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Dave Campbell
Editorial Content Chief, *WOOD* magazine

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One bookcase, three popular styles

Simply change the wood type and trim details to suit your taste. We'll show you how.

Here's a masterpiece you can build that will showcase your treasured tomes for years to come. Simply build the basic case in the wood of your choice, and then add the traditional, country, or Shaker top and bottom trim. The bookcase, which measures 33¾" wide by 13" deep by approximately 6½' high, has a fixed shelf and three adjustable shelves to hold loads of books or display items. We used primarily oak and oak plywood for the traditional bookcase, cherry and cherry plywood for the Shaker unit, and knotty pine and knotty-pine plywood for the country look. But, you also can use less-expensive materials, such as solid poplar with birch plywood, particularly if you plan to paint the unit.

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First, build a case

1 Cut the sides (A) to the size listed in the **Materials List,** on *pages 11-12*. As explained in the Materials key, choose the plywood species that suits your bookcase style.

2 Using a dado-blade set adjusted to the thickness of your ¾" plywood, cut ¼"-deep rabbets on the inside face of the sides (A) at their ends, where shown on **Drawing 1**. Then, cut a ¼"-deep dado near the center, where dimensioned. Now, on the outside face of the sides, drill countersunk shank holes centered on the width of the rabbets and dadoes.

3 To drill the 19/64" holes on the inside face of the sides (A) for the shelf paddle-support sleeves, where dimensioned on **Drawings 1** and **1a**, first mark centerlines for the holes on masking tape along the sides' inside faces. Mark near one edge first, and then transfer the marks to the opposite edge using a framing square. (See the sidebar, *right*, for more information on the shelf support and sleeve hardware.)

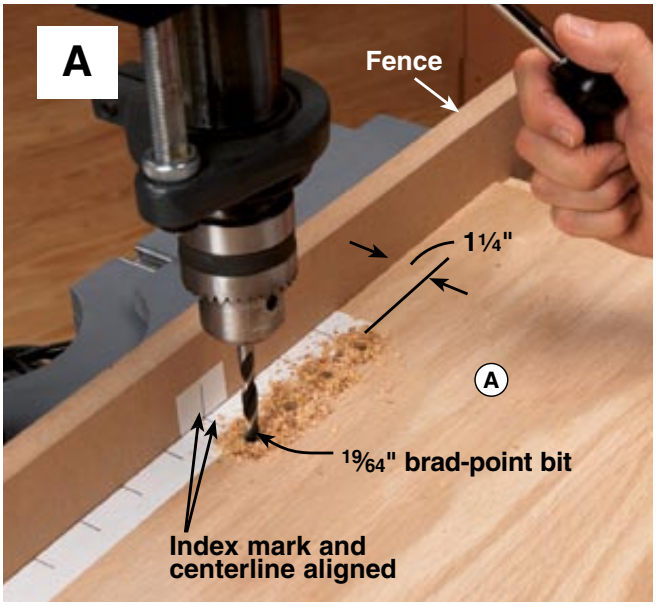
4 Next, chuck a 19/64" brad-point bit in your drill press, and position the fence 1¼" back from the bit's center. Make an index mark on the fence centered with the bit. Then, aligning the marked centerlines with the index mark, drill 5/16"-deep holes in the sides, as shown in **Photo A**. Now, sand the sides with 220-grit sandpaper.

5 From ¾"-thick stock, cut four 1¼×71½" pieces to form the front stiles (B). Laminate the pieces to make a pair of 1½"-thick stiles.

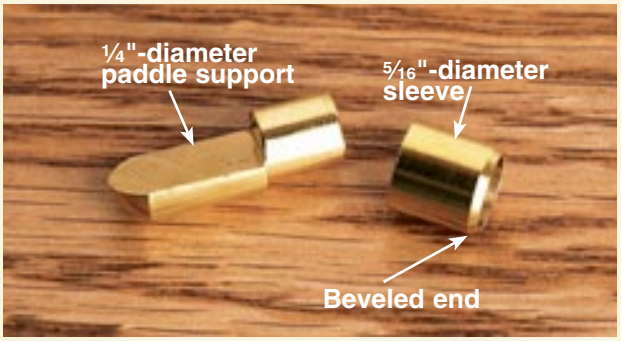
6 Using the same dado-blade stack as before, cut a ¾" rabbet ½" deep along the back face of the stiles, where shown on **Drawing 2**, Step 1, to receive the sides (A). Then, glue and clamp the stiles to the front edge of the sides, where shown on **Drawing 3**. When the glue dries, adjust the dado set to match your ¾"-thick stock, and cut a ¼"-deep groove along the inside face of the stiles, where shown on **Drawing 2**, Step 2.

7 Cut the top, fixed shelf, and bottom (C) and their accompanying rails (D, E, F) to size.

8 **For a Shaker bookcase**, lay out the curve on the top front rail (D), where dimensioned on **Drawing 4**. Then, bandsaw and sand the rail to shape.



With the marked centerlines on the tape aligned with the drill-press fence's index mark, drill 19/64" holes 5/16"-deep in the sides (A).



A case for shelf supports with metal sleeves

Ever been frustrated by shelf supports that won't stay in their holes, sag over time, or require pliers to remove? Holes that are worn or drilled slightly oversize to prevent binding cause the first two problems, and holes that are swollen by moisture or drilled slightly undersize to resist loosening cause the third problem. Here's a simple way to prevent these irritations. Use brass paddle supports with mating sleeves, shown in the photo *above*. The sleeves protect the holes from wear, and they provide a consistent fit with the supports so they're always easy to insert and remove. Another plus: The sleeves hide the hole walls, which can be unsightly, particularly in plywood.

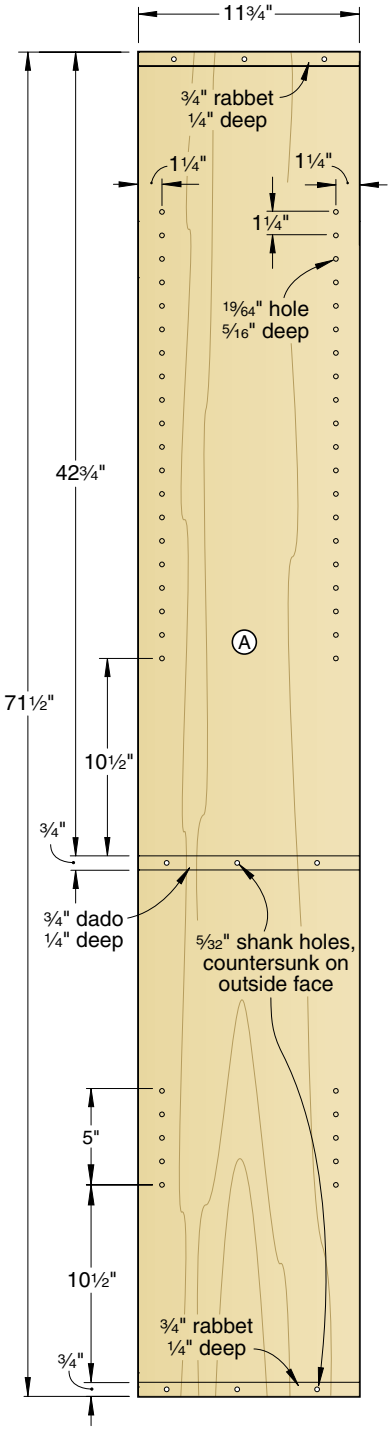
To ensure the 5/16"-diameter sleeves stay snug in their holes, drill the holes using a 19/64" brad-point bit. To install the sleeves, insert their beveled end in the holes, and tap them in flush with a hammer. See Sources on *page 11* to buy the paddle supports, sleeves, and bit.

9 For a country bookcase, make four copies of the top front rail/base front trim full-size partial pattern, on *page 13*. Next, draw a centerline across the width of the top front rail (D). Spray-adhere two copies to the rail, aligning them with the marked centerline, where shown on **Drawing 5**. (You'll need to trim one copy and flip it over to complete the contour.) Set aside the remaining copies. Now, bandsaw and sand the rail to shape, and remove the patterns.

10 Glue and clamp the top, fixed-shelf, and bottom front rails (D, E, F) to the top, fixed shelf, and bottom (C), where shown on **Drawing 3**, keeping the rails' and panels' ends flush and the rails' top edge even with the panels' top face. Position the top panel's best face down and the fixed shelf and bottom panels' best face up. When the glue dries, sand the assemblies smooth.

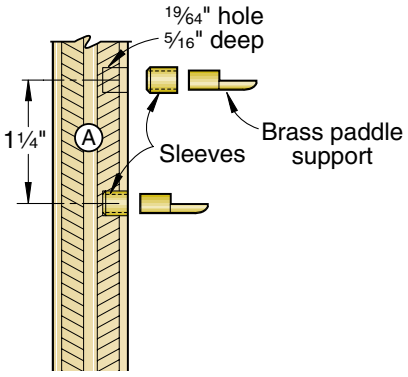
11 Assemble the case by gluing, screwing, and clamping the side assemblies (A/B) to the top, fixed-shelf, and bottom assemblies (C/D, C/E, C/F). Check the case for square.

1 SIDE



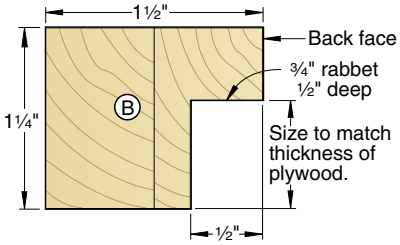
(Inside face shown)

1a SHELF SUPPORT DETAIL

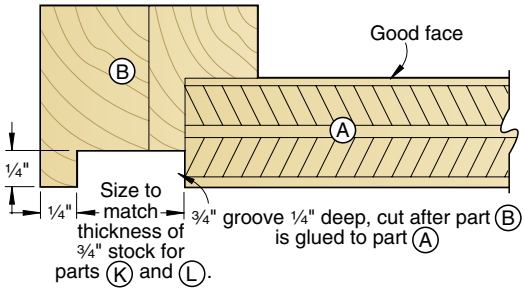


2 FRONT STILE DETAIL TOP VIEW

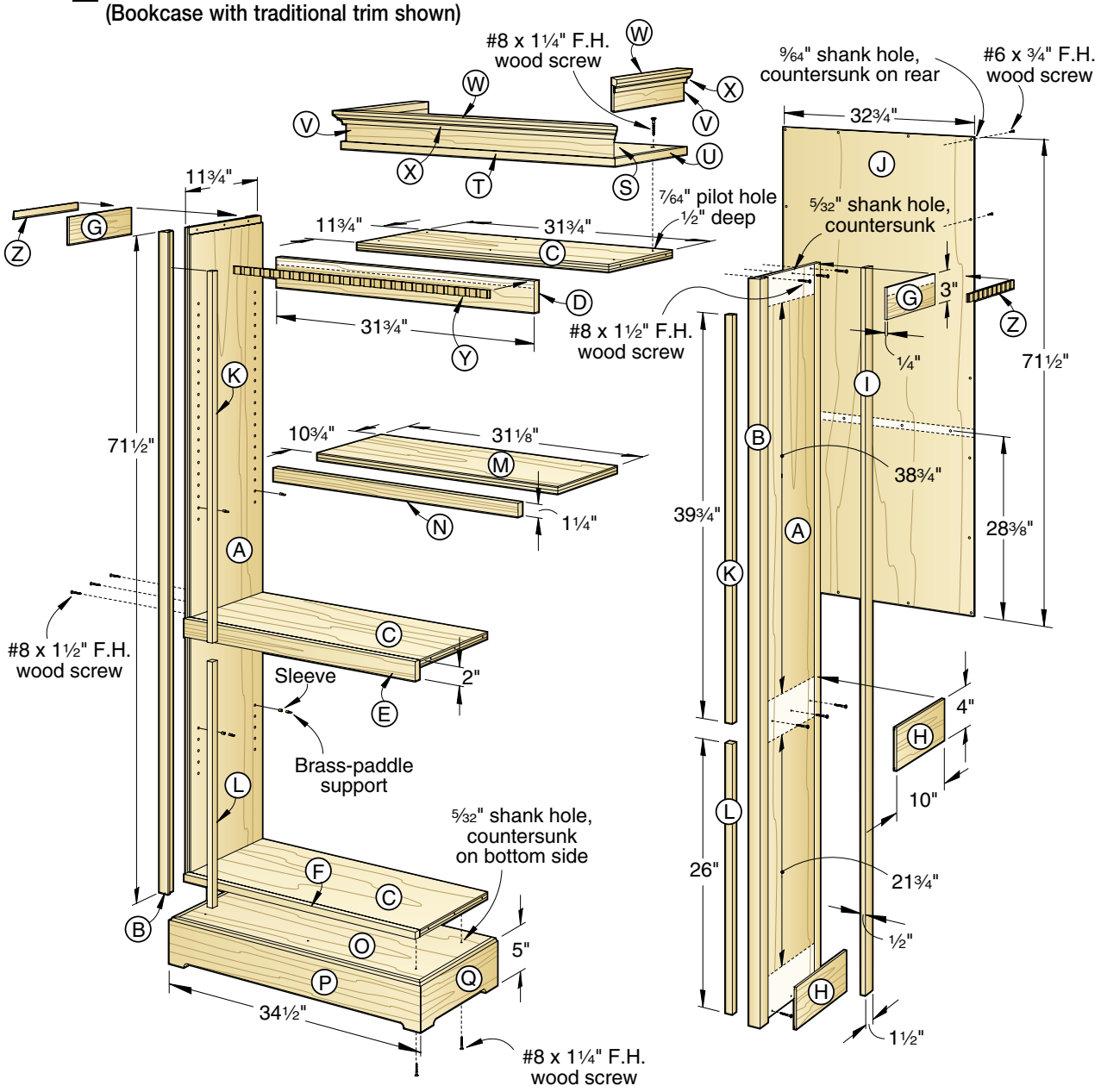
Step 1 Cut the rabbet, and glue the stile (B) to the side (A).



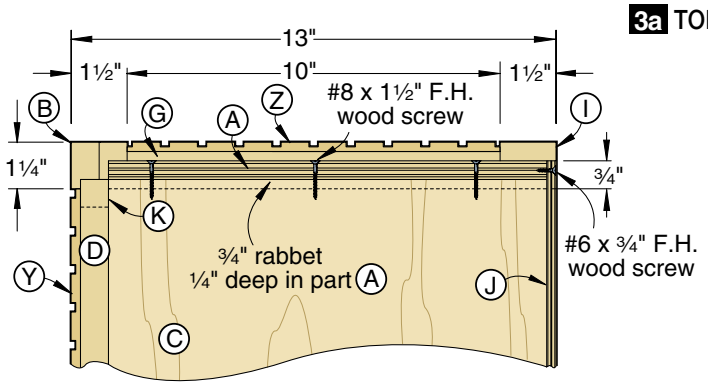
Step 2 Cut a groove in the stile/side assembly.



3 EXPLODED VIEW
(Bookcase with traditional trim shown)



3a TOP SECTION VIEW



Now, complete the case

1 Cut the top side rails (G), middle and bottom side rails (H), and back stiles (I) to size. Sand the parts smooth. To avoid glue squeeze-out when mounting these parts, see the Shop Tip, *right*.

2 Glue and clamp the top side rails (G) and bottom side rails (H) to the sides (A), flush with their top and bottom edges, where shown on **Drawing 3**. Then, when the glue dries, glue and clamp the middle side rails (H) to the sides, as shown in **Photo B**.

3 Glue and clamp the back stiles (I) to the sides (A), flush with their ends and tight against the side rails (G, H). The stiles overhang the sides' back edges by ¼".

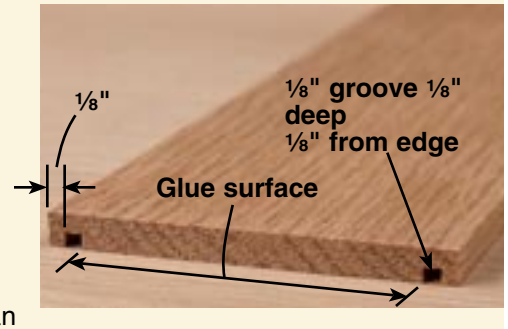
4 Cut the ¼" plywood back (J) to size. Then, on the rear of the back, drill countersunk shank holes, where shown on **Drawing 3**. Now, position the back on the case, drill pilot holes using the shank holes as guides, and drive the screws.

5 Cut the upper and lower fillers (K, L) to size to fit the ¾"-wide grooves in the front stiles (B). **For traditional and Shaker bookcases**, cut the upper filler (K) 39¾" long. **For a country bookcase**, cut the upper filler (K) 38½" long. Glue and clamp the fillers in place.

6 Cut the adjustable shelves (M) and shelf trim (N) to size. Then, glue and clamp the trim to the shelves, flush with their ends and top faces. Sand the shelves smooth.

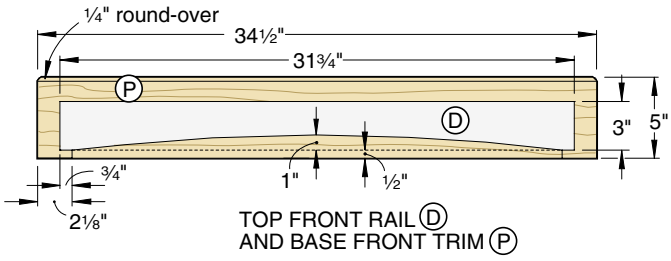
SHOP TIP

A "groovy" way to put the squeeze on glue squeeze-out

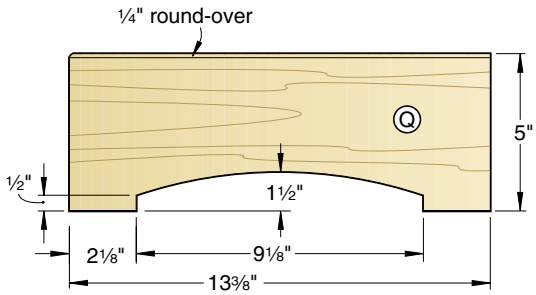


Removing excess glue when assembling parts is messy and risky. If you leave the slightest residue, it can seal the wood and block stain penetration, resulting in a blotchy finish. Here's a simple way to avoid the problem. Cut ⅛" grooves ⅛" deep ⅛" from a part's edges on its glue surface, where shown *above*. Then, apply glue to the area between the grooves, and clamp the part in place. The grooves will capture the excess glue, preventing it from oozing beyond the part's edges.

4 SHAKER TOP FRONT RAIL AND BASE TRIM

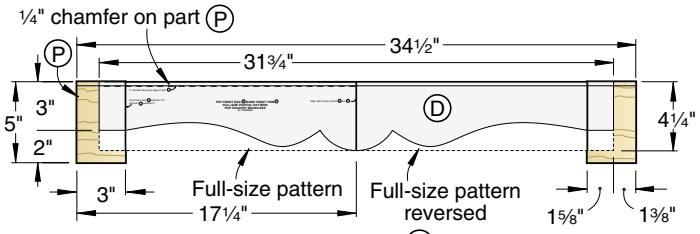


TOP FRONT RAIL (D)
AND BASE FRONT TRIM (P)

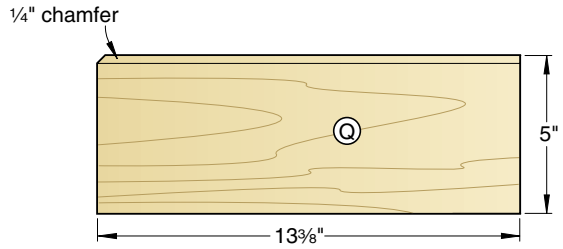


BASE SIDE TRIM

5 COUNTRY TOP FRONT RAIL AND BASE TRIM



TOP FRONT RAIL (D)
AND BASE FRONT TRIM (P)



BASE SIDE TRIM

Add the base

1 Cut the bottom panel (O) to size. Next, to form the front trim (P) and side trim (Q), cut a 5×65" workpiece from ¾"-thick stock. Then, rout the applicable profile along an edge of the workpiece. **For a Shaker bookcase**, rout a ¼" round-over where shown on **Drawing 4**. **For a country bookcase**, rout a ¼" chamfer, where shown on **Drawing 5**. **For a traditional bookcase**, rout a ¼" cove, where shown on **Drawing 6**.

2 Miter-cut the trim (P, Q) to length to fit the bottom panel. For the best appearance, maintain a continuous grain flow across the trim pieces, as laid out on the **Cutting Diagram.**

3 Lay out the applicable contour on the trim. **For a Shaker bookcase**, lay out the curve on the front and side trim (P, Q), where dimensioned on **Drawing 4**. **For a country bookcase**, adhere the remaining two copies of the base front trim pattern to the front trim (P), as you did for the top front rail (D), where shown on **Drawing 5**. [The country base's side trim (Q) does not have a contour.] **For a traditional base**, lay out the contour on the front and side trim (P, Q), where dimensioned on **Drawing 6**.

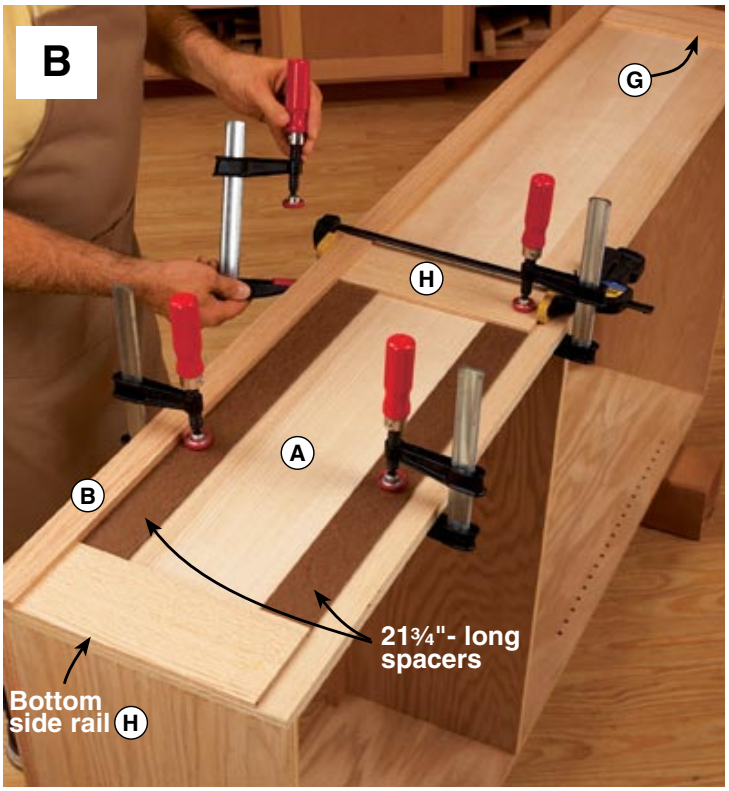
4 Bandsaw the trim to shape, cutting just outside the lines, and then sand to the lines.

5 Cut the corner blocks (R) to size, angle-cutting one end, where dimensioned on **Drawing 6**.

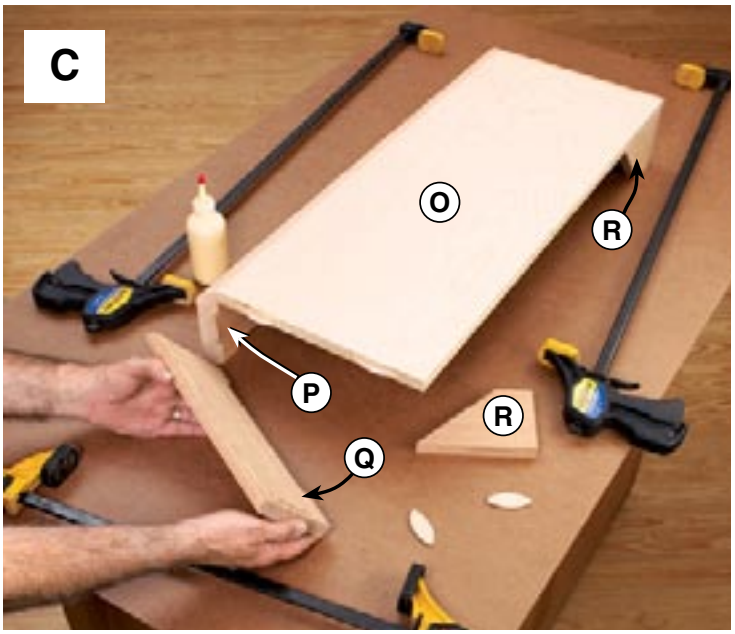
6 Mark centerlines for #20 biscuits on the bottom panel (O), trim (P, Q), and corner blocks (R), where shown on **Drawing 6**. Then, position your biscuit-joiner fence to center the slot cutter on the thickness of the bottom panel. Plunge all of the slots except the ones in the trim's mitered ends. For these, reposition the fence to offset the slot ⅛" from the trim's inside face to ensure the slot cutter does not go through the outside face. Now, plunge the slots in the mitered ends.

7 Assemble the bottom panel, trim, and corner blocks, as shown in **Photo C**. When the glue dries, sand the assembly smooth.

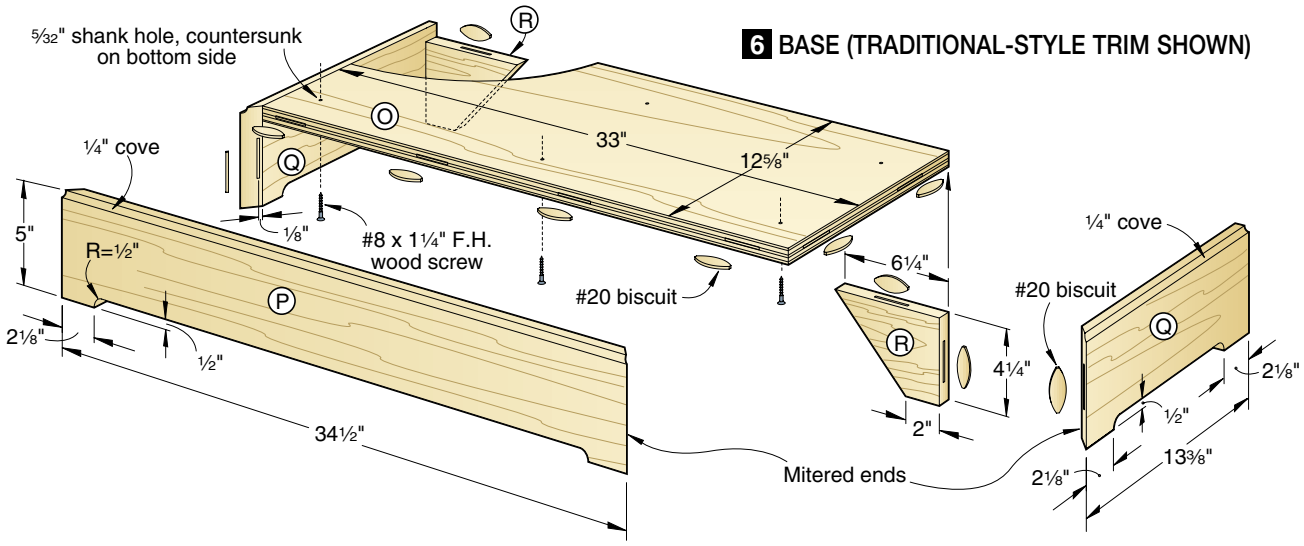
8 Using a helper, set the bookcase on its back on your workbench. Then, position and clamp the base assembly (O/P/Q/R) tight against the bookcase's bottom, flush with the back and centered side to side. Drill countersunk mounting holes through the bottom panel (O) and ½" into the bottom (C), where shown on **Drawings 3** and **6**, and drive the screws. Now, with the instructions in one of the three following sections, add a traditional, Shaker, or country top to the bookcase.



Using 21¾"-long spacers to position the middle side rail (H) above the bottom side rail, glue and clamp the rail to the side (A).



With glue applied in the biscuit slots, assemble the bottom panel (O), trim (P, Q), and corner blocks (R) with #20 biscuits, and clamp the assembly together.



6 BASE (TRADITIONAL-STYLE TRIM SHOWN)

Make a traditional top

1 Cut the plywood top panel (S) to size. Then, miter-cut the front and side edging (T, U) to length to fit the panel, where shown on **Drawing 7**. Now, glue and clamp the edging to the panel.

2 To form the top trim assembly, cut the band, cap, and cove blanks (V, W, X) to the listed sizes, except cut the cove blank (X) to a width of 1½". (The cove blank is initially extra wide for safety when routing.) Rout a ¼" chamfer along an edge of the cap blank (W) and a ½" cove along an edge of the cove blank (X), where shown. Now, rip the cove blank to a width of ⅝".

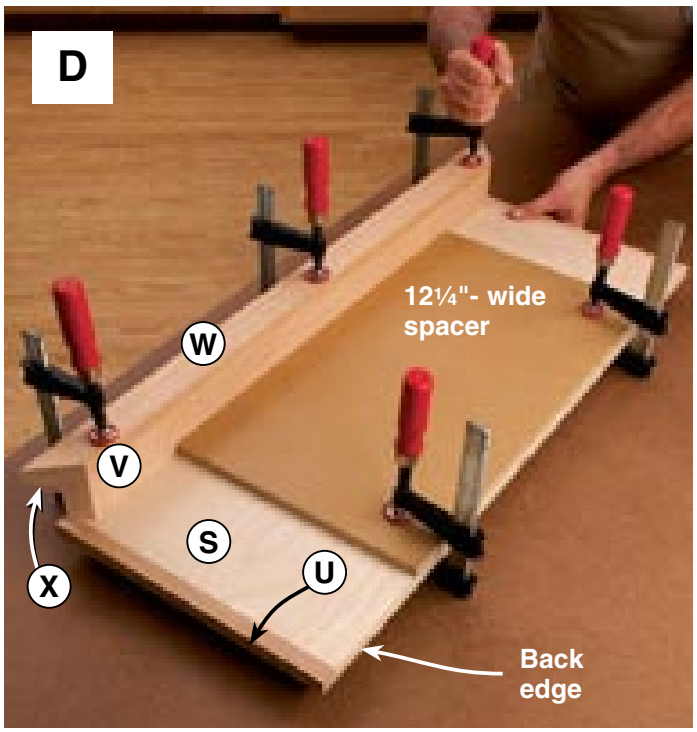
3 Glue and clamp the blanks together in the arrangement shown on **Drawings 7** and **7a**. When the glue dries, miter-cut the assembly so the back (short) edge measures 12¼" for the sides and 32¼" for the front.

4 Glue the front trim piece to the top panel (S), as shown in **Photo D**. Then, glue and clamp the side trim pieces in place.

5 With the bookcase on its back, position and clamp the top panel/trim assembly (S through X) tight against the bookcase's top, flush with the back and centered side to side. Drill mounting holes through the top panel (S) and into the top (C), where shown on **Drawings 3** and **7**, and drive the screws.

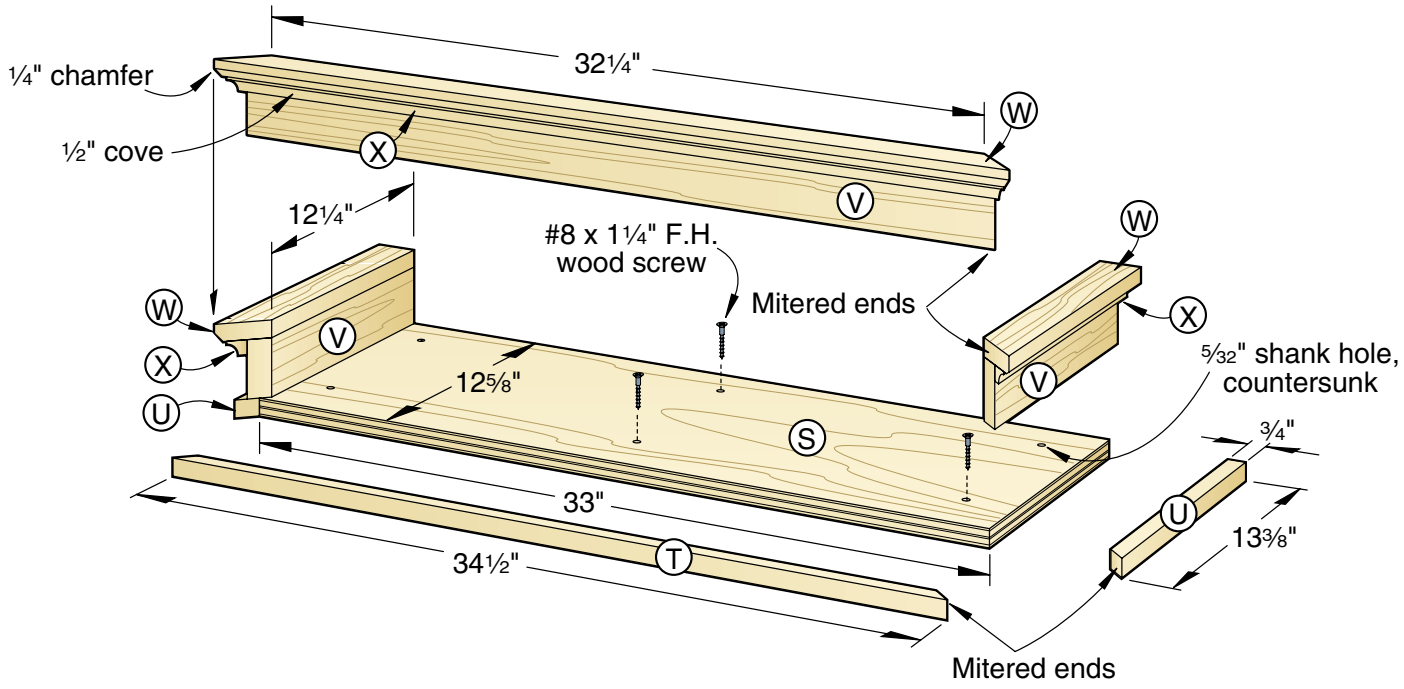
6 To form the front and side dentil molding (Y, Z), shown on **Drawings 3** and **3a**, cut a ¾×5¼" workpiece from ¼"-thick oak. Mark the locations for ¼" dadoes spaced ¾" apart along the length of the workpiece, where dimensioned on **Drawing 8**. Now, using a dado blade, cut the dadoes ⅛" deep.

7 Cut the molding to the listed lengths, leaving ¼"-wide recesses at the ends of the front dentil molding (Y) and ⅛" wide recesses at the ends of the side dentil molding (Z), where shown. Now, glue the front molding to the top front rail (D) and the side molding to the top side rails (G), tight against the top-panel edging (T, U), where shown on **Drawing 3**.

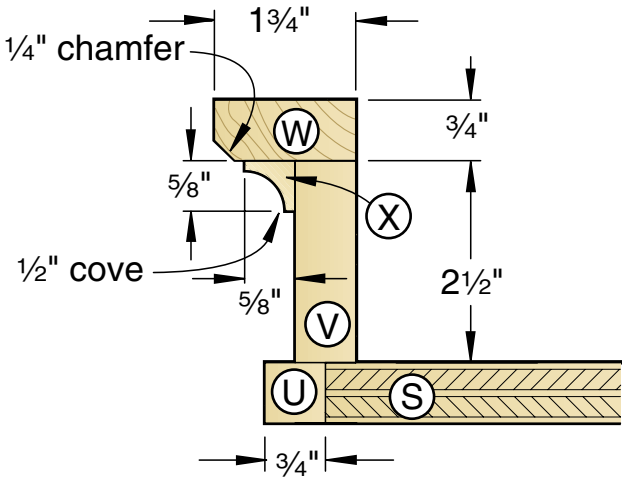


Using a 12¼"-wide scrap spacer to position the front trim (V/W/X) from the back edge of the top panel (S) and centering the assembly side to side, glue and clamp it to the panel.

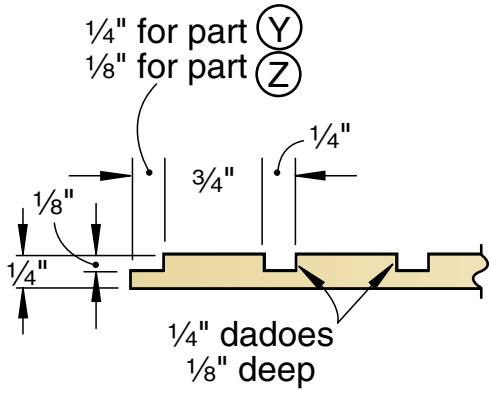
7 TRADITIONAL TOP

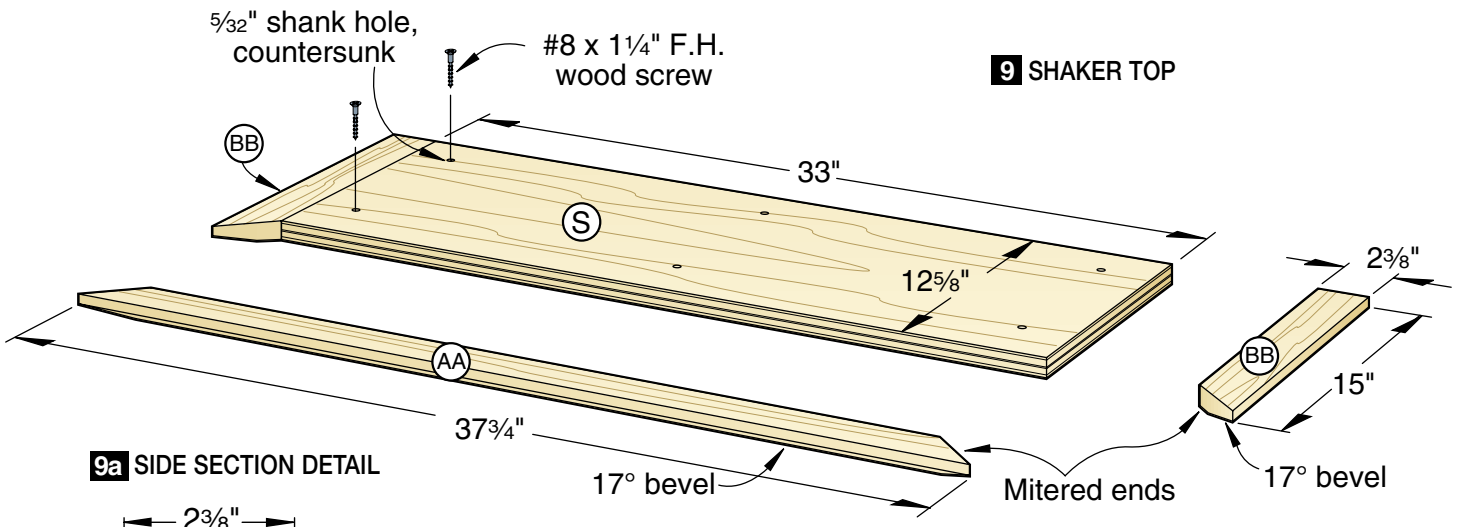


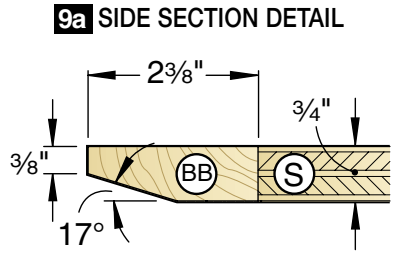
7a SIDE SECTION DETAIL

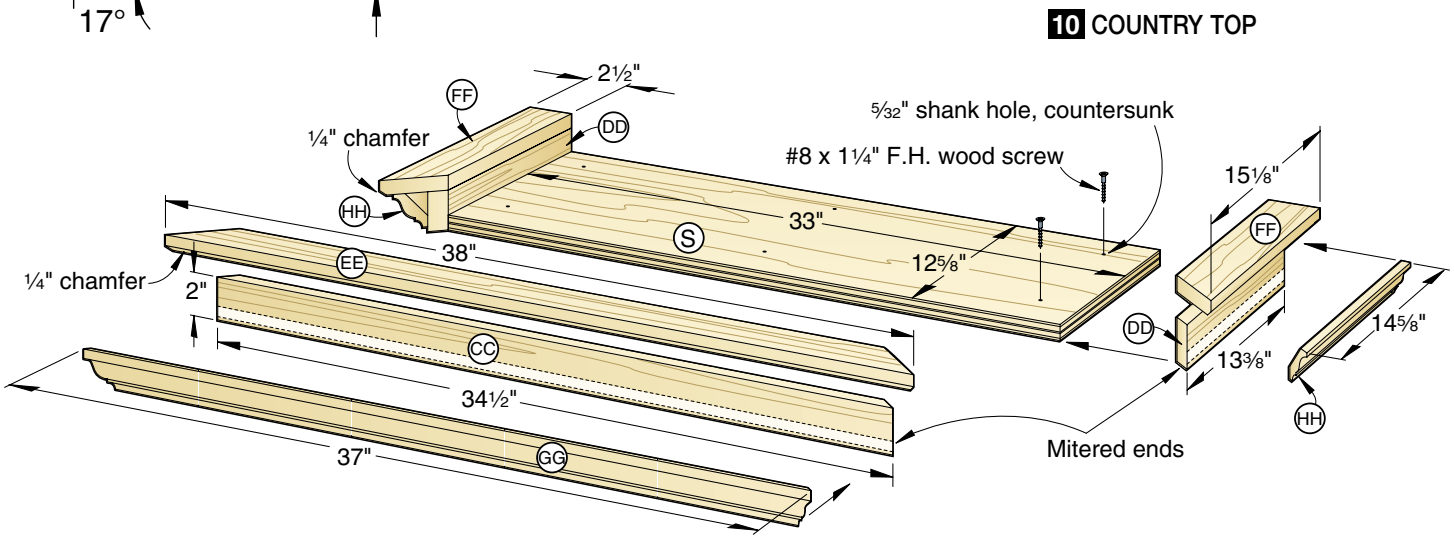


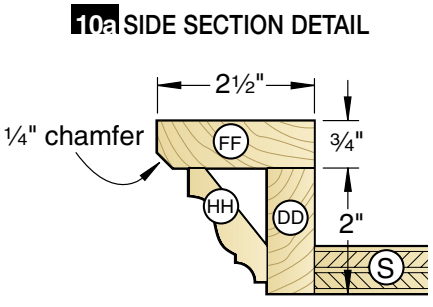
8 DENTIL MOLDING DETAIL











Build a Shaker top

1 Cut the plywood top panel (S) to size. Then, miter-cut the front and side edging (AA, BB) to length to fit the panel, where shown on **Drawing 9**. Now, glue and clamp the edging to the panel.

2 Tilt your tablesaw's blade to 17° from vertical. Now, using a tall auxiliary fence attached to your rip fence for support, bevel-rip the edging, where dimensioned on **Drawing 9a**, cutting the side edging first and then the front edging. Sand the bevels smooth.

3 With the bookcase on its back, position and clamp the top panel/trim assembly (S/AA/BB) tight against the bookcase's top, flush with the back and centered side to side. Drill mounting holes through the top panel (S) and into the top (C), where shown on **Drawings 3** and **9**, and drive the screws.

Add a country top

1 Cut the plywood top panel (S) to size. Then, miter-cut the front and side bands (CC, DD) to length to fit the panel, where shown on **Drawings 10** and **10a.** Now, glue and clamp the bands to the panel.

2 From ¾"-thick knotty pine, cut a 2½×72" workpiece to form the front and side caps (EE, FF). Then, rout a ¼" chamfer along an edge of the workpiece, where shown. Miter-cut the caps to length to fit on top of the bands (CC, DD). Now, glue and clamp the caps in place, keeping their back edge flush with the bands' back face.

3 Cut the front and side crown molding (GG, HH) to the lengths listed. (We used architectural pine wood molding no. WM54, available at home centers.) Then, glue the molding to the bands (CC, DD) and caps (EE, FF), where shown.

Finish up

1 Sand any areas that need it with 220-grit sandpaper, and remove the dust.

2 Finish the bookcase as you wish. For the traditional bookcase, we applied ZAR Oil-Based Stain no. 114 Provincial and two coats of AquaZAR Water-Based Clear Satin Polyurethane, sanding to 320 grit between coats.

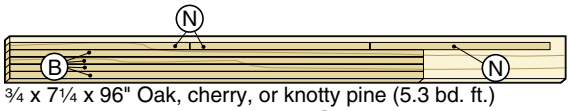
For the Shaker bookcase, we omitted a stain and applied two coats of DEFT Satin Lacquer Clear Wood Finish, sanding to 320 grit between coats.

For the country bookcase, we first applied Minwax Pre-Stain Wood Conditioner to help the knotty pine absorb the stain evenly. (We kept the wood wet until it stopped soaking in the conditioner before wiping off the excess.) Then, we applied Minwax Oil-Based Wood Finish, no. 218 Puritan Pine. After the stain dried, we finished with two coats of Minwax Fast-Drying Polyurethane, sanding to 220 grit between coats.

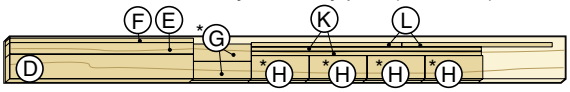
3 Finally, install the sleeves (beveled end in first) for the paddle supports in all of the holes in the sides (A). Then, with your helper, place the bookcase where you wish, and install the paddle supports and shelves (M/N). Now, start filling this lofty library with your favorite books.

Produced by **Marlen Kemmet**
Written by **Owen Duvall** with **Chuck Hedlund**
Project design: **Jeff Mertz**
Graphic design: **Design by Antje**
Illustrations: **Roxanne LeMoine**

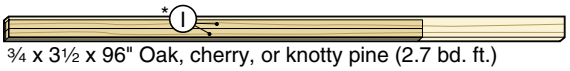
Cutting Diagram



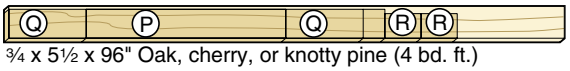
¾ x 7¼ x 96" Oak, cherry, or knotty pine (5.3 bd. ft.)



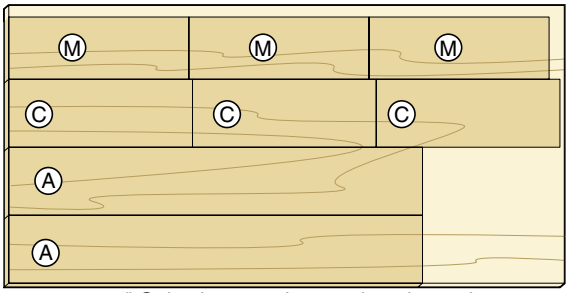
¾ x 7¼ x 96" Oak, cherry, or knotty pine (5.3 bd. ft.)
*Plane or resaw to the thicknesses listed in the Materials List.



¾ x 3½ x 96" Oak, cherry, or knotty pine (2.7 bd. ft.)

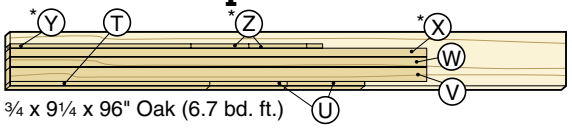


¾ x 5½ x 96" Oak, cherry, or knotty pine (4 bd. ft.)



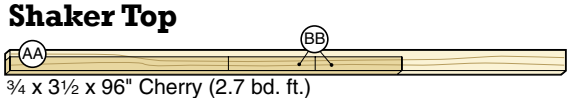
¾ x 48 x 96" Oak, cherry, or knotty-pine plywood

Traditional Top



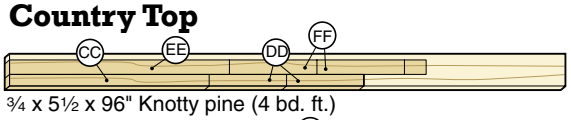
¾ x 9¼ x 96" Oak (6.7 bd. ft.)

Shaker Top

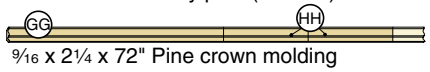


¾ x 3½ x 96" Cherry (2.7 bd. ft.)

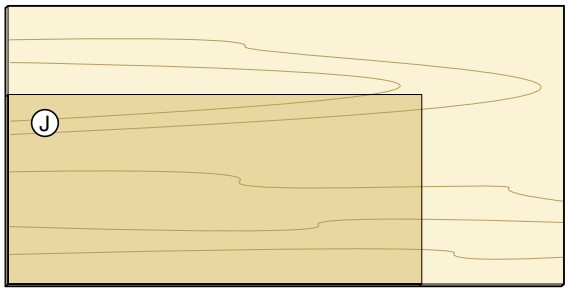
Country Top



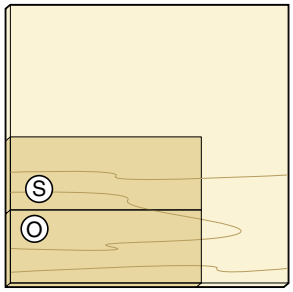
¾ x 5½ x 96" Knotty pine (4 bd. ft.)



9/16 x 2¼ x 72" Pine crown molding



¼ x 48 x 96" Oak, cherry, or knotty-pine plywood



¾ x 48 x 48" Birch plywood

Materials List

Case		FINISHED SIZE T	W	L	Matl.	Qty*.
A	sides	¾"	11¾"	71½"	CP	2
B	front stiles	1½"	1¼"	71½"	CL	2
C	top, fixed shelf, and bottom	¾"	11¾"	31¾"	CP	3
D	top front rail	¾"	†	31¾"	CS	1
E	fixed-shelf front rail	¾"	2"	31¾"	CS	1
F	bottom front rail	¾"	¾"	31¾"	CS	1
G	top side rails	¼"	3"	10"	CS	2
H	middle and bottom side rails	¼"	4"	10"	CS	4
I	back stiles	½"	1½"	71½"	CS	2
J	back	¼"	32¾"	71½"	CP	1
K	upper fillers	¾"	¾"	††	CS	2
L	lower fillers	¾"	¾"	26"	CS	2
M	adjustable shelves	¾"	10¾"	31⅛"	CP	3
N	shelf trim	¾"	1¼"	31⅛"	CS	3
Base						
O	bottom panel	¾"	12⅝"	33"	BP	1
P*	front trim	¾"	5"	34½"	CS	1
Q*	side trim	¾"	5"	13⅜"	CS	2
R	corner blocks	¾"	4¼"	6¼"	CS	2
Traditional Top						
S	top panel	¾"	12⅝"	33"	BP	1
T	front edging	¾"	¾"	34½"	O	1
U	side edging	¾"	¾"	13⅜"	O	2
V	band blank	¾"	2½"	72"	O	1
W	cap blank	¾"	1¾"	72"	O	1
X*	cove blank	⅝"	⅝"	72"	O	1

continued on next page

*Parts initially cut oversize. See the instructions.

†For traditional and Shaker bookcases, width of part D is 3". **For country bookcase**, width of part D is 4¼".

††For traditional and Shaker bookcases, length of part K is 39¾". **For country bookcase**, length of part K is 38½".

Materials key: CP–choose plywood species, CL–choose laminated solid stock species, CS–choose solid stock species, BP–birch plywood, O–oak, C–cherry, KP–knotty pine, P–pine. For items CP, CL, and CS, use oak for the traditional bookcase, cherry for the Shaker bookcase, and knotty pine for the country bookcase.

Supplies: Spray adhesive; #6×¾", #8×1¼", and #8×1½" flathead wood screws; #20 biscuits.

Blades and bits: Dado-blade set, 19⁄64" brad-point drill bit. For the country bookcase: chamfer router bit. For the Shaker bookcase: ¼" round-over router bit. For the traditional bookcase: chamfer, ¼" and ½" cove router bits.

Sources

Hardware. Brass paddle supports, no. 63Z06.04, package of 20 (1 package); brass sleeves, no. 63Z06.06, package of 20 (5 packages). Call Lee Valley 800/871-8158, or go to www.leevalley.com.

Drill bit. 19⁄64" brad-point drill bit, no. 07J02.19. Lee Valley—phone and Web address above.

Y*	front dentil molding	1/4"	3/4"	31 1/4"	O	1
Z*	side dentil molding	1/4"	3/4"	10"	O	2
Shaker top						
S	top panel	3/4"	12 5/8"	33"	BP	1
AA	front edging	3/4"	2 3/8"	37 3/4"	C	1
BB	side edging	3/4"	2 3/8"	15"	C	2
Country Top						
S	top panel	3/4"	12 5/8"	33"	BP	1
CC	front band	3/4"	2"	34 1/2"	KP	1
DD	side bands	3/4"	2"	13 3/8"	KP	2
EE*	front cap	3/4"	2 1/2"	38"	KP	1
FF*	side caps	3/4"	2 1/2"	15 1/8"	KP	2
GG	front crown molding	9/16"	2 1/4"	37"	P	1
HH	side crown molding	9/16"	2 1/4"	14 5/8"	P	2

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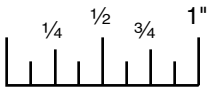
¼" chamfer along top edge of part Ⓟ

Join pattern here.

From here, part Ⓓ extends 1⅝",
and part Ⓟ extends 3".

TOP FRONT RAIL Ⓓ/BASE FRONT TRIM Ⓟ
FULL-SIZE PARTIAL PATTERN
FOR COUNTRY BOOKCASE
(4 needed)

To ensure full-size patterns are correct size, your printer should be set to print at 100% (not fit to page). Measure full-size patterns to verify size.



¼" chamfer along top edge of part Ⓟ

Join pattern here.

Align with center of parts Ⓓ and Ⓟ.

Ⓓ/Ⓟ