

RUHLMANN'S TORPEDO LEG

Traditional techniques
for shaping and
veneering this
distinctive form

TEXT AND PHOTOS BY PAUL HENRY

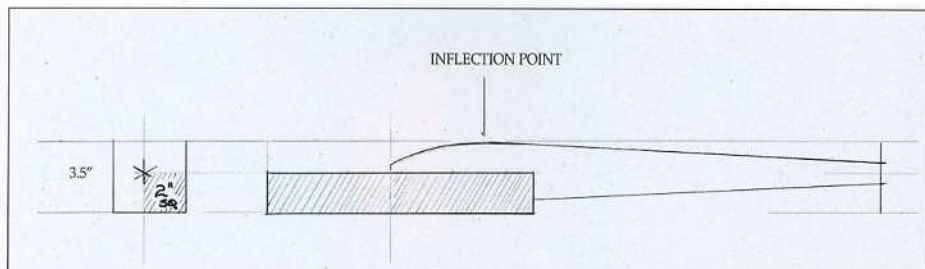
Emile-Jacques Ruhlmann's torpedo leg is a unique contribution to the vocabulary of furniture forms, and an icon of Art Deco design. It is both visually elegant and mysterious in its construction. But like the cabriole leg, it is only mysterious until it becomes obvious.

Woodworkers like clever things, and I have seen many clever jigs for making this leg: a jig for milling segmented facets, for routing the curves, a tablesaw jig for cutting the lap joint, a jig for attaching it to the case with blind tenons or biscuits. And at every step I could see plenty of margin for error resulting in a botched job...and so I said forget it, you'd be crazy to try.

My epiphany moment came at the Metropolitan Museum of Art in New York when I was confronted by a roomful of these legs (*Ruhlmann: Genius of Art Deco*, June-September, 2004), and it became clear how Ruhlmann had them made. I returned to my shop and made a sample to satisfy myself about my idea.

What I had discovered was that by carving the torpedo out of a larger block of wood you can avoid any tricky joinery altogether, and can have the upper member integrated into the case for maximum strength. Carve and veneer the leg at your bench, glue up the leg to the carcass, then veneer the carcass. Simple? Well, not really. It does require a bit of practice with hot hide





glue and a hammer. But at least this method relies on the quality of your workmanship, and not upon the precision of your jigs. Plus, it is the way Ruhlmann did it, and I am convinced it is the easiest way of all.

For this article I want to demonstrate the torpedo leg shaped off of the corner, with a dramatic 270° exposure and eight faceted sides. I always draw these things first full size

on 1/4" MDF, both to accurately describe the line and to give me a template I can cut out for future use [see drawing].

SHAPING THE LEGS

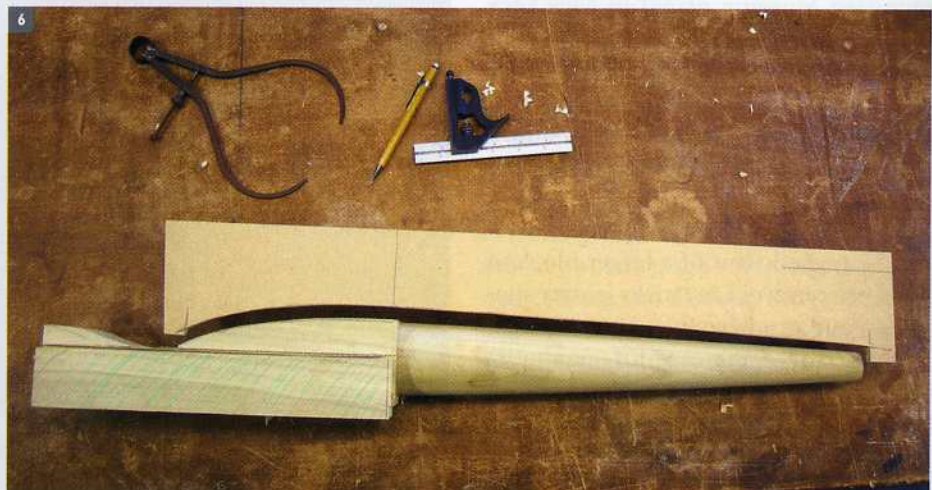
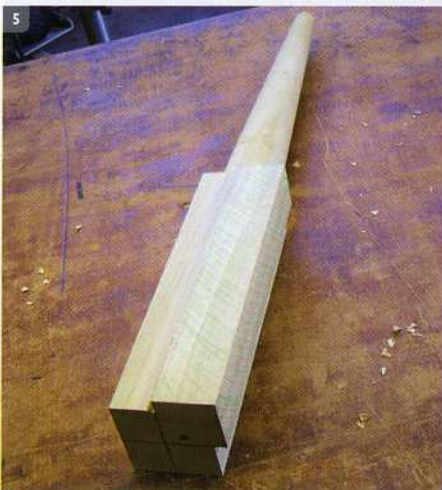
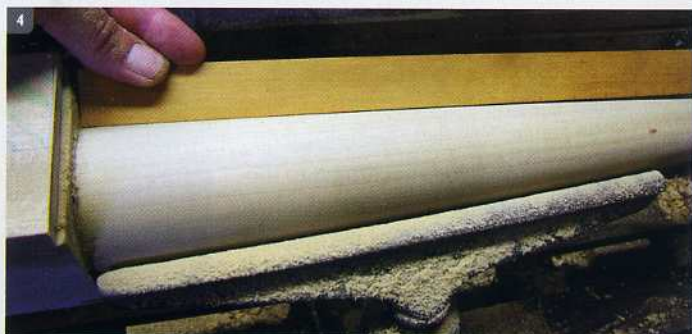
Begin with a block of poplar 3-1/2" square and a few inches longer at the top than is needed. Mark the 2" upper block: the centerline of the torpedo corresponds

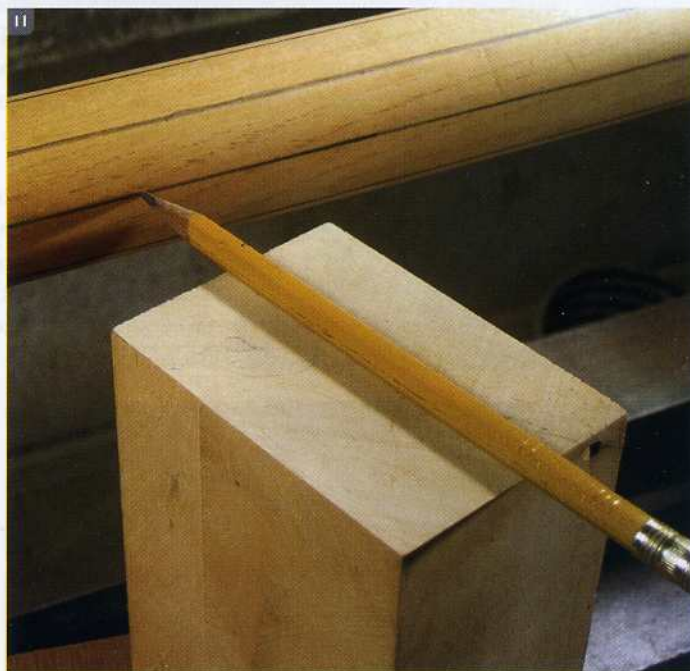
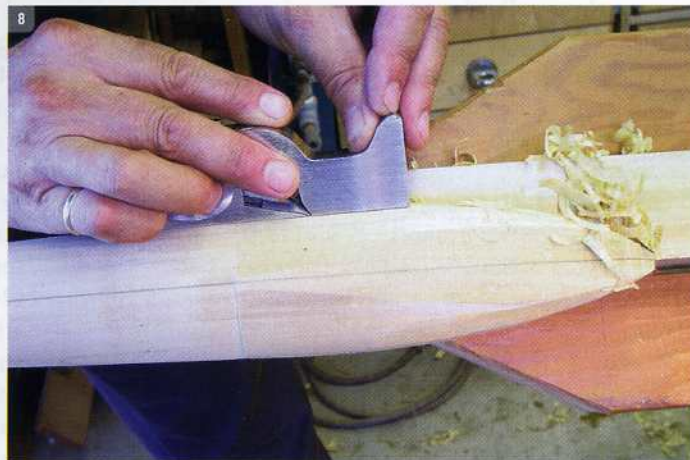
to the outside corner of the cabinet, and so the lower segment of the leg must be turned with that axis as center. For ease of visualization and turning, I bandsawed some of the lower block off (1).

Carefully turn the lower leg round. At the lowest edge of the case, I turn the leg to approximately 2-3/4" diameter and then taper to approximately 1" at the toe (2).

Remember that the widest part of the torpedo (the inflection point) occurs above the lowest edge of the case [refer again to the drawing], so it is important to avoid the natural inclination to turn a slight entasis on the lower leg (3) and instead to turn a true cone (4).

When you are satisfied with the turned element, remove it from the lathe and iso-





late the 2" square top part with a few cuts at the tablesaw (5). Be careful not to cut too deeply, but merely establish the upper edges of the cabinet.

Use your template to mark the upper profile on the two faces that can be band-sawn off, then cut the leg and the top block, leaving a little wood to trim by hand (6). I try to keep the upper center intact as long as possible.

The other two faces must be carved by hand, which may be the most difficult part of the project. Nibble up to the line dictated by your template without cutting too deeply into the face of the upper 2" block (7). Assuming this will all be veneered, a few errant chisel marks may not matter, but the shape must be accurate.

The top of the torpedo should emerge slowly under your tools; I use a rabbit plane

to carefully round off the edges (8) and keep my eye on the lines previously drawn. Check with your template in all directions (9).

Lastly, smooth all the facets to create a full round curve on the upper end. I use a strong light and rely on the visual cues of the shadows and highlights to create a smooth curve (10).

When you are satisfied that the shape is a smooth tapered cylinder without flat spots, return it to the lathe to mark the facets. A simple block with a pencil does the trick (11). Mark the corners accurately and then eyeball the other four points to make eight lines.

Return the leg to your bench and, using chisels, rasps, and especially a sanding board, flatten the spaces between the lines (12).

Keep sighting the length to be sure the lines remain straight. The sanding board is

great for making small adjustments. Only at the last moment should the pencil lines disappear (13, 14).

At this point the leg is ready for veneer.

As stated earlier, my procedure would now be to veneer the torpedo, then cut the joinery and assemble the case, and then veneer the case up to the torpedo. This requires a bit of skill and practice with hot hide glue and a hammer, but it is easier than you may think and, best of all, it is totally reversible.

HAMMER VENEERING BASICS

I love hide glue. Both the hot version and the cold (Old Brown Glue) have distinct advantages over modern glues and deserve a place in the shop. They have a crisp, hard glue line, both are totally reversible, and neither will affect the subsequent finishing if

you get sloppy. For hammer veneering, choose the hot hide glue for its quick set time and strong initial tack. It will hold the veneer in place without clamping, and set up in minutes. If you are not satisfied with the placement, heat it up to 150°, remove it, and try again.

A veneer hammer is more like a squeegee that presses out excess glue and ensures a snug bond between veneer and substrate. For this project there are actually advantages in using a burly veneer: unlike a straight veneer, the burl will react to the heat and moisture like a damp sponge and allow the hammer to stretch it into place, ensuring tight seams. Burl veneers are generally short, but the busy grain pattern allows for nearly invisible splices in the length, as long as you are careful to match the color that can vary markedly over a single sheet.

ONE PIECE AT A TIME

I begin by applying thinned hide glue (one part glue to 6-8 parts hot water) as a sizing to the bare wood. This prevents the wood from absorbing too much hot glue during the veneering process, which could

starve the joint and cause frustration and failure. Allow the leg to dry fully, and then lightly sand it smooth again.

Burl veneers are curly and fragile, and must be prepared and softened before using. You can make your own softening solution with glycerin, water and alcohol, but I buy mine pre-made from Veneer Systems, Inc. [100 River Rock Suite 104, Buffalo, New York 14207; (800) 825-0840]. Brush or spray both sides of each sheet, then slowly press them between layers of clean newsprint (not newspaper!) or paper towels. I use a vacuum bag and leave them in moderate pressure overnight.

Lay out your veneer and plan your cuts (15). I use a Berol Prismacolor pencil to mark the sequence because the lead is both very visible and waterproof, and will sand out easily when dry. Use a cardboard template that is slightly oversize to allow slippage but not waste too much veneer.

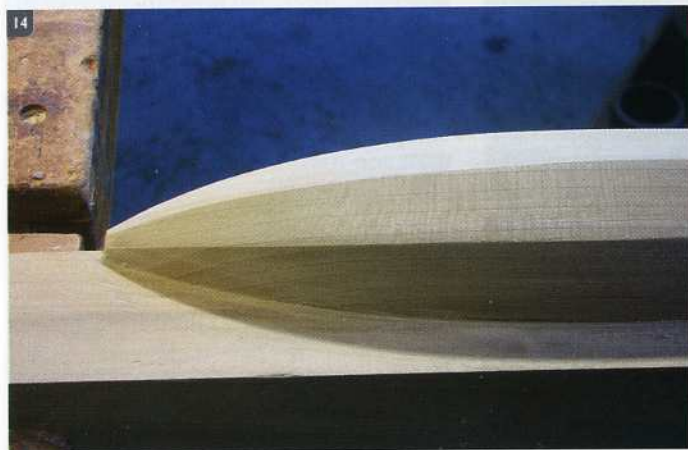
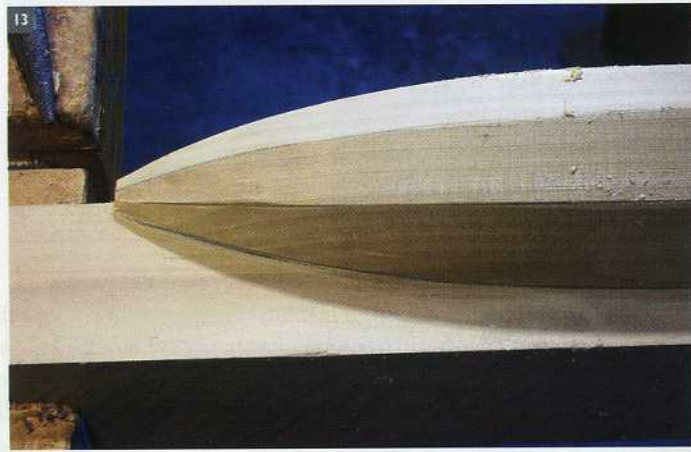
The important face pieces I labeled #1-#6, but the first ones to glue on will be the back pieces under the cabinet. Each new facet covers the edge of the previous one. After the veneer is glued on, it must be

allowed to dry fully before it can be safely sanded flush to the adjacent face. This may take an hour or more, but it is best not to rush it, as you need a nice, crisp edge to veneer to.

Of course, waiting is not a problem if you are making four legs: I found it was possible to glue a few pieces at a time on each leg, then set it aside and move on. By the time you finish the fourth leg, the first will be dry.

When you are ready, apply hot hide glue to the leg only where the first veneer will go, then press the veneer face down into it. Apply glue to the backside of the veneer, then flip it over and immediately apply hot glue to the top of the veneer. This will equalize the moisture and keep the veneer from curling up on you, and will provide lubrication for the hammer to slide over. You have less than a minute from the time you first touch the glue brush to get the veneer set, so move purposefully to secure the edges with light strokes of the hammer, then as the glue sets press firmly and squeeze out the excess.

The glue will escape with a crackling





sound. Be careful not to stretch the veneer too much or it will shrink and crack as it dries. If the glue has cooled before you are satisfied, warm it with a hot iron (set to permanent press). Pushing against cold glue will crack and ruin the veneer.

The next pieces to go on are #1 and #6, which must be curved to match the line at the cabinet. Use a template to find the correct line and carefully trim the veneer to shape (16). These are the only pieces that need a close fit, as all others simply overlap.

Use the hammer to press the first piece along the edge. Don't worry about the section below the case (17).

Use a veneer saw to cut on an angle from

the bottom point of the cabinet. Heat the cutoff section with an iron and remove it (18). Find a good color match, and avoid any obvious grain discrepancies, and the seam will become nearly invisible (19, 20). The last piece is ready to be glued on (21).

FINAL DRESSING

The edges of the veneer are often a visual distraction. For this project, I did not add the vertical inlay stripe that Ruhlmann often did to hide this problem, but I could imagine working with Michael Fortune's very clever inlay tool [see *Woodwork* #73, February 2002] to do the job. Return the leg to the lathe, and guide the cutter hori-

zontally along a shelf the way you did with a pencil earlier. I have had great success with this simple tool.

Instead, I chose to feather the edges down until only the glue line was visible between the facets. Sticklers may complain that the facets are now not exactly equal, but keep your calipers in your pocket: if the presentation is clean, the eye will be satisfied.

Paul Henry has been building and restoring furniture for more than 30 years. He is an instructor of furniture design at Palomar College, and an aspiring luthier. His website is: www.paulhenryfurniture.com.