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Bill Krier
Editor
WOOD® magazine

Adobe Acrobat Troubleshooting Guide

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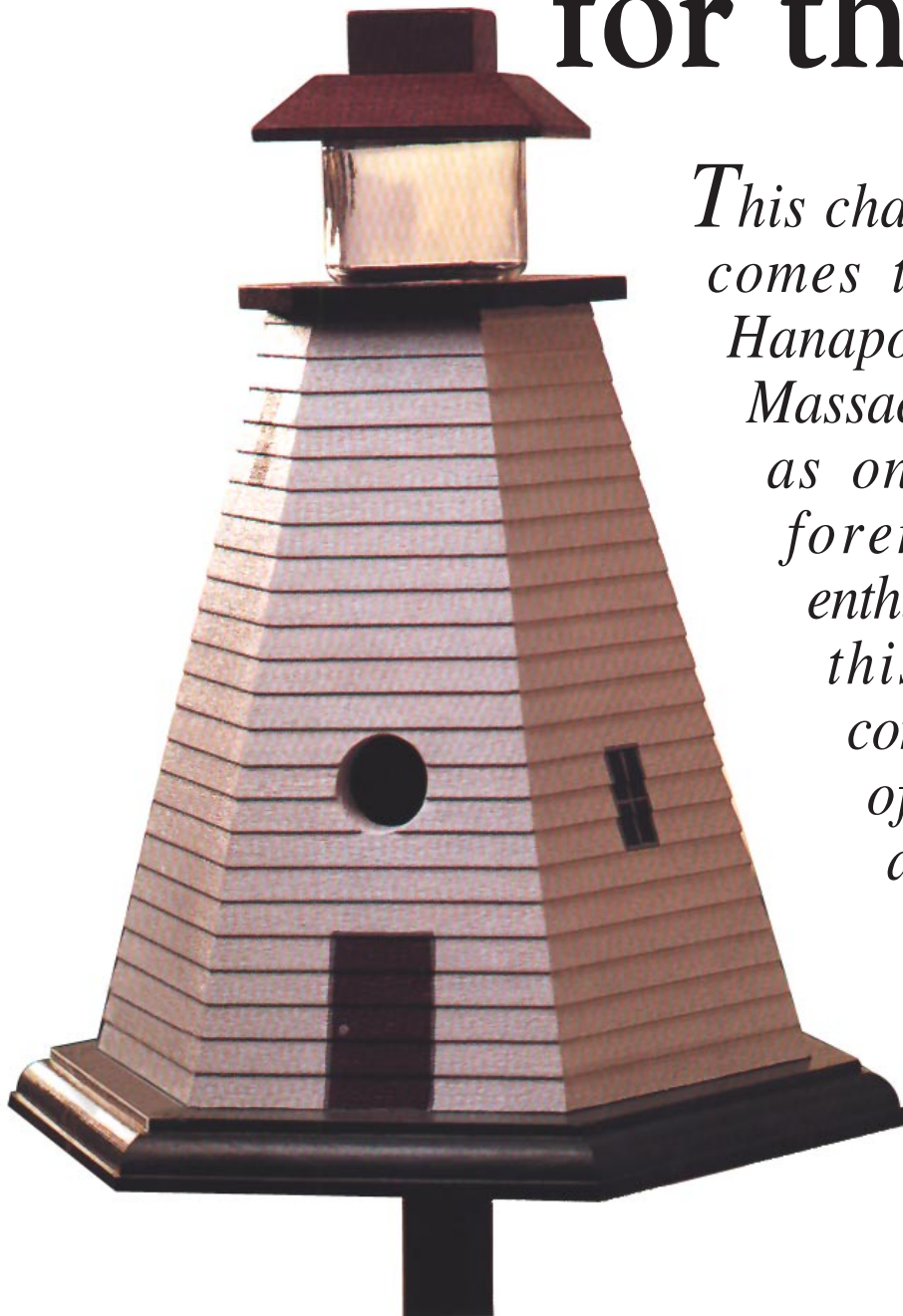
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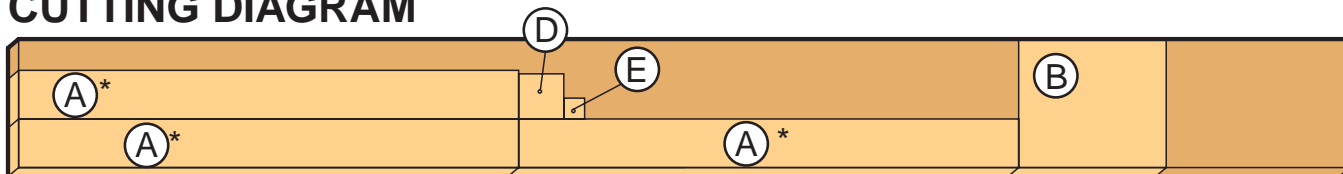


Lighthouse for the birds



This charming nesting box comes to us from Larry Hanapole of Marblehead, Massachusetts, who ranks as one of the world's foremost lighthouse enthusiasts. In designing this project, Larry combined the features of two originals he admired on the coasts of Maine and Nova Scotia.

CUTTING DIAGRAM



$\frac{3}{4}$ x $9\frac{1}{4}$ x 96" Poplar (*Plane or resaw to thickness)



$\frac{1}{4}$ x $5\frac{1}{2}$ x 12" Poplar

Bill of Materials

Part	Finished Size			Mati.	Qty.
	T	W	L		
A* walls	$\frac{5}{8}$ "	$4\frac{1}{4}$ "	$8\frac{15}{16}$ "	EP	6
B base	$\frac{3}{4}$ "	$9\frac{1}{4}$ "	$10\frac{5}{8}$ "	P	1
C walk	$\frac{1}{4}$ "	4"	$5\frac{5}{8}$ "	P	1
D roof	$\frac{3}{4}$ "	$3\frac{1}{4}$ "	$3\frac{1}{4}$ "	P	1
E roof cap	$\frac{3}{4}$ "	$1\frac{1}{2}$ "	$1\frac{1}{2}$ "	P	1

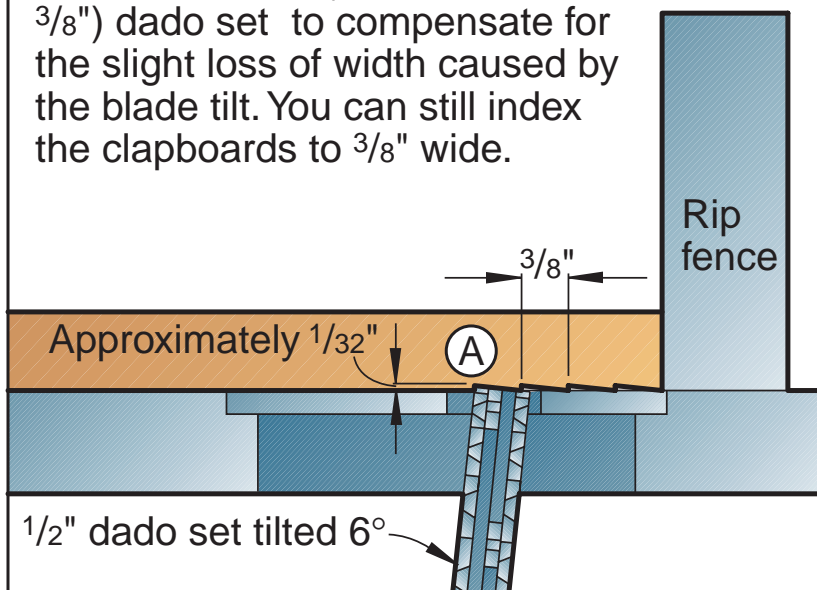
*Initially cut part oversized. Please read all instructions before cutting.

Materials Key: EP—edge-joined poplar; P—poplar.

Supplies: #8x $1\frac{1}{2}$ " flathead wood screws; Heinz baby food jar; #17x $\frac{3}{4}$ " brads; exterior latex trim paints; slowset epoxy.

CLAPBOARD CUTTING SETUP

Note: Use a $\frac{1}{2}$ " (rather than a $\frac{3}{8}$ ") dado set to compensate for the slight loss of width caused by the blade tilt. You can still index the clapboards to $\frac{3}{8}$ " wide.



Let's build the hexagonal tower first

1 To make the walls (A), first cut three pieces of $\frac{3}{4}$ "-thick stock to $3\frac{1}{2}$ x 36 ". (We selected poplar.) Plane or resaw these boards to $\frac{5}{8}$ " thick. Then, fit your tablesaw with a $\frac{1}{2}$ " dado set, and tilt it to 6° from square as shown on the Clapboard Cutting Setup drawing *below left*. (See Tip no. 1 about dado sets *below*.)

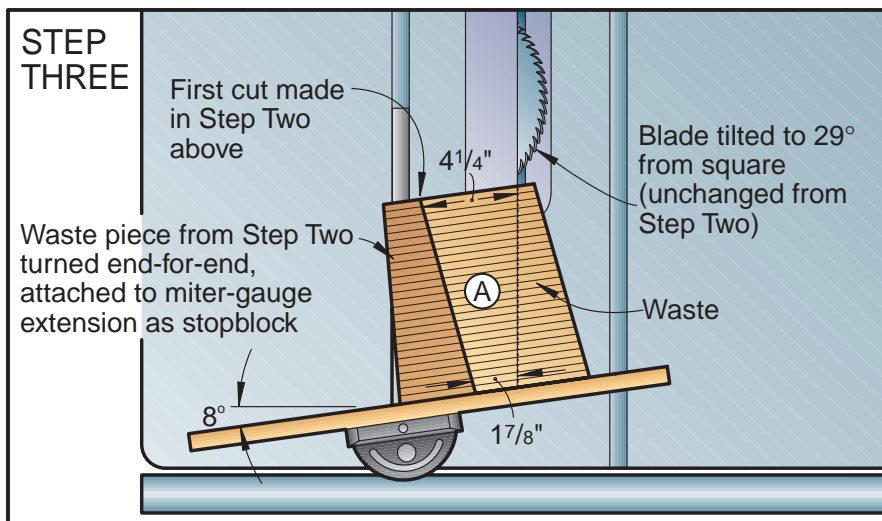
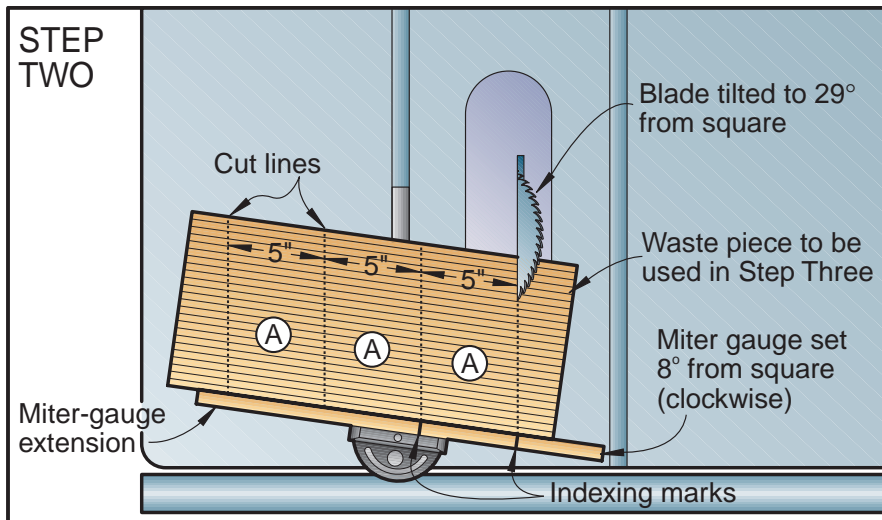
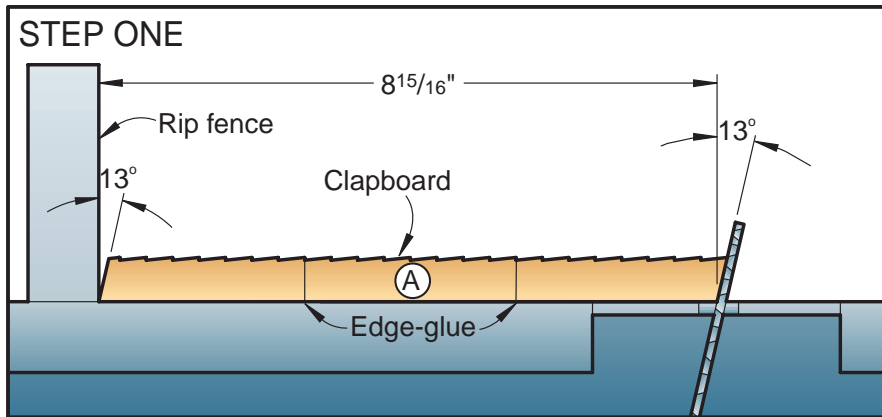
2 Make ten indexing marks $\frac{3}{8}$ " apart on your saw table, starting flush with the edge of the dado set. (*Note: If you have an accurate ruling system on your table, simply make a mark every $\frac{3}{8}$ " along the rule with a washable marker.*) Attach an auxiliary wooden fence to your rip fence, and align the edge with the first indexing mark. Now, cut the first clapboard lengthwise in all three boards. Move the fence back to the second reference mark, and again cut all three boards. Repeat this procedure until you've machined the entire surface of each board.

3 Rip the edges of each board so that it contains eight complete clapboards. Then, edge-glue and clamp the three boards. Wipe away any glue squeeze-out on the clapboard surface, and allow the glue to dry.

4 Bevel-rip both edges of this edge-glued stock at 13° from square to a finished width of $8\frac{15}{16}$ ". (See Step One

TIP no. 1 – To minimize scoring on the clapboard, we recommend using a sharp, high-quality, carbide-tipped dado set. As an alternative, you can also rout the clapboard using a trim router (with adjustable-tilt base) and mortising bit.

THREE-STEP WALL PREPARATION DRAWING



TIP no. 2 – Choose an entry-hole diameter and location that suit the species of bird(s) you hope to attract. For example, bluebirds prefer a 1½" hole 6" up from the floor. Tree swallows like the same diameter if it's located about half that distance from the floor. For most species of wrens, bore a 1" hole between 1" and 6" from the floor.

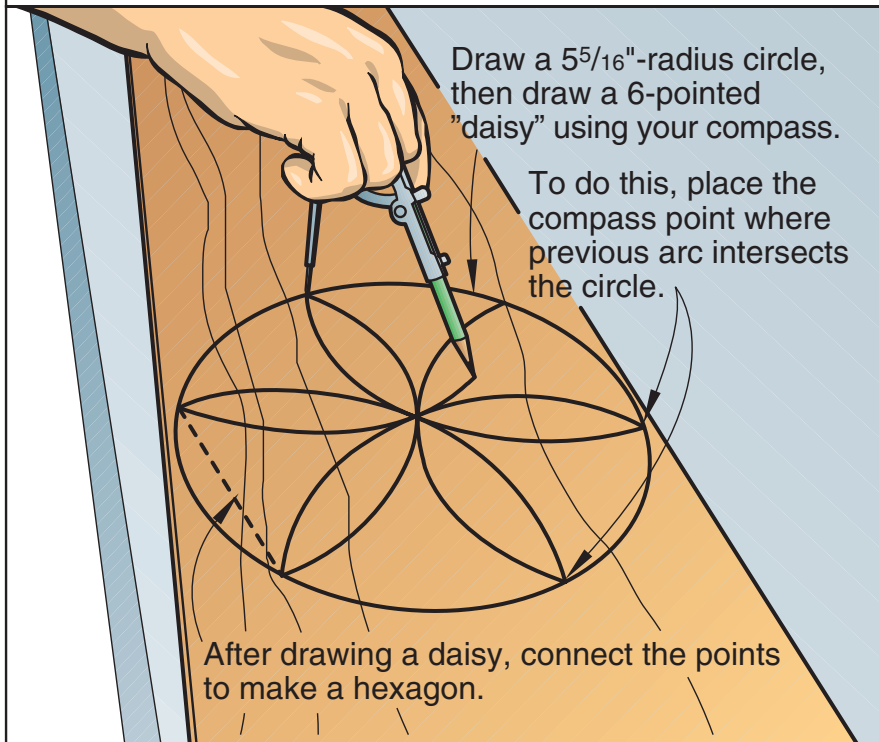
of the Three-Step Wall Preparation drawing at left.) To do this, bevel-rip the first edge with the clapboard facedown, then flip the stock over to bevel the other edge. (*Note: Make sure you orient your stock as shown in Step One so the clapboard overlap will run in the right direction with respect to the beveled edges. This should leave you with a partial clapboard at one edge. Designate this the top edge before you miter-cut the walls.*) Now, reset the blade to perpendicular, and crosscut your 36"-long piece of stock into two equal lengths.

5 To compound-miter the right-hand side of the six walls, first set your miter gauge at 8° from square (in a clockwise direction), and attach an extension to it. (See Step Two of the Three-Step Wall Preparation drawing.) Tilt your blade to 29° from square, and double-check this angle with a gauge. Next, lay out three 5"-wide wall blanks on each piece of clapboard stock, leaving a small waste section at the lead end. Miter-cut this waste section as shown in the drawing, and save it to use in Step Three. Now, cut the six wall blanks. (We drew indexing marks on our miter-gauge extension and realigned them with the layout lines on the stock as we cut each successive wall blank.)

6 Miter-cut the left-hand side of the walls to finished shape. To do this, reset your miter gauge to 8° from square in a counterclockwise direction. (See Step Three of the drawing.) Remove the extension from your miter gauge, and attach the waste piece you saved in the previous step as a stopblock. (We used two #8×1½" flathead wood screws.) Next, reposition the extension to cut the blanks to 4¼" wide at the bottom edge, and reattach it to the miter gauge. Turn each blank end-for-end, and hold it snug against the stopblock and extension. Now, without changing your setup, cut each wall to shape.

7 Bore an entry hole in one of your six walls. To do this, lay out a centerpoint on the clapboard surface, and use a multi-spur or Forstner bit in your drill press. (*Note: Select a hole diameter and location according to the bird species you want to attract. See Tip no. 2 at left.*)

DRAWING A "DAISY" TO LAY OUT THE BASE



8 Dry-assemble the six walls to check for fit, then epoxy and clamp. (We used slow-set epoxy and clamped the assembly with heavy rubber bands. Before clamping, we aligned the bottom edges of the walls, then sanded the top edges smooth after assembly.) Next, nail the walls using #17× $\frac{3}{4}$ " brads. (We drilled $\frac{1}{16}$ " pilot holes first to avoid splitting the stock.) Now, set the nails, and fill the holes.

Next, machine the base, walk, and roof

1 Lay out and cut the hexagonal base (B) to shape. To do this, first draw a $5\frac{5}{16}$ "-radius circle on $\frac{3}{4}$ "-thick stock using your compass. Then, draw a six-pointed "daisy" with your compass as shown *above*. Connect the six points with straight lines to complete the layout, and then bandsaw the hexagon to shape, keeping your blade outside the line. Now, sand to the line. (We used our stationary disc sander.)

2 Fit your table-mounted router with a $\frac{3}{8}$ " beading bit. (See the Router Setup detail that accompanies the Exploded View drawing on *next page*.) Rout the edge of the base on all six sides, then sand the base smooth.

3 On a $5\frac{1}{2}$ ×12" piece of $\frac{1}{4}$ "-thick

stock, lay out the hexagonal walk (C) using the same procedure you used to lay out the base, but start with a $2\frac{5}{16}$ "-radius circle. (You can plane or resaw $\frac{3}{4}$ "-thick stock.) Before you cut the walk to shape, bore a 2"-diameter hole through the stock for the glass to sit in, using the same centerpoint you used for the hexagonal layout. (We used an inverted Heinz baby food jar, which fits nicely into a hole this size. We used a multi-spur bit to bore the hole.) Now, bandsaw the walk to shape, keeping your blade outside the line. Sand to the line, then sand the walk smooth.

4 Lay out the roof (D) in the center of a 5×12" piece of $\frac{3}{4}$ "-thick stock as dimensioned in the Bill of Materials. Then, move your tablesaw rip fence to the side of the blade opposite its direction of tilt. Tilt the blade to 45° from square, and bevel-rip both edges of your roof to width. Now, using your miter gauge and extension, bevel-cut both ends of the roof to size.

5 Bandsaw a $1\frac{1}{2}$ " square of $\frac{3}{4}$ "-thick stock for the roof cap (E). Sand the roof and cap smooth. Next, epoxy and clamp the cap to the top center of the roof. Remove any squeeze-out, and allow the epoxy to cure.

6 Next, bore a centered recess for the glass in the bottom face of the roof. To do this, lay a handscrew clamp flat on your drill-press table, and use it to clamp the roof cap. (Our Heinz baby food jar has a $2\frac{5}{16}$ " outside diameter. We set our wing-type circle cutter at a radius of $1\frac{5}{32}$ " and cut a $\frac{1}{2}$ "-deep circle. We then bored out the core of the circle using a 2" multi-spur bit.)

You're nearly ready for tenants

1 Sand the top and bottom edges of your assembled tower flush. Then, sand the entry hole if necessary. Next, center and clamp the base to the tower bottom. Invert this assembly, then drill and countersink two shank holes in the base where shown and dimensioned on the Exploded View drawing. Now, drill pilot holes in the tower bottom through the shank holes, and then unclamp.

2 Center the walk on top of the tower, then epoxy and clamp it in place. Wipe away any squeeze-out, and allow the epoxy to cure.

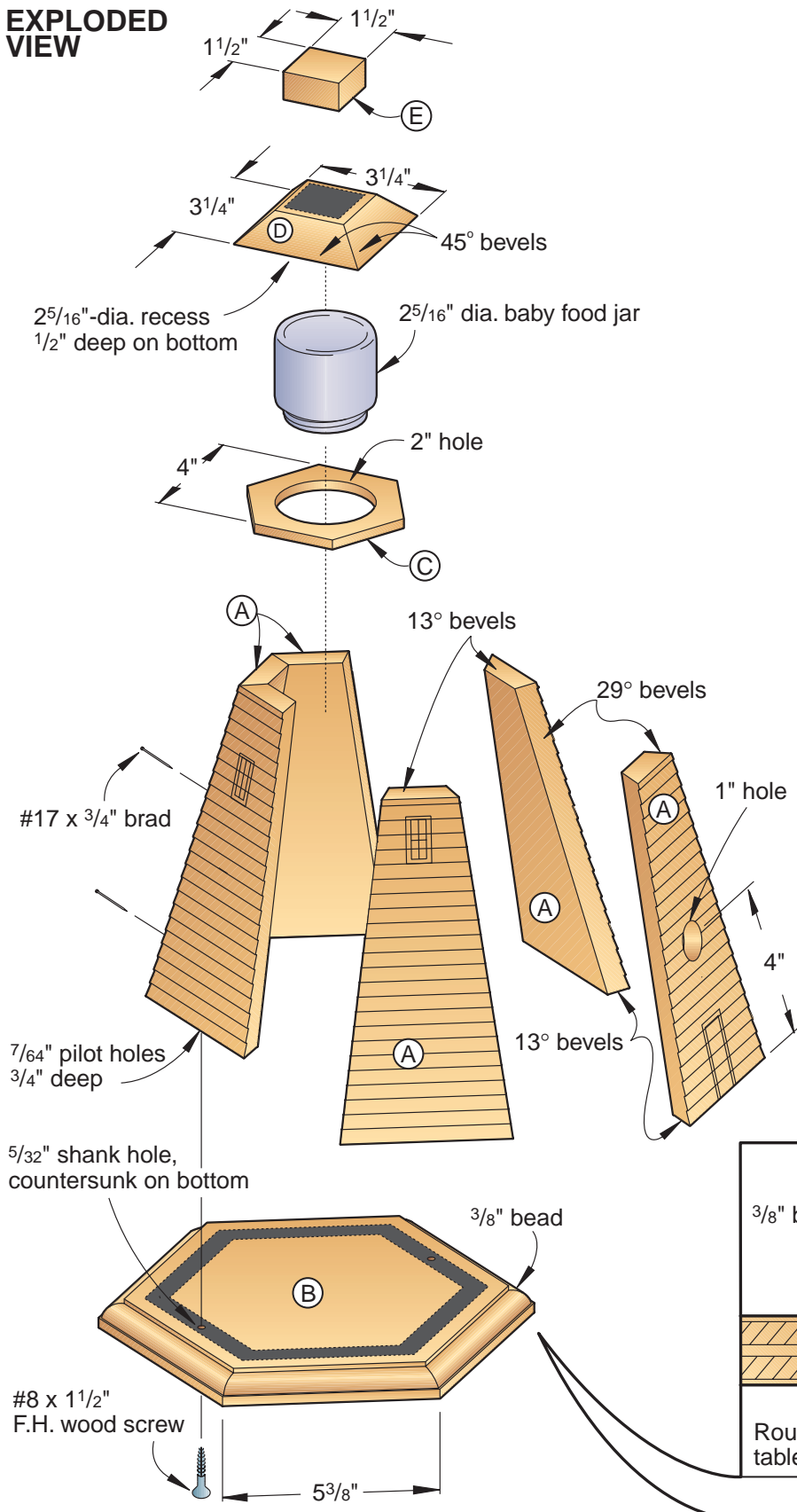
3 At this point, paint the various parts according to your tastes. (We applied a latex primer, then used exterior latex trim paints—olive green for the base, barn red for the roof and door, black for the walk and windows, gray for the window and door trim, and white for the tower. We painted the tower first, then laid out and painted the windows and door after the white paint had dried. See Tip no. 3 on *next page* about laying out the door and windows.) Do not paint the interior of your birdhouse.

4 After the paints have dried, epoxy and gently clamp the glass into the walk, then epoxy and clamp the roof to the glass. (We applied epoxy around the inside edge of the walk hole, then inserted the threaded mouth of the jar. Next, we dabbed epoxy sparingly in the bottom of the roof recess before clamping on the roof.)

5 When the epoxy has cured, attach the base to the tower using two #8× $1\frac{1}{2}$ " flathead wood screws. Now, mount your house in a location suitable for the species you wish to attract. (See Tip no. 4 on *next page*.) ♣

Produced by Marlen Kemmet
 Illustrations: Roxanne LeMoine, Carson Ode
 Graphic Design: Jodi Downing
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EXPLODED VIEW



TIP no. 3 – We made our door 1 3/16 x 1 7/8" (five clapboards high, (and our windows 5/8 x 1 1/8" (three clapboards high)). We laid out the door on the entry-hole wall and laid out the windows in spiral fashion around the tower, starting on the wall to the right of the door. We located the five windows on the eighth, eleventh, fourteenth, seventeenth, and twentieth clapboard up from the base.

TIP no. 4 – Birds also differ in their preferences as to nesting elevation. Bluebirds tend to nest at between 5 and 10 feet above the ground. Tree swallows prefer a higher nest (10-15 feet). Wrens usually nest 6 to 10 feet above ground level.

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