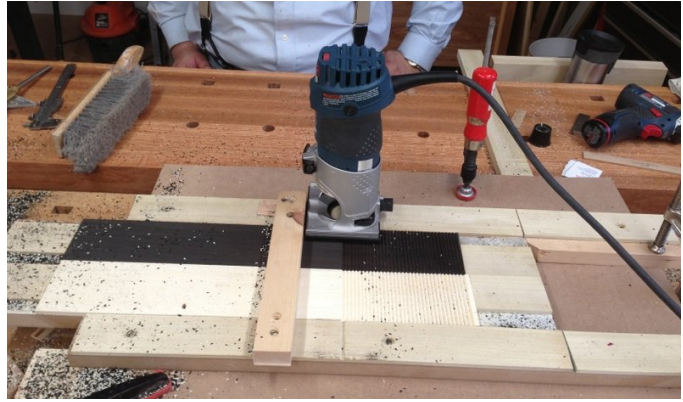
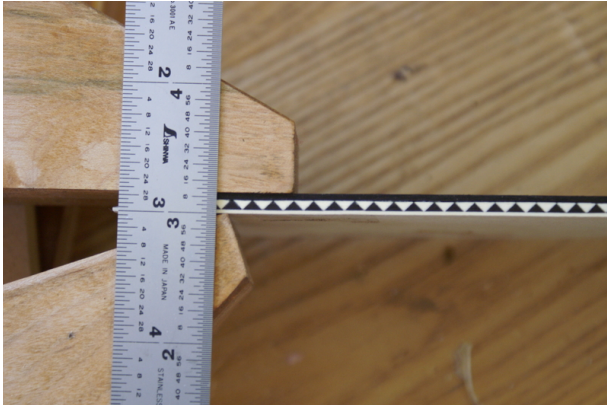


# A Method for Sawtooth Banding

by Don Michael and Jim Russell

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## The Methodology

The methodology for making this banding is straightforward and based on a process used by Rob Millard in one of his YouTube videos:

- Glue a long flat piece of Holly and a long flat piece of Ebony side to side to a “sled”
- Cut a series of evenly spaced v-grooves across the joined pieces with a trim router
- Separate the Holly and the Ebony
- Fold one over the other and match the sawtooth pattern
- Add skins of solid Holly and Ebony to either side of the sawtooth layer

and the result is a brick of sawtooth banding.

While the overall concept is straightforward, the extremely small dimensions of the finished banding demands precision in preparing the jig, selecting the tools, aligning the components and truing up the results.

## The Jig

The jig is designed to position the banding material and to guide a router to crosscut the v-grooves repeatedly and consistently throughout the length of the banding material. The jig consists of a base, two rails, a sled and a crossbar. The two rails fastened to the base steady the router base and align the sled. The sled has the banding material to be grooved attached to its surface and slides between the rails. The last piece is a guide running across the jig perpendicular to the sled and screwed to the two rails.

The router cuts a v-groove across the banding material using the guide. The sled is then moved a distance equal to exactly twice the depth of the router bit cut. This process is executed repeatedly until all of the cross cuts are accomplished.

## The Bit

Three different bits were tried. The key is not only a well-cutting bit but a sharp, clean point. Some bits, though looking pointed, leave rounded channel bottoms. A new MLCS v groove bit and a Craftsman high-speed steel bit were tried without success.

The [Whiteside 90° v-groove bit #1500](#) produced excellent results. The grind is exact and the point is sharp.

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## Sizing the Banding Brick

This step is necessary in order to size the jig parts. The exact size of the banding material required is determined by the project for which the banding is being prepared. The length of the banding brick should be at least an inch longer than the longest continuous section of banding required for the project. The width of the banding brick is a function of the thickness and number of strips desired, the width of the kerf of the saw used to rip the strips and some waste for cleanup. The size of the banding brick shown in these photos is about 17" long by 2" wide which is ample for the drawers of the Portsmouth Table for two tables.



### Determine the desired thickness of the banding material.

The recommended thickness of the banding material should be the height of the V groove plus  $\frac{1}{64}$  plus the thickness of your resaw kerf plus the thickness of the outside skin layer plus at least  $\frac{1}{32}$  fudge depending on how confident you are that you are going to get everything exactly flat and re-sawn exactly right. To fabricate sawteeth  $\frac{1}{16}$ " high we used  $\frac{1}{4}$ " thickness of banding material. This thickness allows for the  $\frac{1}{16}$ " sawteeth,  $\frac{1}{16}$ " kerf of the 7- $\frac{1}{4}$ " Diablo circular saw blade used to resaw,  $\frac{1}{32}$  outer skin and  $\frac{3}{32}$ " cumulative waste allowance and extra thickness for the Ebony skin.

The general concept behind the extra thickness is:

1. When the sawteeth are separated (sawn away), about  $\frac{1}{64}$  of material remains attached to the sawteeth side so that it can trued up and flattened
2. On the other side of the kerf, the remaining banding material is sufficient to be used as the skin layer for the complementary sawteeth after it is trued up and flattened

Prepare the light and dark banding material to the length, width and thickness determined above. Both materials must be the same thickness. If it is intended to have one skin thicker than the other, (we wanted the Ebony skin thicker given the abuse that was apparent around the edges of the drawer on the original table) use the thicker dimension for both. The skin layer thicknesses can be adjusted in the last step.

Prepare spacing material of the same a thickness as the banding material as determined above, about 2" wide, and of accumulated length (can be multiple pieces) approximately 3 times the length of the sled. Spacing material can be any wood.

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## Fabricating the Jig

The jig is used only once and then discarded. While it is theoretically possible to reuse the jig, difficulty in getting all of the parts exactly coplanar is probably not worth the time with the effort. It is easier to remanufacture the entire jig.

Consistent thickness and flatness are necessary. Cut a piece of 3/4" MDF four times the width and two times the length of the banding brick. This will be used for the sled and the rails. Cut another piece of MDF a few inches wider and the same length to be the base. The extra width is to allow clamping to the workbench without having the clamps on the rails.

The rails, which will be ripped from the sled later, are about 2" wide (depending upon your router base, you may need to adjust the width to get adequate support) and the length of the sled.

## Prepare the Sled and Rails

Glue a piece of spacing material along one side of the sled surface, being careful to keep it flush to the edge.

Glue the Holly banding material to the sled touching the spacer material and about 3 inches horizontally from the left side of the sled.

Glue the Ebony banding material to the sled adjacent to and touching the Holly banding material with the ends approximately aligned.

Glue another piece of spacing material to the sled adjacent to and touching the Ebony banding material.



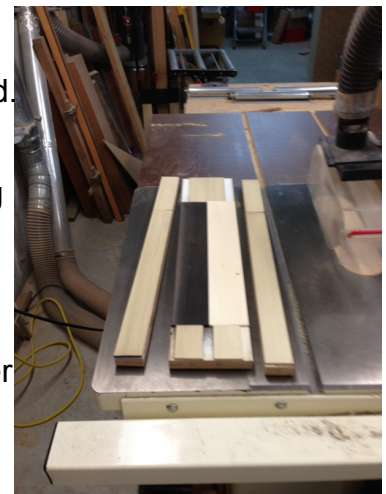
Cut pieces of spacer to fill the remaining spaces on the sled not occupied by the banding material and glue them to the sled. Allow everything to dry.

True up one long edge of the sled, making sure that it results in the banding material being exactly parallel to the edge.

Pass the sled with all of the material glued to the top through either a planer or sander to get all of the components coplanar (exactly flat and of the same thickness). If the banding and spacer material are

prepared properly, it should only be necessary to remove a few thousandths in order to retain the necessary flatness across all pieces.

Using the table saw, rip the rails off of either side of the sled, leaving all of the banding material on the finished sled with the Ebony and Holly still connected.





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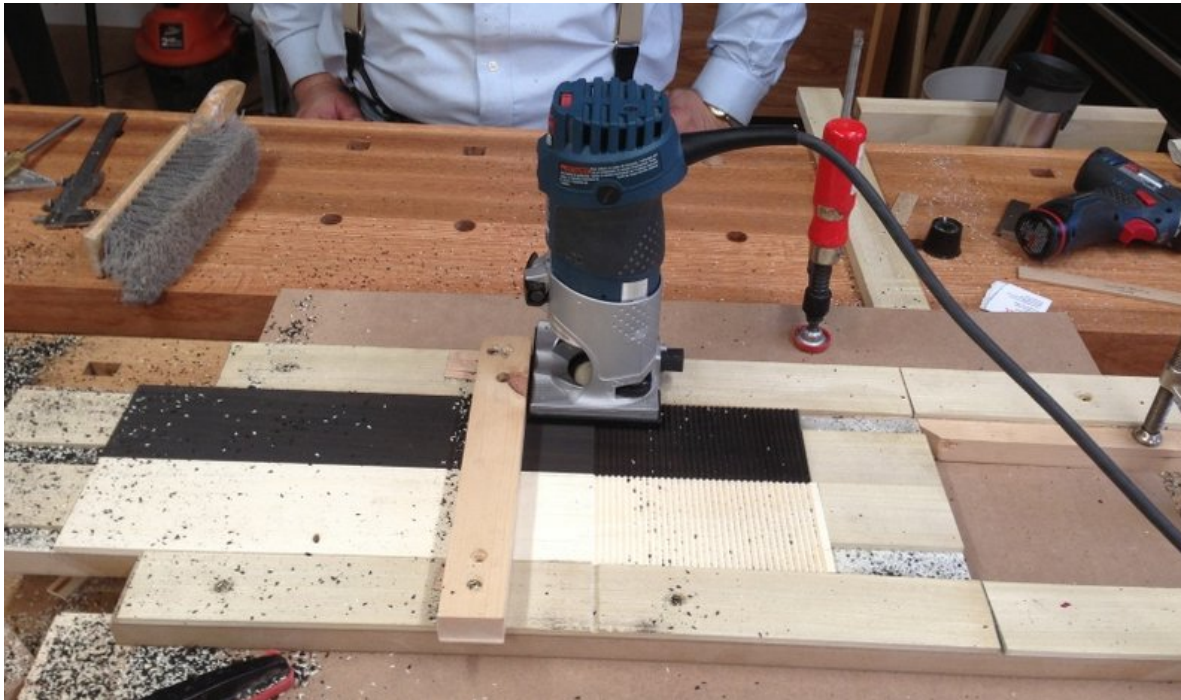
## Assemble the Jig

Screw one rail down to the base a few inches from the edge. The base should be large enough to allow it to be clamped to a workbench without the necessity of putting the clamps on the rails.

Place the sled containing the banding material adjacent to the rail that has just been screwed down.

Place the remaining rail on the opposite side of the sled and gently squeeze them together.

Screw down the second rail. The sled should be able to move lengthwise under some tension but should not need to be hammered to accomplish movement.



Cut a piece of wood about  $\frac{3}{4}$ T x 1-1/2 W and of length to span the rails. Joint one edge.

Using an accurate square, screw down this cross cut guide to the two rails about one third of the way from the left end of the jig. Exact lateral placement is not important, but being perpendicular to the banding material is critical. Take care with setting this guide. The jointed edge should be on the router side.

It may be beneficial to place a thin piece of veneer under the guide on the rails to prevent the cross cut guide from creating extra friction on the sled. If the sled moves to your satisfaction without this, it is probably not necessary.

## Using the Jig

### Make Gauges

For a 90° v-groove bit, the base of the triangular saw tooth is exactly 2 times its height. Successful use of this jig requires that the sled be moved exactly the same distance, i.e the width of a tooth



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base, for each V- groove cut.

To accomplish this it is necessary to fabricate two spacer guides. Fabricate a spacer approximately 3/4W x 8L and with thickness exactly the height of the sawtooth required. In the case of the Portsmouth table, the height of the sawtooth is 1/16". Cut a 2" piece from this spacer; this is the **height gauge**. Cut the remainder in half lengthwise and glue the two halves together using a very light coat of glue; this is the **width gauge**.

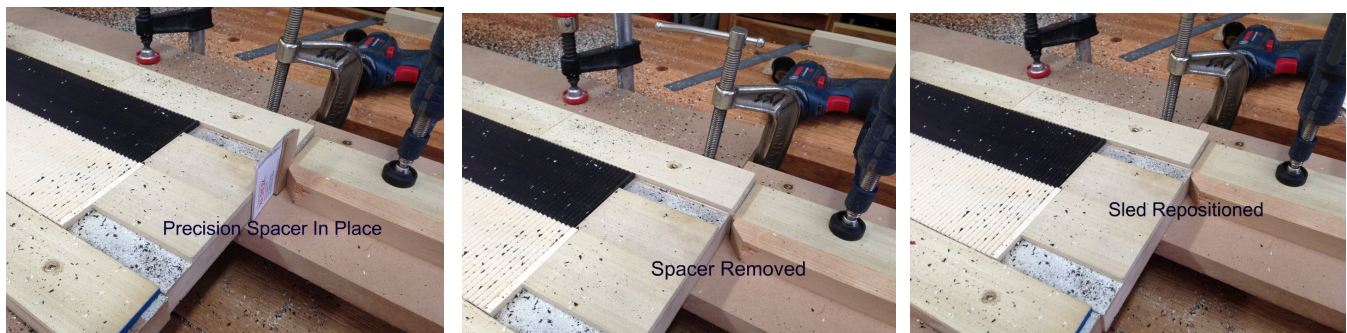
Plane the edge of the height gauge to about 45° so the gauge can be held directly against the tip of the router bit. Use the height gauge to set the depth of the bit in the router. It is best to set the router bit just slightly more than the height gauge, exposing the tip of the bit so that you can just click it with your fingernail.

If the horizontal groove spacing is ever so slightly less than the width gauge, the spacing of the triangles will fit together nicely when they are folded on top of one another. If the horizontal spacing is slightly greater than the width gauge, then the tops of the sawteeth will be flat and will not fit nicely into the complementary teeth.

## The Cutting Process

Test the spacing as follows. Start at the spacer-filled section to the right of the banding material. Make about an inch of grooves, cut the piece off of the sled, split lengthwise and fit them together to make sure everything is correct. Make adjustments, if necessary. Once everything is to your satisfaction, start making grooves in the banding material. As can be seen in the pictures, we "adjusted" the thickness of the width gauge by adding two business cards in thickness.

The process to cut the grooves and move the material horizontally is as follows:

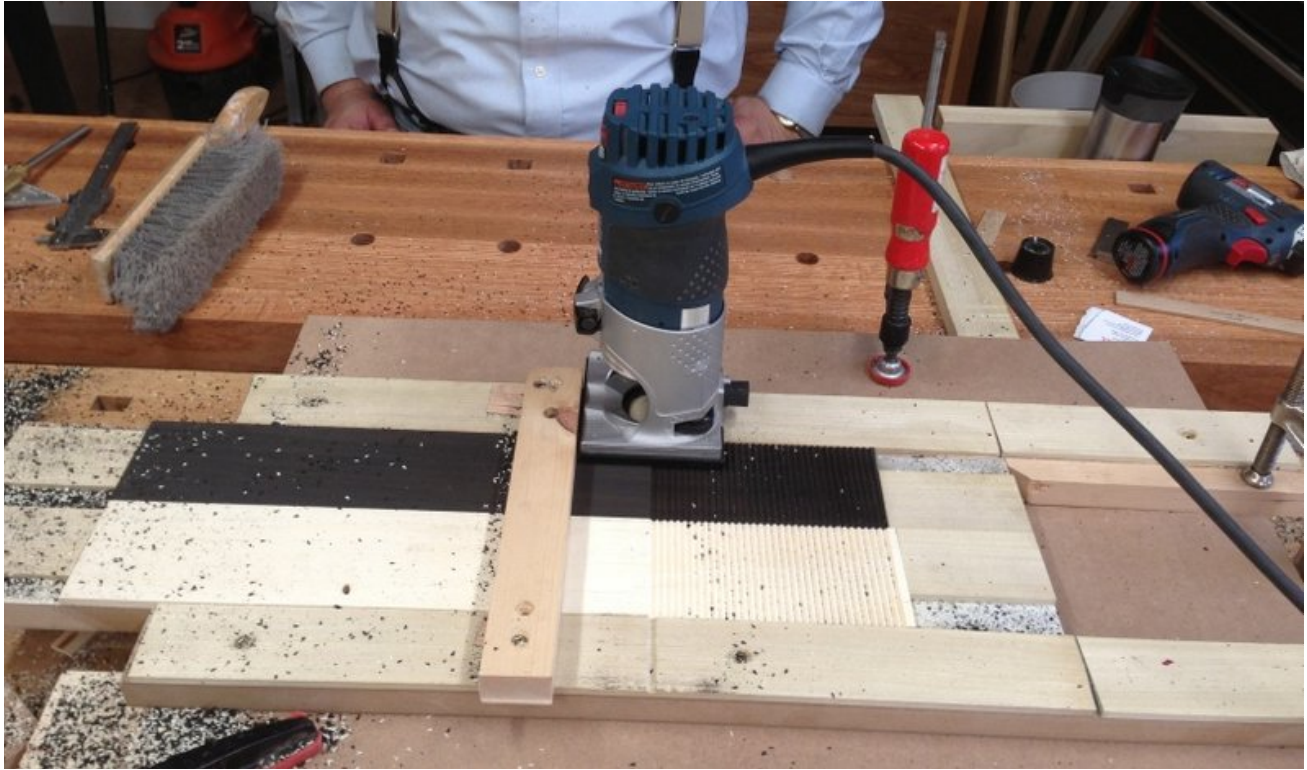


1. Position the sled in the jig
2. Riding the router against the crosscut guide, cut a groove across the entire jig
3. Place the width gauge on the right end of the sled. Place a piece of wood snugly against the width gauge. Press it against the end of the sled (do not allow the sled to move) and clamp the piece of wood (a stop) to the jig
4. Remove the width gauge and reposition the sled to engage the stop.
5. Repeat steps two through four forever. Maybe it only seemed like forever. Eventually you will run out of banding material to crosscut

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## Making the Layers

Once all of the V-grooves are cut, it is time to separate the Holly from the Ebony, fold the two pieces over on each other, separate the excess material from the sawteeth and glue the separated material to the opposite side of the sawteeth.

The steps are:

Rip the sled in half, separating the Holly and Ebony v-grooved material and test fit.

Glue the sawteeth together and let dry thoroughly. Be sure to apply uniform clamping pressure so that the product will not vary in thickness.

Resaw on the Holly side leaving about 1/64th of solid Holly and the sawteeth. Take care to stay away from the Ebony sawtooth points at this time.



Retain the sawn away Holly still glued to the MDF. This will be flattened again and glued down to the Ebony side of the sawtooth layer as a banding skin layer.

Using a plane and scraper, take down the Holly waste on the sawtooth banding until the tips of the



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opposite (Ebony) triangles are just visible.

Resaw on the Ebony side leaving as much waste at the base of the sawteeth as possible while maintaining enough Ebony with the MDF to make the Ebony skin. DO NOT PLANE AND SCRAPE THE Ebony AT THIS TIME. THE SAWTEETH ARE TOO DELICATE.

Flatten the Ebony that was just sawn away and is still glued to the MDF. Glue the flattened Ebony layer down to the Holly sawteeth. Allow it to dry thoroughly.

Using a plane and scraper, take down the solid Ebony waste on the Ebony sawtooth base until the tops of the Holly sawteeth are just visible.

Flatten the Holly material that was sawn away earlier and is still glued to the MDF. Glue the Holly layer with the attached MDF down to the Ebony sawtooth base. Allow the dry thoroughly.

Saw off the MDF attached to the Holly skin. Take the Holly skin down to the final thickness being careful to maintain uniform thickness.

Now repeat on the Ebony side. We left the Ebony skin thick to simplify installation and add more strength to the banding after installation on the drawer.

Finally, rip the brick into banding strips.

