



Cable-Exit Fairings

This simple modification hides the holes and may slightly enhance aircraft performance.

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Here's a small, fun and satisfying little project that takes little time or skill and gives almost instant satisfaction...and we all need one of those every now and then! (The project *and* the satisfaction.)

On most airplanes, there are at least two places where control cables exit the skin and are, at least for short runs, exposed. It's usually rudder cables penetrating the side of the fuselage, but there are plenty of designs with cable-actuated ailerons and even elevators. Putting a small, streamlined fairing over the cable

Protrusions can increase friction, and fairings such as this one help smooth the way.

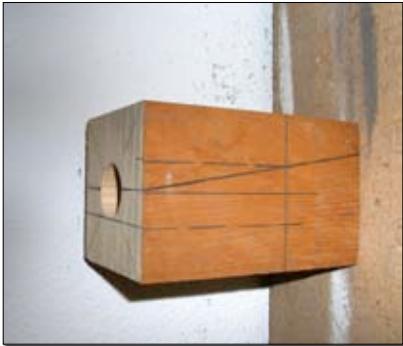




A 1-inch Forstner bit cuts into the endgrain of a block of straight-grain fir.



A piece of dead soft aluminum will form the fairing. The process starts by tightly clamping it across the hardwood "cone." Changing the angle of the block will change the shape of the cone.



The layout of the hole and cut drawn on the side of the block.

exit hides the hole and might even add some fraction of a knot to forward progress. They can be made easily from either aluminum or fiberglass.

Building It

The shape of the fairing is a tapering section of a cone surrounded by mount-

ing flanges on the long axis. To make it you'll need a two-part "die set." Start by making the female half of the "die" from a 5-inch-long block, about 3 to 4 inches square, of a resilient, interlinked, tough composite material. Like wood. A chunk of 4x4 fir will do just fine.

Drill the block along the lengthwise centerline. In the illustrations a 1-inch Forstner bit was used to drill a 3-inch-deep hole. There's nothing magic about these dimensions—it was just the biggest bit in my shop, and the shank was only long enough to permit a 3-inch hole.

Once the hole was drilled, a line was scribed on side of the of the block, running from a point aligned with the center of the hole across to a point on the wall of the hole about an eighth-inch shy of the bottom. A sharp, coarse bandsaw blade cut the block into two pieces, one of which forms the die. After rounding



Cut along the angle with a bandsaw or sharp handsaw. When the block falls open, there's a conical recess that is the female side of the die.



A vice supplies the power to force the dies together and form the aluminum.

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deep socket that measured $2\frac{3}{2}$ inch outside diameter...close enough. Cut a blank of soft aluminum to the width of the female die, and about a half inch longer than the recessed cone. Clamp or tack the blank to the female die with the front edges aligned. Tap the socket against the blank until a rough recess is started, then form the cone by pressing the rod into the aluminum with a vice or C-clamp. This will squeeze the aluminum into shape. The aluminum usually buckles up a little just in back of the point of the cone. Duckbill pliers or a small hand seamer will straighten it out in a few seconds—soft aluminum is pretty easy to work with. With a little tapping, trimming and edge-dressing, you'll have a neat little fairing, ready to rivet or bond over the cable exit.

The female die can also be used as a female mold to build a composite fairing. Coat the mold surface with resin and then let it cure completely. Sand the surface to a smooth finish and coat it with release solution. Wet out three layers of 7-ounce fiberglass cloth (or lighter) and lay it in the mold. If you lay the weave at 45° to the long axis of the cone, the glass will conform to the curve more easily. After it cures, pop it free and finish to suit. †



A piece of water pipe of the same size as this deep socket may be used as the male die.



The female die, appropriately waxed, can also be used to form a fiberglass fairing.



The finished product. All you need is paint to match the aircraft.

A hand seamer (left) straightens the inevitable wrinkling that will occur along the edges.