SEGMENTED TURNING BASICS
GREAT WOOD FOR SIMPLE PIECES
USING COMMON WOODS
ADDING A SIMPLE ACCENT
ADDING SIMPLE FEATURES
USING SCRAP
COMPLETING WITH PAINT
ADDING COLOR AND ACCENT RINGS
BUILDING SKILL AND ADVANCING
BUILDING BLOCKS FOR THE PROJECT

- DESIGN – LAYOUT
BUILDING BLOCKS FOR THE PROJECT

- DESIGN – LAYOUT
- PREPARING WOOD
BUILDING BLOCKS FOR THE PROJECT

- DESIGN – LAYOUT
- PREPARING WOOD
- MAKING COMPONENTS
BUILDING BLOCKS FOR THE PROJECT

- DESIGN – LAYOUT
- PREPARING WOOD
- MAKING COMPONENTS
- ASSEMBLY
BUILDING BLOCKS FOR THE PROJECT

- DESIGN – LAYOUT
- PREPARING WOOD
- MAKING COMPONENTS
- ASSEMBLY
- TURNING
BUILDING BLOCKS FOR THE PROJECT

- DESIGN – LAYOUT
- PREPARING WOOD
- MAKING COMPONENTS
- ASSEMBLY
- TURNING
- FINISHING
UNLISTED STEPS

- Redrawing, adjusting design
- Tool calibration
- Re-cutting components
- Adjusting fit
- Addressing misalignment
- Addressing cross grain
- Correcting turning errors
**BASIC TERMS**

- **Segment Edge Length**
- **Segment Width**
- **Segment/Board thickness**
SIMPLE MATH

- SEGMENT EDGE LENGTH = CIRCUMFERENCE ÷ # SEGMENTS
SIMPLE MATH

SEGMENT INCLUDED ANGLE = 360 DEGREES (CIRCLE) ÷ # SEGMENTS

□ SEGMENT CUT ANGLE IS $\frac{1}{2}$ OF ABOVE
EXAMPLE

RING DIAMETER IS 10 INCHES
WE DESIRE 12 SEGMENTS / RING
MATH EXAMPLE

RING DIAMETER IS 10 INCHES
WE DESIRE 12 SEGMENTS / RING

- DIAMETER 10 \times 3.14 (\pi) = 31.4 \text{ INCHES CIRCUMFERENCE}
MATH EXAMPLE

RING DIAMETER IS 10 INCHES
WE DESIRE 12 SEGMENTS / RING

- DIAMETER 10 x 3.14 (π) = 31.4 INCHES CIRCUMFERENCE
- SEGMENT EDGE LENGTH 31.4 / 12 = 2.6 INCHES
MATH EXAMPLE

RING DIAMETER IS 10 INCHES
WE DESIRE 12 SEGMENTS / RING

- DIAMETER 10 x 3.14 (π) = 31.4 INCHES CIRCUMFERENCE
- SEGMENT EDGE LENGTH 31.4 ÷ 12 = 2.6 INCHES
- SEGMENT INCLUDED ANGLE IS 360° ÷ 12 SEGMENTS = 30°
MATH EXAMPLE

RING DIAMETER IS 10 INCHES
WE DESIRE 12 SEGMENTS / RING

- DIAMETER 10 \times 3.14 (\Pi) = 31.4 INCHES CIRCUMFERENCE
- SEGMENT EDGE LENGTH $31.4 \div 12 = 2.6$ INCHES
- SEGMENT INCLUDED ANGLE IS $360^\circ \div 12$ SEGMENTS $= 30^\circ$
- SEGMENT CUT ANGLE IS $30^\circ \div 2 = 15^\circ$
WE NEED A SHAPE!
WE NEED A DRAWING!
ADD RING THICKNESSES

Ring (stock) thickness
CALCULATE SEGMENT WIDTH

Outside radius

OR-IR = Segment Width

Inside radius
NOW WE HAVE ALL THE DIMENSIONS

Segment Edge Length

Segment Width

Segment/Board thickness

Segment cut angle
Sample Bowl

- Diameter: 4 1/4"
- Height: 3"
- Wall: 1/4"
- 1250s/layer

<table>
<thead>
<tr>
<th>OR</th>
<th>Dia.</th>
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<tbody>
<tr>
<td>1 3/4</td>
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<tr>
<td>2 1/4</td>
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<tr>
<td>2 1/2</td>
<td>4 1/4</td>
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<tr>
<td>2 7/16</td>
<td>4 1/8</td>
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<tr>
<td>1 11/16</td>
<td>3 3/4</td>
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<tr>
<td>1 5/16</td>
<td>3 1/4</td>
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<tr>
<td>1 1/8</td>
<td>2 1/4</td>
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BOARD WIDTH/SEGMENT WIDTH

Segment edge length

Segment width

Board Width

Segment Width
CREATE A CUT PLAN

<table>
<thead>
<tr>
<th>Layer</th>
<th>Rip Width</th>
<th>Safe Height</th>
<th>Layer OD</th>
<th>Side Edge</th>
<th>Cut Angle</th>
<th>Notes</th>
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<td>16&quot;</td>
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<td>2 1/4&quot;</td>
<td>-</td>
<td>90°</td>
<td>BASE</td>
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* Approximate
**Draw the Project**

Sample Bowl

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<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
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<th>3</th>
<th>2</th>
<th>1</th>
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<td>4 1/8</td>
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Diameter: 4 1/4"  Height: 3"  Wall: 1/4"  12 sec/layer
USE COMMERCIAL SOFTWARE
# Software Generated Cutting Plan

![Cutting Summary 082409 p.1](image)

<table>
<thead>
<tr>
<th>Type</th>
<th>Segments</th>
<th>Board Thickness</th>
<th>Diameter</th>
<th>Segments Edge Length</th>
<th>Vertical Spurter Width</th>
<th>Board Width</th>
<th>Economy Board Length</th>
<th>Miter Angle</th>
<th>Blade Total Angle</th>
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**Notes:**
- od = Outside Diameter, id = Inside Diameter, w = Upper Outside Diameter, h = Lower Outside Diameter

**Measures:**
- H = 7 1/2 "$\frac{1}{2}"
- W = 5 1/4 "$\frac{1}{4}"

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PREPARING STOCK
RIPPING TO WIDTH
PREPARING TO CUT THE SEGMENTS
MEASURING SEGMENT EDGE LENGTH
CUTTING SEGMENTS
KEEP SEGMENTS IN ORDER
Videos

Segmentology The Basics
Segmentology Beyond The Basics
Segmentology Tilt
Making The Wedgie Sled
NEW VERSION CUTTING SLED
USE A WEDGIE™ TO SET UP
USE A WEDGIE™ TO SET UP

Seg-Easy

Wedgie’s
CUT STOP
PROJECT LAID OUT
WHY WE SAND SEGMENTS
WHY WE SAND SEGMENTS
WHY WE SAND SEGMENT FACES (SOMETIMES)
USING A DISC SANDER
DISC SANDER CONSIDERATIONS
FINAL CLEAN UP
GLUING RINGS (WHEN THEY FIT TIGHT)
GLUING UP RINGS (WHEN THEY DON’T)
PIVOT DOWELS MUST BE CENTERED
SMALL RINGS – SMALLER DOWELS
PREPARING TO SAND ½ RINGS
PENCIL MARKS TO ASSIST FLATTENING
HOLD FLUSH TO SANDER
SANDING NOT COMPLETED
RE-GLUE ½ RINGS
ALL RINGS GLUED
NUMBER RING EDGE
FLATTENING A RING ON THE LATHE
SAND RINGS ON A THICKNESS SANDER
BUILD VESSEL ON TWO FACE PLATES
FACEPLATE CONSIDERATIONS
IF YOU DON’T PRE-DRILL THE GLUE BLOCK...
SCREWS
CHECK FLATNESS WITH STRAIGHT EDGE
COMPLETE WITH A SANDING STICK
FOOT PROBLEMS – SOLID BASES

- SMALL SOLID BASES OK
  - KEEP UNDER 4 INCHES IN DIAMETER (?)
  - ADD VENEERS BETWEEN BASE AND FIRST RING TO INCREASE “SLIPPAGE”
LARGER SOLID BASES

- Absolute movement is larger
- Causes larger stresses
- Base ring “stretched”
- Excessive amount of movement may lead to separation/splitting
- Alignment of base and bottom ring changes
FOOT PROBLEMS – “PIE SHAPED” FEET

- DIFFICULT TO CONSTRUCT PERFECTLY

- AS WOOD SHRINKS
  - INCLUDED ANGLE INCREASES
  - JOINTS MAY OPEN DUE TO STRESS
FOOT PROBLEMS – “PIE SHAPED” FEET

- AS THE WOOD DRIES ALONG GROWTH RINGS...
FOOT PROBLEMS – “PLUGGED PIE SHAPE” FEET

- Addition of a “plug” degrades the foot further
  - Solid plug presses against the base segments
  - Movement may force joint open
WHY USE THE IN SET (FLOATING) FOOT?

- ELIMINATES SPLITTING OF BASE
- MAY BE ESTHETICALLY DESIRABLE
- SIMPLIFIES PROJECT COMPLETION
WHAT THEY LOOK LIKE FROM THE BOTTOM
BUILDING A FLOATING FOOT

Add First Ring

Faceplate/Glue Block
Cut a groove into first ring
Faceplate/Glue Block

Make an insert slightly smaller
BUILDING A FLOATING FOOT

Add Second Ring

Faceplate/Glue Block
GLUE ON FIRST RING (FLOATING FOOT METHOD)
CREATE A RECESS IN FIRST RING
MUST BE SQUARE AND FLAT
BUILD A BASE INSERT DISC
TRANSFER RECESS DIAMETER TO INSERT
INSERT MUST BE A LOOSE FIT, FINISH
GLUE INSERT INTO BASE RING
RE-FLATTEN BASE WITH INSERT IN PLACE
ADD SECOND RING
ALTERNATE GLUE PRESS
BUILD FROM TOP DOWN ALSO
KEEP FLATTENING AND ADDING RINGS
BACK SIDE OF CHUCK
FIRST EXTERIOR SHAPING
TURN & SEAL INTERIOR
RE-FLATTEN RINGS – GLUE TOGETHER
PART OFF TOP FACE PLATE
RE-TRUE EXTERIOR, COMPLETE NECK
REDUCE FOOT, SEAL EXTERIOR, ADD FINISH
PARTED OFF AND COMPLETED
RUB JOINTS, QUARTER RINGS
STILL STOP A \( \frac{1}{2} \) RING
FLATTENING HALF RINGS
COMPLETING RINGS
SPLITTING A RING – WIDE BS BLADE
USING THE SAFETY PUSH BLOCK
MUST KEEP FINGERS AWAY FROM CUT
DONE!
PREPPING RINGS WITHOUT A SANDER
EASILY BUILT FIXTURE
SAND EACH $\frac{1}{2}$ RING ON OPPOSITE FACE
BUILDING WITH VENEERS
BUILD AS A SEPARATE ELEMENT
ALWAYS SPREAD THE GLUE
USE VENEER TO SEPARATE COLORS
HALF OF THE SPLIT RING
A VENEER PRESS
PRESS 2-4 HOURS FOR GLUE TO DRY
SOLID BASE, FLATTING ONE SIDE
FIND THE CENTER
MARKING THE CENTER
MOUNTING THE BASE
FLATTENING THE OTHER SIDE
CHECKING FOR FLATNESS
ALWAYS THE SANDING STICK!
ADDING THE FIRST RING
SPREAD THE GLUE
RING IN PLACE
TRANSFERRED TO A "GLUE PRESS"
MOUNTING THE FEATURE RING
BASE SECTION COMPLETED
USING THE GLUE PRESS AGAIN
ASSEMBLING THE FULL VESSEL
TURNING THE EXTERIOR
TURNING THE INTERIOR
SANDING THE INTERIOR
SEALING THE INTERIOR
SQUARING THE EDGES
FINAL GLUE UP
CLEANING UP THE GLUE LINE
PARTING OFF THE TOP GLUE BLOCK
Cleansing the Interior Glue Line
SANDING
PREPARING TO ADD FINISH
RAISING THE GRAIN
EBONIZING & FINISHING
COMPLETING THE FOOT – VACUUM CHUCK
VACUUM PUMP FROM <$100.00
PARTING OFF BOTTOM FACE PLATE
CLEANING UP THE BASE
DETAILING THE BASE
BASE COMPLETED
READY TO BUFF OUT
BUFFING THE VESSEL
FINISHED PROJECT
WHAT ELSE CAN WE DO?

Transitional vessels
Curt Theobald
Tea With A Twist - Bill Smith
Malcolm Tibbitts
OPEN SEGMENT CONSTRUCTION

• Introduced in 1996 by Bill Smith

• Ring contain “gaps” and are not glued to each other

• Segments must be placed individually requiring precise indexing

Bill Smith
RESOURCES FOR LEARNING

- [www.jlrodgers.com](http://www.jlrodgers.com) CLICK ON “LEARN SEGMENTED TURNING”
BOOKS

- **WOODTURNING WITH RAY ALLEN**, **RAY ALLEN & DALE NISH**, **FOX CHAPEL PUBLISHING**, **2004**

- **THE ART OF SEGMENTED WOOD TURNING**, **MALCOLM TIBBETTS**, **LINDEN PUBLISHING**, **2005**

- **SEGMENTED TURNING**, **DENNIS KEELING**, **THE TAUTON PRESS**, **2012**

- **THE FUNDAMENTALS OF SEGMENTED WOODTURNING**, **JIM RODGERS**, **LINDEN PUBLISHING**, **2016**
OTHER RESOURCES

- www.jlrodgers.com
- www.turnedwood.com
- www.segmentedturning.com
- www.woodturnerpro.com
- www.segeasy.com
RESOURCES

- WWW/JLRODGERS.COM
- PRESENTATION
- SEGMENT EDGE ESTIMATION TABLE
- ARTICLE ON TURNING A BOWL