

Turnings from Segments

First: Rings versus Staves

- ▶ **There is a difference**
- ▶ **Rings of segments**
 - ▶ *What we're doing here!*
- ▶ **Stave construction**
 - ▶ **Similar but different**
- ▶ **They can be combined with care.**

Segmented and Staved

Stave Vessel

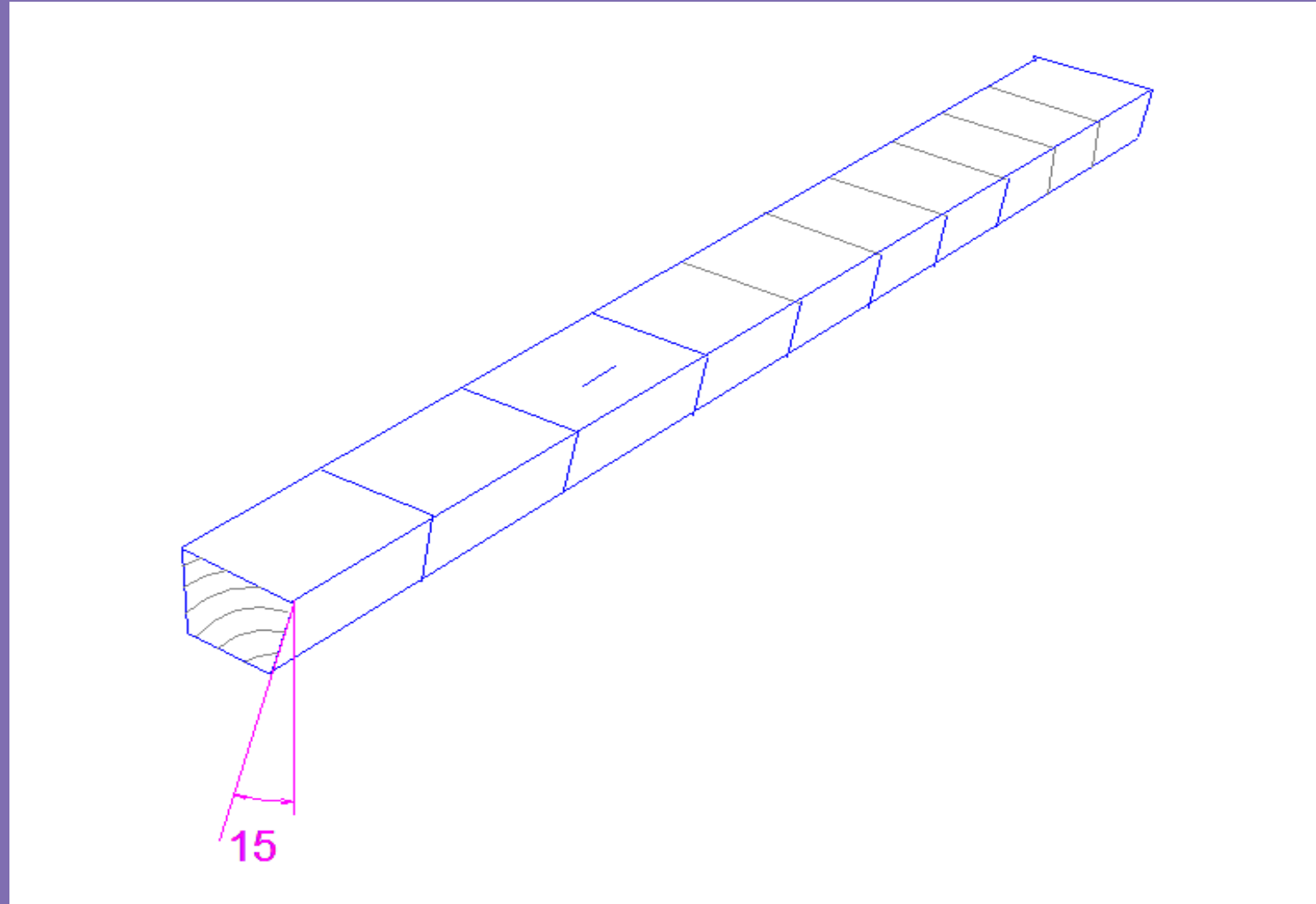


Straight Staves

Segment/Stave Mix

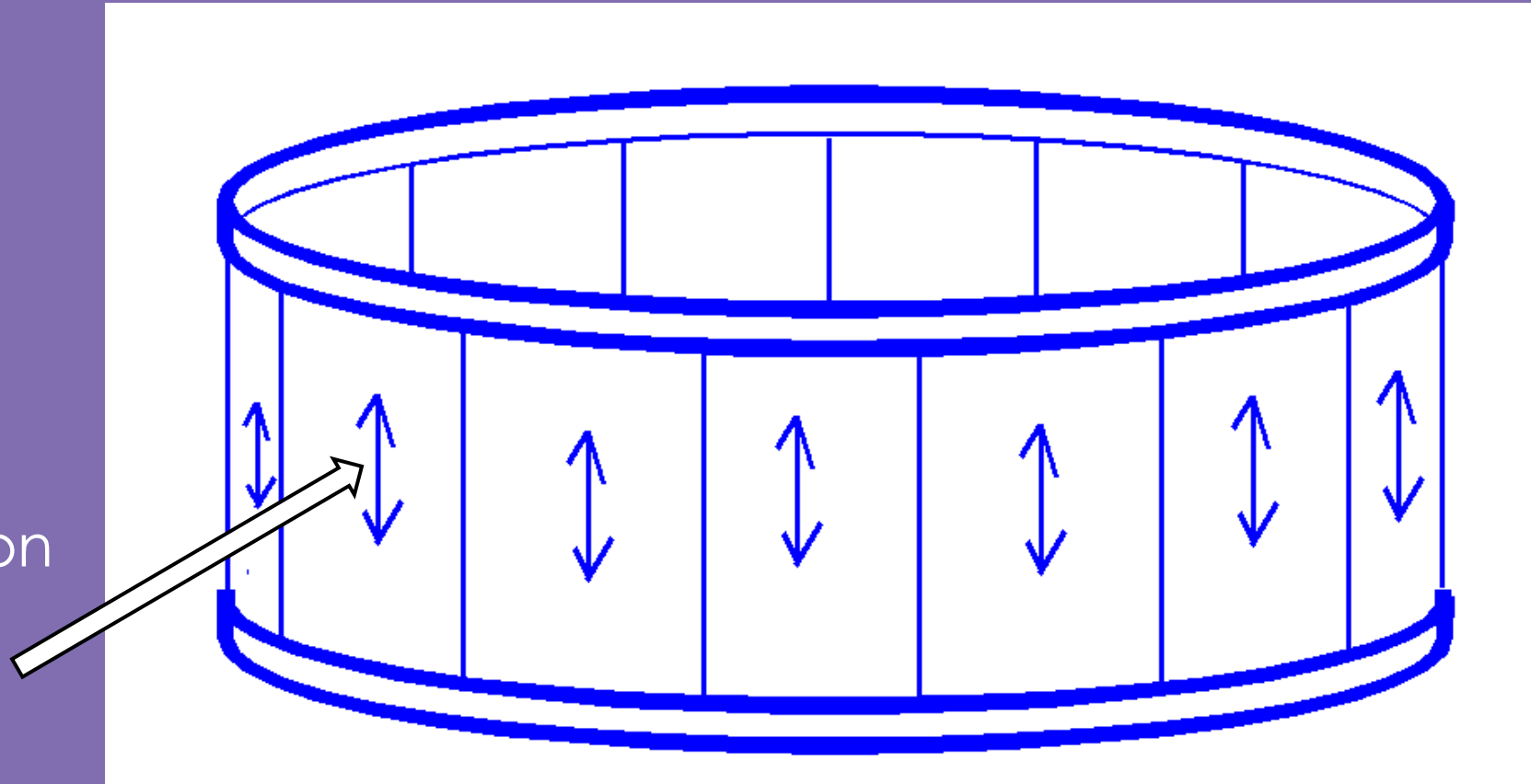


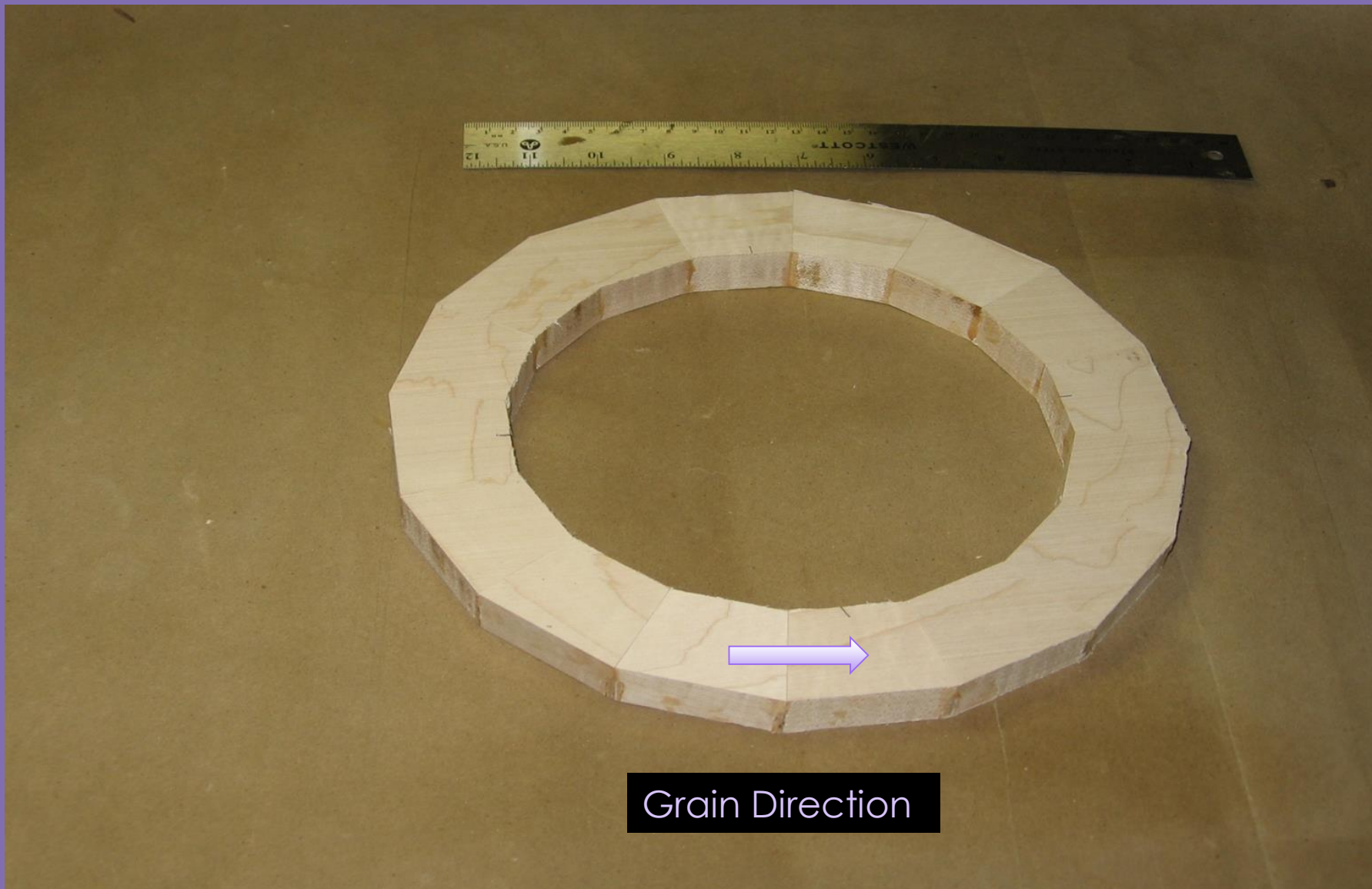
Stave Construction



Stave Construction

Grain
Direction





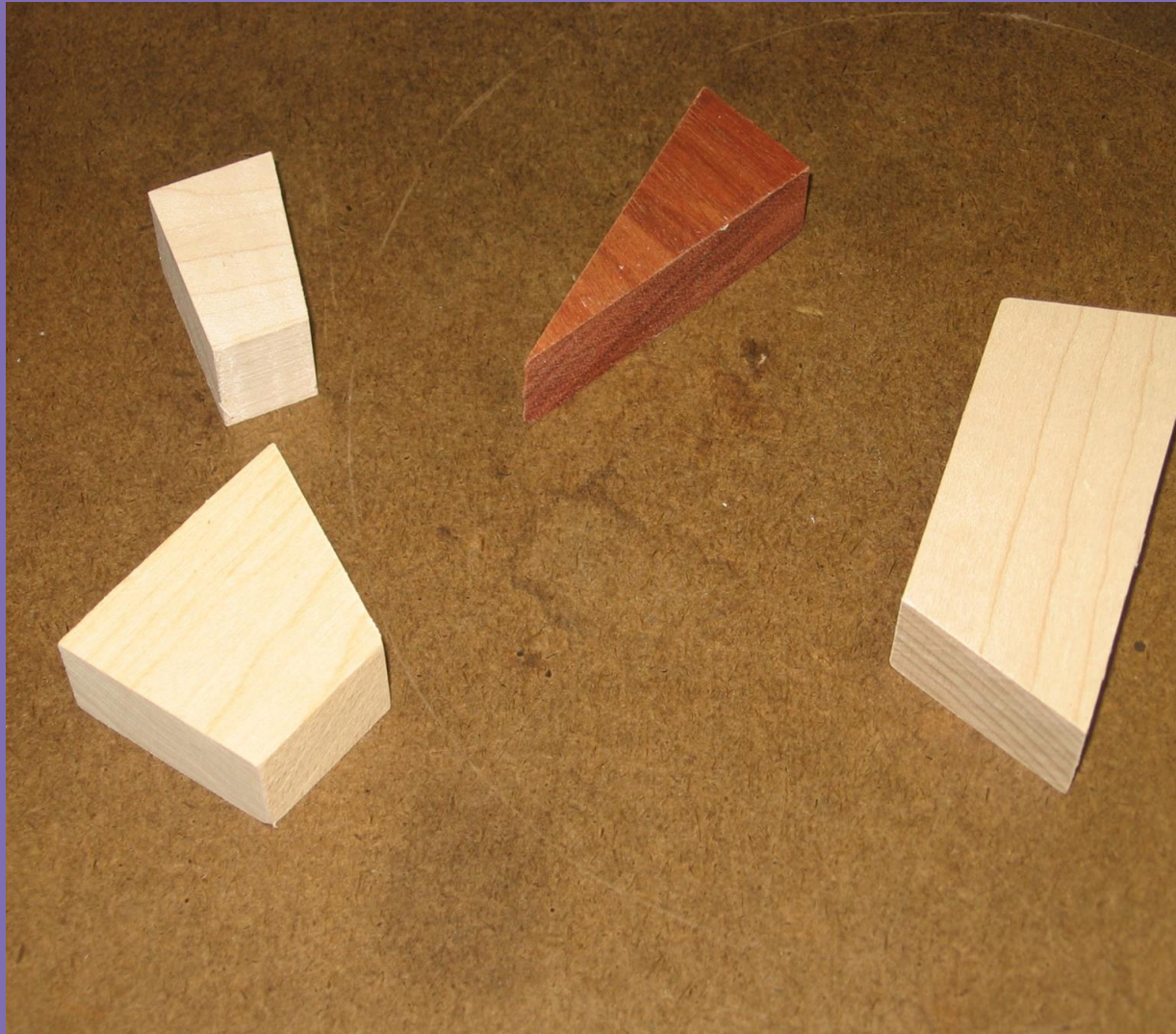
A Ring of 16 Segments

Segments & Staves

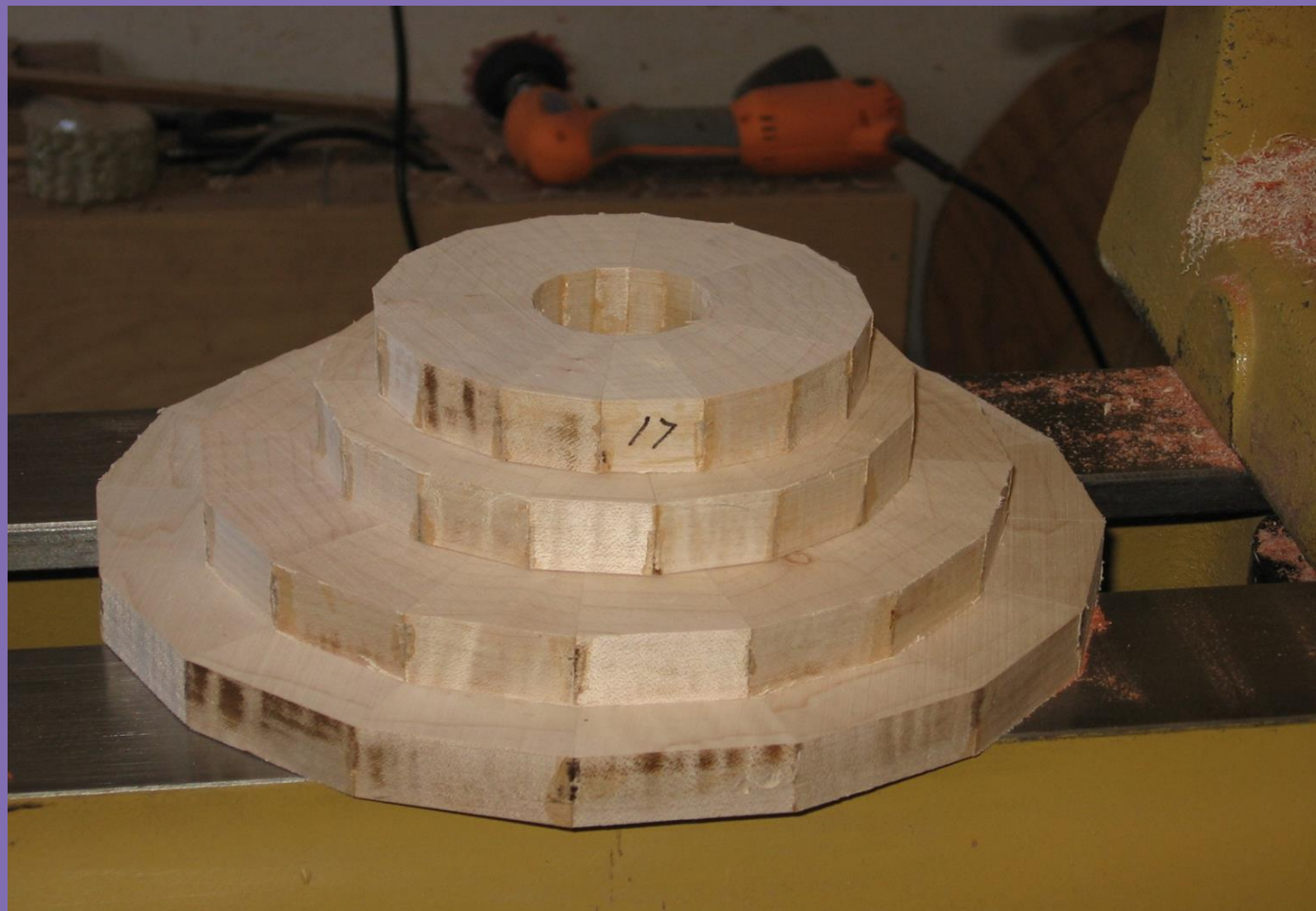
Watch for weak glue joints



Tilted Staves



Examples of Segments

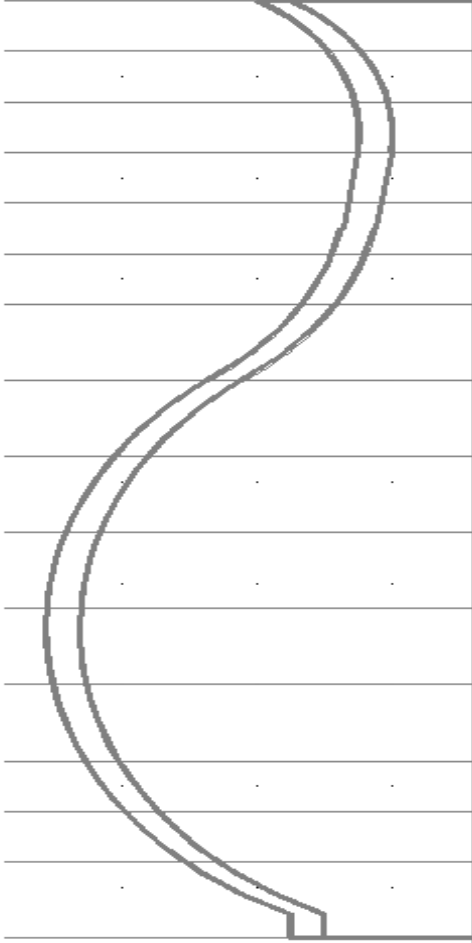


Stacks of Rings

The Process

- Design – Shape, Size, Features
- Detailing – Create the Cut List
- Collect and Mill the Lumber
- Cut Segments
- Make Rings
- Assemble Rings into Stacks
- Turn the Stacks

Detailing Sheet



#	R	W	T	N	Ca	SL
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Understanding Segments



Critical Parameters

Ca == Cut Angle

SL == Segment Length



The 'not so critical' parameters

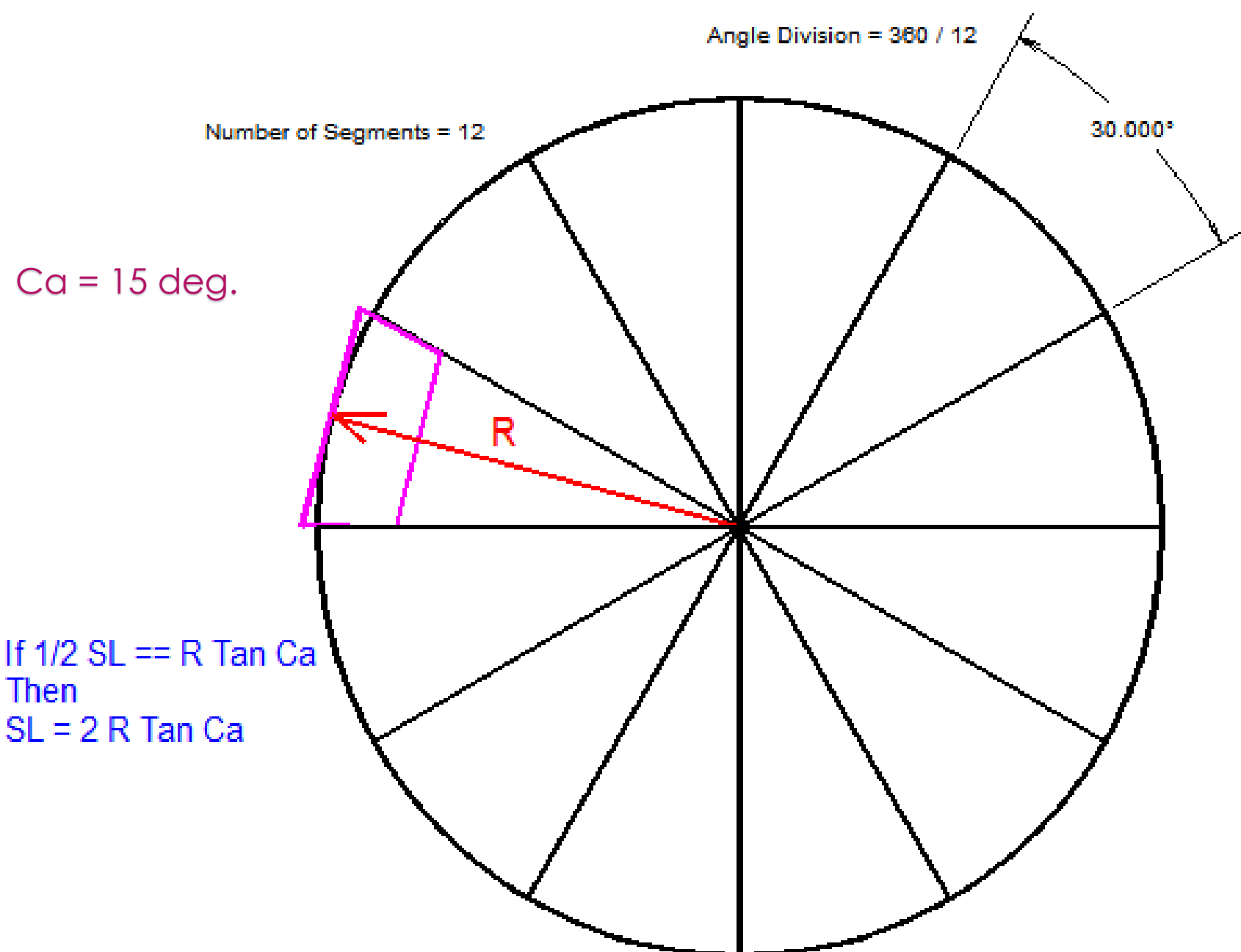
W == Width

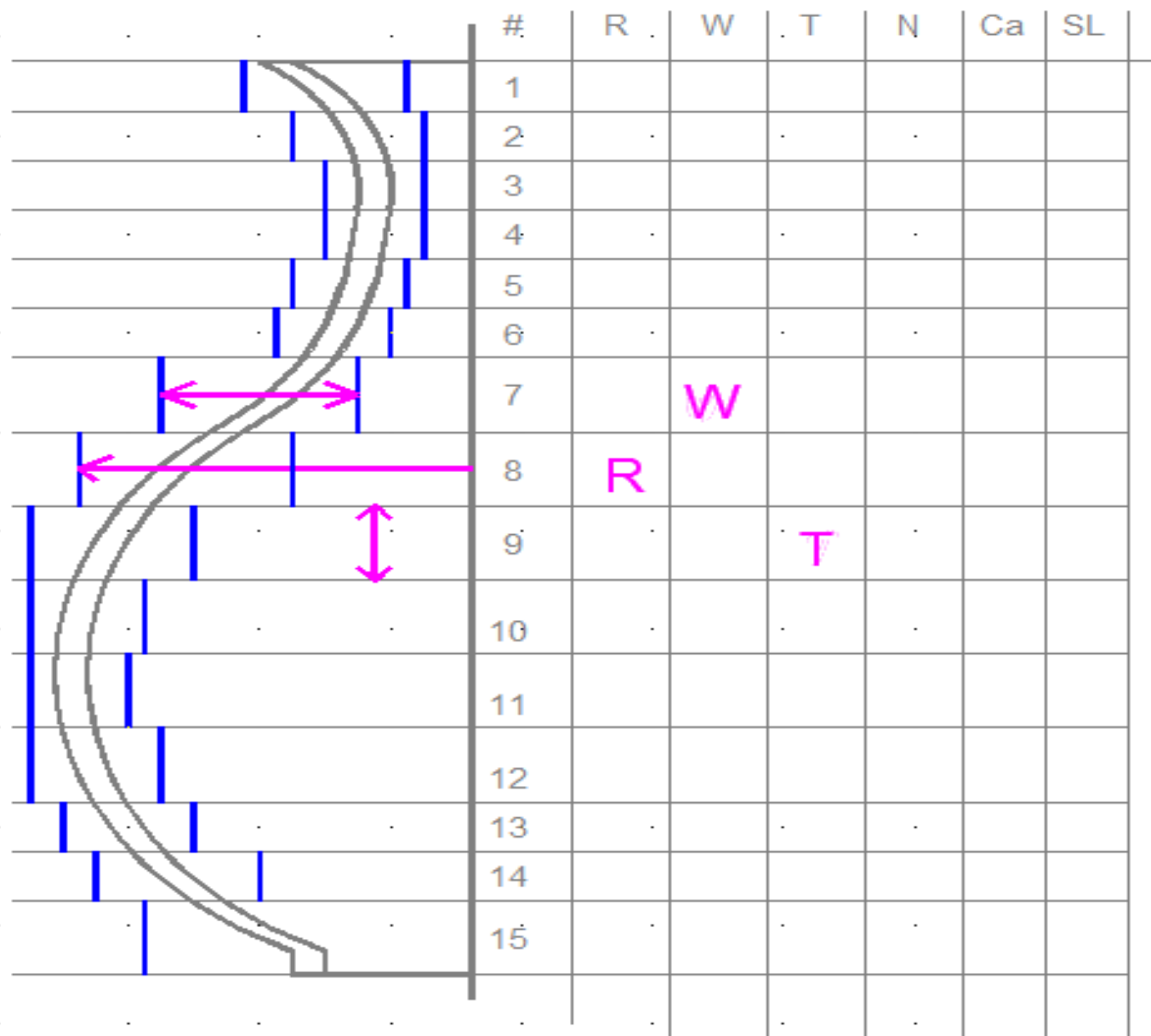
T == Thickness

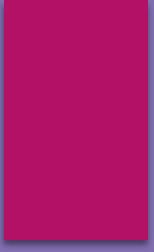
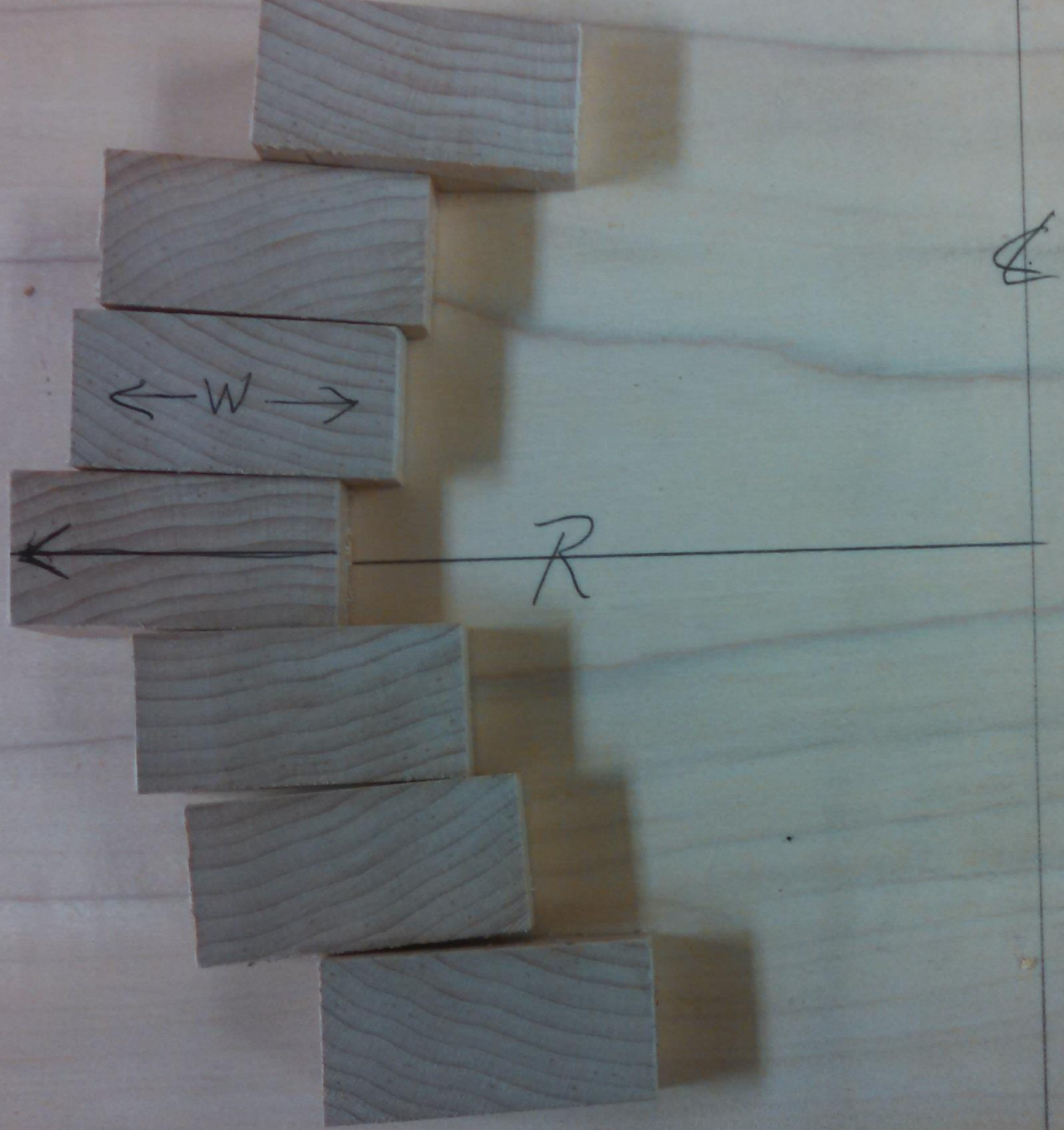


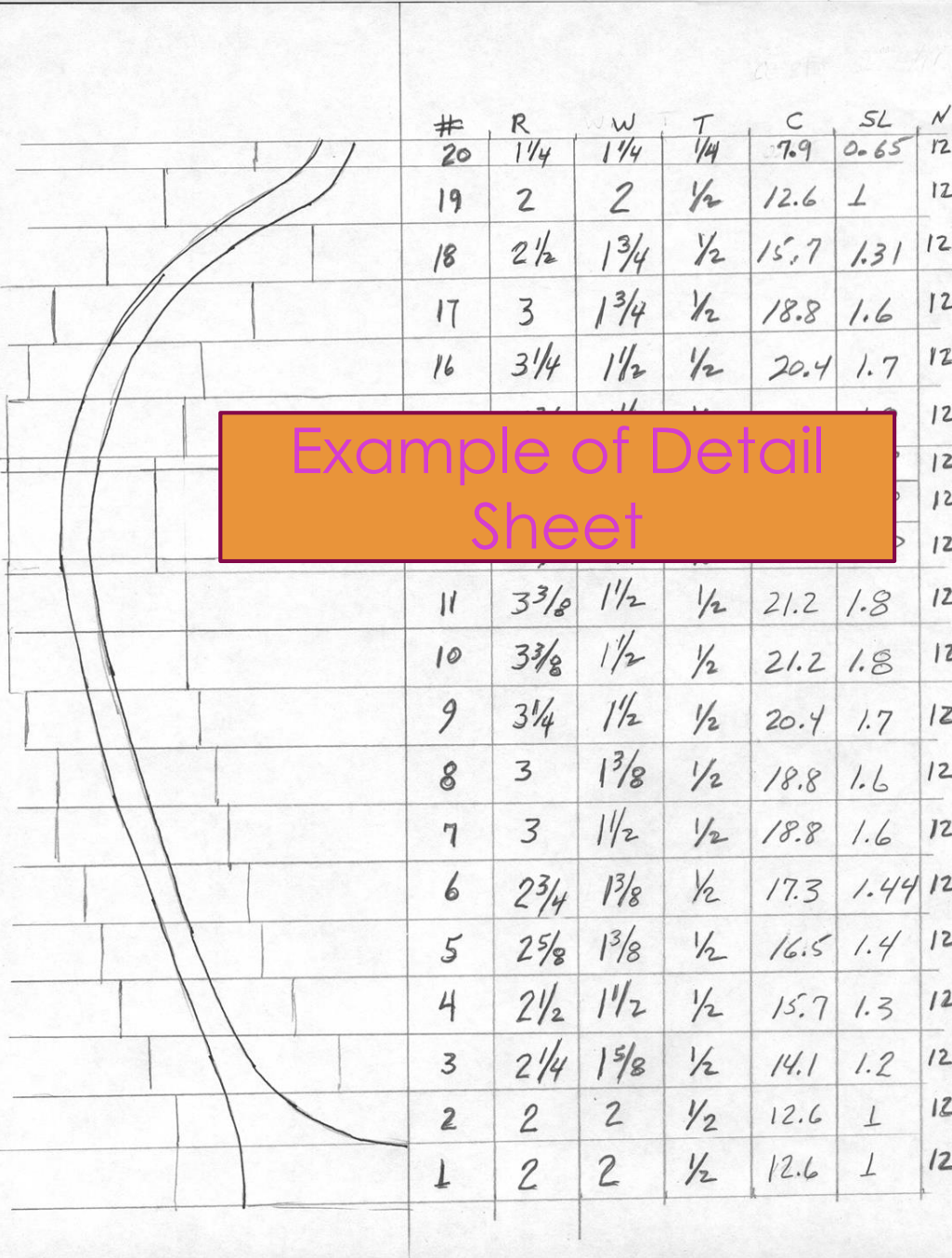
$\langle CA \rangle$

SL









#	R	W	T	C	SL	N
20	1 1/4	1 1/4	1/4	7.9	0.65	12
19	2	2	1/2	12.6	1	12
18	2 1/2	1 3/4	1/2	15.7	1.31	12
17	3	1 3/4	1/2	18.8	1.6	12
16	3 1/4	1 1/2	1/2	20.4	1.7	12
						12
						12
						12
						12
11	3 3/8	1 1/2	1/2	21.2	1.8	12
10	3 3/8	1 1/2	1/2	21.2	1.8	12
9	3 1/4	1 1/2	1/2	20.4	1.7	12
8	3	1 3/8	1/2	18.8	1.6	12
7	3	1 1/2	1/2	18.8	1.6	12
6	2 3/4	1 3/8	1/2	17.3	1.44	12
5	2 5/8	1 3/8	1/2	16.5	1.4	12
4	2 1/2	1 1/2	1/2	15.7	1.3	12
3	2 1/4	1 5/8	1/2	14.1	1.2	12
2	2	2	1/2	12.6	1	12
1	2	2	1/2	12.6	1	12

Example of Detail Sheet

Mixing Segments

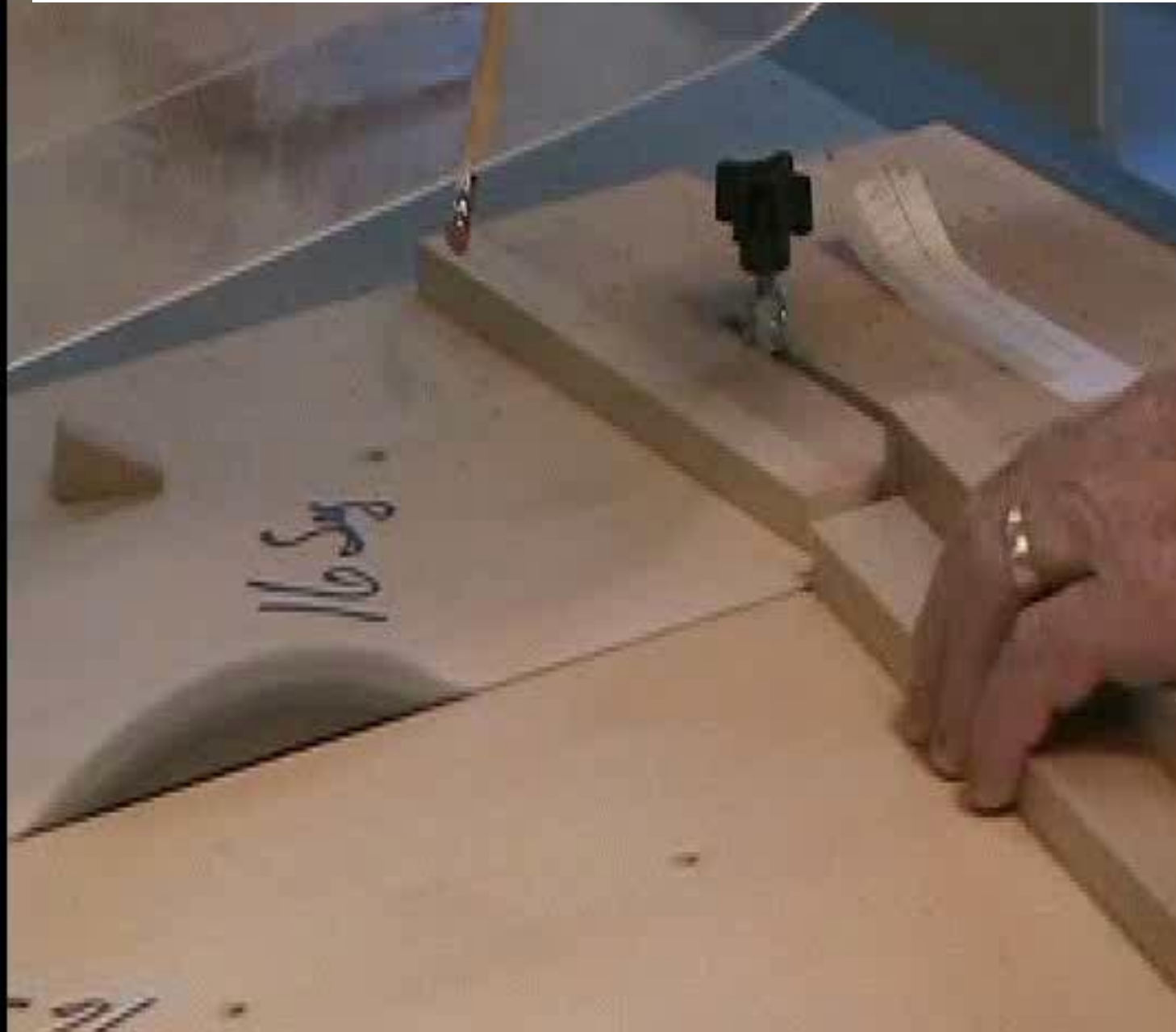
- ▶ As a general rule:
 - ▶ Segments are in even multiples
 - ▶ Mix 4 segment rings with 8, 16, 32 segment rings
 - ▶ Mix 6 segment rings with 12 or 24 segment rings
 - ▶ Mix 10 segment rings with 20 or 40 segment rings
 - ▶ Segments need not be even numbers though
 - ▶ Mix 9 segment rings with 18 segment rings
 - ▶ Mix 7 segment rings with 14 segment rings
 - ▶ Don't let rules inhibit your creativity

Collect and Mill the Lumber

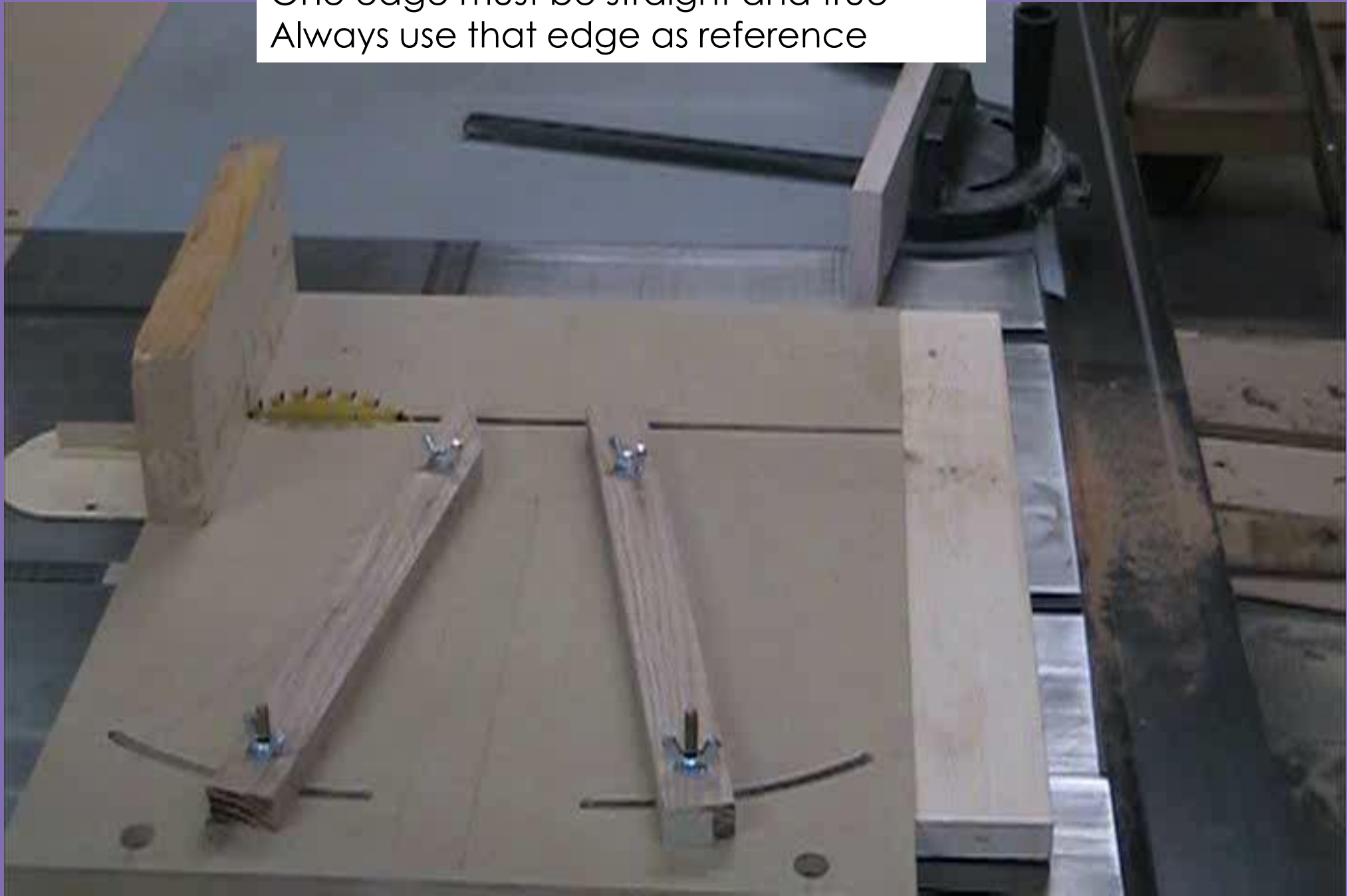
- **This is not your wood scraps**
- **Select lumber to accomplish your design**
- **Cut to length and width and mill just like for Furniture**
- **Straight and true / edges square with faces**
- **Mark each piece for its intended ring**



Workpiece must be straight, true, and edges parallel



One edge must be straight and true
Always use that edge as reference



Dry Fit

Sanding Review

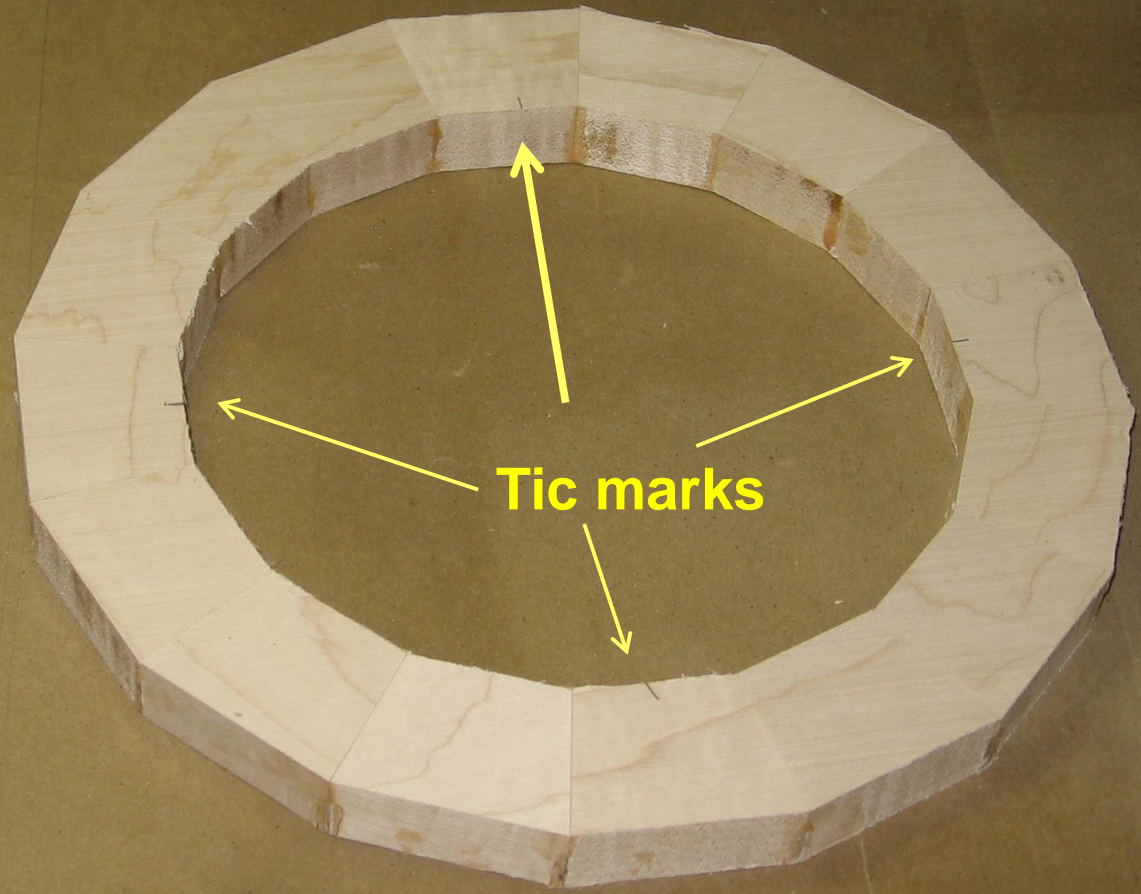
- **Key is flat and parallel sides**
- **Drum Sander (~100 grit)**
- **Sanding on the Lathe with Flat Board**
- **Tooling on the Lathe (Advanced Skill)**



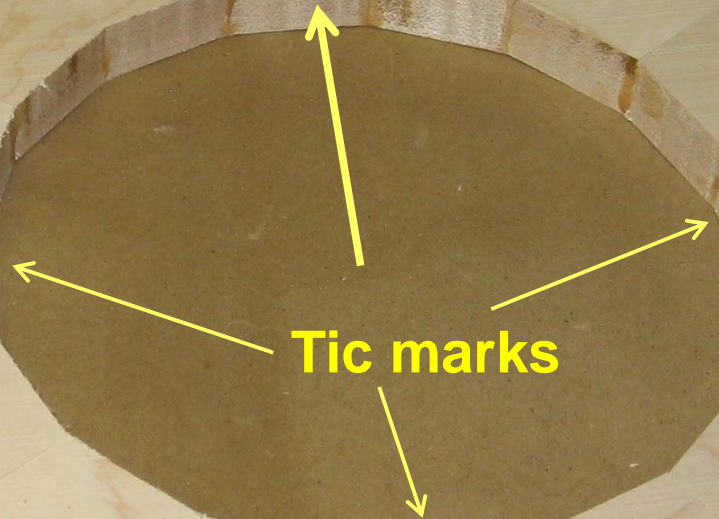
Sanding
Alternate

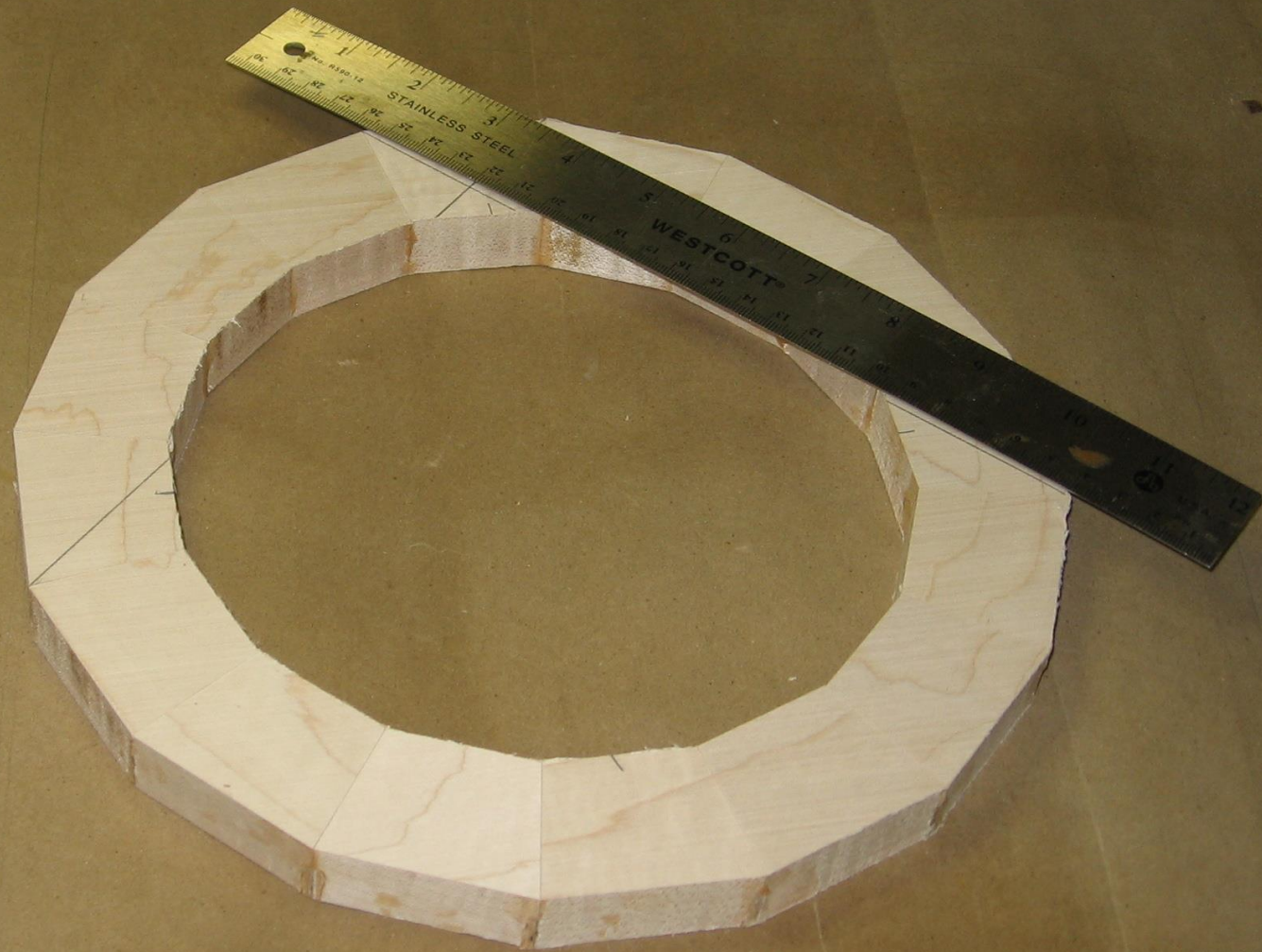
Attach Disks into stacks

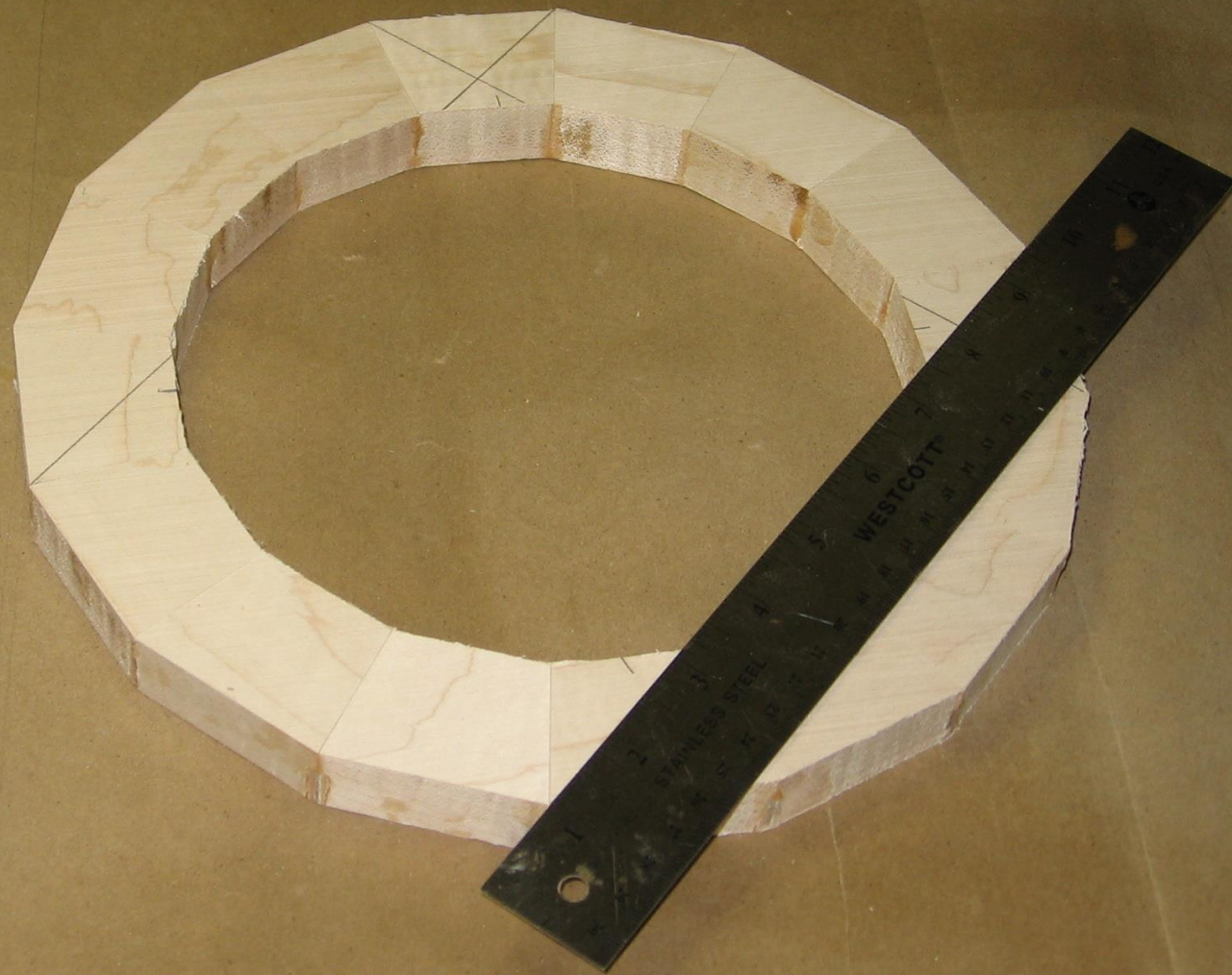
- ▶ Pairs
- ▶ Then 2 pairs
- ▶ Etc.
- ▶ Match glue joints to center of next ring

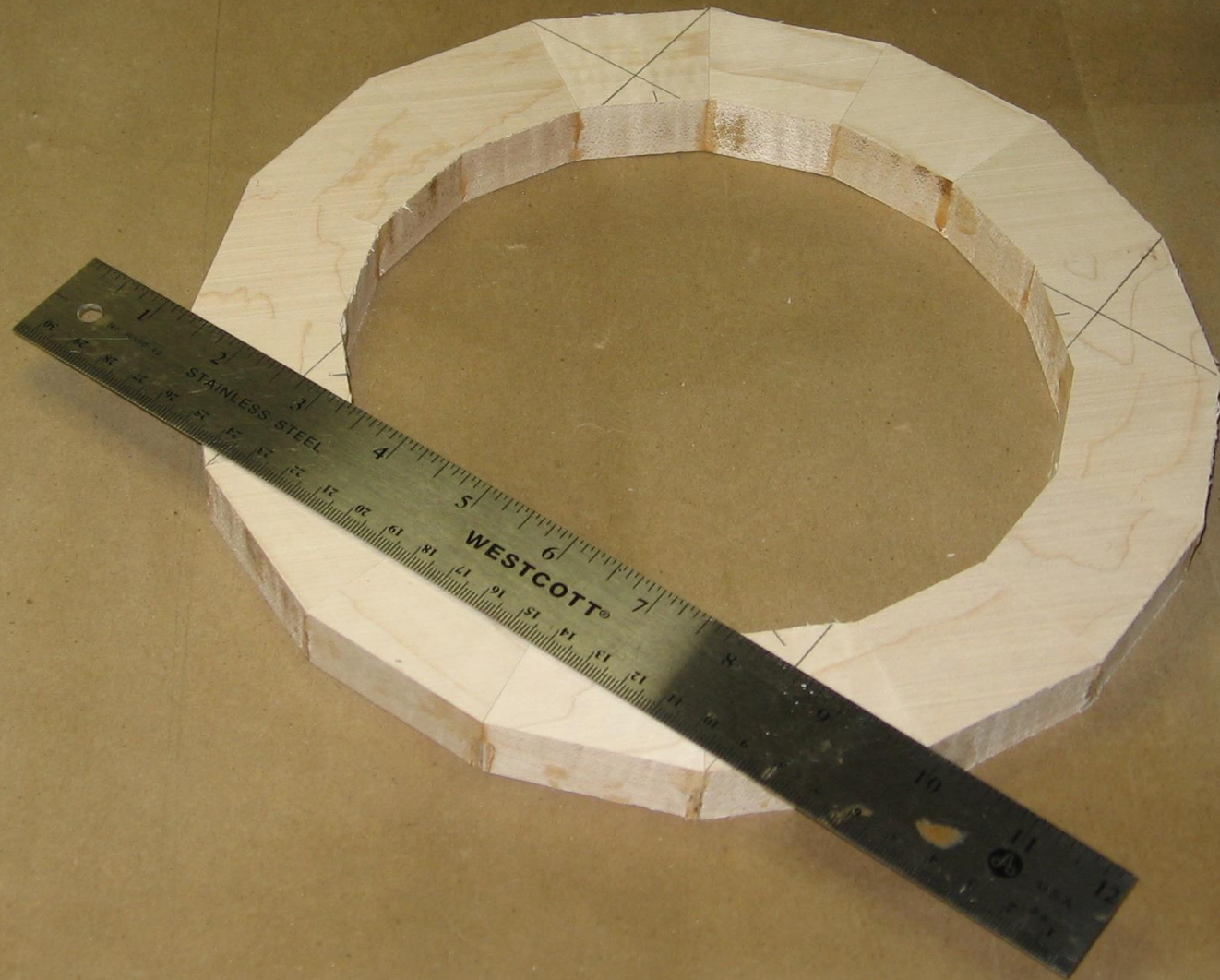


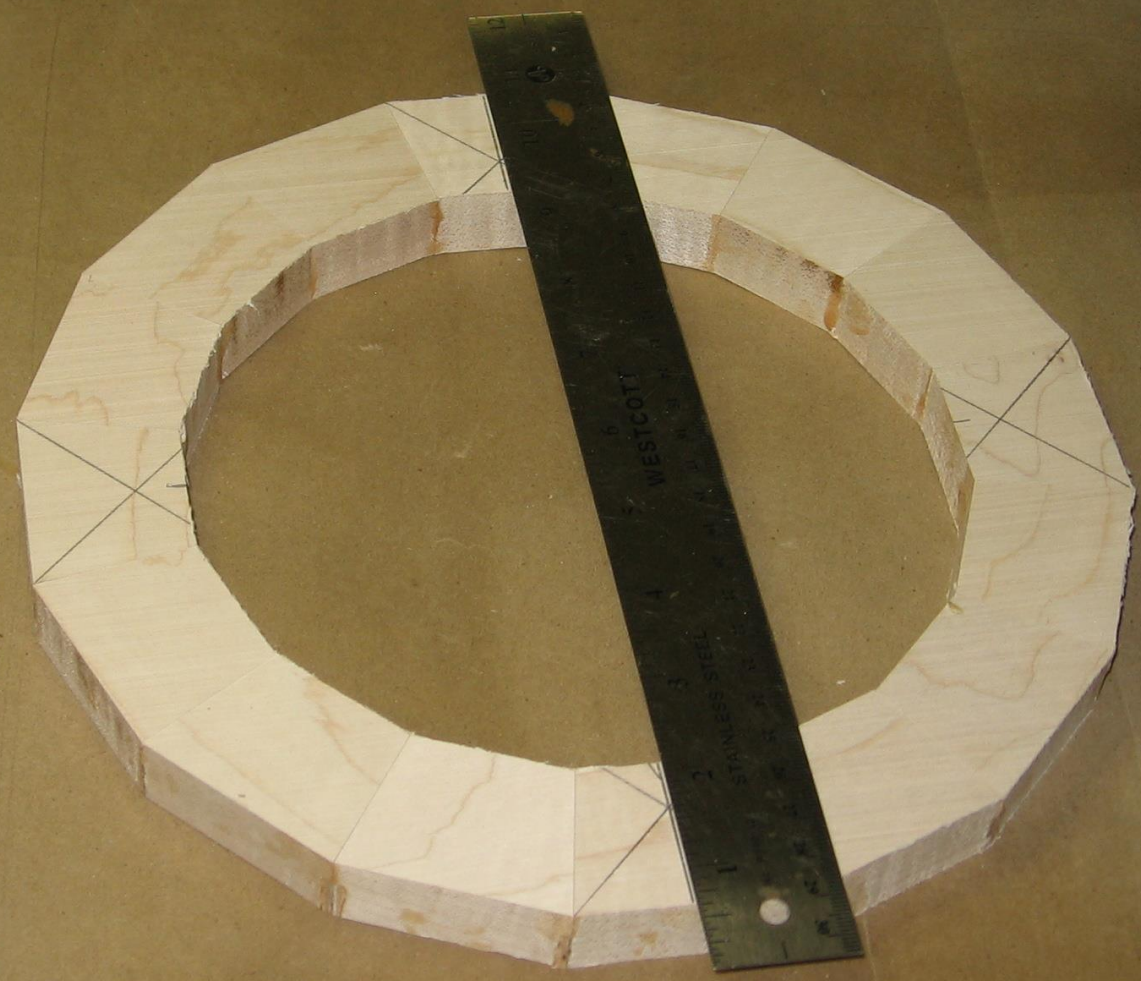
Tic marks

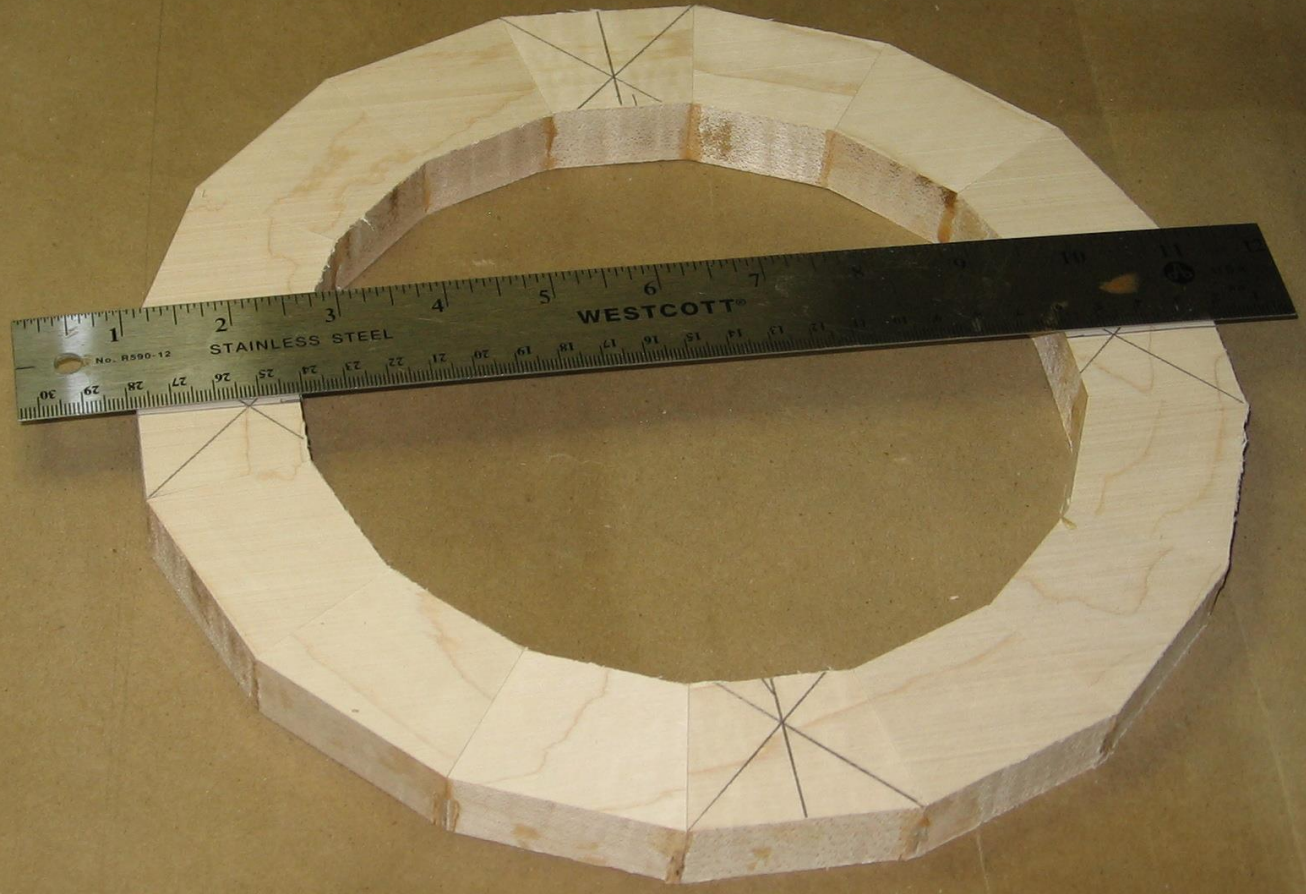










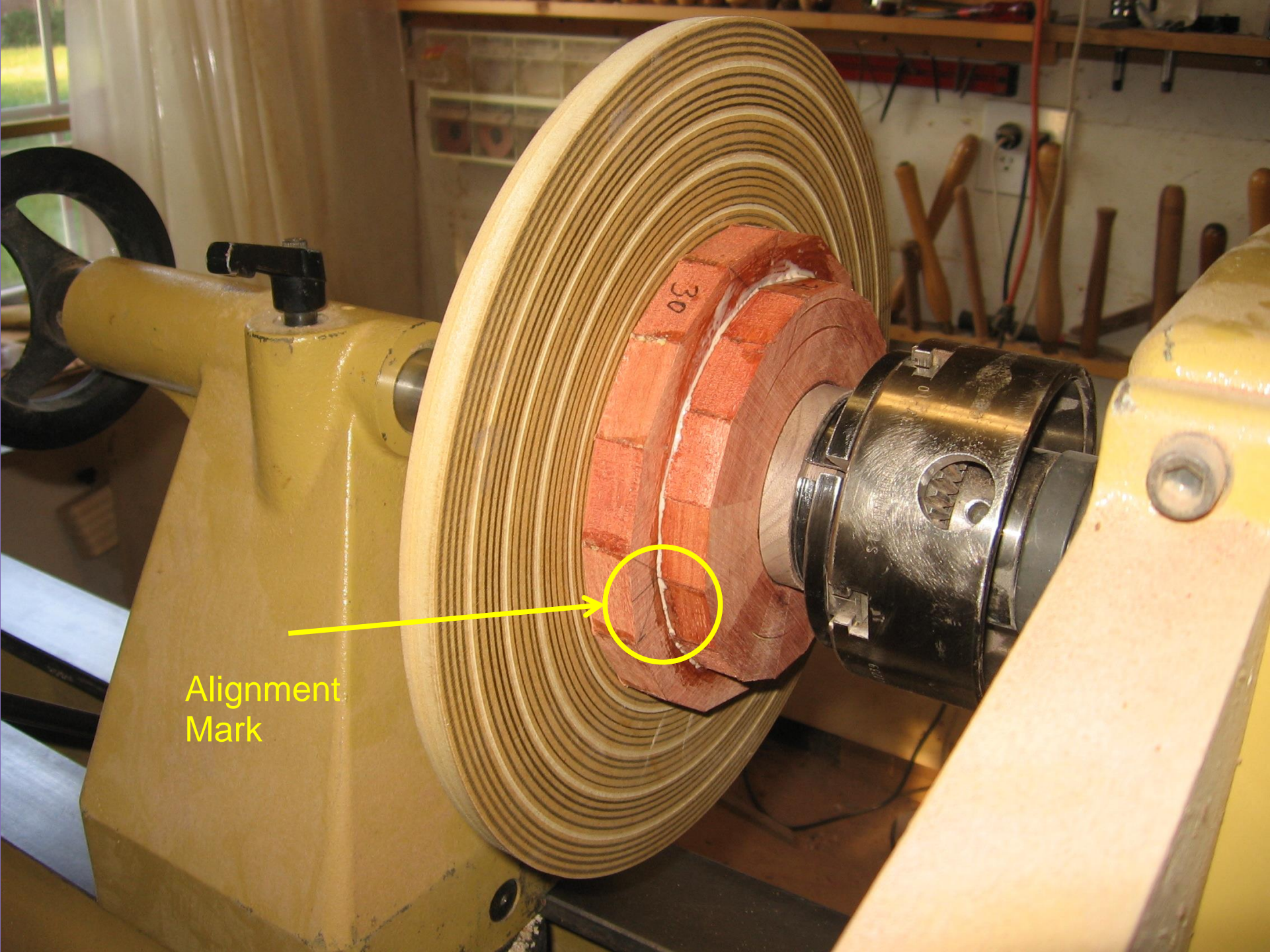




Chord method thanks to Karen Kerce Browning

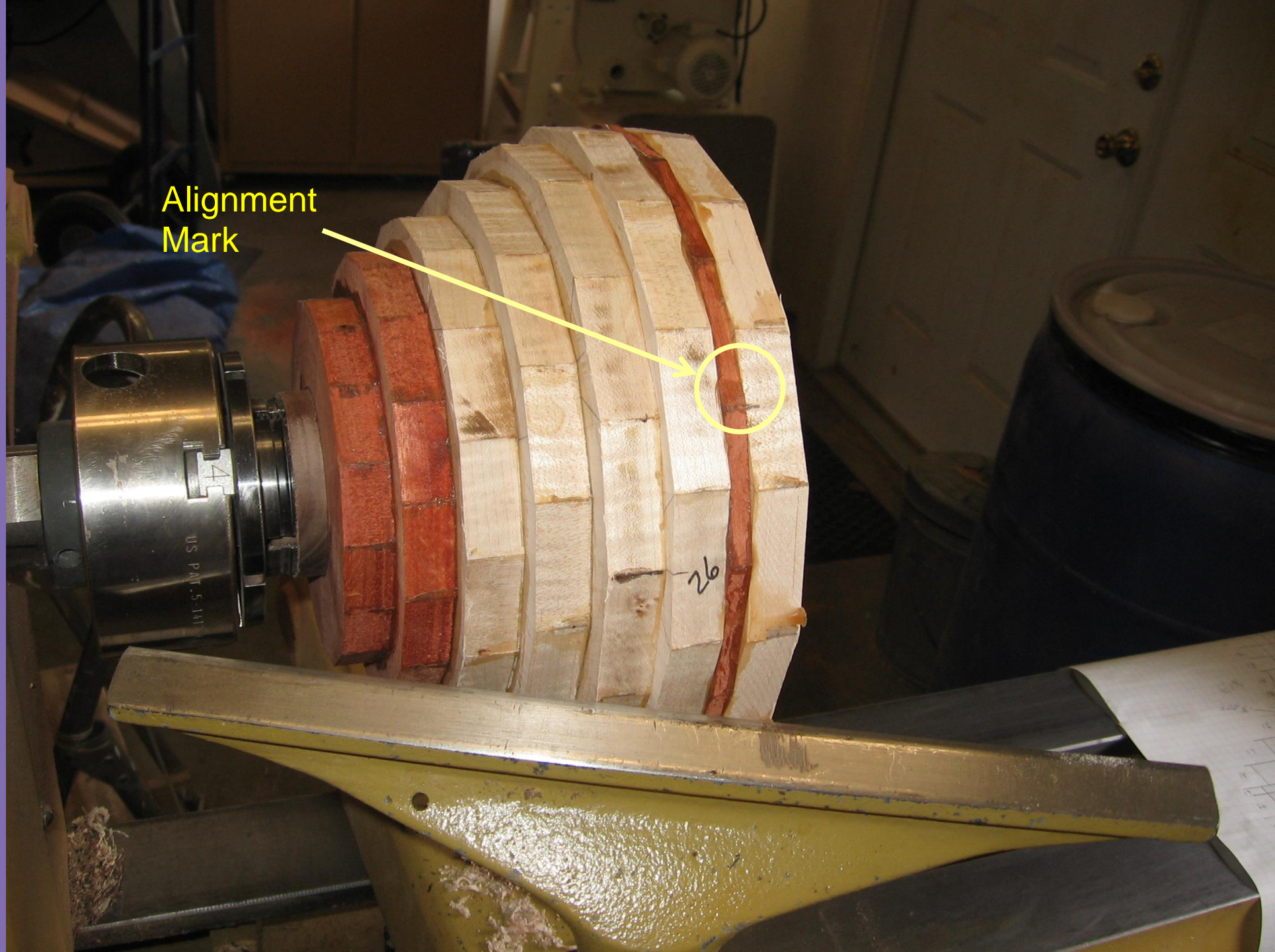
Stacking Rings

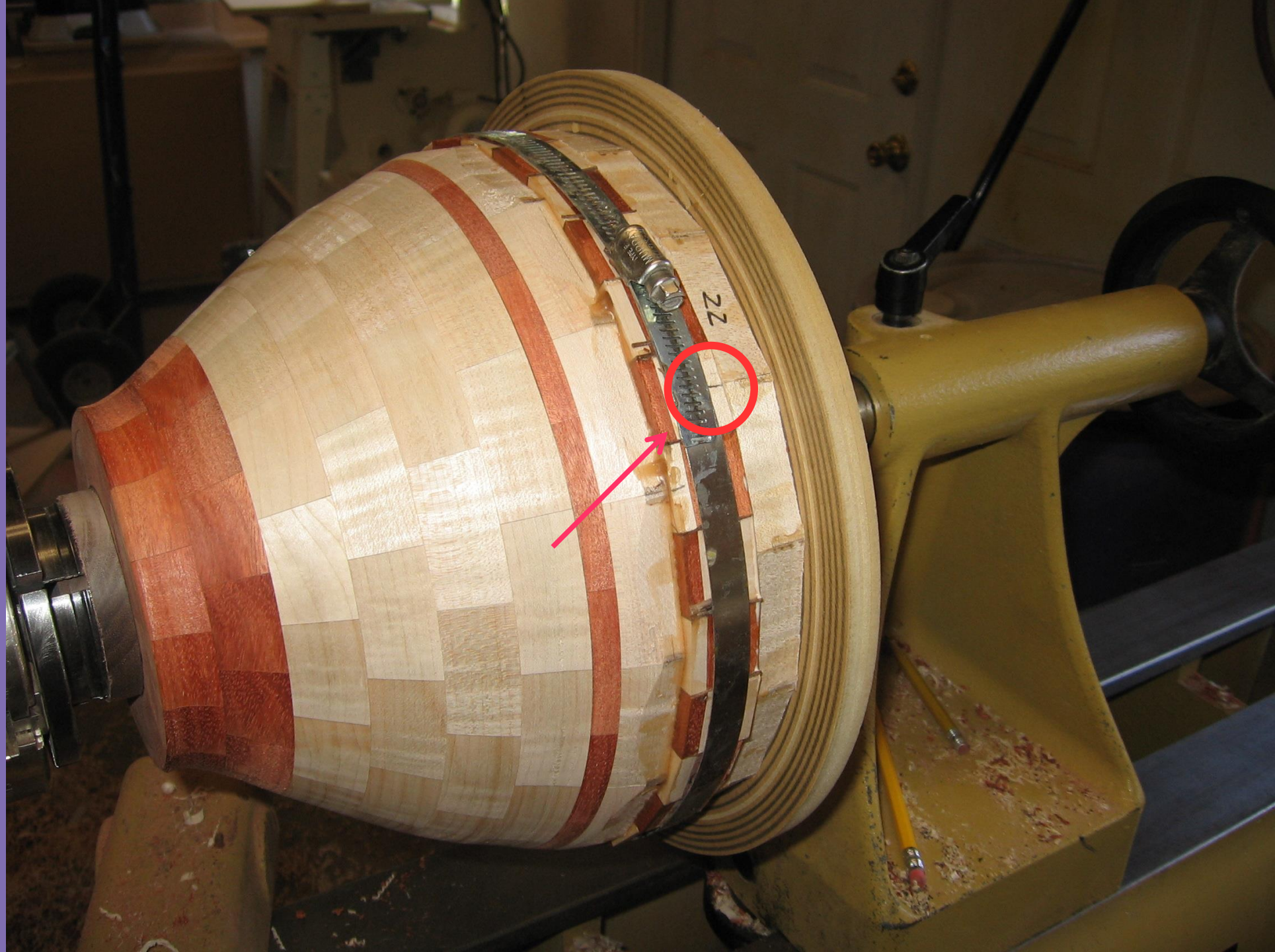




Alignment
Mark

Alignment
Mark





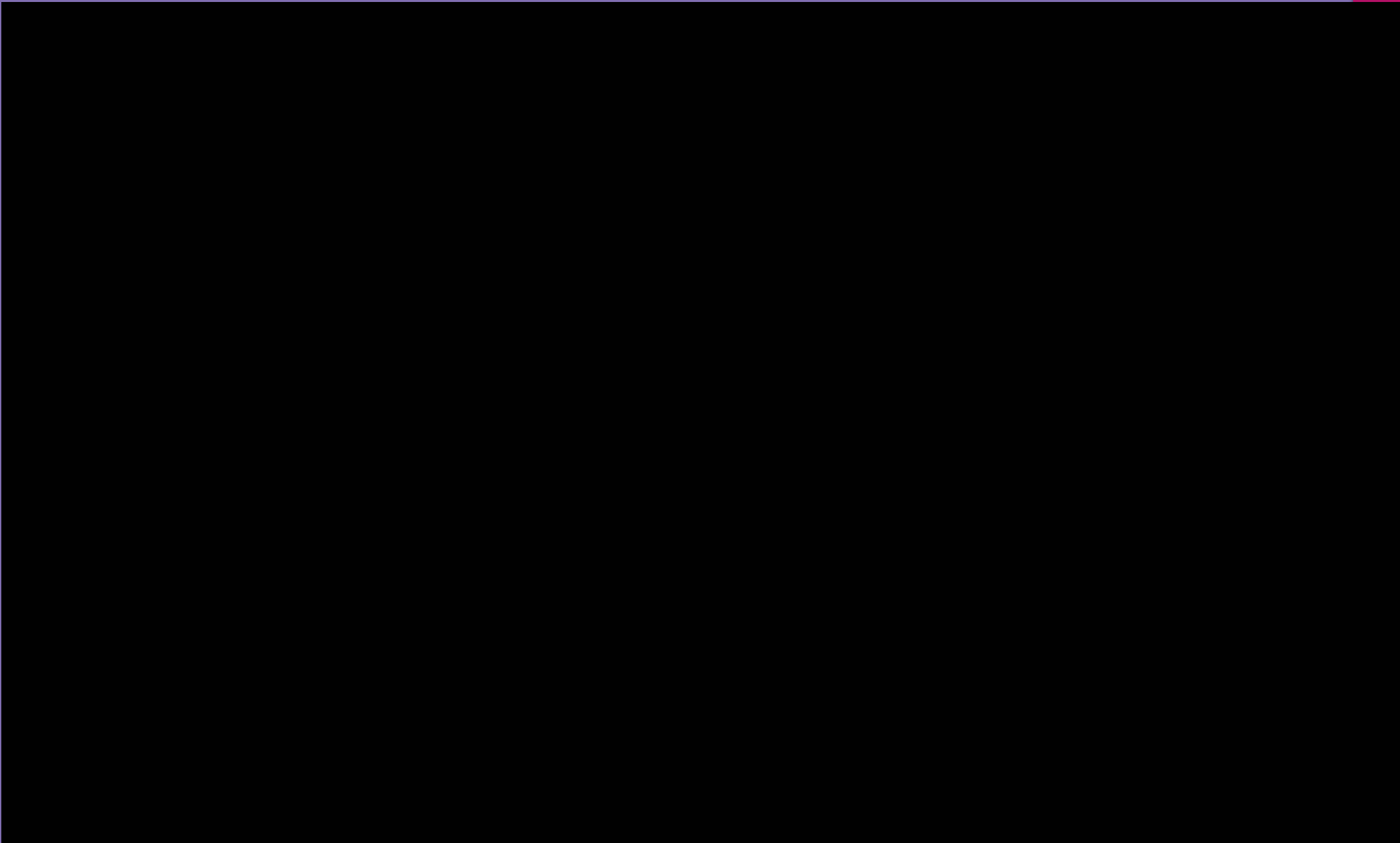
The Feature Ring

- ▶ Usually at the Waist of the Vessel
- ▶ Sometimes Multiples
- ▶ Sometimes at the Top or Base
- ▶ Fancy



Always use tailstock





Turning reviewed – Typical Approach

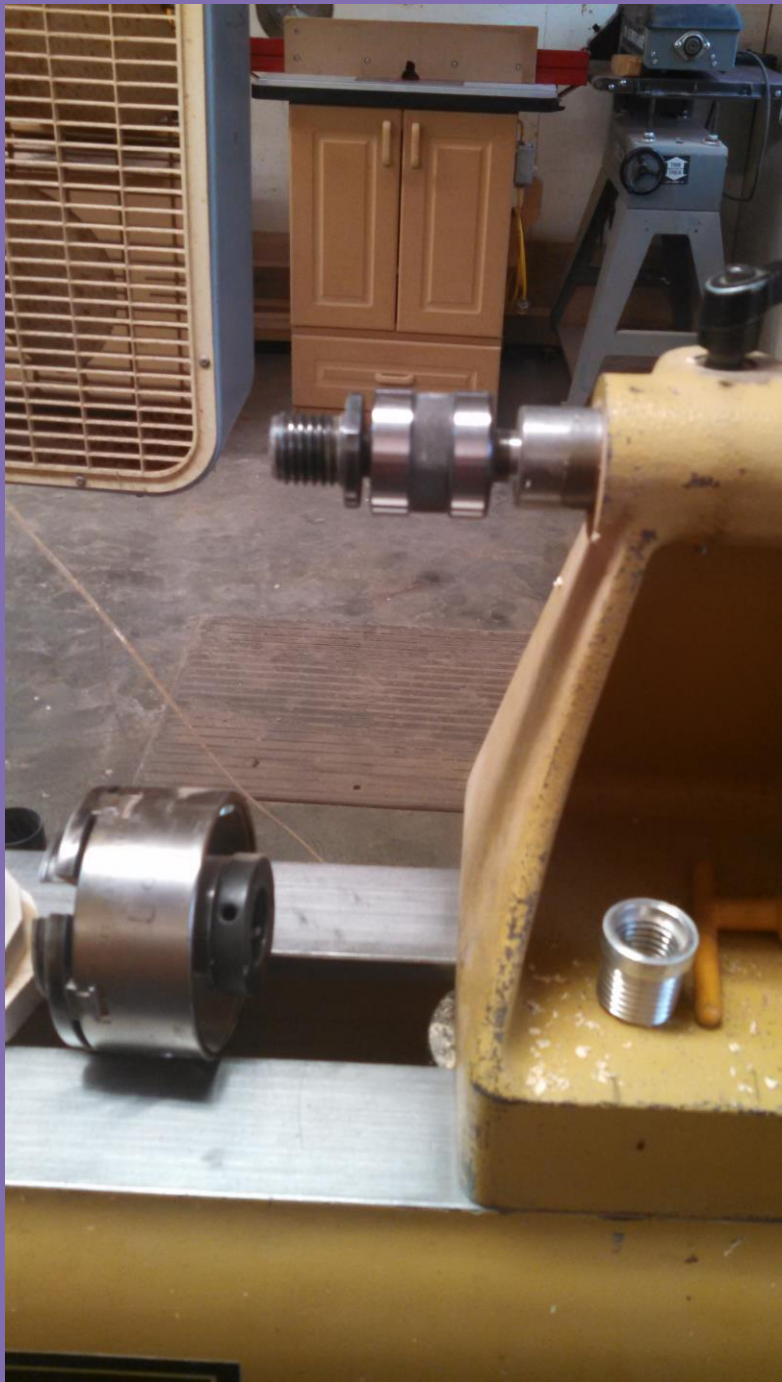
- ▶ First: Turn rough outside shape on sections
- ▶ Next: Join sections with double stick tape – between centers
- ▶ Then: A second round of roughing the joined pieces
- ▶ Break them apart
- ▶ Remove inside of each section
 - ▶ Care for thickness
 - ▶ Leave ample gluing surface to join
- ▶ Glue sections together and let cure
- ▶ Final turning/sanding/parting
- ▶ There will be variations to this process depending on the item

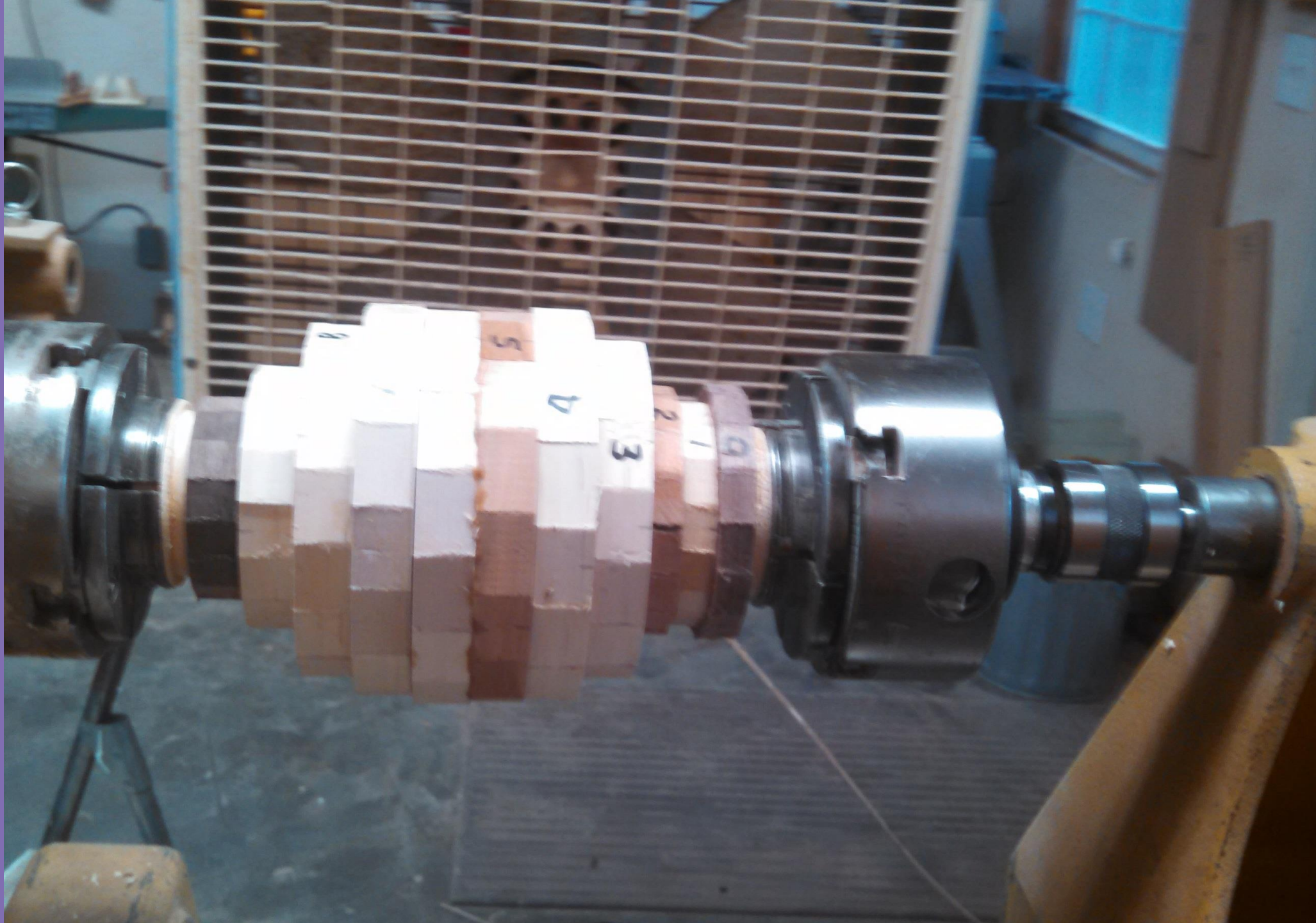


The END
Basic Segmented Vessels

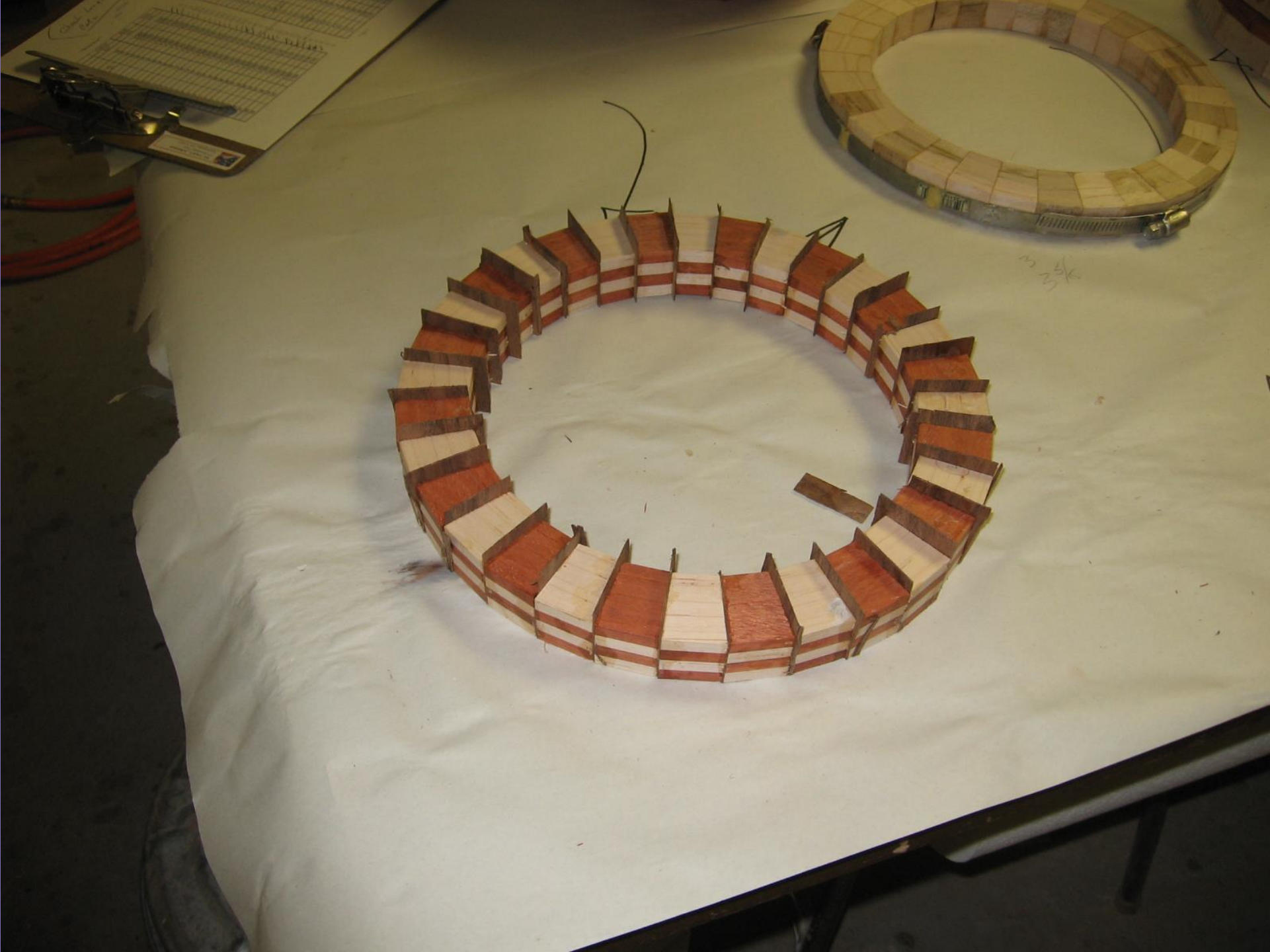
The END

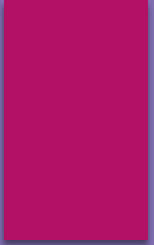
Basic Segmented Vessels











<http://www.tnvalleywoodclub.org/articles/PDFs/basic%20seg%20vessel%20calc%20with%20filler.xls>