



Assembling the back is key to moving forward

BY STEVE BROWN

Making chairs can be intimidating even to experienced woodworkers, and Chippendale-style chairs are no exception. The chair I'm making here, even without the ornamentation found on so many examples, has a combination of angles and curves that are admittedly complex. But the techniques and joinery needed to build the chair are familiar. The structure is a frame mortise-and-tenoned together. If you can tackle the back assembly, where the legs cant in toward the ground as well as kick back, you can certainly handle the rest of the chair. So building the back is what I will focus on here.



Building

The side seat rail's rear tenon, which attaches to the back assembly, is cut at a compound angle and comes with its own set of challenges. I'll explain those in detail in the Master Class on pp. 74–84.

I recommend working from full-scale drawings and the patterns traced from them. You'll use these from chalking out the parts to laying out joinery. But as you assemble the chair, leave the drawings and patterns aside. When you can, measure off the parts directly. That way, you're building to the actual piece, not your drawing of it.



a Chippendale Chair

Start with the rear legs

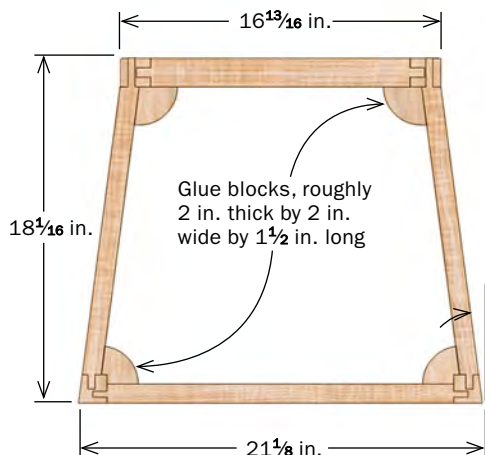
This chair is made of curly maple, though mahogany is another traditional choice. One clear, flatsawn 8/4 board, 10 in. wide by 8 ft. long, should be enough for the whole chair. I start by using my templates to chalk out the parts on the plank. I usually locate the rear legs first because they are large and curved and their grain orientation is a priority. Then I lay out the rest of the parts and rough them all out on the bandsaw.

I begin the joinery by cutting the mortises in the rear legs. Later, after the joinery is complete, these legs will be carved and round-

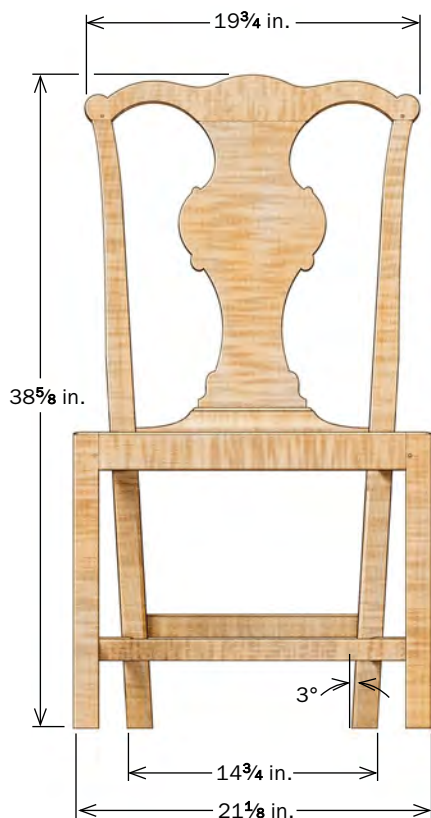
ed, but to simplify cutting the mortises I shape them in distinct stages. First I establish the flat section on the front of the leg where the side rails meet it. This is a vital reference surface, and I create it at the jointer. Then I clamp the two legs side-by-side in a bench vise with their reference flats facing up and the tick marks for the back seat rail mortises aligned. I use a handplane to smooth the bandsawn surfaces on the front of the legs to the layout lines. I then turn the legs so their reference flats are facing down and smooth the bandsawn surfaces on their back faces with a spokeshave. I leave the inside and outside faces of the legs flat for now.

Chippendale side chair

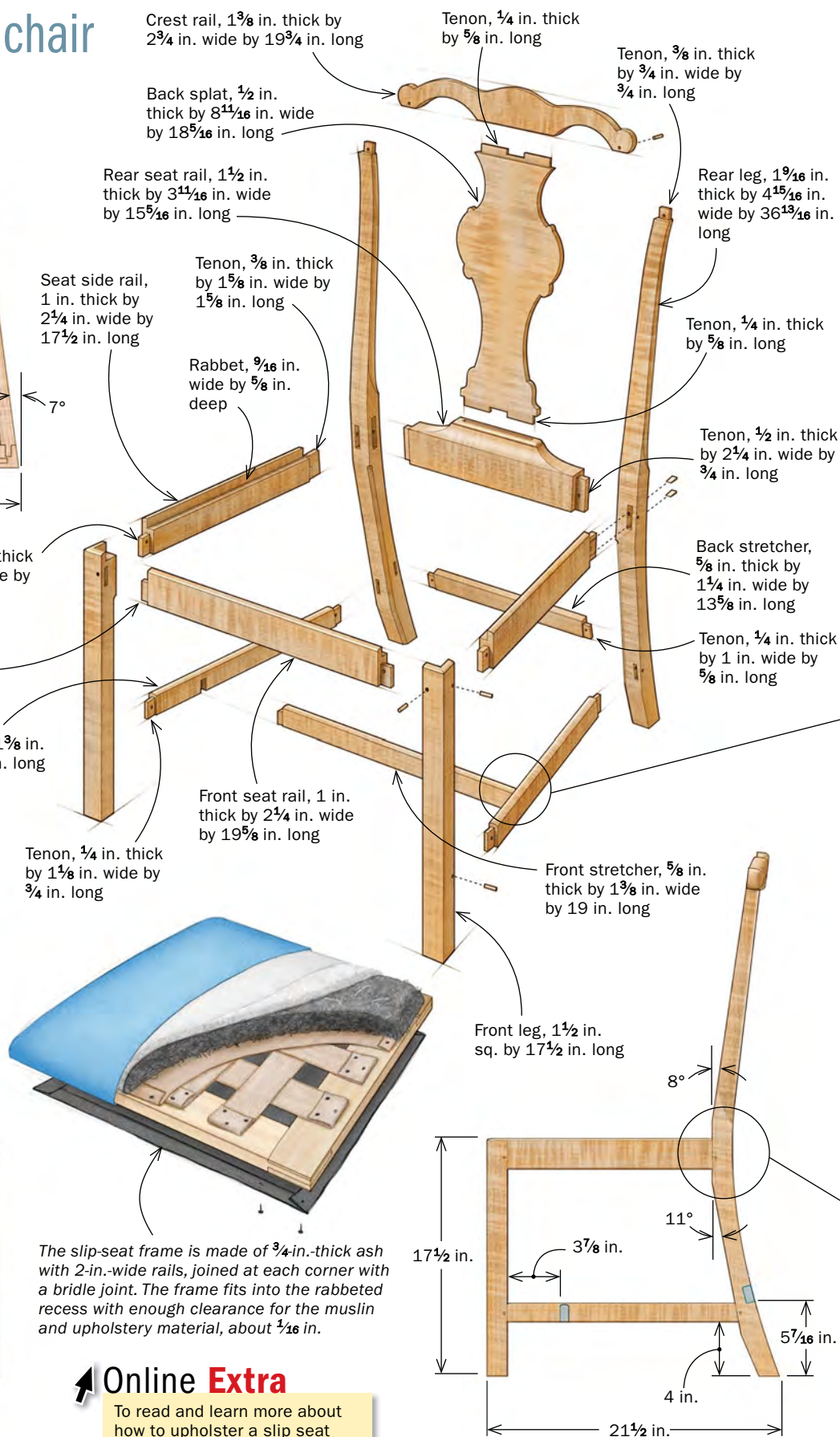
A classic design grounded in angles, curves, and gentle shaping.



SEAT TOP VIEW

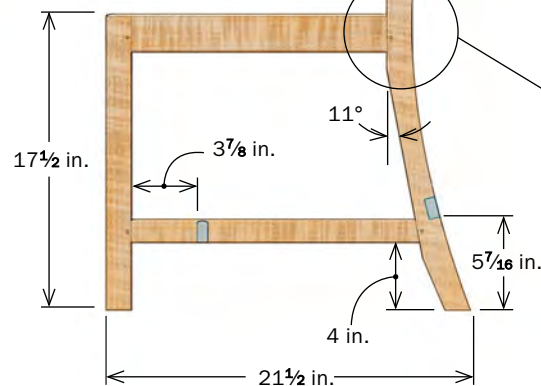


FRONT VIEW



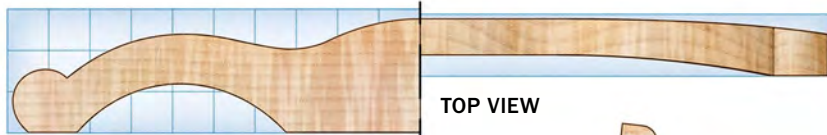
Online Extra

To read and learn more about how to upholster a slip seat the traditional way, go to FineWoodworking.com/271.

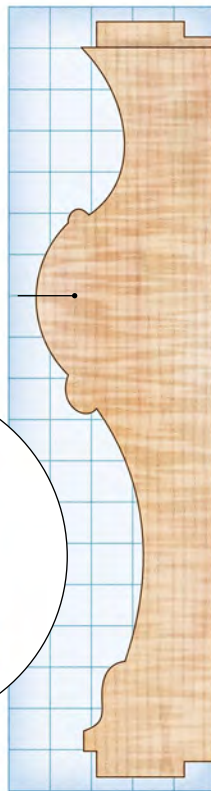


SIDE VIEW

CREST RAIL PATTERN

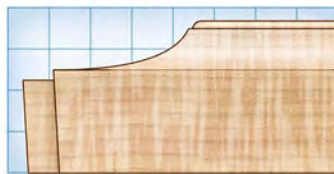


BACK SPLAT



DOVETAIL
DETAIL
TOP VIEW

REAR SEAT RAIL



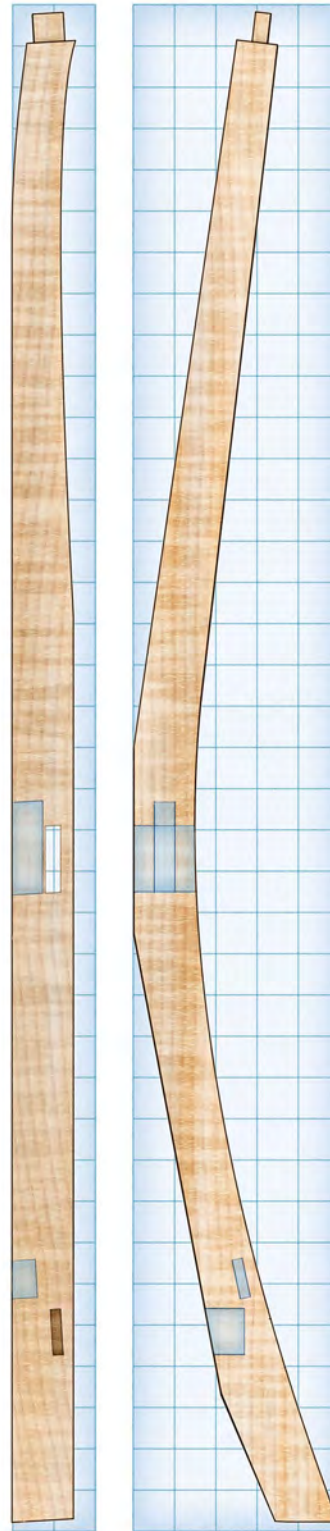
FRONT VIEW

SIDE VIEW

WEDGE
DETAIL
SIDE VIEW

Grid pattern
shown: Each
square is equal
to 1 in.

REAR LEG PATTERN



FRONT VIEW

SIDE VIEW

Next I lay out the mortises. I locate them along the leg by transferring the tick marks from my template, and I do the layout with a square, a bevel gauge, and a marking gauge. The mortise for the rear seat rail is straightforward, but the others involve some angles. The through-mortise for the side seat rail is normal except that the lines for the top and bottom are slanted to the cant angle of the legs. The mortise for the side stretcher will also need the top and bottom scribed at the cant angle. And the mortises for both the side and back stretchers need to account for the leg's backward slant.

Mortise before shaping

It's helpful to keep a few things in mind when mortising these legs, which I do with a hollow-chisel mortiser. For one, when mortising into the front face of the leg I support it with shaped cauls, which both orient and stabilize it.

Second, I cut the through-mortise for the side seat rail from the back. It's easier to lay the leg on the mortise table with the reference flat down. Also, the back of the mortise will be cut cleanly, and any blowout on the front will be covered by the shoulder of the rail.

Third, if you use a machine to cut these mortises, like I do, be mindful that since the leg angles backward the mortise for the stretcher will be deeper at the top than at the bottom. When setting the mortiser's depth stop, I aim for $\frac{1}{2}$ in. at the shallow end of the mortise.

Last, because of the angles involved, you'll need to use a chisel to pare the ends of the mortises to the layout lines.

Once the mortises are done, trace the front pattern on the leg and bandsaw the inside and outside faces to shape. Then you can begin the hand shaping. To see a clear explanation

Start with the rear legs



Fair the legs. With the front and back profiles cut and the seat rail reference flats jointed, clamp the rear legs together with the reference flats flush and the tick marks for the rear seat rail's mortise aligned. Then plane the sawn surfaces.



Mark the remaining joinery. Use the template to make tick marks for all the rail and stretcher mortises and for the shoulder of the crest-rail tenon. Nick the leg's inside front corner so the marks get chamfered away or covered up later.



Time to taper the top of the legs. When bandsawing, Brown cuts carefully to the line except at the top of the outside corner, where he veers off approximately $\frac{3}{4}$ in. below the shoulder to avoid leaving too much short grain. He fairs this after gluing on the crest rail.

of the shaping method I use, read Dan Faia's "Porringer-Top Tea Table" (*FWW* #191).

Bottom of the back

Next you'll fit the rear seat rail and the rear stretcher to the leg. Begin by cutting the rail to length at the cant angle. My method for this is simple: a wedge-shaped block whose slope matches the cant. Pair this with a crosscut sled for accurate, repeatable results. Now you can cut the tenons on the rear seat rail by referencing off its angled ends.

The top edge of the rear seat rail is mortised to receive the splat. Traditionally, a separate part, called a shoe, was mortised for the splat and then attached to the rail. However, my rail and shoe are one solid piece. After cutting the splat mortise, I give the shoe its cove and thumbnail profile. I use a mix of the tablesaw, router table, and hand tools to shape this piece.



Mortise the legs. After cutting the mortise for the back seat rail, chop the through-mortise for the side rail. Working in this sequence helps avoid breaking through the small amount of wood between the mortises. Brown is mortising from the back here to keep the joint's show face clean.



Shape the back of the legs. After drawing layout lines, Brown knocks off most of the waste by creating a large chamfer with a rasp and spokeshave. Once this chamfer is created, chamfer the resulting arrises into smaller flats until you reach the desired shape.

Shape the rear seat rail



Cut the rail blank to length, angling the ends. Brown uses a wedge against the fence of his crosscut sled to hold the stock at the cant angle.



Tablesaw tenons. Brown starts with the cheeks, then trims off most of the waste to avoid kickback when cutting the shoulders. He registers the end of the rail against the fence to finish the shoulders.



Give the back rail some character. After mortising the rail for the splat, Brown cuts a cove on it at the tablesaw (far left) before adding a thumbnail at the router table (left). He cuts the thumbnail's return by hand after bandsawing the side sweeps (below).

Since the chair is now coming together, it is a good time to begin measuring off the chair and its parts instead of the drawing and your templates. For example, at this point, I clamp the legs and back rail together so I can mark, cut, and fit the back stretcher.

With those members fitted, it's time for the first glue-up, comprising the rear legs, rear seat rail, and back stretcher. Use angled cauls to apply even pressure and protect the through-mortises.

It's important to do this glue-up before working on the crest rail blank, because it fixes the legs in space, which will help you more accurately lay out the tenons on the legs and the mortises on the crest rail; it also helps in laying out the crest rail's profile.

Cutting and fitting the crest rail to leg joints takes a bit of back and forth. I do the tenons by hand and mortises at the hollow-chisel mortiser. Once they have been fitted, you can determine the centerline



Make the rear stretcher and crest rail



Lay out and cut the stretcher tenons. With the legs and rear seat rail dry-clamped, transfer the stretcher mortise locations onto the back of the legs. Set the stretcher in place to mark the tenon shoulder and length. Once the tenons are cut, the lower half of the back can be glued together.

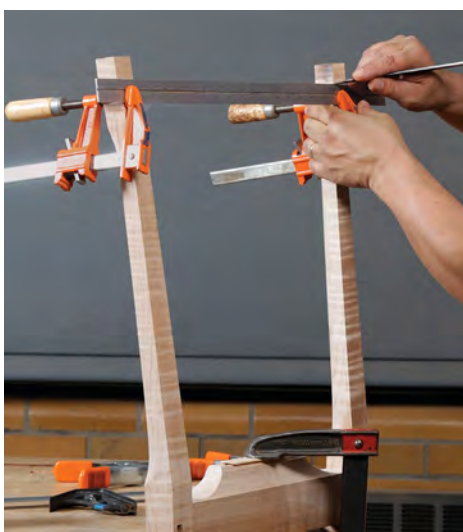
between the legs and use that to lay out the mortises for the splat.

A trick for fitting the splat

The last part of the rear frame to be fitted is the splat. It tenons into the crest rail and the shoe, and its tenons are bareface—they have only one shoulder. The bottom tenon is angled, but the top one is in line with the splat. I cut both tenons while the splat is still a square blank, which simplifies the layout and joinery.

To overcome the challenge of determining the splat's shoulder-to-shoulder distance and the appropriate angle for the bottom tenon, I glue three scraps together into a simple jig. I fit one scrap into the shoe, another into the crest rail, and use the third to join the first two.

After transferring the layout from the jig, I typically cut and fit the splat's bottom tenon first. After cutting



Knife the shoulder for the top tenons. With a straightedge, connect the legs' shoulder nicks from before. Use a square to transfer the lines across the sides.



Mortise the crest rail for the legs. Brown starts by marking the tenon widths on the top of the legs using a cardboard template (inset). Then he sets the crest rail in place to transfer these marks for the mortise locations.



Tenon the legs. Start by cutting the cheeks and shoulders of the tenons. Lay the crest rail in place and transfer the end lines of the crest rail mortises onto the tenons. Then cut the tenons to width.



Mortise the crest rail for the splat. This mortise is stepped, with the outsides deeper than the central section, because a single wide tenon could be weakened by excessive seasonal movement.

Cut out the splat



the cheeks at the tablesaw, I line up the centerline of the splat with that of the shoe and transfer the end points of the mortises. After cutting the bottom tenons, I insert the splat into the shoe to lay out the shoulder of the top tenons directly from the chair. For this, I use a straightedge laid across the shoulders of the leg tenons. When the tenons are cut and fitted, you can bandsaw the profiles of the splats and crest rails.

Time for the second glue-up, which I do in stages to reduce stress. First, I glue and clamp the splat to the crest rail. For this glue-up I have the rear seat rail and posts dry-fitted to the splat. After an hour or so, I glue up the rest of the chair back.

With the hard part done ...

When building the rest of the chair, be sure to keep a few things in mind. First, given the angles in the seat, it's easiest to begin with the side seat rail's rear tenons (covered in Master Class), work forward to the front legs, and fit the front rail to the space between the front legs.

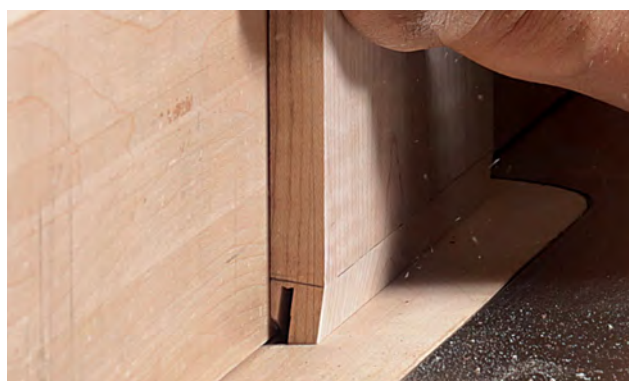
Speaking of the front legs, I recommend mortising them as square blanks. Be mindful that their outside



Make a back-splat template. The crest rail and shoe mortises are at an angle to each other. To find it, slip tenoned stock into each mortise (far left). From there, glue and clamp a third piece of scrap between the tenoned pieces (left). Lift off the crest rail to remove the jig.



Transfer the angle. The jig represents the top and bottom of the tenoned splat and indicates both the angle and the distance from one mortise to the other, as well as the tenon shoulders. By lining up its corners with a face of the splat blank, you can trace this information directly onto the splat.



Saw the tenons. Tilt the tablesaw blade to the correct angle and cut the lower tenon. Return the blade to 90° when cutting the upper one, though.



Bandsaw the splat profile. Brown leaves flats toward the top of the workpiece to give the clamps a place to seat. This waste gets sawn off later.

Two-stage glue-up

Start at the top.

For a perfectly shaped caul for this glue-up, Brown uses an offcut from the crest rail. Once he has these parts clamped he dry-fits them to the shoe and legs.



Trim the splat's flats after the glue dries. Because the crest rail is proud of the back of the splat, Brown tapes a scrap to the bottom of the splat, giving him a secure platform at the bandsaw.



Glue the rest. To close the joints where the legs meet the crest rail and the splat meets the shoe, it may be necessary to clamp blocks near the bottom of the splat. The large block here has a cleat to hook it to the bottom of the seat rail.



Curves ahead. After blending and fairing the front surface of the crest rail, legs, and splat, shape the back of the crest rail.

Bevels and sweeps. The shaping makes the chair. The crest rail is gently rounded over in the back, and the splat's edges are beveled, greatly lightening its look.

Moving forward



Dry-fit the rails to measure for the stretchers. When possible, it's best to measure from the chair, not the drawing. So when laying out the three remaining stretchers, dry-assemble the rest of the chair. A big, stout caul at the back will help close up the shoulders.

faces will ultimately be beveled, so account for that when laying out mortises for side rails and stretchers. Also, I fit the side rails to the front legs before cutting the bevels. This way I can mark the leg exactly where it meets the rail.

The slip-seat simply press-fits into a rabbet in the side and front seat rails, bolstered by two-part glue blocks at each corner. I cut this rabbet on the router table, referencing off the outside of the rails. Given all the steps needed to fit these pieces, referencing off the outside keeps the show edge parallel.

The only piece in the chair not joined using a mortise-and-tenon is the front stretcher. It is joined to the side stretchers from below with a lapped dovetail.

When gluing up the rest of the chair, I continue in stages. For the third stage, I glue the front rail to the front legs, with the rest of the frame dry-assembled to the chair back. When that's dry, glue the side rails to the front legs while dry-fitted to the rear legs. Take note that before the final glue-up you'll need to plane off the thin triangle of the side rail that extends beyond the leg. For the final stage, glue in the side stretchers and the dovetailed cross-brace, and glue the seat frame to the back. □

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Side stretchers have slanted shoulders. With platforms holding the side stretchers at the right height, set a bevel gauge to the backward slant of the leg. Knife this angle down the stretchers' sides. Use a square for the tops and bottoms.



Front stretcher gets a lapped dovetail. Lay out the shoulder by clamping the stretcher against the bottoms of the side stretchers with the chair dry-fitted.



Transfer the dovetail. Use a sharp pencil to mark the dovetail's shape and thickness. Saw, chop, and pare to these lines.