

Beads of Courage Box



Woodworkers of Southeast Texas

Presentation by:

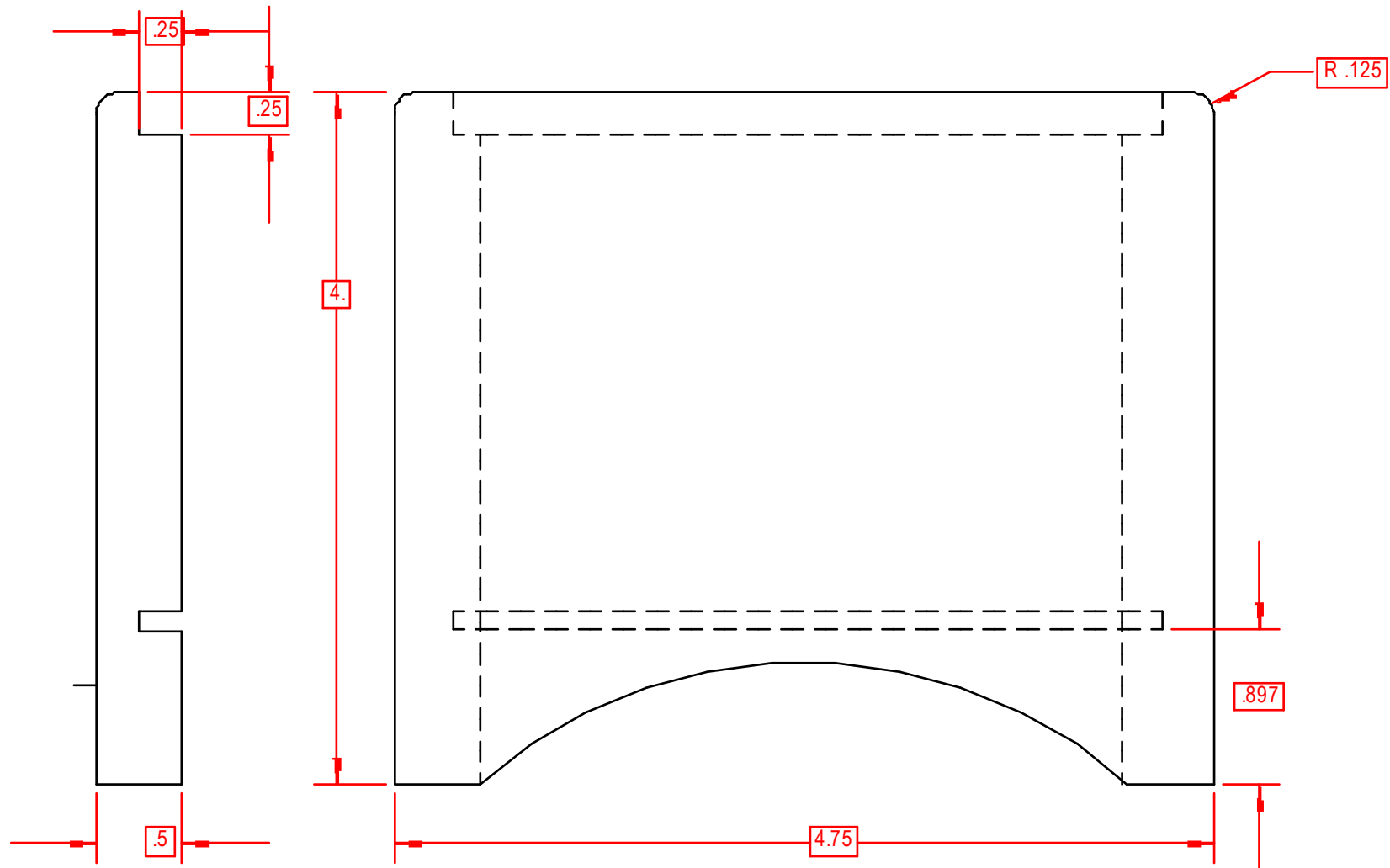
Richard Hicks

August 27, 2012

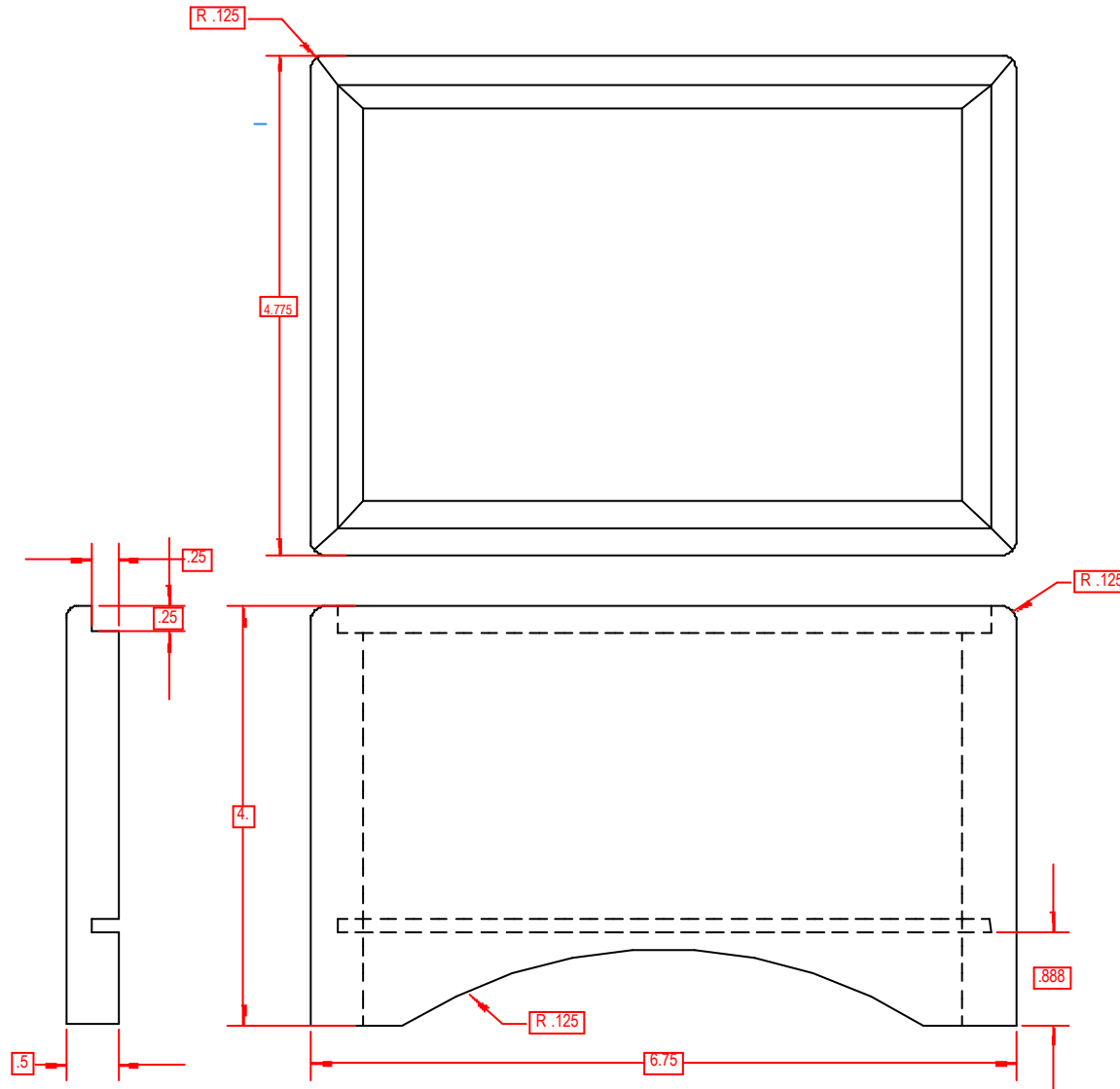
Information and Details

- Original box design by club member Ralph 'Red' Dressel.
- User suggested size is about 5" x 5" x 4" (external).
- Cardboard over wrap box is 5" wide x 7" long x 5" deep (inside).
 - Part# S-4344 from Uline Corp in Dallas, TX.
 - Cost ~ \$.50 each including shipping (Quantity 100).
- Our box dimensions are:
 - External: 4 $\frac{3}{4}$ " wide x 6 $\frac{3}{4}$ " long x 4" high.
 - Internal: 3 $\frac{3}{4}$ " wide x 5 $\frac{3}{4}$ " long x 2 $\frac{3}{4}$ " deep.
- Maximum height of knob is $\frac{3}{4}$ ".
- We've made all of our boxes using paint grade maple donated by Wes Vice Hardwoods in Nederland.
- Finish is lacquer, but other finishes are acceptable (no paint).
- Mat board liner in the bottom is a nice addition, but not required.
- Original estimate was 100 boxes per year - we've made 50 in 1 year.

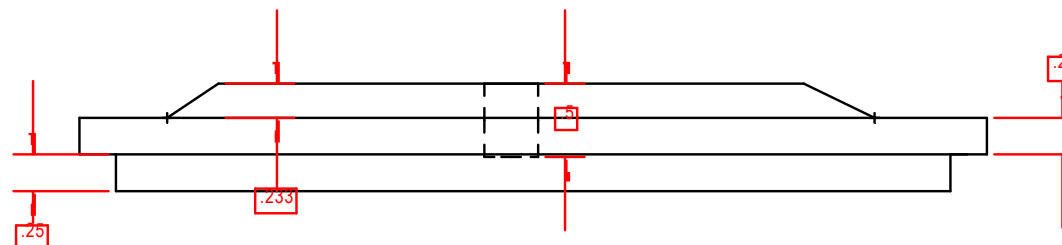
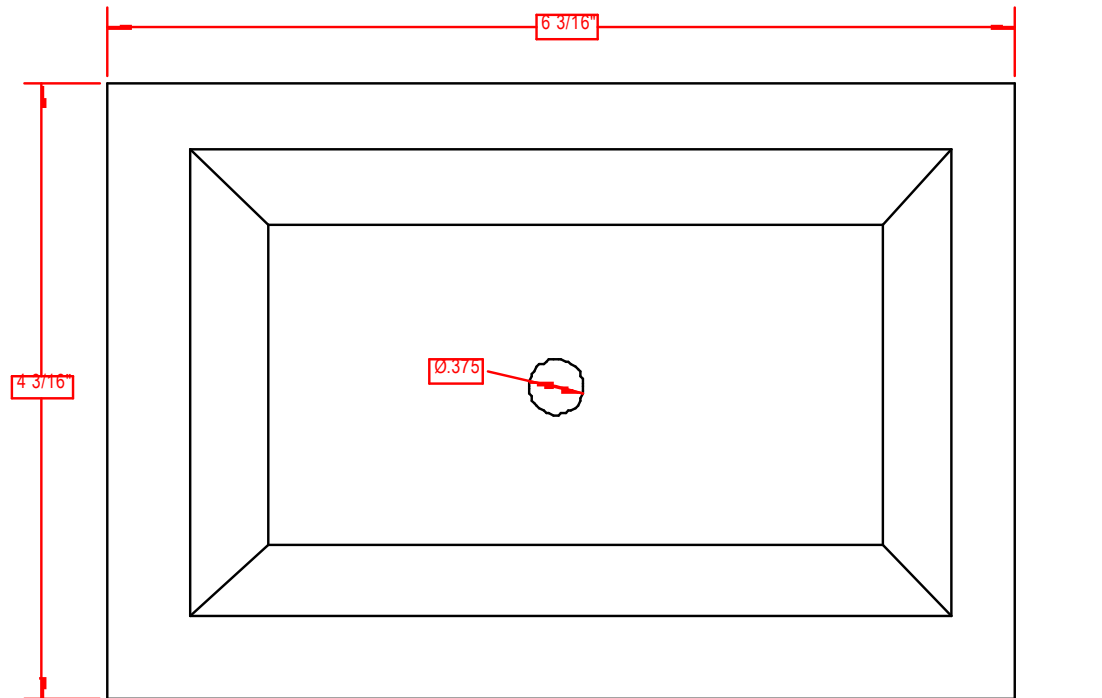
Drawing - End View



Drawing - Long View



Drawing - Top



Cut list:

- 2 pieces, 4 " wide x 6 $\frac{3}{4}$ " long x $\frac{1}{2}$ " thick (long sides).
- 2 pieces, 4" wide x 4 $\frac{3}{4}$ " long x $\frac{1}{2}$ " thick (short sides).
- 1 piece, 4 $\frac{3}{16}$ " wide x 6 $\frac{3}{16}$ " long x $\frac{3}{4}$ " thick (top).
- 1 piece, 4 $\frac{3}{16}$ " wide x 6 $\frac{3}{16}$ " long x $\frac{1}{8}$ " thick or $\frac{1}{4}$ " thick plywood (bottom).
- 1 piece, 3 $\frac{3}{4}$ " wide x 5 $\frac{3}{4}$ " long mat board (optional).
- 1 knob, with a $\frac{3}{8}$ " x $\frac{3}{8}$ " tenon and maximum $\frac{3}{4}$ " high.

Tips:

- It's much easier to machine the entire 25" long piece vs. the individual pieces.
- It's much easier to apply the finish to the inside of the box prior to assembly.
- The use of jigs will speed up the manufacturing process and insure that the parts are a consistent size and interchangeable.
- It's faster to make the boxes and tops as separate operations.
- Top and bottom size allows for $\frac{1}{32}$ " clearance all the way around.

Wood selection:

- Select the wood - For minimum waste, look for 5" to 6" wide boards.
- Look for attractive mix of heartwood/sapwood in the boards.
- 50 board feet will make about 25 boxes.

Wood preparation:

1. Surface all of the boards to $\frac{3}{4}$ " thick.
2. Each box requires:
 1. One piece 4" wide x 25" long x $\frac{1}{2}$ " (sides).
 2. One piece 4 $\frac{1}{4}$ " wide x 6 $\frac{1}{4}$ " long x $\frac{3}{4}$ " thick (top).
 3. One piece 4 $\frac{1}{4}$ " wide x 6 $\frac{1}{4}$ " long x 1/8" (or $\frac{1}{4}$ " plywood (bottom).
3. Cut boards to multiples of 25" (eg. 25", 50", 75", 100") and save the cutoffs for tops (be sure you have enough cutoffs to make the tops).
4. Surface the boards from step 3 to $\frac{1}{2}$ ".

Making the box:

- Cut the $\frac{1}{2}$ " thick boards 25" long.
- Joint one edge.
- Rip the 25" long boards to 4" wide.
- Decide which side will be the inside of the box and mark it.
- Cut a $\frac{1}{4}$ " deep dado $\frac{7}{8}$ " from one edge, on the inside surface, for the bottom panel. The dado width will depend on the thickness of the plywood bottom material ($\frac{1}{8}$ " or $\frac{1}{4}$ "). Make it a loose fit!
- Cut a $\frac{1}{4}$ " x $\frac{1}{4}$ " rabbit on the inside surface of the opposite edge for the top.
- Rout a $\frac{1}{8}$ " round-over on the outside of the top edge.
- Sand the inside surface to at least 220 grit - do not sand the outside surface.
- Apply finish to the inside surface and let it dry.
- Cut the plywood bottom panel, $4 \frac{3}{16}$ " wide x $6 \frac{3}{16}$ " long.
- Sand both sides and finish the inside surface of the bottom panel (unless you plan to use mat board liners).



Rip 4" wide - table saw



$\frac{1}{8}$ " or $\frac{1}{4}$ " dado, $\frac{1}{4}$ " deep, $\frac{7}{8}$ " from edge - table saw



$\frac{1}{4}$ " x $\frac{1}{4}$ " rabbit on top edge - jointer, router, table saw



$\frac{1}{8}$ " round-over outside of top edge - router

Finished Box Strips



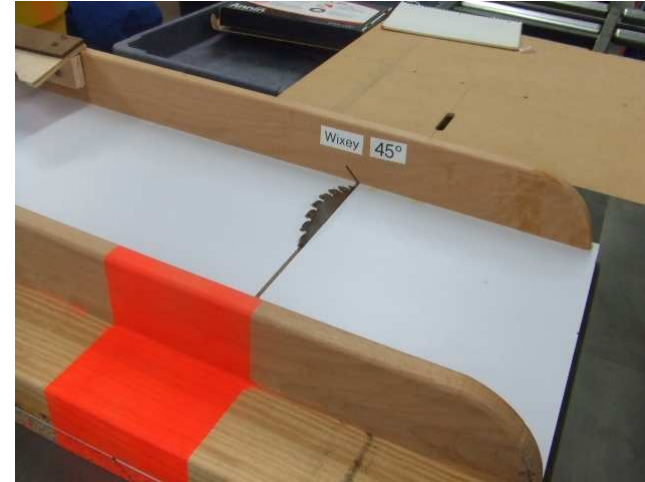
Making the box (continued):

- Cut the four sides of the box from the 25" long box strips
- Two sides are $4 \frac{3}{4}$ " long
- Two sides are $6 \frac{3}{4}$ " long
- 45 degree miters
- Use a sled or miter saw
- It's important that the miters are exactly 45 degrees

Miter Sled



Set the blade to 45 degrees



Sled is in place and ready to use



Cutting the miters



Finished cutting the pieces

Making the box (continued):

- Use the templates to mark the curves on the outside bottom of the box sides.
- Cut the curves with a band saw (or scroll saw).
- Sand the curved surfaces using a spindle sander (or drum sander).
- Glue the box pieces together and clamp. We're using packing tape as a clamp - it's cheap, fast and easy to use.
 - Use the cheap tape - it stretches and clamps better.
 - Lay the tape, sticky side up, so that it will be in the center of the box sides.
 - Lay the pieces on the tape, inside surfaces up, edge to edge (miters open) in the same order they were cut from the board.
 - Use a straight edge to align the pieces as you place them on the tape.
 - Apply a small line of woodworkers glue to each mitered edge.
 - Set the bottom panel in one of the long side pieces.
 - Fold the pieces up and stretch the tape as you complete the box - then stick the end of the tape on one of the sides.
 - Allow the glue to dry (at least 3-4 hours).

Finished Box Sides



Gluing up the box using tape as a clamp



Alternative Gluing Method

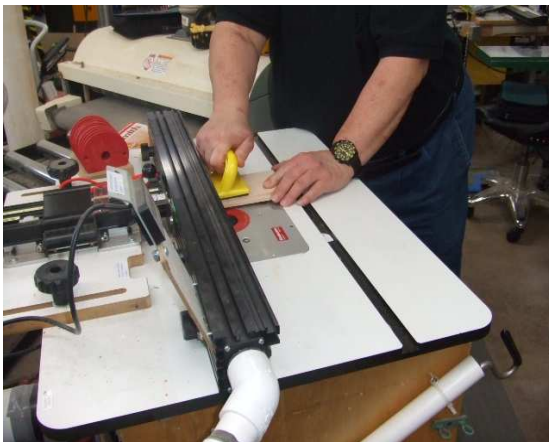


Making the box (continued):

- After the glue dries, remove the tape.
- Sand the sides to at least 180 grit.
- Rout the edges and the curves on the bottom with a 1/8" round over bit. Do not round over the edges of the feet.
- Sand the sides to at least 220 grit.
- Apply the finish and let it dry.
- Glue the mat board (optional) onto the bottom panel inside of the box.
- Apply $\frac{1}{2}$ " felt dots to the bottom of the legs.

Making the top:

- Cut the top blanks 4 3/16" wide x 6 3/16" long (allows 1/32" clearance).
- Drill a 3/8" diameter hole 1/2" deep in the center of the top.
- Machine the top using a raised panel router bit (or tilt the table saw blade and cut a bevel that leaves 1/2" of material on the edge and a flat top that's about 2" x 4").
- Cut a 1/4" x 1/4" rabbit on the inside surface of the top.
- Sand both sides to at least 220 grit.
- Apply finish to both sides of the top and let it dry.
- Turn a knob, 3/4" maximum height, with a 3/8" x 3/8" tenon.
- Glue the knob to the top after the top is finished and dry.



Machine the top



Top is ready to sand and finish

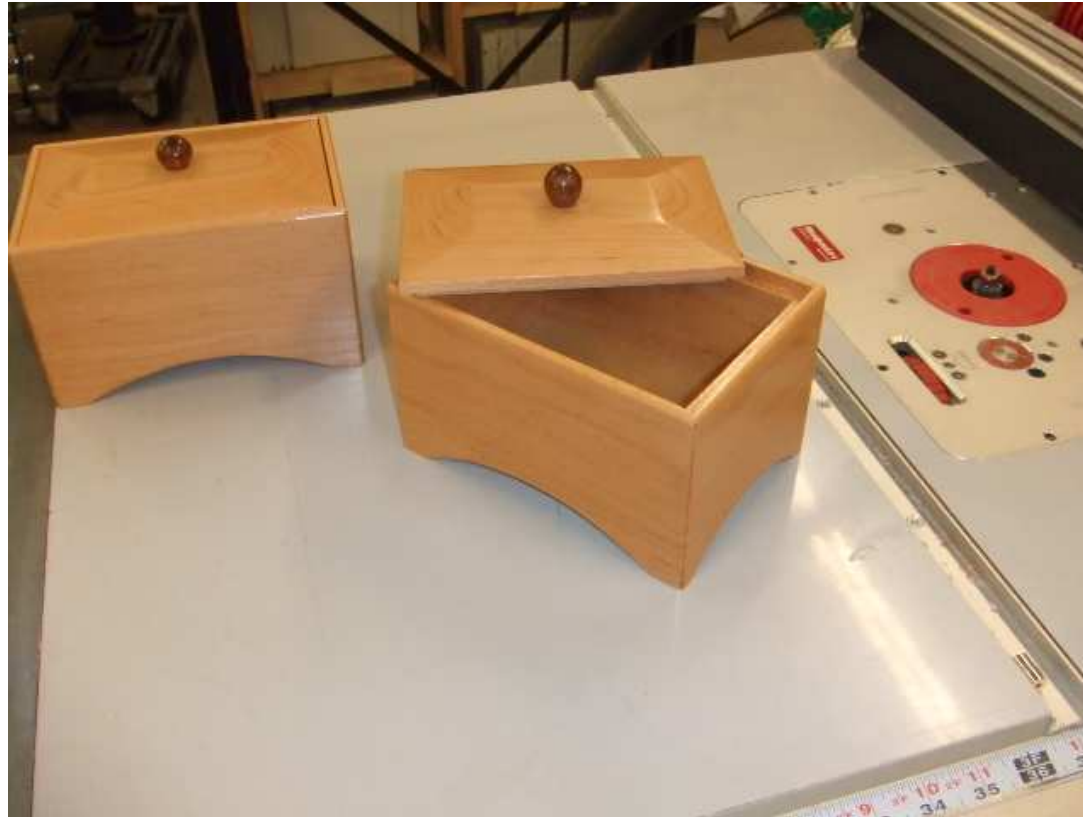
Completed Tops



Completed Knobs



Finished Boxes



These are prototype boxes made from German Beech

Finished Box



This is a finished box as delivered to Houston

Beads of Courage Boxes

Richard Hicks on August 27, 2012