Multi-axis Weed Pots

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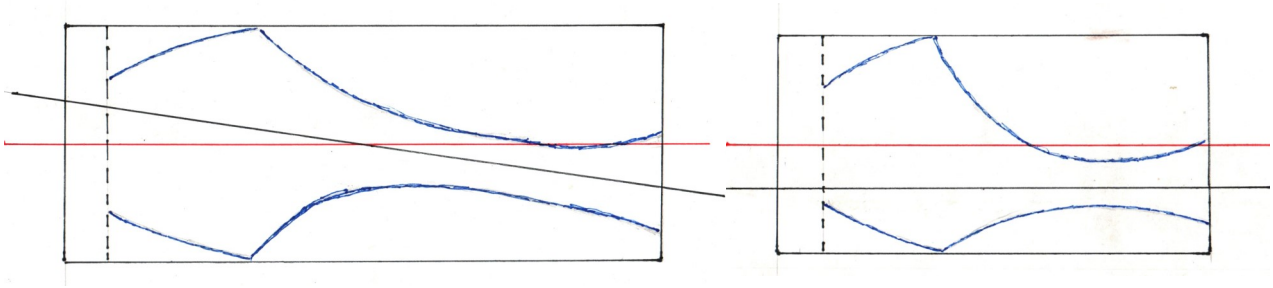
- Tools needed:
- 1/2” bowl gouge
- 3/8” or 1/2” spindle gouge
- Parting tool
- Jacobs/drill chuck and drill bits
- Drive center (I prefer a Steb drive) and live center with a point and cone
- 4-jaw chuck
- Optional– 3/8” beading and parting tool, round nose scraper
- Two different styles are described here—cross axis vase where two axis are same distance from center, but on opposite sides of center (the two vases on each side of picture), and a parallel axis where two axis are same distance from center, but on same side of center. (vase in the middle)



Cross axis vase

- Weed pots only have a small hole drilled in them so pick a piece of wood that is dry.
- Blank size– 7-7.5” long, 2.75-3.25” diameter. Diameter needed is based on your chuck jaws. The piece will be held in a chuck on the second axis so depending on how small of a tenon your chuck can hold, the blank can be made smaller. For example if your chuck can close down to 2”, the blank needs to be roughly 3.25” to accommodate the tenon. If your chuck can close down to 1.5” the blank only needs to be 2.75” in diameter.

- Mount the blank between centers (main axis) and turn the blank to a cylinder.

- Position the blank with the best figure (grain pattern, spalting, burl pattern) facing straight up. This way the best figure will be highlighted when the piece is complete. Using the tool rest at center height, draw a line across the blank. This line marks the second axis.
- Remove the blank from the lathe and extend the line draw on the side through the center point one end. Mark an offset of 1/2" from the center on this line. Flip to other end, extend the line through the center and mark a 1/2" offset on the opposite side of center from what you marked on the first end. The 2 offsets are the second axis.

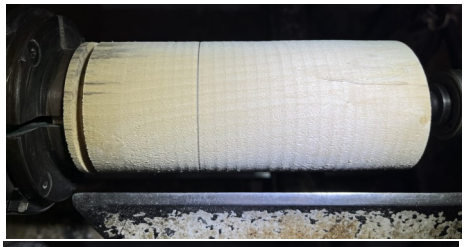
- Mount the cylinder between the offset centers. Make sure the toolrest does not hit the piece when rotated.
- Start the lathe at a slow speed and then slowly increase the speed. The piece should run balanced, but take notice of any vibrations and adjust speed as needed. Make sure the quill is locked.

- Turn a tenon on the end that will be the bottom of the vase that is sized for your chuck. Make sure the tenon has a shoulder all the way around it so that the face of the jaws have something to come in contact with. Because you are on the second axis, you will initially be turning a fair amount of "air". I find that a 3/8" beading and parting tool can be more stable than a 1/8" parting tool in this case. Take light cuts until the wood is solid all the way around.

- Mount the blank in the chuck on the tenon. Put the drill chuck in the tailstock with a short bit of the desired diameter (I typically use a 1/4" bit, about 4-5" long) Drill the hole. Then switch out the drill bit for a longer one and finish drilling to final depth. **NOTE**: You need to account for another tenon and room to part the vase off, so allow an addition 1/2" of space at the bottom when drilling.

- Remove the piece from the chuck and put your drive center back in. (I have a Steb center that fits in my chuck so I don't have to remove the chuck.) Mount the piece on the main axis again and turn another tenon on the same end as the off-axis tenon. This process will remove some or all of the second axis tenon—because of this you will need to re-mark the second axis on this end. Just remember that it is on the opposite side of center from where the vase hole is on the other end.

- Mount the piece on this main axis tenon in the chuck.



- I like to divide the piece into thirds. The bottom third will be the large part of the vase. I draw a reference line at this point. I first make a parting cut about 1/4" above the chuck to mark the bottom. Turn a tapered barrel shape on the bottom third. Don't sand yet, you may want to tweak the shape after turning the neck.

- With the bottom complete, mount between centers on the second axis. Use a cone tip on your live center to center on the hole. First turn away the "shadow" area to get to solid wood all the way around. Putting a solid color on the lathe ways helps to see the shadow better. I use a 1/4" thick piece of black foam. I use a bowl gouge for this as the tool has to hang over the tool rest for this part and a bowl gouge will be more stable than a spindle gouge.

- You can now reposition the tool rest closer. Set the top of the vase diameter and shape the top. Stop the lathe and verify that you have removed the hole left by from the live center on the main axis.

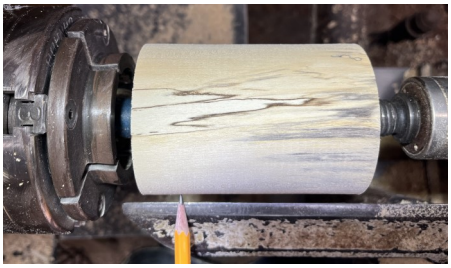
- Start shaping the cove that goes from the bottom to the top of the vase. Don't try to set the narrowest part of the neck too soon. You will find you may need to adjust the narrowest part as you get the shape refined. Stop and check your progress to see how the two axis are meeting. One side of the base will appear to be taller than the other. Keep turning the neck portion until you have turned away the line that was drawn at the 1/3 mark or you get the proportions of neck to base you want.

- Refine the neck curve to it's final shape. If you have difficulties getting the curve right, a large, round nosed scraper can be useful. Use a beefy one as it will have to hang over the tool rest quite a ways—mine are 3/8 or 1/2" thick.

- With the neck shaped, you can now sand the top. Power sanding or hand sanding will work. Power sanding works a bit better when needing to sand closer to the base. Just make sure you keep following the curve where the neck meets the base—pull the sand paper off the piece, don't round over the where the two axis meet, keep that a crisp line.

- Put the piece back in the chuck on the main axis tenon. You can now do any last minute adjustments to the base to tweak the look. Sand the base, again make sure you don't round off the area where the two axis meet. The parting cut at the bottom gives you space to get the sandpaper on the bottom edge to ease that sharp corner.
- Use the parting tool to part to about a 1/4" of the center. Part at an angle so the bottom is just a little concave. The mult-axis shape is too difficult to try and part completely off. Use a backsaw to cut the last bit and then use your spindle gouge or a rotary tool to remove the small nub that is left. A little sanding on the bottom and the piece is complete.

Parallel Axis Vase



- As with the cross axis vase, start with a dry blank 2.75-3.25" in diameter, but a little shorter, 4.5-5" long.
- Turn to a cylinder, position best figure face up, and draw a line at center using the toolrest as a guide. True up the bottom end so it is flat.
- Remove from the lathe and extend the line across each end through the center and mark a 1/2" offset on each end, on the same side of center. This is the second axis, it should be parallel to the main axis.

- I drill the hole for these vases on the drill press as it is just faster to do so (that's why we trued up the bottom). If you don't have a drill press, you will need to mount the cylinder between centers on the second axis, put a tenon on the bottom, and then hold the piece in a chuck to drill the hole on the lathe the same way you did with the cross axis vase.
- Mount the piece between centers on the main axis and turn a tenon on the bottom. If you used a tenon on the second axis to drill the hole, you might have to re-mark the second axis on the bottom as you might have turned that point off.

- Mount the piece in a chuck on the main axis tenon. Make a shallow parting cut in about 1/4" above the chuck to mark the bottom of the vase, then mark a line about 1/3 up from the bottom to give you an idea of how tall the bottom part will be.

- Turn the base portion as you did with the cross axis piece—tapered barrel shape.
- Remove the piece from the chuck and mount between centers on the second axis. Again, use a cone tip on the live center. Start the lathe slowly and slowly increase the speed. This piece does not turn balanced so it can cause the lathe to vibrate. If vibration occurs, slightly increase the speed to see if it smooths out, if not keep your speed a little slower.
- Using a bowl gouge, turn the shadow wood away until you have solid wood all around. **NOTE**: You cannot do this for the entire length of the neck—you will have to leave some of the shadow area as you get closer to the base to allow for shaping of the neck.
- Set the diameter of the very top of the neck and shape the top. Again, remember to stop and see if you have removed the center point left by the live center on the main axis—you should be enough off center for it not to be a problem, be good to check anyway
- As with the first vase, create a continuous curve from the base to the top. Stop and check where the neck meets the base. You should turn down to the 1/3 mark you made. It is very easy for these shorter vase to be "bottom heavy", so make sure the neck length has a pleasing proportion to the base.
- Sand the neck portion as before, remembering not to round over where the two axis meet.
- Mount back in the chuck on the main axis and tweak the base as needed. Many times the diameter of the base might be too big in proportion to the finished neck and has to be reduced. Fine tune the base, sand and part to 1/4". Use the backsaw to cut from lathe trim up the nub and sand the bottom.