Turned Bird Houses

Shelter from half-inch-thick stock

SUSAN SCHAUER

Author's turned bird houses are attractive, economical, and weatherproof.

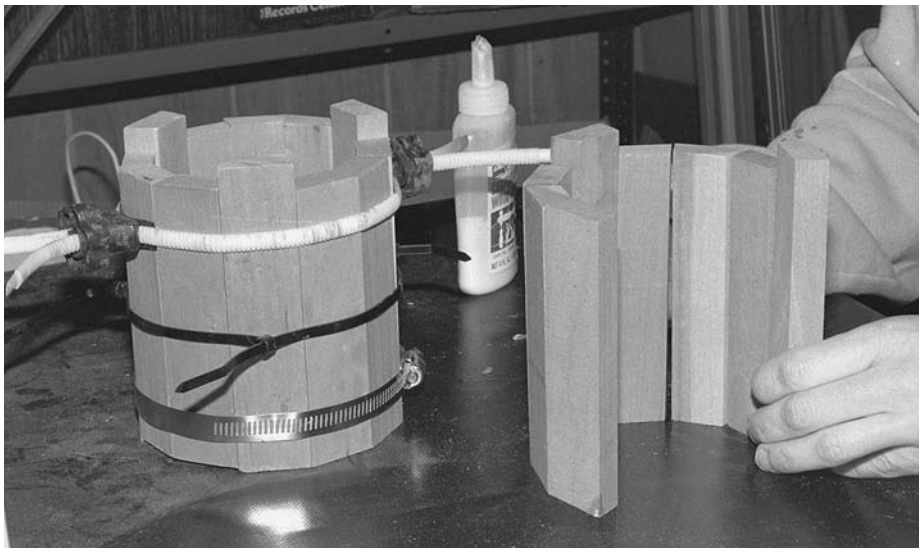
Locals call me the "Birdhouse Lady." I take it as a compliment. My turning career began making lathe-turned birdhouses, and I continue to make them today. They are beautiful, functional, and popular. I got my start after reading a wonderful article by Andy Barnum (*American Woodworker,* April 1990), describing his methods for turning staved birdhouses. Although our designs are similar, our methods are not. Since birdhouses are a major source of income for me, I have had to develop an efficient system which does not compromise the design.

The birdhouse I'm going to describe is functional. It is weatherproof and durable. With a little maintenance (a fresh coat of varnish every few years), it can last indefinitely. It is also economical to produce. The entire birdhouse is made with flat lumber, $1/2$ inch thick or less: the body is coopered, the top is ring-segmented, and the pendant base is turned from glued-up scrap. The type of wood can vary, so use what's readily available. My houses are primarily oak, cherry, and cedar.

When designing a functional birdhouse, you need to consider the species of bird you wish to attract. Different birds have different needs, and we accommodate those needs by varying two things: entrance hole size and cavity size (see the chart on page 17). My standard birdhouse, described here, is made for the widest variety of species. The inside cavity measures $4\,1/2$ inches in diameter and is 9 inches high, and the entrance hole is $1\,1/2$ inches in diameter. Such a house is suitable for the largest variety of birds in my area.

The body

The body of the birdhouse is turned from a glued-up cylinder made from



Glue up the staves, then clamp using one of several methods: ducting clamps, utility cable ties, or hose clamps.

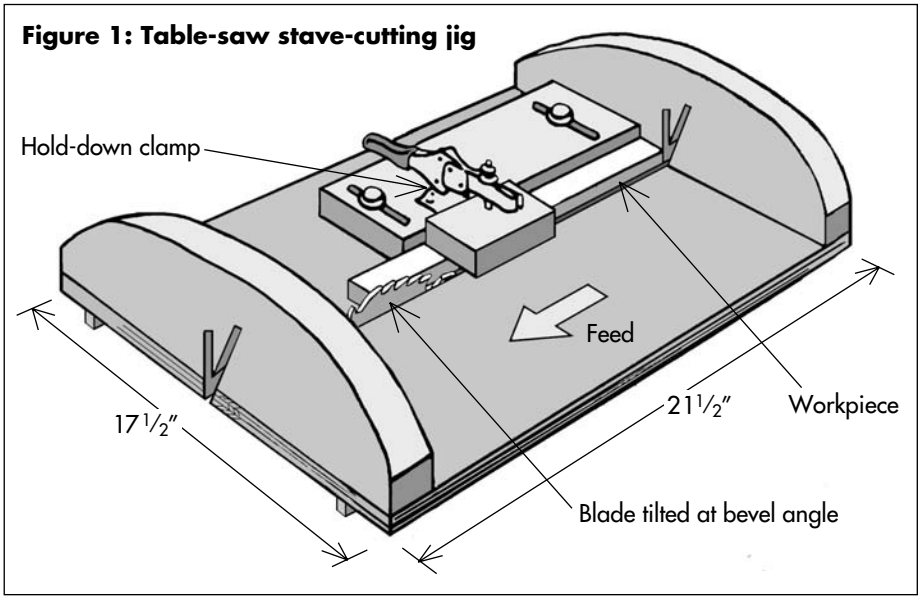
twelve individual staves; like wooden containers for hundreds of years, the birdhouse is coopered. Before plastic or cardboard, even while glass, ceramic, and sheet-metal were available, coopering was an important technology for creating containers to hold liquid and dry goods alike. Coopering is the efficient, economical way to turn flat boards into buckets, barrels, flasks, vessels, and, of course, birdhouses. Coopering saves lumber and turning time and makes for a more interesting design if grain is taken into account when gluing up the assembly. By sandwiching veneer in between the staves, even more unique designs can be created.

For a twelve-sided cylinder, the cut angle is 15 degrees per edge (see *Cooperage Math* sidebar, below right) The width of each stave will vary, depending upon the size of the cavity as well as the thickness of the lumber you're using. I have designed a computer printout of all the variables I'll need to know in coming up with a particular design. For example, I may want to know what minimum thickness of lumber I can use for a given size house; how many staves I will need and the angle of cut for each stave in that particular design. These have been so useful to me that I have produced copies for others. (See the note at the end of this article.)

Although a small number of staves can be easily cut with a standard table saw or bandsaw and fence, efficiency and safety is much enhanced by using a jig I specially designed for this purpose (see Figure 1, below).

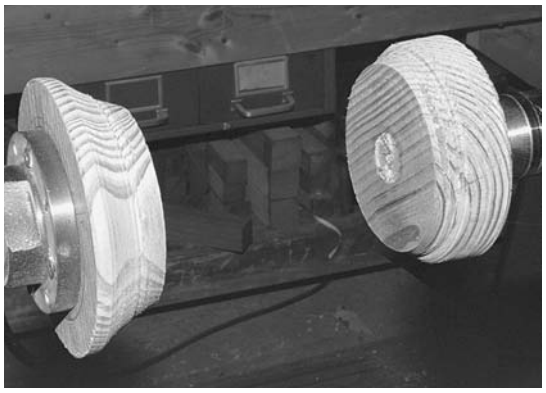
After cutting the staves to width, you need to cut them to length. I cut nine staves that measure $5\frac{1}{4}$ inches long and three staves that are slightly longer, $5\frac{5}{8}$ inches long. I then stagger the placement of the longer staves between the shorter ones (photo above). Later, when I attach the roof, these longer staves will be the attachment points and will keep the roof up off the body of the birdhouse for ventilation The staves are glued together edge to edge and can then be clamped using any of a variety of methods (photo above shows three methods). Standard hose clamps work very well. I also use plastic cable ties used for bundling utility cables. These are very convenient, and the glue will not stick to them. But since they don't have a release mechanism, they tend to be single-use items, unless you are patient with a small probe or scriber to re-

Figure 1: Table-saw stave-cutting jig



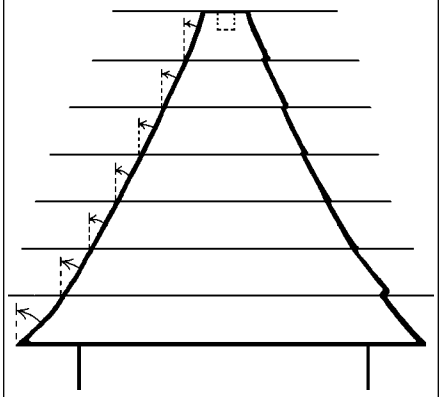
Cooperage Math

The width and number of the staves for a given container and the angle of the bevel joint between them can be determined using a little math. Begin with the diameter of the desired container and determine the circumference by multiplying the diameter by π (3.14). Divide the circumference by the number of staves to determine the width of each, and divide 360 degrees by the number of edges (2 times the number of staves) to determine the bevel angle.

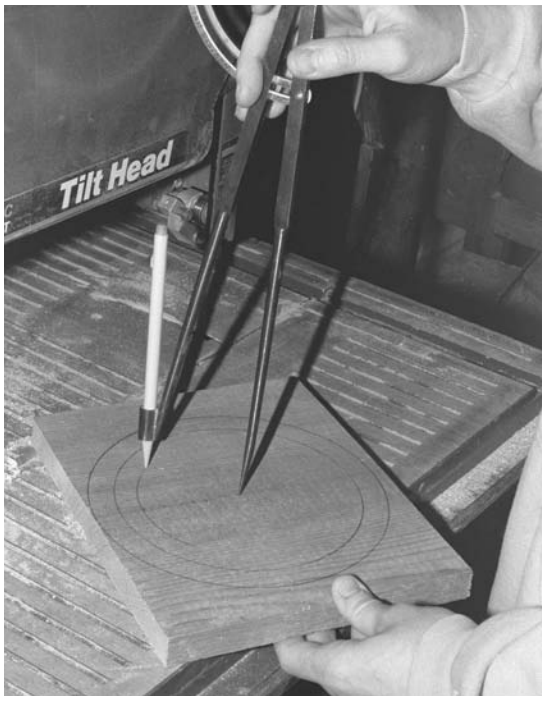


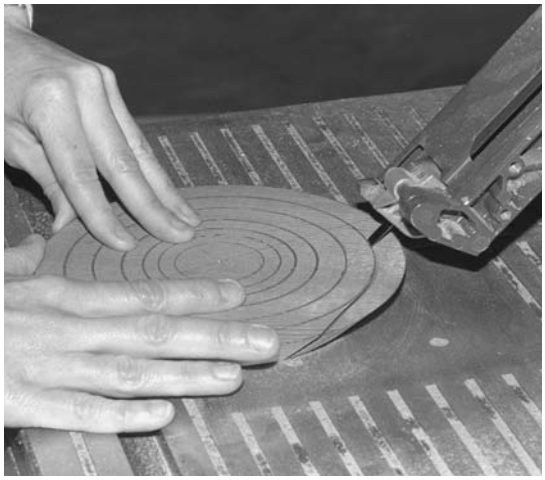
The birdhouse body is turned between centers, using two tapered centers that fit the inside diameter of the body.

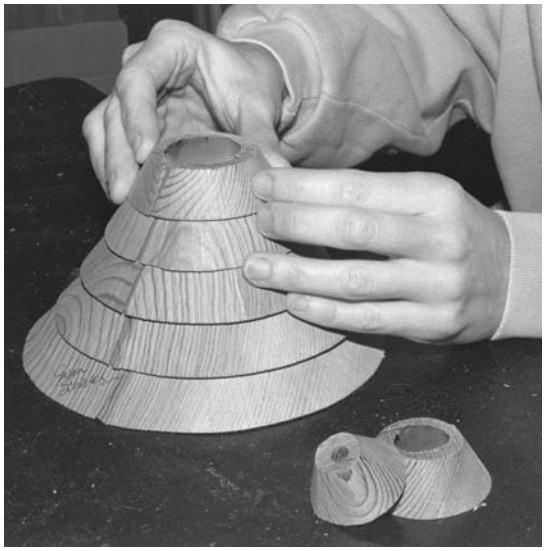
Figure 2: Determining roof segment angles



1. Draw the shape of the roof.
2. Draw lines the thickness of your lumber.
3. Measure angles to cut on bandsaw.







To make the roof, lay out the rings with a compass, top. Set the bandsaw to the angle determined as in Figure 2, and saw out the rings, center. Finally, glue the rings together, above.

lease them. Larger clamps are sold through heating and air conditioning outlets for use with round flexible ducting. The glue I use is unimportant at this stage since I later coat the house with epoxy. Therefore, I use whatever is available, usually PVA yellow wood glue.

When the glue has dried, I turn the outside smooth. There are a number of ways to do this. One simple way is to sand the bottom edge flat and glue the house to a waste block. Easier yet is to turn two tapered centers out of waste wood. Place the glued-up blank between them and turn it between centers (photos above). This allows for slight irregularity in the glued-up cylinder and also ensures a relatively consistent wall thickness. I use a roughing gouge to turn down the outside. If the tool is kept sharp, this is all that is necessary to get a clean cut. Minimal sanding finishes the job. The house should be lightweight, but thick enough for the bottom end-grain edge to accept screws for attaching the base. I usually turn down to a thickness of $^3/_8$ inch. Next, use a parting tool to cut the bottom edge flat to receive the base of the house. Then, at the other end of the cylinder, with a spindle gouge, taper the three longer staves (by cutting the sharp corners off) where the roof will be attached.

Next I coat the body with a two-part epoxy (which will make it waterproof), and after that dries, I sand it smooth and varnish it with a UV-inhibitor varnish. (Keep in mind that epoxy deteriorates quickly in sunlight. The UV-inhibitor, exterior-grade varnish is necessary if the birdhouse to be used outdoors.)

The roof

The roof I've designed for my birdhouses is made up of concentric rings. Little wood is wasted in this process (only the saw kerf), and it keeps the house lightweight. Although I could turn the roof rings on the lathe, I find it both faster and easier to make them on my bandsaw. I begin by drawing the roof shape I want on a piece of paper (Figure 2, above). Next, I determine the thickness of lumber to be used and draw lines across the roof design at that thickness. Then, I simply measure the angle of each edge and write this down. This will be the angle of cut on the bandsaw (photos at right). I draw the rings directly onto the cedar

The base is turned from glued-up scraps of various species.

blank with a compass. At the bandsaw, I make an entrance cut into the ring, cut around the ring, then turn off the saw and slip the blade through the entrance kerf. Next, I drill a 1/4-inch hole in the last (top) ring to receive the decorative finial at the top of the roof. With a small amount of epoxy, I glue the rings on top of each other.

When these dry, I coat the entire roof, inside and out, with two coats of epoxy. This will strengthen and seal the roof. Finally, I sand the roof assembly lightly and paint on one or two coats of the UV-inhibitor varnish. The roof is complete.

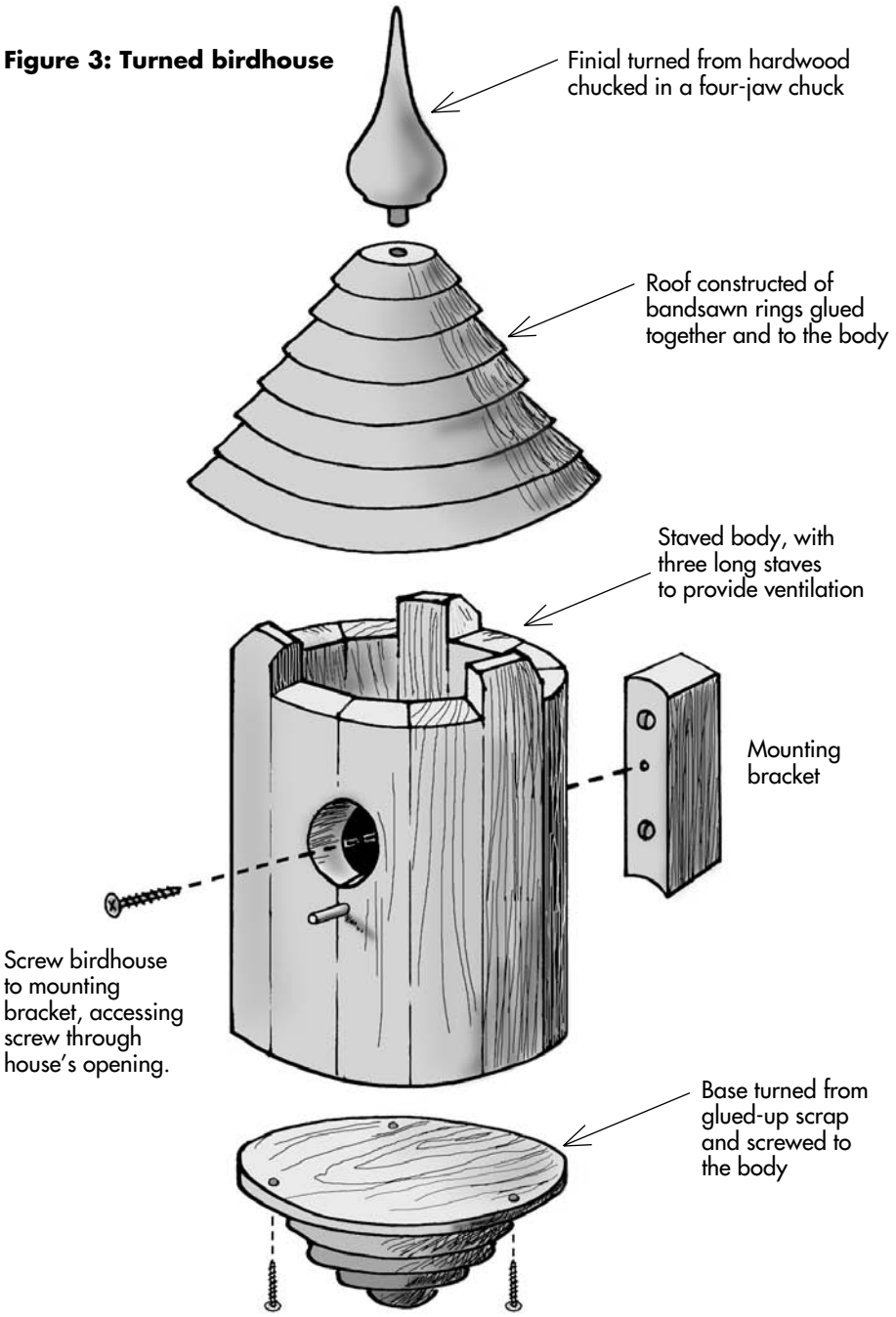
The base

When gluing up wood for the base, as in the rest of the birdhouse, I use scrap lumber (photo above). I glue together a pleasing combination of wood of varying species and thicknesses. It's always different and part of what makes each house unique. I attach this to a waste block with double-sided tape. Then I turn whatever shape comes to mind. I do consider the diameter of the body of the house I turned earlier and match this to the diameter of the base, leaving a relatively thin flat at the perimeter where I will screw the base to the body.

The finial

To turn the decorative finial for the top of the roof, I chuck a piece of hardwood in a four-jaw chuck and turn it down with a roughing gouge, finishing with a small spin-

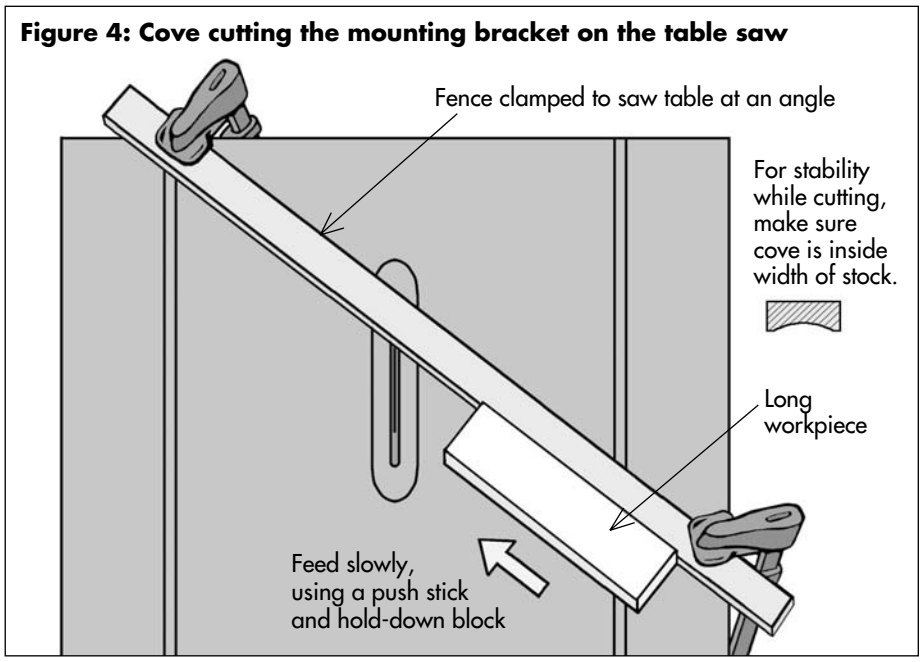
Figure 3: Turned birdhouse



Bird house specifications, by species (measurements given in inches)

Bird	*Entrance diameter*	*Entrance height*	*Floor diameter*	*Chamber height*
Bluebirds	1 1/2	6 – 7	4 – 5 1/2	11 – 12
Chickadees	1 1/8 – 1 1/2	6 – 7	4 – 5	9 – 12
House finch	1 3/8 – 2	5 – 7	4 – 5	9 – 12
Flycatchers	1 1/2 – 2 1/2	6 – 7	5 – 6	9 – 12
Kestrel	3	10 – 12	8 – 9	14 – 16
Purple martin	2 – 2 1/2	1	6	6
Nuthatches	1 1/8 – 1 1/2	6 – 7	4 – 5	9 – 12
Sparrow	1 3/16 – 2	6 – 7	4 – 5	9 – 12
Starling	1 5/8 – 4	6 – 10	5 – 6	13 – 20
Swallows	1 1/4 – 1 1/2	6 – 7	4 –5	9 – 12
Titmice	1 3/8 – 1 1/2	6 – 7	4 – 5	9 – 12
Warbler	1 1/4 – 1 1/2	5 – 7	4 – 5	9 – 12
Woodpeckers	1 1/4 – 3	8 – 14	3 – 8	10 – 16
Wrens	1 – 1 1/2	6 – 7	4 – 5	9 – 12

Figure 4: Cove cutting the mounting bracket on the table saw



Screw the birdhouse to the mounting bracket through the house's opening.

dle gouge. All kinds of shapes can work here, including one that reiterates the shape of the roof. I leave a tenon at the bottom to glue (with epoxy) into the hole drilled for that purpose in the top of the roof.

Mounting

When designing a way to mount these houses, my main concern was simplicity. I wanted to be able to mount the house with one screw that could be easily reached through the entrance hole of the house. The problem is, the house is round. If you use just one screw into a flat mounting bracket, the house will rock from side to side; it won't sit properly. The solution is to make a mounting bracket that is concave, the same curvature as the outside of the house, which can be done quickly and easily on the tablesaw. Find a long, straight piece of lumber that you can lay across your tablesaw top at an angle and clamp at both ends (see Figure 4, above). This will be your fence. The angle of this fence in relation to the tablesaw blade as well as the blade height will determine the shape and depth of the cove. You will want to use waste wood as test pieces to run across the blade and then adjust the height of the blade or angle of the fence to get the result you wish.

Use caution during this operation. The cut should be light, and can be accomplished in one pass, using a push stick and hold-down block.

I make my mounting bracket of cherry or oak. It measures $3\frac{3}{4}$ x $1\frac{1}{4}$ x $\frac{7}{8}$ inches, but I don't cut the piece to length until I have cut the cove on the tablesaw. It is always easier and safer to run a longer piece of lumber over the table saw, and you can cut multiple mounting brackets from it.

Not just for the birds

Birdhouses offer considerable variety in terms of size, shape, and style. But the stave construction method can be used for lots more than birdhouses. Beginning with the traditional bucket and barrel forms, you can turn these basic forms into various gift items, including kitchen containers, jewelry boxes, desk accessories, and planters. I've done some staved vessels, an example of which is shown at right. The idea of turning flat boards into cylindrical objects is full of possibilities.

Susan Schauer (formerly Susan Ellison) is a professional turner in Easton, MD. For a copy of her cutting specifications for different stave configurations, send $10 to 9716 Bantry Road, Easton, MD 21601. Email: sschauer @shore.intercom.net.

Staved construction can also be used to make vessels. Above, "Festival," cherry, holly, mahogany, $8\frac{1}{4}$" high, 1990. Below, "Diamond Bowl," walnut, mahogany, holly, $10\frac{1}{4}$" dia., 1991.

Permanent collection, Hoyt Institute of Fine Art