MAKING WINDSHIELD FRAMES FOR MY ACRO II

by Tony Hohenwalde, Contributing Editor

Following a fruitless search through ten years of SPORT AVIATION magazine, EAA builders tips, and other reference materials at hand, I finally picked up the phone, called Ben Owen and slowly, desperately cried HELP! As always, he did. Although Lou Stolp is no longer associated with the Starduster Corporation, they sent me an article Lou had written, which is presented below:

HOW TO INSTALL WINDSHIELDS by Lou Stolp. READ ONCE COMPLETELY BEFORE STARTING! One of the most frustrating jobs for many builders is fitting the windshield and especially the band around the lower attachment to the cowl. Lets approach the problem step by step. Like many problems, there may be better ways to do the job, but this one works very well.

The first thing to do is fit the windshield to the cowl. It is advisable to have a smaller cockpit hole in the cowl than you intend to end up with so as to give

support when fitting the windshield and forming the band. The same basic windshield will fit many airplanes so they must be individually fit. First remove the protective coating, then hold the shield in approximately the position you want it and eyeball where to cut the majority of the trim. Next, place reference marks on the cowl to position the windshield to the cowl. Measure from rear cockpit bulkhead forward and the same distance up from the longerons. Mark the final windshield trim with a felt tipped pen. This is done by placing a small spacer under the pen and holding it flat against the cowling. After final windshield trimming, all edges must be smoothed by sanding or similar method. Next, mark a line 1/2" up from the bottom of the windshield so it parallels the longer edge. Divide this line starting 1/2" from the tail of the windshield into approximately 2" divisions. Using a high speed (fast turning) drill motor, drill some #10 or 3/16 inch test holes in a piece of scrap plex to make sure it does not crack the plexiglas. DO NOT DRILL PILOT HOLES as they can cause the larger drill to grab when it goes through. When you are satisfied you are drilling a smooth hole in the scrap, drill the holes in the windshield. After drilling all the holes, slightly chamfer the edges of all holes. When this is done, you are well on the way to becoming a hero.

Now all that we have left is to install the attach band. Make the band from .040" aluminum "O" condition, but lets make a pattern first. Poster cardboard is good to make the pattern but Bond paper works very well. Hold the pattern material against the outside of the windshield and draw a line around the lower edge. On the pattern, draw parallel lines 1" from this line, both sides. This is your pattern. Now cut this from the .040" soft aluminum. Using skin clamps, secure this aluminum to the lower edge of the windshield making sure to center the band. Drill No. 30 holes with the No. 10 holes in the glass. The windshield has larger holes so there will be no bind on the glass causing it to crack. Start from the center when drilling the band and cleco each hole if you have them available; if not, use bolts and nuts. Do not overtighten. After the band is drilled it may be removed and countersunk, if you want to use flush rivets. Check fit and smoothness, then install a piece of plastic electrical tape to the band where it will come in contact with the windshield. Next, using 1/8" soft countersunk rivets, again starting at the center, remove the clecos one at a time and using a lage O.D. washer against the plexiglas, rivet the band to the windshield. Now you are almost a hero. All you have to do is bend up the flange. Clamp a short length of approximately 1 inch diameter hardwood Dowel in the vise. Hold the windshield upside down and index the flange over the Dowel approximately on the center line of the flange. With a rubber hammer, gently form the flange to approximately the proper angle. It takes very little forming. Now a second person is handy. Hold the windshield on the cowl and using a short length of 1 inch hardwood Dowel and a hammer, complete the forming. It is a help to buck up under the cowl while forming the flange. Drill attach holes as necessary and again facing the mating side with electric plastic tape, the shield is ready to install. Make final cockpit trim and install the windshield. You are now eligible for a hero badge. How about that!

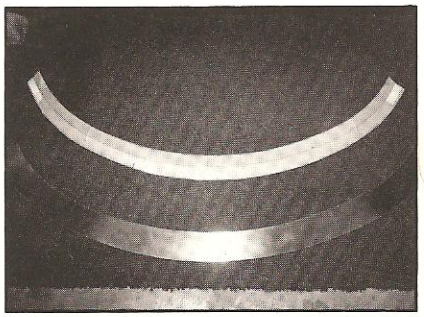
I deviated from Lou's instructions almost immediately — I read it more than once! Seriously, I found his article very helpful. There were some step-by-step photos with the article, but they were copied from another copy, and would not reproduce very well again. Therefore, I have included some pictures of my own installation.

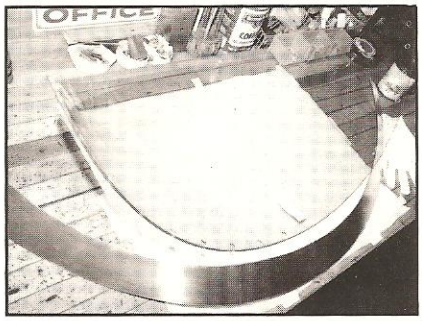
As Lou's article states, I made a cardboard pattern and then cut the frame from .040 inch 6061-0 aluminum. (See Photo 1.) I deviated from the article in that I drilled 5/16 inch diameter holes in the plexiglas and 3/16 inch diameter holes in the frame. I then used 1/2 inch 10-32 machine screws to mount the frame to the windshield. (See Photos 2, 3 and 4).

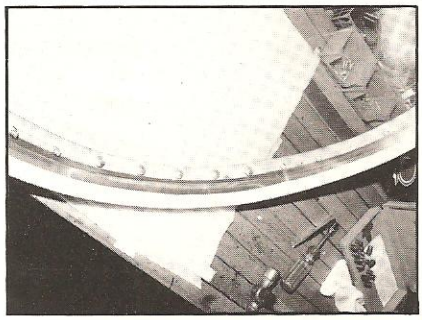
In Photo 5, you can see the plastic electrical tape on the back of the frame. There is also a thin, rubber washer between the plexiglas and the metal washer and nut. Photo 5 also shows the forming process using the hardwood dowel and mallet. Gentle taps is the key word here. Aluminum in the "O" condition is very easily formed and "Gorilla" tactics are taboo.

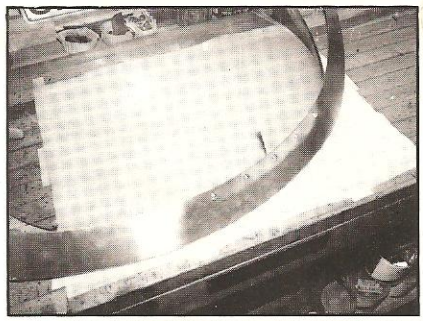
Photo 6 shows the final "Dress-up" forming with the windshield on the aircraft. Lou is 100% right about the extra pair of hands. This is a very tedious task to attempt alone. The hands in the pictures belong to my good friend, Ernie Welborn, aviation enthusiast and retired Sheet Metal Worker and Technical Illustrator for Martin Marietta Corporation.

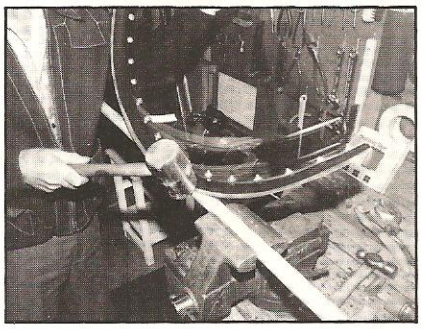
Photos 7 and 8 show the windshields installed on our Acro II. I purchased the windshields from "The Airplane Factory, Inc." They included some helpful hints on the care and feeding of plexiglas, presented below:

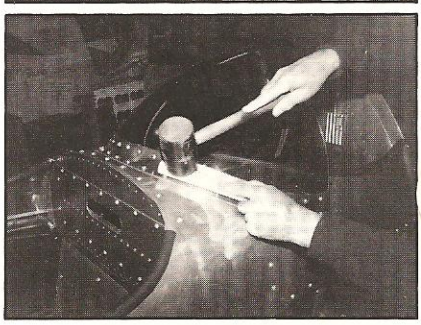
1


2


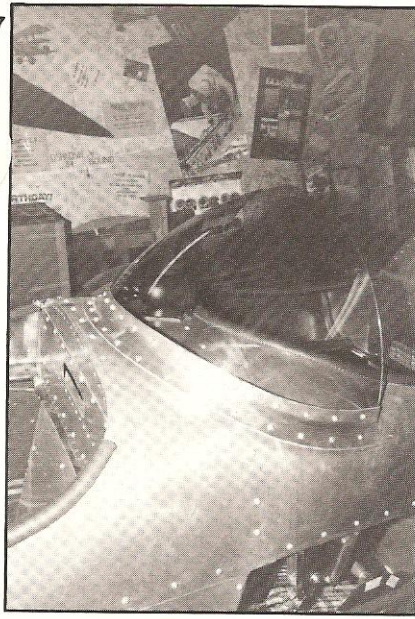
3


4


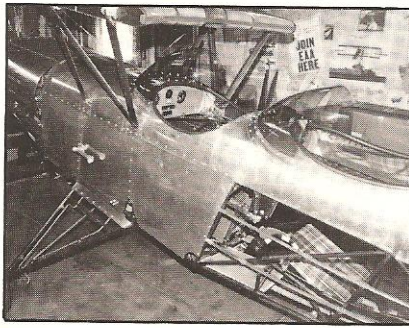
5


6


7



8



TECHNICAL TIPS FOR