The Steps to Success in making a **Segmented Bowl**

Gold Country Woodcrafters
Shingle Springs, Ca
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Agenda

- Definition
- Why Do Segmentation
- Outline of Steps – Big Picture
- Step Details
- Alternative Tools / Approaches
- Advanced Segmentation
- Key Learnings
- Conclusion

Definition

- **Segmented Turning**
  - Turning on a lathe where the initial work-piece is composed of multiple glued-together parts
  - Creates patterns and visual effects in turned projects.
  - Also known as polychromatic turning.

Why Do Segmentation

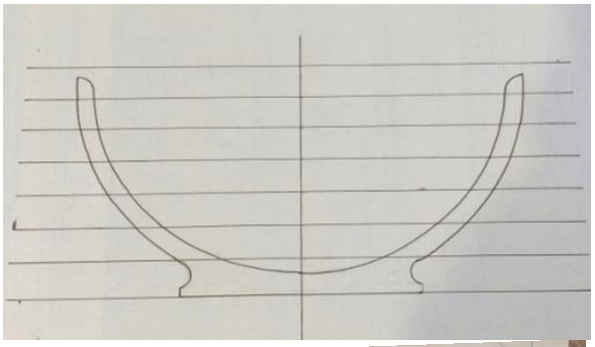
- More efficient use of wood - less waste
- Less expensive than using solid wood
  - if even available
- Endless creative options
- Minimizes End Grain Turning
- Enables larger bowls to be built

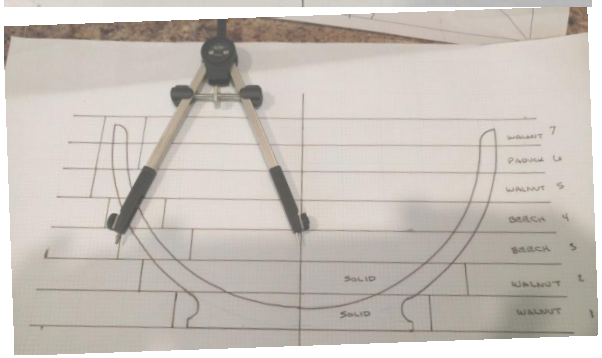
Outline of Steps – Big Picture

- Plan & design
- Cut segments
- Prepare segments for assembly
- Construct the base
- Create the segment rings
- Attach the rings
- Turn the stack to the design shape
- Reverse chuck to finish bottom
- Finish

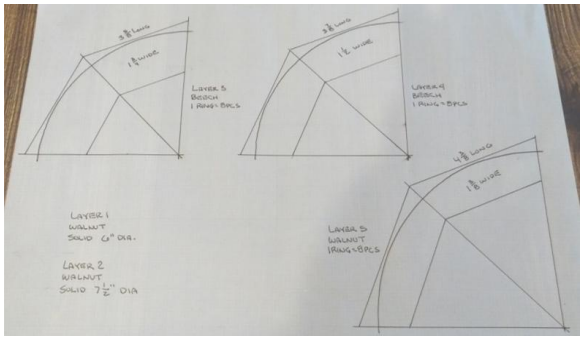
Step Details
Start with a plan / design

- **Prepare a sectional diagram of the project**
  - Graph paper works well
    - The scaled drawing shows all the sizes
  - Indicate inside and outside profile
  - Indicate each layer by color/type of wood
    - Show width of each segment





- **Segments**
  - 8 segments works best (easiest to layout)
    - End cuts of 22-1/2 degrees
  - The more segments the more accuracy required
    - 16 piece segments difficult due to accuracy
  - Can alter the number of segments in various rings
    - Even numbers of segments allow symmetry



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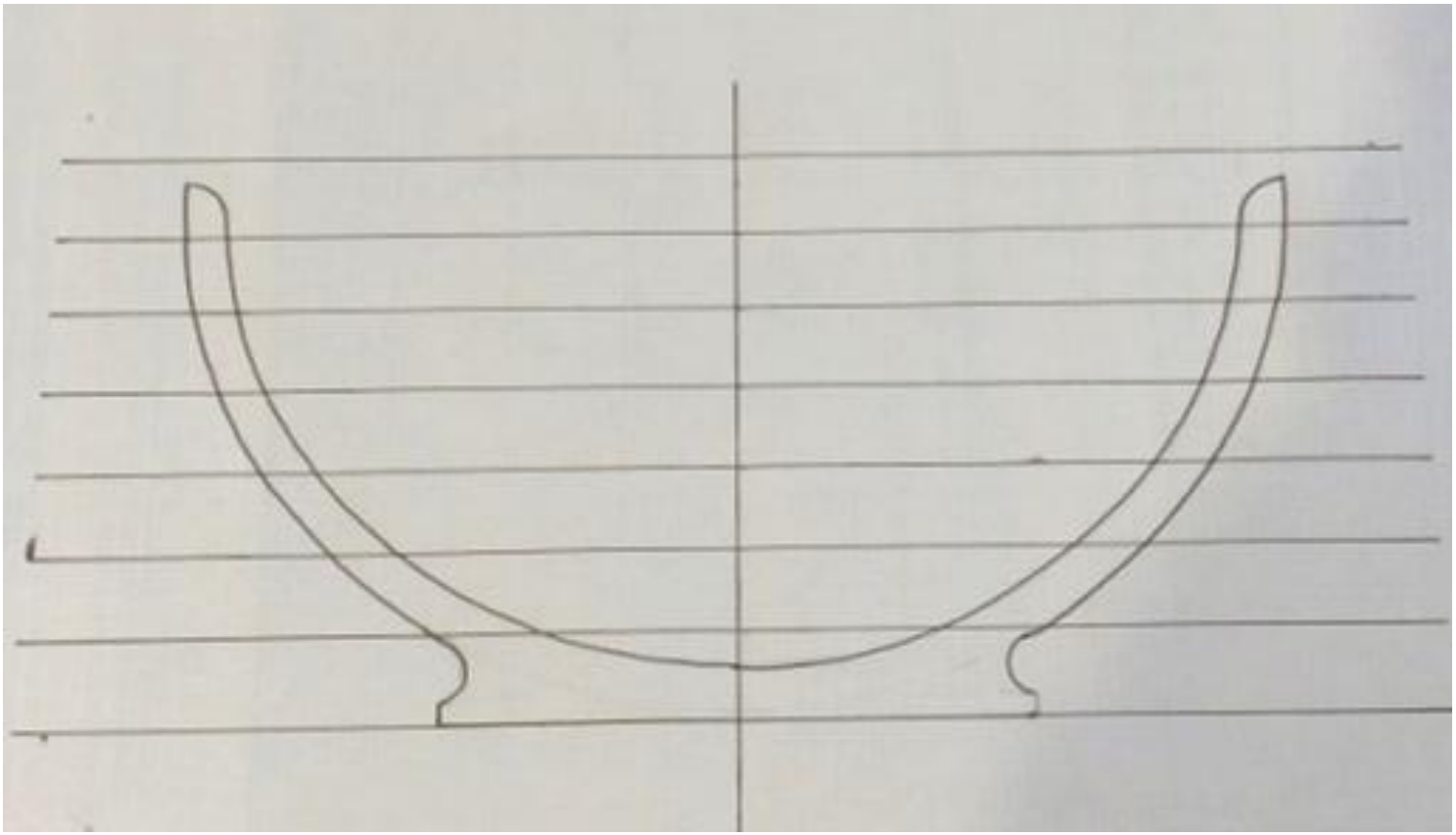
Start with a plan / design



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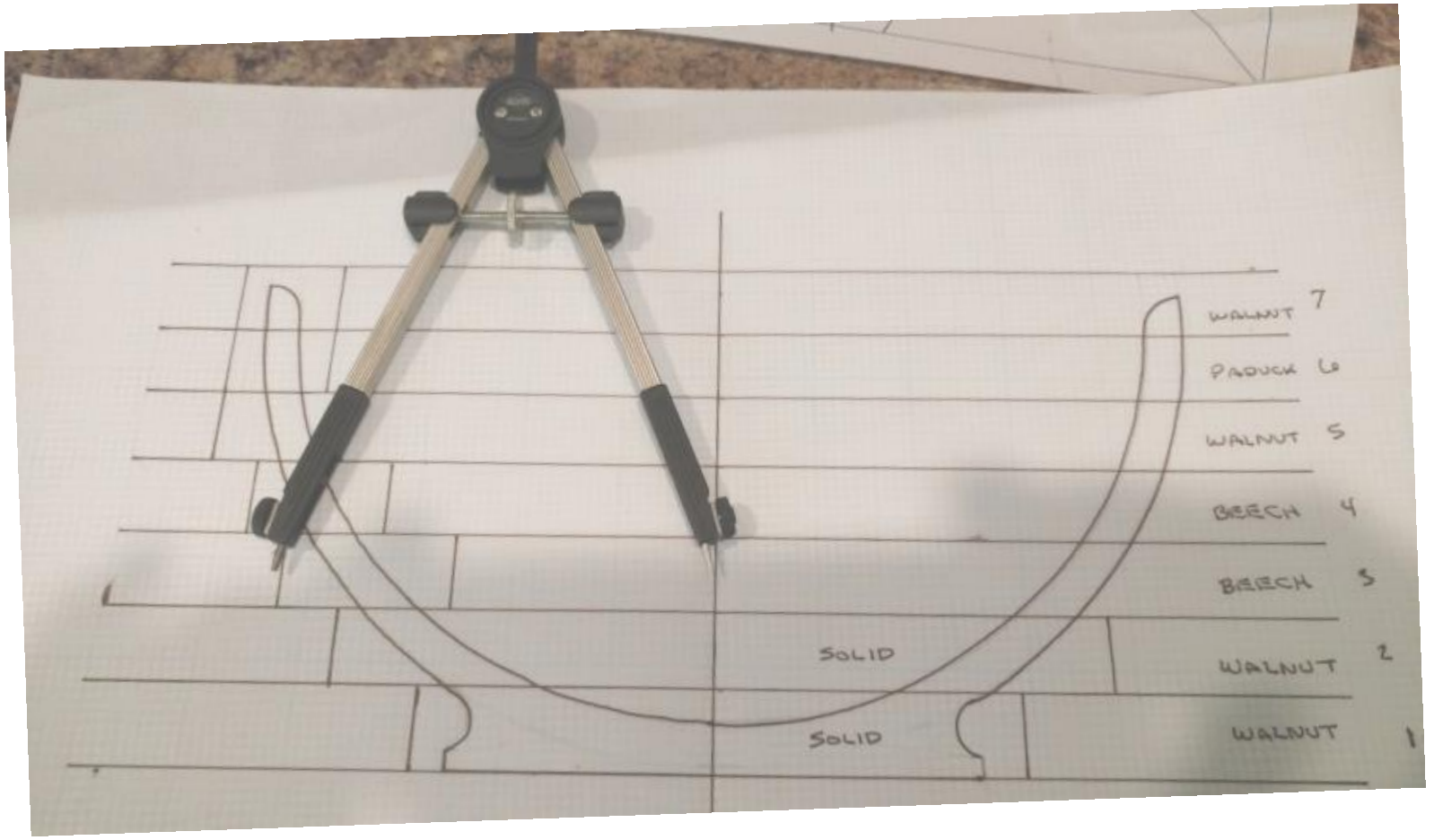

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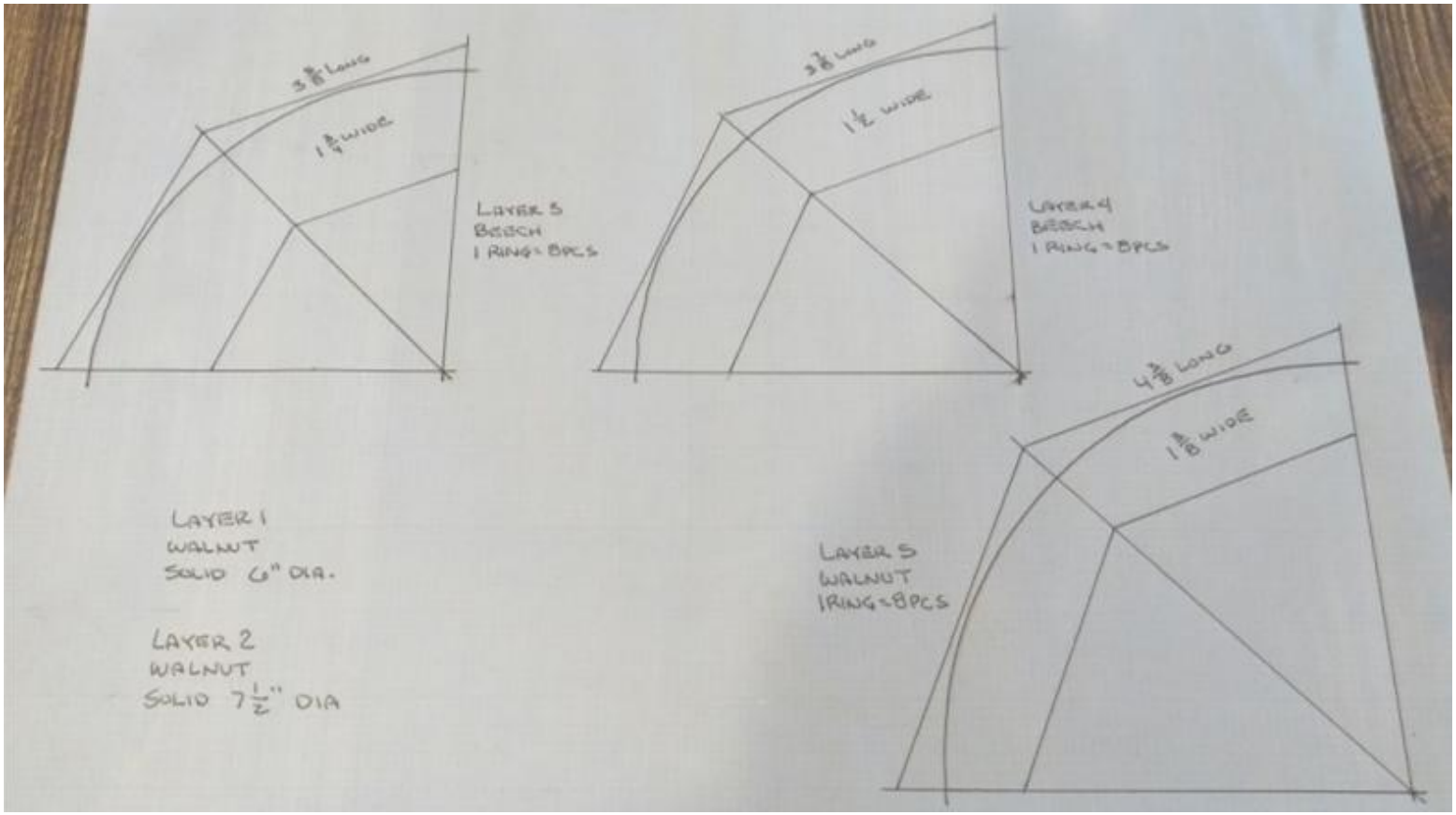
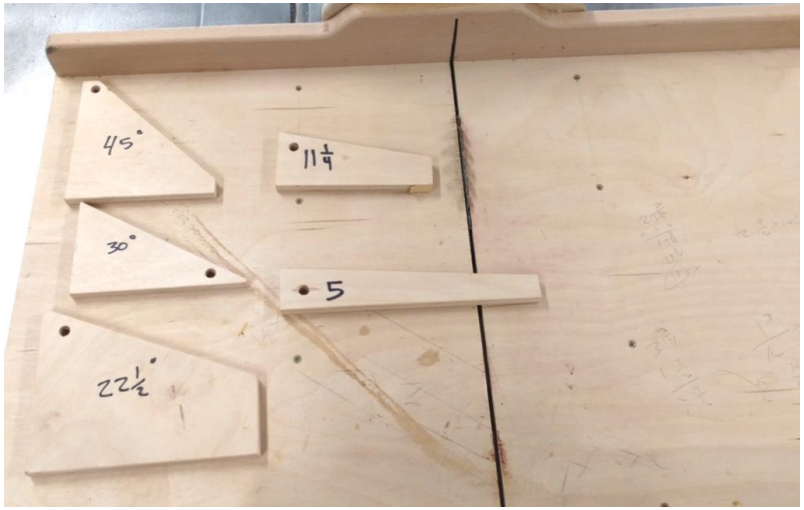
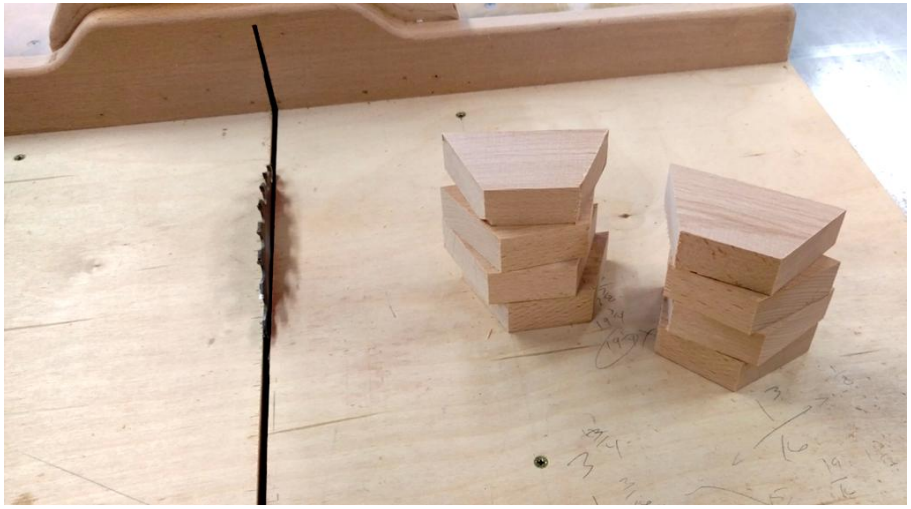


Step Details
Cutting the segments

- Using the plan, rip required strips of each size and wood
  - Using a sled, cut segments to proper length and angle (accuracy is important on angle, width and length) Quality joints require table saw and sled
  - The segment angle is determined by dividing the # of segments into 180
  - For tall segments (>1-1$^{1/2}$”) rip the angle on the table saw



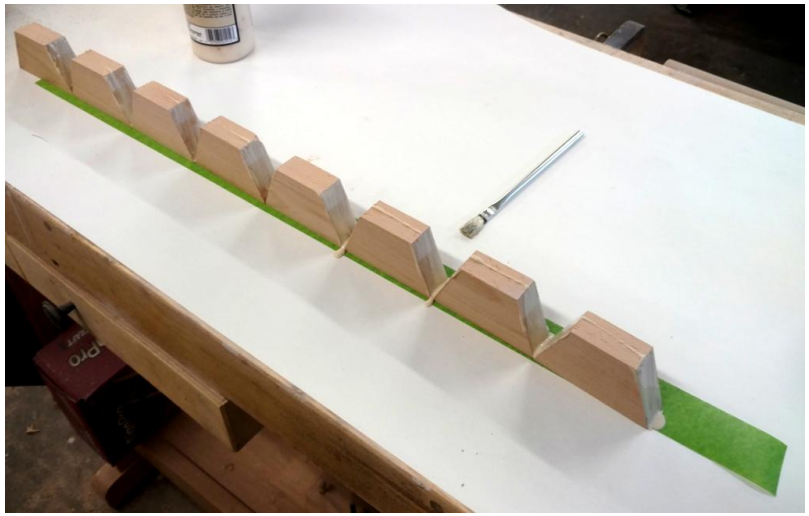


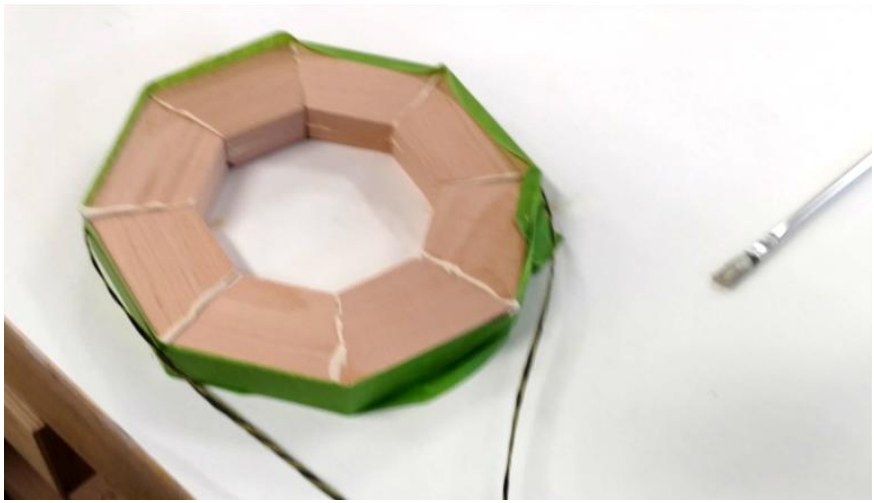
Step Details
Constructing the base

- First two layers are normally solid
- Layout perpendicular reference lines and glue
- Clamp solid base sections together

Step Details
Creating Segment Rings

- Glue and clamp the segmented rings
- Remove clamp, excess glue, tape
- Run thru drum sander till both sides smooth
- Layout reference marks on each ring





Step Details
Creating segment rings

- Most suitable glue for closed segment work is yellow aliphatic glue (PVA, Titebond etc)
  - Preferably waterproof for salad bowl

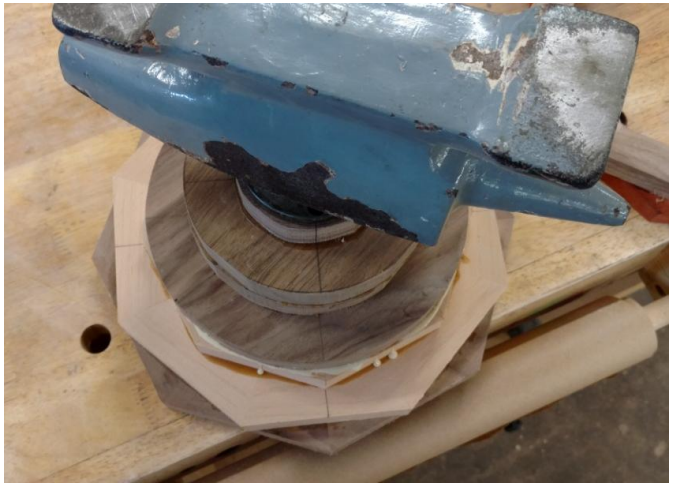
- Best to glue up entire ring at once.
  - Can do semicircle and correct joint before gluing halves together but harder to clamp
  - Important to offset joints by centering alternate segments ½ joint…lineup joints as you stack them

Step Details
Assembling Segment Rings

- Only glue up 2 or 3 segments then turn inside to finish profile, rough in outside

- Option to reverse mount a portion of bowl /vase to turn in two halves.
  - Glue on temp tennon to opposite end to accommodate turning and flattening mating surface
  - Turning in 2 halves also reduces vibration on tall vases or bowls.

- Minimal pressure needed on small mating surfaces…Use 10 # anvil or clamp as needed



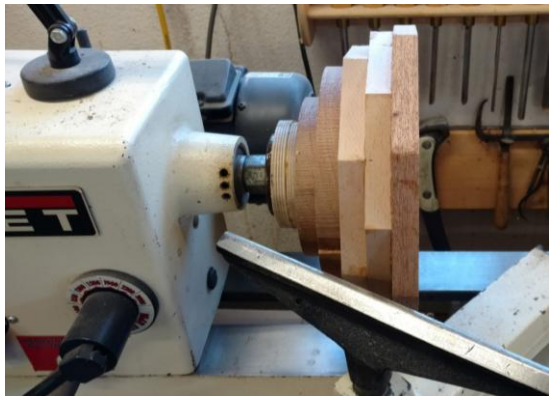
- Alternative glue up can be done on lathe
  - Use tailstock as clamp
  - Key to center /orient joints
    - Use double stick tape on a “centering” faceplate on tail stock

Step Details

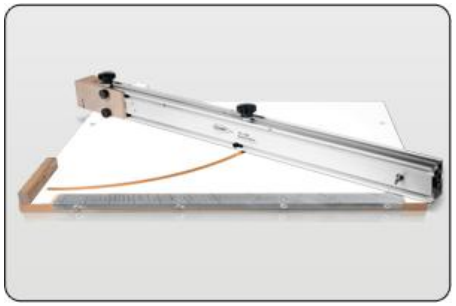
- Attaching the segmented stack to the lathe
  - Use the lathe chuck/faceplate to attach the segmented pieces to the lathe always use a sacrificial tennon that is later parted off
  - Insure the base is true, re-true as necessary

- Turn the stack to the designed shape (can and should be done in sections)
  - Use calipers to compare I/S and O/S dimensions to drawing

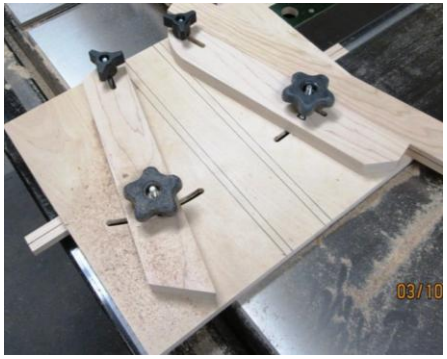
- Reverse bowl and mount in large face chuck.. Pare off tenon and finish bottom



Alternative Tools / Approaches



- Cutting Segment Angles
  - Dubby Sled
    - ~ $200, Set up/tuning required



  - Weggie Sled
    - Easy to make, challenge is accurate template

  - DIY Miter Sleds

- Combining Rings
  - Bowl Press
    - Lots on plans on the Web

Advanced Segmentation

Key Learnings

- Setting the angle on the jig to cut the segment angle is critical. We mean critical !
  - Test and retest
- Turn inside of bowl as you build the stack
  - Especially hollow form or steep walled bowls
- True base on the lathe
  - Minimize the Eiffel Tower
- Insure a solid connection to the lathe when turning
- Refresh your bowl turning skills
  - Rough internal surface can present challenges

Conclusion

- Easy to do if you follow the steps
- A drawing / design up front is critical
- Accuracy in all cuts is critical

Thank You