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Classic Project

In this plan you'll find:

- Step-by-step construction instruction.
- A complete bill of materials.
- Construction drawings and related photos.
- Tips to help you complete the project and become a better woodworker.

Colonial Bunk Bed

Build A Colonial Bunk Bed

To make this bunk bed the author selected a style that could stand the test of time and then got busy machining all the parts ...twice.

By Rick White

For the growing family, saving space always seems to be a top priority. There's just never enough room for all the stuff kids collect these days and the most crowded place in the house is usually their bedroom. A bunk bed helps solve this problem by opening up more floor space and permitting greater flexibility in positioning furniture.

While designing this project I decided that, besides safety, choosing a timeless style was most important, especially since this bed will most likely be used by my grandchildren some day. I decided on a combination of spindles and frame and panel construction since both styles have already stood the test of time.

Red oak is ideal for bunk beds since it will stand up to the rough and tumble ways of any kid, and it's always a nice wood to work. The 56 spindles and the hardware used in this project are available from The Woodworkers' Store *(21801 Industrial Blvd., Rogers MN 55374)*. In addition, you'll need 50 board feet of 3/4" thick stock, another 20 board feet of 2½" thick stock and two sheets of 3/4" birch plywood. The project took me about 40 hours to complete at a cost of about $390.00, not counting the two mattresses.

Machining the Posts

Get started by ripping the eight posts (pieces 1 and 2) from 2½" thick stock, cutting them a little wide, then plane the newly sawn edges clean and square so the posts are 2⅜" by 2⅜". Crosscut the pieces to length and layout the mortises for the rails and bed rail fasteners following the **elevation drawings on page 10**. The four tall posts will be used for the headboards while the shorter posts will be used for the footboards.

For routing the mortises in the posts, I made a special base for my plunge router that centers the bit on the edge of a board **(See Figure 1)**. This jig was Paul L. Williams' winning trick in our September/October issue, and it works like a charm! Once you've made the jig, mount it to your router and install a 1/2" straight bit. Adjust the router to cut 1⅛" deep for ploughing out the mortises that will join with the rail tenons. Set the router on a corner post and turn it until the guide dowels on the jig contact the stock. By keeping the dowels bearing against the sides, you can rout perfectly centered mortises in two or three passes.

Now, rout 3/16" deep mortises for the eight bed rail fasteners (pieces 9) with a 5/8" straight bit, then square the corners with a chisel. Next, use a 1/4" straight bit to rout a 1/2" deep channel in the center of each mortise. Those deeper channels will accomodate the hooks when the fasteners are connected.

When the beds are stacked the posts are connected with short dowels (pieces 12). For the dowels to fit, drill 3/4" diameter by 1½" deep holes in the top end of the tall posts and the bottom end of the short posts. While you're at it, drill 3/4" diameter by 1/2" deep holes at the top of each short post for holding the decorative oak buttons (pieces 13). When the beds aren't

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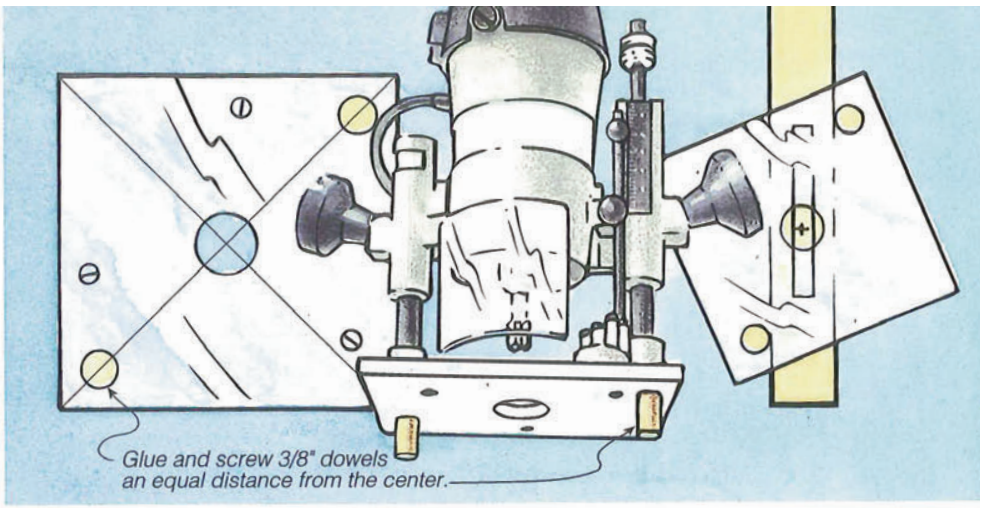


Figure 1: Use 3/8" thick polycarbonate and two short pieces of dowel to make a router base jig for cutting perfectly centered mortises in your bed posts.

stacked, you'll use four more of these buttons to fill the dowel holes in the headboard posts.

I finished up the posts by routing 1/4" chamfers on all their edges and ends. The reveal created by chamfering the ends makes a nice accent and hides any slight misalignment between the posts when the beds are stacked.

Headboard and Footboard Rails

If you can't find wide stock for the top rails (pieces 3) glue narrower boards into panels and rip the panels to width. Next, rip the lower rails (pieces 4) and the middle rails (pieces 5) to size, along with the raised panels (pieces 6) and the stiles (pieces 7). Once everything is the right width, cut all these pieces to length.

Grooves must now be cut in some of the edges of the rails and stiles to hold the raised panels **(see elevation drawings on page 10)**. Cut the grooves with a 1/4" dado blade raised 1/2" in your table saw. Adjust the fence to center the blade on 3/4" thick stock. Mark one side of all your rails and stiles with an "X" and keep that side against the fence during these cuts. This way, if your cuts aren't exactly centered, you'll still be consistent.

Cut the 1¼" long tenons on the rails with a 3/4" dado blade raised 1/8". Clamp a set up block to the fence, then adjust the fence so the set up block is 1/2" from the edge of the blade. Screw a 24" long auxiliary fence to your miter gauge so that one end just touches the blade when the miter gauge is in its slot. Set your rails onto the miter gauge and butt them against the set up block. Make the first pass to define the tenon shoulder, then take several more passes to remove the remaining waste. Do this to the ends of every rail, making cuts on both the front and back sides. Complete each tenon by cutting 1/2" notches with a sharp handsaw. Be sure to test your set up on a scrap piece to insure that the tenons will fit properly.

Cut the tenons on the headboard stiles with a 1/2" dado blade raised 1/4". Move the saw fence to align the set up block with the edge of the blade, then cut a sample piece to test the tenon fit in the rail grooves. Once you're satisfied with the fit, cut the stile tenons.

The next step is drilling the holes for the spindles (pieces 8). Chuck a 1/2" bit in your drill press and clamp a 4" tall fence to the drill press table so it centers the bit on 3/4" stock. Layout the fourteen hole locations on the appropriate edges of the upper and lower rails of the footboards and on the upper and middle rails of the headboards **(see elevation drawing on page 10)**. Since the rails are different widths, you need to adjust the drill press table to keep all the holes 5/8" deep.

The pattern on page 11 shows the curves for the upper and lower rails. Enlarge these patterns and lay them out on your stock. After cutting them out with a saber saw or band saw, sand the inside curves with a drum sander and use a belt sander for the outside curves. Now you can notch the top edges of each upper rail tenon with a handsaw.

The Panels

The two narrow panels (pieces 6) in each headboard are raised on a table saw. This method is perfect for producing simple, flat angles. Raise your saw blade 1/8" and set the fence 1⅜" from the blade. Now cut four kerfs into one side of each panel **(See Figure 2)**. Next, angle the blade 12° and raise it 1⅜". Set the fence 3/8" from the blade and cut the panel edges.

In order for the panels to fit into the grooves in the rails and stiles, the back of the panel edges must be rabbeted. Install a 1/2" dado blade and raise it 3/16". Clamp a piece of wood scrap to the rip fence and move this assembly so the blade just grazes the wood, then cut the rabbets on the back of the raised panels.

Temporarily assemble the panels and stiles between the rails. The panels should fit snugly without being forced. If everything fits properly, take apart the pieces and sand them thoroughly. Next, spread glue in the grooves where the stile tenons join the rails (don't put glue anywhere else or the panels won't float) and reassemble the structures. Make sure the outside edge of the side stiles are flush with the rail tenon shoulders, and check the assemblies for squareness.

Assembling a piece of furniture is one of the most rewarding steps in a project, and the key to its success is organization. Collect the pieces you need for each endboard, and assemble them one at a time. First squirt glue in

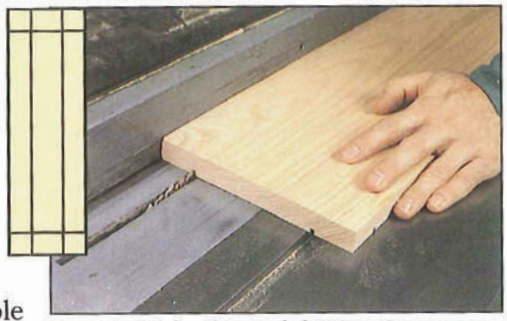


Figure 2: Raising the panels is a two step process. First cut 1/8" deep kerfs on the face of the panel (shown above), then raise the blade and angle it 12° to cut the sloped edges (shown below).

the spindle holes and insert the spindles, then draw the rails further onto the spindles with bar clamps. Once the rails and spindles are together, spread glue in the post mortises and set the posts onto the rail tenons. When both posts are mounted on the assembly, draw the joints tight with bar clamps. Follow this basic sequence for each endboard assembly, and always remember to check for squareness.

After the endboards are assembled, place the rail fasteners into their mortises in the posts. Drill 5/32" pilot holes and secure the fasteners.

The Side Rails

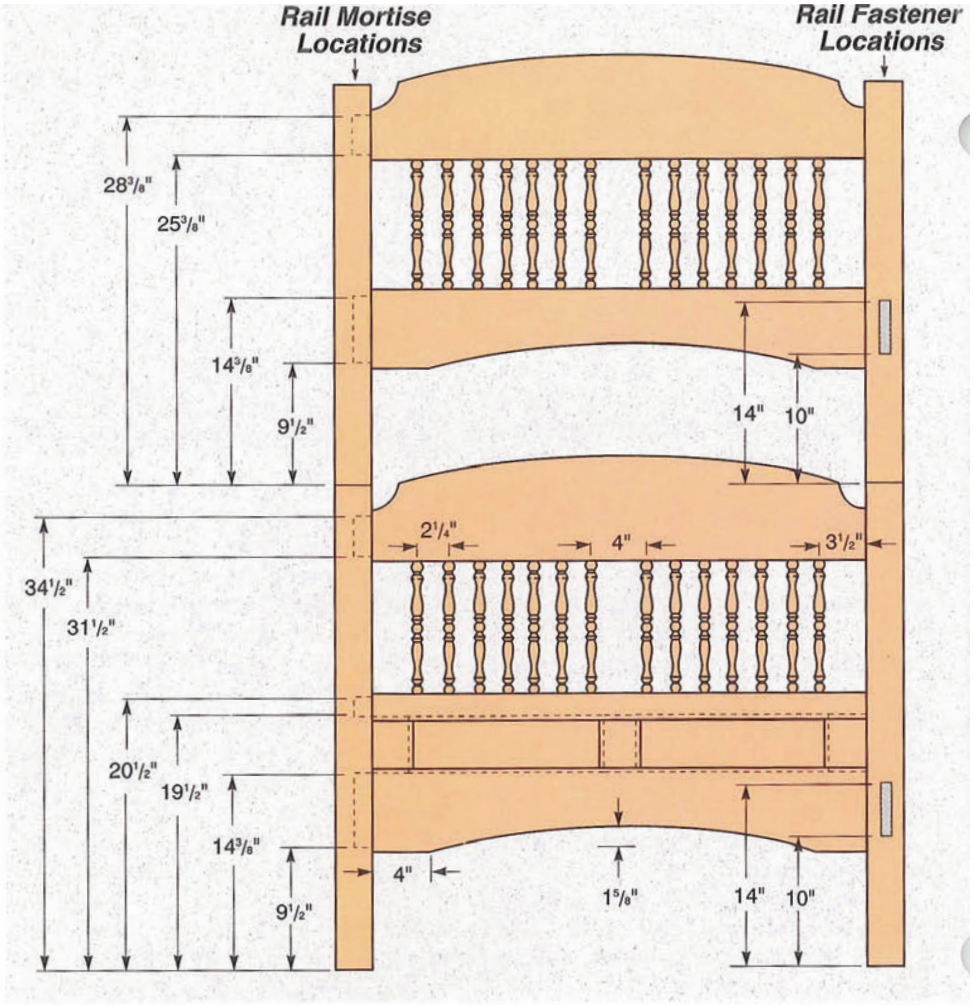
Rip four side rails (pieces 10) and cut them to length, then layout the mortises (see page 11) for the bed rail fasteners (pieces 9). Rout the 4" long by 3/16" deep mortises with the help of the centering base you made earlier and the jig shown in **Figure 3** on page 12. Clamp the jig to a rail end and hold it in a vise. Set up your router with a 5/8" straight bit, rout the mortises, then square the corners with a chisel.

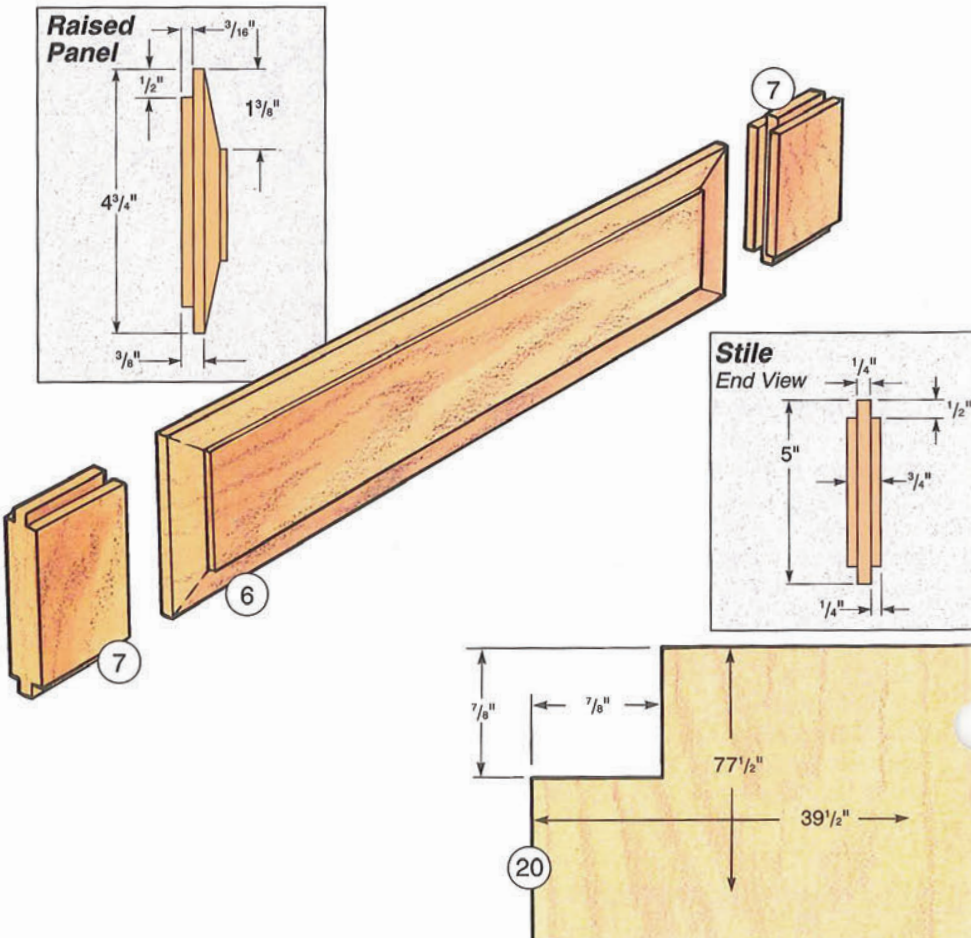
Set the fasteners in place and give each hook a whack with a hammer. When you remove the fasteners you'll see two marks where the hook stampings project from the back plates. Install a 1/4" straight bit in your router and rout small channels in the mortises at the indentation mark locations. The deeper channels will allow the bed rail fasteners to sit flush with the ends of the rails. Set the bed rail fasteners into the mortises and drill 5/32" pilot holes.

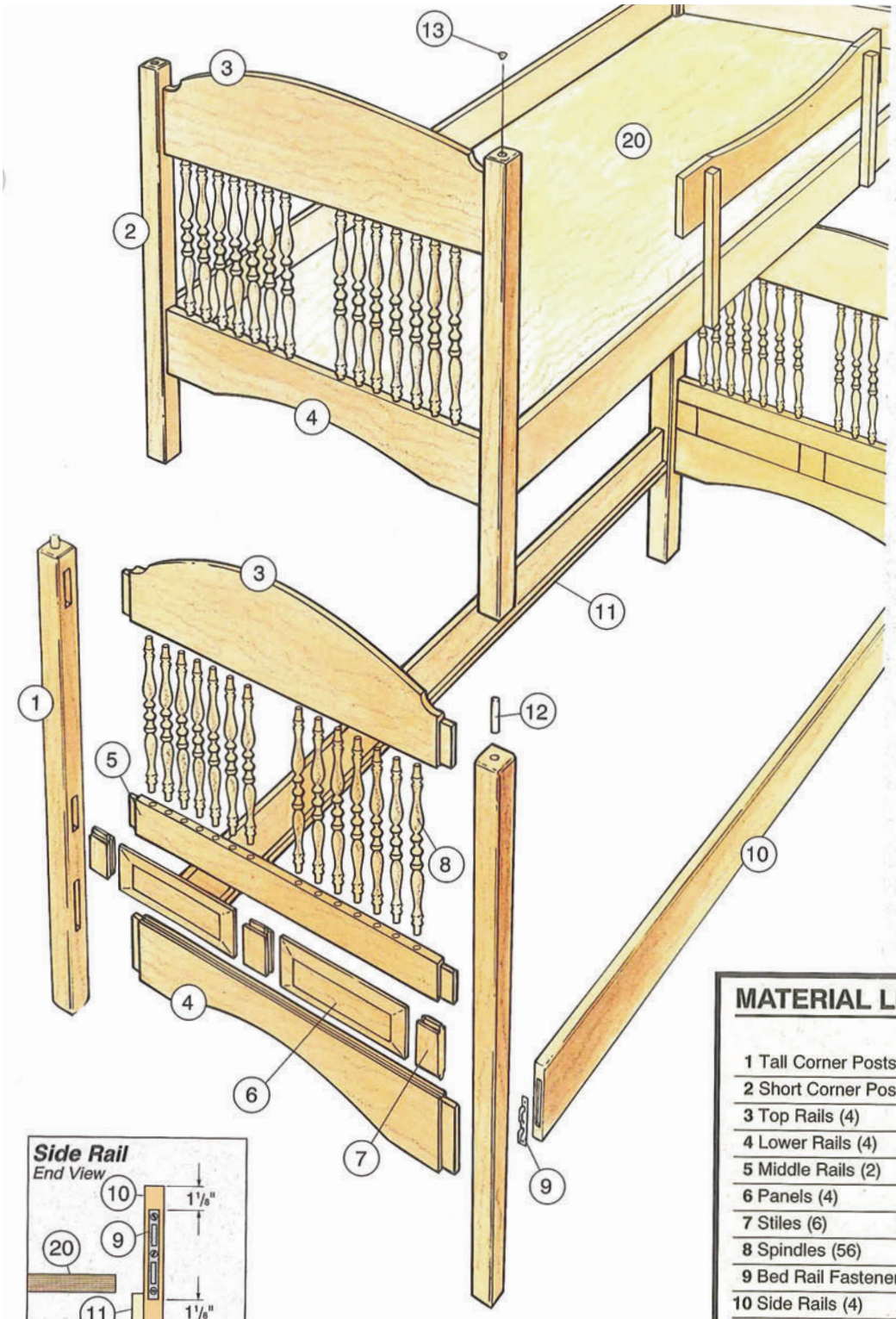
Before moving on to the ladder and guard rail there are a few details to complete. First cut the four ledger strips (pieces 11), then glue and screw them to the inside face of the rails **(see elevation on page 11)**. For the dowel connectors (pieces 12), cut four pieces of 3/4" diameter dowel, then sand them and round over their ends so they slip into the post holes easily. Finally, glue a post cap (pieces 13) into the hole in the top of each footboard post. Store the remaining oak buttons in a safe place until you're ready to unstack the beds.

The Ladder and Guard Rail

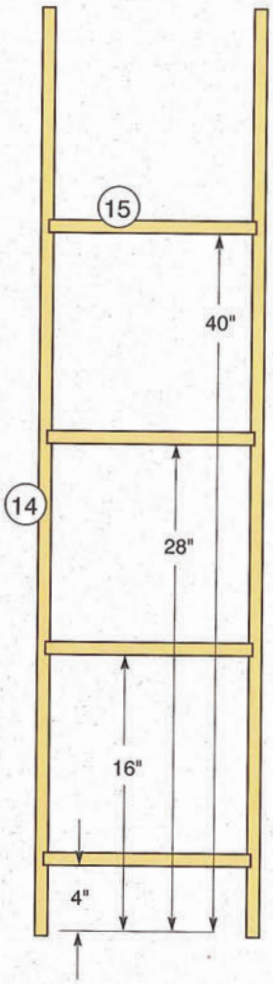
Rip stock for the ladder stiles (pieces 14) and cut the pieces to length, then layout the dado positions on their outside faces **(see elevation drawing** at far right on page 11**)**. Make a handy







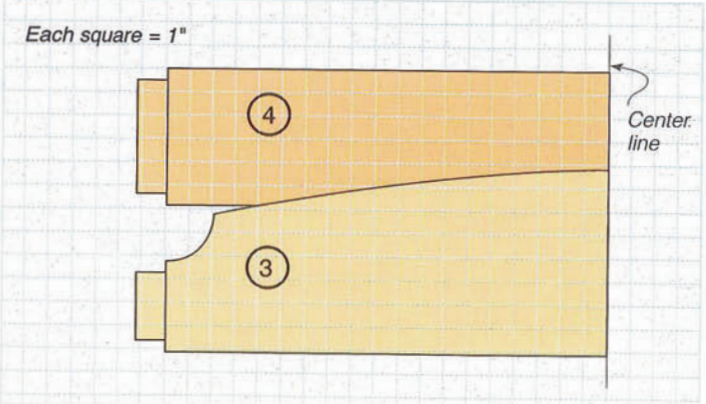
Ladder Dado Locations

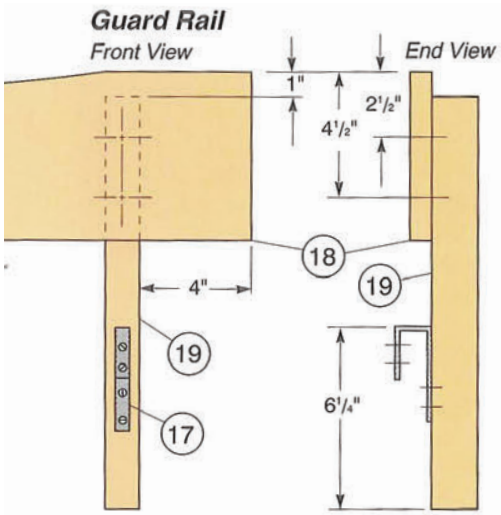


MATERIAL LIST

	T x W x L
1 Tall Corner Posts (4)	2½" x 2½" x 37"
2 Short Corner Posts (4)	2½" x 2½" x 31"
3 Top Rails (4)	3/4" x 8" x 40½"
4 Lower Rails (4)	3/4" x 5⅞" x 40½"
5 Middle Rails (2)	3/4" x 2" x 40½"
6 Panels (4)	3/4" x 4¾" x 15¼"
7 Stiles (6)	3/4" x 3" x 5"
8 Spindles (56)	7/8" x 10"
9 Bed Rail Fasteners (2 sets)	4"
10 Side Rails (4)	3/4" x 6¼" x 76"
11 Ledger Strips (4)	3/4" x 1⅜" x 76"
12 Connecting Dowels (4)	3/4" x 1½"
13 Post Caps (8)	3/4" dia. oak buttons
14 Ladder Stiles (2)	3/4" x 2¼" x 52¾"
15 Ladder Steps (4)	3/4" x 2⅜" x 12"
16 Oak Plugs (20)	3/8" diameter
17 Ladder Hooks (3 pairs)	Vinyl coated steel
18 Guard Rail (1)	3/4" x 6" x 36"
19 Guard Rail Supports (2)	1⅛" x 1⅜" x 15½"
20 Mattress Boards (2)	3/4" x 39½" x 77½" (ply)

Use the grid below to make a template of the arc for pieces 3, 4 and 18.





alignment tool for cutting the dadoes by screwing a 2" tall auxiliary fence to your miter gauge that extends well past the blade, and run it over a 3/4" dado blade raised 1". Now you can align each dado location with the cut in your auxiliary fence. Lower the blade so it projects 1/4" above the table saw surface and make your cuts. For a finished look, rout a 1/8" chamfer on all the edges of the stiles.

Each step is held in the dadoes with screws, so chuck a 3/8" bit in your drill press and drill two 1/4" deep counterbores in the outside face of each stile at the step locations. Next, cut the four steps (pieces 15) to size and chamfer their front edges. Now dry assemble the ladder and drill 3/32" pilot holes through the stiles and into the steps. Take the ladder apart and spread glue in each dado, then reassemble it and drive #8-2" screws into all the pilot holes. Sand the ladder thoroughly and glue 3/8" oak plugs (pieces 16) in the counterbores. Set the ladder hooks (pieces 17) in place on the stiles and drill 3/32" pilot holes.

Don't secure the hooks until after the finish is applied.

The guard rail is made from just three pieces; the rail (piece 18) and two supports (pieces 19). Rip stock for each piece and cut them to length. Following the **elevation drawing at left,** layout the screw hole locations on the guard rail and drill the counterbores. Now position the supports and drill the pilot holes with a 3/32" bit. Assemble the supports to the guard rail, then position the two ladder hooks and drill their pilot holes. Again, don't attach them until after the bed is finished. Cover the support screws with 3/8" oak plugs and sand them flush.

Cut the two mattress boards (pieces 20) to size from the plywood, notching the corners so they fit around the bed posts **(see elevation drawing).**

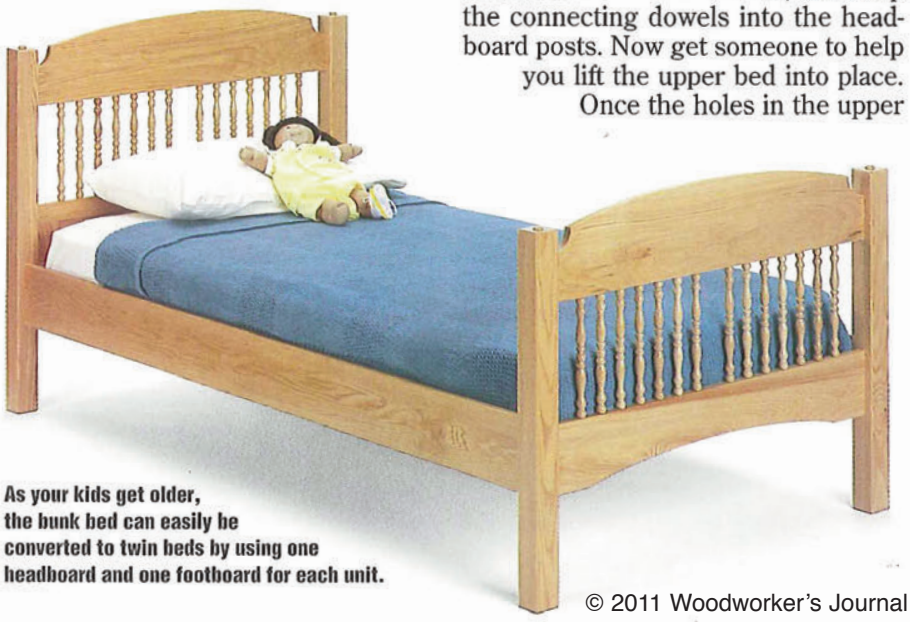
The Final Act

Sand the bed thoroughly through 150 grit, being sure to ease any sharp edges or corners. I applied two coats of polyurethane because it will hold up the best under the heavy use kids will put the bed through. Once the finish is dry, screw the hooks to the ladder and the guard rail.

For bunk beds, use the headboards on the lower unit and the footboards on the upper unit. (If you want individual beds, use one headboard and one footboard for each unit and add the oak buttons to the top of the headboards.) Connect the side rails to the headboards and footboards, then slip the connecting dowels into the headboard posts. Now get someone to help you lift the upper bed into place.

Once the holes in the upper unit's posts engage the connecting dowels, set your mattress boards into place. Slip the hooks on the guard rail and the ladder over the bed rails. For added safety, these hooks are bored so you can screw them to the rails. This is a good feature as it prevents younger kids from accidently knocking off the ladder or guard rail. I know that with my rambunctious youngsters it will definitely prove to be a necessary precaution.

Add your mattresses and bedding, and you're all set. You'll find more floor space available in the kids' room, and they'll have a great time with their new furniture.



As your kids get older, the bunk bed can easily be converted to twin beds by using one headboard and one footboard for each unit.

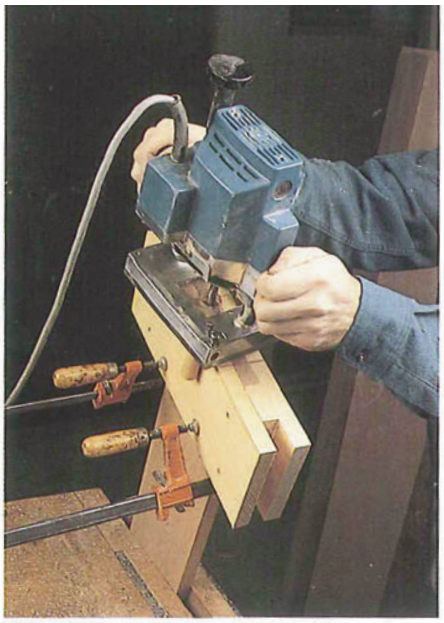
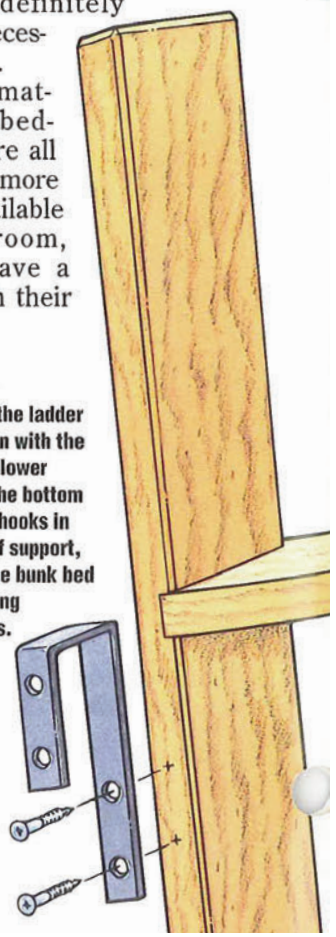


Figure 3: Make the jig shown above to wrap around the side rails. Use it with the post mortising jig to rout the shallow bed rail fastener mortise in the end of each rail.



Screw two hooks to the ladder so their tops are even with the top step. Attach the lower hooks so they grab the bottom side rail. Using four hooks in this way gives lots of support, and you can make the bunk bed even safer by screwing the hooks to the rails.

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Note: if you intend to build this project for use by children, please make sure you follow current governmental safety guidelines for the country, state or jurisdiction in which you live. For the USA, current guidelines can be found at the Consumer Product Safety Commision website: http://www.cpsc.gov. While efforts are made to design this plan to safety guidelines, no guarantee is made that this plan is current with the particular regulations or guidelines of your governmental jurisdiction.

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Thank you again for your purchase, and happy woodworking!

Matt Becker
Internet Production Coordinator