

A Simple Jig for Smooth Ellipses

by Clayton DeKorne



The old string method for tracing an ellipse is tried and true (see "Simple Interior Arches," 2/93). But for an exacting curve that won't get buried in drywall, the technique has its pitfalls. It's difficult to keep the pencil perfectly straight while holding constant

tension on the string, and the pencil point runs with the grain of the wood. These snares result in an imperfect shape and wobbles along the curve, problems that Grant Taylor, a custom doormaker in South Ackworth, N.H., couldn't live with. He needs to cut



Grant Taylor of South Ackworth, N.H. hogs out a perfect ellipse with his router as he builds an elliptograph — a shop-made jig for cutting an ellipse. When he is finished making the jig, Taylor will use it for making precise cutouts for custom door lights, elliptical arches, and oval sinks.

very precise curves on a semi-production basis to fit custom glass panels, and the tastes of discerning clients. So Taylor fashioned a router jig. It takes some time to build this jig, but once you have it, you can reproduce any ellipse with speed and precision. Taylor uses the jig mostly for elliptical window cutouts and arched door rails, but it works equally well for other precision ovals, such as sink cutouts in solid-surfacing and arched fronts for built-in cabinets.

An Elliptograph

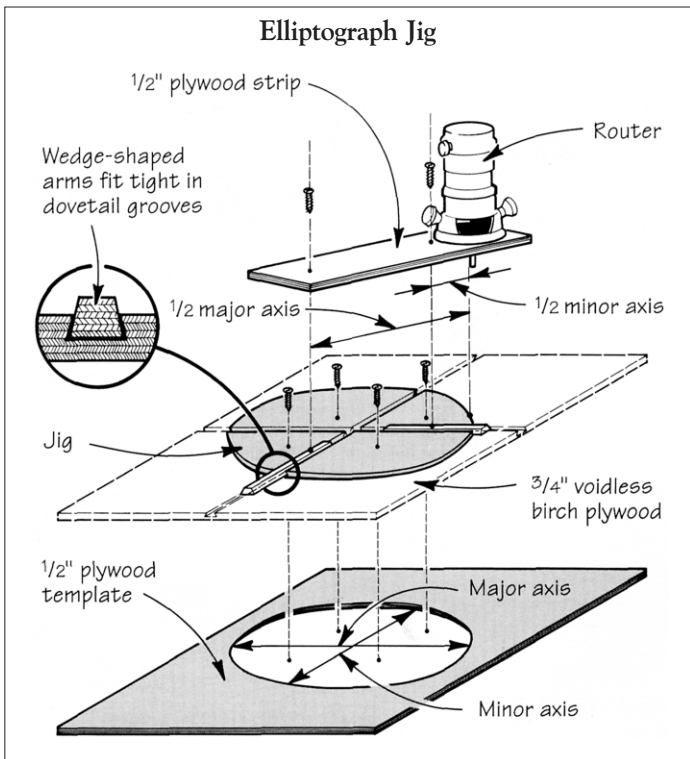
Taylor's contraption is an "elliptograph" built of voidless birch plywood and drywall screws. Taylor begins by routing two keyed grooves with a dovetail bit in a rectangular piece of plywood. The grooves run perpendicular to one another, along the major and minor axes of the ellipse, as shown in the illustration. To cut the grooves, Taylor uses a template collar to guide his router base along two hardwood rails. He joints the rails straight and smooth before he temporarily screws them to the plywood.

He then cuts two arms — precise wedges that fit tight in the dovetail grooves. These arms slide back and forth, and Taylor rubs in a little furniture wax to ease the movement.

Next, Taylor mounts his router on a plywood strip and measures along the strip two distances from the bit — one, half the length of the minor axis, and the other, half the length of the major axis of the ellipse he wants to cut. At each distance he drives a screw through the strip into one arm in a groove. Once the strip is joined to the arms of the jig, he can pull the router around. The arms slip in their grooves and the router hogs out a perfect ellipse in the plywood rectangle. Once he's made a few passes and cut all the way through the birch plywood, the jig is complete.

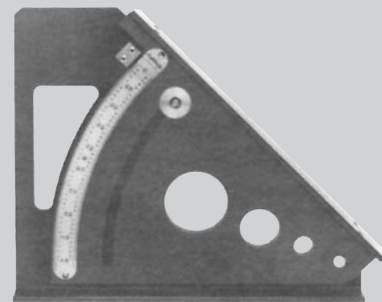
It's a curious machine to watch in action — a gangling clockwork motion as the arms slip back and forth in their grooves. The geometry that governs the machine's motion is complex, but you don't need to understand it to make it work. All you need to do is measure the major and minor axes of the ellipse you want to cut and the shape will be perfectly traced by the motion of the machine.

Typically, Taylor screws the jig to a piece of 1/2-inch plywood and cuts a template. He can then clamp this template over his work — be it a door, countertop, or cabinet front — and cut with a template guide and a flush-cutting router bit. ■



An elliptograph is constructed from a rectangle of voidless birch plywood. Taylor uses the jig to cut a template, which can be easily clamped to the finished work. Then, using a flush-cutting router bit, he cuts the ellipse.

TOOLBITS



Precise, not precious. The AngleWright Adjustable Triangle (AngleWright Tool Co., P.O. Box 25632, Los Angeles, CA 90025; 310/471-7432) is designed to make quick and accurate machine adjustments and angle layouts. It is similar to an adjustable drafting triangle, and is precise enough for layouts on paper or plywood. But its true merit is as an accessory to table saws or radial arm saws for quickly setting angles. On a table saw, the triangle can be used with a standard sliding miter gauge to position a piece of wood at a precise angle. The adjustable arms are 11 inches long and 1 1/2 inches wide, so it holds the wood much better than a miter gauge. It is also more accurate. The protractor scale reads in 10-minute or .2-degree settings.

Plus, the precision markings and adjustable hairline indicator make these small increments as easy to read as the 1/64-inch marks on a good tape measure. On a radial arm saw, this triangle is an excellent gauge for multiple angle cuts when placed (or screwed) against the saw's stationary fence.

At a cost of about \$80, the Adjustable Triangle is pricey, but you get your money's worth. It is a beautifully-machined tool, with precision-milled aluminum legs and a brass hinge and thumb screw. Don't mistake this for simple flair, however. There is no superfluous rose wood on this tool. It's made for small-scale production of precise angle cuts, not for hanging in a show case.

— C.D.