

Making Curved Crown Molding

Glue-laminated trim can be shaped on a table saw

by John La Torre, Jr.

As a carpenter, I spend most of my time at work swinging a hammer or wielding a saw. But I'm always looking for a chance to try a new technique. Recently, while I was touring a house under construction, owner Paul Kreutzfeldt showed me a straight piece of stock crown molding he planned to use for the kitchen ceiling, then looked up at a curved wall in the room and said, "That piece is going to be a bear."

"Yup," I answered, excited. "Mind if I give it a try?"

"Go right ahead," he said with a smile.

There are two basic approaches to making curved trim. You can glue several pieces of wood end-to-end and then cut the curve on a bandsaw, or you can laminate thin strips of wood around a curved form. If you use the first method and decide to stain the trim, the separate pieces may accept stain differently, and the joints usually show through. Laminated trim, on the other hand, is stronger than butt-joined trim and usually looks better when it's stained. Because Kreutzfeldt had yet to choose between staining and painting his crown molding, I decided to

laminate it. As it turns out, Kreutzfeldt decided to paint it (photo above).

Making the bending form—The first step was to make a form that matched the curvature of the convex wall. Finished with drywall, the wall defined a 90° arc having a radius of about 24½ in. Unfortunately, the curve was far from perfect, wandering out of round by up to ¾ in. That forced me to make a template for the form.

To create the template, I bandsawed a 24½-in. radius curve in a sheet of ½-in. tempered Masonite. I then held this template against the curved wall 3¾ in. from the ceiling, which is where the bottom of the crown molding would contact the wall. After scribing the template with a pencil compass, I trimmed it with a jigsaw for a snug fit.

Molding in the round. Made with basic shop tools, the laminated crown molding seen above wraps around a slightly out-of-round convex wall, butting at both ends into straight, factory-made crown. Photo by Rich Miller.

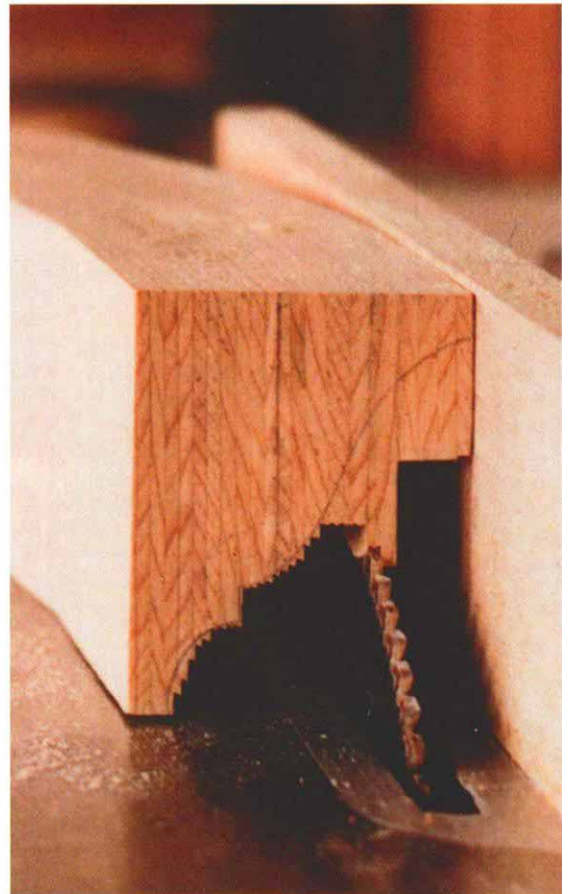
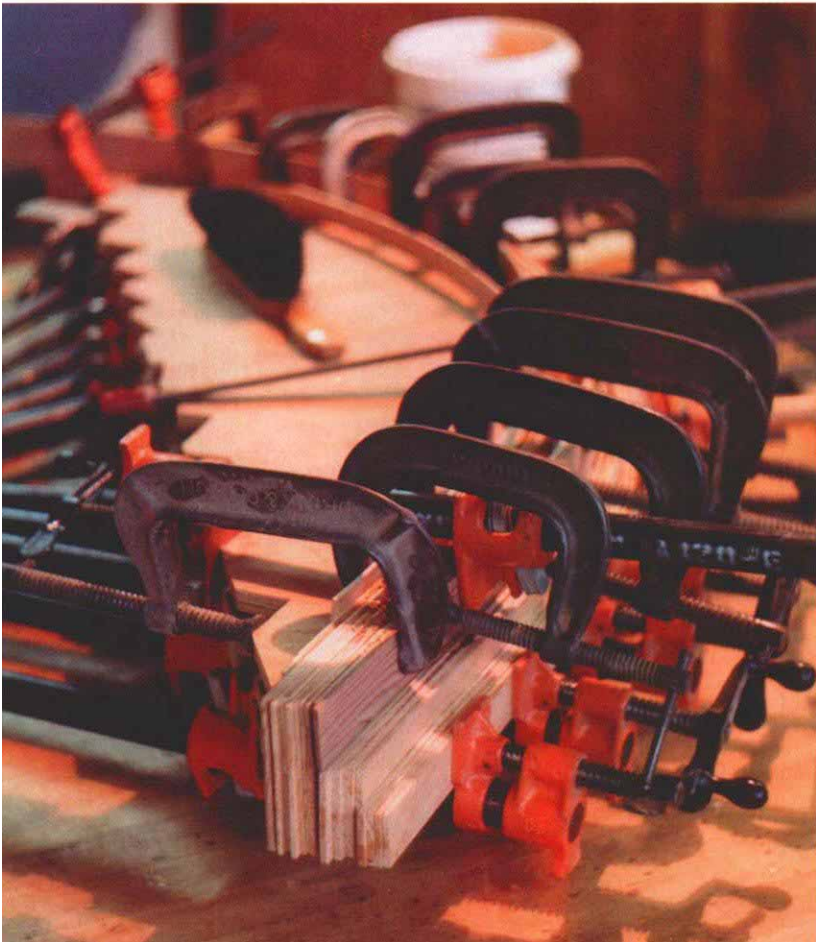
Making the bending form itself was the easy part. Back at my shop, I traced the outline of the template onto three pieces of ¾-in. plywood, cut them out and nailed them together, placing ¾-in. plywood spacers between layers to produce the proper thickness. Finally, on the back edge of the form, I bandsawed a series of steps parallel to the front edge to give the clamps good purchase (photos next page).

Preparing the stock—The next step was to prepare thin strips of wood for lamination. The factory-made crown molding I wanted to match was made of white pine, but I selected clear sugar pine for my molding. Sugar pine has a uniform straight grain, is easily bent without splitting, and well, that's what I had on hand.

I produced the laminating stock by resawing 7/8-in. by 4-in. wide boards, which produced thin boards that were 3/16 in. thick. I used my bandsaw for ripping the boards into strips because its 1/16-in. saw kerf wastes less wood than my table-saw blade. Then I ran the strips through a 10-in. bench planer to remove irregu-



Glue up. The laminating form consisted of three layers of $\frac{3}{4}$ -in. plywood separated by $\frac{3}{4}$ -in. plywood spacers (photo above). A series of steps bandsawn into the back of the form provided solid footing for an assortment of clamps. Extra strips of pine (photo below) placed against the molding stock helped distribute the clamping pressure.



Low-tech shaping. The molding was contoured by making a series of cuts on a table saw to remove the waste up to the layout line. A mark on the rip fence indexed the center of the saw blade, indicating the optimal spot for the molding to contact the fence during the cutting operation.

larities and to reduce the strips to a uniform thickness of $\frac{1}{8}$ in.

Next, I traced the cross section of the factory molding on graph paper. Examining this profile, I decided to laminate the trim out of three different widths of sugar-pine stock to simplify the removal of waste from the laminated blank.

With the strips cut to width, I dry-clamped them to the form to identify and eliminate any problems before glue up. I discovered that keeping the strips aligned would be difficult. My solution was to trace a slightly oversized cross section of the three-step assembly on two scraps of plywood, cut the patterns out and then slip the scraps over opposite ends of the assembly. These simple jigs helped to prevent the wood strips from sliding around during glue up.

Shake it up—For laminating jobs, I like to use urea-formaldehyde glue, which starts as a tan-colored powder that must be mixed with water (for more on builders' adhesives, see *FHB* #65, pp. 4045). I used to employ a stick or a rubber spatula for mixing but sometimes ended up with lumps of powder that wouldn't dissolve. Then I discovered a better method: Put the powder in a plastic container, add the correct amount of water and then shake the container in a circular motion. Surprisingly, mixing in this way is faster than with a stick and produces a lump-free mixture every time.

To make glue up simpler, I taped the pine strips together edge-to-edge on my glue-up table. Then I spread the glue across the assembly using a paint roller. That done, I removed the masking tape, coated the masked areas with glue, tilted the strips upright and pressed them together.

Glue up took every clamp I had (including C-clamps, bar clamps and pipe clamps), and it wasn't a pretty sight (photos facing page). I installed the first clamp at the midpoint of the form and worked my way toward both ends, alternating clamps above and below the form. Extra strips of wood placed against the outer plies of sugar pine helped distribute the clamping pressure evenly. Excess was scraped off before the glue cured.

After letting the glue cure for 24 hours, I removed the blank from the form. Checking the concave side of the blank against the template, I saw that the molding was within $\frac{1}{16}$ in. of a perfect fit. I decided not to shave it further just yet.

Sculpting on the table saw—Once the glue up was completed, I ran the curved blank, top-edge-down, through the thickness planer to remove slight irregularities from the bottom edge of the blank. Then I flipped the blank over and planed its top edge to size. Planing the curved blank was easy—I simply steered it through the planer to keep it perpendicular to the cutterhead.

With the sizing completed, I squared both ends of the blank and traced the outline of the factory crown molding on one end. Now all I had to do was remove everything that didn't look like crown molding.

Probably the easiest way to make crown molding is to cut it on a shaper. Many cabinet shops nearby had a shaper, but none had a cutter

that matched my molding. I could have ordered custom-made cutters, but that would have cost \$300 to \$400, difficult to justify for a one-off piece of trim.

I decided to shape the blank by making a series of table-saw cuts to remove most of the waste (photo facing page). This worked remarkably well. I clamped a $3\frac{3}{4}$ -in. tall board to the fence to make it the same height as the molding, then marked the top of the fence to index the centerline of the saw blade. While making each cut, I held the blank against the fence at the index mark. Any deviation from this mark was insignificant, because it merely caused the saw blade to wander into the waste area, requiring nothing more than a second pass across the table saw to get it right.

My blade cut a $\frac{1}{8}$ -in. wide kerf, so I made the cuts by moving the fence toward the blade in $\frac{1}{16}$ -in. increments, raising the blade just enough each time to remove the maximum amount of stock without cutting across the layout line. In this fashion, I finished with a cross section very close to that of the factory crown.

Because the stock laid flat on the saw table, the cutting operation was accomplished safely and easily. I also kept my fingers far away from the sawblade at all times.

Scraping it smooth—All that remained was to smooth out the small, sharp steps on the molding blank. I figured this would be the easy part, but it turned out to be the most difficult.

First I tried sanding, but the sandpaper quickly became clogged with pine resin. I soon realized I'd have to scrape the pine smooth.

To make a scraper, I cut a 45° angle on the end of a scrap piece of the factory molding and traced its profile on the blade of an old tapping knife. Then I cut the blade to the layout line using a bench grinder and raised a cutting edge by rubbing the blade with a hardened-steel punch.

Dragging this homemade scraper along the molding at a 45° angle produced satisfying re-

sults (photo below). Each pass left behind a small trail of fine dust instead of the curled shavings a perfectly tuned scraper would produce, but little by little the sharp steps began to disappear. Scraping the molding down to the layout line took two hours and a lot of elbow grease.

The scraping left the molding with some torn fibers and minor irregularities, so I decided to finish the job by sanding. I began by using 80-grit sandpaper to work out the irregularities, then worked my way up to finer-grit paper. I use Wetordry TRM-ITE sandpaper (3M Construction Markets Department, 3M Center, Bldg. 225-4S-08, St. Paul, Minn. 55144; 612-736-7761) because its backing doesn't tear while sanding. The sanding took about three hours and just about wore me out.

Installation—Earlier, when trimming the ends of the curved blank, I had left the ends $1\frac{1}{2}$ in. long. Now I used the bandsaw to cut a $1\frac{1}{2}$ -in. long triangular stub tenon on both ends of the molding. These tenons would fit into the triangular voids behind the factory crown molding, aligning the joints while providing solid backing for the ends of the factory molding.

The final step was to fit and attach the curved crown to the wall. Using a belt sander, I relieved the concealed edges a bit so that the molding fit snugly against the wall and the ceiling. By now Kreutzfeldt had decided to paint the crown molding, but just a small amount of belt-sanding produced such a tight fit against the wall and the ceiling that no caulking was necessary. I applied construction adhesive along the back and top of the curved crown, then fastened the molding to the wall with screws run through the stubs.

As Kreutzfeldt installed the straight runs of crown molding, I was gratified to see that just a bit of sanding produced a satisfying match of curved to straight molding. □

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A homemade scraper. The author smoothed the sawcuts using a scraper made out of an old tapping knife. The edge of the scraper was shaped with a bench grinder.

