From the first time I started to turn wood in high school shop class, I've been fascinated with polychromatic turning. Instead of turning a blank cut from a single log, my preference is to glue up a variety of geometric shapes, using different wood species and strips of veneer. The result is a multicolored blank that can be turned into an object of unique beauty.

A good way to learn about polychromatic turning is to make tree ornaments like the ones shown here. These ornate turnings make excellent gifts and craft sale items. Although every ornament I make is unique, they all share the same basic anatomy, and are usually assembled from 3 parts that are turned separately: a top cap, an icicle, and a polychromatic globe that contains two end caps. I don’t use patterns when turning the parts. In fact (as you’ll see on the pages ahead), turning is the easy part of the project. Once you learn how to cut and assemble a polychromatic blank, you’ll be able to apply these techniques when making other polychromatic projects like bowls, urns and plates.

Try your hand at polychromatic turning with a beautiful holiday project

By Don Russell

Cut tiny wedges to create a multi-colored blank

The globe of the turned ornament I’m making here contains 48 pieces: 24 wedge-shaped pieces (12 padauk, 12 yellowheart) and 24 pieces of green veneer that go between the wedges. Wedges are identical in size, and each one contains two 75° angles. To arrive at this cutting angle, you divide 360° by the desired number of wedges (360/24 = 15), then divide the result in half. Though I prefer to use my radial arm saw to cut tiny parts (see sidebar, below), the same job can be done on the tablesaw or chopsaw. Whatever tool you use, plan to spend some time getting the wedge angle exactly right. Otherwise, your blank won’t have the tight joints required for a good-looking globe.

Get set for perfect cuts. With the blade tilted 75°, I cut an angled stop block and clamp it to the radial arm saw’s fence to establish wedge size. Note that the bottom of the stop block is cut back to provide clearance for sawdust. Once you’ve cut one 75° end, simply flip the workpiece to make the next cut and create a new wedge. I make sure to remove each wedge carefully. Test and adjust as necessary. Cut enough test wedges to form a quarter circle (6 wedges in this case), then see how the assembled wedges fit against a square. A gap like the one visible here indicates that the saw’s bevel angle is too steep. Keep testing and adjusting until no gaps appear.

Why I love my radial arm saw

I’ve got a fine tablesaw in my shop, but I prefer using my 1960s-era DeWalt radial arm saw for many crosscutting operations. The absence of a blade guard demands close attention to hand position when cutting. But if you pay attention to safety, you’ll come to appreciate these vintage machines for a number of reasons, just like I have.

• No problems with tiny parts. A RAS offers the same benefits as a power miter saw or SCM saw: You can set up a stop block and rapidly produce identical parts with excellent precision. Small parts can’t jam between the blade and the fence, or be pulled into the throat plate opening.

• Compact. The adjustability of the DeWalt’s turret and carriage assembly provides excellent compound angle cutting capability for parts of all sizes. Dados in wide boards can also be cut easily.

• Excellent build quality. Over 50 years of use have done little to diminish the accuracy of the DeWalt saws in my shop. I get mirror-smooth cuts with a Forrest Woodworker I blade. I also find it amazing that spare parts for these antique machines are still available online. I can’t think of a better example of a quality-built, American-made product.

Photos: Stan Kaady
Glue up the globe & tape it twice

When I’ve got all the wedges and green veneer strips to create my blank, I lay down a wide strip of masking tape on a flat work surface and along one leg of a plastic square (a metal square works just as well). With the sticky side of the tape facing up, you can place your wedges and veneer strips in a continuous line, ready for glueup. The clear, stretchy “clamping” tape I use is made by 3M; it’s called 8884 Stretchable Tape—great for clamping when regular clamps won’t work.

Place the parts. Use the legs of a square to keep parts aligned as you press them onto masking tape.

Glue & assemble. After spreading glue in every opening and on the exposed ends, bend the parts into a cylinder and secure the assembly with masking tape.

Glue with a screw. The centered holes in the end pieces make it easy to glue these parts to the globe body using a long, 1/4” machine bolt. Use washers and a wing nut to apply even pressure.

Clamp with stretchy tape. Wrapping the cylinder with 3M’s special tape provides more clamping pressure than you can achieve with masking tape alone.

Flatten as needed. If wedges have shifted out of alignment, apply hammer persuasion.

Match the bevels. By pressing the globe’s bevelled opening against the bevelled end piece while it’s spinning in the lathe, I can tell when bevels match to make a good glue joint. A dark burn mark indicates good contact. Keep refining the end’s bevel till you get one. Before removing the end, bore a centered, 1/4”-dia. hole with a bit that’s mounted in a tailstock chuck.

Cut a dovetail. After flattening one end of the globe blank with a 1/2” gouge, I use a scraper to dovetail the end, as shown above. The dovetail can be grabbed solidly in the chuck when I flatten the opposite end of the blank.

Hollow it out. A side-cutting, roundnose scraper makes quick work of hollowing the globe to make it lighter. I aim for a wall thickness of 1/4” - 1/2”.

Hollowed out. The ornamental hollow makes it easier to glue these parts to the globe body using a long, 1/4” machine bolt. Use washers and a wing nut to apply even pressure.

Flatten & hollow the globe, then add top pieces

I use a SuperNova2 chuck to grip the cylindrical blank for the rough shaping that needs to be done at this stage. The goal here is to flatten both ends of the blank and then hollow out the interior so the ornament won’t be so heavy. I also need to create a 45° bevel joint for attaching the two end pieces. The beveled connection will create a cleaner line than a butt joint when the globe’s final shape is turned.

Match the bevels. By pressing the globe’s bevelled opening against the bevelled end piece while it’s spinning in the lathe, I can tell when bevels match to make a good glue joint. A dark burn mark indicates good contact. Keep refining the end’s bevel till you get one. Before removing the end, bore a centered, 1/4”-dia. hole with a bit that’s mounted in a tailstock chuck.

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Clamp with stretchy tape. Wrapping the cylinder with 3M’s special tape provides more clamping pressure than you can achieve with masking tape alone.
Turn the globe, then sand & finish

The globe blank is ready for its transformation, but mounting it on the lathe is a little tricky. The ends are already drilled to fit over a \( \frac{1}{4} \)-dia. pen-turning mandrel, but I also counterbore each end, drilling \( \frac{1}{2} \)-deep with a \( \frac{1}{4} \)--dia. bit. This makes it easier to turn the ends down to their shallow profiles. Plastic bushings forced tight against the workpiece hold it fast, while also providing clearance for turning tools.

Set up for a spin. A pen-turning mandrel extends through the blank, held in the headstock and in a ball bearing tailstock. Plastic bushings and a pair of rubber washers grip the workpiece so that it doesn’t rotate on the mandrel.

Sand with an air assist. The globe needs to be sanded, but dark sawdust can get into the pores of the globe’s light-toned wood. To avoid contamination, I blow compressed air over the workpiece while sanding at 180 grit.

No pattern required. I use a \( \frac{1}{4} \)" gouge with a standard fingernail grind to rough out the globe’s shape. I aim for a pleasing form, judging by eye rather than relying on a pattern. To smooth the globe, I use a scraper.

Start to finish with sanding sealer. Four light coats prevent dark resin & dust from bleeding into the lighter wood. I go over each coat lightly with a white ScotchBrite pad, then apply two light coats of spray lacquer. The final touch: a buffed coat of suntan lotion to prevent UV damage.

Finish up with hook & line

Completing the ornament calls for a couple of unusual ingredients: some monofilament fishing line and a medium-size fish hook. The small eye in the hook is just the right size to hold the plastic line used to hang the ornament. With a pair of wire nippers, I snip off the curved section of the hook so the straight length can extend through a hole drilled in the cap. Bending the end of the metal over holds it in place.

Fine work. When the cap piece has been fitted with its string and steel hanger, you can glue cap and icicle to the globe.

Turn the icicle & cap

I like to use ebony for the icicle and cap because the dark wood contrasts nicely with the globe colors. Whatever wood you use for these small parts, make sure it’s got ebony-like characteristics—clear, dense and strong. Since I’ve done so many of these ornaments, I don’t need a pattern to create a pleasing icicle or cap shape. If you’re new to a project like this, you might want to create a pattern. Remember to turn a tenon on these two parts so they can fit in the holes bored in the ends of the globe.

Work back from the tip. The point of the icicle isn’t supported by the tailstock, so it needs to be shaped first. I use my \( \frac{1}{2} \)" gouge for this work.

The \( \frac{1}{4} \)" tenon comes last. An open-end wrench that matches the diameter of globe holes is the perfect measuring device as I turn the tenon with a parting tool.

Sanding = finishing. Thanks to ebony’s resinous makeup and tight grain, it can gain a polished appearance simply by sanding with 220-grit sandpaper. I fold the paper to get into contoured sections of the profile.

A tree for tiny turnings. I turned a tree-type display to show off some of my ornaments at craft shows. Once you get the hang of cutting tiny parts and assembling them in different geometric arrangements, there’s no end to the variety of ornaments you can create.

Tools & Supplies: See Buyer’s Guide on Page XX.