Banding
A Furniture Embellishment

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Don Michael and Jim Russell
Terms

Inlay
Stringing
Purfling
Banding
Inlay

Decorative technique of inserting pieces of contrasting material into a cavity in a base object to form patterns or pictures and flushed with the matrix.
Stringing

- A type of inlay
- Long thin strips of contrasting material
- Typically 1/32” to 1/16” wide
- Accent edges in place of molding
- Form patterns to replace carving
Purfling

An ornamental border, as the inlaid border near the outer edge of the table and back of a stringed instrument.
Banding

Often used as:

- Table top edge treatment
- Border surrounding inlay
- Line separating table elements
- Cuff banding on feet
Banding

- Made up of geometric patterns and/or layers of contrasting woods intricately arranged to form geometrical patterned narrow bands
- Often used as a border
- Widely used in New England
- Invaluable tool in determining the place of its manufacture
Buy vs Make

- **Buy**
  - Fast
  - Limited to available
    - designs
    - sizes
  - Possible quality concerns

- **Make**
  - Low cost of entry
  - Fabrication - set of simple steps
  - Limited only by maker’s creativity
  - Can be made to an exact size
  - High quality
Fabrication Considerations

Virtually all bandings are sliced from bricks

- Made up of one or more of the following elements
  - Layers of flat thin sheets
  - Rectangular sections
  - Diamond sections
  - Triangular sections

- That are cut
  - Across the grain orthogonally
  - Across the grain diagonally
Fabrication Considerations

● Assembly Phase
  ○ Cut multiple sets or large quantity of identical very small elements
  ○ Assemble into patterned rows
  ○ Sandwiched between layers or “skins”

● Use Phase
  ○ Slice thin layers of the band pattern from the “brick” and inlay into the furniture component
Fabrication Considerations

Elements that make up banding are

- Fragile
- Very small
- Needed in large quantities
- Need to be consistent in size
- May need to color some elements
Fabrication Considerations

Need methods for:

1. Coloring materials
2. Fabricating thin layers of materials
3. Cross cutting very small pieces from the layers
4. Method for assembling pieces into a brick
5. Method for slicing thin and consistent ribbons of banding from the brick
Fabrication Considerations - Coloring

Some banding uses colored wood to add brightness, pzaz. Colored veneer available commercially in many colors, but mostly ~1/40th inch thick.

Black is available 1/32 & 1/16”, Anigre, Costello, Tupelo

Dying your own:

   Dependant upon wood species, characteristics desired, and thickness.

Physical variables: pressure, heat, time.
Assembly Considerations

- Most bricks are 3” wide or less.
- Length of bricks are determined by the desired uninterrupted banding strip
- A typical “thin layer” is about 3” x 20”
  - Commercial veneers can be used for layers from 1/40” to 1/16”
  - Resaw wood for thicker layers
  - Commercial veneers are typically 36” long
Assembly Sequence

Build complex bandings from simple parts

1. Make a brick of two different colors. The thickness is determined by the project requirements.

2. Slice the pack across the grain at 90 Degrees.

3. Flip every other piece.

4. Glue pieces together on top of a skin. The thickness of the skin is determined by the project requirements.

5. Add the top skin.

By changing the sizes and colors of some elements some very interesting visual effects can be realized.
Assembly Sequence

Build complex bandings from simple parts

Make a three layer brick of two color and slice it across the grain. The width of the slice is set by the project needs.

Make a complimentary three layer brick of two color and slice it across the grain. The width of the slice is set by the project needs.

Make a layer using alternate elements from above.

Glue pieces together on top of a skin. The thickness of the skin is determined by the project requirements. Add the top skin.

Get Creative by adding extra elements and colors.
Build complex bandings from simple parts

Make a brick of two different colors. The thickness is determined by the project requirements.
Slice the pack across the grain at 45 Degrees.
Rotate each piece 45 degrees to the right.
Glue rotated pieces together on top of a skin. The thickness of the skin is determined by the project requirements.
Flip one of two glued bricks.
Glue two bricks together.

By changing the sizes of some elements some very interesting effects take place. Make the black section wider, put a light colored skin between the bricks and make the outside skins dark and you get an Arrow or Dart banding.
Assembly Sequence for Herringbone Banding

1. Make a brick of two different colors. The thickness is determined by the project requirements.
2. Slice the pack across the grain at 45 Degrees.
3. Rotate each piece 45 degrees to the right.
4. Glue rotated pieces together on top of a skin. The thickness of the skin is determined by the project requirements.
5. Add the top skin.
Sample Table Banding

What Jim made, H is all 1/32 thick pieces

My reading of the drawing

Alt. A: all b&w pcs 1/16" thick

SCALE 5:1
Cutting considerations

If the core is to be made up of different pieces, thickness consistency is critical.

If the core includes pieces of the same material arranged alternating $90^\circ$, cutting width of pieces to match thickness is critical.
How Large a Brick Do I Need?

Let’s say we’re making the table edge banding shown earlier.

- Table top is 17” and square. Consider pattern matching, small “oops” and some extra for holding. Say +3”, so make brick 20” long.
- I’ll band 4 sides of the table. Consider larger “Oops” and make at least 6 strips. (or more if you might use this same banding in the future)
- Assume I’ll make the strips 1/16” thick and my saw kerf is 1/16”. I’ll allow 1/32” for trueing.
- Add ½” for holding the brick.

$6 \times (1/16 + 1/16 = 1/32) + \frac{1}{2} = 1-7/16, \text{ say } 1-\frac{1}{2}$

Final brick is at least 1-\(\frac{1}{2}\) x 20”
Core Components

Skins and any internal uninterrupted layers are the same size as the brick, 1-½ x 20”.

Pattern is 1” repeating. Therefore, brick is 20 patterns long.

5/16 color = 20 pcs

1/16 white, 2/pattern = 40 pcs

3/16 bwb, 3/pattern = 60 pcs
Core Components

B-W-B  60 pcs x (3/16 + 1/16) = 15”, say 18”
   Glue three sheets of 1/16” veneer together, then trim to 1-¾ x 18” *(Make this first! Actual thickness will determine the thickness of the colored and white pcs.)*

Color  20 pcs x (5/16 + 1/16) = 7-¾” long, say 9-¼”
   Before-coloring piece is 1-¾ x 9-¼”
   Color after cutting into pieces.

White  40 pcs x (3/16 + 1/16) = 10”, say 12”
Glue-up

Method 1

- Lay 1 skin on oversized caul covered in cellophane tape.
- Laying glue only as fast as you can work (maybe an inch or two at a time, apply glue to skin and start arranging pieces, applying glue lightly to bottom of each piece.
- Check frequently that pieces are perpendicular to edge of skin.
- When done, cover with another caul and clamp. Note: top caul may be cork-lined to accommodate small variations in height.
Glue-up

Alternate method:

- Cover suitable sized MDF with packing tape, sticky side UP
- Arrange pieces on tape, pressing firmly.
- Check for squareness frequently.
- When done, apply thin layer of glue to top surface and to skin, apply skin, add corked and cellophaned caul and clamp.
Glue-up

Optional:

- With pieces glued to one skin, gently roll across a tube so that pieces spread lightly apart.
- Put skimpy amount of thinned glue between pieces.
- Put assembly back on cellophane-covered caul.

Finally: Glue top of assembly to 2nd skin, add corked and cellophane-covered caul and clamp.

Note: Each glueing step has long drying time.
Make Banding Strips - at last!

- Trim both long edges of the brick straight and parallel.
- Slice into strips of desired thickness (1/16” used in examples here). You may want to sandwich the brick between pieces of scrap wood to insure a clean edge.
- If using a band saw, true the edge after each cut.

Pat yourself on the back and get on with the banding installation!
Fabrication Methods

Tools, jigs and process used to fabricate a large number of identical small cross grain pieces required to assemble a banding brick.
Fabrication Methods

- Fabrication process requirements
  - Dimensional precision
  - Highly repeatable
  - Able to make two basic cross cuts
  - Produce three basic shapes
  - Able to make long thin slices
- Thicknessing Jig for dimensional consistency
- Cross Cut Jig with repeating gauge
- Thin Strip Jig for slicing off ribbons of finished banding
Cross Cut Jig - Material Consideration

- Bricks have the grain running on the long dimension
- Crosscut to fabricate banding components
  - Very fragile
  - Normally very small
Cross Cut Jig - Two Cuts Will Produce Most Bricks

- The jig must be able to make
  - Straight cut at 90 degrees
  - Slanted cut (normally 45 or 60 degrees)
Two Cuts Can Produce All Non-Curved Pieces

By creatively choosing the colors and grain direction of the pieces, a spectacular array of bandings can be created.
A Jig That Makes Two Cuts Will Produce These
Fabrication - Thicknessing

- Consistent and precise thickness is essential
- A simple drill press jig can produce very good results.

Shop Built Drill Press Thicknessing Jig

https://www.youtube.com/watch?v=mWaF1ibGEwY
Fabrication - Thicknessing

- Consistent precise thickness of pieces is essential
- Commercial sanders are expensive but very reliable and easy to use

Drum Sander
Small Piece Crosscut Sled

Key Elements

- Zero Clearance Crosscut sled
- Repeating gauge
- Thin kerf blade
Thin Strip Cutter Jig

- **Back Guide and Splitter**: Align with left side of blade.
- **Auxiliary Fence**
- **Stop**: Maintains the front to back position of the jig base.
- **Track Guide**: Maintains the horizontal position of the jig base.
Thin Strip Cutter Jig

- Safely cut thin strips
- All thin strips are the same thickness
- Cutoff can not get trapped
1) Position the Sled on the table saw.
2) Place the Auxiliary Fence on top of the Sled and clamp the Auxiliary Fence to the table saw fence.
3) Adjust the table saw fence to the desired distance between the right side of the saw blade and the left side of the Auxiliary Fence. This will be the thickness of the slice.
4) Using a push stick, and with the Auxiliary Fence as the fence, slice off a sliver of wood. As soon as the wood passes the Auxiliary Fence it will fall off. Repeat until you have all the strips.
Thin Strip Push Stick

- Disposable push stick
- Make it long so it holds down the material
- The tab behind the cutoff must remain in place.
Banding Calculations

Formulas for determining the brick size and yield
Calculate Width of Banding Brick

\[ B_w = 1.1 \times N_p \left( K_w + P_w \right) + 3" \]

- \( B_w \) = length of banding brick
- 1.1 = allows for 10% waste
- \( N_p \) = Number of pieces yield required
- \( K_w \) = Saw kerf width
- \( P_w \) = Piece width
- 3” = Extra length needed to hold while cutting
Calculate Width of Banding Brick - Example

\[ B_w = 1.1 \times \frac{N_p}{N_p} (K_w + P_w) + 3" \]

\[ B_w = 1.1 \times 60 \left( \frac{1}{16} + \frac{3}{16} \right) + 3" \]

\[ B_w = 19.5" \]
Calculate the Depth of the Brick

\[ B_d = 0.5 + N (T_b + K_w) \]

- \( T_b \) = Thickness of banding desired
- \( K_w \) = Saw kerf width
- \( N \) = Number of banding strips required
- \( B_d \) = Depth of Brick
- 0.5” = Something to hold onto while cutting and/or gluing
Calculate the Depth of the Brick

\[ T_b = \frac{1}{16}'' \]
\[ K_w = \frac{1}{16}'' \]
\[ N = 20 \]

\[ B_d = 0.5 + N \left( T_b + K_w \right) \]

\[ B_d = 0.5'' + 20 \left( \frac{1}{16}'' + \frac{1}{16}'' \right) \]

\[ B_d = 3'' \]