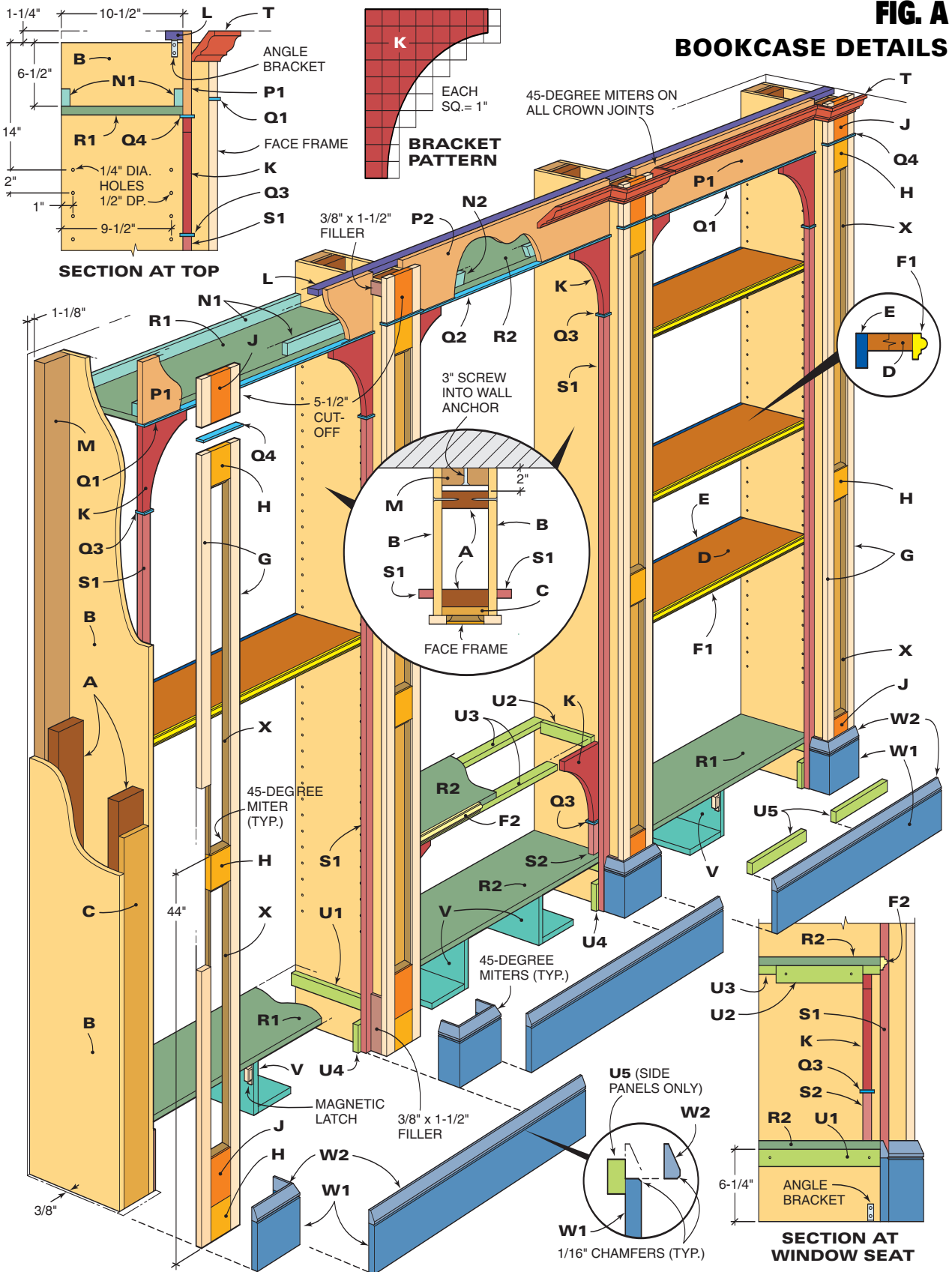
Intermediate

More BOOKCASE >>



case





Cutting List

KEY	QTY.	SIZE & DESCRIPTION
A	8	1-1/2" x 4" x 95" center partition struts
B	8	3/4" x 12-3/4" x 95" plywood partition sides
C	4	3/4" x 4" x 95" plywood partition fronts
D	12	3/4" x 9-3/8" x 39" reinforced plywood shelves*
E	12	1/2" x 1-1/2" x 39" hardwood rear shelf supports*
F1	12	5/8" x 1-1/8" x 39" decorative edge molding*
F2	1	5/8" x 1-1/8" x 39-3/4" decorative edge molding*
G	8	3/4" x 1-1/2" x 95-1/2" partition face stiles
H	12	3/4" x 4" x 3-1/4" partition rails
J	8	3/4" x 5-1/2" x 3-1/4" partition rails
K	8	3/4" x 7-1/4" x 10" curved brackets
L	1	3/4" x 1-1/2" x 143-1/2" ceiling cleat*
M	4	1-1/2" x 4" x 95" wall cleats
N1	4	3/4" x 1-1/2" x 39-1/4" soffit cleats*
N2	2	3/4" x 1-1/2" x 42-1/4" soffit cleats*
P1	2	3/4" x 7-1/4" x 39-1/2" front fascia*
P2	1	3/4" x 7-1/4" x 42-1/4" front fascia*
Q1	2	1/4" x 1-1/4" x 39-1/4" left and right upper fillets
Q2	1	1/4" x 1-1/4" x 42-1/4" upper center fillets
Q3	8	1/4" x 1-1/4" x 1-1/2" under-bracket fillets
Q4	4	1/4" x 1" x 6-3/4" face frame fillets
R1	4	3/4" x 10-1/2" x 39-1/4" side base shelf and soffit (plywood)
R2	3	3/4" x 10-1/2" x 42-1/4" center base shelf, soffit and bench (plywood)
S1	6	3/4" x 1-1/4" x 78-1/4" bracket support molding
S2	2	3/4" x 1-1/4" x 3-1/4" seat bracket support molding
T	20 ft.	3-1/4" hardwood crown molding
U1	6	3/4" x 1-1/2" x 10-1/2" side and center base shelf supports
U2	2	3/4" x 1-1/2" x 7-1/2" side bench supports
U3	2	3/4" x 1-1/2" x 42-1/4" bench cleats (glued from underneath)
U4	6	3/4" x 1-1/2" x 4-3/4" base section stops
U5	4	3/4" x 1-1/2" x 12" side panel base cleats (glue to W1 and W2)
V	6	3/4" x 6-1/4" x 10-1/2" plywood center base shelf supports
W1	20 ft.	3/4" x 5-1/2" (1x6 base molding)*
W2	20 ft.	3/4" x 1-1/2" (bifold stop molding as base cap)*
X	30 ft.	1/2" quarter-round face frame trim*

* Cut pieces to fit

The sandwich-style partitions are the backbone of the project

Cut your plywood lengthwise to the dimensions in the Cutting List to make your exterior partition skin. Equip your circular saw with a new, thin-kerf 40-tooth carbide blade. Use a long cutting guide (available at home centers) clamped to the plywood sheet to guide your saw for straight cuts. Also rip straight 8-ft. 2x6s to 4-in. widths with your table saw for the core of each partition. **NOTE:** Buy your 2x6s about a week in advance and bring them inside to dry out and adjust. You may have some that'll warp or twist as they adjust to the dry environment inside the house, so buy a couple of extra pieces just in case.

Assemble the partitions on a flat surface as shown in **Photo 2** and then set them aside for the glue to dry. Once the glue is dry, drill the 1/4-in. holes for the shelf pins as shown in **Photo 3**.

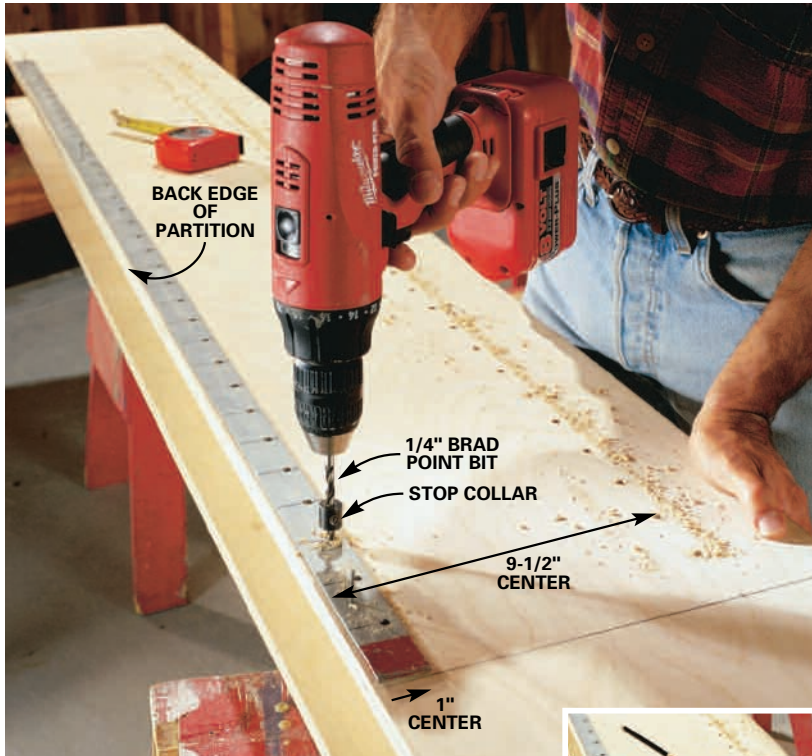
Notice the 2-in. gap at the back of the sandwich. This is crucial. It'll allow you to slip the partitions over cleats attached to the wall with room to spare, as shown in **Photo 7**. **TIP:** The extra 1/2 in. of space between the cleat on the wall and the



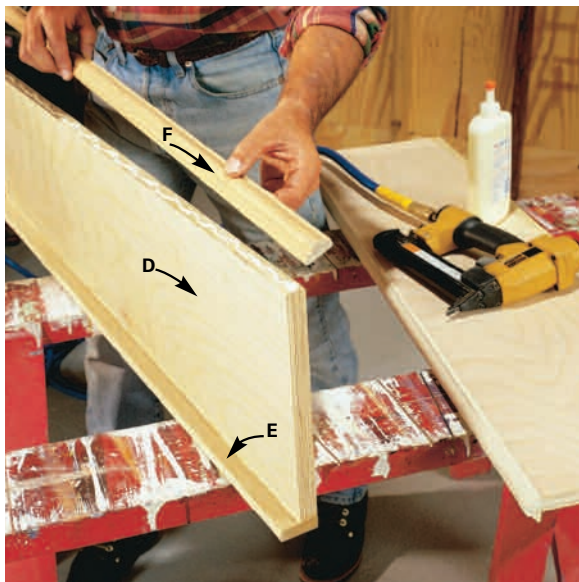
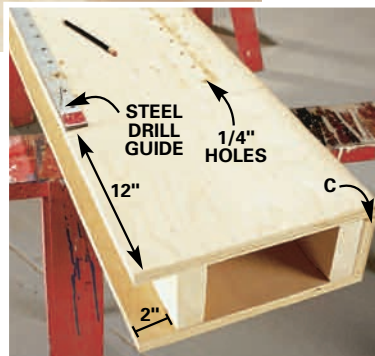
1 MEASURE the width of your room and the height of the ceiling. Also check the window placement. Our room was almost 12 ft. wide with an 8-ft. ceiling, and the window was very close to the center. If there's no window, just build shelves into the center section.



2 GLUE AND NAIL the plywood sides (B) to straight 2x6s (A) ripped to 4 in. wide. Leave a 2-in. gap at the back and a 3/4-in. gap in the front. Next, glue and nail the front 3/4-in. plywood piece (C) so it's flush with the sides. Make all four partitions exactly alike and be sure the pieces are all cut 1-1/4 in. less than your ceiling height. Let the glue dry for a couple of hours before assembling.



3 MEASURE 12 in. down from the top of your partition and drill 1/4-in. holes, 1/2 in. deep, every 2 in. to accept the shelf pins. Ensure accuracy by making a drill guide from a steel strip, available at your hardware store. Just mark and drill the strip with a 1/4-in. twist bit and you've got a great jig you can use for future projects. Mark one end with paint so you always know which end goes up, then drill three 1/16-in. holes evenly along the length so you can use brad nails to attach the guide to your work surface.



4 GLUE and nail 1/2-in. thick hardwood strips on the backside of the shelf (E) and 1-1/8 in. decorative molding to the front (F). An 18-gauge air nailer is worth renting for this task. You can nail the molding as you align it without the possibility of it shifting, not to mention you'll be done in less than a tenth of the time required for ordinary nailing.

recess in the partition is convenient for running wiring for low-voltage lights in the soffits of the bookcase. We were just storing books, so the lighting wasn't necessary.

Save time: Preassemble the shelves while the glue sets for the partitions

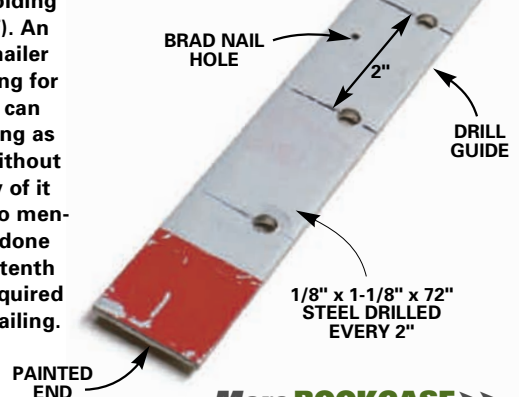
While the glue is drying on the partitions, it's a good idea to get other parts cut and ready to assemble. Start with the shelves. From measuring the room in **Photo 1**, you'll have a good sense of the shelf length. Make them all about an inch or more too long and trim them later for an exact fit. By making the shelves a bit long, you don't have to fuss with perfectly

aligning the moldings on the front and back of the shelf as you glue and nail them together. Also, save time by forming an assembly line.

NOTE: Don't make these shelves more than 42 in. long or they may noticeably sag. Our shelves are 39 in. long.

The 1/2-in. anti-sag

cleat glued to the rear of the shelf is not a stock item, but you can make it on a table saw. First cut 1-1/2 in. wide strips



More BOOKCASE >>>

Classic built-in bookcase

from a wider board. Then tip this piece on end and cut the 3/4-in. width down to 1/2 in. This step is called resawing and can be tricky because the workpiece gets narrow. Use a push stick to keep your fingers clear of the blade. If this is beyond your adventurous spirit, have the lumberyard folks cut it for you for a nominal fee, and stick to the fun parts of the project. And don't forget, while you're resawing (or having someone else do it), make parts Q.

The front molding of the shelf (5/8 in. thick and 1-1/8 in. wide) covers the nasty plywood edge and also stiffens the shelf. This molding came from a local home center. Match it with the profile shown in **Fig. A** or feel free to use any similar profile with the same dimensions.



face frame detail



5 TRACE the brackets (K) from the dimensional grid in Fig. A and cut them out carefully with a jigsaw. Sand the curve smooth with 100-grit sandpaper followed by 150-grit sandpaper.



6 CUT the long stiles (G) of the face frame and nail them with 8d finish nails to the short rails (H and J). Use a drill bit to make a pilot hole slightly smaller than the diameter of the nail. Set the nails and fill the recesses with matching putty later.

Trace the curved brackets using the grid method

Mark your first bracket (K) on a piece of 1x8. First lay out a 1-in. square grid on the 1x8, then mark the shape intersections with the grid and draw a smooth line connecting

the dots. Once the lines are drawn, cut out the shape with a jigsaw and use your first cutout as a template for the rest. Smooth the curve with a drum sander or sanding block.

The partition faces are like super-narrow face frames on cabinets

Because they're so narrow and don't have to support weight as real cabinet face frames do, you can just nail the face frame parts together as shown in **Photo 6** and **Fig. A**. Once they're nailed, you'll need to sand the front and back completely flat to get them to lie nicely against the partition fronts. The tool of choice for this is a random orbital sander (a good \$60 tool if you don't already own one). You can start with 80-grit paper and finish with 150-grit.

Glue and screw the partition cleats to your wall

In this article, we're assuming you have wood or tile floors, but if you have carpeting, you'll need to roll it back, remove the tackless strip, and then stretch and trim it later. We've also assumed that most of you have drywall over wood studs, but if you don't, use the right anchor for your wall, whether it's concrete, brick or plaster. If you have drywall with wood framing, you probably won't hit a stud as you try to screw the partition cleats to the wall (**Photo 7**).

Before fastening the wall cleats, screw a 1x2 cleat to the ceiling so the front edge is 10-1/2 in. from the back wall. This cleat serves two purposes: It helps support the partition and works as a cleat for the fascia (**Photo 9**). Our ceiling joists ran perpendicular to the wall, so we could get a solid connection into the ceiling every 16 in. (your joists may be 24 in. on center). If the joists are running parallel to the back wall, you'll need to use anchors and construction adhesive.

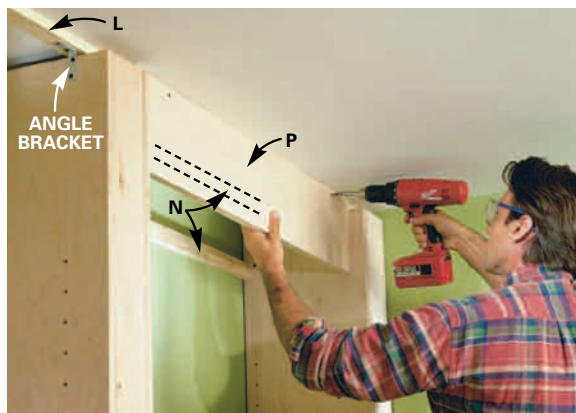
Next, drill four 3/16-in. diameter holes along the length of each wall

More BOOKCASE >>>



7 FASTEN the wall cleats to your drywall with wall anchors and construction adhesive. We used a screw-in anchor called an E-Z Ancor with a 3-in. No. 8 deck screw. Use a level to get the first cleat perfectly plumb, then use your tape measure to place the remaining cleats.

TIP the column partitions into place and slip them over the wall cleats. Fasten the partitions to the cleats with 2-in. screws (3 and 6 in. from the ceiling and the floor, respectively). They'll be hidden later by the upper soffit and lower base of the bookcase. Use a framing square to make sure the partitions are square to the back wall, then fasten them to the ceiling cleat with 2-in. steel angle supports.



9 CUT each fascia piece (P) to fit snugly between the partitions. Cut and fit the cleats (N) as well. Screw the fascia to the ceiling cleat with 1-5/8 in. wood or deck screws.

Classic built-in bookcase

cleat, plumb the cleat into position and then drive a nail through the holes to mark the anchor locations in the drywall. Screw in your wall anchors and then smear construction adhesive on the back-side of the cleat and screw it to the wall. Measure top and bottom to the next cleat to ensure they'll be parallel. Install the rest in the same manner. **NOTE:**

Keep the end wall cleats 1-1/8 in. from adjacent side walls.

bracket and upper partition

Slip the partitions over the wall cleats and screw them into place

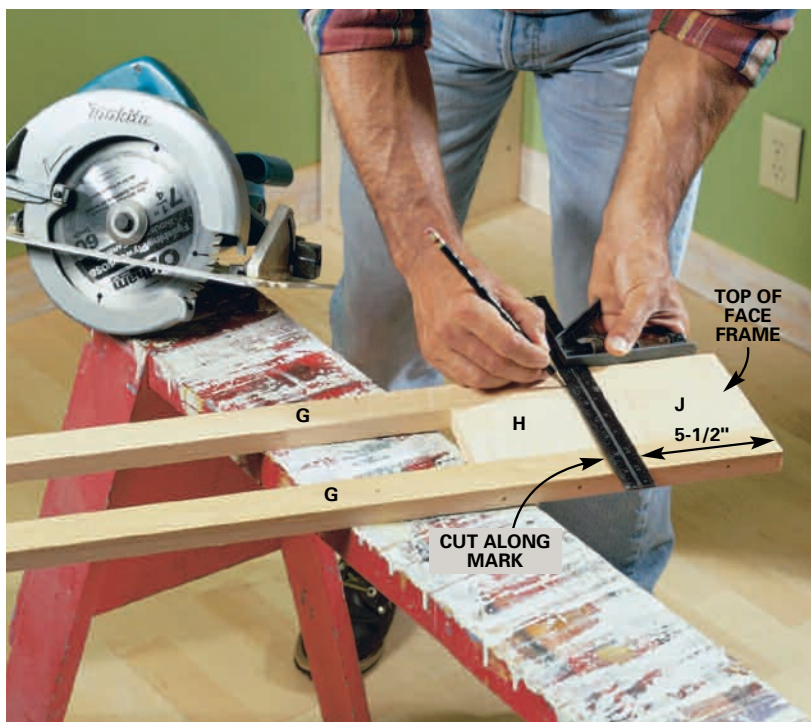
Carry the partitions into the room and tip them up carefully to avoid scarring the ceiling. The partitions are fastened only at the top and bottom, as mentioned in **Photo 8**, so the screwheads will be covered by other parts later. Once the partition is fastened to the cleat, screw the angle brackets to the partitions at the top and bottom 10 in. from the back wall as shown in **Photo 9**. Use a framing square to ensure the partitions are perpendicular to the back wall. Once the partition is perfectly aligned, drive a screw through the brackets into the ceiling cleat and then into the bracket on the floor.

Install cleats to hold the fascia, soffit and base shelf in place

Before you screw the fascia pieces



10 **CUT** the fillets (Q1 through Q4) on a table saw. Sand each piece (100 grit) to soften the sharp edges. Cut and nail each piece into place with a small finish nail. Glue and nail the brackets (K) below the fascia and fillet. Cut the lower bracket supports (S), center them below the brackets and fillet, and glue and nail them to the partition sides with the air nailer.



11 **CUT** the tops off each face frame 5-1/2 in. from the top to make room for the column fillets (Q4). Make the cuts perfectly square.

(P) between the partitions, screw a 1x2 cleat (N1 and N2) to the back-side of each fascia 3/4 in. up from the bottom. Next, fasten the matching wall cleats parallel to the fascia

cleat against the back wall. To finish the top of each section, cut the soffit pieces R and nail them to the cleats.

Screw 1x2 strips (U1) to the bottom of the partitions and make



12 **CENTER** the face frames evenly on the front of the partitions, then glue and nail them to the plywood partition fronts. Glue the fillet (Q4) in place and then glue and nail the top section of the face frame to the top of the partition.



CUT AND NAIL the **13** crown molding to finish the joints along the ceiling. Cut and glue small pieces of wood to fill the gaps on the side of each partition behind the face frame.

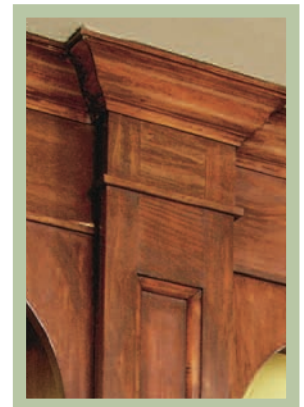


14 **CUT** your crown molding more safely and accurately by positioning the molding upside down on the miter saw bed. Mark the pieces so you can see the mark and slowly cut through the piece. Let the saw fall through the molding. Don't force the saw or hurry the cut.

center floor supports (V) from scrap plywood to support the lower base shelves (**Photo 15**). If you have a floor heat register, remove the cover and install an extension boot (**Photo 17**).

Dressing up the plain boxes with the right trim makes all the difference

Start by nailing the fillet trim (Q1 and Q2) on the bottom of the fascia. The fillet is wider than the fascia, so center it so it extends equally on the front and back of the fascia. Next, glue each bracket (K) to the partition side and nail it to the partition and to the fillet above. Working your way down the side, continue with the small fillet (Q3). Glue this small piece to the bottom of the bracket with molding glue (a tackier woodworking glue) or carpenter's glue. Cut the bracket supports to fit between the fillet and the floor to support the



mitered crown detail

curved bracket. These supports are designed to nestle the shelves and hide the gaps between the shelf ends and the partition sides. Cut the center seat (**Photo 17**) and fit the brackets and fillets underneath as shown in **Fig. A** (the seat height is 22 in.).

Cut the partition face frames as shown in **Photo 11** and fasten them to the partitions. Notice that the plywood front of the partition becomes the background for the face frame. It's not necessary to get

More BOOKCASE >>>

Classic built-in bookcase

a tight fit against the ceiling because the crown molding will cover the ceiling joint and the exposed screws along the top of the fascia.

Crown molding can be fussy, so if you've never installed it before, see "For More Information" on p. 44 and buy an extra piece of molding

(you can always return the unused piece). I've installed miles of crown over the years and still found the small pieces a bit challenging this time because the ceiling was somewhat irregular. The key is to cut the pieces uniform-

ly. I like to draw a line right on the bed of my miter saw and always align the molding edge with the saw. Small gaps at the joints can be filled with putty and sanded, so don't drive yourself nuts seeking perfection against a ceiling that's not. Don't bother coping the crown pieces (**Photo 13**), because they'll be tough to fit; miter them instead.

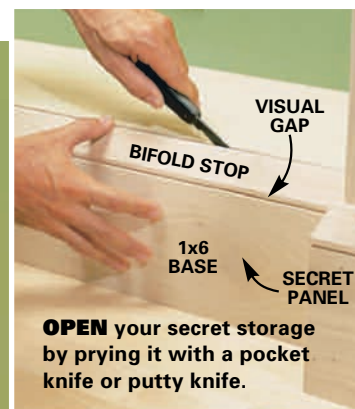
Fitting the base and making a secret compartment

This project will tie in with the rest of the room better if you replace your existing base molding and carry it through along the bottom of the bookcase. We made a two-piece base with 1x6 capped with bifold stop for the top member. To create a small gap between the two base pieces (**Photo 16 and Fig. A**), we chamfered the top edge of the 1x6 and the bottom edge of the bifold

CUT AND NAIL 15
the base molding to wrap around the face frame and partition sides. Note that you'll need small fillets to fill the gaps in the same way as you did at the top under the crown molding returns. Screw in cleats (U) 6-1/4 in. from the floor on the side of each partition. Also screw the floor cleats (V) to the floor to support the center of each base shelf (R).



baseboard detail



16 ASSEMBLE the "removable" secret-panel base section to create a secret storage box under the base shelf. Keep the base panel in place with a cabinet magnet catch fastened to the side of the support piece (V).

More **BOOKCASE** >>>

Classic built-in bookcase

stop slightly with a block plane. This lends a traditional custom molding look.

To create the secret compartment panels, cut some 12-in. blocks and glue them to the back of the 1x6 base pieces and nail the stop molding to the blocks (see **Fig. A**). Glue a pair of small blocks to the backside of parts S to create a stop for the secret panels. Install a magnetic cabinet latch to the center base shelf support (V) to hold the secret panel in place.

Fill all the nail holes, then sand and finish the bookcase

Sand the bookcase with 100-grit sandpaper followed by 150-grit. Paint the bookcase if you'd like or create the handsome antique finish we did. We used Old Masters Gel Stain (see Buyer's Guide) and mixed five parts Cherry to two parts Red



Shopping List

DESCRIPTION	QTY.
3/4" birch plywood.	4
1x8 x 8' birch (fascia and bracket material).	2
1x6 x 10' birch base molding.	2
1x6 x 10' birch (face frame parts).	4
1x6 x 7' birch bracket supports and fillet material.	3
Bifold stop.	20'
1/2" birch quarter-round.	30'
3-1/4" birch crown molding.	20'
1x2 pine cleat strips.	24'
5/8" x 1-1/8" x 8' decra molding.	7
1/4" steel shelf pins.	48
3" deck screws.	2 dozen
2" deck screws.	2 lbs.
1-1/2" 18-gauge air nails.	1 box
8d galvanized casing nails.	1 lb.
Carpenter's glue.	1 pt.
Magnetic cabinet latches.	2

Buyer's Guide

Old Masters Stain can be found at paint supply stores. Call 800-747-3436 for a local dealer. www.oldmastrs.com

For More Information

- "Easy to Install Cove Molding," Dec./Jan. '99, p. 36.
- "Wall Fasteners," Nov. '96, p. 68.

17 ASSEMBLE the window seat by screwing cleats (U2) to the sides of each center partition and then nail the seat to the cleats. Note: The seat is reinforced below by front and rear supports glued to the underside of the seat before it is nailed in place. Glue molding to the front of the seat, then nail the seat brackets and fillets in place as shown in Fig. A.

Mahogany to one part Special Walnut. Blend these in a separate container and apply them to the sanded surface with a clean rag. Apply enough to cover, and remove the excess after a few minutes. Gently remove just enough stain to enhance the grain pattern. A dry brush works to get the excess stain out of the corners. You can rub a bit more aggressively if you'd like to reveal some highlights or simulate wear. Let the stain dry and finish the cabinet with two coats of polyurethane varnish.



seat with optional cushion

Art Direction • BECKY PFLUGER
Photography • BILL ZUEHLKE
Project Design • DAVID RADTKE
Illustrator • EUGENE THOMPSON