

How to Make a Shell From Shell Designer

By Steve Garrison, ©2025 WoodShells.com



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Before You Start Reading If you'll watch [this video](#) before going through these instructions it will make it easier to understand. This video goes through the construction process step-by-step.

About This Program. These instructions are meant for introducing people to the fun and unusual craft of making seashells out of wood. At first glance the shells look like they are complicated and hard to make, but I have simplified the process as much as I could. By following these instructions you can make your own and see for yourself that it's not really all that difficult to get great results that you can be proud of, and others will admire you and your artwork. You will need a few woodshop tools to make them including rotary tool and carving burrs, table-mounted router and either a table saw or band saw for cutting the wedges. I cut out segments using a scroll saw – a specialty tool that a lot of people don't have, but the segments can also be cut out using a simple hand saw such as a jeweler saw or a coping saw. Between these two hand saws I would recommend a jeweler's saw with spiral blades that are also used on a scroll saw – I don't know of any manufacturer that makes pin-end spiral blades. There are several brands that make excellent quality spiral blades including Olson, Flying Dutchman, Pegas, and a few others. There are also a lot of sizes to choose from, and I have been using a size zero for this particular shell which is more on the small side.

For a beginner, the hardest part of this process would be making the wedges to cut the segments from, but I have simplified that. I have

tried several different methods of making the wedges, and the method I will be describing in these instructions is the best and most repeatable method for a shell about the size of my example shells. It allows a little bit of error in the wedge angle, and the error will be removed at a later stage using a small table-mounted router. The rest of the process is easy to understand, you'll essentially be gluing together a segmented wood carving blank and then smoothing it to its final form with either abrasives used in a hand-held rotary tool such as a Dremel, or you can carve it with a knife or chisels if you prefer. Traditional wood glue can be used, but it is easier and much faster to use medium viscosity CA glue and accelerator. Plus with CA glue you won't need any rubber band clamps, just a few seconds of hand pressure pressing the segments against a hard flat surface which also eliminates most warping caused by rubber banding them together with conventional wood glue. I now use a piece of synthetic quartz countertop material that I obtained from a fabrication shop for this purpose.

You can use whatever kind of wood you like, I used southern yellow pine for the shell pictured in the photos. The wood of course needs to be dry and stable. It will be cut into thin pieces which might warp if your wood has knots or other defects. The sharp edge must be sharp or else the shell will have a hole down the center.

Step 1. Making the Wedges. For these smaller example shells I used wood from a 2x10 southern yellow pine board I bought at Lowe's. I selected a board from the middle of the log so it would be mostly quarter-sawn grain, and the end-grain pattern wouldn't change very much from one wedge to the next. I'm orienting the grain to run along the length of the wedges. My table saw like most, has a worm gear to adjust the bevel angle, and I know that it takes exactly 30 turns of the handwheel to change the bevel angle from square to 45 degrees - so

that's 1.5 degrees per turn. I am using 16 wedges to make a full circle, so $360 / 16 = 22.5$ degrees. I only want to set the bevel angle once and rip as many wedges as I can get from a board, so I'll set the bevel to half of the 22.5 degrees = 11.25 degrees and the wedges will be isosceles triangles instead of right triangles. So $11.25 / 1.5 = 7.5$ turns of the handwheel to set the angle. Make the first cut to remove the square edge, and flip the board end-over-end to make the next cut. Adjust the fence so the blade just catches the edge to make a sharp edge on the wedges. If you have any thickness on the thin edge, you will have a hole through the axis of the shell. The hole can of course be drilled and plugged later if needed. Any error in the wedge angle will be removed later when the shell is in two halves.



Figure 1. Sawing wedge material on a table saw. After each cut the board is flipped end-over-end to cut the next wedge.

Step 2. Print the patterns and fold them along the axis. If you are gluing the patterns directly onto the wood, the printed side should face outwards. Printed side faces inside if using acetone transfer. The rectangle for the pattern area is centered on the axis of the shell, so

matching the corners will ensure that the fold is on the axis. Use a pair of scissors to cut exactly on the corners and line up the corners to make the fold. Cut all the segments to the same length as the length of the pattern, they will all be the same length. Align the ends of the pattern with the ends of the wedges and tape or glue it down. If you are using acetone transfer, use a square of cotton cloth a few inches square or so and fold it over your index fingertip and saturate the area over your fingerprint with acetone nail polish remover. Rub the back of the pattern so the acetone soaks through the paper and causes the toner on the underside to transfer onto the wood being careful to not let the pattern slip or wrinkle. Flip the wedge over and repeat this for the other side and then the other patterns. When the pattern is removed the print should be transferred onto the wood. don't put tape over the printed area or it will stop the acetone from transferring the print under it. The toner should transfer to clearly mark the wood if the surface is smooth enough. The smallest segment of each half (segments 8 and 16) should be made thicker in order to have a little extra wood to route off in making the halves flat. Cut the pattern for these two along the axis, and shift them over on the wedge onto the thicker portion. Only the half of the pattern with the dashed lines will be used on these two. Cut the interior and exterior of the pattern, and also cut along the axis line. Some of this extra wood will be routed off to flatten the halves.

Which pattern set to use. There are two sets of patterns, A or B. Set A should be used for right oriented shells with glue on patterns, or left oriented shells with acetone transfer. Set B should be used for right oriented shells with acetone transfer, or left oriented glue on. This will put the slightly larger face that is farther from the apex facing the aperture of the shell.

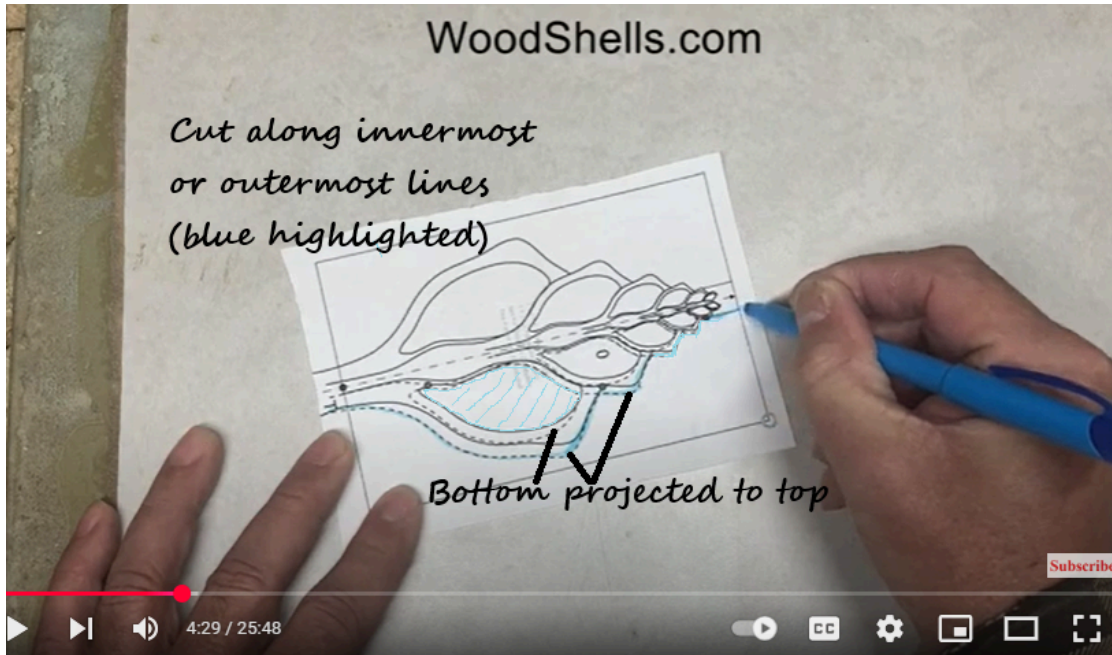


Figure 2. The dashed lines are the bottom projected to the top. Saw along innermost lines for interior cutouts, and along outermost lines for exterior.

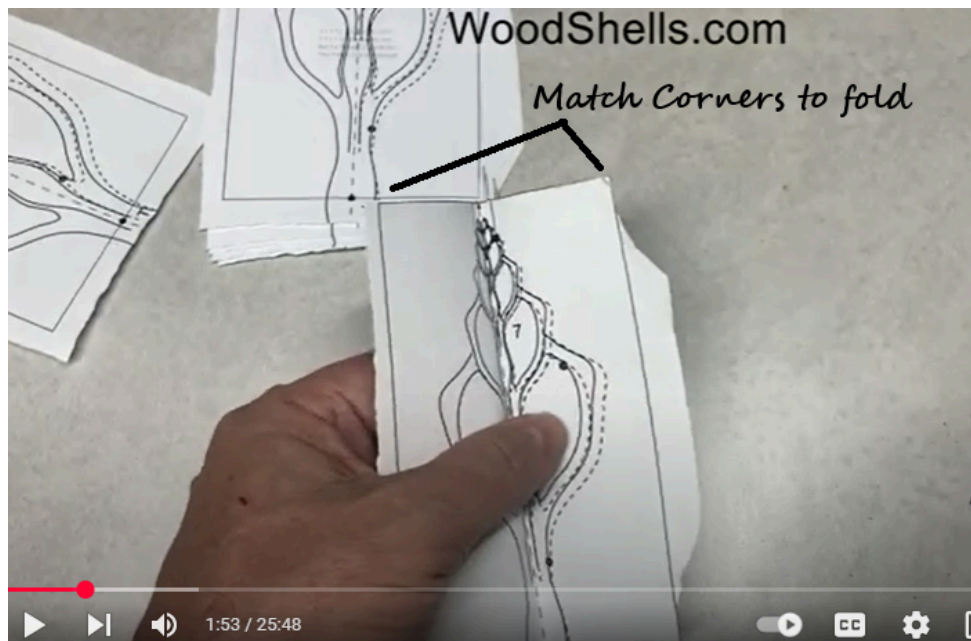


Figure 3. Match corners of the pattern area to fold precisely along the axis.

Step 3. Gluing segments into pairs. Remove any fuzzies from the joint surfaces. Use a piece of tape as a hinge and firmly press it onto the segments, this will keep the segments aligned when you fold it back together with glue. The tape will also help keep some of the CA glue off your fingertips as it squeezes out. I use Scotch super hold tape that I found at Walmart in the office supply area, it works much better than regular tape for sticking to wood. Open the tape hinge and apply the CA accelerator to one side of the joint. Apply medium CA glue to the other segment along all the joint edges. Close the segments together and hold it down tight with hand pressure on top of the flat surface, this will ensure that the segments stay flat while the glue sets without any flexing. Keep pressure on them for a few seconds or so while the glue sets. Continue this with the other segment pairs. After the segments are all glued into pairs, glue the pairs into groups of 4. Smooth the interior of the groups while they are still easily accessible before gluing the groups of 4 into 2 halves of 8 segments each. Now that the shell is assembled in 2 halves, it is time to remove the excess wood from the 2 thick segments to flatten the joint between the halves. This can be done with a table mounted router with a straight bit. I use a 1" diameter planing bit that is very handy for this, but any straight or mortising bit will work. Attach both shell halves to a flat board leaving the thick segments hanging over the edge and hot-glue the corner where the shell meets the board. Do not apply glue to the joint surfaces. Adjust the router bit height so that it only takes a little bit of wood off at a time. Clamp a straight edge to the table to guide the edge of the base board to keep the bit from accidentally bumping into it. Carefully route off the excess, the final pass should be with the top edge of the bit level with the top surface of the base board. Now remove the baseboard, and lap the joint surfaces with sandpaper on the granite or quartz tile to make the joint as flat as possible. Carefully glue the halves together to complete the assembly.



Figure 4. Flattening halves with table-mounted router.

Step 4. Use a Dremel carbide grit blade, or a carbide grit mushroom shaping wheel to knock down the corners before sanding. Keep the grit blade in motion pulling it sideways across the surface like in the video. This tool is particularly aggressive having a larger diameter than other bits. The mushroom wheel is a miniature wood grinding wheel that is also more aggressive than the smaller diameter bits.

Make a square sander for your rotary tool by hot gluing a small square of cloth-backed sandpaper about $\frac{3}{4}$ " or smaller to the head of a nail. Roofing nails fit a $\frac{1}{8}$ " collet, and drywall nails fit in a $\frac{3}{32}$ " collet. Apply a drop of hot glue to the nail head and wait a few seconds before pulling the nozzle away to help heat up the head of the nail for better adhesion. Lay the sandpaper square abrasive side down and glue the nail head in the center. Try to get the glue to squeeze out evenly around the nail head to form a ring. This surprisingly simple tool works very well, and can be used at low to medium speed –

higher speeds make the square stiffer. Sometimes the glue will let go, but they are easy enough to make and re-use the nails. Write the grit number on the back. Power sanding lets you skip grits, I typically use 100, 180, 220, and finish with 320 grit. Sometimes I use sandpaper wrapped around a corner of a stick or even a good quality (recommend Nicholson) fine tooth triangular file - a file made for sharpening steel saw teeth - to smooth interior corners. The square sanders have a tendency to round out interior corners if you're not careful enough. Leaving the sandpaper square instead of round prevents the edge from gouging the wood.

Shape the lip. It will make the shell more like a real seashell instead of being flat and square. This will enable the shell to be displayed in a more natural way sitting on its opening, and it may eliminate the need for a display stand depending on your preference.



Figure 5. Square sanders are simply a piece of cloth-backed abrasive hot-glued onto the head of a nail for a shank. Works great!