

Simple Table



You'll be able to seat eight people comfortably around this table--as many as 12 if some of them are small children. This table is made of 3/4-, 1- and 1-1/4-in.-thick stock. If you don't have a jointer and planer, ask your lumber supplier to prepare the boards, but be sure to emphasize that the material must be flat and straight.

MATERIALS LIST--DINING TABLE		
Key	No.	Size and description (use)
A	16	3/4 x 3 x 28" oak (leg core)
B	16	3/4 x 4-1/2 x 28" oak (leg face board)
C	2	1-1/4 x 3 x 22" oak (end top rail)
D	2	1-1/4 x 5 x 22" oak (end bottom rail)
E	1	1-1/4 x 3 x 55 7/8" oak (long top rail)
F	1	1-1/4 x 5 x 55-7/8" oak (long bottom rail)
G	16	1/2 x 1-1/4 x 14-1/2" oak (slat)
H*	1	1 x 42 x 83" oak (top panel)
I	2	1 x 3-1/2 x 42-1/2" oak (breadboard end)
J	2	1/4 x 1 x 41" oak (spline)
K**	8	3/8 x 5/8 x 1-1/8" oak (plug)
L	8	1/4"-20 x 5" rh machine screw, washer
M***	8	1/4"-20 steel cross dowel
N	4	1/4"-dia. x 3" lagscrew, washer
O	as reqd.	No. 20 joining plate
P**	4	1/4"-dia. x 1-1/2" dowel
Misc.: Medium Fumed Oak aniline dye (No. W1190) available from Woodworker's Supply, 5604 Alameda Place N.E., Albuquerque, NM 87113; Waterlox Original Sealer/Finish (Waterlox Coatings Corp., 9808 Meech Ave., Cleveland, OH 44105).		
* Overall size, laminate from available stock.		
** Finished dimension. Cut oversize and trim flush.		
*** Cross dowel (No. 31823) available from Rockler Woodworking and Hardware, 4365 Willow Dr., Medina, MN 55340.		

Leg Construction

Each leg is formed by surrounding a solid core with mitered face boards. First rip stock for the leg cores, using up any wood that has defects in its appearance. Crosscut these boards a few inches longer than finished length. Spread glue, assemble them in stacks of four, and apply clamps. After about 20 minutes, scrape off glue that has oozed from the joints. Secure a tall auxiliary fence to the table saw rip fence and clamp a holddown featherboard to the auxiliary fence. Set the table saw blade at 45° and rip bevels along both edges of each face board (Photo 1). Then, crosscut the boards to match the cores.

Apply glue to the face-board mating surfaces and to all sides of a core for one of the legs. Assemble the leg, alternating clamp direction so that even pressure is applied on all sides (Photo 2). Construct the remaining legs in the same manner and scrape off excess glue after about 20 minutes. When the glue is dry, use a band saw and miter gauge to crosscut the legs to finished length.



With a featherboard holding the stock against the table, rip a 45° bevel on both edges of each leg face board.



Lay out the leg mortises as shown in the drawing. Then, use a plunge router with a spiral up-cutting bit and edge guide to cut them (Photo 3). Take two or three passes to reach the full mortise depth so you don't burn the bit or overload the router. Square the ends of the mortises with a sharp chisel.

The Rails And Slats

Use a dado blade in the table saw to cut the rail tenons (Photo 4). Since the blade will leave small ridges, it's best to cut the tenons about 1/32 in. oversize and then pare to the exact size. Clamp a stopblock to the saw table to set the tenon length. Hold the rails on edge to cut the shoulders at the top and bottom edges. Use a sharp chisel to pare the small ridges off the faces of each tenon.

Lay out the through mortises in the end rails and use a 7/16-in.-dia. bit in the drill press to bore slightly overlapping holes that remove most of the waste from each mortise (Photo 5). Use a sharp chisel to finish cutting the joints (Photo 6). Work halfway through the joint from one face, then turn the rail over to finish from the other side.



Spread glue on joint surfaces and clamp the face boards to the leg core. Alternate clamp directions to pull the joints tight.



Rout the leg mortises with a spiral upcutting bit. Reach finished depth in several passes to reduce router strain.



Use a dado blade in the table saw to cut the rail tenons. A stopblock clamped to the table ensures consistent cuts.



Using a 7/16-in.-dia. bit, bore slightly overlapping holes to remove most of the waste from the end-rail mortises.



Finish the through mortises with a sharp chisel. Work halfway through from each face to avoid tearing the wood surfaces.



Test fit each through tenon in its mortise. Mark around each tenon end to indicate the outer surface of the rail. Using this line as a guide, chamfer the tenon ends (Photo 7). Rip and crosscut the base slats to size and lay out the slat locations on the rails. Use the plunge router with edge guide to make the cuts (Photo 8). Clamp two rails together to provide a wider base for the router. Square the ends of each mortise with a chisel, and test fit the slats.

Next, mark the hole locations in the end top rails for fastening the tabletop. Use a Forstner bit to counterbore the recess for each bolt head (Photo 9), and then bore two side-by-side 1/4-in.-dia. holes for each bolt. Use a sharp chisel to remove the waste between the holes, leaving elongated slots. These wide bolt holes will allow the top to move with seasonal changes in humidity.



Lay out the slat locations in the rails and rout the mortises. Clamp two rails together to form a base for the router.



Use a Forstner bit and drill press to counterbore recesses for the lagscrews in the bottom edges of the top end rails.



Assemble the end rails and slats. Use two clamps to hold the pieces together until the rails are glued to the legs.

Base Assembly

Begin assembly of the base by joining the slats to the end rails. It's not necessary to use glue unless the slats are too loose. Use two clamps to hold the assembly together until it's joined to the legs (Photo 10).

Spread glue in the leg mortises and on the rail tenons for one end of the table. Join the end rails to the legs, apply clamps, and compare opposite diagonal measurements to be sure that the assembly is square (Photo 11). Then, let the glue cure and repeat the procedure for the other table end.

Join the slats and long rails, install clamps and then compare diagonal measurements. Spread glue on the through-tenon joints and assemble the table base. Use clamps on either side of the through tenons to apply even pressure (Photo 12).

Bore holes through the top rails and into the through tenons for dowels that will secure the joints. Apply glue and drive each pin into place (Photo 13). Cut off the dowel about 1/16 in. above the rail surface and use a sharp chisel to pare it flush. Turn the base over and install dowels through the bottom tenons.



Join the end assembly to the legs and clamp. Compare opposite diagonals to be sure that the assembly is square.



Assemble the slats and long rails and glue the long rails to the ends. Use clamps to pull the joints tight.



Lock the tenons to the rails by gluing a dowel through the joint. Turn the base over and repeat on the bottom joints.

The Tabletop

Select the stock for the tabletop, rip the boards to width, and crosscut a few inches longer than finished length. Plane or joint the edges of each board so they're straight and square, and then lay out joining-plate slots spaced about 7 in. on center. When cutting the slots, hold both the plate joiner and board tightly to your worktable so the slots will be accurately positioned.

Since the boards are long and heavy, it's best to begin assembly by joining only two. Then, after the glue cures, add one board at a time until the panel is complete. Use clamps every 6 to 8 in. along the joint to pull the boards together. After about 20 minutes, scrape off the excess glue, then wait another 30 minutes before adding the next board (Photo 14).

While the joining plates will ensure a reasonably flat panel, you'll need to plane the top to achieve a truly smooth and even surface. Use a jointer or jack plane to level the top. Make sure that the plane is razor-sharp, and work diagonally across the panel, taking light cuts (Photo 15). Use a cabinet scraper parallel to the grain to remove the plane marks, and then plane the edges parallel and to finished width.

Cut the top 1/2 in. longer than its final dimension with a circular saw or sabre saw. To make the finished cuts, first mount a 1/2-in. shank, top-bearing template bit in your router. Clamp a straightedge guide across the top panel, 1/4 in. from the end, and double-check that it's square to the panel edge. Then trim the end, allowing the router bearing to follow the straightedge guide (Photo 16). Use a scrap block clamped to the edge of the panel to prevent tearout at the end of the cut. Trim the opposite end using the same technique.

Rip and crosscut the two breadboard ends to finished size. Next, use a sharp block plane to cut the chamfered profile on the ends of each strip.

Use a slotting cutter to rout the 1/4-in.-wide x 1/2-in.-deep spline groove in the ends of the top panel. Note that the groove stops short of the panel edges. Use the same bit to cut a matching groove in one edge of each breadboard end.



Begin assembly of the top by joining only two boards. After the glue cures, add one board at a time to reach full width.



Use a jointer or jack plane to flatten the panel. Set the plane to take a very light cut, and work diagonally across the top.



To trim the ends of the tabletop, use a template routing bit that follows a straightedge clamped to the workpiece.



Cut a spline with a 1/2-in. radius on the ends for each breadboard-end joint. Fit each spline into its groove in the top panel (Photo 17), install the breadboard ends and temporarily clamp them in place. Using a doweling jig and a long 1/4-in.-dia. bit, bore holes for machine screws that will fasten the breadboard ends to the top panel (Photo 18). When that's done, turn the top panel upside down and bore holes for the steel cross dowels using a brad-point bit with depth stop.

Remove the end pieces and use a sharp chisel to widen the four holes in each to 1/2-in. slots. Then, use a router with edge guide to cut a mortise centered over each hole. Square the ends of the mortises with a sharp chisel as shown in the drawing.



Cut splines for the breadboard-end joints. A 1/2-in. radius on the ends matches the slot profile.



Clamp the breadboard end to the tabletop and use a doweling jig to bore through the strip into the end of the top.



Assemble the breadboard ends and the top panel, but don't use any glue on the joints. Insert a cross dowel in each tabletop hole, aligning the hole in the dowel with the machine screw hole in the breadboard end (Photo 19). Install the screws and washers to hold the ends in place.

Cut small blocks to plug the mortises over the screwheads, and glue the blocks in place (Photo 20). Let each block protrude from the edge of the strip. When the glue has cured, use a small block plane to trim the blocks flush.

Set the tabletop on the base, adjust it for proper overhang on all sides, bore pilot holes and install the 3-in. lagscrews and washers. Then, remove the top and sand all table surfaces to 220 grit.



Cover the screwheads with small blocks glued into squared recesses. After the glue cures, trim the blocks flush.

Finishing

We stained our table with a water-based aniline dye. To prepare for staining, wipe all surfaces with a damp sponge to intentionally raise the grain. When the wood is dry, lightly smooth the table with 220-grit sandpaper.

Apply the dye solution with a brush or rag, working quickly to avoid lap marks. Let the table dry overnight before applying the first coat of finish. If the wood surface is still a bit rough, lightly wipe with 320-grit sandpaper. Don't sand aggressively or you'll create light patches in the dyed surface. Clean with a tack cloth before proceeding.

We finished our table with four coats of Waterlox Original Sealer/Finish. Brush or wipe on the first coat and let it dry overnight. Lightly sand with 320-grit paper and remove all dust. For the remaining coats, let the finish sit on the wood for about 30 minutes, wipe off all excess, and let it dry over-night. When the last coat has fully cured, burnish with 4/0 steel wool and polish with a soft cloth.