



Turn a Pad-Foot Leg

A graceful leg
that's easy to make
entirely on the lathe

BY JON SIEGEL

There are many names for the furniture leg that's less elaborate than a cabriole but more complex than a simple taper. I've heard it called pad foot, spoon foot, and Dutch foot. By any name, it was most popular on Queen Anne tables and lowboys. It also can complement Federal or Shaker-inspired furniture.

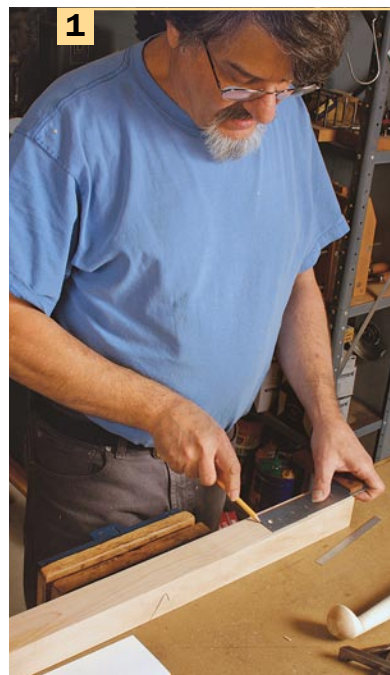
Unlike cabriole legs, pad-foot legs are produced entirely on the lathe, with no bandsaw work beforehand or hand-finishing afterward.

Making a pad-foot leg involves multi-axis turning—that is, using two pairs of center points. The leg is partially turned while mounted in one pair of centers, then moved to the second pair to finish.

One pair falls at the true center of each end of the leg blank. The second pair is offset in from the true centers in two directions by a fraction of an inch at the bottom of the leg, and a smaller fraction at the top. The two axes—that is, the imaginary lines connecting the centers—cross at a

Start with careful layout

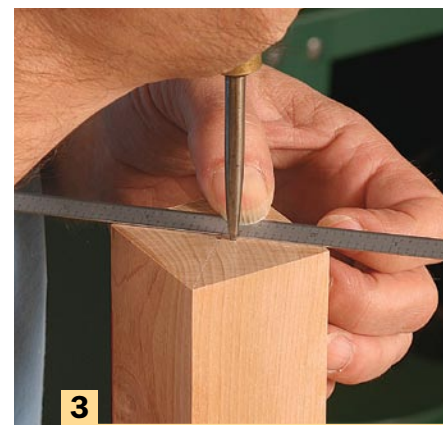
The most important step in turning a pad-foot leg is locating the offset centers on the blank. It's easiest to begin with the offset at the foot, then mark the offset at the top.



1 Mark the pommel. This defines the transition line where the two axes intersect. Marking all four faces will help you see the line when the leg is turning.



2 Mark the bottom offset. Measure from the true center toward the inside corner of the leg.



3 Mark the top offset. Measure from the true center along the diagonal pointing to the outside corner of the leg for this offset point.

transition point. That's usually at the base of the pommel, the square section that receives the mortises for a table apron or the carcase of a chest.

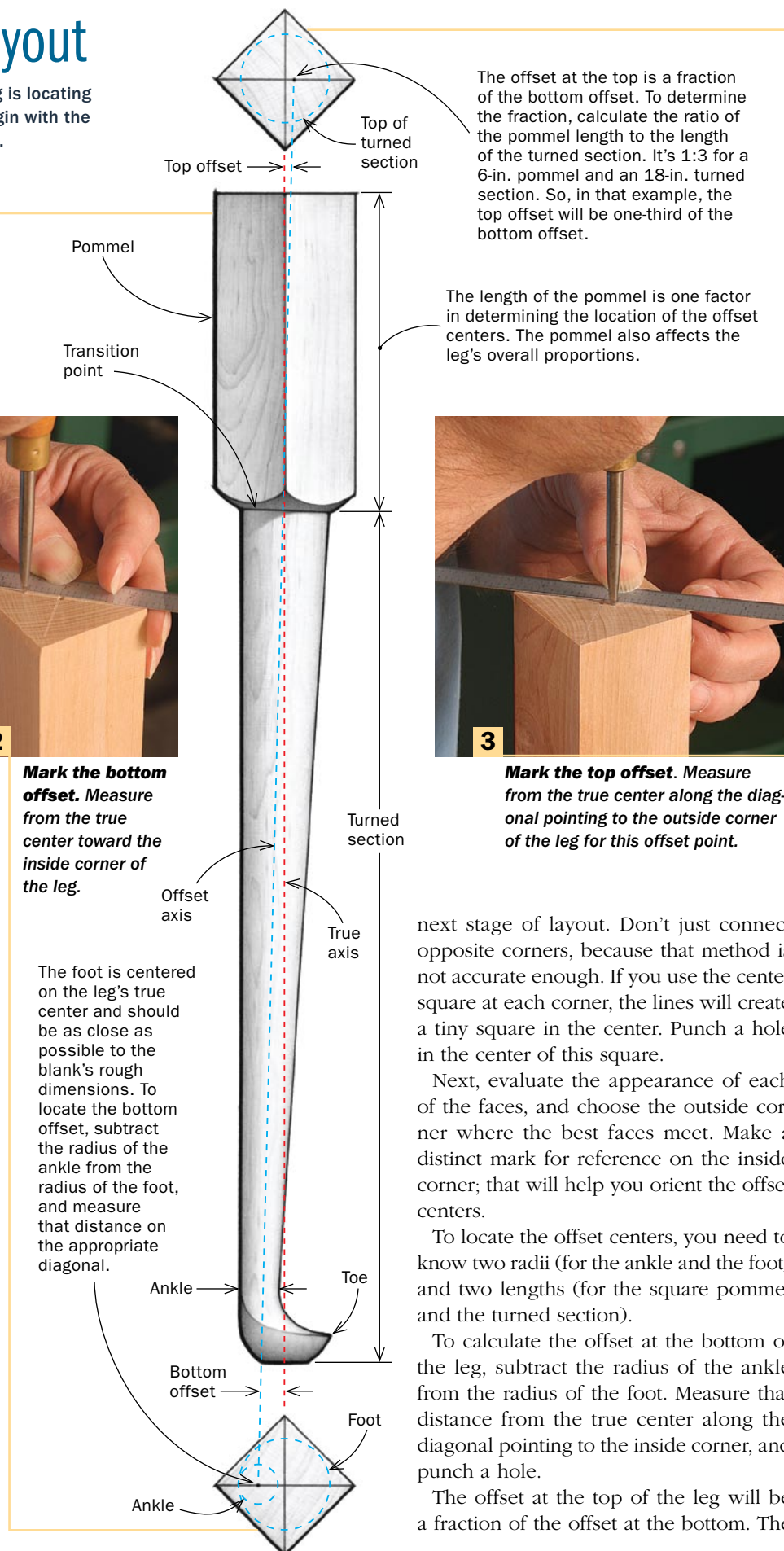
Accurate layout is critical

To produce these legs, you must precisely locate the two sets of center points and the transition point. That involves careful marking and a little arithmetic.

For the leg shown here, begin with 8/4 stock, milled to about 17/8 in. square. (I prefer maple, but any hardwood will do.) A blank that size will give you a well-proportioned leg for many tables. The leg will measure 1 3/4 in. dia. at the widest part of the foot (that's the line defining the toe), and 3/4 in. dia. at the ankle, where the leg is narrowest. The square pommel can be whatever length suits your design.

To find the true center at each end of the blank, I normally use a marking gauge, but for these legs I use a center square because it gives me diagonal lines for the

The foot is centered on the leg's true center and should be as close as possible to the blank's rough dimensions. To locate the bottom offset, subtract the radius of the ankle from the radius of the foot, and measure that distance on the appropriate diagonal.



The offset at the top is a fraction of the bottom offset. To determine the fraction, calculate the ratio of the pommel length to the length of the turned section. It's 1:3 for a 6-in. pommel and an 18-in. turned section. So, in that example, the top offset will be one-third of the bottom offset.

The length of the pommel is one factor in determining the location of the offset centers. The pommel also affects the leg's overall proportions.

next stage of layout. Don't just connect opposite corners, because that method is not accurate enough. If you use the center square at each corner, the lines will create a tiny square in the center. Punch a hole in the center of this square.

Next, evaluate the appearance of each of the faces, and choose the outside corner where the best faces meet. Make a distinct mark for reference on the inside corner; that will help you orient the offset centers.

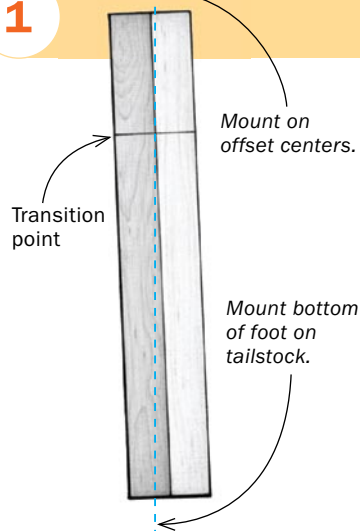
To locate the offset centers, you need to know two radii (for the ankle and the foot) and two lengths (for the square pommel and the turned section).

To calculate the offset at the bottom of the leg, subtract the radius of the ankle from the radius of the foot. Measure that distance from the true center along the diagonal pointing to the inside corner, and punch a hole.

The offset at the top of the leg will be a fraction of the offset at the bottom. The

Shape the leg

1



Begin on offset centers. Most of the leg will be turned with the blank mounted askew. The bottom of the leg, with the greatest offset, goes on the tailstock.

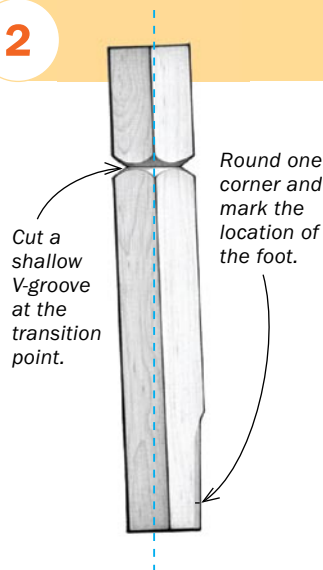
fraction is the ratio of the pommel length to the turned length. That is, if the pommel is 6 in. and the turned section 18 in., the ratio is 1 to 3. That means the top offset will be one-third the length of the bottom offset. Measure from the true center along the diagonal pointing to the outside corner and punch another hole.

Finally, draw a dark pencil line to mark the length of the pommel and locate the transition point for the turning. If you mark all four faces of the leg blank, it will be easier to see the transition point when the blank is turning on the lathe.

Begin turning on the offset centers

Mount the blank on the offset center points, with the top of the leg at the headstock. Start the lathe and look carefully at the shadow lines—the multiple images

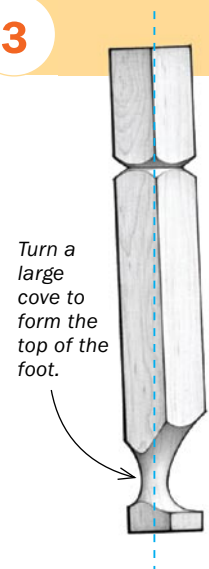
2



Cut the transition and mark the foot. Using a skew (left), cut a V-groove and slightly round the corners of the pommel. Next, you'll need to rough the foot area a bit to round one corner. Stop just short of the inner shadow line; the author's pointing to the spot you want (center), about $\frac{1}{8}$ in. above the second shadow line. Now you can mark a line (right) for the height of the toe.

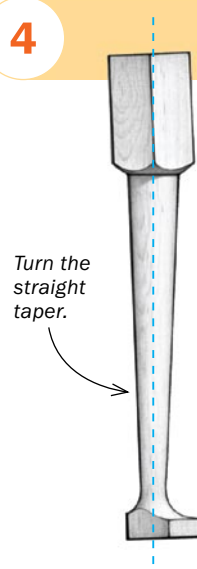


3



Watch the lines. A large cove cut forms the ankle and the top of the foot. Enlarge the cove until you reach the line marking the height of the toe.

4



Cut the taper. When cutting, use your free hand to steady the blank. Check the line with a straightedge.

you see as the blank spins eccentrically. Be sure there's only one shadow line at the transition point—the mark you made for the length of the pommel. To tweak the alignment, shut off the lathe and tap the blank near one end to shift it slightly on its centers. Be sure to tighten the blank again so it won't wobble.

Use a $\frac{5}{8}$ -in. skew with its long point down to make the transition cut. Cut about $\frac{1}{8}$ in. to $\frac{1}{4}$ in. deeper than the flats on the square pommel.

Move to the foot, where you'll see two shadow lines. Use a $\frac{3}{4}$ -in. roughing gouge to cut down to within $\frac{1}{8}$ in. of the second shadow line (see photo, facing page). Because the blank is turning off-center, you'll round off only one corner. Mark a line to locate the height of the foot.

Next, use a $\frac{5}{8}$ -in. or $\frac{1}{2}$ -in. spindle gouge to shape the curve that forms the ankle and the flare at the toe. Begin these cuts well to the left of where you want the toe and widen the curve as you make it deeper. Use calipers to check the diameter at the ankle.

Finally, use the roughing gouge to taper the leg from transition to ankle. Steady the blank with your free hand as you cut, a technique that also allows you to feel any irregularities in the taper. Use a straight-edge to check that the taper is even when you make the final smoothing cuts. When this part of the turning is completed, sand it before going on to the next step. I like to use broken P100- and P120-grit sanding belts for the first pass, then finish to at least P220 grit.

Finish on the true centers

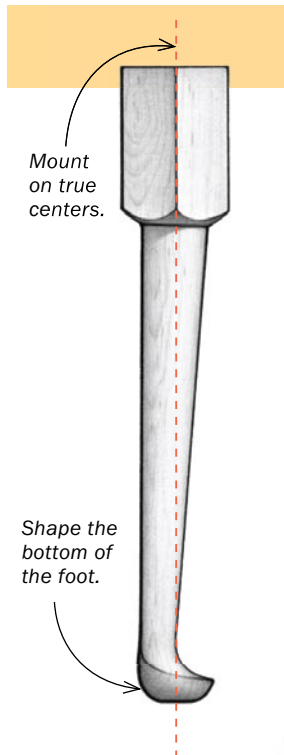
Mount the blank on the true centers. Use the $\frac{1}{2}$ -in. spindle gouge to shape the bottom of the foot, beginning at the toe. It's the same kind of cut you'd use to shape a bead. Round that part of the leg down so that it's between $\frac{3}{4}$ in. and 1 in. dia. at the very bottom.

Lightly sand the foot, being careful not to blunt the sharp line that defines the toe.

If you've done everything correctly, that sharp line should blend smoothly into the taper at the back of the leg. If you see a bulge instead of a smooth taper, you can turn or sand it away, although that will reduce the diameter of the toe slightly. □

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Finish the foot



Complete the turning. With the leg remounted on the true centers, use a spindle gouge to round over the bottom of the foot (above), leaving the diameter at the base $\frac{3}{4}$ in. to 1 in. Sand the turning lightly (right), being careful to avoid rounding over the sharp line defining the toe.



VARIATIONS

Sample legs from Siegel's shop (left) show the range of design options. Siegel's porringer table (below) adapts one of those styles to a Queen Anne design. The legs are splayed slightly to compensate for the angle of the offset.

