



Woodsmith **PLANS**

# CURVED-LID TREASURE BOX



# CURVED-LID TREASURE BOX

*The curved lid and ebonized sides of this attractive box show off the highly figured wood and your woodworking skills.*



▲ *With its felt-lined compartment and sleek design, this treasure box will be at home in just about any setting.*

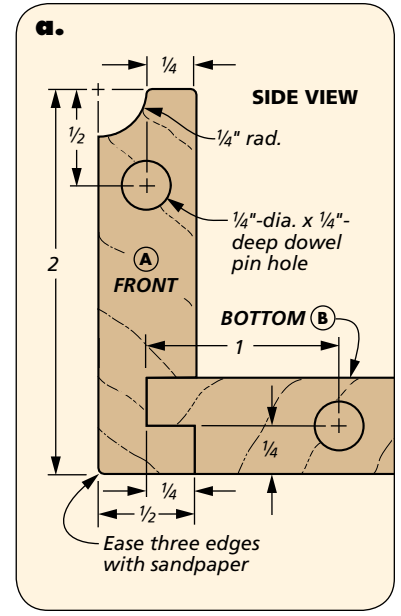
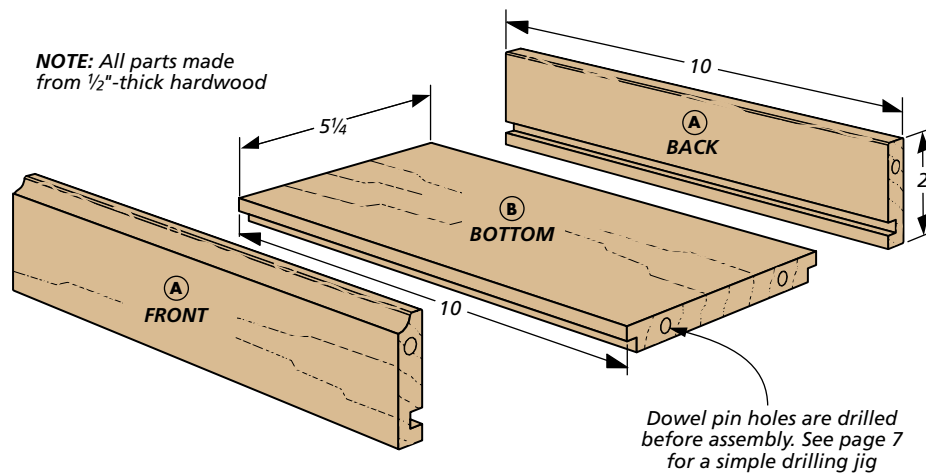
**I**t's tough to point out the best thing about this treasure box. For starters, it has a broad contoured lid and matching front and back panels, which show off the beauty of the wood. Since the project is so small, splurging for highly figured, expensive wood really won't end up costing much. The bold ebonized sides add an interesting design element, too. And for practicality, the lid is attached with

a couple of hinges and the inside compartment is lined with felt.

In addition to adding up to a beautiful box, you'll find that these features present some woodworking challenges, as well.

For the joinery, I kept things simple — dowel joints for the sides and tongue and groove for the bottom. And I'll show you a sure-fire way to line up the holes for the dowels using a shop-made jig.

**NOTE:** All parts made from 1/2"-thick hardwood



## Assembling the Front, Back & Bottom

At the heart of the treasure box is the basic case, formed by the front, back, and bottom. Later, you'll attach the sides with dowel joints and finally, the hinged lid. But these curved pieces rely on having a square case. So, you can begin by cutting the front, back, and side pieces to size from 1/2"-thick stock.

**FRONT & BACK.** The drawings below give you an overview of the steps for shaping the front and back. Both pieces have a groove on the inside face that will hold the bottom. I started by cutting this groove at the table saw using a dado blade.

Then, once you've cut the groove, you can set the back aside.

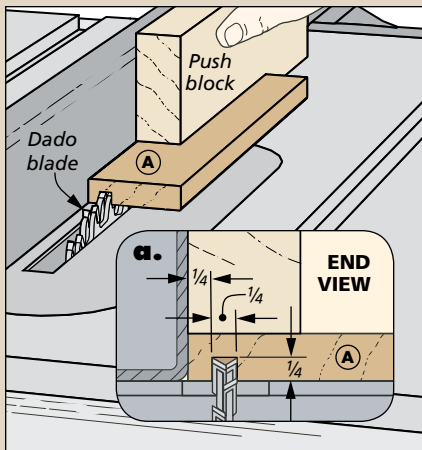
Next, you'll rout a cove along the top edge of the front. This cove (and another you'll make later on the front of the lid) will form the recess to open the lid.

**BOTTOM.** After you've completed the front and back, the next thing to do is make the bottom. There's not much to do here. Rabbits on the front and back edges create tongues that fit into the grooves in the front and back pieces. Once again, I turned to the table saw and a dado blade to make these cuts.

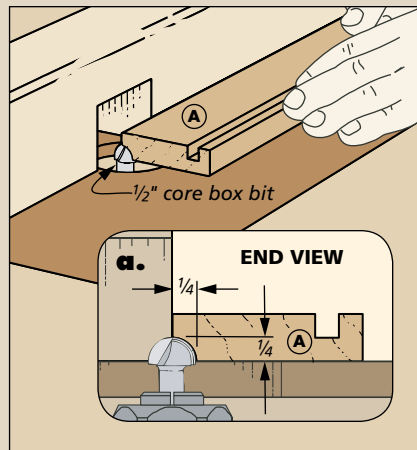
**DOWEL JOINTS.** Now you're ready to drill a few holes for the dowel joints. To keep the holes properly positioned, I used a simple, shop-made jig. You can find out how to make the jig yourself by turning to page 7. When using the jig, I put a piece of tape on the drill bit to mark the depth of the hole, as you see in the right illustration below.

**ASSEMBLY.** The assembly is pretty straightforward, just apply a little glue on the edges of the bottom and in the groove on the front and back. Then, use a couple of clamps to hold everything together.

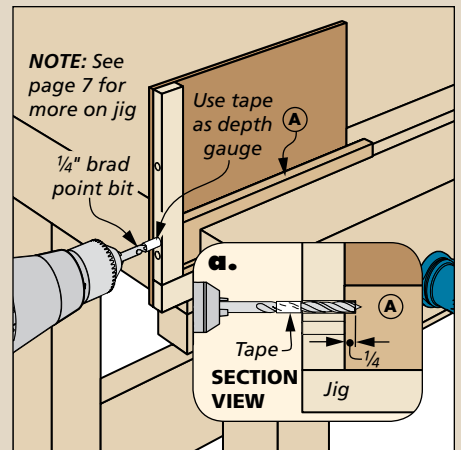
## HOW-TO: MAKE THE FRONT & BACK



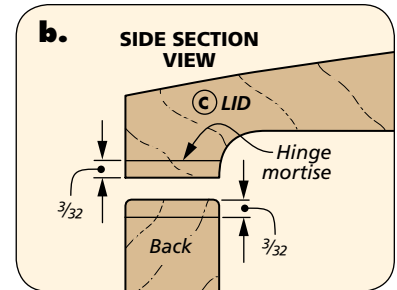
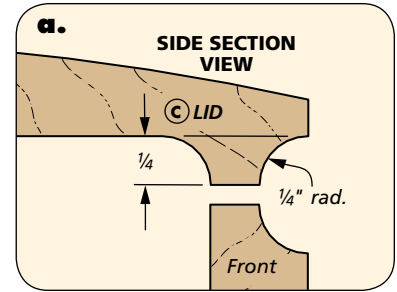
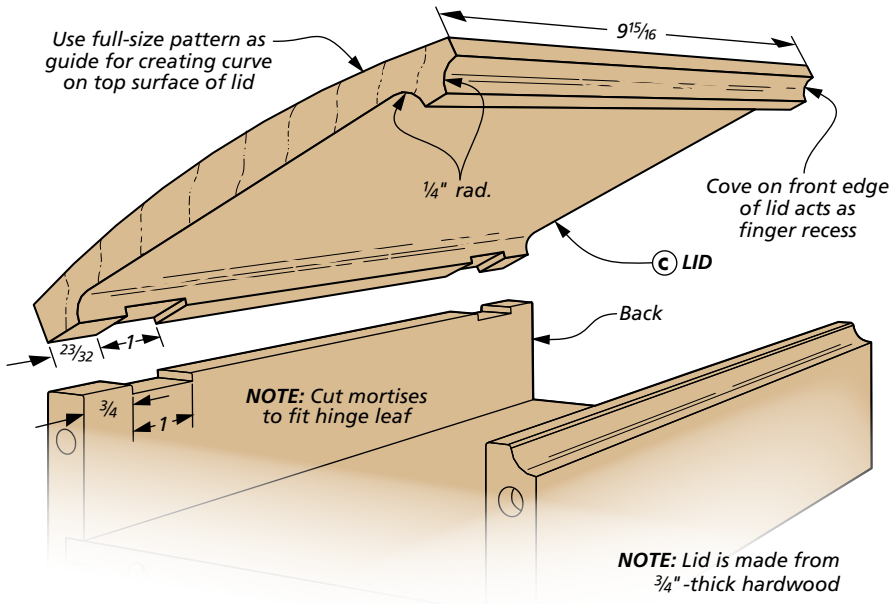
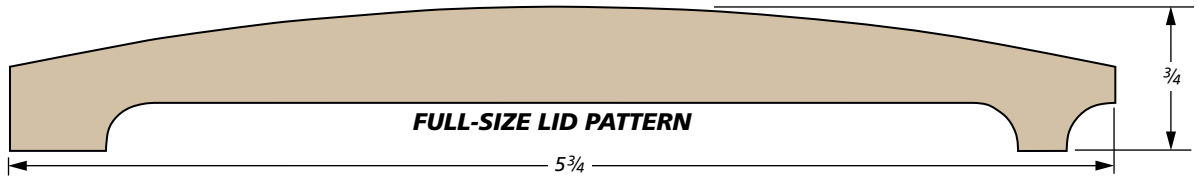
**Create the Groove.** Using a dado blade on the table saw and a push block, cut the groove that will hold the bottom.



**Rout the Cove.** At the router table, use a core box bit to rout the cove profile on the top edge of the front.



**Drill for Dowels.** A simple, shop-made drilling jig makes it easy to line up the holes for the dowel joints.



## Shaping the Lid

After completing the front, back, and bottom assembly, it's time to move on to the lid. (You may be tempted to start on the sides, but the assembly goes much smoother if you add them last.) Though shaping the lid looks complicated, it's not too tough to do if you break it down into a few simple steps.

**SHAPING THE LID.** After cutting a blank for the lid and planing it square and flat, I started working on shaping it at the table saw. The box below shows you the basic process.

As you can see, I copied the full-size pattern (above) and glued it on both edges of the blank with some spray adhesive. This gave me a

visual reference and made shaping the piece much easier.

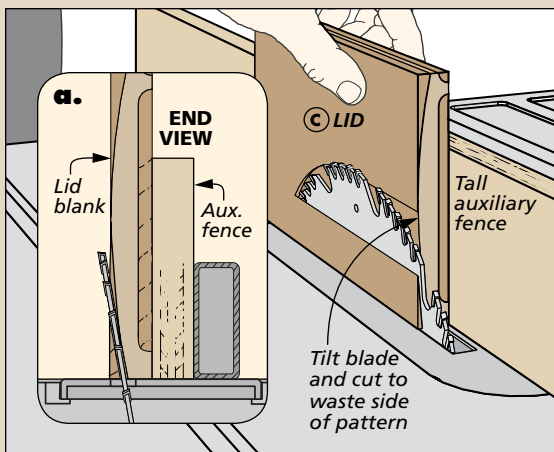
Using the pattern as a guide, raise the table saw blade, and tilt it to match the lower part of the curved layout line. Make a cut on both edges to remove the waste.

Now take another look at the pattern, and reset the fence and the angle of the blade to make a second cut. This time, remove the waste a little higher up on the blank. Note: Be sure to use a tall auxiliary fence to make these cuts safely.

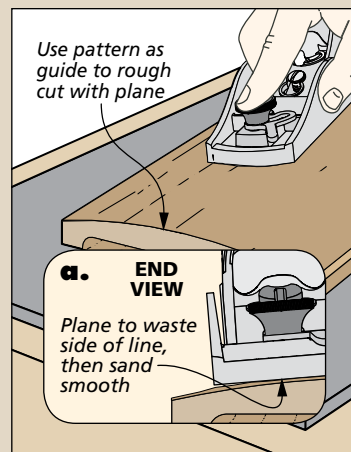
**A LITTLE HAND WORK.** Now it's time to reach for your block plane and refine the shape. Set the blade to take very thin shavings. Then you can knock down the high spots by taking long strokes from end to end. Skewing the blade helps you get smoother cuts. Check your progress often by comparing the layout lines on the pattern to the workpiece.

**SAND TO FINAL SHAPE.** I finished up by hand sanding the lid. I started with 100-grit paper and quickly moved through the grits to 220. Once you're happy with the curve of the top of the lid, you can move on to shaping the underside.

## HOW-TO: MAKE THE CURVED LID



**Angle Cut.** With the pattern attached for reference, tilt the saw blade to stay just outside the line. Once it's lined up, nibble off the corners from both edges.



**Planing a Curve.** Using a block plane, take even strokes from end to end and remove high spots.

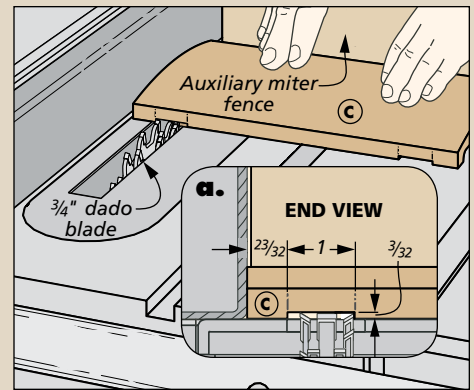
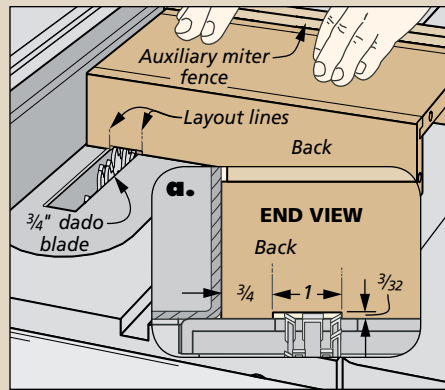
## SHOP TIP

**ADD THE COVES.** To shape the underside of the lid, you'll need to head back to the router table. With the same core box bit setup you used earlier to shape the front, you can cut the matching cove on the front edge of the lid. The illustrations below also show how to reset the fence to cut two grooves to form the curved shape inside the lid.

Finally, with a dado blade set to match the depth of the grooves, you can remove the rest of the waste between the two routed grooves. I used the miter gauge with an auxiliary fence to guide these cuts. It's also a good idea to set the rip fence to limit the outside edge of the cut and prevent cutting into the cove profile (right drawing below).

**PLANE & SCRAPE.** To clean up the saw marks left by the dado blade, use a block plane and card scraper. This combination makes short work of removing the saw marks on the flat part of the bottom. Then, finish up by doing a little hand sanding.

**HINGE MORTISES.** With the lid shaped and sanded smooth, it's time to add the hinge mortises. You'll want to have your hinges on hand before you do this. Then you can make sure the mortises you cut match the leaf both in width and depth.



**Hinge Mortises.** First, you'll want to set the height of the dado blade to match the thickness of the hinge leaf. Make the first cut on the layout line. Then, slide the box over to the other layout mark to complete the cut. Use the rip fence as a stop for the second cut.

There are a variety of different techniques for cutting hinge mortises, but the easiest way in this case is at the table saw. Using the dado blade, you can quickly cut perfect mortises in both the case and the lid. The illustrations in the box above show the details.

The most important thing to keep in mind when using this method is to make sure the blade is set to the correct height. You may want to make a few test cuts to sneak up on the fit. And you'll need to shift the table saw fence over  $\frac{1}{32}$ " when cutting the lid mortises.

## MATERIALS, SUPPLIES & CUTTING DIAGRAM

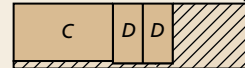
A	Front/Back (2)	$\frac{1}{2}$ x 2 - 10
B	Bottom (1)	$\frac{1}{2}$ x 5 $\frac{1}{4}$ - 10
C	Lid (1)	$\frac{3}{4}$ x 5 $\frac{3}{4}$ - 9 $\frac{15}{16}$
D	Sides (2)	$\frac{3}{4}$ x 3 - 6

- (1 pr.) 1 $\frac{1}{4}$ " x 1" x  $\frac{3}{32}$ " Hinges w/Screws
- (1)  $\frac{1}{4}$ " - dia. Hardwood Dowel

$\frac{1}{2}$ " x 5 $\frac{1}{2}$ " - 36" Hard Maple (1.4 Bd. Ft.)

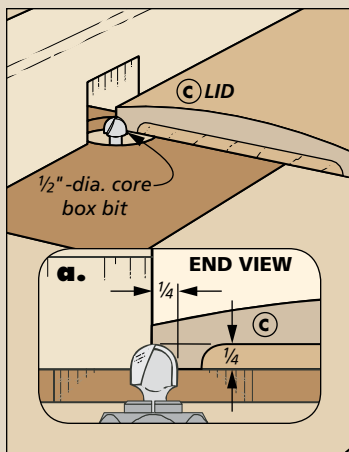


$\frac{3}{4}$ " x 6 $\frac{1}{2}$ " - 24" Hard Maple (1.1 Bd. Ft.)

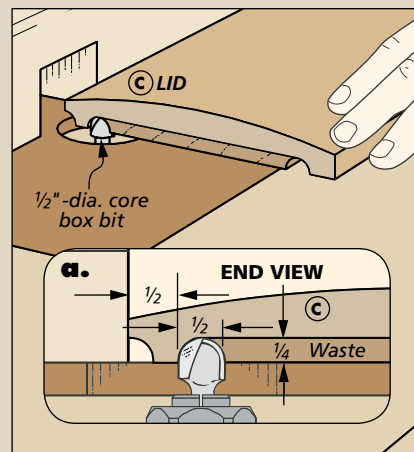


**ALSO NEEDED:**  
Posterboard, Felt

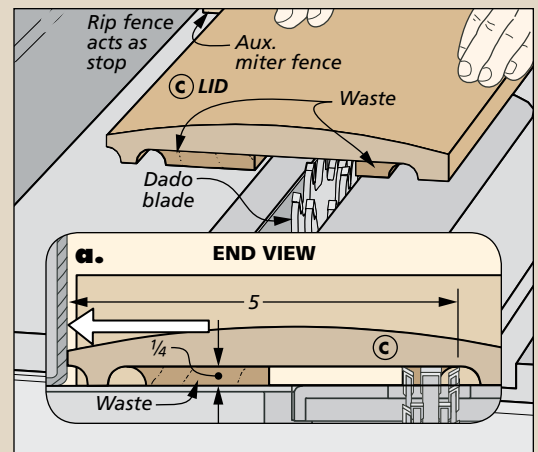
## HOW-TO: COMPLETE THE LID



**Outside Cove.** With only half of the bit exposed, rout the cove profile on the front of the lid.

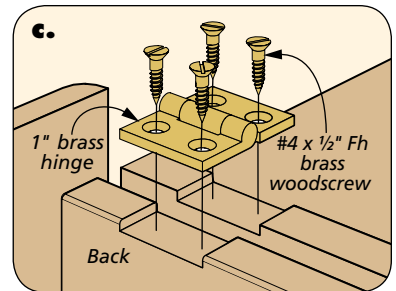
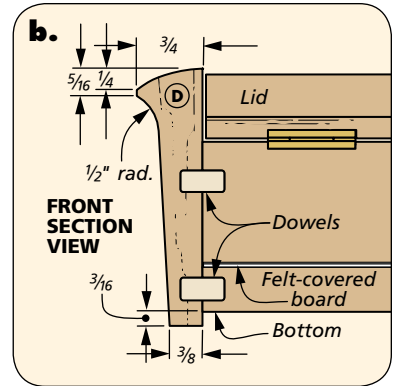
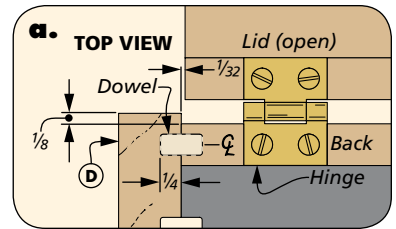
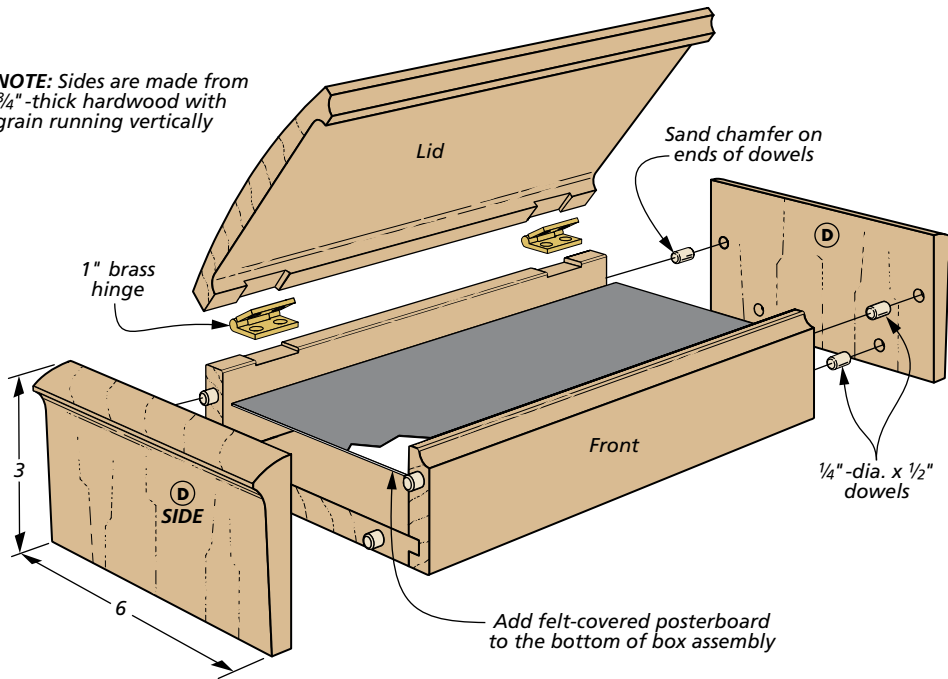


**Inside Coves.** Then, reset the fence to expose the full bit, and rout a  $\frac{1}{4}$ "-deep groove  $\frac{1}{2}$ " in from both edges.



**Remove the Waste.** At the table saw, use a dado blade to remove the waste between the grooves. The rip fence acts as a stop.

**NOTE:** Sides are made from  $\frac{3}{4}$ "-thick hardwood with grain running vertically



## Adding the Sides & Final Assembly

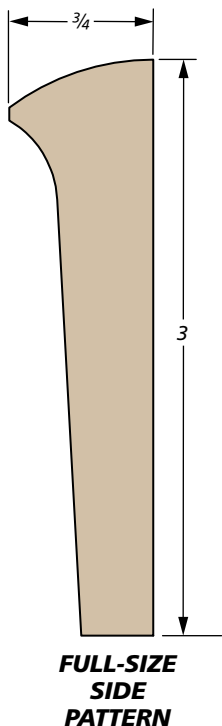
Once you've completed the lid and base, the next step is to make the sides. But before you begin, I want to point out the grain orientation. As you can see in the drawing above, you'll want to be sure the grain runs vertically. This way, not only will the sides match the bottom, but they'll expand and contract at the same rate, preventing splitting due to seasonal changes.

**START WITH FLAT STOCK.** The sides have a tapered and curved profile (pattern in left margin). But before you start to work on the shape, you'll need to mark the positions of the dowel holes using dowel centers.

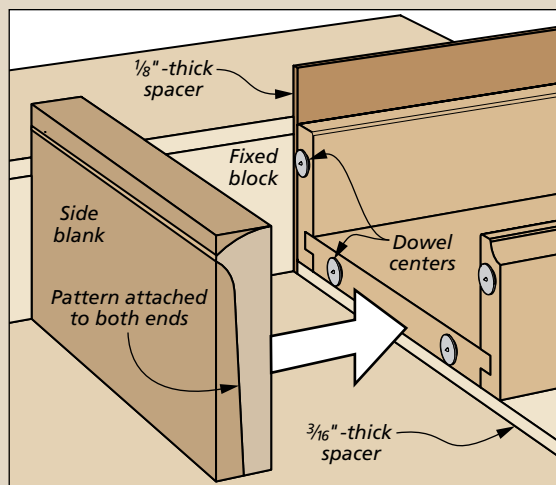
The box at the bottom of the page shows you how to do this. To help determine the reveals, I positioned spacers behind the back and below the bottom. Once all of the locations

are marked, use the drill press to drill the matching holes.

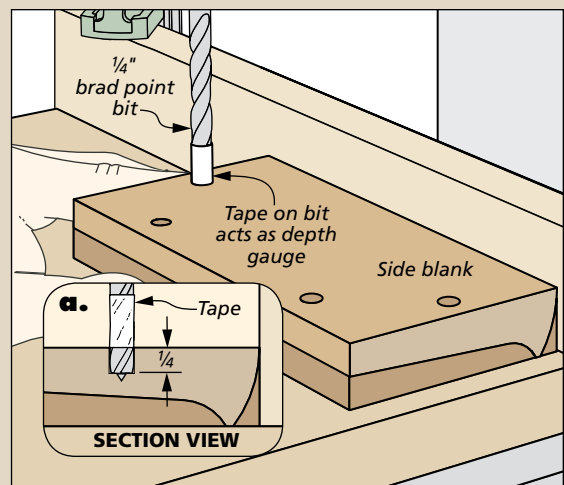
**SHAPING THE SIDES.** Now you're ready to shape the sides. Once again, the full-size pattern will be helpful.



## HOW-TO: DRILLING MATCHING DOWEL HOLES



**Marking Holes.** Using spacers to position the case, add dowel centers in the holes in the front, back, and bottom. Then, mark the hole locations on the sides.



**Drilling the Dowel Holes.** With the positions marked, use the drill press to make sure the holes are perfectly straight and will fit the case properly.

I started by clipping off the corner at the table saw, as shown in the box below. Then I moved to the router table for the next step.

Using a larger (1"-dia.) core box bit, set the fence to rout a channel to form the top curve. After that, it's back to the table saw to make a taper cut. As you can see in the right drawing in the box, I attached the piece to a taller "carrier board" for safety.

**FINAL SHAPING & SANDING.** At this point, you just need to do some sanding to smooth out the curves and the taper. And since the sides are going to be ebonized, I decided to pre-raise the grain by wiping on a little water. After a few minutes, I sanded the pieces again with 220-grit sandpaper. This way, the fibers won't swell as much when I apply the ink to ebonize the pieces.

**EBONIZING.** I used India ink (available at art supply stores) to ebonize the sides, as shown in the box above. You could use dye, but I've had better results with the colorfast ink.

Since I had to color the sides separately, I dyed the case and lid before assembly, as well. Cherry dye really brings out the figure of the curly maple. (I used *TransTint* dye from *Rockler*: 1 qt. water, 6 tsp. *Orange*, and 4 tsp. *Reddish Brown*.) Just tape

## SHOP TIP



After sanding the sides, start ebonizing by using the dropper to spread a liberal amount of ink on the surface.



Then, with a disposable foam brush, you can spread the ink across the surface and work it into the grain as much as possible.

the ends of the case to avoid getting dye on them — it could prevent the glue from bonding properly.

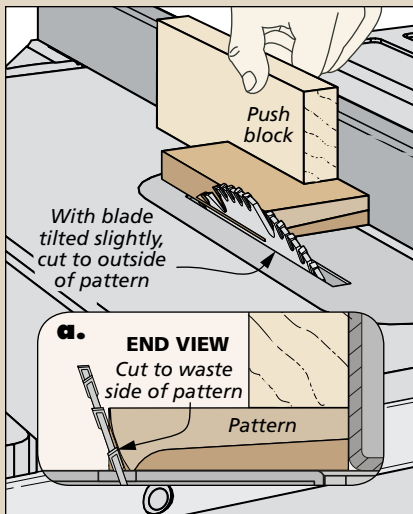
**ASSEMBLY.** The nice thing about using dowel joints is that it makes aligning the assembly a breeze. All you need to do is add a little bit of glue to the dowels and along the edge of the case, and clamp the box. I used softwood blocks on the clamps to avoid marring the ebonized sides. Apply just enough pressure to keep the sides tight to the case. When the glue dried,

I finished the box by adding a few coats of spray lacquer.

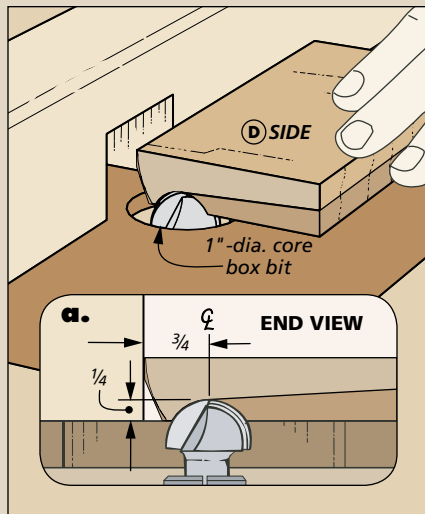
After the clear finish has cured, add the hinges and attach the lid. Since you've already cut the mortises, this step is also pretty straightforward. (I used 1¼" x 1" x 3/32" Precision Box Hinges #PB-405 from *Horton Brasses, Inc.*) I drilled pilot holes for the brass screws to make installing them easier.

**A FELT LINER.** Finally, attach felt to posterboard with spray adhesive, and cut it to fit in the bottom.

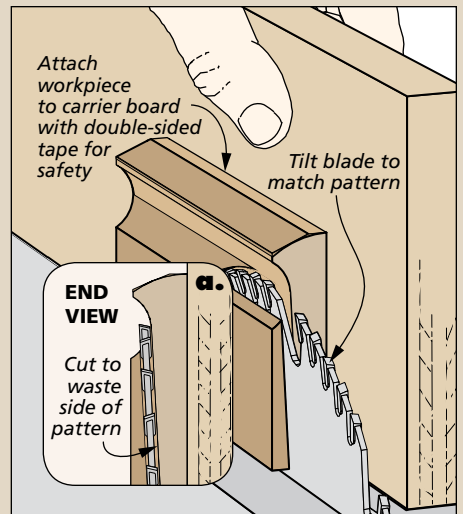
## SHAPING THE SIDES



**Top Angle.** With the pattern on the blank, tilt the blade to match the angle and cut away the corner.



**Core Box Groove.** Use the pattern to set the bit height and fence position. Then rout the groove in the blank.



**Taper Cut.** After attaching the blank to a carrier board for safety, tilt the blade to match the pattern (3°) and cut the taper.

# DOWEL JIG

Before you can assemble the curved-lid treasure box, you'll need to drill some holes for the dowel joinery. The problem is it's often difficult to drill straight holes in the end grain of a workpiece. To make this task easier, I built a drilling jig to position and drill the holes for the dowels.

As you can see in the drawing, the jig has a base made out of  $\frac{1}{4}$ " hardboard. Hardwood strips are attached to the bottom and front edges to serve as stops for the workpieces.

Before attaching the vertical stop, I drilled holes through its edge at my drill press. These holes will guide your bit for the holes in the front, back, and bottom of the box.

And when I used the jig, I wrapped the drill bit with tape, marking the depths of the holes.

