comfy classic garden bench

Build the best seat outside the house with this handsome project.

Solid cedar, mortise-and-tenon joinery, waterproof glue, and stainless-steel fasteners mean this traditionally styled bench will look good for years.

Start with the legs

Note: *Due to the high moisture content of construction-grade lumber, the cedar used for this project can shrink significantly after you purchase it. To minimize shrinkage problems, stack and sticker your boards indoors and off the floor for at least one week. When selecting glue, turn the higher moisture content of the lumber to your advantage by using polyurethane glue, which requires moisture to cure.*

1 For the rear legs (A), front legs (B), and arms (E), laminate oversize blanks from two pieces of 1½"-thick stock. (We used polyurethane glue.) Plane the resulting 3"-thick blanks to 2½" thick, removing equal amounts from each face. Then joint one edge. Rip and crosscut the blanks to the sizes listed on the **Materials List**.

2 Referring to **Drawing 1**, lay out the shape of the rear legs (A) on the *inside* faces, including the dashed line at the upper front face of the leg. (When first bandsawing the leg to shape, you'll cut along the straight dashed line.) Then lay out the notch for the arm (E), the lower mortise on the inside face, the mortise on the front face, and the centerline of the #20 biscuit slot. Make sure the legs are mirror images. Now make a photocopy of the **Rear Leg End Patterns** on *page 17* and adhere them to the blanks with spray adhesive.

3 To stabilize the rear leg (A) blanks when cutting the arm (E) notches, attach a 6"-tall extension to your tablesaw miter gauge. Raise the blade to 2⅜". Then place one blank on edge against the miter gauge, and using the fence as a stop, define both edges of the notch with saw kerfs, as shown in **Photo A**. Now make multiple passes between the two kerfs to clean out the notch. Move the fence and miter gauge to the other side of the blade and repeat with the other leg blank.

4 To form the ½×2½" mortise 1$\frac{1}{16}$" deep in the front edge of each rear leg (A), chuck a ½" brad-point bit in your drill press and position the fence to center the bit on the mortise marked on each blank. Then drill overlapping holes 1$\frac{1}{16}$" deep. Smooth the sides of the mortise and square the ends with a chisel. Now cut a slot for a #20 biscuit, centered in the front face of each leg, where shown on **Drawing 1**.

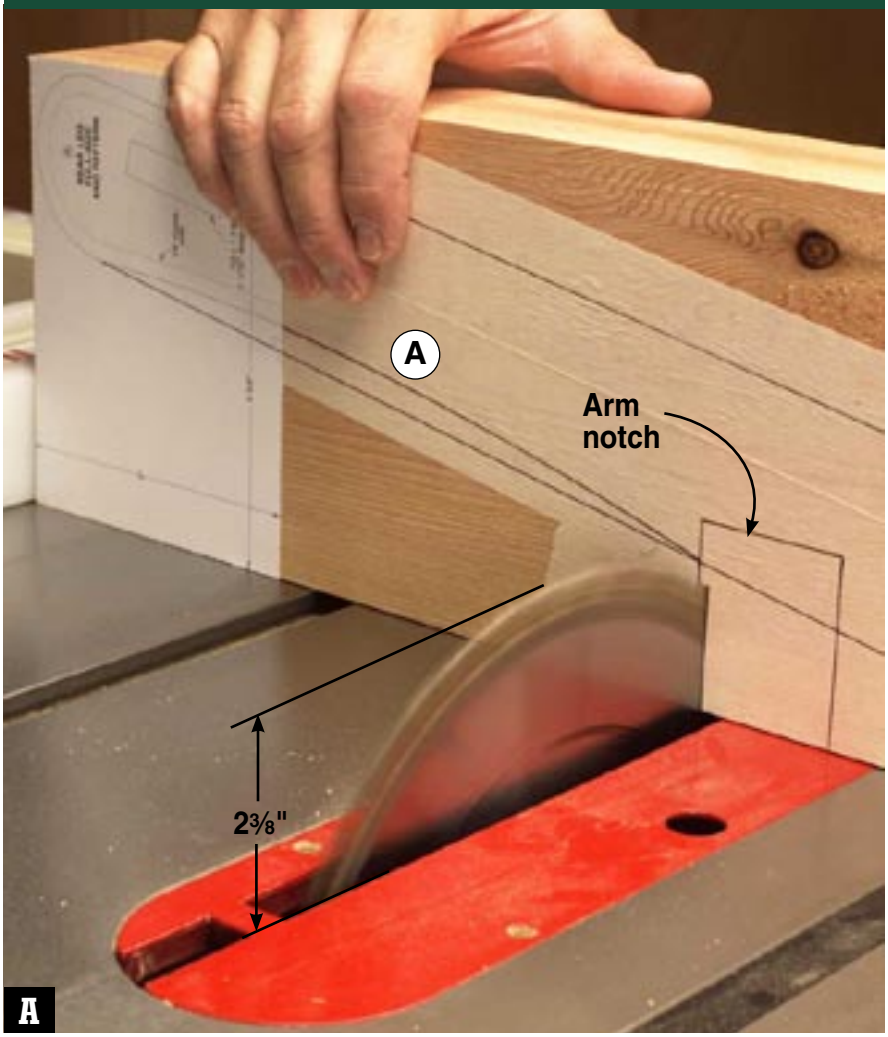
5 Bandsaw and sand each rear leg (A) *back* profile to shape. Then placing each leg blank on the front edge, use your drill press to drill ⅜" counterbores ⅝" deep with $\frac{5}{32}$" centered holes, centered vertically in the arm (E) notch, where shown on **Drawing 1**.

6 Bandsaw and sand each rear leg (A) *front* profile to shape, following the straight dashed line between the notch for the arm (E) and the top of the leg. Then, placing the front edge of the angled portion of the leg against the drill-press fence, center a ½" brad-point bit on the mortises and drill 1$\frac{1}{16}$"-deep overlapping holes. Clean up the mortises with a chisel.

7 Bandsaw and sand the final profile of the upper front portion of the rear legs (A) to shape. Then rout ¼" round-overs along all ends and edges *except* for the arm (E) notch. Finish-sand the rear legs.

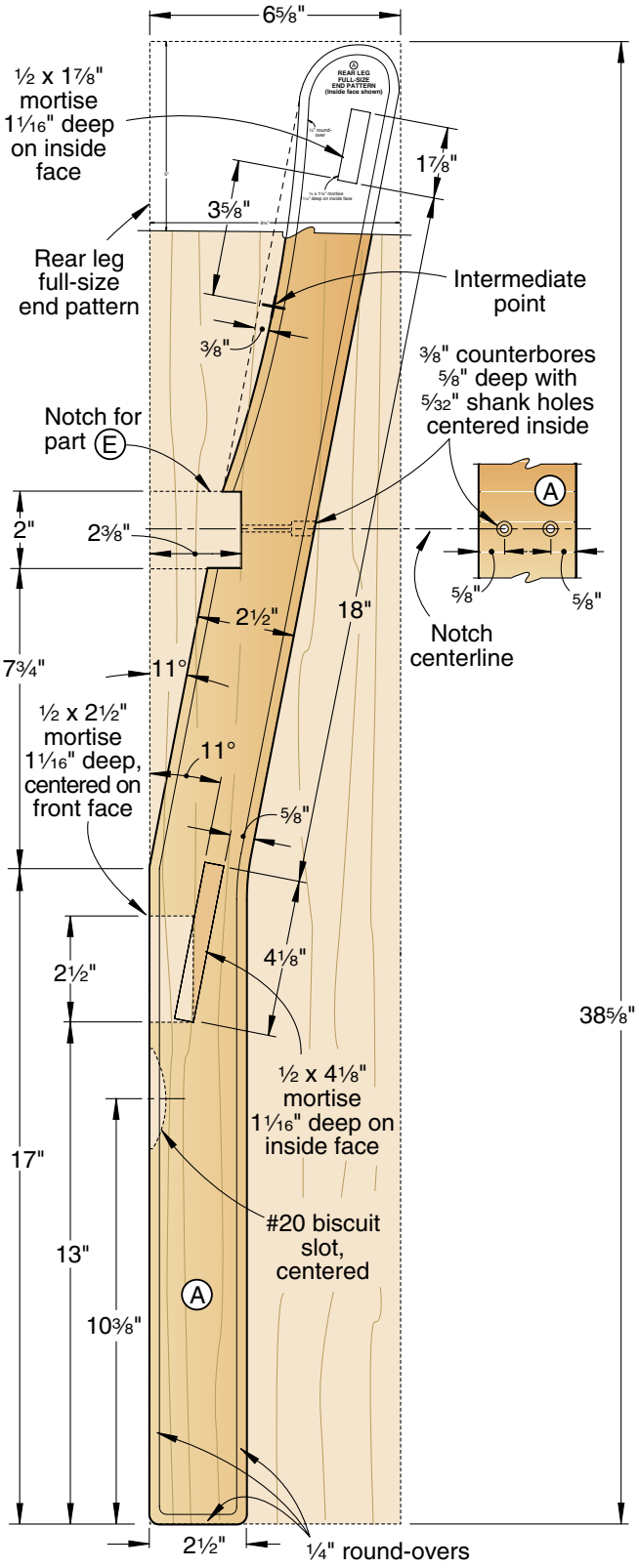
8 Referring to **Drawing 2**, lay out the mortises and the centerlines of the #20 biscuit slots on the *inside* and *rear* faces of each front leg (B). Make sure the parts are mirror images. Drill and chisel the mortises, and cut the biscuit slots. Rout ¼" round-overs along the bottom ends and all the edges. Finish-sand the legs.

CUT THE ARM NOTCHES

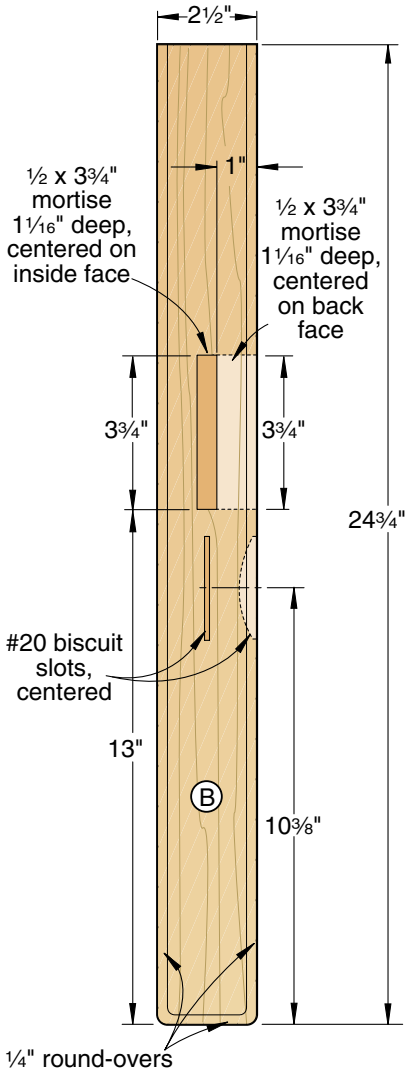


Position the fence to align one edge of the arm notch with the blade, and make a cut. Reposition the fence, and cut the other edge.

1 REAR LEG
(Inside face shown)



2 FRONT LEG
(Inside face shown)



Build the end assemblies

1 Plane two 8'-long 2×6s and one 8'-long 2×8 to 1¼" thick for the end rails (C), front rail (F), lower back rail (G), upper back rail (H), center rail (L), center cleat (M), and end cleats (N).

2 From the 1¼"-thick stock, cut the end rails (C) to size. Then install a ¾" dado blade in your tablesaw, and adjust it to cut ⅜" deep. With the rails flat on the saw table, cut 1"-long tenon face cheeks on both ends of the rails, where shown on **Drawing 3** and as shown in **Photo B**. Now position each rail on edge, and cut the front tenon upper and lower cheeks and the rear tenon lower cheek. Next, measuring from the bottom of the tenon, mark the 2½" rear tenon width and form the top rear tenon cheeks with your bandsaw.

3 Make a photocopy of the **End Rail End Patterns** on *page 18,* and adhere them to one end rail (C) with spray adhesive, where shown on **Drawing 3**. Then lay out the three intermediate points of the top profile where dimensioned, and connect the end patterns with a smooth line connecting the points. Bandsaw and sand the rail to shape. Now cut slots for #20 biscuits centered in the bottom edge of the rail, where dimensioned on the patterns. Next, using the completed end rail as a template, trace the profile onto the other end rail, and bandsaw and sand it to shape. Lay out the biscuit centerlines, and cut the slots. Chuck a ¼" round-over bit into your table-mounted router and rout the bottom edges of the rails.

4 From the 1¼" stock, cut the end cleats (N) to size. Again using the end rail (C) as a template, trace the top profile onto the cleats, where shown on **Drawing 3**. Then bandsaw and sand the top profile to shape. Now draw the 1½" cleat width, as shown in **Photo C**, and bandsaw and sand them to shape. Set the cleats aside.

5 Cut six blanks for the brackets (D) to the size listed. Make a copy of the **Bracket Pattern** on *page 20*, and adhere it to one blank. Cut centered slots for #20 biscuits in all six blanks, where dimensioned on the pattern. Then bandsaw and sand the bracket to shape. Using this bracket as a template, trace the shape onto the remaining bracket blanks and bandsaw and sand them to shape. Now use your table-mounted router to rout ¼" round-overs along the edges of all the brackets, where shown on the pattern.

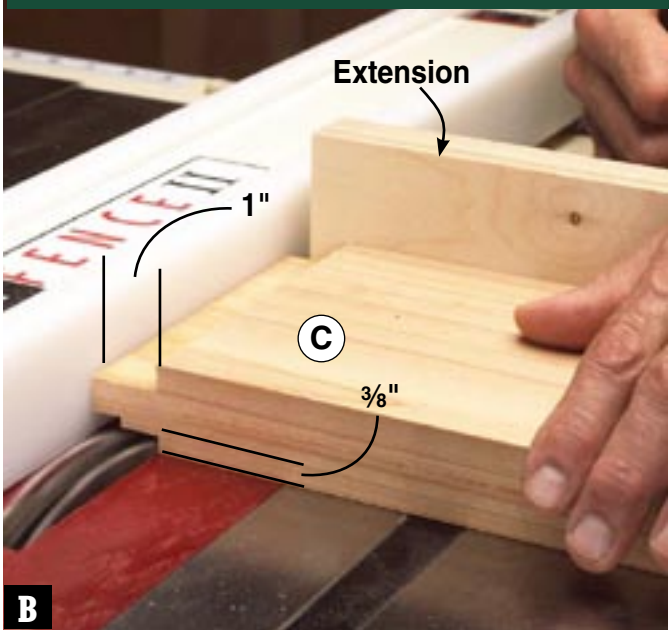
6 Retrieve the laminated blanks for the arms (E). Make a copy of the **Arm End Patterns** on *page 21,* and adhere them to one blank, where shown on **Drawing 4**. Drill two ⅜" counterbores ⅝" deep with 5/32" shank holes centered inside, where dimensioned. Then lay out the two intermediate points of the top profile, where dimensioned. Now complete the pattern by drawing a smooth line through the intermediate points. Bandsaw and sand the arm to shape. Using this arm as a template, trace the outline onto the other blank. Drill the holes and bandsaw and sand the arm to shape. Next rout ¼" round-overs along the edges of both arms.

7 To cut a centered 2½"-wide notch 1" deep at the rear of each arm (E), where shown on **Drawings 4** and **5**, define one side of each notch with a 1"-long bandsaw cut, as shown in **Photo D**. Then reposition the fence 3" from the right side of the blade and define the other side of the notch with another cut. Now saw out the material between the side cuts.

8 Spread glue in each rear leg (A) front mortise and in each front leg (B) back mortise. Insert the end rail (C) tenons, where shown on **Drawing 5**, and clamp the assemblies. Then glue and biscuit four of the brackets (D) in place, clamping them tight into the corners to square the assemblies.

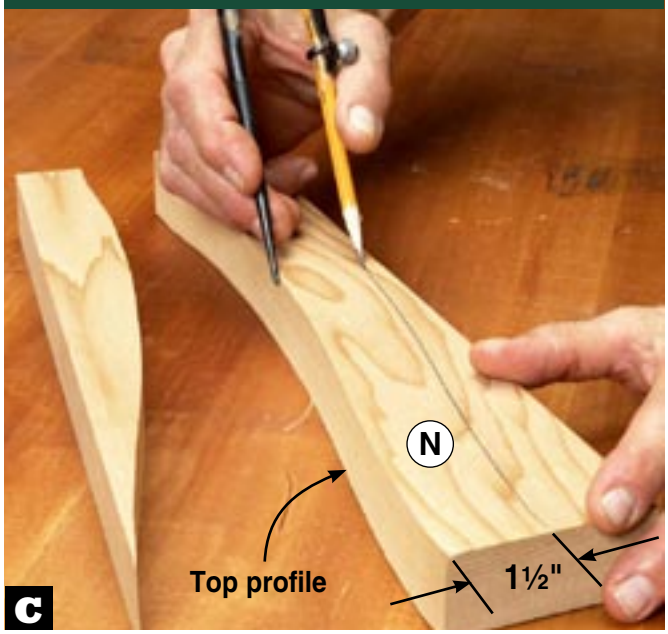
9 Glue and clamp the arms (E) in place, interlocking the notches with the rear leg (A) notches, and centering the arms over the front legs (B). Fasten the arms to the rear legs, as shown in **Photo E**. Then using the holes in the arms as guides, drill pilot holes into the front legs and drive the screws.

CUT THE TENON FACE CHEEKS

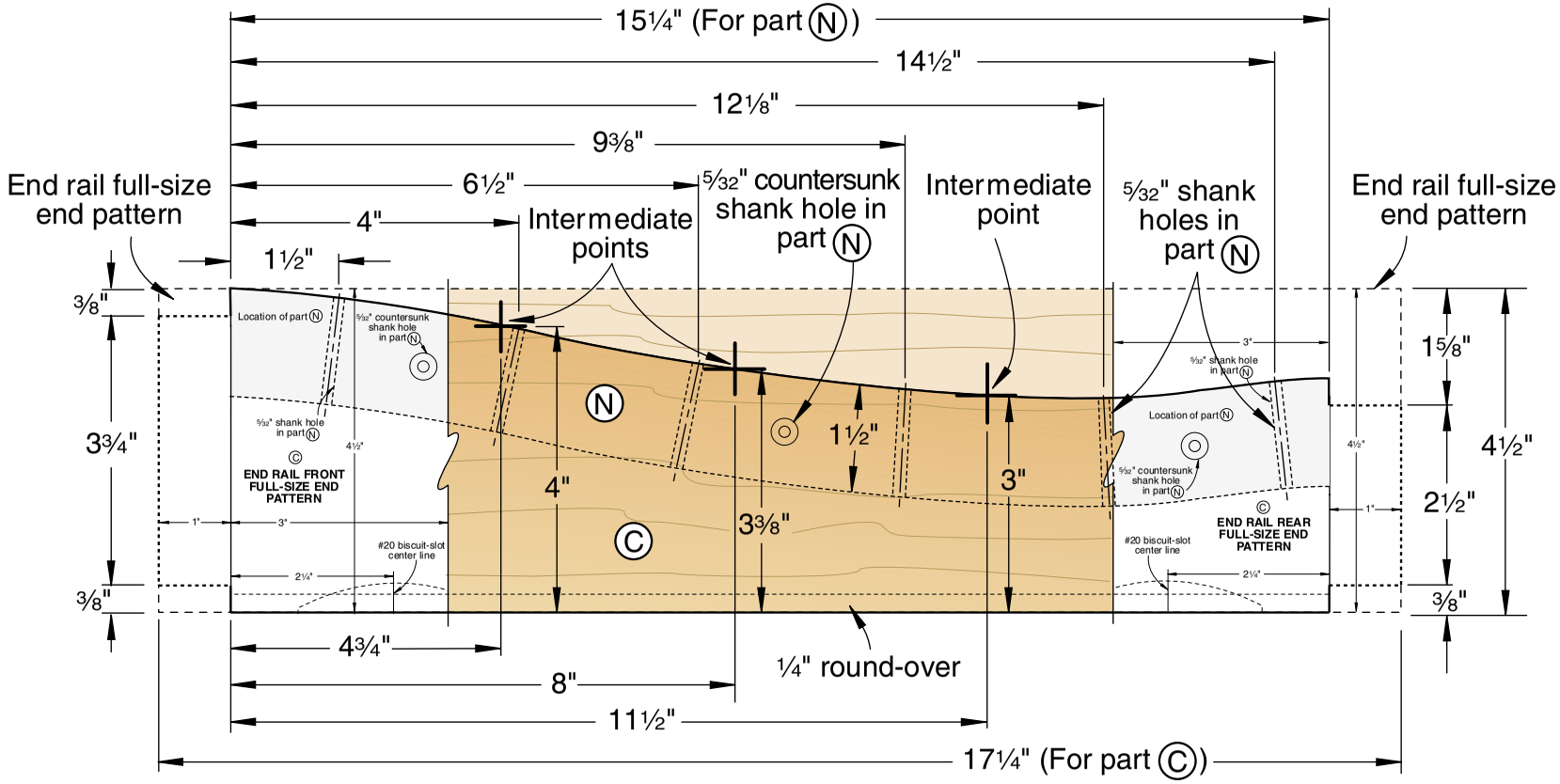


Backing the cuts with a miter-gauge extension, position the fence as a stop, and cut 1"-long tenons on each face.

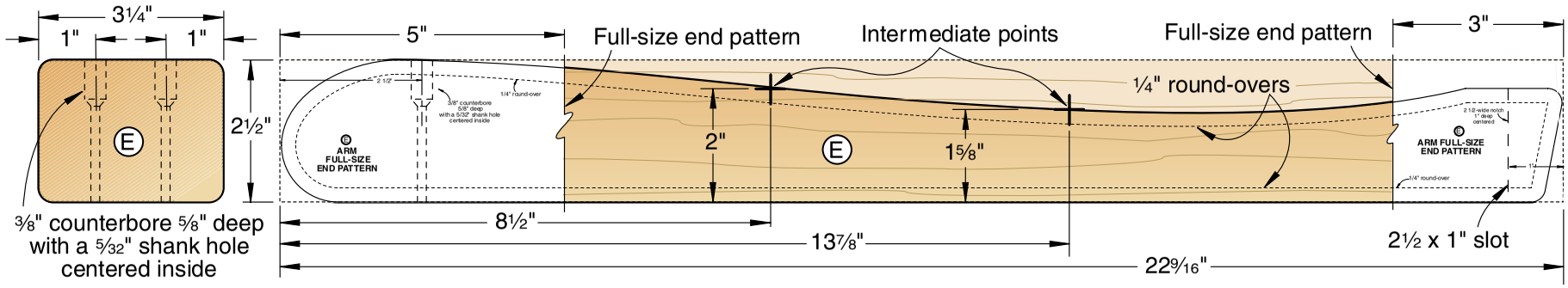
MARK THE END CLEAT WIDTH



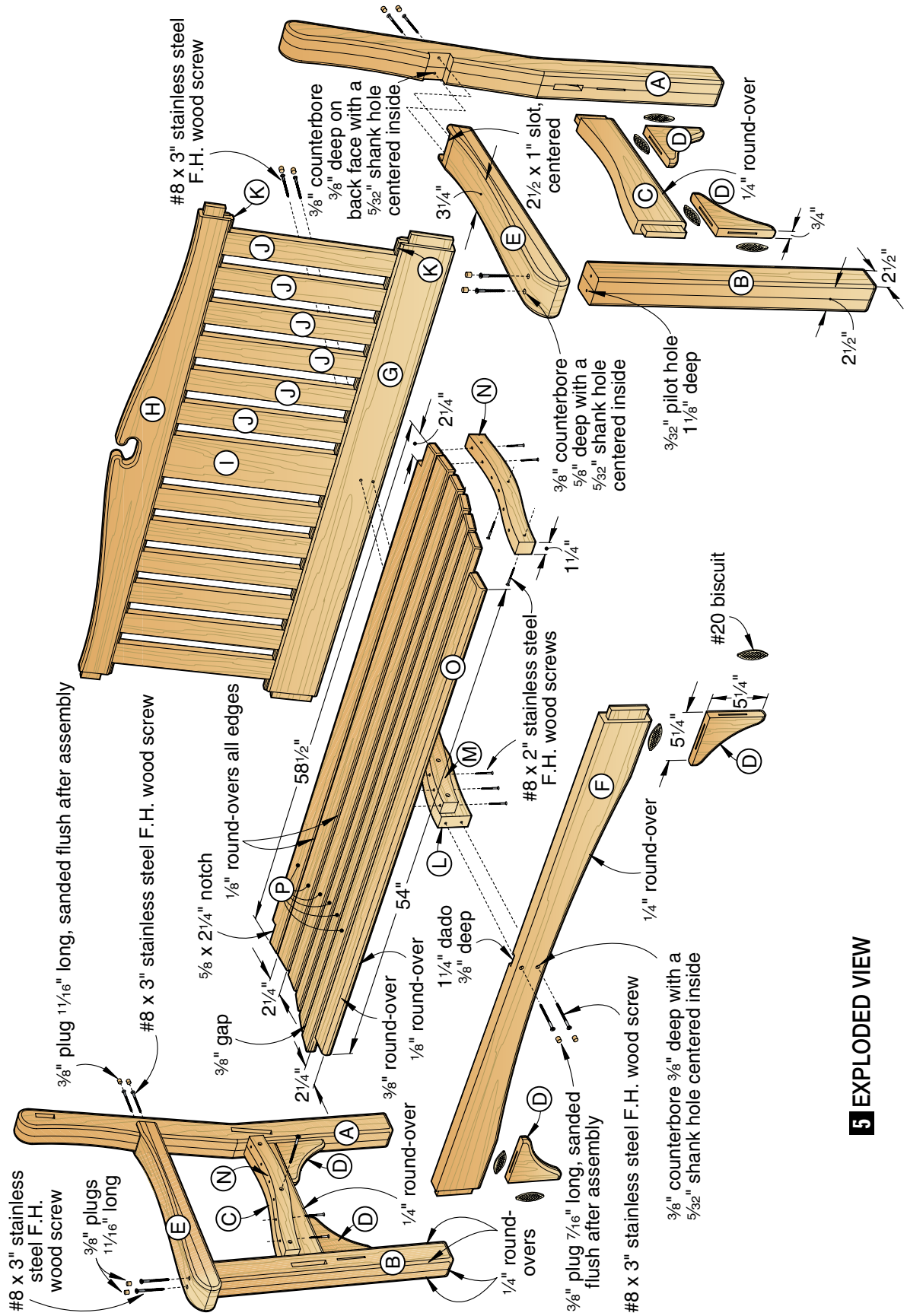
With your compass opened to 1½", follow the top profile of the end cleat (N) with the compass point and draw the cleat width.



3 END RAIL AND END CLEAT

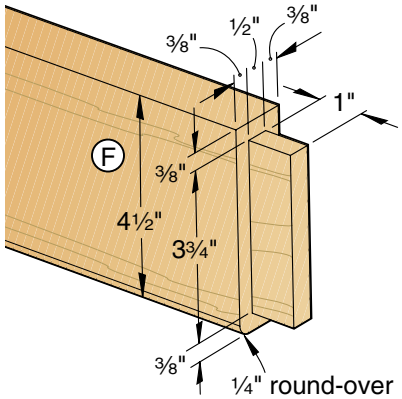


4 ARM (End and side view)

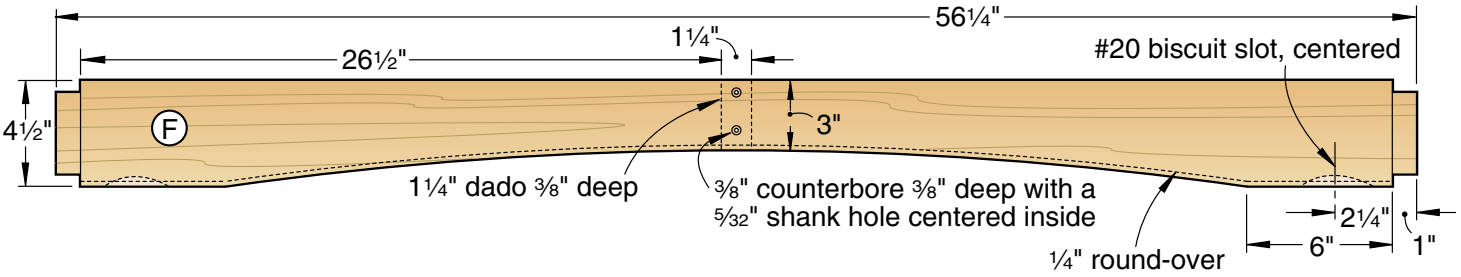


5 EXPLODED VIEW

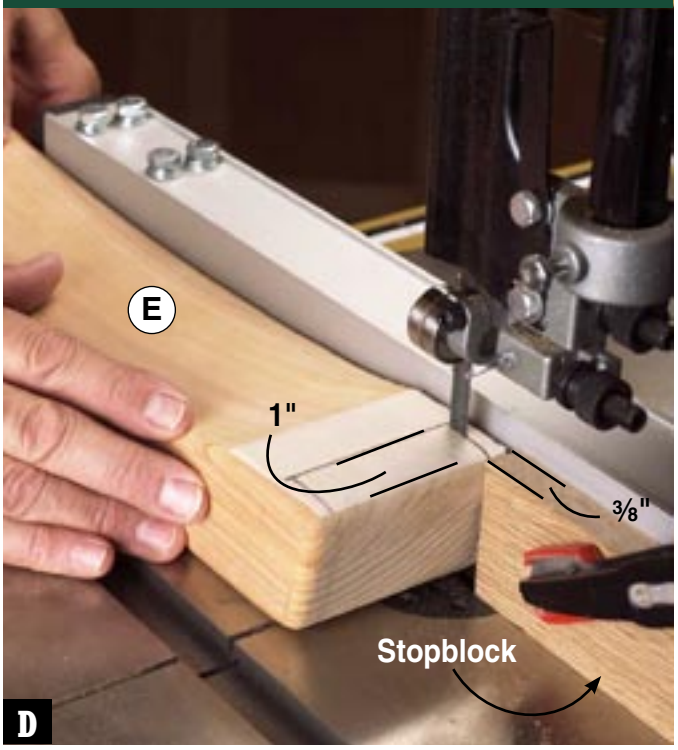
5a FRONT RAIL TENON DETAIL



5b FRONT RAIL

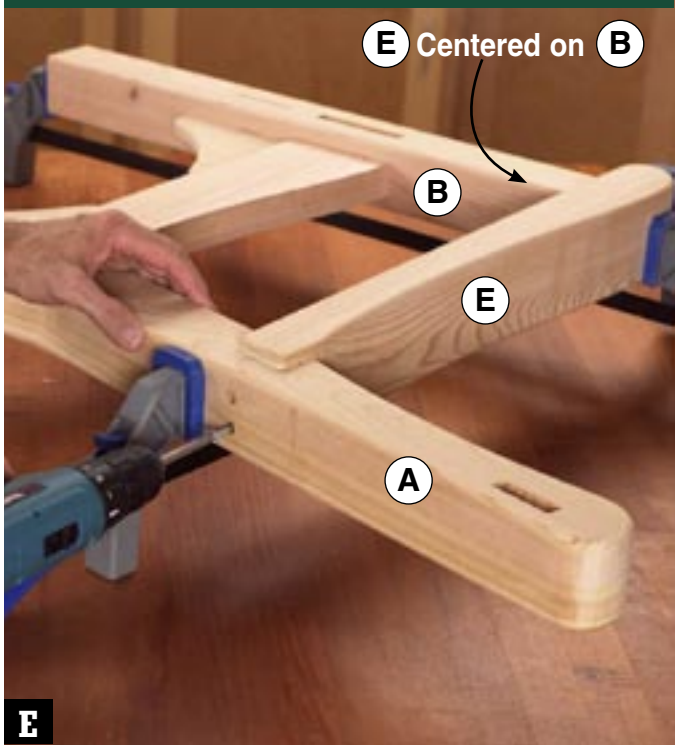


BANDSAW THE ARM NOTCH



With the bandsaw rip fence 3/8" from the left side of the blade and a stopblock 1" from the front of the blade, cut one side of the notch.

ADD THE ARMS



Glue and clamp the arms in place. Then using the holes in the rear legs as guides, drill pilot holes into the arms, and drive the screws.

SHOP TIP

Masking tape adds clarity to part layout

More than half the parts in this project require laying out the shape of the part and the location of mortises, biscuit slots, and notches. When drawing on softwood, such as cedar, or coarse-grained wood, such as oak, your pencil may wander off course as it follows the grain. And, the poor contrast of pencil lines on dark woods makes following layout lines difficult when bandsawing and sanding. Finally, after you finish shaping the part, you'll have to sand away all remaining lines. Here's an easy solution.

Before drawing any lines, adhere 2"-wide masking tape to the stock approximately where the layout lines will be. Then draw the lines on the tape with a pencil. Correct mistakes by taping over them and redrawing. To avoid cutting errors and to increase visibility, go over your final layout lines with an ultra-fine-point marker. After shaping the part, remove the masking tape.

Make rails for the back

1 From the 1¼"-thick stock, cut the front rail (F), lower back rail (G), and upper back rail (H) to size. Then, as when forming the tenons on the end rails (C) shown in **Photo B**, install a ¾" dado blade in your tablesaw, adjust it to cut ⅜" deep, position the fence as a stop, and cut 1"-long tenon face cheeks on the part ends, where shown and dimensioned on **Drawings 5**, **5a**, **6**, **6a**, and **6b**. Now stand the rails on edge and cut the front rail upper and lower tenon cheeks and the lower back rail lower tenon cheeks. Next cut a centered 1¼" dado in the rear face of the front rail for the center seat rail (L).

2 Install a ½" dado blade in your tablesaw and adjust it to cut ¾" deep. Then cut centered grooves in the top edge of the lower back rail (G) and the bottom edge of the upper back rail (H), where dimensioned on **Drawings 6a** and **6b**. Now mark the 1⅞" upper back rail tenon width, and form the top tenon cheeks with your bandsaw.

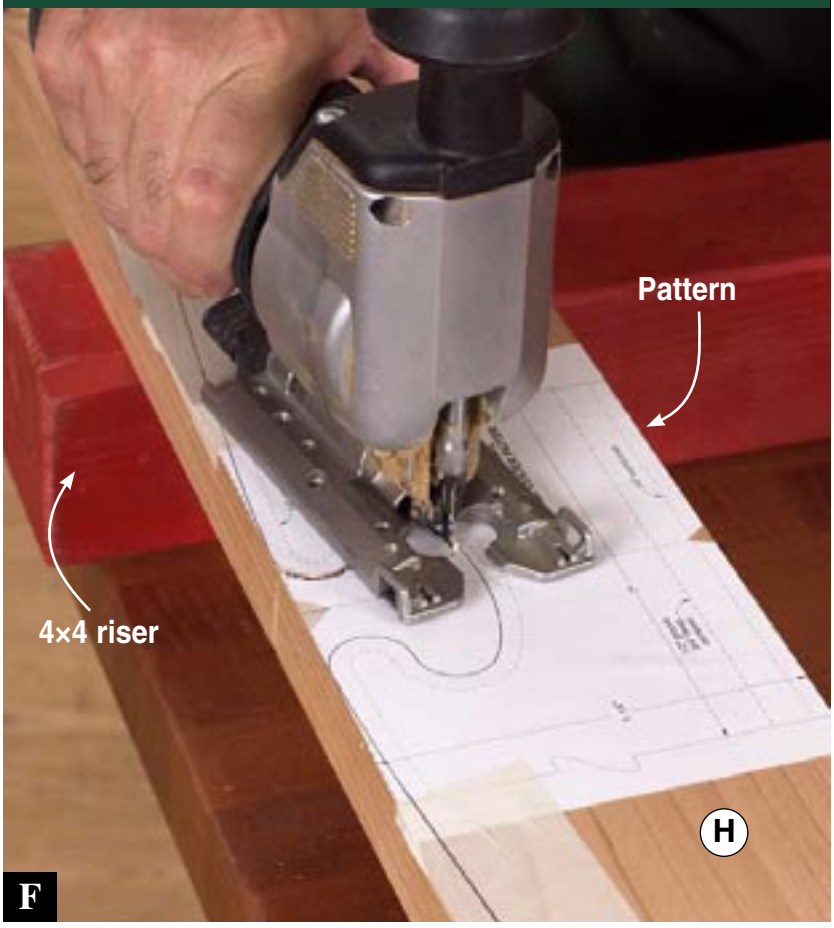
3 Drill ⅜" counterbores with centered 5/32" shank holes in the front rail (F) and lower back rail (G), where shown on **Drawings 5b** and **6**. Cut slots for #20 biscuits in the front rail, where dimensioned. Using a fairing stick, draw the arch at the bottom of the front rail. Bandsaw and sand it to shape.

4 Chuck a 3/16" drill bit 6" long into your drill press and drill centered weep holes in the lower back rail (G), where shown on **Drawing 6**. Drill as deep into the rail as the throw of the drill press allows, and finish the holes with a handheld drill.

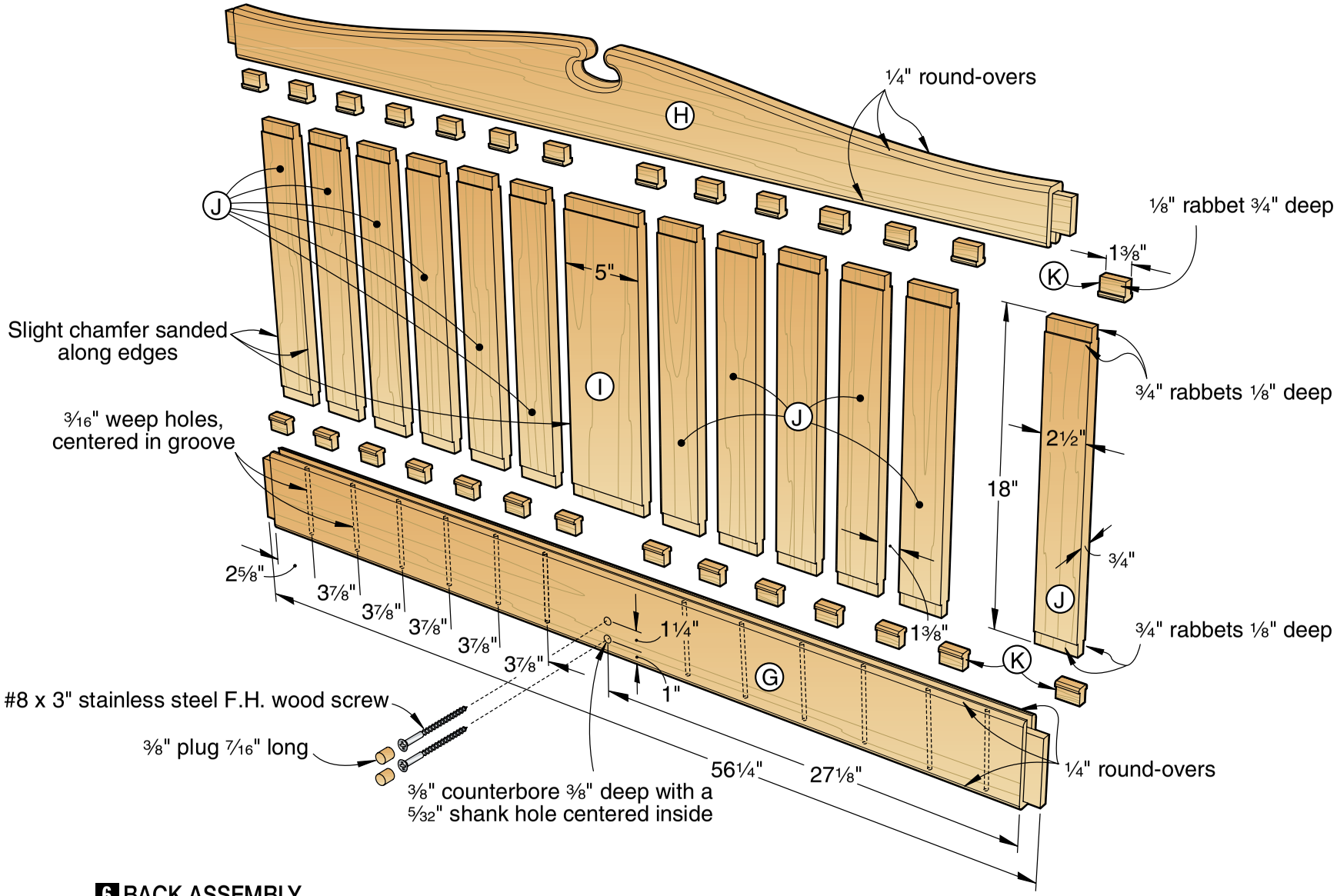
5 Make a photocopy of the **Upper Back Rail Center Pattern** on *page 22,* and adhere it to the upper back rail (H), where shown on **Drawing 6c**. Then to the left and right of the center pattern, lay out three intermediate points of the top curve, where dimensioned, and complete the pattern with smooth lines through the points. Remove the center cutout, as shown in **Photo F**. Now bandsaw the remaining profiles, and sand them and the center cutout to shape.

6 Chuck a ¼" round-over bit into your handheld router and rout the front rail (F) bottom front edge and all edges of the lower back rail (G) and upper back rail (H). Finish-sand the parts.

JIGSAW THE BACK RAIL CUTOUT

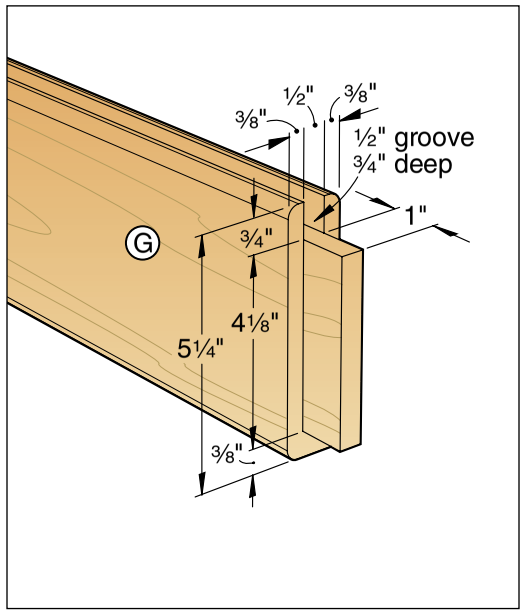


Place the upper back rail (H) on a pair of 4×4 risers for blade clearance and use your jigsaw to remove the center cutout.

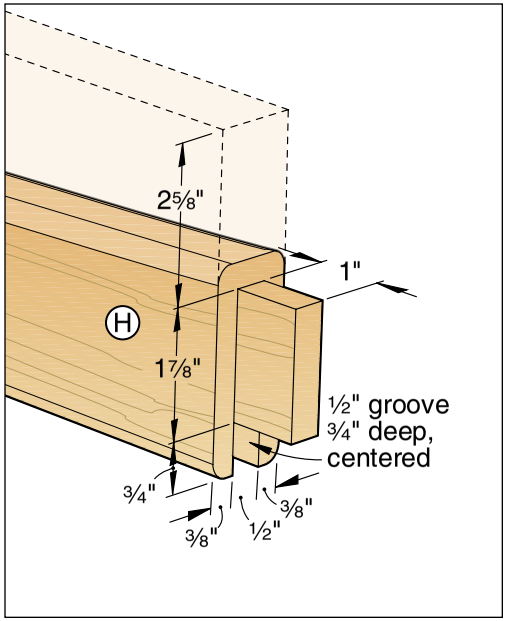


6 BACK ASSEMBLY
(Rear face shown)

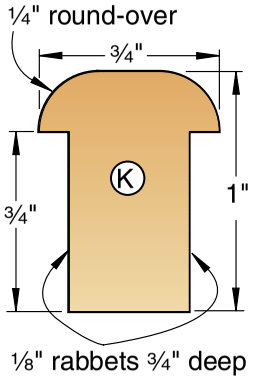
6a LOWER BACK RAIL TENON DETAIL



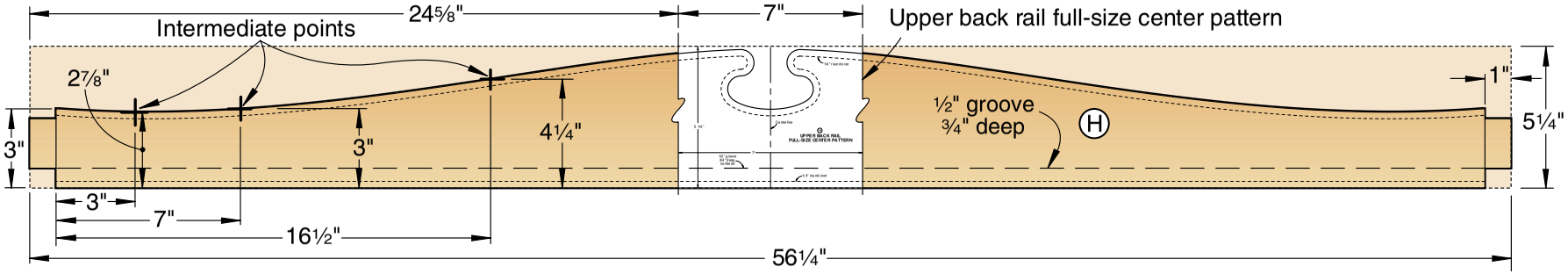
6b UPPER BACK RAIL TENON DETAIL



6d SPACER DETAIL



6c UPPER BACK RAIL



Now assemble the back

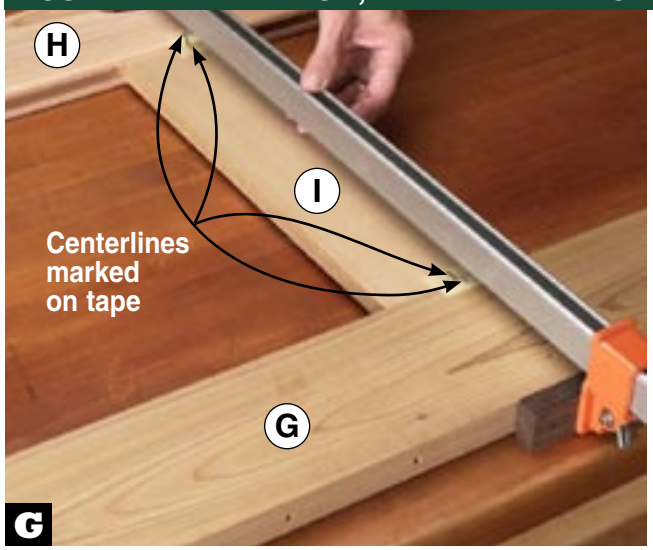
1 From ¾"-thick stock, cut the center back slat (I) and back slats (J) to size. Install a ¾" dado blade in your tablesaw, and adjust it to cut ⅛" deep. Then cut ¾"-long tenons on the ends of the slats, where shown on **Drawing 6**. Now finish-sand the slats and sand slight chamfers along all the edges with a sanding block.

2 Cut a ¾×1×48" blank for the spacers (K). Then cut ⅛" rabbets ¾" deep along the bottom edges, where shown on **Drawing 6d**. To accomplish this task, see the **Shop Tip** on *page 13*. Chuck a ¼" round-over bit into your table-mounted router, position the fence flush with the pilot bearing, and rout the top edges of the blank. Now cut 24 spacers to length. (You'll measure and cut the remaining four to length during assembly.)

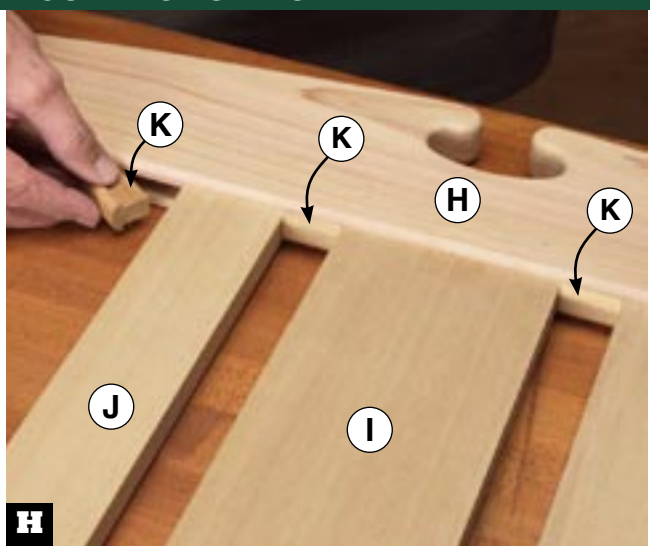
3 Mark centerlines on the front faces of the lower back rail (G), upper back rail (H), and center back slat (I). Then assemble the three parts, as shown in **Photo G**. Now insert spacers (K) and slide the back slats (J) into the lower and upper rail grooves from each end, as shown in **Photo H**. With the outside slats in place, measure the last four spacers, as shown in **Photo I**, cut them to length, and glue them in place.

4 Capturing the front rail (F), lower back rail (G), and upper back rail (H) tenons in the rear leg (A) and front leg (B) mortises, glue and clamp the end assemblies to the front rail and back assembly, as shown in **Photo J**. Then glue, biscuit, and clamp the remaining two brackets (D) to the front legs and front rail, where shown on **Drawing 5**.

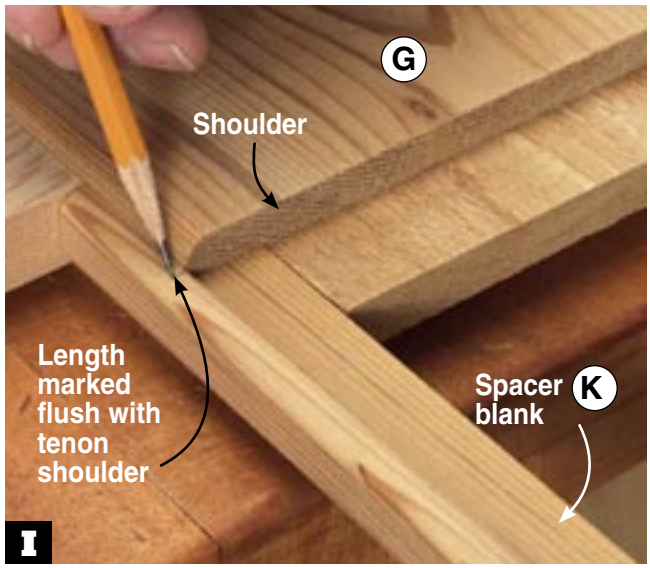
ASSEMBLE THE BACK, THEN THE BENCH IN FOUR EASY STEPS



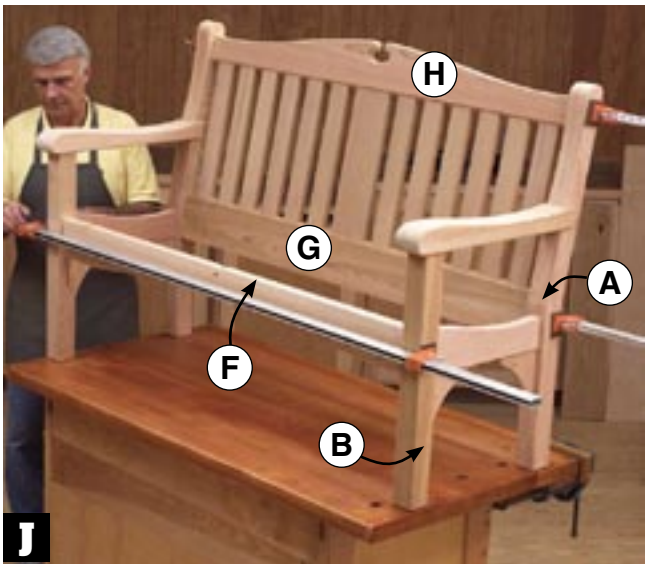
Glue and clamp the lower back rail (G), upper back rail (H), and center back slat (I), aligning the marked centerlines.



Working from both sides of the center back slat (I), alternately glue spacers (K) into the rail (G, H) grooves and add back slats (J).



Insert the remaining spacer blank into the rail groove [lower back rail (G) shown], and mark the length flush with the tenon shoulder.



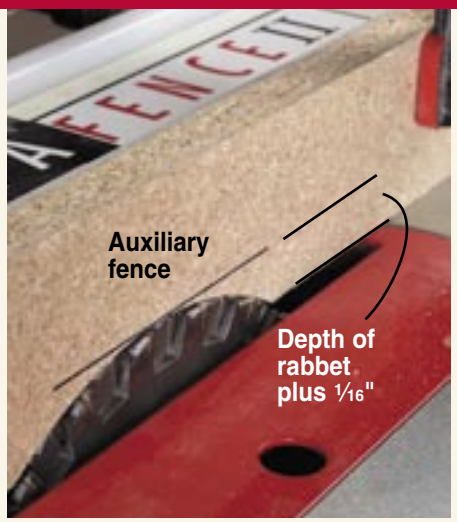
Capturing the rail (F, G, H) tenons in the leg (A, B) mortises, glue and clamp the end assemblies to the front rail and back assembly.

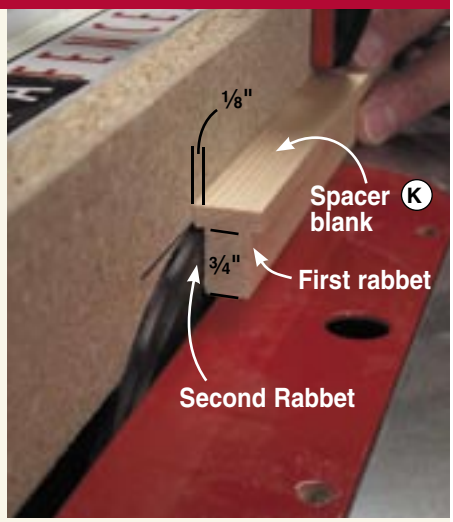
SHOP TIP

House your dado blade to cut clean rabbets

To cut rabbets, like those along the edges of the spacer (K) blank, you can install a dado blade the exact width of the rabbet in your tablesaw, and adjust the height. Then clamp an auxiliary fence to the rip fence, and position it so the blade just grazes the surface, and cut the rabbet. But this method may require shimming the dado blade to obtain the exact width rabbet, and the minute gap between the blade and the auxiliary fence leaves a ragged "splinter" along the edge. **Here's a better way**.

Install a dado blade 1/8" wider than the needed rabbet, and position it just below the table surface. Then attach a wood auxiliary fence to the rip fence. (Use 3/4"-thick stock for dado blades up to 1/2" wide and 1 1/2"-thick stock for blades over 1/2".) Make a mark on the auxiliary fence 1/16" higher than the depth of the rabbet. (The extra 1/16" keeps the blade from dragging on the auxiliary fence during final adjustment.) Position the rip fence so the auxiliary fence covers all but about 1/16" of the blade, and lock the fence in place. Now turn on the saw and slowly raise it to the marked line, as shown *above*. (The extra-width cut in the auxiliary fence provides for plenty of side-to-side adjustment.) Turn off the saw, and adjust the blade and fence to cut a rabbet to the desired depth and width. The housed blade eliminates the splinter-producing gap. Turn on the saw, and cut the rabbets in the workpiece, as shown *above*.



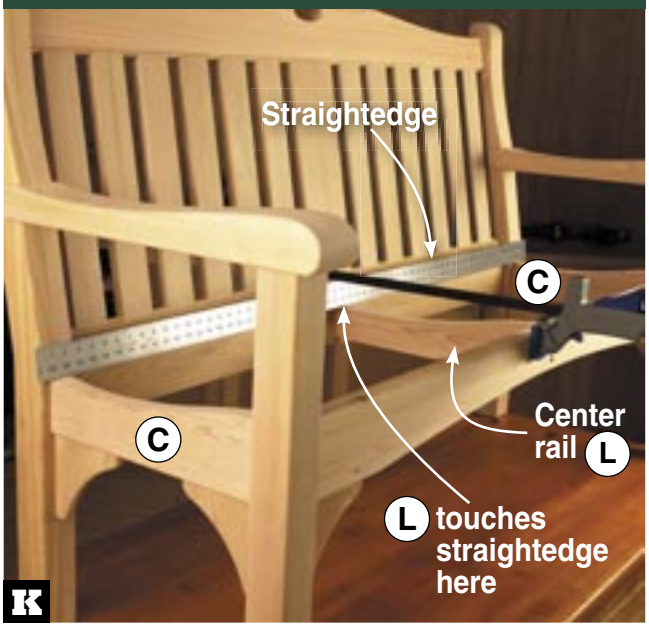


Make the seat

1 From the 1 1/4"-thick stock, cut the center rail (L) to size. Make a photocopy of the **Center Rail End Patterns** on *page 19*, and adhere them to the center rail, where shown on **Drawing 7**. Lay out the three intermediate points of the top profile where dimensioned, and connect the end patterns with a smooth line connecting the points. Then lay out the endpoints of the bottom profile and connect them with a curved line. Now bandsaw and sand the rail to shape.

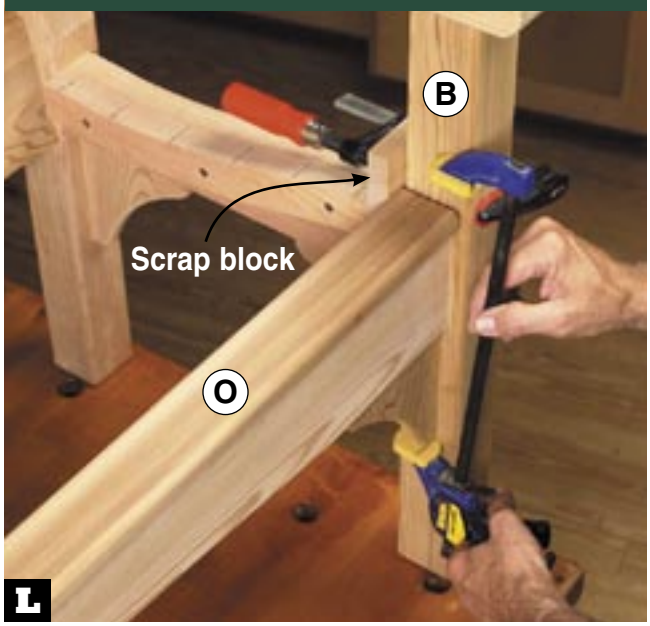
2 From the 1 1/4"-thick stock, cut the center cleat (M) to size. Using the center rail (L) as a template, trace the top profile onto the center cleat, and bandsaw and sand it to shape. Then draw the 1 1/2" cleat width, where shown on **Drawing 7**, and bandsaw and sand it to shape. Retrieve the end cleats (N) and drill 5/32" shank holes in all the cleats, where shown on **Drawings 3** and **7**.

ALIGN THE CENTER SEAT RAIL

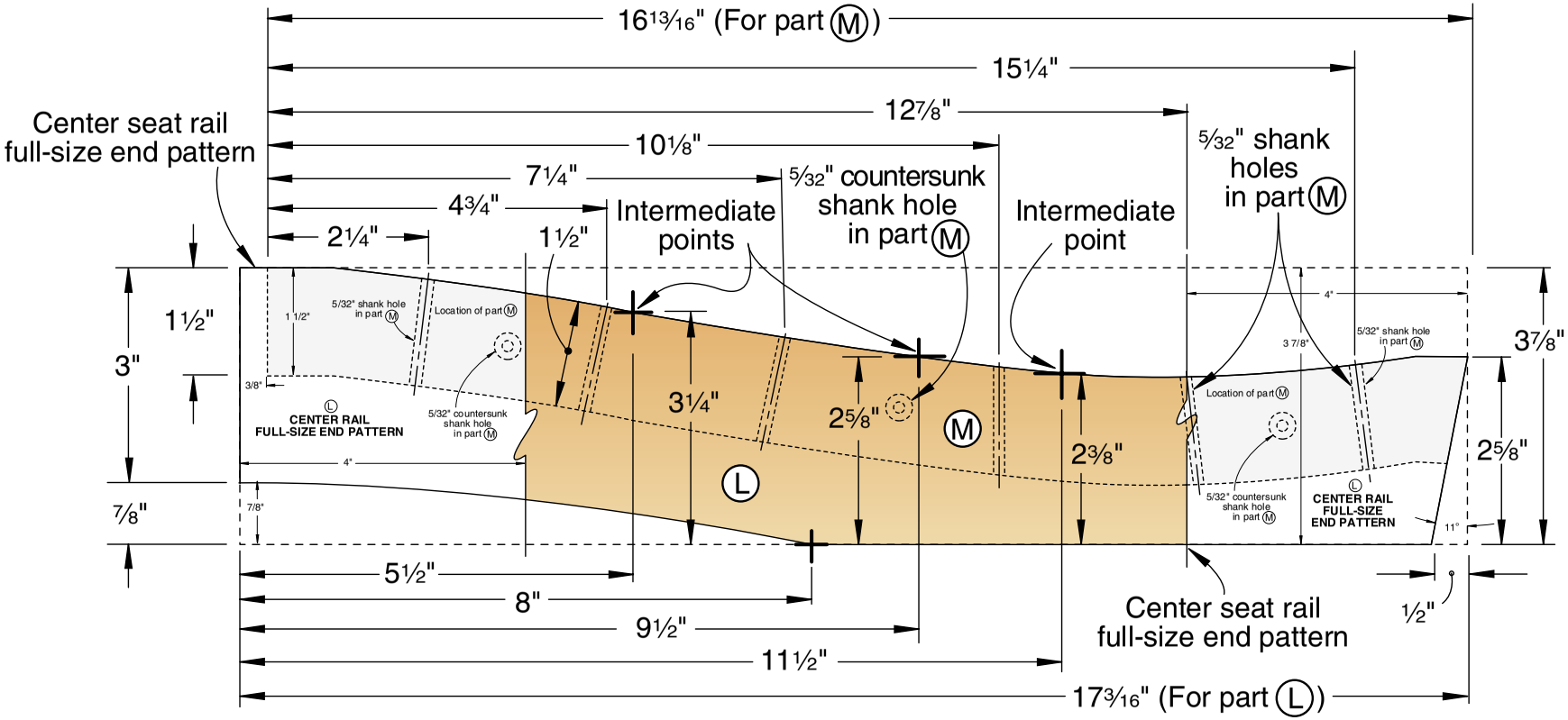


Align the center rail (L) with a straightedge resting on the top edges of the end rails (C). Then clamp the center rail in place.

ADD THE FRONT SEAT SLAT

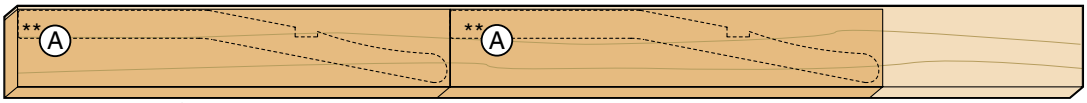


Clamp scrap blocks to the front legs (B). Then apply glue, center the slat (O), push it against the blocks, and clamp it in place.

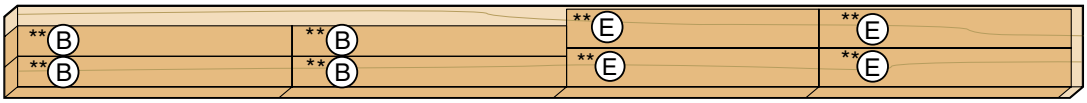


7 CENTER RAIL AND CENTER CLEAT

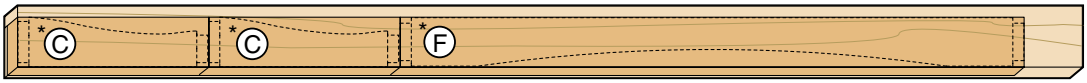
Cutting Diagram



1½ x 7¼ x 96" Cedar (10.7 bd. ft.) (2 needed)
**Plane or resaw to the thickness listed in the Materials List after laminating parts.

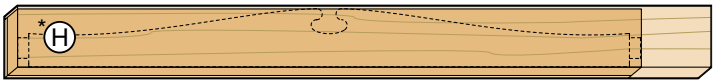


1½ x 7¼ x 96" Cedar (10.7 bd. ft.)

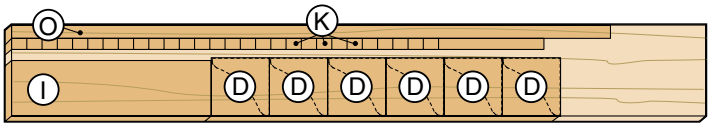


1½ x 5½ x 96" Cedar (8 bd. ft.) *Plane or resaw to the thickness listed in the Materials List.

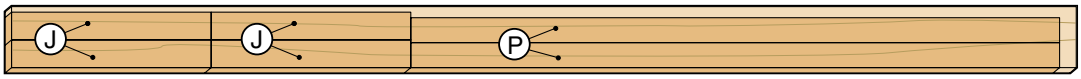
1½ x 7¼ x 96" Cedar (10.7 bd. ft.)



1½ x 5½ x 60" Cedar (5 bd. ft.)



¾ x 9¼ x 60" Cedar (4.2 bd. ft.)



¾ x 5½ x 96" Cedar (4 bd. ft.) (3 needed)

Materials List

End assemblies		FINISHED SIZE T	W	L	Matl.	Qty.
A*	rear legs	2½"	6⅝"	38⅝"	LC	2
B*	front legs	2½"	2½"	24¾"	LC	2
C	end rails	1¼"	4½"	17¼"	C	2
D	brackets	¾"	5¼"	5¼"	C	6
E*	arms	2½"	3¼"	22 9/16"	LC	2
Seat						
F	front rail	1¼"	4½"	56¼"	C	1
G	lower back rail	1¼"	5¼"	56¼"	C	1
H	upper back rail	1¼"	5¼"	56¼"	C	1
I	center back slat	¾"	5"	18"	C	1
J	back slats	¾"	2½"	18"	C	12
K*	spacers	¾"	1"	1⅜"	C	28
L	center rail	1¼"	3⅞"	17 3/16"	C	1
M	center cleat	1¼"	3⅛"	16 13/16"	C	1
N	end cleats	1¼"	3"	15¼"	C	2
O	front seat slat	¾"	2¼"	54"	C	1
P	seat slats	¾"	2¼"	58½"	C	6

*Parts initially cut oversize. See the instructions.
Materials key: LC–laminated cedar, C–cedar.
Supplies: #8x2" and #8x3" stainless steel deck screws, #20 biscuits, spray adhesive, polyurethane glue.
Blades and bits: Stack dado set; ⅛", ¼", ⅜" round-over router bits; ½" brad-point drill bit; 3/16" drill bit 6" long; ⅜" plug cutter.

3 Clamp the center rail (L) in place, as shown in **Photo K**. Then using the shank holes in the front rail (F) and lower back rail (G) as guides, drill 3/32" pilot holes into the center rail and drive the screws. Now glue and clamp the center cleat (M) to the center rail (L) and the end cleats (N) to the end rails (C), keeping the top edges flush. Using the shank holes in the cleats as guides, drill pilot holes into the rails and drive the screws.

4 From ¾"-thick stock, cut the front seat slat (O) and seat slats (P) to size. Then cut ⅝×2¼" notches in the corners of the rear seat slat (P), where shown on **Drawing 5**. Rout a ⅜" round-over along the top front edge of the front seat slat. Switch to a ⅛" round-over bit and rout all the remaining ends and edges of the slats (O, P). Finish-sand the slats. Now glue and clamp the front seat slat in place, as shown in **Photo L**.

Apply finish and assemble

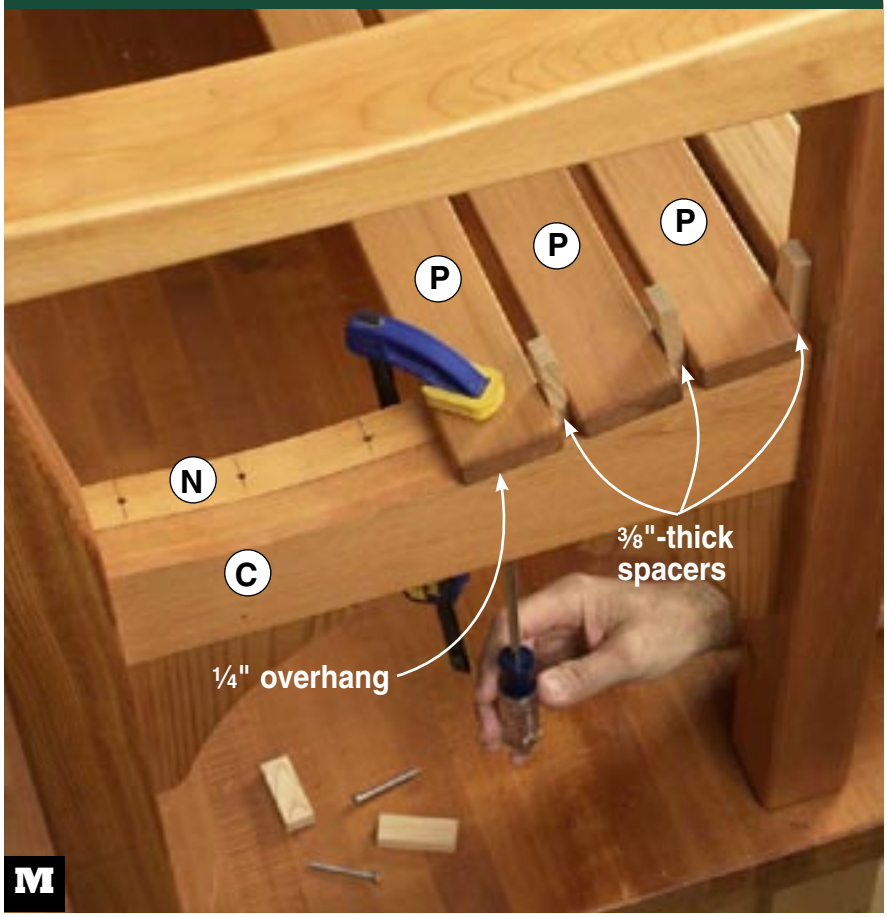
1 To plug the counterbores, chuck a ⅜" plug cutter into your drill press and cut four 7/16"-long and eight 11/16"-long plugs. Cut the plugs from scrap that matches the color of the wood around each counterbore. Glue the plugs in place. To avoid sanding away wood temporarily swollen from glue moisture, let the glue dry overnight. Then trim the plugs slightly proud of the surrounding surface and sand them smooth.

2 Inspect all the parts, and finish-sand where needed. Apply an outdoor finish. (We used Cabot Clear Solution wood finish no. 3002 Cedar, and let it dry for 24 hours.)

3 Cut ⅜"-thick spacers for positioning the seat slats (P). Then screw the slats in place, as shown in **Photo M**, with the slat ends overhanging the outside faces of the end rails (C) by ¼". Now check with your feng shui consultant, position the bench in your garden landscape for maximum positive energy, and unburden your feet.

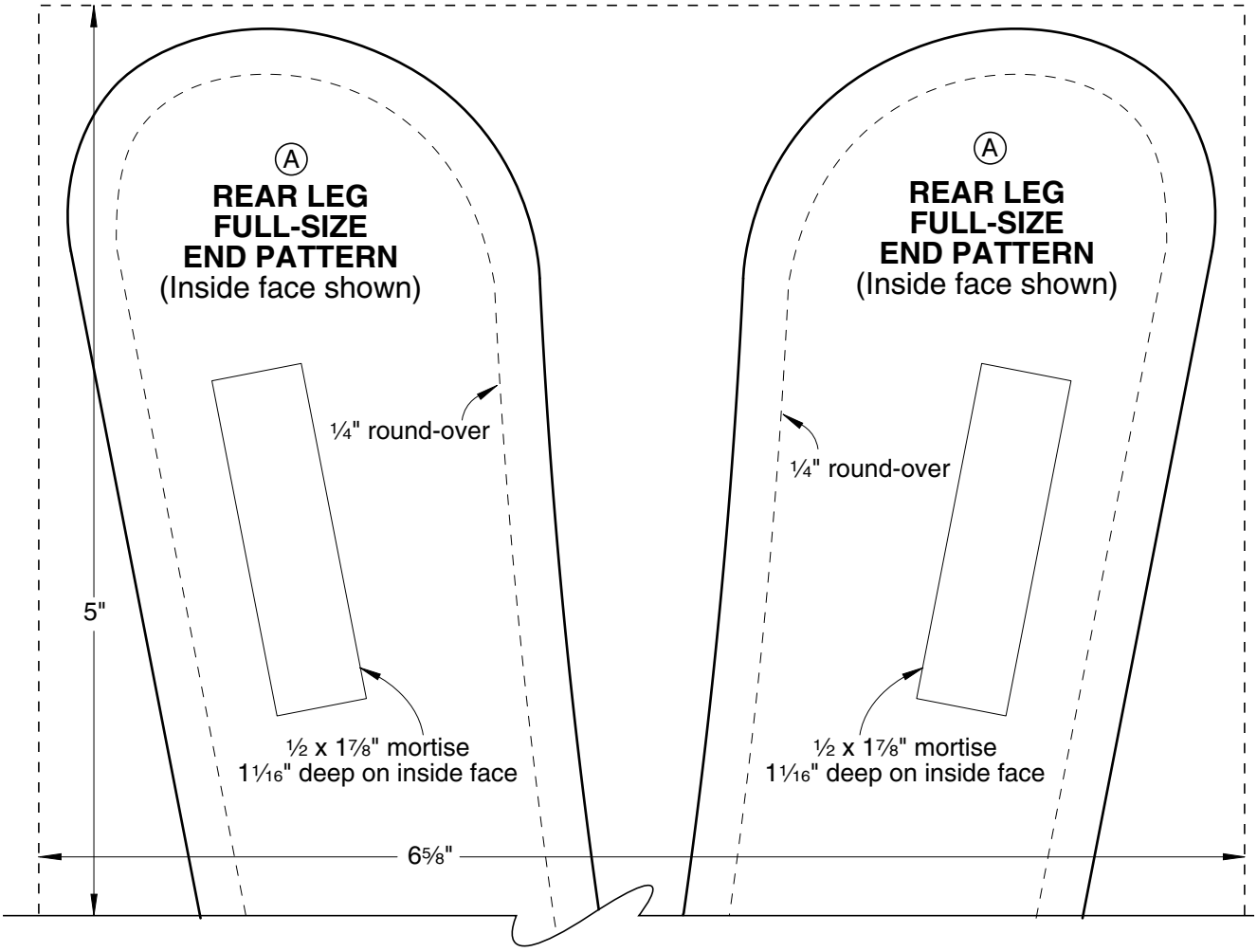
Produced by **Marlen Kemmet**
Written by **Jan Svec** with **Chuck Hedlund**
Project design: **Kevin Boyle**
Illustrations: **Roxanne LeMoine**
Graphic design: **Lorna Johnson**

USE SPACERS TO ALIGN SLATS

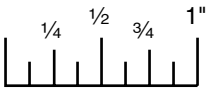


Inserting ⅜"-thick spacers to align the seat slats (P), clamp them in place, drill pilot holes, and screw the slats to the cleats (M, N).

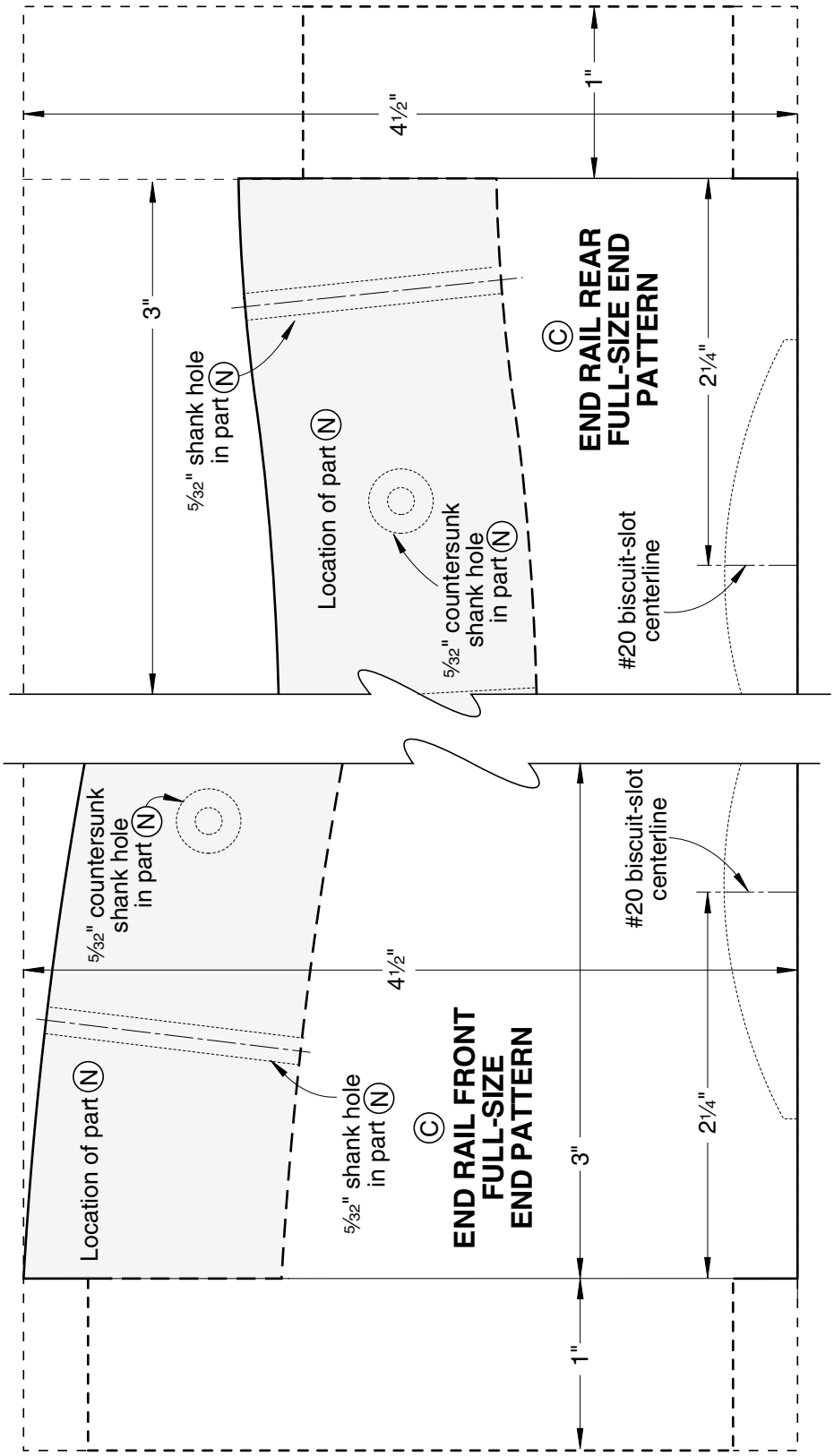
FULL-SIZE PATTERNS



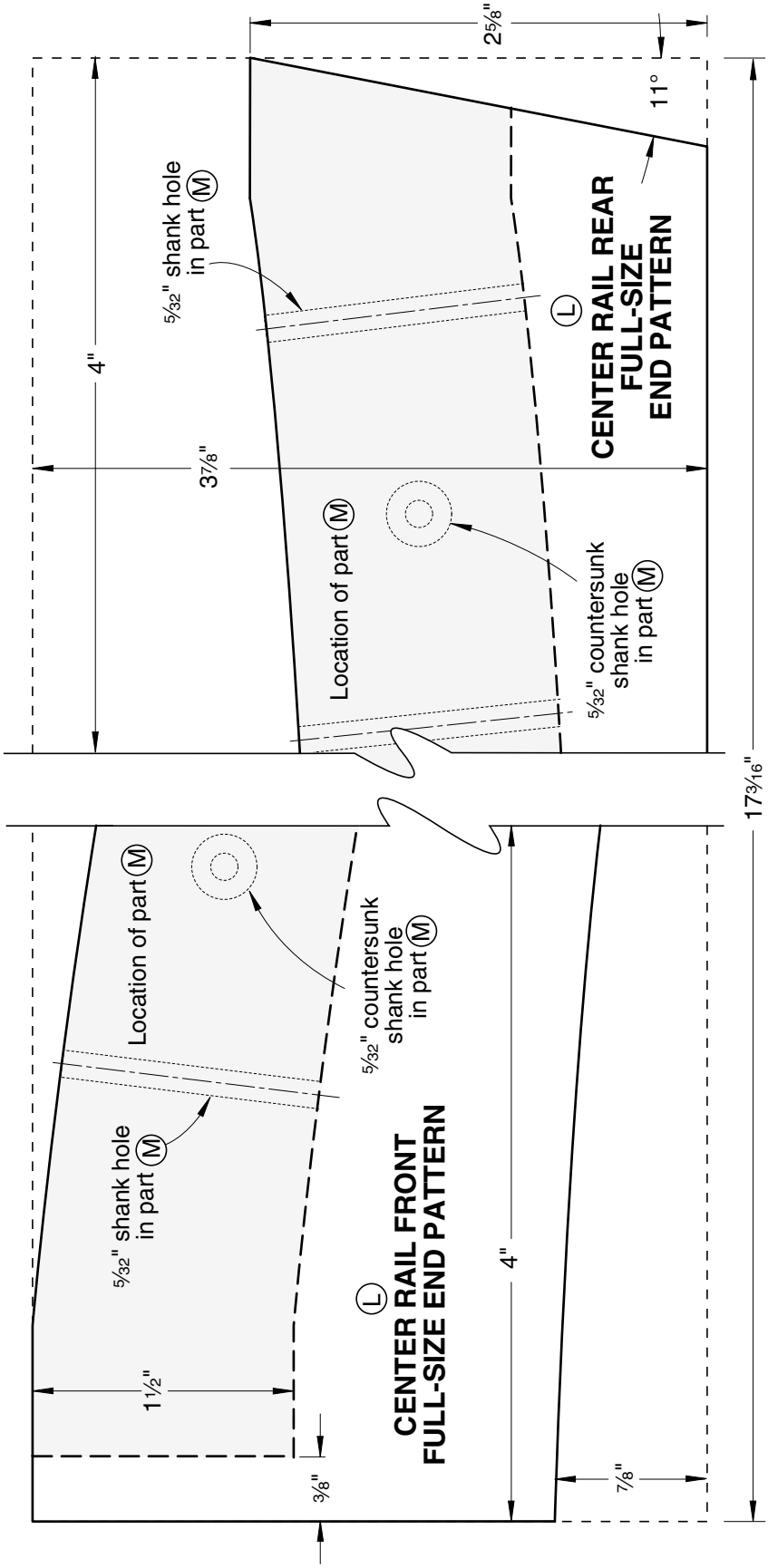
To ensure full-size patterns are correct size, your printer should be set to print at 100% (not fit to page). Measure full-size patterns to verify size.



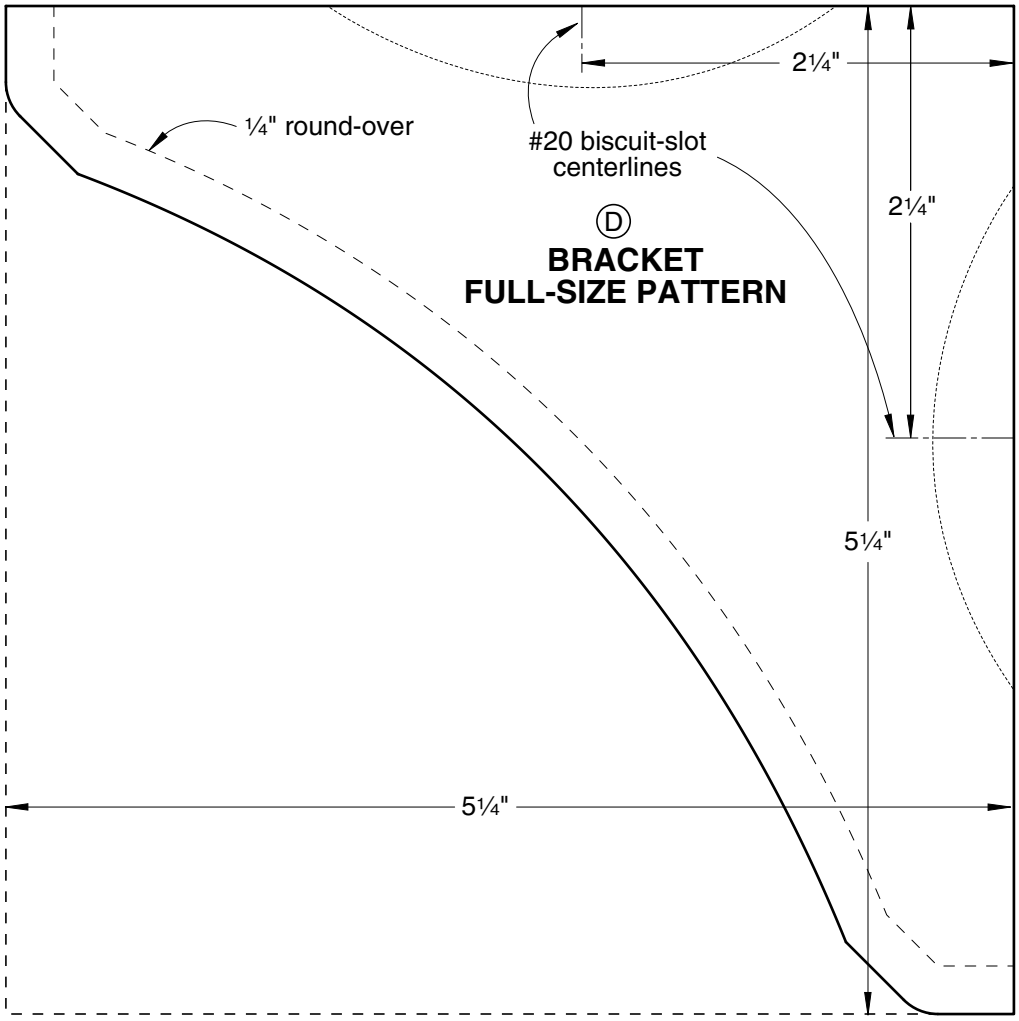
FULL-SIZE PATTERNS



FULL-SIZE PATTERNS



FULL-SIZE PATTERN



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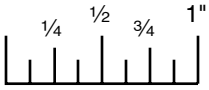
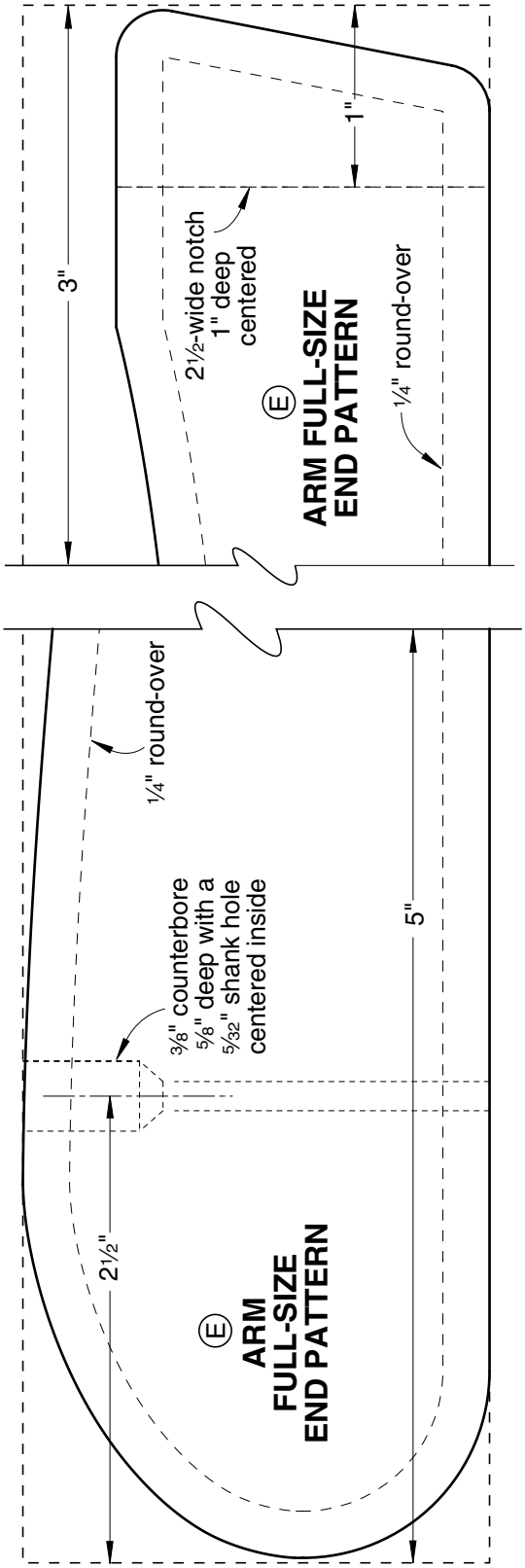
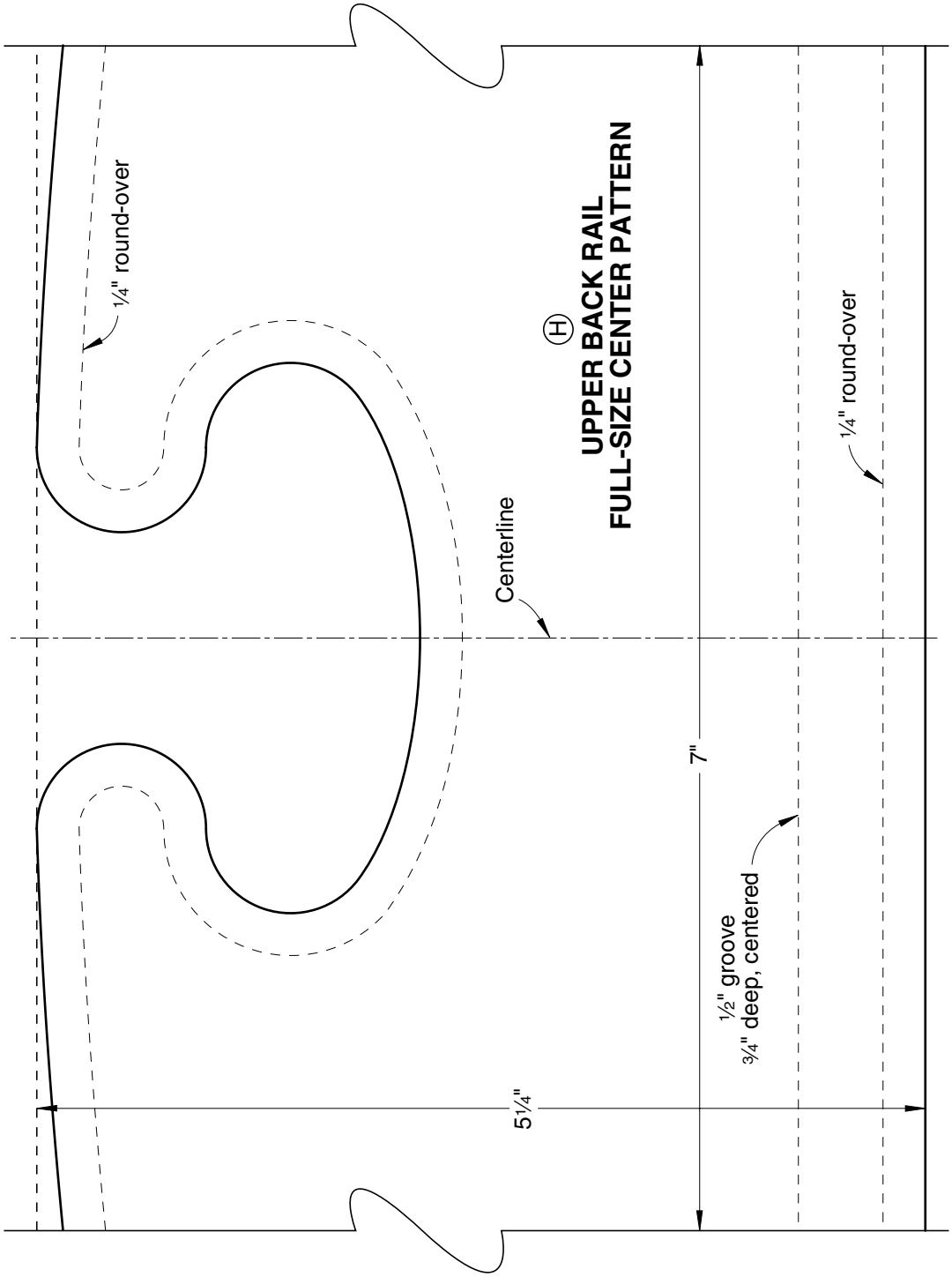


FULL-SIZE PATTERNS



FULL-SIZE PATTERN



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UPPER BACK RAIL
FULL-SIZE CENTER PATTERN