

The Art of the Scroll Saw

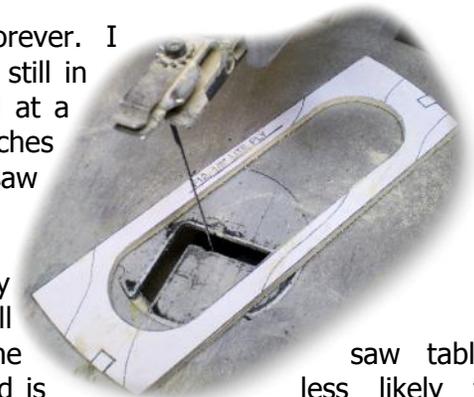
by David P. Andersen



A band saw can cut thicker wood and it doesn't chatter when cutting metal, but a scroll saw is more versatile. A scroll saw can cut holes and tight curves. The blade can be rotated 90-degrees to crosscut long pieces. It is safer. But you must select the proper scroll saw for your needs.

Consider a scroll saw to be an investment. Properly cared-for, it will last forever. I used my previous scroll saw for twenty years. I sold it at a club auction, still in perfect condition, for a profit. My Dremel 1671 scroll saw was purchased at a hobby shop. It has a blade travel of $\frac{3}{4}$ inches. It can cut balsa up to 2 $\frac{1}{2}$ inches thick. Cutting material greater than $\frac{3}{4}$ inches is slower than a bandsaw because the chips do not immediately clear the blade.

Choose a machine with low vibration and quiet operation so you can enjoy workshop rapture late at night without waking the household. A well balanced saw is so low in vibration that it will not disturb wood resting on the table. Two cutting speeds are desirable. The slower speed gives finer control and is less likely to melt plastic. Modeling requires cutting holes in formers and ribs. Choose a saw that releases the blade quickly, easily and without tools.



saw table.
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releases the blade

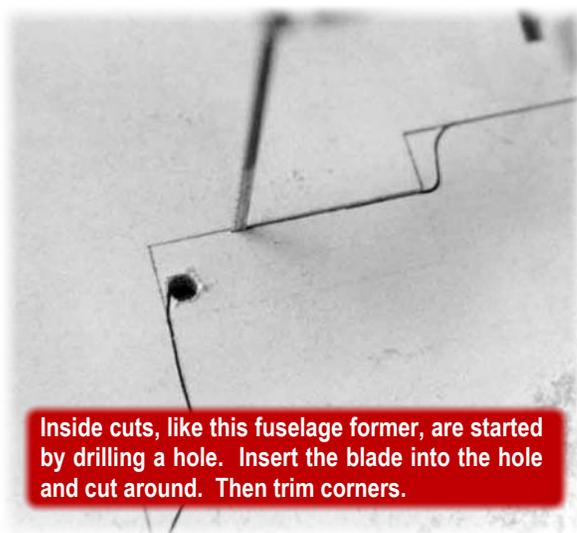
The cheaper models merely vibrate the blade. Some are too noisy for home use and they cannot cut thick blocks of balsa. Choose a scroll saw with as large a throat as possible. It is not uncommon to cut plywood 12 inches square in giant scale modeling. Scroll saws with 16-inches of clearance are available.

Photocopy the pattern from the plans or cut out the pattern from the plans. Apply a few dabs of Kinko's Glue Stick or similar slow-setting glue to the back of the pattern and attach it to the stock. Cut out the part and peel off the pattern before the glue sets. Better yet, use double-sided tape; it peels off more easily. For metal, completely cover the surface of the metal blank with double-sided tape and press the pattern in place. When cutting metal, cut slowly and press down hard to keep the metal from chattering.

Sometimes the bottom surface of the wood splinters as it is cut. To prevent this, support the stock with a sacrificial backing of scrap wood. Use a fresh blade and cut slowly.

Push the wood directly into the blade. Don't inadvertently add sidewise pressure on the blade or else the cut may not be vertical. This is easy to do, especially on curves. It is especially important when cutting thick material. If the cut is not vertical, the walls will not be parallel; and stacked parts may not be identical.

To cut several identical pieces simultaneously "gang-cutting", stack several sheets of stock, stuck together with double-sided tape, pins or screws. Then attach a paper pattern on the top surface and cut them all simultaneously. If you like perfection, cut slightly outside the line, then trim away half of the line with a disk sander or a sanding block.



Inside cuts, like this fuselage former, are started by drilling a hole. Insert the blade into the hole and cut around. Then trim corners.

“Cutting all those parts is half the FUN”

Jeff Quesenberry

Gang-cutting wing ribs is known as “the stacked rib method.” Cut top and bottom lines in the same direction, e.g., leading edge to trailing edge. Any lack of verticality in the blade will be cancelled.

Sometimes a pattern contains markings for the alignment of other parts, such as a rib location or a servo position. In this case, we can transfer the pattern directly to the stock by making a photocopy of the part. Set the darkness level to very dark so that lots of ink is deposited. Then apply the copy to the stock, face down, and iron the back of the paper with a hot iron. The ink will be softened and transferred to the wood. The image will be reversed which usually doesn't matter. But if a non-reversed image is necessary, find a copy machine that has a reverse image control. Use it to reverse the image during copying.

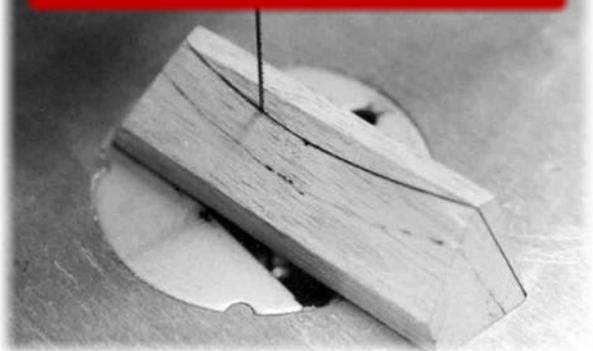
Magazine plans tend to be drawn with wide lines so they will look good when reduced and printed in a magazine. No problem. Just remember that the true edge of the part is the center of the line, so cut away half of the line. To be really precise, cut outside that line and sand away half of the line with a sanding block or a disk sander. A small, low-power disk sander is adequate (and preferred) for this task.

Delicate parts can be gang-cut by pinning them together. A couple of T-pins pushed down thru the pattern and the stack works well for balsa. For very soft or very thin balsa, use dress pins - the kind with the tiny heads. Push them upwards thru the wood and squash the heads into the wood so that the heads are flush with the lower surface. Set the saw speed on low for better control.

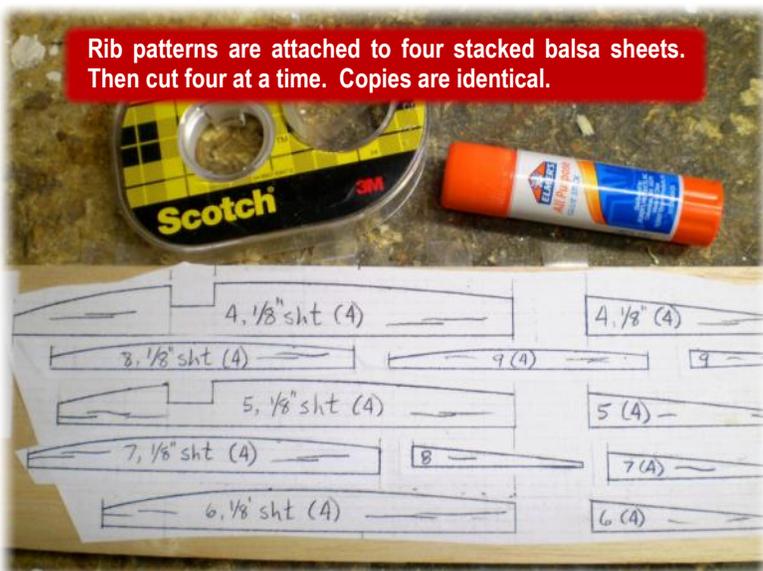
For intermediate-size balsa, such as 3/32-inch wing ribs, stack blanks with two small pieces of double-sided tape between each layer. Scroll saw blades cut right thru double-sided tape. The parts can be easily pried apart later because Scotch tape doesn't adhere very well to balsa and even less so to plywood. We need only to keep the parts from shifting while cutting.

When cutting thin aluminum or lithoplate (scale modelers use tons of this stuff for hatches, vents, panels, etc.), attach the material to scrap ply with double-sided tape. Use only a couple of little pieces of tape - just enough to keep it from slipping. The ply backing keeps the edge of the metal from curling while being cut. Peel the pattern off and then pry the result from the backing with a thin blade.

Complex shapes, like this windscreen fairing, are cut one face at a time.



Rib patterns are attached to four stacked balsa sheets. Then cut four at a time. Copies are identical.



For 3/16-inch plywood or thicker hardwood or metal, double-sided tape may not hold. Drill two pilot holes thru the stacked blanks and screw the layers together.

To cut plastic, it's important to keep the blade cool, else the plastic will melt and make a mess. It may even fuse together after the cut. Use a fresh blade and cut slowly with a low-speed setting.

Even complex shapes such as air scoops and windscreen fairings can be formed with a scroll saw by cutting one face at a time. Start with a rectangular block. Apply a side-view pattern to one side and a top-view pattern to another. Cut out one of the patterns and spot-glue the pieces right back together again.

Rotate the work and cut out the other pattern. Break off the remaining spot-glued pieces. All that is left to do is to round the edges. Your friends will think you are a master wood-carver. Savor the illusion for a while before revealing how it was done.

For RC model building, a pin-end regular tooth blade (0.018" thick x 0.110" width x 20 teeth per inch, typically) is adequate for all ordinary materials and thicknesses. Pin-end blades are preferred for ease of use. I haven't found a need for unpinned blades. Very fine blades are for intricate cuts with sharp radiuses of curvature not generally found in RC model work. Course blades cut faster than we modelers need. The wider blades tend to make a straighter cut. Blades are cheap; replace them frequently.



Finish the cut by sanding away half of the line with a disk sander.

Always wear glasses to protect your eyes from flying chips, especially when cutting metal. And wear a dusk mask when cutting wood to protect to prevent developing sensitivity to wood dust.

How could the scroll saw be improved? Wouldn't it be nice to have a scroll saw blade that is 1/4 inch wide for cutting spar notches?

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