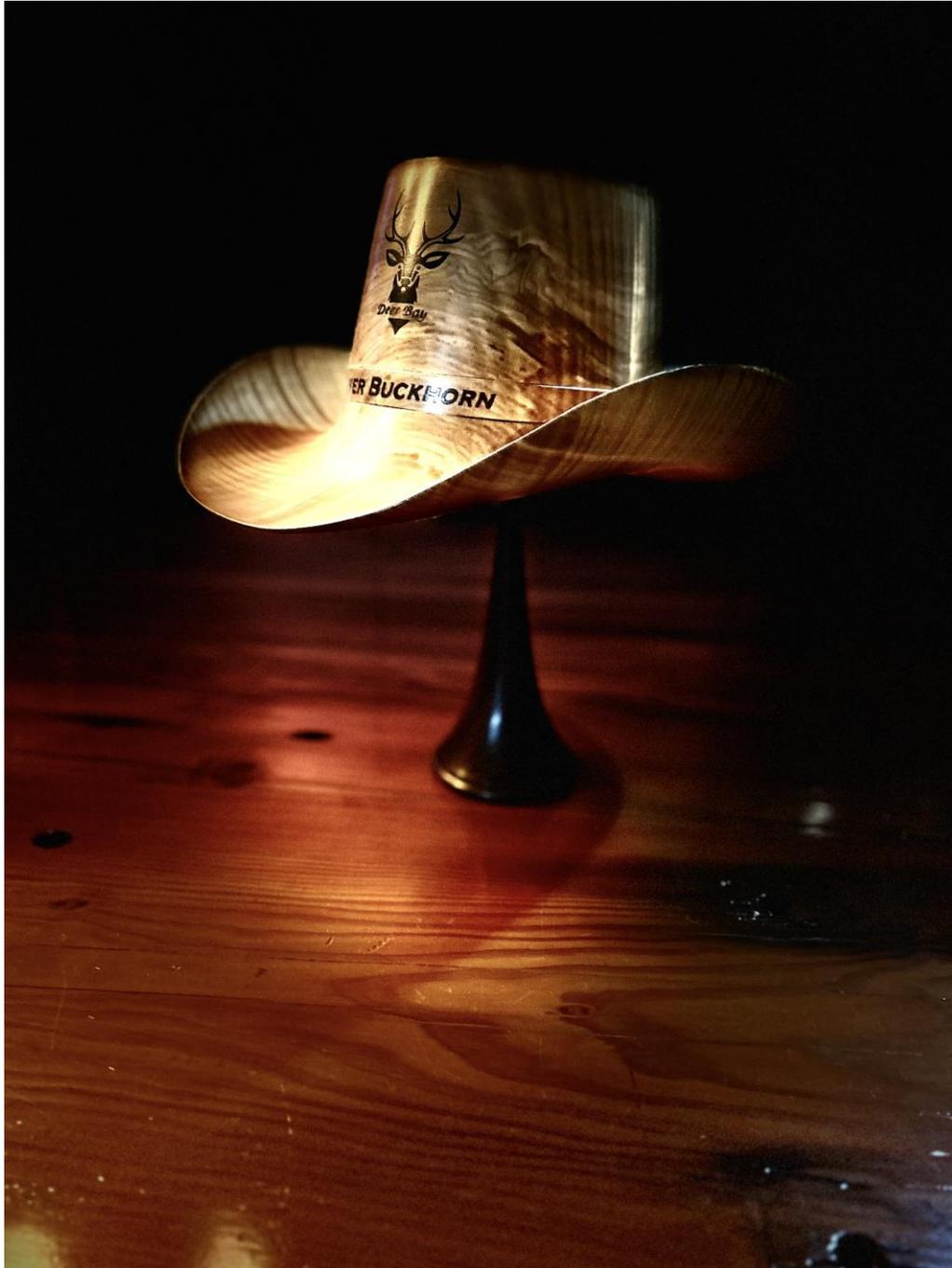


Turning Trees, Jim Williams

Jim@Turningtrees.ca, 705-740-5102 (cell), Turningtrees.ca

Turning a Full Size Cowboy Hat



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Turning a Full Size Cowboy Hat

Cowboy Hat

Type of Wood

- For turning a hat I would typically use a lighter coloured wood
- Maple or birch are good choices
- Maple is readily available and the light colour allows a light to shine through
- Using a light is the best way to help gauge the thickness while turning to 3/32" thickness

To Get Started

- To customize the fit of the hat , you will need to take a head circumference measurement
- A flexible curve ruler is needed to accurately take the measurements



- Placement of the ruler is important
- Place the ruler about 1/4" above the ears
- Keep the ruler tight against the head with no gaps to obtain the most accurate measurement
- The ruler should fit snugly not tight

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- Hold the ruler firmly together where it overlaps as you remove the ruler from the head in order to retain the shape



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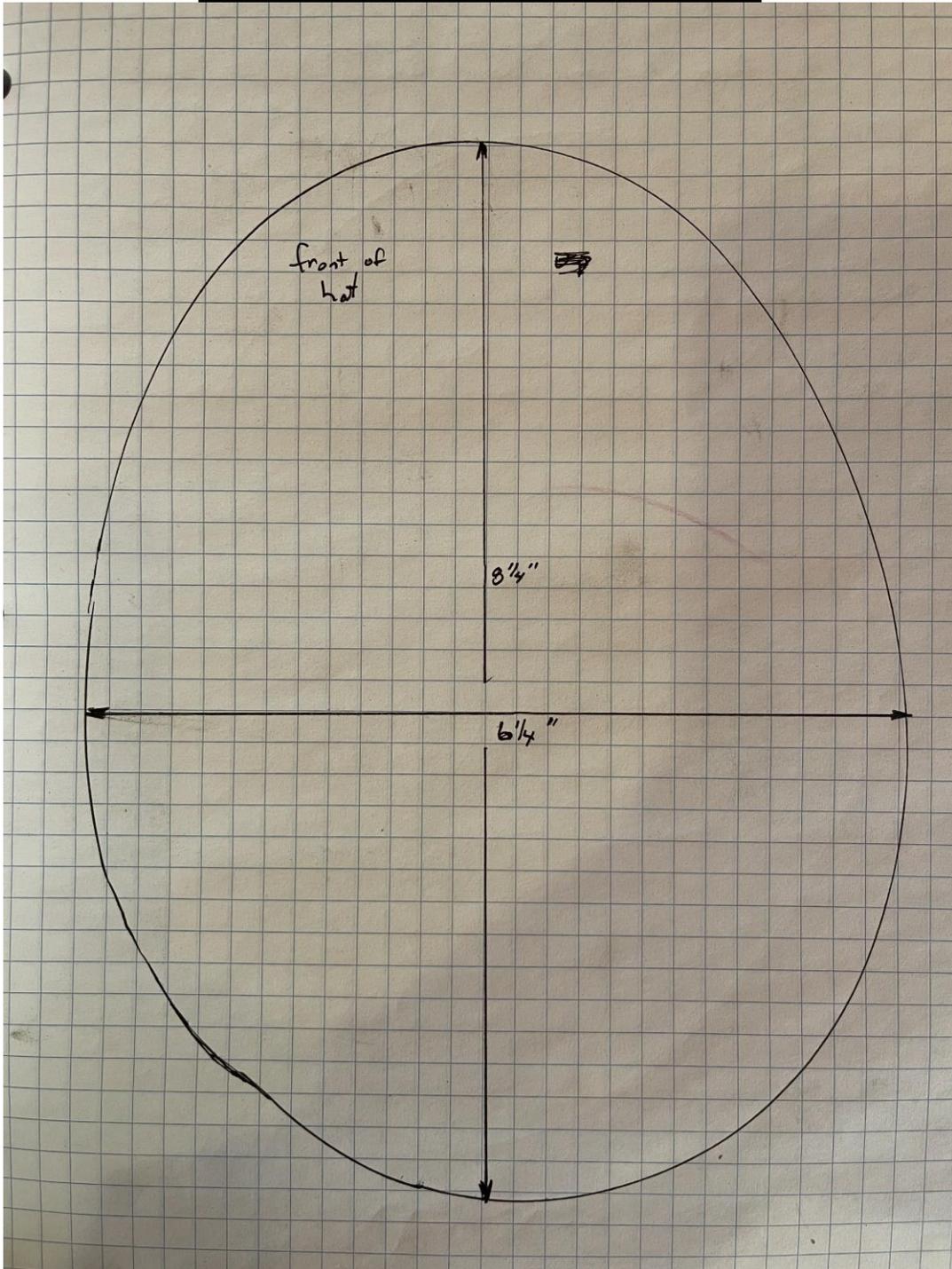
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- Once removed carefully place the ruler on a piece of paper and trace the inside shape
- Repeat the process of measuring and tracing on the same piece of paper, overlapping the markings to make sure the measurements remain constant

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Turning a Full Size Cowboy Hat



- With the paper and head size on the paper measure the widest point side to side
- In this example the head width is $6 \frac{1}{4}$ "
- Measure the length of the head size
- In this example the head length is $8 \frac{1}{4}$ "

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- Now add these to measurements together and divide by 2 to get the average
 $6 \frac{1}{4} + 8 \frac{1}{4} = 14 \frac{1}{2}$
 $14 \frac{1}{2} / 2 = 7 \frac{1}{4}$ would be inside measurement
- Now to adjust for the wall thickness of the hat which is $\frac{1}{8}$ " on each side
 $\frac{1}{8} + \frac{1}{8} = \frac{1}{4}$
- Also add $\frac{1}{4}$ " for shrinkage of the wet wood
- Total = $7 \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = 7 \frac{3}{4}$ "
- Mark the pattern up and front of the head on the paper
- From the paper carefully cut out the shape of the head size
- Using a piece of $\frac{3}{4}$ " wood, turn the paper over/upside down on the wood and carefully trace the shape
- The paper needs to be turned over because you need the left side of the head size to be on the left side of the finished hat.
- As you turn the hat over to wear the sides will reverse from the original traced pattern
- Now use the band saw and carefully cut out the wood pattern form
- Sand the edges and round a bit
- Drill four $1 \frac{1}{4}$ " holes in the wood pattern to allow heat from the light to escape during the bending process of the hat
- Mark the measurements of the pattern on the wood form
- Mark the side you traced as up, and the front of the head on the wood pattern

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Turning a Full Size Cowboy Hat

Prepare the Wood

- Source a piece of wood
- 18" – 20" diameter works well
- Cut the log to 18" length
- Mark the centre growth rings, this will aid in keeping the hat balanced



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Jim@Turningtrees.ca, 705-740-5102 (cell), Turningtrees.ca

Turning a Full Size Cowboy Hat

- Mark the log on both ends so you are away from the pith by at least 1 ¼"
- Then mark it 8" wide and remove the bark
- Cut the log in half



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Jim@Turningtrees.ca, 705-740-5102 (cell), Turningtrees.ca

Turning a Full Size Cowboy Hat

- Set the log on its bark side
- Draw across the blank from end to end where you marked the growth rings
- Measure along this line to get the centre of the log (around 9")
- Set your compass at the diameter of 18" and draw a circle
- This is the approximated outside diameter of the hat
- Mark with an "x" where the compass was in the centre
- Chain saw around the blank as close as possible



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- Flip the blank over and cut down on an angle leaving approximately 10" diameter at the top

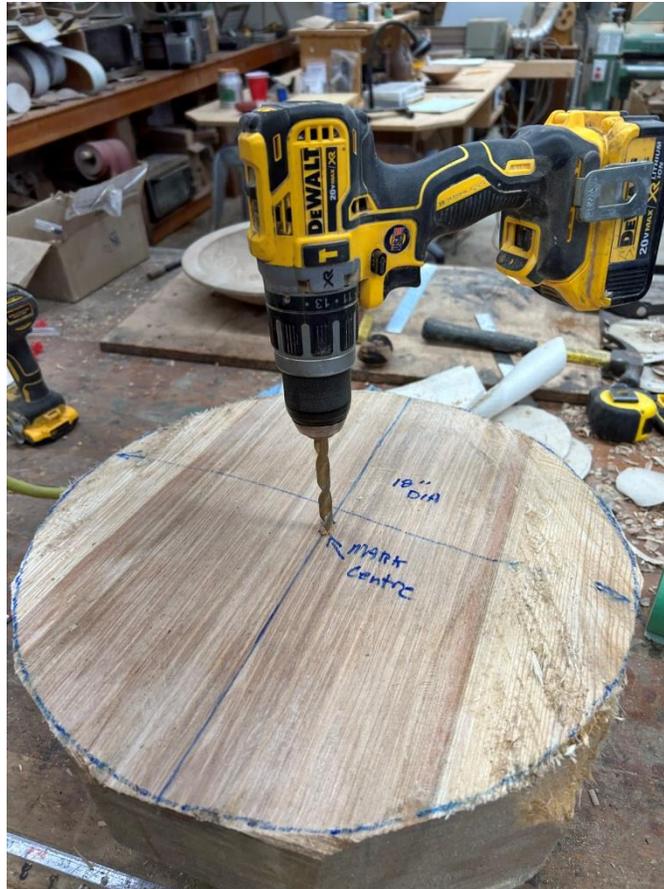


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Turning a Full Size Cowboy Hat

- Take the blank into your shop and set on the work bench
- With the large side up (bottom of the hat) using the centre point from the compass "x" , drill a 7/16" hole for the worm screw



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Turning a Full Size Cowboy Hat

- Now install a chuck on your lathe with a worm screw



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Jim@Turningtrees.ca, 705-740-5102 (cell), Turningtrees.ca

Turning a Full Size Cowboy Hat

- Turn the lathe on in forward with the speed set real low
- Hold the blank up to the worm screw
- Once it's tight against the chuck bring the tail stock up and tighten for support



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Jim@Turningtrees.ca, 705-740-5102 (cell), Turningtrees.ca

Turning a Full Size Cowboy Hat

Turning the Hat

- Now that the blank is mounted turn the lathe up as much as possible , (with no vibration)
- Rough turn to get round shape
- Once round at the large end, it is necessary to flatten the top of the hat at the tail stock
- Once flat, shut the lathe off and carefully back the tail stock off and very gently remove the little nib of wood with a chisel, that you couldn't get with the gouge
- Then re install the tail stock and tighten
- This will create a point to mount the blank later to get centre
- Now make a tenon to fit the chuck
- Example make it 4" diameter



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Turning a Full Size Cowboy Hat

- Now remove the tail stock
- Install your cone shape live centre
- Take the chuck and loosely put over the tenon, bring the tail stock up and loosely tighten the cone into the chuck
- Slowly tighten the tail stock with slight pressure , but not too much as you will rotate the chuck on the tenon by hand as you tighten the chuck on the tenon and tighten the tail stock
- This will line it up nice
- Once the chuck is snug, tighten the tail stock into the chuck
- Turn on the lathe and ensure the chuck and blank are rotating smoothly



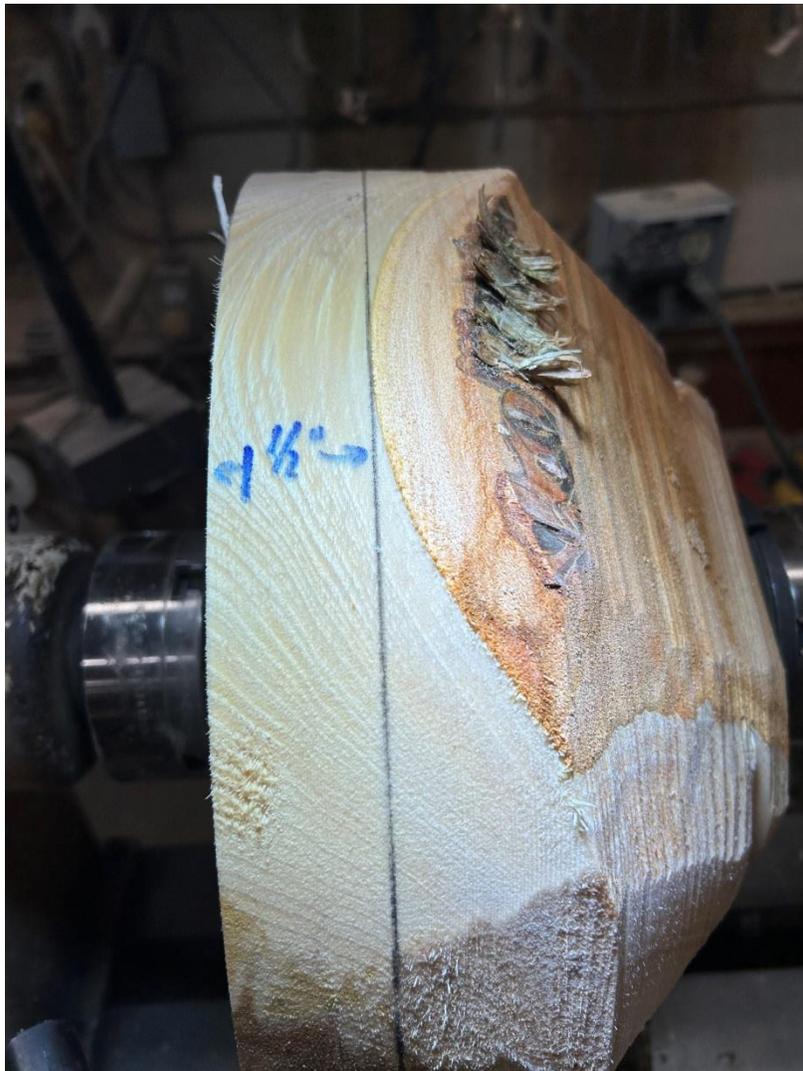
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Turning a Full Size Cowboy Hat

Start Shaping the Hat

- A cowboy hat has a 4" brim
- So the outside diameter of the brim is $4" + 4" = 7 \frac{3}{4}"$ (hat size) = $15 \frac{3}{4}"$
- The exterior needs to be turned to $15 \frac{3}{4}"$
- Once we have the $15 \frac{3}{4}"$ diameter we need to measure up $1 \frac{1}{2}"$ from the bottom of the brim
- This is the depth of the brim from the bottom of the band to the bottom of the brim



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Turning a Full Size Cowboy Hat

Coring a Mirror Frame Blank

- Once you have measured up 1 ½” for the hat brim, now we can core out a mirror frame
- With you callipers set to 7 ¾” diameter mark at the top of the hat
- To make the mirror frame using he McNaughton or Michelsen cutters



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Jim@Turningtrees.ca, 705-740-5102 (cell), Turningtrees.ca

Turning a Full Size Cowboy Hat

- Cut parallel to the top of the hat towards the brim
- Be careful not to cut into the brim
- Once you have cut to the brim, move the tool rest in front of the brim and cut in until you meet with the cut you just finished
- You have to be careful and measure often so these two cuts meet
- Once you have the frame cut in, slide the tail stock back and remove the mirror frame



- Slide the tail stock back and tighten
- You have to wax the mirror frame and let it dry
- Once dry, turn to fit a mirror



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Turning a Full Size Cowboy Hat

- Measure up from the top of the brim 4 ½" – 5" this is the height of the hat
- We now turn the outside of the hat first



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Turning a Full Size Cowboy Hat

- So the overall height including the brim is 6" to 6 ½"
- Set the calliper to the 7 ¾" diameter and start turning the top of the hat
- You need about ¾" – 7/8" of flat 1" for the band
- Now the diameter of the top of the hat is around 5" – 6" on average
- Adjust this depending on the head size
- Start tapering the hat to the band that you already have established
- When finished the top should taper to the bottom of the hat to just above the hat band
- Make it a straight or gentle curve, both look nice



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Jim@Turningtrees.ca, 705-740-5102 (cell), Turningtrees.ca

Turning a Full Size Cowboy Hat

Shaping the Top of the Brim

- We have left 1 ½” in the depth for the brim
- A cowboy hat curves up about ¼” and ¾” back on the edge of the brim
- Gently curve this up from the underside before we start turning the top of the brim
- Now start curving the brim down from the bottom of the band
- We need a nice flowing curve for the bottom of the band downward and start coming back up slowly to the outside of the brim
- This must be a nice flowing curve or the hat will not bend properly (very important)



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Turning a Full Size Cowboy Hat

- Remove the hat from the worm screw
- Remove the cone shaped live centre from the tail stock
- Mount the top of the hat in the chuck
- Put the light shining at the top of the brim
- Start at the outside bottom of the brim, thin to 3/32"
- Only go in 1" increments, no more than that at a time
- Check with the callipers often
- You can't go back after, the hat will move as it is drying, so make sure you are at the final thickness
- Continue checking the wall thickness until the brim is complete

Mini Hat Blank

- Now the brim is complete
- To core out for a mini hat there are two options
- A McNaughton style straight knife or a Mickelsen cutter
- Plunge into the bottom of the hat just inside the hat on an angle around 50 degrees
- You should have approximately 8" diameter when starting the plunge cut

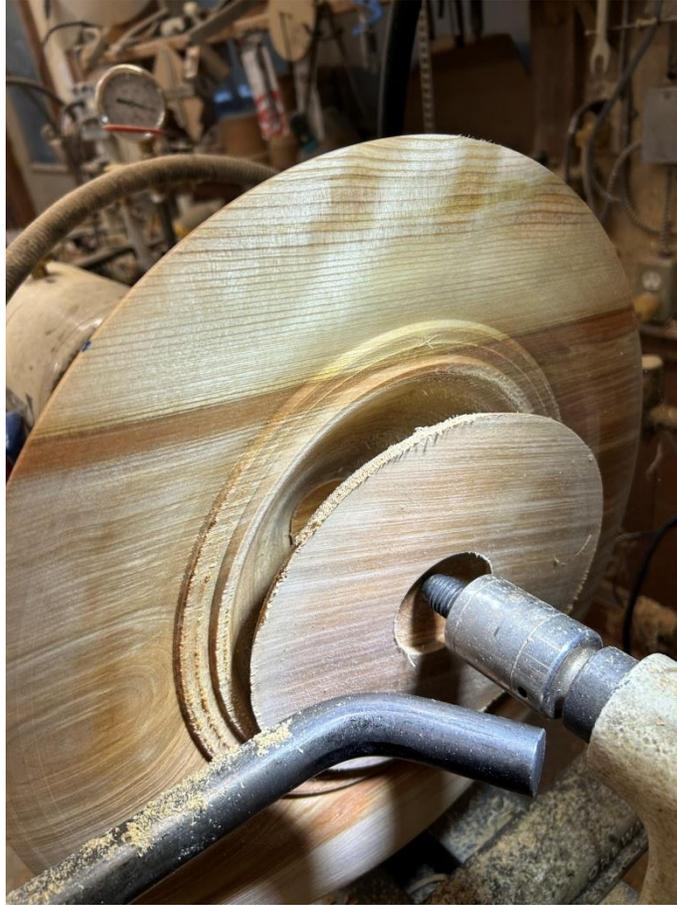


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Turning a Full Size Cowboy Hat

- Keep plunge cutting until the mini blank is small enough to break off



Hollow Out the Inside of the Hat

- Continue hollowing out the hat to a wall thickness of 3/32"
- Using the light will help you when hollowing the hat
- Use the callipers to verify the thickness, the light is only a guide
- Hollow out to the top of the hat

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Turning a Full Size Cowboy Hat

To Shape the Inside of the Top of the Hat

- I use a ¼” bowl gouge, turn the flute to the 3 o’clock position
- Place the gouge at the outer edge and make a recess about ¼” – 3/8” deep
- This will create a nice detail on the outside of the top of the hat when you finish the top of the hat later
- Make the recess go up the ¼” – 3/8” then back down and finish straight across the top of the hat
- This will leave the outer cap of the hat ¼” – 3/8” higher than the centre of the top of the hat
- This way when turned over the hat will sit on the outer edges



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Turning a Full Size Cowboy Hat

Sanding the Inside and Outside of the Hat

- If the wood is very wet, sometimes I blow the hat out with the compressor from the inside of the hat
- This will remove some of the water, so it will sand easier
- Put the lathe in reverse and slow it down
- Sand the hat from 120, 180, 220 grits
- Use a 3" disk
- The top inside detail needs to be sanded by hand
- You can't sand the outside top of the hat yet
- If you want you can now put a mixture of 50/50 laquer/thinner on while still on the lathe to the inside of the hat
- This helps slow down the drying and prevent dirty fingers from staining the wood

Turn the Outside of the Hat

- Remove the hat from the chuck
- Install you lighted jamb chuck on the head stock
- Turn on the light



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Jim@Turningtrees.ca, 705-740-5102 (cell), Turningtrees.ca

Turning a Full Size Cowboy Hat

- Place the hat over the jamb chuck
- Bring up tail stock to match dimple you left, this will help centre the hat on the jamb chuck
- Sand the outside of the hat



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Turning a Full Size Cowboy Hat

Burnish the Hat Band

- With the hat in the chuck and tail stock up
- Place the tool rest close to the hat band
- I use Padauk and Ebony pieces 1" x ¼" x 6" long
- Sand these to a point on the end grain
- Turn the lathe on and push the point straight in to make a line
- Don't push too hard, if you make too much heat you might crack the hat
- To burnish the entire band, put your thumb behind the long sanded edge and apply pressure while moving along the band
- Now move the tool rest to the top of the hat
- Remove excess wood using the light to gauge the thickness
- Follow the recess on the exterior of the top down then go straight across the top of the hat
- Remove the tail stock and carefully remove the nub in the middle of the hat
- Turn very light cuts so you don't knock the hat from the jamb chuck



- Sand the top of the hat
- Remove hat from the jamb chuck

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Turning a Full Size Cowboy Hat

Bending the Hat

- Put the hat upside down in the bender
- The grain runs parallel to the sides of the bender
- Place the hat band so it sits about ¼" above the top of the blocks
- If the brim sits on the blocks it will crack the hat when drying
- Put some tension on the hat, but not too much
- Now place two sets of tree rubber bands tied together across the top of the hat, attach to the screws on the bender



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Jim@Turningtrees.ca, 705-740-5102 (cell), Turningtrees.ca

Turning a Full Size Cowboy Hat

- Make sure the bands have the same tension on each side of the hat
- Once it starts to bend, if one side bends more than the other side, adjust the tension on each side



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Turning a Full Size Cowboy Hat

- Once the hat is in the bender with the elastic bands on, leave the hat in the bender for 12-15 hours, do not tighten it anymore, even if it doesn't look like it is bending to the pattern you want it to fit yet
- If you tighten it more too soon, you will crack the hat
- After 12 hours place one light about 6" above the hat, and one light at the front of the hat under the brim



- The hat will start to bend and take shape to the pattern you have made
- Place the mold in the hat, it will be tight at the front and back, don't force it in
- Once the hat moves more keep trying to fit the pattern in
- Keep adjusting the elastics
- After 12-15 hours remove the lights
- Leave the hat in the bender for at least two more days
- Sand the hat to 320 grit inside and outside
- Be careful when sanding around the band as it sands of easily

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Turning a Full Size Cowboy Hat

- Once removed from the bender, put a finish on as soon as possible as this helps prevent spring back of the wood
- You can finish the hat with sanding sealer, spray on three coats, then spray on lacquer one final coat
- Wipe on poly works very well (satin finish)