Segmented Wood Turning

Presented by

Steve Nagy

March 22, 2020

What is Segmented Turning

Segmented Turning is using segments of wood to create bowls, vases, plates, ribbons etc…

It is gluing wood segments together to create artistic forms, patterns and visual effects in turned projects.

Advantages of Segmented turning

- Imagination design is Unlimited
- No end grain turning
- Hollowing made easier (only sections at a time or none at all)
- You get to make Jigs
- You can use a lot of your scrap wood
- More efficient use of wood

Disadvantages of Segmented Turning

- Takes more time than normal turning. Expotentially more time the bigger the project, or the more pieces involved in the project (cutting, sanding, gluing rings, flattening rings, attaching rings, etc… etc… etc…

Segmented Turning -   DESIGN

- Have to have design to start.
  - Unlike normal turning where you throw a piece of wood on the lathe and see what you can create segementing is different.

  - You have to have a design before you can build a bowl or vase to turn.

How to design a project - Manually

1. Draw the project out on graph paper.

    - Draw the silhoutte out proportionally
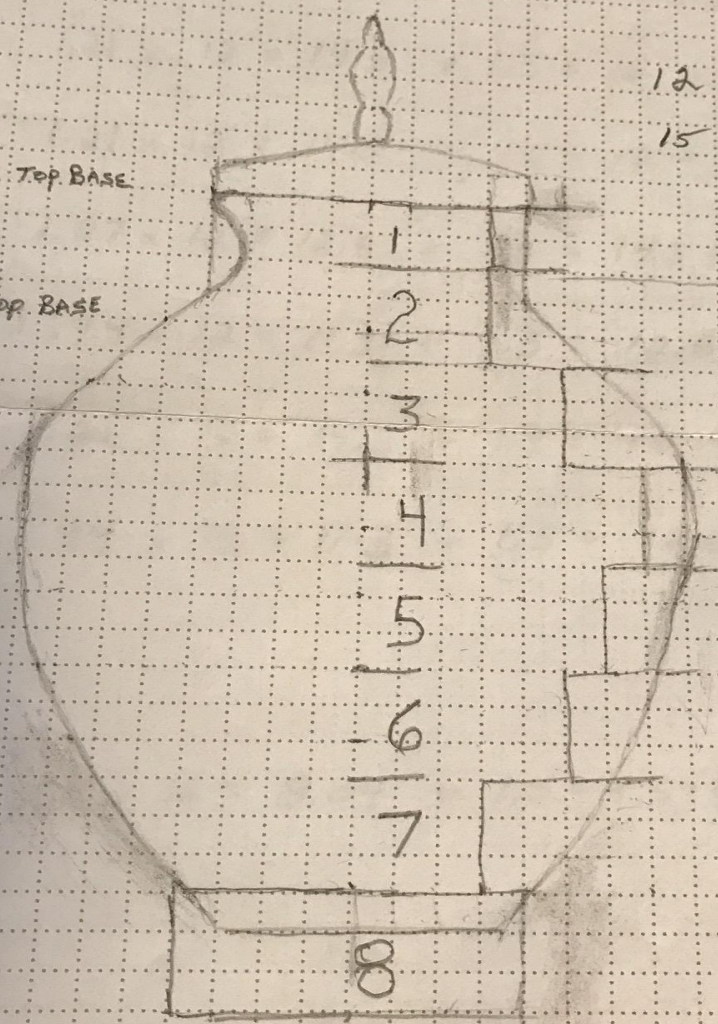   Do this first before using any software programs, so you know and understand what the program is doing for you.

Calculating how to cut each segment - Manually
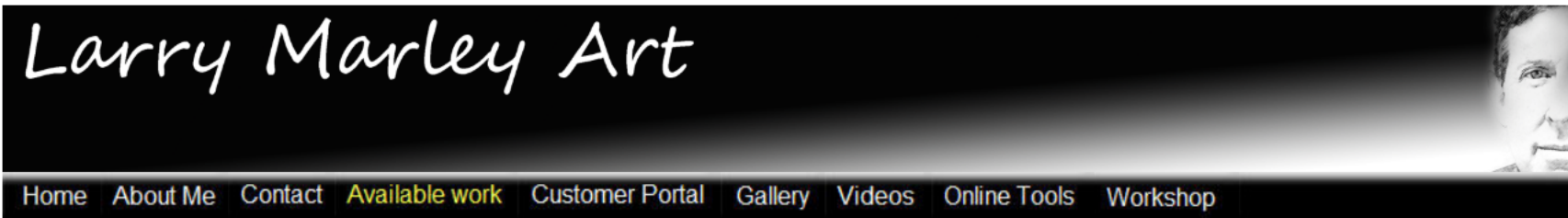
Approximate Segment Length =
(Diameter of the segment ring) x π / (Number of segments)

Example: Ring 7
Our ring is 4" diameter with 12 segments, where π = 3.14
Therefore SEL (segment length) = 4" x 3.14 / 12 = 1.04

Online Calculator – Marley Turned Segmanted Turning Calculator

Electronics, Cars, Fashion, Collect: ✕ | AOL - News, Weather, Entertainm ✕ | 🍎 iCloud Photos ✕ | 🌐 Segmented Turning Calculator ✕ | +

← → C | 🔒 marleyturned.com/Shop_Utilities.html

▦ Apps | 🗁 Imported From IE | 🗁 Motorcycle | 🚋 Saint Charles Misso… | 🗁 Woodturning | G | 🗁 Sunday school | 🗁 Other bookmarks

Larry Marley Art

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Shop Utilities

These Utilities are free, and worth every penny....

Use at your own risk.

Segmenting Intro

Utility Tutorial

MarleyTurned Segmented Turning Calculator 5.4
Valid Formats: Decimal .125, 2.5, or Fractions 1/8, 2 1/2

Shop Calculators

Project Name:	Untitled
Ring Number:	1
Ring Height:	3/4
Wall Thickness (measured segment width):	1/2 — What is this?
Ring Diameter (outside diameter):	4
Number of Segments:	12
Glue up Tolerance:	1/8
Saw Blade Kerf:	1/8
Cutting Method:	Economy (flip each cut) ▾
Display Results As:	Fractions ▾
Comments:	
Wood Species:	Add Wood Species/Price below. (optional) ▾
ADD Wood Species:	Price / BF: $ [ ] [ ] Add	Load Defaults

Calculate | Print Results | Export to CSV | Save Project | Load Project | Load Wood Data | TS Export | Clear

Electronics, Cars, Fashion, Collect × | AOL - News, Weather, Entertainm × | iCloud Photos × | Segmented Turning Calculator × | +

marleyturned.com/Shop_Utilities.html

Apps | Imported From IE | Motorcycle | Saint Charles Misso... | Woodturning | G | Sunday school | Other bookmarks

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Comments:	
Wood Species:	Add Wood Species/Price below. (optional) ▾
ADD Wood Species:	Price / BF: $ ____ Add Load Defaults

Calculate | Print Results | Export to CSV | Save Project | Load Project | Load Wood Data | TS Export | Clear

Project Name: Untitled

	Ring	Ring Height	Ring Dia.	Wall Thickness	Segs	Angle	Seg Length	RIP Width / Seg Width	Cutting Method	Board Length	Miter Zone	BoardFT ---- Price	Comments
Delete / Edit	1	3/4	4	1/2	12	15	1 1/8	13/16	Economy	13 1/8	3/16	0.05BF	

Project Price: $0.00

Values displayed in yellow are used to dimension stock to be cut into segments

IMG_5468.jpeg | IMG_5467.jpeg | IMG_5466.jpeg | Show all

Type here to search

4:16 PM
3/9/2020

How to design a project

2. Use Software Programs
   - Segment Project Planner ($35.00)
     Bill Kandler bkandler@segmentedturning.com
   - Segment Pro ($79.00)
     Llyod Johnson -   woodturnerpro.com
   - Segment Pro, Woodturner Pro, Lamination Pro,
     Free 3D design ($139.00)

Insert Page showing Segment Project Planner

File   Edit   View/Select   Calculate   Help

Project File: C:\Users\snagy\Documents\SPP\Projects\Steve Vase 8 wide.spr

New

Saw Width: 0"
Cutting Accuracy: 1/32"
Glue-Up Tolerance: 0"

Cutting Mode: ● Economy   ○ Grain Matching

Units: English, in., fractional

Lyr	Sides	Layer Height	Outer Diameter	Wall Thickness	Gap Width	Gap Count	Gap Material	Side Incline	Stagger	Material Thickness	Miter Angle	Blade Tilt	Edge Length	Board Length	Board Width	GlueUp Diameter
1	12	3/4"	4-19/32"	1-1/2"	0"		Air			3/4"	15.000°		1-7/32"	10-9/16"	1-19/32"	4-3/4"
2	12	3/4"	6-3/32"	1-13/16"	5/32"	12	Cherry		15	3/4"	15.000°		1-15/32"	13-1/32"	1-15/16"	6-5/16"
3	12	3/4"	6-3/4"	1"	1/16"	12	Cherry		15	3/4"	15.000°		1-3/4"	18-5/32"	1-1/8"	7"
4	12	3/4"	7-5/16"	3/4"	1/16"	12	Cherry		15	3/4"	15.000°		1-29/32"	20-5/8"	7/8"	7-9/16"
5	12	3/4"	7-13/16"	3/4"	1/16"	12	Cherry		15	3/4"	15.000°		2-1/32"	22-1/8"	7/8"	8-3/32"
6	12	3/4"	8"	19/32"	0"					3/4"	15.000°		2-5/32"	23-7/8"	3/4"	8-9/32"
7	12	3/4"	8"	19/32"	0"					3/4"	15.000°		2-5/32"	23-7/8"	3/4"	8-9/32"
8	12	3/4"	8"	19/32"	0"					3/4"	15.000°		2-5/32"	23-7/8"	3/4"	8-9/32"

Display Type >>   ○ Project Outline   ● Project Detail   ○ Current Ring   ○ Local Rings

Print   ↺   Proj Parms

Solid Color   Paint Ring   Open Project
Seg Design   Paint All   Save Project
Seg Image   Paint Bckgrnd   New Project

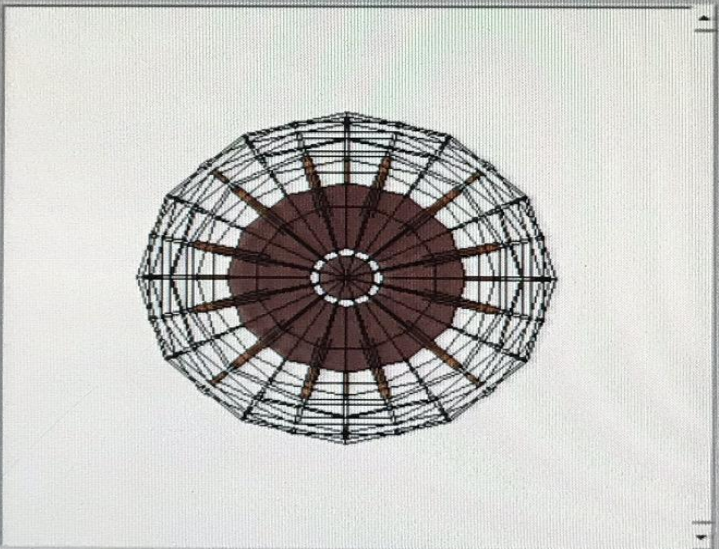Split Layer   Clear Ring   Preferences
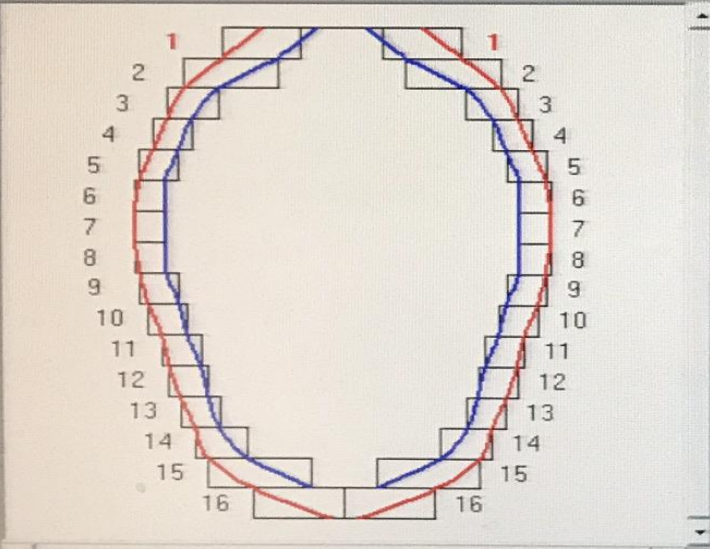Combine Lyrs   Clear All

Substitute   Exit

Turning Rpt.

Current Color

Layer 1   Side View   1X 2X 3X 4X 5X 6X 7X   Top View

Displaying Project

Proj. Hgt.: 12"   Proj. Cost: $1.27   Min. Wall: 15/32"   Min. Lyr.: 14

Steve Small Vase - WOODTurner PRO

File Edit View Project Help

Seg   Row   150%   Prev Page   Next Page

1   Disk

My Plan

Row Details

Board Thickness   1/2"

Outside Diameter   2-1/2"
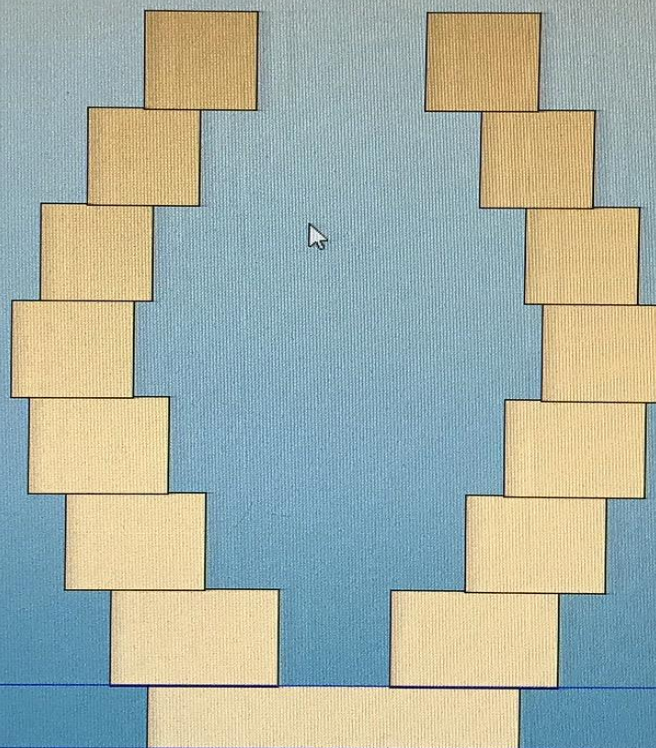
Species   Ash

Calculations

Notes:

New Row   Delete Row

Project Properties

Profile SNAP!

☑ Open segments are: 4

☑ Paint repeats per row.

Vertical Spacers: Walnut

Multi-Row Resize:
◉ Proportional   ○ Specifi
○ Uniform

📁 Photos
📁 Plans
   ✛ My Plan
📁 Supporting Files
📁 Credits
   ✱ Author

Keyboard Shortcuts

Click	Select Segmen
Shift-Click	Select Segmen
Dbl Click Select Row	
Right Click	Paint Segments
Left, Right	Outside Diamete
Ctrl-Left, Right	Inside Diameter
Up, Down	Change Rows
Ctrl-Up, Down	Change Height
X	Reset Rpecies:
Shift-X	Reset Species:

Ready

Arrow keys: left/right adjusts diameter   h: 5-3/4"   w: 4-3/8"   Total Volume³: 19-3/4" | Selected Volume³:

Slide 11 of 31   Notes   Comments

w is the center of the Lathe.   X:141 ; Y:932   Polygons: 1495   Points: 16

Insert Page showing Segment Pro
And Woodturner pro

Cutting Summary - Steve Small Vase

R#	Row Type	Species (Default)	Segs	Board Thickness	Outside Diameter	Inside Diameter	Edge Length	Vertical Spacer	Board Width	Econ. Bd. Length	Grain Match	Miter Angle	Blade Tilt	Slope	S1	S2
8	Flat	Ash	12	3/4"	2-5/8"	1-1/8"	11/16"		3/4"	7-11/16"	9-15/16"	15°			12	
7	Flat	Ash	12	3/4"	3-3/8"	1-7/8"	7/8"		13/16"	10-1/16"	12-3/8"	15°			12	
6	Flat	Ash	12	3/4"	4"	2-1/2"	1-1/16"		13/16"	12"	14-3/8"	15°			12	
5	Flat	Ash	12	3/4"	4-3/8"	2-3/4"	1-3/16"		7/8"	13-1/16"	15-9/16"	15°			12	
4	Flat	Ash	12	3/4"	4-1/8"	2-1/4"	1-1/8"		1"	11-7/8"	14-3/4"	15°			12	
3	Flat	Ash	12	3/4"	3-5/8"	1-3/4"	1"		1"	10-5/16"	13-1/8"	15°			12	
2	Flat	Ash	12	3/4"	3"	3/4"	13/16"		1-1/8"	7-13/16"	11-1/8"	15°			1	
1	Disk	Ash	1	1/2"	2-1/2"											

Calculate Lumber Needed

- For each ring add the length of each segment times the number of segments, plus the width of your saw blade times the number of segments, then add 2-3 inches for your fingers to have something to hold on to for the last piece.
    - Example:
- 12 x 1.5"= 18" plus 1/8 x 12 = 1.5" Total= 18 + 1.5 + 3 = 22.5"
    - (12 segmnets)   (1/8" saw blade width) (3" fingers)
- You need a board length of 22.5" to complete this one ring.

Create a cutting list

Cutting Summary - Steve Small Vase

R#	Row Type	Species (Default)	Segs	Board Thickness	Outside Diameter	Inside Diameter	Edge Length	Vertical Spacer	Board Width	Econ. Bd. Length	Grain Match	Miter Angle	Blade Tilt	Slope	S1	S2
8	Flat	Ash	12	3/4"	2-5/8"	1-1/8"	11/16"		3/4"	7-11/16"	9-15/16"	15°			12	
7	Flat	Ash	12	3/4"	3-3/8"	1-7/8"	7/8"		13/16"	10-1/16"	12-3/8"	15°			12	
6	Flat	Ash	12	3/4"	4"	2-1/2"	1-1/16"		13/16"	12"	14-3/8"	15°			12	
5	Flat	Ash	12	3/4"	4-3/8"	2-3/4"	1-3/16"		7/8"	13-1/16"	15-9/16"	15°			12	
4	Flat	Ash	12	3/4"	4-1/8"	2-1/4"	1-1/8"		1"	11-7/8"	14-3/4"	15°			12	
3	Flat	Ash	12	3/4"	3-5/8"	1-3/4"	1"		1"	10-5/16"	13-1/8"	15°			12	
2	Flat	Ash	12	3/4"	3"	3/4"	13/16"		1-1/8"	7-13/16"	11-1/8"	15°			1	
1	Disk	Ash	1	1/2"	2-1/2"											

Calculating the Angle to cut

- There are 360 degrees in a circle.
- Take the number of segments you want and divide that into 360. Then divide that by 2 (because you are going to cut an angle on both sides of the segment.
- Example:
  - 360 / 10 = 36 degrees / 2 = 18 degrees for each side of segment.
  - 360 / 12 = 30 degrees / 2 = 15 degrees for each side of segment.
  - 360 / 24 = 15 degrees / 2 = 7.5 degrees for each side of segment.
  - 360 / 48 = 7.5 degrees / 2 = 3.75 degrees for each side of segment.

Cutting the Angle

Many ways to cut the segmented angle

- Chop Saw (Set angle and use stop block)
- Band Saw (Set Fence to angle & segment length)
- Table Saw (Set angle and use stop block)
  - You can use a miter gauge but will need an extension to reach the blade (risky with hands too close to blade).
  - Much better to use a Sled with adjustable angle fence.
- Test cut full ring of 12 segments making sure there are no gaps in the ring.

Sleds for Table Saw

Simple Adjustable Angle Sled

Video was shown during the live demo. Check the library for a DVD of the demo.

Wedgie sled – Everything Changes

Beauty is you get perfect circle every time

BUT
- Set to full angle using the wedgie sled
- Must mark top of board and Do NOT flip board
- Do not flip board
- Center angle on sled as much as possible or you will not get the diameter ring you are expecting
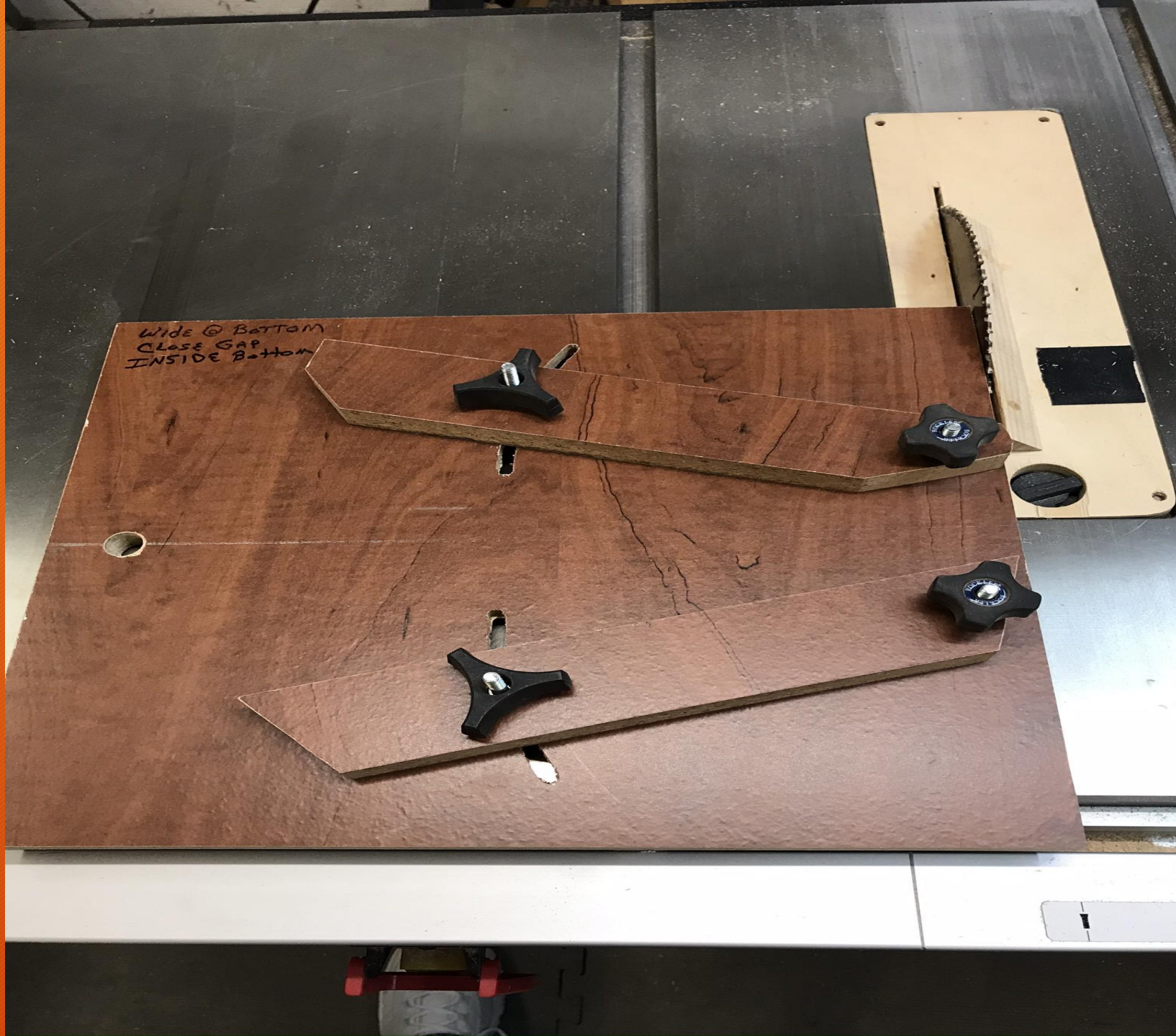
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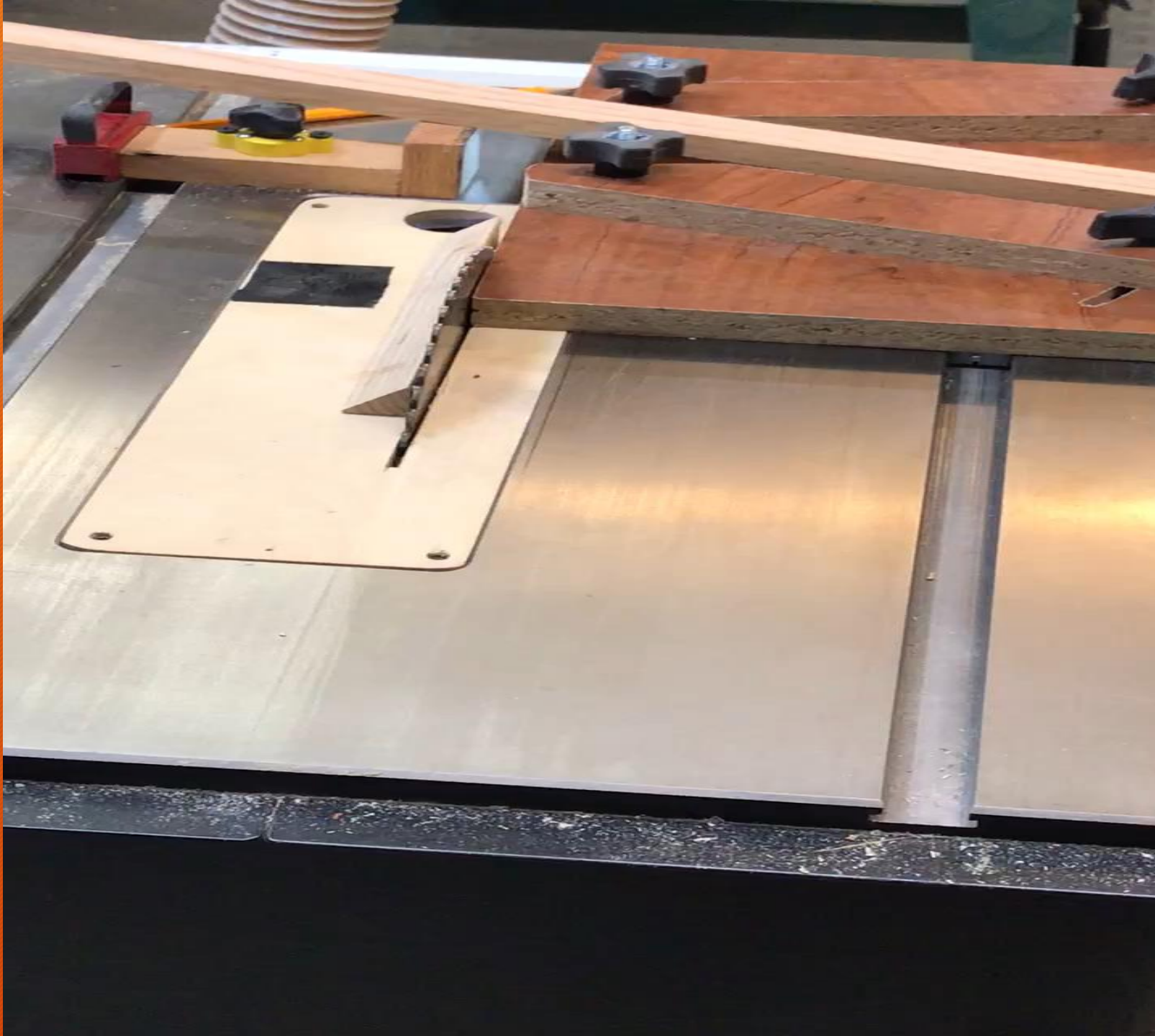
Assembling the Rings

- Clean off all the fuzz. Simple light sanding.
- Put all 12 segments together and check for gaps
- Even though you checked angle before cutting there are several reasons why a few rings may not come out perfect.
  - Board not tight against fence
  - Board not tight against stop block
  - Board sanded too much when removing fuzz, etc…

- Perfect Ring with no gaps – Glue it up

- Gap in Ring – Glue it up in 2 halves
  - Then sand the halves on a flat surface or disk sander, then glue up the 2 halves.
  - Be careful to sand Only as much as needed to make flat to surface.
    - Sanding will shorten ring, and will make is somewhat oblong if you take toooo much off.

Holding Rings together

- Rubber Bands

- Zip Ties

- Hose Clamps

- Rub Joint

- Twisted Roap

Stacking Rings

- Must flatten at least one side
  - Belt Sander
  - Flat Sand paper on board
  - Big disk sander

Building the Vase on the Lathe

- Solid Disk or Segmented Disk, attach to Face Plate
- Center and glue flat side of ring 1 to the base and use tailstock to press ring to base.
- Let glue set 15 to 20 Minutes
- Face off ring 1 flat
- Glue flat side of ring 2 to ring 1 alternating glue joints block style
- Use tailstock to press rings together
- Let glue set 15-20 minutes
- Etc… etc… etc…

Alternate way to build Vase

- If you have a drum sander or some other way of getting Both sides of the rings flat, you can stack and press as many rings together as you feel comfortable with doing.

- Use hot glue and small scrap pieces of wood to hold rings in place while gluing and pressing rings together.

- You can use any kind of weight to put on top of stack you have laying around. Weights, Buckets filled with stuff, Machinery you can balance

You can make a Segmented Ring Press. Several Youtube videos showing how to build these. This is where I got the info on building this one.

Turning the Vase

- You can build the vase then turn it just as you would any solid wood vase

- BUT WHY

- After 3-4 rings are attached turn the inside. Nothing is in your way. It is simple open turning. You have complete access to the bottom of the vase. You use straight tools to make it a smooth as you can.

- Add 3-4 more rings and turn again
- When the vase starts getting smaller in diameter you can turn as you would a normal solid vase

- BUT WHY

- Turn the top part of the vase the same as you do the bottom.
- Build the vase in 2 sections then simply join the two sections together in the middle

- This way you have NO hollow turning involved. Yet you have a completed hollow turned vase

Gallery

Limited only by your Imagination
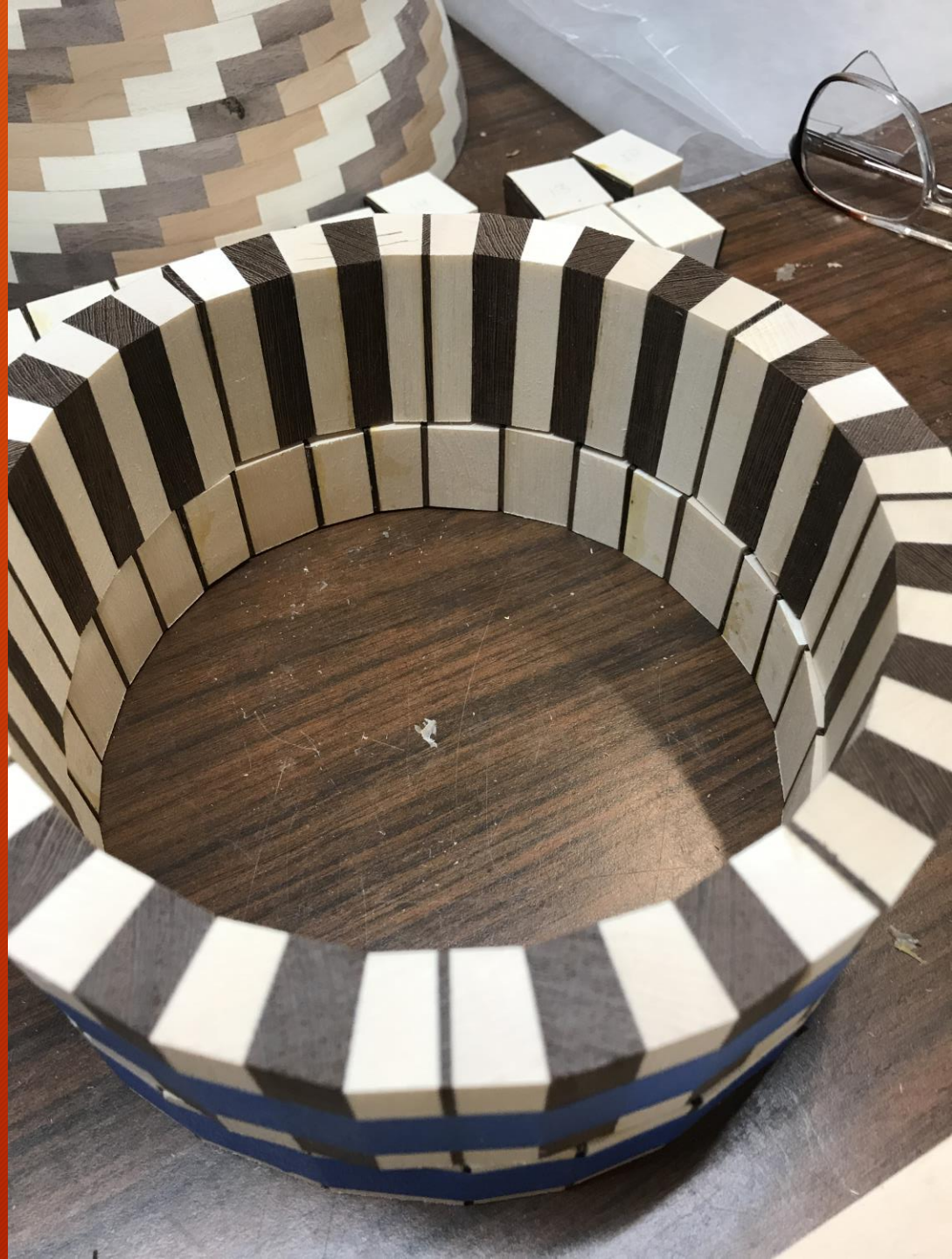Start simple and small
Then test your skills larger

Questions ????