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Serving Tray

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- Step by Step construction instruction.
- A complete bill of materials.
- Exploded view and elevation drawings.
- How-to photos with instructive captions.
- Tips to help you complete the project and become a better woodworker.

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Serving Tray

This tray table's simple and elegant lines are a study in positive and negative space. The "X" shaped leg joinery's history is traceable to the ancient Egyptians, but we'll use entirely modern methods to execute the rest of the design.

After the tray stiles and rails are cut to width and rabbeted, they can be mitered to length. Use a fine-tooth crosscut blade to help minimize tearout on splintery mahogany.

While today's woodworkers have plenty of 19th- and 20th-century motifs to look to for design inspiration, for this project we turned to the distant past. Curule chairs were popular during the medieval period, but they actually can be traced even further back than that, to the dynasties of ancient Egypt. They're familiar enough, with their knuckle-jointed "X"-shaped bases, but the design element doesn't seem to find a lot of application in today's furniture. we weren't particularly interested in making a curule chair, but the "X" shaped legs seemed an equally fitting choice for a serving tray. We settled on mahogany for this project—it's a great species for a beginner, essentially knot-free and easy to mill and finish. Its fine grain also adds elegance.

Getting Started

We'll build the tray first, then move on to the base. An overriding concern for our initial design was that the legs must be true and at perfect right angles to the base and floor. A slight skew in or out would result in a spindly, awkward look. If you construct the tray first, there's some room for tweaking the base rails to push the legs out or pull them in.

The first thing to do is cut the tray's stiles and end rails (pieces 1 and 2) to width but a bit long. These pieces get a rabbet along their top edges, so use a straight bit in your router table or a dado blade in your table saw to form them, as shown in the *Elevation*

Drawings. Once the rabbets are milled, miter the parts to length and lay out for the matching notches on the inside of each stile which will accept the two support rails (pieces 3).

Cut them by hand, if you're up to it. Setting up to make these cuts with a router is more hassle than it's worth. Now grab your biscuit joiner and cut slots to help beef up the miter joints. This table may be handling a good amount of weight, so you'll want to ensure that the joinery will be as strong as possible. Dry-fit the frame to make sure that you've got clean miters. At this point, you can go ahead and shape the support rails (see the *Elevations*) and form the tenons at their ends. When they're ready, dry-assemble your tray again, for a final look. The tops of the support rails should be perfectly flush with the bottoms of the rabbets on the end rails and stiles. When everything matches up, go ahead and glue up these pieces and set them aside.

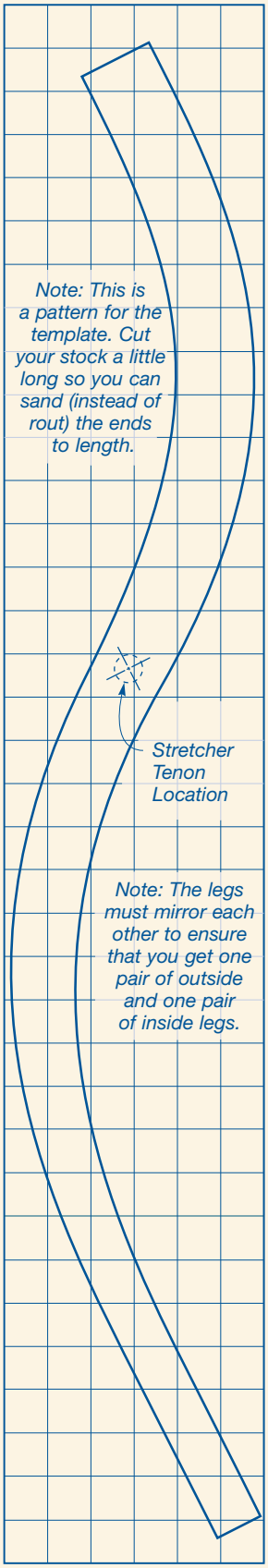
Making Handles and Rim

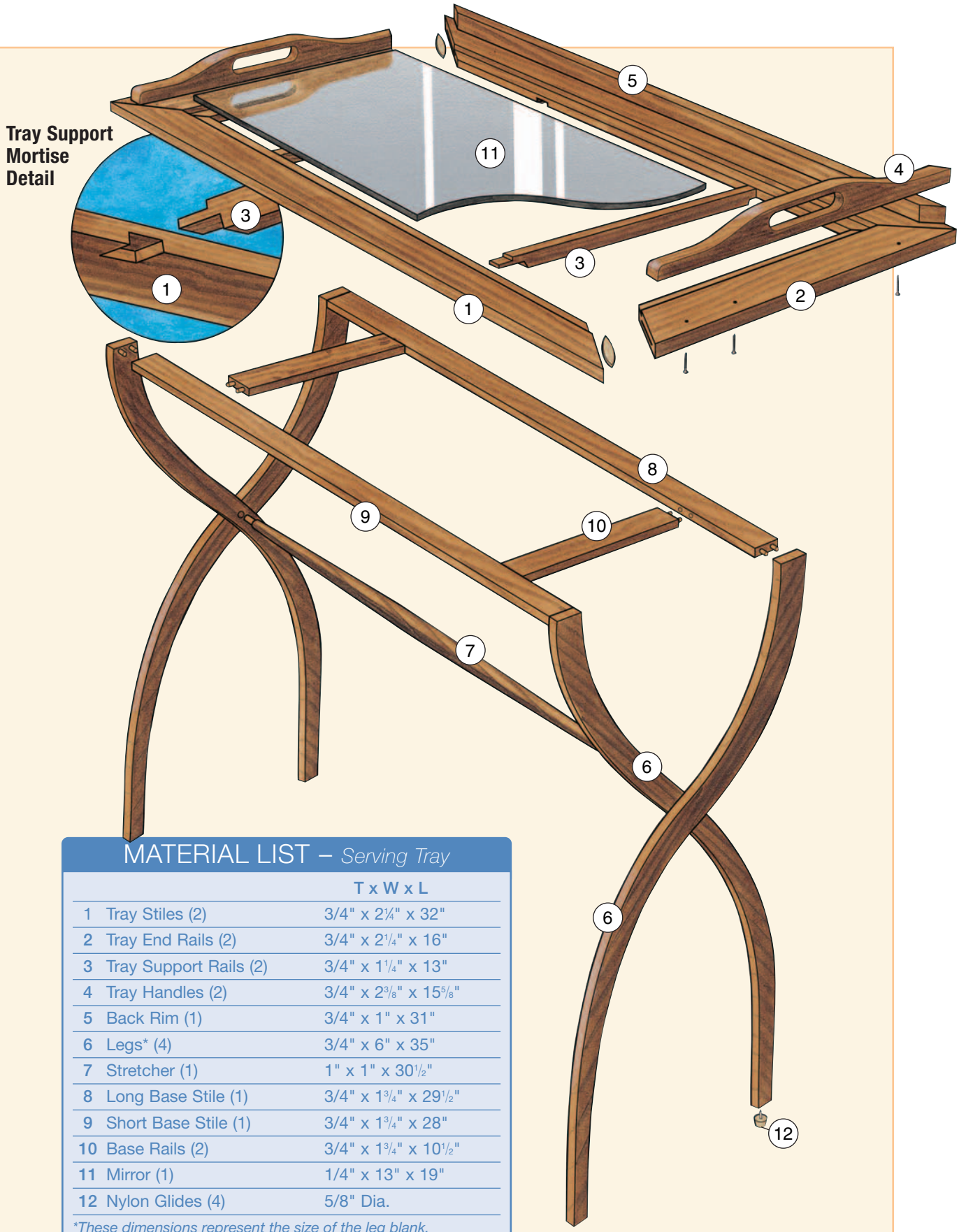
While the glue is drying, cut and shape the handles and form the miters on their ends, as well as on the ends of the back rim (pieces 4 and 5). These pieces all get a soft roundover and plenty of time under the sandpaper, as they are the showiest part of the project and will be reflected by the mirrored top. When they're ready to install, predrill pilot holes from the bottom of the frame, three for each handle and five for

A biscuit or plate joiner is a great way to strengthen and align miter joints. The biscuits fit just under the tray's rabbet.

Tray Exploded View

Each square equals one inch.



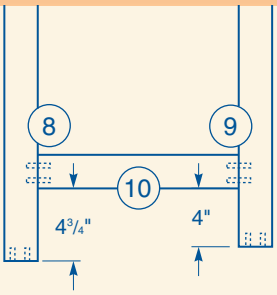


MATERIAL LIST – *Serving Tray*

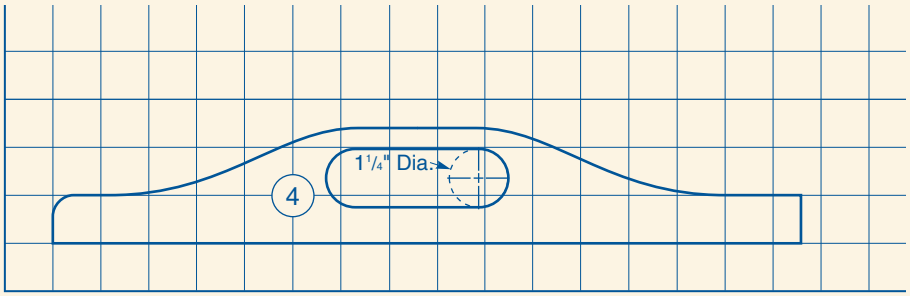
		T x W x L
1	Tray Stiles (2)	3/4" x 2¼" x 32"
2	Tray End Rails (2)	3/4" x 2¼" x 16"
3	Tray Support Rails (2)	3/4" x 1¼" x 13"
4	Tray Handles (2)	3/4" x 2⅜" x 15⅝"
5	Back Rim (1)	3/4" x 1" x 31"
6	Legs* (4)	3/4" x 6" x 35"
7	Stretcher (1)	1" x 1" x 30½"
8	Long Base Stile (1)	3/4" x 1¾" x 29½"
9	Short Base Stile (1)	3/4" x 1¾" x 28"
10	Base Rails (2)	3/4" x 1¾" x 10½"
11	Mirror (1)	1/4" x 13" x 19"
12	Nylon Glides (4)	5/8" Dia.

**These dimensions represent the size of the leg blank.*

Technical Drawings

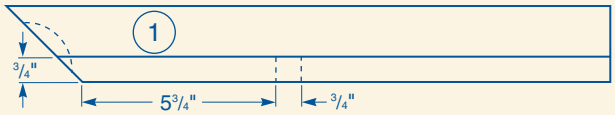


Base Subassembly
(Top View)

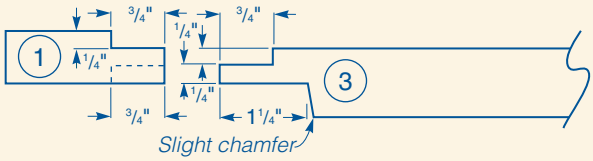


Each square equals one inch.

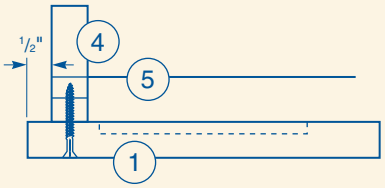
Tray Stile
(Top View)



Support Rail and Tray Stile
(Side View)



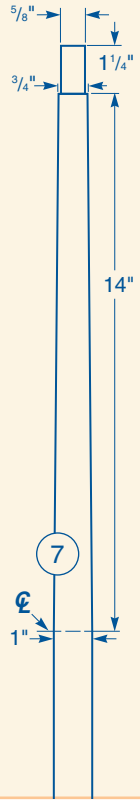
Tray Handle Location
(Front View)



LAYING OUT AND FORMING THE LEGS

Use the scaled drawing to help create a fair and true template of the tray leg. The next step (in preparation for template routing) is to transfer the shape to the hardwood leg blank.

Stretcher
(Side View)



QuickTip

Toolbox Toothbrushes Tackle Tiny Tasks

Keep a couple of hard-bristled toothbrushes handy in your shop and you'll find hundreds of uses for them. They're perfect for cleaning out carvings and intricate patterns when refinishing, or getting rid of dust and oil build-up on router bit bearings. They can be used to clean delicate parts where a wire brush would be too intrusive or coarse. And nothing works like a toothbrush and an air gun to clear dust from an inside corner before finishing.

the rim. Again, you don't want to short-change this piece on strength—you might be carrying some pretty precious cargo on it! Form the miters at the corners of the rim and handles and glue them up. Once the glue dries, you can screw the assembly in place on top of the frame—just be sure to keep the rim flush with the back and the handles 1/2" shy of each end.

Before moving on to assembling the base, we recommend creating a cardboard template for ordering your mirrored top. We used full 1/4" mirror glass for ours—it's not cheap, and it doesn't sand or plane well, either! Take the template to your glass shop and let them create the top directly from it, rather than from a set of measurements. It's the best way to eliminate any possibility of dimensional errors.

Take the leg blank to your band saw and cut within 1/16" of the line you marked onto the blank. Don't cut into the line; you need to leave some material for the router bit to remove. This will ensure uniform legs.

Use double-sided tape and one screw at the tenon mortise location to attach the template to a roughed-out leg. A flush-trimming bit shapes the legs. Note: Don't attempt to rout across the end grain on the legs. Use a disk sander to do the final shaping here to prevent router mishaps.

Since there are only four mortises to chop, lay them out and cut them by hand. The support rail's top edge must align perfectly with the rabbet on the tray stiles and rails.

Creating the X Factor

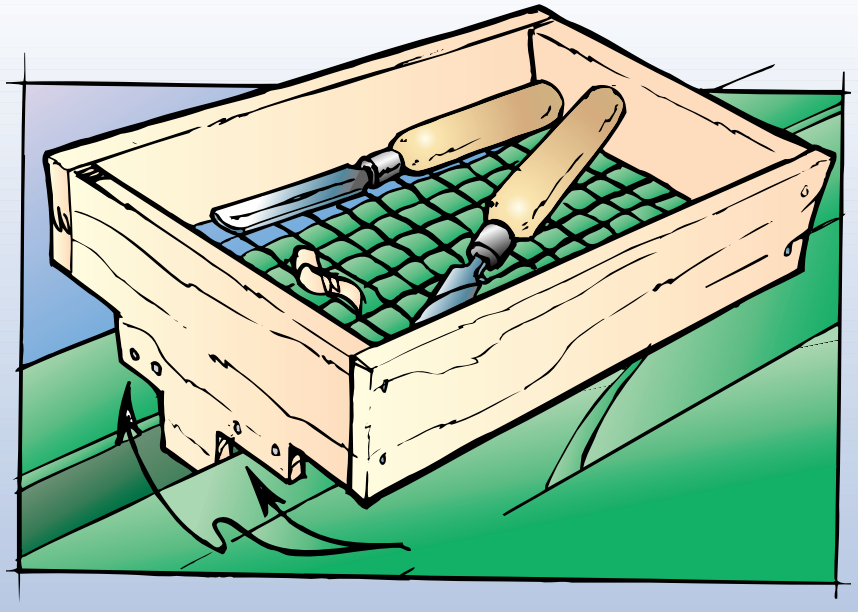
The legs (pieces 6) are created using a template. No method ensures uniformity better, and as was mentioned earlier, perfectly even and matching legs are a real key to the success of this tray project.

Spend some extra time refining your template, lightly sanding it until it is true and smooth all around. Then, as you can see in the sequence of *photos* on the previous two pages, it's a simple matter of transferring the shape to your stock, cutting the stock slightly oversized on the band saw and then applying your template. We installed one small screw at the middle (which would later be hidden by the stretcher tenon) and turned to double-sided tape for the ends. One word of caution: Once you start the final pass with your flush-cutting

QuickTip

Shaving-free Lathe Tool Caddy

To work efficiently at the lathe, it helps if your woodturning tools are sharp, near and clean. Here's a simple caddy you can build from scrap wood and wire mesh to hold them. It hugs the lathe bed securely with a dozen ring magnets embedded in its underside. Just slide this caddy close to your work, and the tools remain clean as the chips fall through the wire mesh bottom.



bit, you may want to stay away from the ends. End grain will often fracture if you try to cut across it in this manner. It's not an inevitable occurrence, of course, but mahogany isn't priced like pine; you may want to take a conservative approach and protect your lumber investment from the scrap bin. A way around the end grain problem is to leave a little stock at each end and use a disk sander (while the template is still attached) to bring the stock flush to the template at each end. Sand your legs and lay them aside for now; you'll want all your base pieces ready to go before you assemble any of them.

The turned tenons on both ends of the stretcher need to be long enough to engage both legs, on each side of the table, as you assemble the project. Use a skew chisel at the lathe to perfect their length and diameter.

Turning the Stretcher

We toyed around with using square stock for the stretcher (piece 7), but this idea never actually made it off the drawing board. Clearly, this tray calls for a round base stretcher—and anyway, this was a great chance to get an hour or two in on the lathe. Once you give spindle turning a try, the lathe will quickly become one of your favorite tools!

Start by locating the centers on the ends of your turning blank. Then machine your square stock into an octagonal profile by cutting off the corners on your table saw. Mount this blank between centers and use a gouge to rough out a cylindrical shape. Switch to a skew to bring the blank down to about 1" in diameter. Now find the center (from end to end) and from there lay out your tenon shoulders. Reduce them down to 5/8" in diameter. (Note: It's critical that the stretcher's length from shoulder to shoulder matches the length of the shorter stile (piece 9) above it, otherwise you'll end up with a pigeon-toed table.) The stretcher tenons will end up being 1¼" long, but when you're turning, you'll want to allow a little extra for paring off. Gradually create an arc that starts with the 1" diameter in the center of the piece and gracefully reduces to 3/4" at each shoulder. Sand the stretcher all the way through to 320 grit (but not the tenons!) while it's still on the lathe, and then trim the tenons to length.

Creating the Tray Support

The next step is to mill the stock for the tray support (pieces 8, 9 and 10). You'll notice that the stiles are different lengths, due to the offset created by the relative position of the legs. Cut these pieces to size, use the *Elevation Drawings* to locate your dowel holes, and glue this subassembly together, making sure to keep things square as you carry this process out.

Bringing it Together

The first assembly step is to bring the sets of legs together. You'll be drilling right through two inner legs, but on the other two you'll limit your depth to 1/2". Remember, these legs mirror each other, so be sure to lay everything out before you start drilling. Next, locate and drill the dowel holes (we used a doweling jig and dowel-centers to make this task a bit easier) at the tops of the legs and pilot holes for the glides at their bottoms. With the machining done, you can dry-assemble the legs, the stretcher and the base subassembly. Check to ensure that all is square and proceed to your final glue-up.

Finishing Up

Test-fit the mirror (piece 11) and tap the glides (piece 12) in place. After sanding everything down to 320 grit, we applied a custom stain concocted by mixing (half and half) Zar's® Rosewood Stain with Carbon Black Woodburst®.

Next, apply a coat of sanding sealer and two coats of lacquer, with a light 320-grit sanding between each coat. The final step is to drop (carefully!) the mirror into place.