

12 SHAKER OVAL BOX



WHEN IT COMES TO WOODWORKING, few styles include so many types of objects as Shaker design. From furniture to accessories to clocks to everyday household objects, if it was made of wood the Shakers seemed to have given serious thought to how it should look. With the possible exception of the straight, simple lines of their furniture, no objects exemplify the Shaker style more than their iconic bentwood storage containers.

According to John Wilson, a Michigan woodworker and supplier who's been making Shaker boxes professionally for decades, the Shakers themselves never called them Shaker boxes, of course — that's a more recent term — but these delightful oval wooden boxes are so tied to Shaker culture that the name "Shaker box" is often applied generically to any bentwood box regardless of origin. In truth, bentwood boxes have been around for centuries in one form or another. Two main types are prominent today, with Shaker style being the most well known.

The other most commonly seen example is usually referred to as a "Colonial" box. Construction methods are the same as for Shaker boxes, wherein steamed or soaked wood bands are bent around a circular form with the box laps tacked into place. Except for slight variations in size and curve of the oval, the most notable difference is the shape and placement of the overlapping ends, called tails or simply laps.

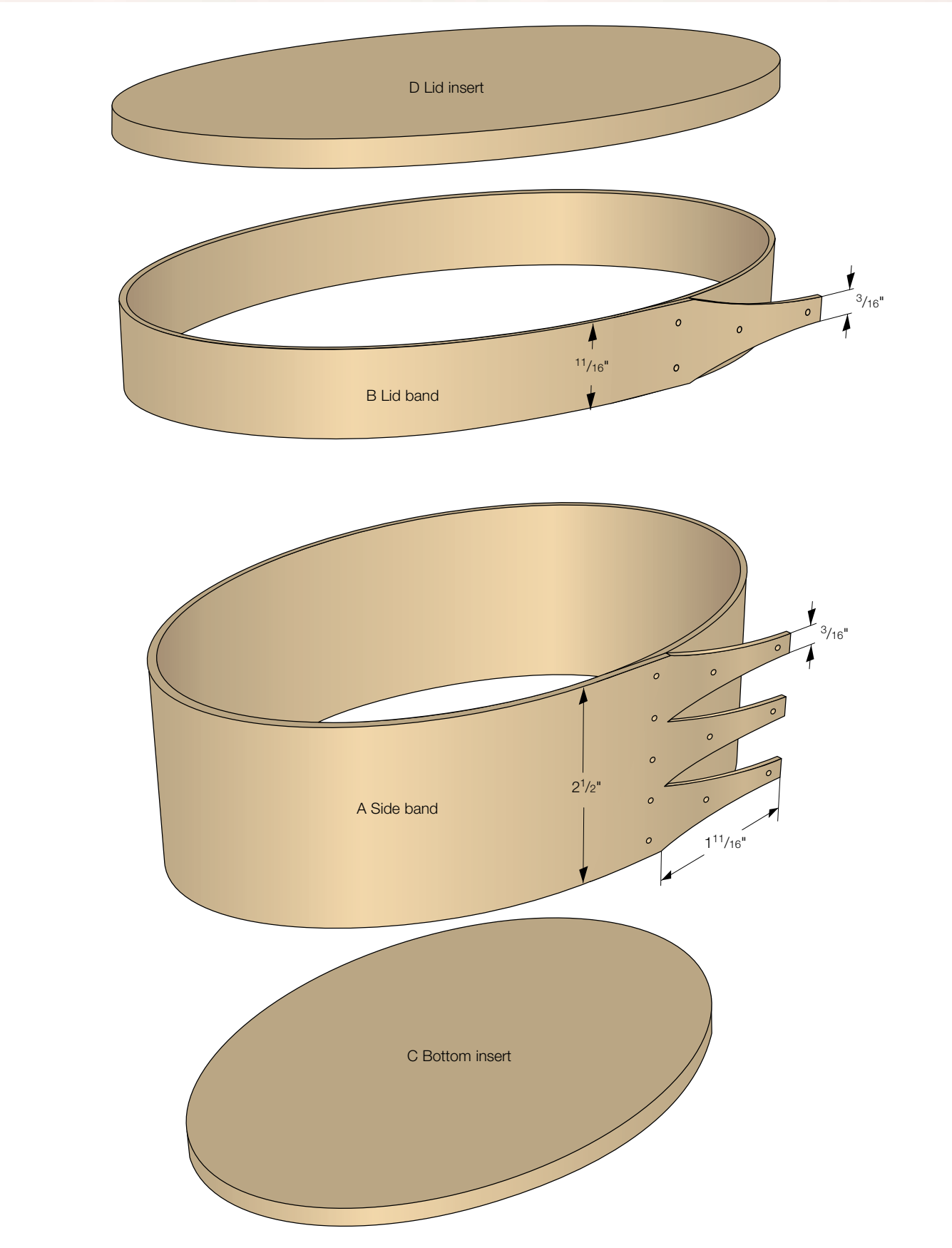
Shaker boxes feature a series of multiple curved swallowtail "fingers" of varying number and width depending on box size. Wilson notes that although these fingers usually pointed to the right, a lot of folk believe that Shaker boxes always point to the right for religious reasons — a notion reinforced by the Internet — but numerous historical samples of left-pointing Shaker boxes exist. What is true about Shaker



boxes is that the laps on both box and lid always point in the same direction.

Colonial boxes, like the one shown here overlap with a single point on the tail with straight edges. These can point either direction, but the laps on the box and the lid always point in opposite directions.

The sizing of Shaker boxes is described today by a numbering system that's fairly new — it's only been in common use for three or four decades — with larger numbers indicating larger boxes. This numbering system covers a huge range of box sizes. Wilson makes boxes from size #000 measuring a dainty 1" wide and 2" long, up to a #20 that comes in at about 26" x 38" — you could almost pack one for a week's vacation. The size of the box determines the thickness of the components. Wilson's #000 box uses bands as thin as .050" (about $\frac{3}{64}$ "), while his #20 uses bands from .135" to .160" (around $\frac{9}{64}$ " to $\frac{5}{32}$ "). The inserts in the lid and box bottom vary correspondingly.



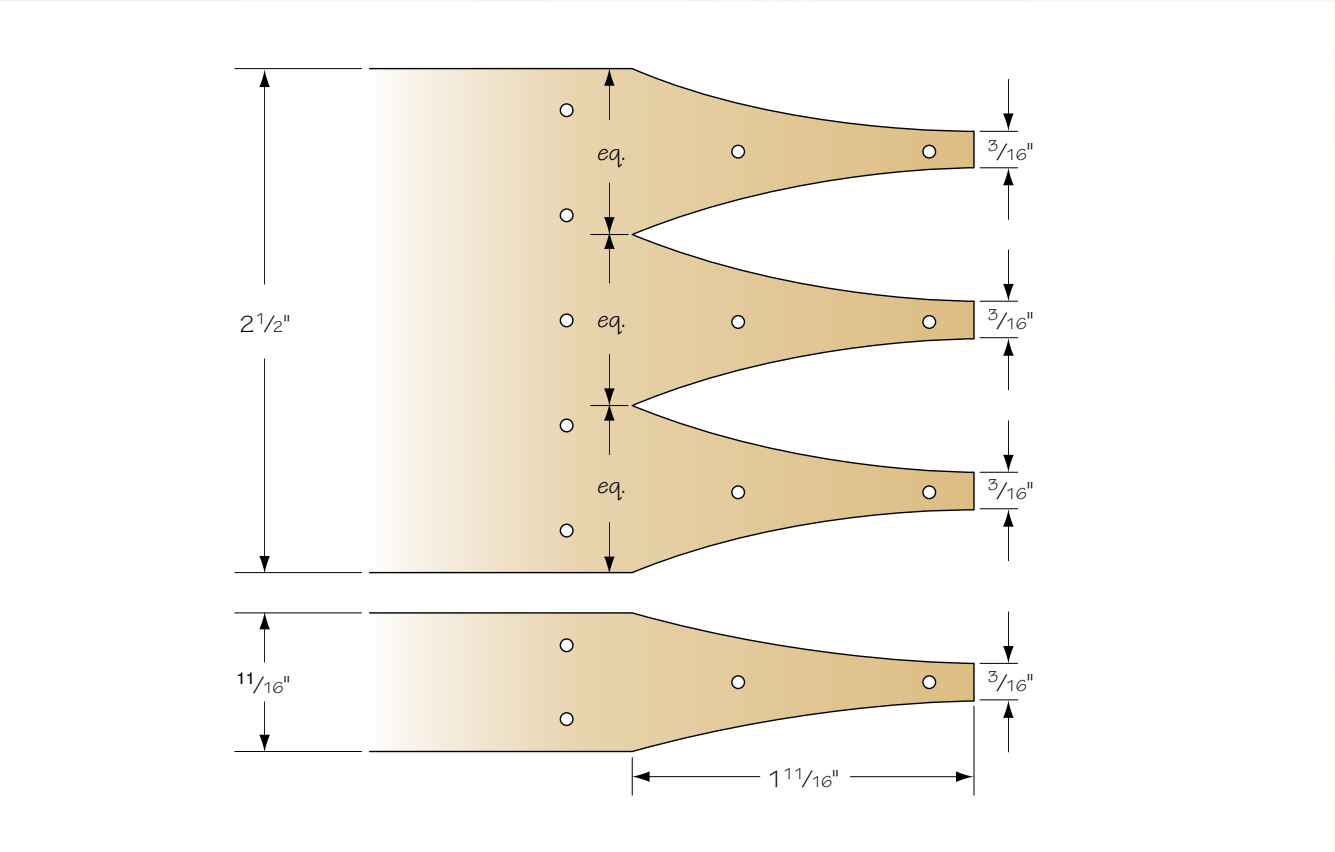
SHAKER OVAL BOX • INCHES (MILLIMETERS)

REFERENCE	QUANTITY	PART	STOCK	THICKNESS (mm)	WIDTH (mm)	LENGTH (mm)	COMMENTS
A	1	side band	cherry	1/16 (2)	2 1/2 (64)	23 (584)	
B	1	lid band	cherry	1/16 (2)	1 1/16 (17)	24 (610)	
C	1	bottom insert	cherry (quartersawn)	1/4 (6)	4 1/2 (115)	7 (178)	
D	1	lid insert	cherry (quartersawn)	1/4 (6)	4 11/16 (119)	7 1/8 (181)	

Overall dimensions: 2 3/4" (high) x 4 7/8" (wide) x 7 1/4" (deep)
Additional Supplies: 3/16" copper tacks; toothpicks.
Comments: Overall dimensions reflect width and length of finished lid. Measurements shown for the Lid Insert (Part D) are approximate, and determined by final dimensions of the main box body after bending, tacking and shaping.

SOURCE LIST

John Wilson & Eric Pintar, LLC
406 E. Broadway
Charlotte, MI 48813
(517)543-5325
www.shakerovalbox.com
Wilson carries all materials for making Shaker boxes, including forms and patterns, hardwood bands, lid/bottom inserts, tacks and soaking trays.



Notes on Shaker Boxes

Unlike most of the projects in this book, before you can build a Shaker box you'll need some very specific supplies and a few shop-made jigs. Let's take a look at what you'll need.

Wood

The bands that take on the bent shape are quite thin as noted earlier. Some of the most common sizes of boxes use stock of around $\frac{1}{16}$ " or less, which can be difficult to make in the shop. Planing woods to this thickness can be difficult and even dangerous — anything less than $\frac{1}{8}$ " thick can break apart during planing, sending shards into the cutter-



head like shrapnel. Danger aside, the results of planing that thin aren't always optimal. While the box lid and bottom inserts are of thicknesses easily milled in the shop, it's best to purchase bending stock from a woodworking supplier.

Water Bath

Wood softens enough for bending when bathed in hot water (or steam). The ideal water bath is long metal tray roughly the shape and size of a window box liner or one of those wallpapering trays. A few decades ago metal versions of those were easy to come by, but these days they're all plastic. You can still find these at flea markets and through some specialty suppliers. However, you can also use an ordinary roasting pan, as I'll do later in the project. Roasting pans are too short to lay the wood bands right in the water, so you'll need to introduce the bands slowly into the hot liquid by dipping half in first and allowing it to soften, then bending it down into the water (pretty much like you would when cooking long pasta).

You can always heat the water on the kitchen stove and do your bending in there, but in the shop you can use a hot-plate or small gas grill (never use a charcoal grill indoors). You don't want the water boiling. A temperature around 180 degrees is good, but don't fuss too much over thermometers and such. As long as the water is good and hot, your wood will bend just fine.



Forms and Shapers

To achieve a precise shape, bending wood requires something on which to shape it. Shaker boxes use two items to achieve this. The first is a bending form sometimes called a "core." (photo, opposite). This is a solid block of wood around which the bands are initially bent to achieve an approximate shape and, more importantly, the correct size for locating the lap locations. These bending forms are cut in the exact shape and size of the box interior; their height is at least that of the band height. You can make these out of any wood you have lying around, gluing multiple pieces to achieve the correct height.

Once the laps have been tacked securely into place and the box size locked in, and while the wood is still wet and

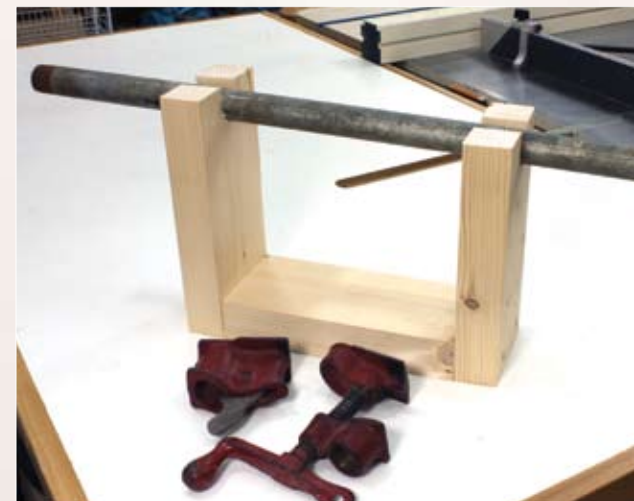
pliable, shapers like those shown in the photo above pushed into the lid and bottom of the box hold it till dry. Holes in the shapers allow airflow. Again, these can be made of any wood. Their overall sized is just slightly larger than the cores, but the edges receive a bevel of 10 degrees and they're inserted like corks into the tacked bands.

Tacks

The Shakers typically used copper tacks, although a number of historical samples evidence steel tacks. These tacks are clinched over on the inside of the box and so their length should be about $\frac{1}{16}$ " more than the box where the bands overlap. For example, tacks for a box using bands of $\frac{1}{16}$ " would need to be $\frac{3}{16}$ " in length.

Anvil

For clinching tacks, an anvil provides a solid metal backing that forces the tips of the tacks over and back into the wood as they're driven, holding it securely. This anvil isn't fancy, and can consist of any short length of pipe held in a cradle of some sort. You can see mine in the photo at left It's a pipe borrowed from one of my clamps, and it rests in open slots on a pair of upright lengths of 2x4 attached to a 2x4 base. Alternatively, if you have a solid bench vise you can clamp the pipe there.



Construction

For this project I've elected to do a #3 box because it's a good size for gifting and household use and a perfect size to work with — not so small that bending and tacking are difficult, and no so large as to be unwieldy. Also, the #3 box uses $\frac{1}{16}$ " cherry stock for the bands; although it can be a difficult thickness to plane down to in the shop, it's readily available from most woodworking suppliers.

Begin by heating your water. It may take a while to get the water hot, so start it going now while you prepare your working components.

Cut the bands for the main box and lid to size, then transfer the finger patterns to the ends of each. You can cut these fingers with a band saw, but a fine-cut blade is a must, and unless you have a zero-clearance insert in your band saw table you may get a lot of tear-out on the underside of these delicate fingers. I opted for a very sharp utility knife, as you can see in Fig. 1. Use fine sandpaper to smooth the finger edges after cutting. Add a bit of a bevel to the top edges of the fingers with the knife or sandpaper. This bevel shouldn't be large, no more than 10 degrees.

Now, drill pilot holes per the pattern locations with a $\frac{1}{16}$ " bit. (Fig. 2) This will prevent splitting in the narrow fingers when driving the tacks later.

Since the bands wrap over on top of themselves when bending the box and lid to shape, you want a smooth transition on the inside of the box which you can achieve by feathering a long bevel — about 1-1/2" to 2" — where the ends of the bands contact the inner surface of the box and lid. Not only does this look better, but it helps ensure a smooth fit when inserting the lid and bottom inserts. Keep in mind that this feathered bevel faces outward, so do it on the same side of the bands that you beveled the fingers. You can do the feathering by hand with a sanding block, but applying the ends with even pressure to a belt sander accomplishes the feathering quickly and evenly. (Fig. 3)



With the two bands prepared, it's time to start "cooking." If you're using a long tray you can just drop the bands in. I'm using a large roasting pan, and in Fig. 4, you can see how I've softened the first portions of the band a bit, then curled it so it can slip into the water around the circumference of the pan. Let the bands soak for 10 to 20 minutes in the hot water.

Start the shaping with the main box band. Use tongs to remove the band, and then wrap it around the #3 bending form as in Fig. 5, making sure that the feathered end and beveled edges of the fingers are facing outward. You need to work quickly because the band will cool pretty fast, but don't panic — if you don't get it quite right, you can put the band back in the water and try again. (It will bend a bit more easily the second try.) Pay particular attention in this photo to how I'm using my thumb to hold all three of the band fingers at the same time as I wrap the band around the bending form. By holding all three evenly, it helps prevent the wood from splitting between the fingers.

When you have the band securely in place around the form, mark the band in a couple spots, as in Fig. 6. You'll have to take



the band off the form to tack it, and will need these marks as a guide to reforming the circular shape on the anvil. When you have the band marked, take it off the form. Now that the wood has cooled, you'll notice that although it pops right out of its oval shape that it's still plenty bent.

Before proceeding further, this is a good time to put the lid band into the hot water so it can be softening up while you move through the next few steps.

Using your marks, bend the band around your anvil — the shape will be more circular at this point than oval, but that's OK for now; we'll get it into its correct shape shortly. Hold the band securely and begin tacking through your pilot holes one-by-one as in Fig. 7. By nailing right on the pipe, the portion of the tack that comes through the inside of the box (about $\frac{1}{16}$ ") is immediately clinched over as you tap it home.

Remove the fully tacked band from the anvil. Although it's cooled considerably, it's still plenty pliable. This is where the shapers come in. Insert a shaper into the top like a cork and push it down into place as in I'm doing in Fig. 8. You'll immediately see the band take on its correct oval shape. Rotate the shaper as needed to adjust the oval so the tacks are



near the center of the box side. Depending on how you've cut and beveled your shapers they may or may not fit all the way down in with moderate pressure, and that's fine. You only want them to be a bit snug; don't pound them in place so tightly that you end up creating a bevel at the top. My #3 shapers are a bit on the small side, and although they fit completely inside the box they're not that tight. Now flip the box over and insert the other shaper into the bottom.

Flip the box right side up. Use tongs to get the lid band from the hot water bath and wrap in around the top of the box as in Fig. 9. (Again, be sure the beveled edges of the finger face outward.) Make some guide marks on the lid band as you did before. Remove it from the box and head over to your anvil, and tack the finger as you did for the main box band.

Slip the finished lid band over the top of the box, being sure to align the tacks. (Fig. 10) Again, my shaper fits down inside my box, but if yours protrudes cork-like from the top of the box, you may need to temporarily remove the shaper to slip the lid band into position. Replace the shaper when you have the lid band on.



That's about all you can do with the box for now, as it needs to dry thoroughly so it will rigidly remain in a perfect oval when the shapers are removed. Give the box at least 24 hours to dry; it's best to lay the box on its side so air can move freely though the holes in the shapers. Don't try to rush things by heating it or putting in the sun or it could dry too quickly, which can cause warping and cracking. Check to see how it's doing after a day — if it still feels damp, give it some more time, maybe even another 24 hours. Remember that the top of the box is a double thickness of wood where the lid band wraps around, and that portion will take the longest to dry.

While the box is drying, prepare your stock for the lid and bottom inserts. Because these boxes are very light and thin, they can be greatly affected by wood movement. The bands aren't an issue as they're not "captured" across their width, but the inserts are. For that reason, using quartersawn wood is best as its seasonal movement is far less than flatsawn stock.

After the box and band are thoroughly dry, remove the shapers. Set the main band on your $\frac{1}{4}$ " stock for the box bottom and trace around the inside of the box. (Fig. 11) The box should be pretty stable at this point, but avoid flexing it as your trace or you could alter its shape. Repeat the process for the lid band, and keep in mind that the lid insert will be slightly larger than the one for the bottom because the lid band encircles the outside of the box.

When tracing the bands for the lid and bottom insert, be sure to mark the portion that goes next to the laps. Due to the overlapping wood on that side, the inserts may not be perfectly symmetrical. This is especially true of the lid insert. The overlapping portion of the lid band is right over the lapped band on the main box. This means that at that location on the box, there's a double thickness of wood that must be taken into account — the lid insert will "bulge" very slightly at this spot. By marking the lap location, you can be sure to orient the lid insert the right way.

Cut out the two inserts on the band saw as in Fig. 12, but don't cut all the way to the line. We're going to fine-tune and smooth the oval curve, plus put a bit of a bevel on the edges of the inserts.



As with the shapers, the bottom and lid inserts receive a slight bevel that imparts a cork-like clamping action that tightens the inserts as they're pushed fully into place. This bevel isn't as large as the 10-degree bevel on the shapers; a bevel of no more than 3 or 4 degrees is good. Making these bevels is a bit tricky — remember that we traced the inserts from the inside of box and lid bands, so you can't just tilt the table on your disk sander down 3 or 4 degrees and sand up to the line or the bevel will be on the wrong side. Instead, tilt the sander table up 3 or 4 degrees. Most sanders have a positive stop at 90 degrees to the disk, so you'll need to defeat this in some manner; usually just removing the angle-set knob and holding the table at the desired upward angle with a clamp does the trick. (Fig. 13) Sand up to your traced lines.

When mounting the inserts into the box and lid, pay attention to the orientation, as it's easy to lose track with all this flipping the box and lid over. As noted earlier, it doesn't matter which way the fingers point, but they must point the same direction on both lid and box to keep with Shaker practice. Also, keep in mind that the process involves more than a little trial and error. You want a snug fit, but if you're struggling to get the inserts into the bands, head back to the sander to remove a bit more stock around the edge. Do this extremely carefully and slowly. You want to sneak up on a good fit; sand too much and a too-loose insert becomes scrap and you'll have to start over.



This is where you'd normally reach for your glue bottle, but don't; no glue needed. Slip the lap edge into the box opening first, so as not to snag on the inside feathered lap, as in Fig. 14. Gently press the insert into place all the way around. Again, if this requires an inordinate amount of force — or if one problematic spot seems to snag on the way in — sand a bit more till the fit is snug but not a struggle. Press the inserts in until they're flush with the bands.

To anchor the inserts, the Shakers used wooden pegs. Drill a series of $\frac{1}{16}$ " holes every few inches around the perimeter of the box and lid inserts, as in Fig. 15. For a #3

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box, I usually space the holes every 2" to $2\frac{1}{2}$ "; for larger boxes a wider spacing is acceptable. These holes don't need to be deep. Again, for a #3 box a depth of $\frac{3}{8}$ " to $\frac{1}{2}$ " is fine.

Slip lengths of toothpicks into the holes — again, no glue needed — and tap them solidly home with a light hammer. Clip the toothpicks off just above the surface. (Fig. 16). Sand all the pegs flush with the surface of the bands. Sand the lid and bottom so the inserts are flush with the edges of the bands — you can do this on a belt sander if you wish, but remember that these boxes are thin and light, so sand gently and slowly — then give the entire box a good sand-

ing inside and out by hand, working up through the grits till you get a smooth surface. Take care sanding around the fingers, as it's easy to snag sandpaper under them.

For a final finish, you have a few options. You can paint the outside of the box (that's what the Shakers usually did until the mid-19th century) or apply a clear coat of shellac, varnish or other oil. I gave the project box several coats of boiled linseed oil, rubbed out to a soft sheen. However, for a box that may get a lot of rough use, especially near a kitchen or bathroom sink, polyurethane is a good choice.

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