

*Beautiful*  
**Wooden Projects  
for Outdoor Living**

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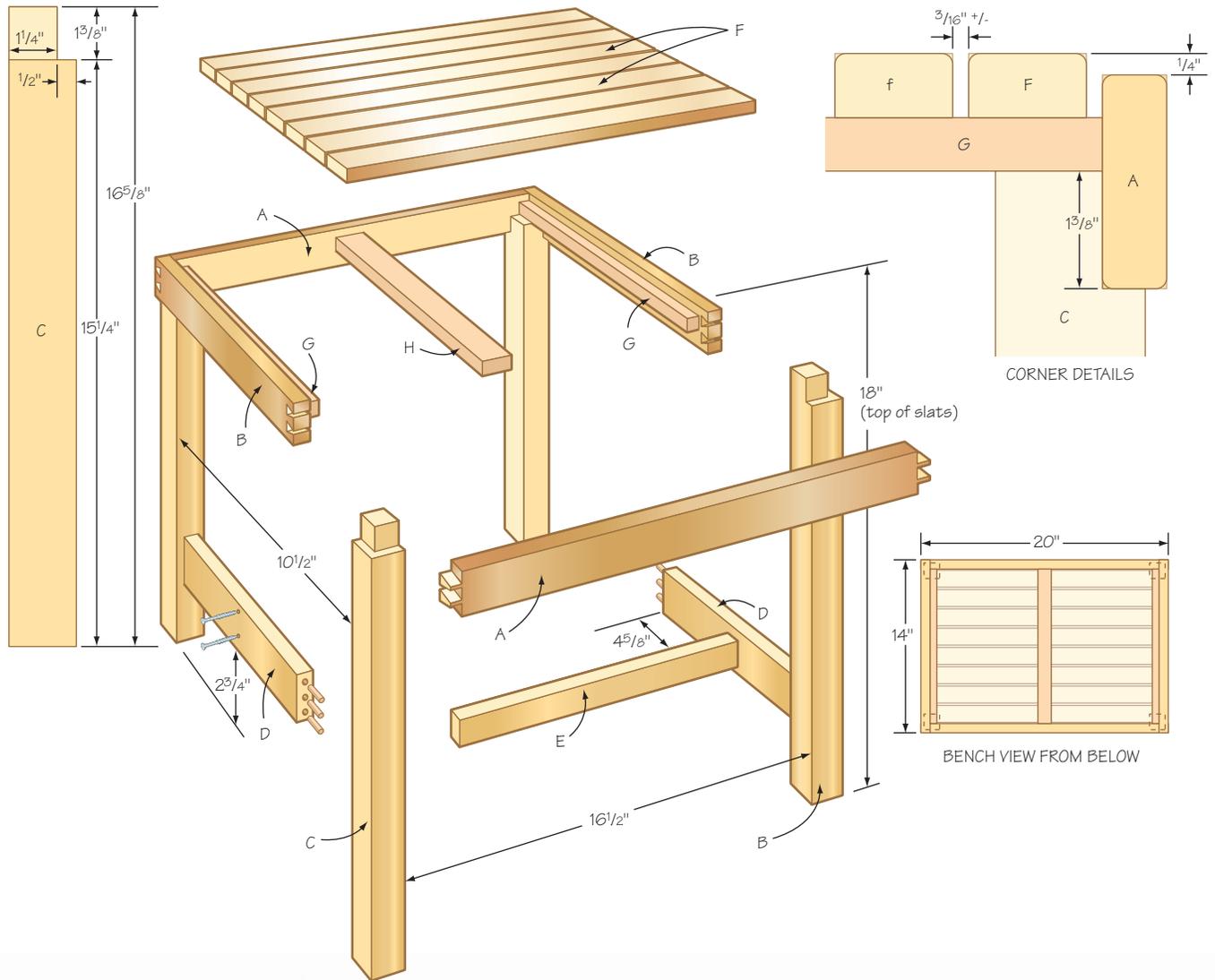
# bench seats and table

## 2

*A favorite landscape design feature* of my backyard is a small, compact deck. It's a great place to hang out with a beverage, but the low square footage is easily overwhelmed by a traditional garden table and four chairs. My solution to this problem was to develop a design for a small table and four bench seats that could be arranged in different seating configurations or moved out of the way completely if necessary. They also function nicely as side tables for lawn chairs and are sturdy enough to stand on to retrieve the cat from lower tree branches.

I chose to use teak for the tops and wenge for the frames and legs. The wenge was an experiment. It's a durable tropical hardwood and, when oiled, provides a striking contrast to the lighter teak.

I made all four benches as a single production run. This not only made the construction process faster and more efficient but also ensured that component sizing and dimensions were exactly the same for all of the benches. Although the measurements are different, I also made the table part of the production run, utilizing the same machine setups for the different steps.



## hardware and supplies

- 3/8" (10mm) x 2" (50mm) gluing dowels
- 1 1/4" (30mm) stainless steel flathead screws

inches (millimeters)

REFERENCE	QUANTITY	PART	STOCK	THICKNESS	(mm)	WIDTH	(mm)	LENGTH	(mm)	COMMENTS
A	2	apron sides	wenge	3/4	(19)	2 1/2	(64)	20	(508)	
B	2	apron ends	wenge	3/4	(19)	2 1/2	(64)	14	(356)	
C	4	legs	wenge	1 3/4	(45)	1 3/4	(45)	16 5/8	(422)	
D	2	leg cross braces	wenge	3/4	(19)	2 1/2	(64)	10	(254)	
E	1	stretcher	wenge	3/4	(19)	2	(51)	15	(381)	
F	8	top slats	teak	3/4	(19)	1 3/8	(35)	18 1/8	(460)	3/16" +/- (5mm) between slats and between the slats, apron sides and ends
G	2	top slat cleats	wenge	5/8	(16)	3/4	(19)	12 1/2	(318)	
H	1	top slat center brace	teak	1 1/2	(38)	3/4	(19)	12 1/2	(318)	

CUTTING LIST  
bench seat (this is for one seat)



**1** Begin the bench by building the apron. Although a number of different joints could be used at the corners, I chose to use through dovetails. This provides a solid joint with lots of gluing surface and the interlocking design keeps the joint from separating or racking. I used a template jig system to machine-cut the dovetails. The only trick here was to be sure that the width dimension of the apron stock matched the jig's layout pattern. Measure the jig carefully and adjust the stock's width accordingly.

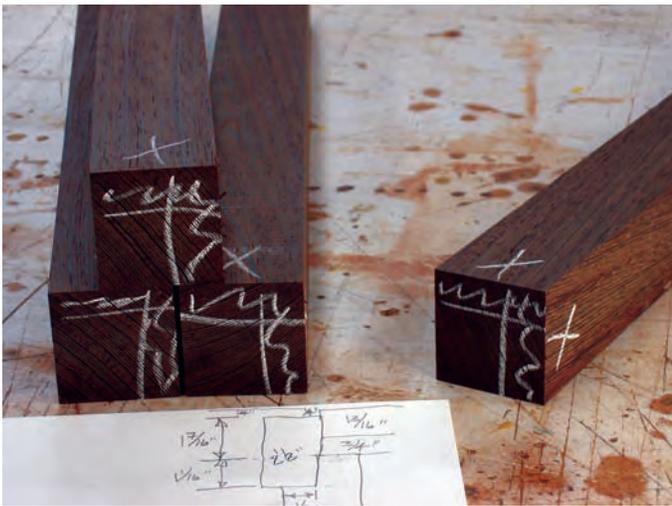


## TECH tip

Building furniture for outdoor use requires careful construction planning. Unlike the loveseat, which relies exclusively on mechanical fasteners, the bench seats are assembled using a combination of glued and mechanical joinery techniques. I was careful to choose a waterproof glue with some gap-filling capability and long-term flexibility and used outdoor-rated or SS screws. All countersunk screw holes that might collect water were glued and plugged.



**2** After applying glue to the dovetail pins and tails with a small brush, assemble the apron using bar clamps. Although the dovetail joints do a good preliminary job of squaring the assembly, carefully equalize opposing corner-to-corner measurements.



**3** Much of the strength of the bench seat results from way that the legs are attached to the apron corners. Each leg has a shoulder cut into the tops of two adjacent sides and a corner of the apron rests on these shoulders. This design provides solid support for the apron-and-top assembly to supplement the mechanical fasteners. After cutting the legs to length, mark the faces to be cut with chalk. This helps keep track of the cutting sequence and prevents cutting errors.



**4** After setting the blade height on the tablesaw, you're ready to make the first two shoulder cuts on each leg. Use the miter gauge and the starter block for safety.

## TECH tip

### dealing with router blowout

No matter how carefully I make router dovetail cuts in hardwoods, there is inevitably a chance for "blowout" or chipping when the bit catches the edge of the wood grain. I'm not a fan of putty or wood dough fillers because the color is never the same as the wood, even with stain and it doesn't hold up outdoors. I make my own filler using glue and sawdust from the wood I'm using. In this case I mixed wenge sawdust with a dark-colored waterproof glue.



**5** Make the crosscuts on the two marked adjacent sides on each leg.



**6** Finish the shoulder cuts on the band saw using a stop clamped to the table to limit the length of cut.



**7** These legs are ready for assembly.

## Miter Gauge Safety

To prevent stock from pinching against the fence and kicking back when you use the miter gauge, use a starter block. This is simply a scrap of wood clamped to the fence behind the leading edge of the blade. Adjust the fence so that the distance from the face of the block plus the blade kerf (in this case) equals the length of cut you need to make. With the stock held against the miter gauge, move it over to just touch the side of the block. Since the front edge of the block is behind the blade, the stock will be clear of both the fence and the block when the cut is made.



**8** Now you're ready to assemble the two, leg-and-cross-brace assemblies using glue and dowels. First, put two legs in place on one end of the apron assembly. With the two legs firmly clamped in the apron end corners, take a measurement between the legs and cut the cross braces to length.



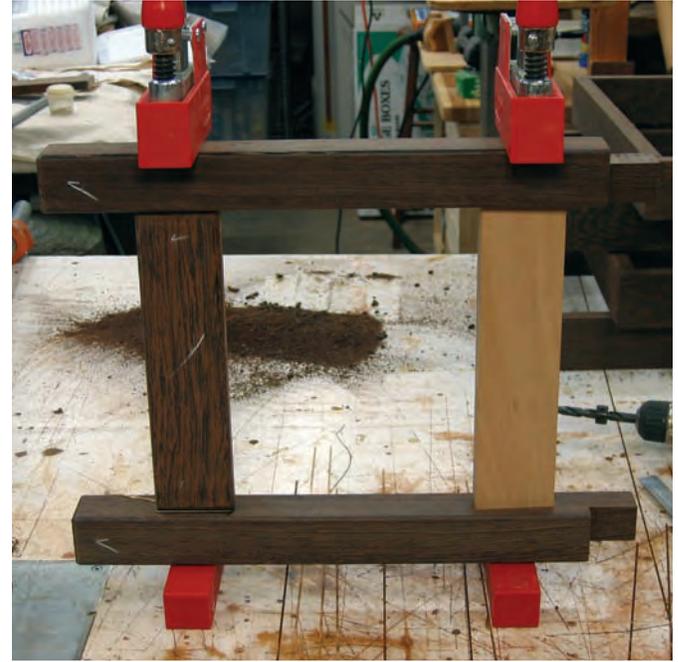
**9** Use a doweling jig to drill holes for  $\frac{3}{8}$ " (10mm) dowels in the ends of the cross braces.



**10** Drill holes in the legs to match the holes in the cross braces.



**11** Using dowels and waterproof glue, assemble and clamp the leg-and-cross-brace assemblies.



**12** Use a spacer cut to the same length as the cross brace so the legs will mate squarely to the brace.



**13** The leg assemblies are now ready to be attached to the apron corners.



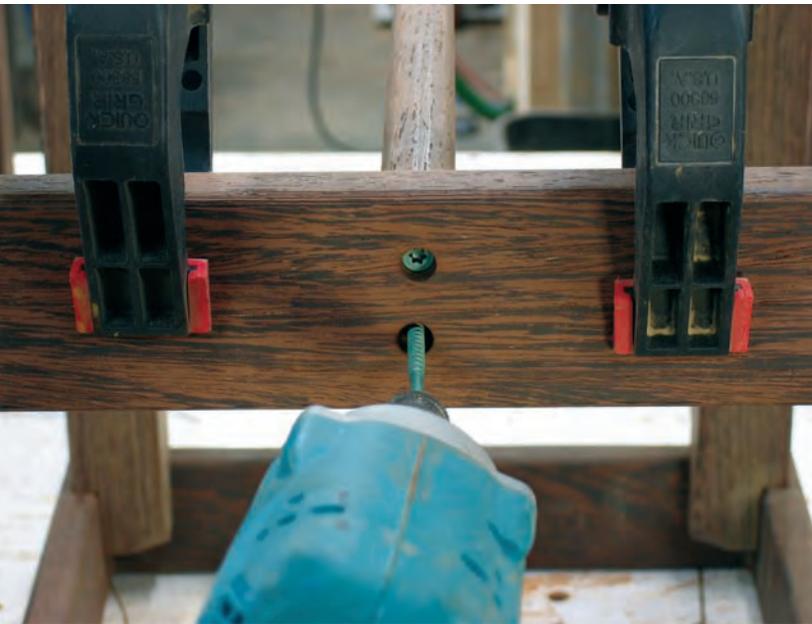
**14** Cut spacers to fit snugly between the legs around all four sides of the inside of the apron. (These will hold the legs tightly in place against the corners during installation.) Apply glue to the two shoulder faces on each leg, set them into the corners and lock them snugly in place with the temporary spacers.



**15** Attach each leg using two screws through the outside corners of the apron. Plug the screw holes. When the glue has dried, remove the temporary spacers.



**16** After cutting the stretcher to length, position it between the leg cross braces, centering it on each cross brace using spacer blocks.



**17** Install the stretcher using glue and countersunk screws. Plug the screw holes.



**18** The top slats are supported by cleats at each end. Glue and screw the cleats to the insides of the end aprons and plug the screw holes.



**19** Use spacers to hold equal spacing between the slats. Trim the spacers if necessary until the slats fit between the side aprons.



**20** So no fasteners will show on the finished bench top, attach the slats from below. With the slats and spacers set loosely in place on the cleats, lay a piece of  $\frac{1}{4}$ " (6mm) plywood (slightly larger than the bench) over the top, then flip the entire assembly upside down on your work surface. If you're careful, the slats and spacers will all stay together inside the apron, ready for installation! Pre-drill into the slats through the cleats at each end and fasten the slats from below with screws. Attach a brace across the center of the slats from below with screws. Although probably not necessary, this brace adds stiffness and strength to the top slat assembly.

## Build the Matching Table

The table closely follows the design of the bench seats. The material, joinery and construction sequences are exactly the same; only sizing and dimensions are different. The table is square and the top has a center hole for a

patio umbrella. The design of the top slats, slat supports and stretchers have been modified to accommodate the umbrella and umbrella base, but those are the only structural differences.

### inches (millimeters)

REFERENCE	QUANTITY	PART	STOCK	THICKNESS		WIDTH		LENGTH		COMMENTS
					(mm)		(mm)		(mm)	
<b>SMALL TABLE</b>										
J	4	apron sides	wenge	$\frac{3}{4}$	(19)	$2\frac{1}{2}$	(64)	25	(635)	
K	4	legs	wenge	$1\frac{3}{4}$	(45)	$1\frac{3}{4}$	(45)	$26\frac{5}{8}$	(676)	
L	2	leg cross braces	wenge	$\frac{3}{4}$	(19)	$2\frac{1}{2}$	(64)	21	(533)	
M	2	stretchers	wenge	$\frac{3}{4}$	(19)	2	(51)	22	(559)	
N	1	center top slat	teak	$\frac{3}{4}$	(19)	$3\frac{1}{2}$	(89)	$23\frac{1}{8}$	(587)	
P	8	top slats	teak	$\frac{3}{4}$	(19)	$2\frac{1}{8}$	(54)	$23\frac{1}{8}$	(587)	$\frac{3}{16}$ " +/- (5mm) between slats and between the slats, apron sides and ends
Q	2	top slat cleats	wenge	$\frac{5}{8}$	(16)	$\frac{3}{4}$	(19)	$23\frac{1}{2}$	(597)	
R	2	top slat center braces	teak	$1\frac{1}{2}$	(38)	$\frac{3}{4}$	(19)	$23\frac{1}{2}$	(597)	

CUTTING LIST  
(bench seats and table)







**1** The bench seats have a single stretcher, but the table needs two – with enough space between them for the umbrella shaft and base. Using spacer blocks to hold the stretchers in position, attach the the stretcher with screws through the outside of the leg cross braces. Plug the screw holes.



**2** The tabletop slats are proportionally wider than the bench seat slats. Make the center slat wider to accommodate the umbrella hole. Install two evenly-spaced teak braces below the slats for extra support.



**3** Drill a small pilot hole in the center of the tabletop. Then, using a sharp Forstner bit and drilling from both sides to avoid split-out, drill a 1<sup>5</sup>/<sub>8</sub>" (40mm)-diameter hole through the slat.



**4** Use a bearing-guided 1/8" (3mm)-radius roundover bit and sandpaper to clean and finish the edges of the hole.

## Apply Exterior Finish

As I said earlier, I like the contrast between the two woods I used for the benches and table. To protect against weathering and to keep the colors looking fresh, I applied a brush-on, wipe-off exterior oil sealer that I plan to reapply yearly.