



low-profile

PLATFORM BED

This project combines the best of both worlds — a modern, elegant design with basic, traditional joinery. Simple techniques make it easy.

Here's a project I've been looking forward to building for some time. This queen-size bed completes the five-piece bedroom suite that includes an armoire, dresser, night stand, and wall mirror. (To see all of these projects together, check out the photo on page 12.)

To match the contemporary look of the other pieces, we decided to

build a platform-style bed. With this type of design, no box spring is needed. So you end up with a sleek, low-profile bed. But best of all, the clean, simple design makes building a large project like this very straightforward.

For starters, the headboard and footboard are both put together with basic mortise and tenon

joinery. Nothing fancy or tricky here. All you have to do is chop a few mortises, cut some tenons to fit, and you're almost done. And the panels in headboard simply slide into grooves cut into the frame pieces. To complete the job, you just cut a couple of rails, install some simple hardware, and the bed is ready to assemble.

CONSTRUCTION DETAILS

OVERALL DIMENSIONS: 68"W x 86½"L x 44"H

NOTE: Bed is sized for a queen-size mattress

NOTE: Bed rail fasteners allow frame to be easily assembled or disassembled

Headboard and footboard assembled with mortise and tenon joinery

Footboard legs are chamfered on bottom and top edges

Gentle curve on footboard rail

Cap doweled to legs

Cap hides joinery at top of headboard

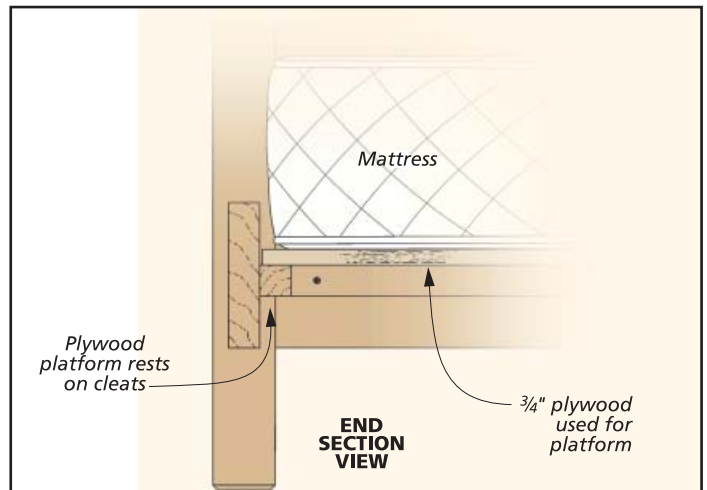
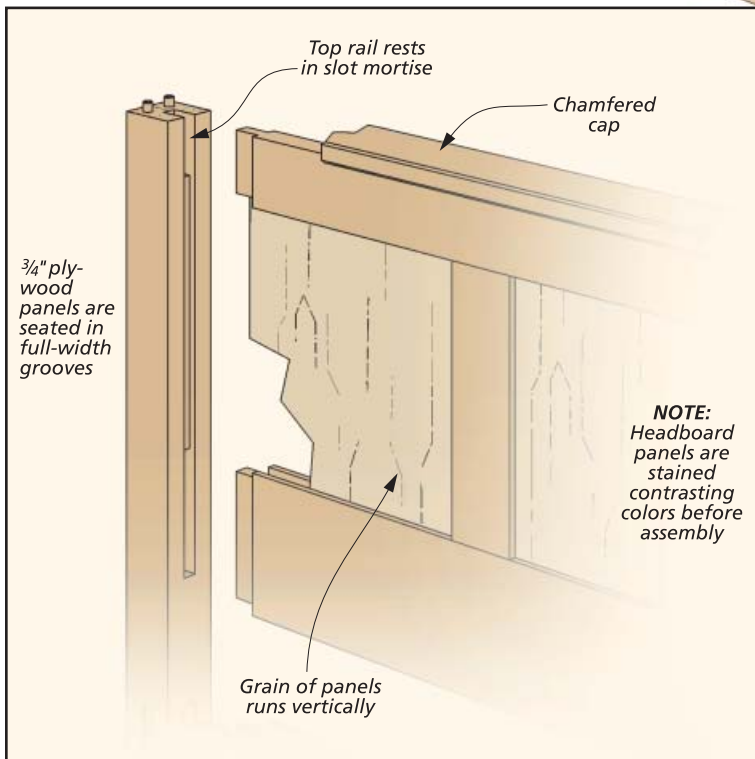
Fastener mortised into leg

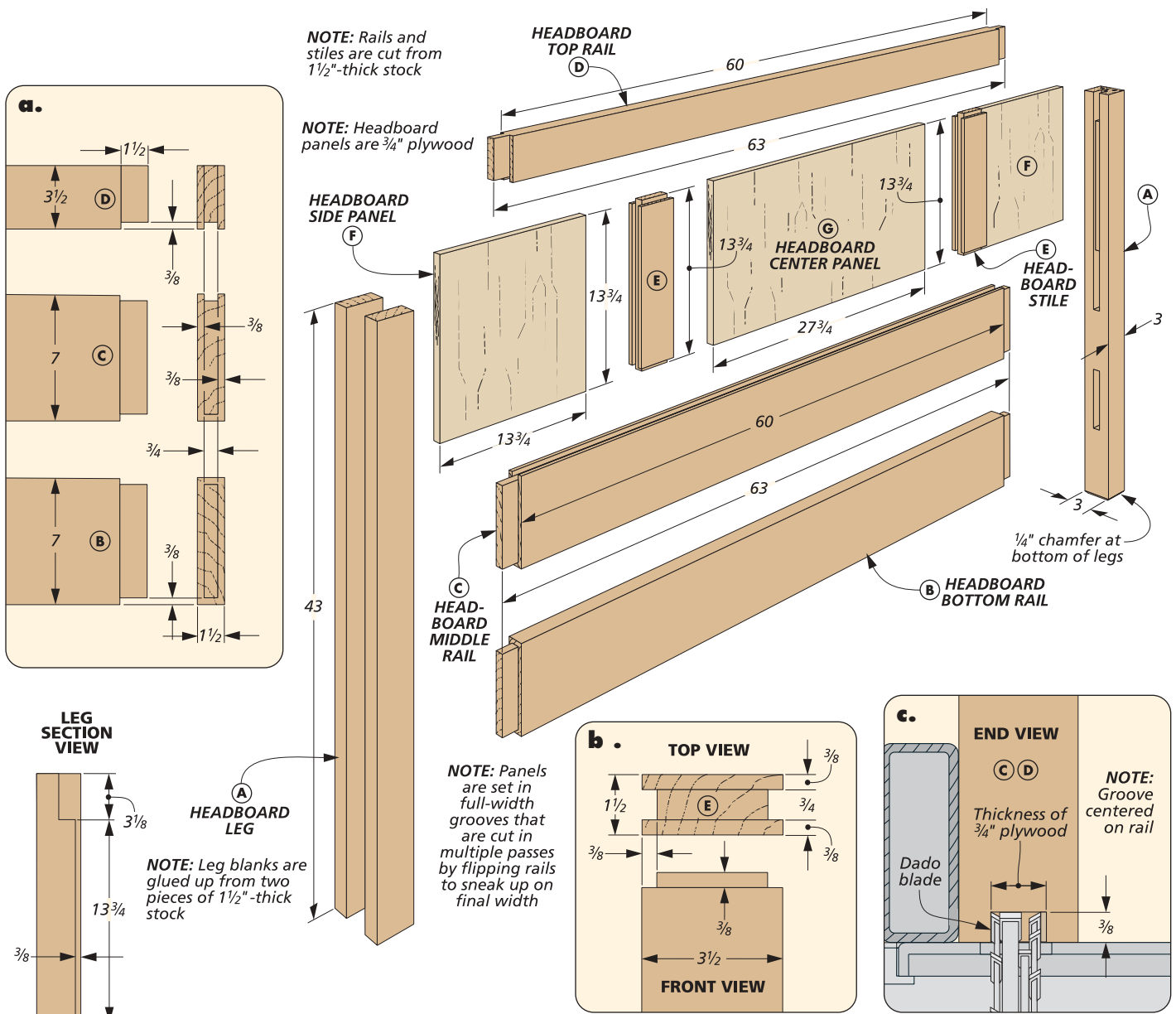
Sturdy plywood platform supports mattress

Cleats are glued and screwed to rails

Bed rail fastener mortised into end of side rail

Leg blanks glued up from two pieces of stock





building a sturdy HEADBOARD

On this project, I decided to get the most involved work out of the way first. That means I started by putting together the headboard.

LOOK IT OVER. Take a look at the drawing above and you'll get a good idea of how the headboard is put together. You'll see that it's really nothing more than a large, mortise and tenon frame.

You start with two sturdy legs and join them with three rails. The space between the upper rails is filled by a pair of vertical stiles and three plywood panels set into grooves. I think the main challenge you'll find might just be the large size of the headboard. But it's not unmanageable.

THE LEGS. To get started, you'll need to make the two stout, 3"-square legs. These will give you a solid foundation. As you can see above, the leg blanks are glued up from two pieces of 1 1/2"-thick stock. Once that job is completed, you can cut them to length, and then turn your attention to the mortise and tenon joinery.

THE LEG JOINERY. As shown in the left margin, each leg has three mortises. Two long mortises for the lower and middle rails, and a narrower, open mortise to capture the upper rail. This open-ended mortise makes the assembly go a little easier and it will be hidden by a cap piece added later. Finally, a shallow groove, sized to

hold the side panels, connects the two upper mortises.

KEEPING IT SIMPLE. But before you get started on the layout, let me point out a couple things you need to know. First, as shown above, you want to orient the leg blanks so the glue lines are along the sides of the headboard. They'll be a lot less noticeable this way.

The second item has to do with the width of the mortises and the grooves in the frame. I did things just a bit differently here.

To keep things simple, I wanted to set the three plywood panels into full-width, centered grooves cut into the frame parts. But now since 3/4"

How-To: Cut the Leg Joinery

plywood is usually a bit undersize, this requires cutting custom-sized grooves to get a good, snug fit. I didn't want to cut full $\frac{3}{4}$ "-wide mortises and then have to cut slightly narrower grooves. So what it boils down to is that I sized the width of the mortises to the plywood as well. It's a pretty minor compromise that makes the joinery go a lot easier.

GETTING TO WORK. Now you're ready to get busy laying out the joinery. I just kept a scrap of the plywood in my apron pocket to use for a layout and joinery gauge.

Once the layout is complete, the drill press, a couple of sharp chisels, and the router table will take care of the hard work. The box at right will lead you through the process.

When you finish routing the groove in the last step, you'll want to stay at the router table for just a bit longer. Install a chamfer bit and then use it to ease the bottoms of the legs. This will keep them from chipping when the bed is moved.

RAILS AND STILES. With the legs ready to go, you can turn your attention to connecting them. Your first task is to cut the three rails and the two stiles to size. Once this was done, I swapped out the standard blade on my table saw for a dado blade to handle the joinery.

Here again, you want to work around your panel plywood. So first, I cut the centered grooves in the upper and middle rail and the two stiles for the panels. Just sneak up on the width of the groove by turning the pieces end for end between passes, as in detail 'c.'

After the grooves are completed, all the pieces get tenons on both ends. Since the tenons on the rails and stiles are all the same thickness, I first cut the stub tenons on the stiles to get the blade setting right. (Bury the blade in an auxiliary fence.) Then you can cut the longer tenons on the three rails, as in detail 'a.'

THE PANELS. With the joinery complete, all you need now are the three plywood panels. After cutting them to size, I did a dry fit of the headboard and then gave some thought on how to approach the glueup.

For me, the real challenge to the leg joinery was doing things in the right order and with the right technique.

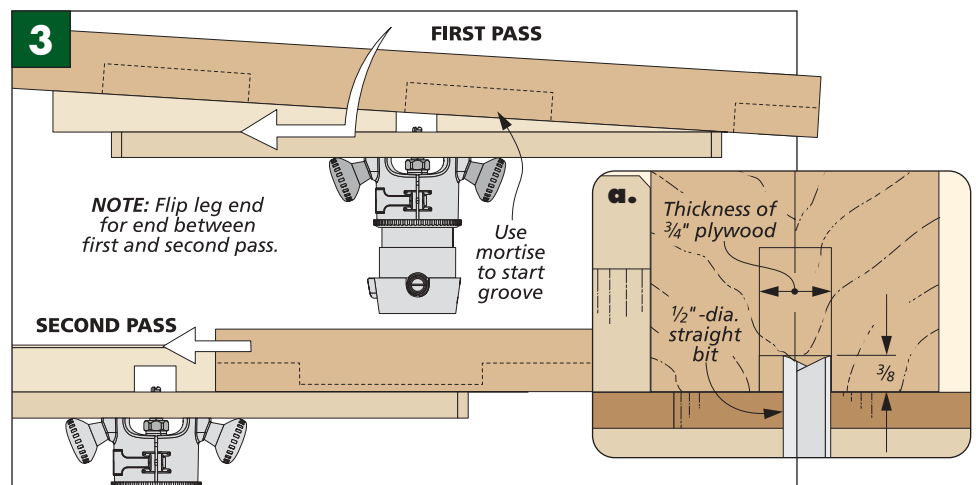
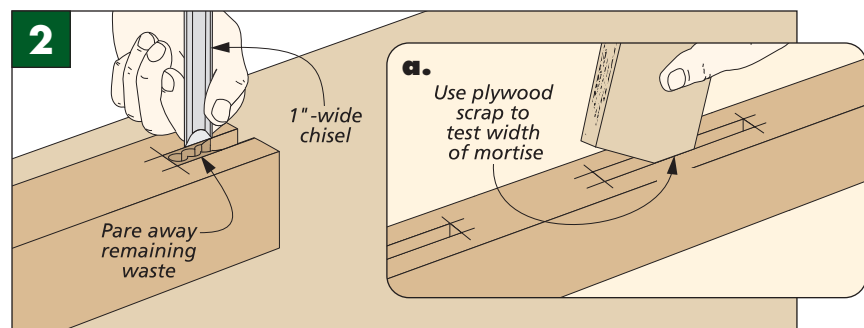
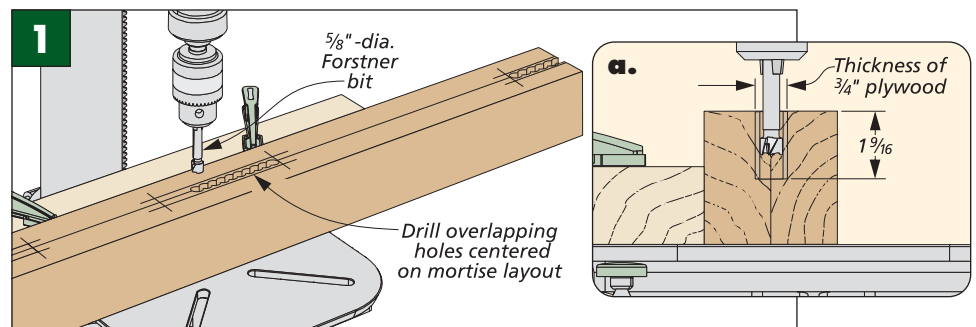
I started the job at the drill press, as shown in Fig. 1. The completed mortise will be slightly less than $\frac{3}{4}$ " wide, so I installed a $\frac{5}{8}$ "-dia. Forstner bit to drill out the waste. A fence clamped to the table will take any guesswork out of centering the holes in the mortises. The tenons on the rails will be $1\frac{1}{2}$ " long, so you'll want to go just a little deeper with the mortises ($\frac{1}{16}$ " should do it).

When the work at the drill press was done, I took the legs to the workbench to clean up the mortises (Fig. 2). The key thing to remember here is that you want to match

the width of the mortises to the thickness of the plywood for the panels. A scrap of the plywood makes a perfect test tenon to check the fit.

When you set down your chisels, the final task is to connect the middle and upper mortises with a panel groove. And since the groove ends in the middle mortise, I decided the router table was the best place to do the work (Fig. 3).

The mortises in the legs make routing the grooves easier by giving you a starting and stopping point for a $\frac{1}{2}$ "-dia. straight bit. To keep the groove centered, make a pass and then flip the leg end for end for a second pass. Again, I used a scrap of my plywood to check for a snug fit.



capping the HEADBOARD

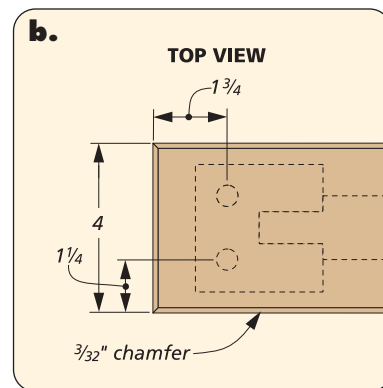
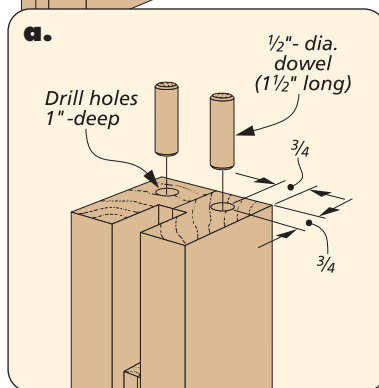
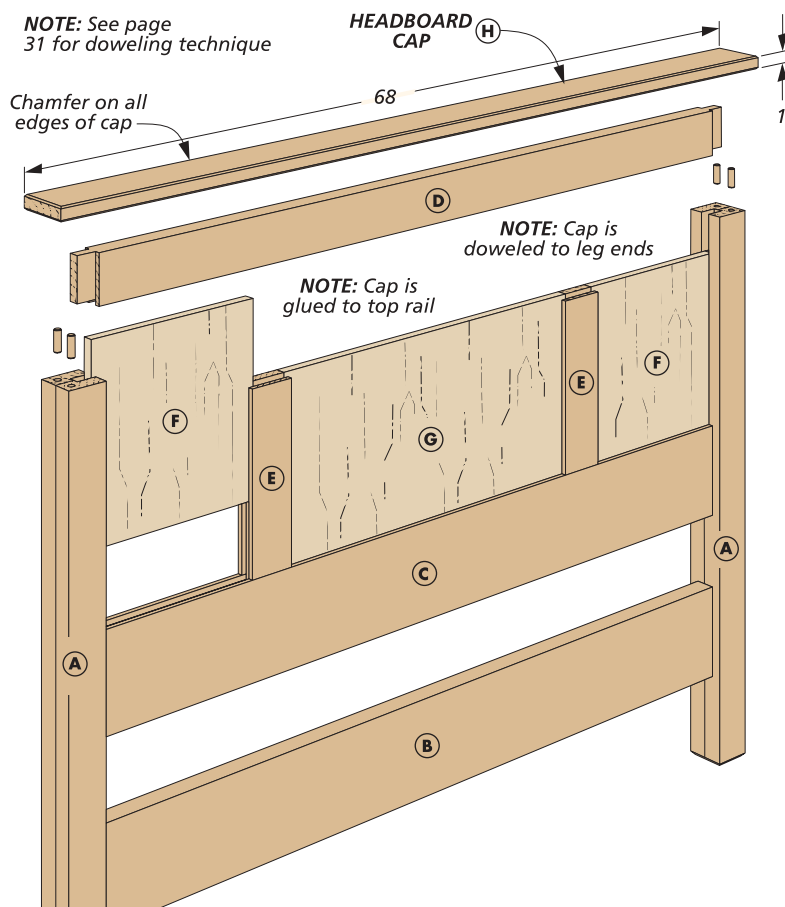
The joinery is complete but don't get too anxious and start gluing the headboard together just yet. There's a certain order to things that you'll want to know about first.

STAIN NOW. You'll remember that the headboard frame and the panels are stained contrasting colors. This left me with a decision — should I stain before or after the assembly. Prestaining made the most sense. So at this point, I took the time to sand and stain all the parts. You'll find the two stain colors at our website.

THE ASSEMBLY. After the stain was dry, I carried all the pieces to the bench and got out the glue and clamps. The large size of the headboard can make the glueup a little tricky. So I took it in stages to make it more manageable. You'll need six-foot clamps to reach from side to side. If you don't have any long clamps, the box below gives you several good options.

I started the assembly by gluing the lower and middle rail between the legs. When this assembly is dry, you can drop the stiles (with glue) and panels into place from above. Finally, the upper rail is glued into the slot mortises in the legs and the clamps can go on.

A SIMPLE CAP. The last piece to be added to the headboard is a chamfered cap that covers the top rail and legs. Glue holds the cap to the long grain of the top rail but the end grain on top of the legs is a poor glue surface. So here, I added a pair of dowels between each leg and the headboard cap, as shown in details 'a' and 'b.' If you turn to page 10, you'll find an easy way to match up the holes for the dowels.



Shop Tips: Stretching Your Clamps



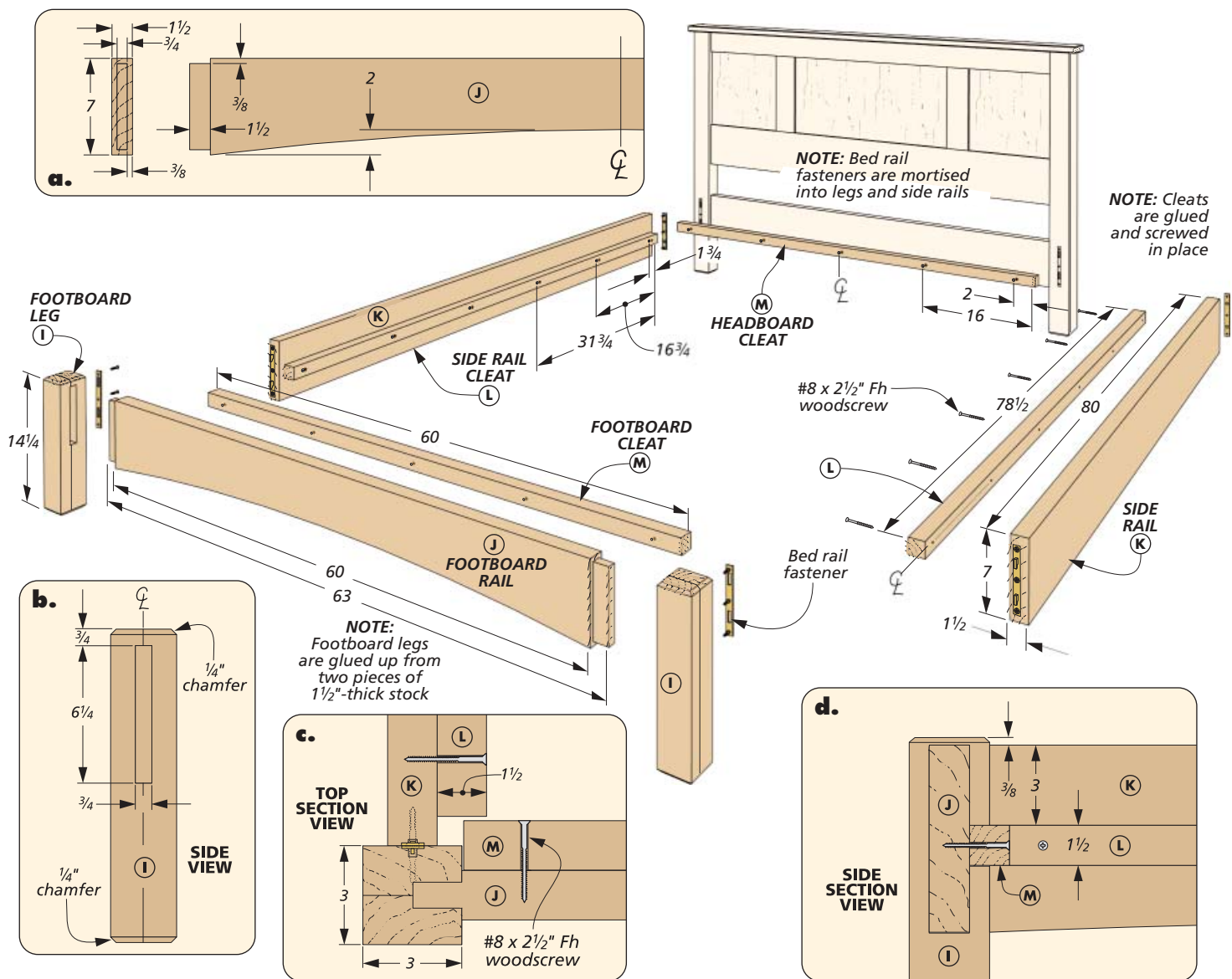
▲ You can avoid the need for long clamps by giving yourself an alternate clamping surface. Here I tightened my clamps down on cleats clamped to the rail.



▲ A cheap solution is to make two clamps into one. All it takes is an inexpensive coupler from the hardware store to make two sections of pipe into one long section.



▲ If one pipe clamp won't do the job, I'll put two to work, back-to-back. The two pads are turned 90° so the clamps can be tightened against one another.



making the FOOTBOARD & RAILS

With the headboard complete, most of the hard work is out of the way. The next job is to build a footboard and a pair of rails to wrap up the frame. Then you'll add the hardware to hold everything together. And finally, some cleats to support a platform for the mattress.

THE FOOTBOARD. First comes the footboard. You can see in the drawing above, it's much simpler than the paneled headboard — merely a pair of legs with a curved rail connecting them. Here again, mortise and tenon joinery supplies the strength.

I'll only mention a couple things about the legs for the footboard. Here, I didn't have plywood panels

to worry about, so I cut mortises that were a full $\frac{3}{4}$ "-wide (detail 'b'). And since the footboard has no cap piece, I routed a chamfer on the tops of the legs as well as the bottoms.

The footboard rail is pretty much self explanatory. The only twist here is the gentle curve cut into the lower edge of the rail. You'll want to do this after the tenons have been cut, as shown in detail 'a.'

To lay out the curve, I simply used a flexible strip of wood pulled into a slight bow by a piece of string tied between the two ends. And once you've marked the line of the curve on the rail, you can take it to the band saw to cut it to shape.

THE SIDE RAILS. The side rails only need a short mention. Just cut them to size and they're ready to go.

THE HARDWARE. Now that you have all the frame pieces made, the next step is to install the bed hardware used to fasten everything. For details on this, you can turn to page 7.

THE CLEATS. With the fasteners in place, the frame can be set up and the cleats that support the platform installed. First, I cut the headboard and footboard cleats to fit and glued and screwed them to the rails (details 'c' and 'd'). The side rail cleats need to be set back from the ends of the rails in order to clear the end cleats, as shown in detail 'c.'

knock-down BED RAIL FASTENERS

When you assemble a bed frame, you want to accomplish two things. First, you want it to be solid as a rock. Next, you need to be able to assemble and disassemble the bed frame quickly and easily for moving. Well as you might guess, there's hardware available that handles both jobs and it works great.

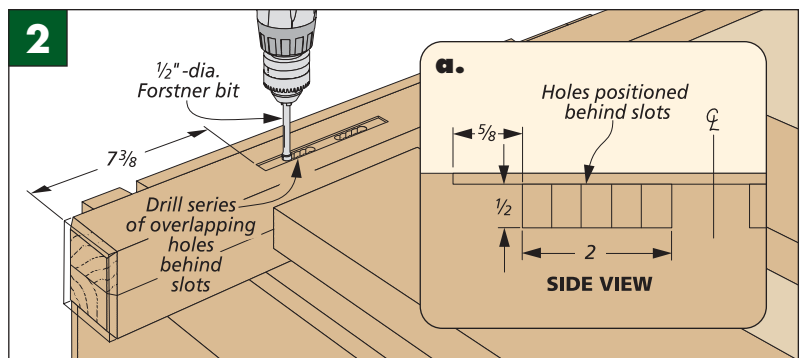
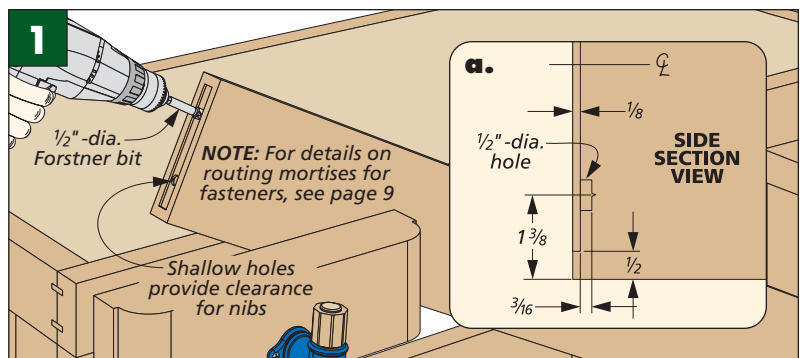
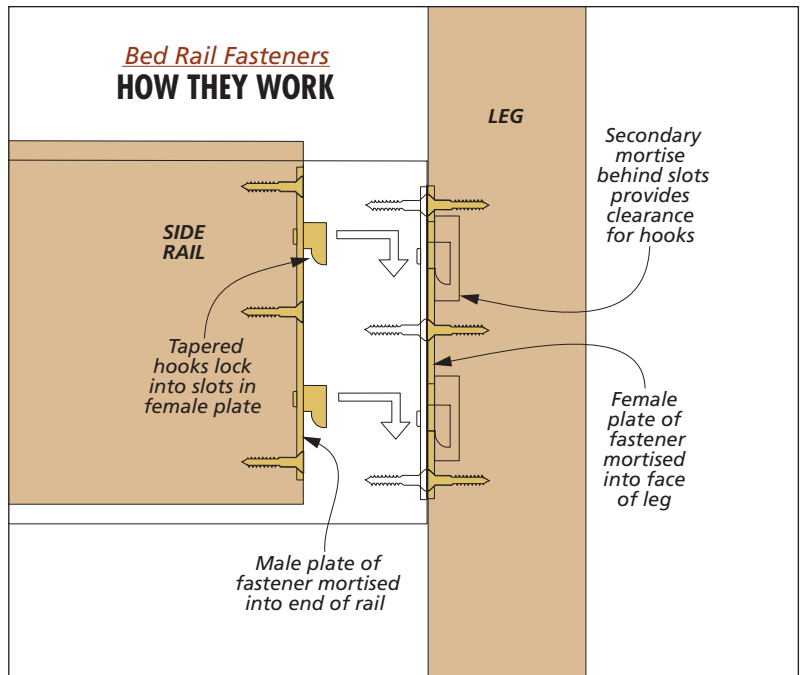


▲ These bed rail fasteners give you the best of both worlds. They make setting up the frame easy. And once it's together, it'll stay together.

HOW THEY WORK. The drawing at upper right shows how the bed rail fasteners I used (and most other types) work. The male plate of the fastener (left in drawing) is mortised into the end of the side rail. It has a pair of tapered hooks that engage two slots in the female plate of the fastener, mortised into the leg. As the rail drops into place, the tapered face of the hooks pulls it tightly against the female plate locking the leg and rail together. All it takes to reverse the lock is a solid "thump" on the bottom of the rail.

MORTISES. The only catch is, to get the best result, the fasteners have to be mortised snugly in place, flush to the surface. This means cutting eight mortises, four of these into tough end grain. So it didn't take me long to decide that routing these mortises was the best way to go. It was an easy job using a simple jig. You'll find the details on page 9.

FINISH UP. Once the shallow plate mortises were routed, I got out a hand drill to complete the job. As you can see in the upper drawing, both parts need a relief area drilled out behind the plate. The side rail mortises simply need a couple of shallow holes to provide clearance for the nubs on the back of the plate (Fig. 1). On the legs, I drilled a deeper, secondary mortise behind the slots in the plate to accommodate the fastener hooks as in Fig. 2.



◀ Seated in a snug fitting mortise on the leg, the slotted plate provides a solid attachment point for the side rails.

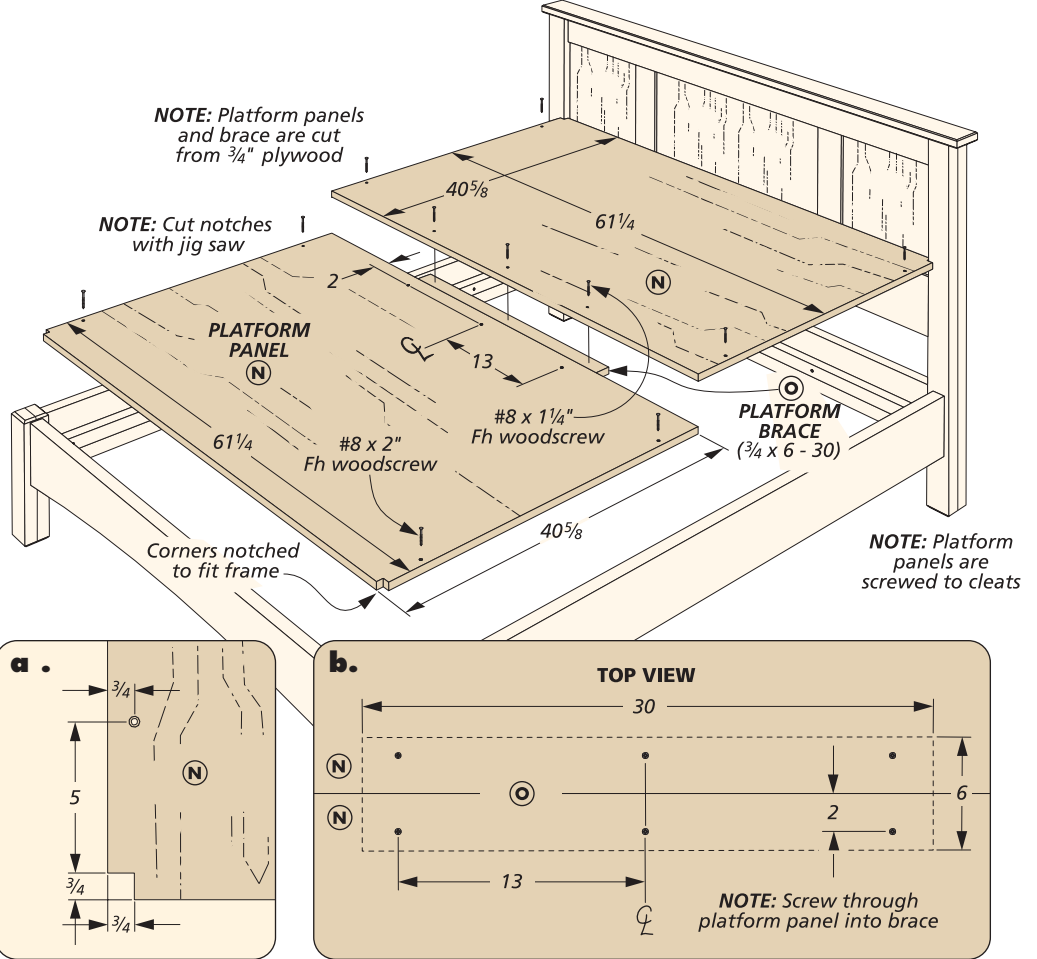
adding the PLATFORM

All you need now is a platform to support the mattress. And for this job, I cut two $\frac{3}{4}$ " plywood panels.

To get a good fit, you'll want to assemble the bed frame before cutting the panels to size. Then two corners of each panel are notched to fit around the legs (detail 'a').

Finally, to make certain there wasn't any sag across the center seam, I fastened a brace between the panels (detail 'b'). The easy way to do this is to set one panel in the frame and then screw the brace to it. Then the second panel is dropped in place and screwed to the brace.

Now, I took it all apart to complete the finish. And after a quick reassembly, it's ready for use. **W**



DESIGNER'S NOTEBOOK

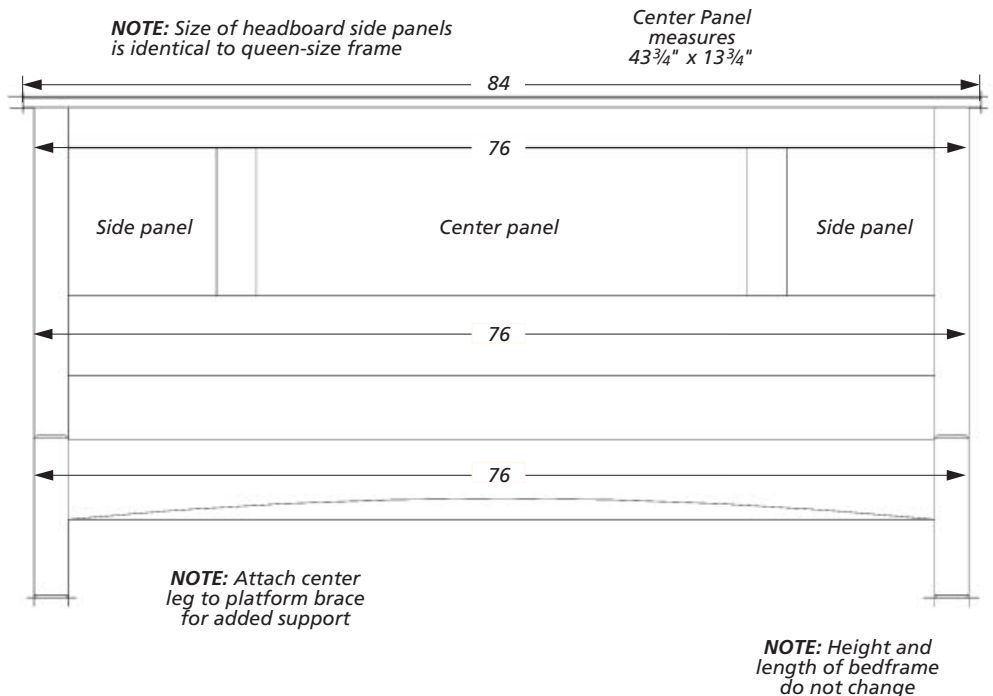
A Different Size

Building a wider frame is about the only change you'll need to make for a king-size version. But I do want to mention a couple minor things.

First, when you build the headboard, you'll have more space to fill with the plywood panels. The best way to do this is to leave the two side panels the same size and make the center panel wider.

And then at the tail end of the project, you'll want to add extra support under the platform. All this takes is a centered leg screwed to the platform brace.

A couple final notes. You'll find dimensions for a full-size bed on our website. And check your mattress size before you start work.



tips from our shop

Bed Rail Fasteners

To attach the rails to the headboard and footboard of the platform bed, I used bed rail fasteners. These are mortised into the legs of the bed as well as the ends of the rails. And since they carry the entire weight of the platform and mattress, you'll want to make sure they fit into the mortises like a hand in a glove. In order to do this,

I made a simple jig that allowed me to quickly rout snug-fitting mortises for the fasteners, as is shown in the photo at right.

As you can see in the drawing below, the jig is just a router template that fits over the workpiece. The top of the jig is nothing more than a piece of 1/2"-thick hardwood with a slot in the center to match the size of the bed rail fasteners.

But instead of trying to cut the slot in the center of the top, I glued up the top out of four separate pieces, using one of the rail fasteners as a spacer to make sure the slot was

perfectly matched to the hardware.

FENCE. The underside of the top has a couple of grooves cut in it to hold a hardboard fence. This way, you can move the fence from one groove to the other to cut the mortises on the legs as well as those in the bed rails. I sized both of these grooves for a *tight, friction fit*.

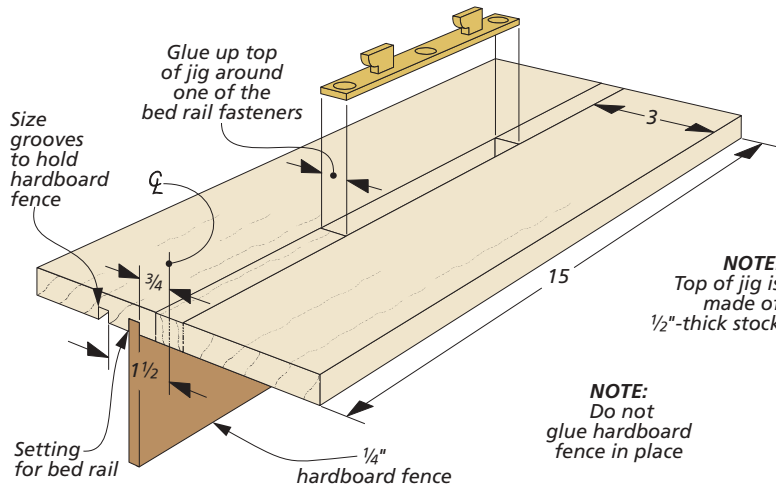
To use the jig, place the fence in the groove closest to the slot opening and then clamp the jig to the end of one of the bed rails, as you can see in Fig. 1. Using a 1/2" dado clean-out bit (see inset photo at left) rout a shallow mortise in the end of the rail. The bearing on the bit follows the slot in the jig, creating a perfectly sized mortise. (You can use one of the rail fasteners as a gauge to check the depth of the mortise.)

After routing the mortises on the bed rails, you can move the fence to the outer groove of the jig and repeat the mortising procedure on the legs of the bed (Figs. 2 and 2a).

Once all the mortises have been routed, the next step is to square up the ends of each mortise with a chisel (Fig. 2b). Then you just have a few little minor details to take care of before screwing the rail fasteners in place. (See page 7 for more.)

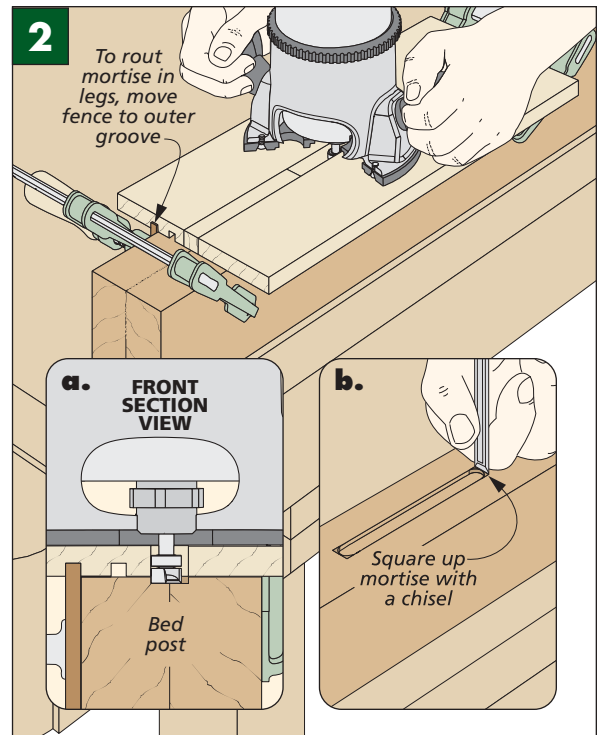
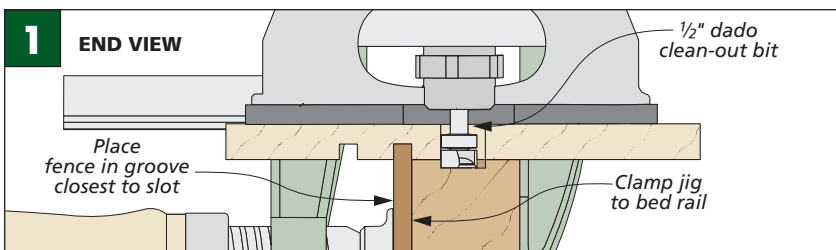


▲ This dado clean-out bit is the perfect length for routing the shallow mortises for the bed rail fasteners.



NOTE:
Top of jig is made of 1/2"-thick stock

NOTE:
Do not glue hardboard fence in place

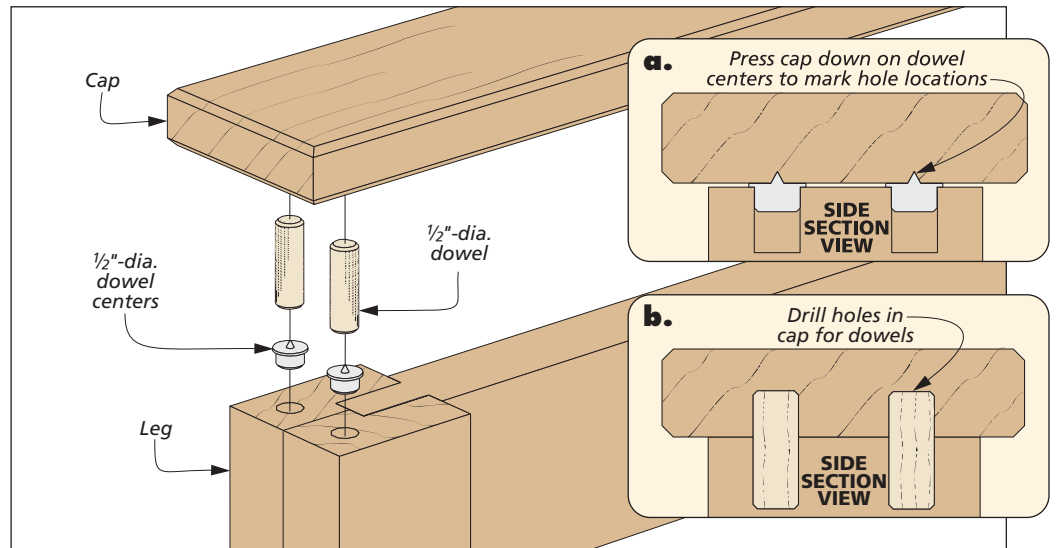


tips from our shop

Headboard Cap

When it came to installing the cap on the headboard of the bed, I used dowels to keep the pieces aligned and create a stronger joint. I just had to make sure the holes in the top of the legs lined up with the holes in the bottom of the cap.

To do this, I used dowel centers. I drilled the holes in the legs first. Then I placed a dowel center in each hole and centered the cap on the headboard. By pressing down on the cap, the dowel centers made "dimples" in the bottom of the cap, letting me know exactly where to drill the matching holes. **W**



hardware & supplies Sources

PLATFORM BED

The platform bed requires minimal hardware. All it takes is one package of bed rail fasteners from either *Woodsmith Store* (#454242) or *Rockler* (#28597).

You'll also need to get a flush trim plunge router bit to cut the mortises for the fasteners. The one I used came from *Amana Tool* (#45460-S) and was 1/2" wide with a cutting depth of 1/4". You'll often find them listed as dado cleanout bits by the manufacturer.

Woodsmith Store

Visit Woodsmith Store online at www.Woodsmithstore.com

Or call 1-800-444-7002

Monday through Friday, from 8 AM to 5 PM Central Time.

Rockler

Visit Rockler online at www.Rocker.com

Materials, Supplies, & Cutting Diagram

Cherry Platform Bed

A	Headboard Legs (2)	3 x 3 - 43	L	Side Rail Cleats (2)	1 1/2 x 1 1/2 - 78 1/2
B	Headboard Bottom Rail (1)	1 1/2 x 7 - 63	M	Headboard/Footboard Cleats (2)	1 1/2 x 1 1/2 - 60
C	Headboard Middle Rail (1)	1 1/2 x 7 - 63	N	Platform Panels (2)	3/4 ply. - 40 3/8 x 61 1/4
D	Headboard Top Rail (1)	1 1/2 x 3 1/2 x 63	O	Platform Brace (1)	3/4 ply. - 6 x 30
E	Headboard Stiles (2)	1 1/2 x 3 1/2 - 13 3/4			
F	Headboard Side Panels (2)	3/4 ply. - 13 3/4 - 13 3/4			
G	Headboard Center Panel (1)	3/4 ply. - 27 3/4 - 13 3/4			
H	Headboard Cap (1)	1 x 4 - 68			
I	Footboard Legs (2)	3 x 3 - 14 1/4			
J	Footboard Rail (1)	1 1/2 x 7 - 63			
K	Side Rails (2)	1 1/2 x 7 - 80			

- (4 sets) 6" Bed Rail Fasteners w/Screws
- (22) #8 x 2 1/2" Fh Woodscrews
- (8) #8 x 2" Fh Woodscrews
- (6) #8 x 1 1/4" Fh Woodscrews

1 1/2" x 10" - 96" Cherry (13.3 Bd. Ft.)



1 1/2" x 4" - 96" Cherry (5.3 Bd. Ft.)



1 1/2" x 7 1/2" - 72" Cherry (7.5 Bd. Ft.)



1 1/2" x 7 1/2" - 72" Cherry (7.5 Bd. Ft.)



1" x 4 1/2" - 72" Cherry (2.8 Bd. Ft.)



1 1/2" x 7 1/2" - 72" Cherry (7.5 Bd. Ft.)



1 1/2" x 7 1/2" - 84" Cherry (8.75 Bd. Ft.)



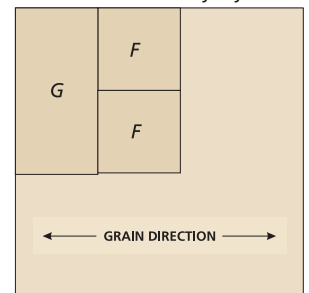
1 1/2" x 7 1/2" - 84" Cherry (8.75 Bd. Ft.)



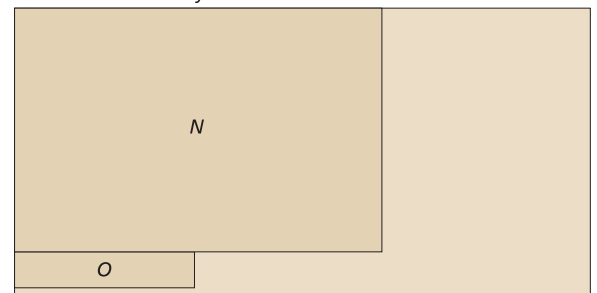
1 1/2" x 7" - 84" Poplar (8.2 Bd. Ft.)



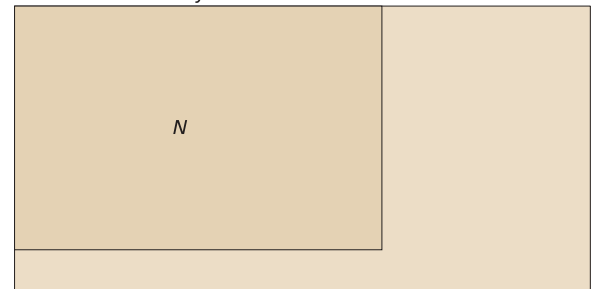
3/4" - 48" x 48" Cherry Plywood



3/4" - 48" x 96" Fir Plywood



3/4" - 48" x 96" Fir Plywood



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