ACRO SPORT Newsletter

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Forming The Leading Edge Skin

or at Least, How I Did It!

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Photos by Becky Sidders

Most of the time we humans get really worked up and worried about things we have never tried or have never seen done. Once we do it, we wonder what we were so worried about. The forming of the leading edge skins is no different. The skins being formed in the photos are for a SONEX, but that doesn't matter. I've used this method on my Sonerai - II and on the Acro Sport as well.

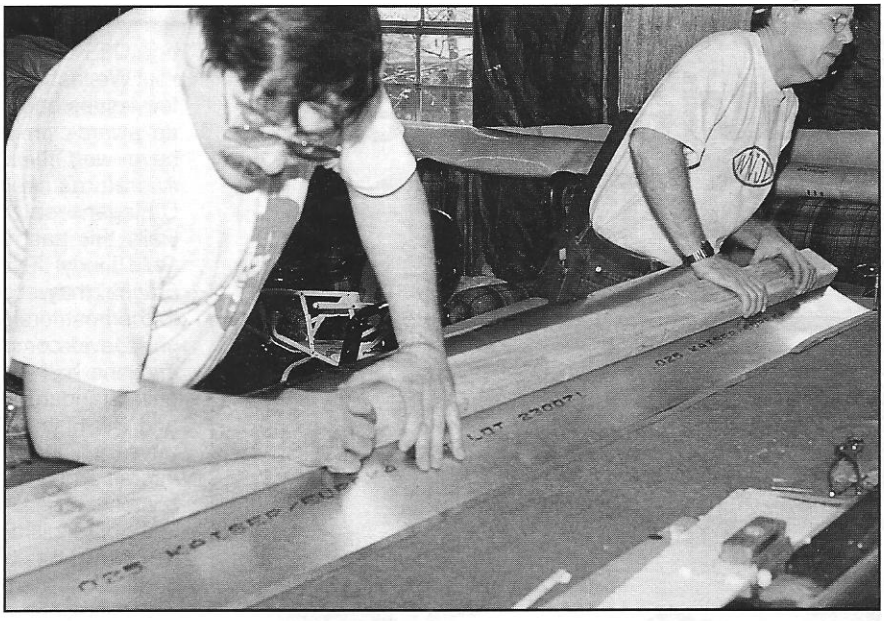
When I ordered the material for the skins I had the supplier, Wicks Aircraft Supply, shear the material to size. They did so for a very reasonable cost. although 2024-T3 is called out in the plans, you could use 6061-T6. It is a little easier to form and is more corrosion resistant. I personally wouldn't consider the 6061 unless I lived in a region with a salt-air climate. Since the 6061 is easier to form, it is also easier to dent!

The only special tools you need are a table as long as the part you will be forming, and a 2x4 that is as long or longer. You will also need one other caring person. The caring person is essential for preventing the condition shown in Photo #3. If you attempt to push the aluminum sheet over without the full length support of the 2x4's a very unsightly kink is guaranteed.

Start by locating the center of the leading edge radius. On the Acro II you will find the tap half of the skin to be about 1/4 inch longer than the bottom. Clamp some form of stop 1/4 inch on to one edge of the skin. With this edge lying away from you on the table, push the other edge over to meet the stops using the 2x4. Now, slowly work the 2x4 back toward you forcing the metal down. Release the metal periodically and check the resulting radius with a nose rib or pattern. The part will end up "V" shaped but will pull down to the shape of the ribs.

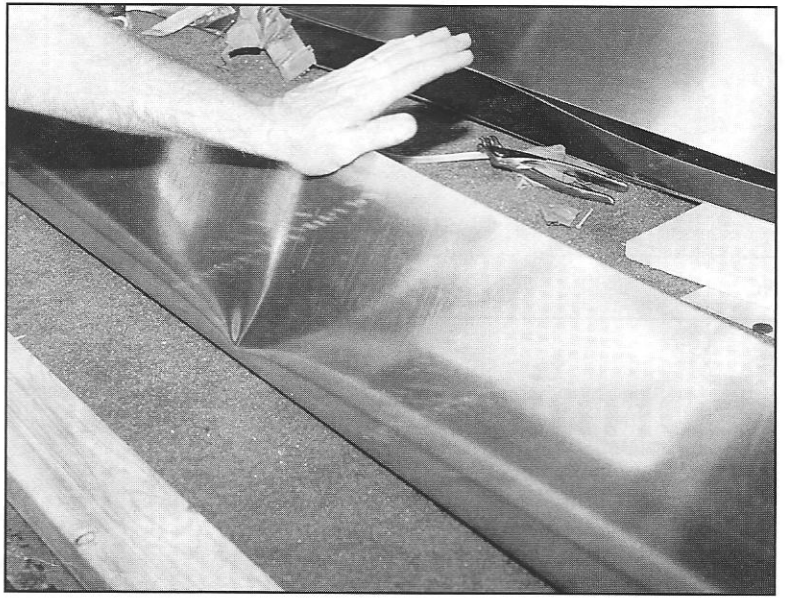
As far as methods of drawing the skin into position on the wing, the method used by Steve Manweiler in Newsletter #52 is as good as any. Steve made several female forms of the leading edge profile and used them to draw the skin tightly against each rib. He used a length of rope with a sliding knot to tighten them into place. You could make this a lot more complicated if you really want to, but the end result should be the same. You must make sure the wing is jigged square and flat before you nail the skin on or it will want to maintain whatever misalignment you have built into it.

Here are some thoughts on the nails used to secure the skin to the wing. Some builders try to pierce the aluminum with the nails as they go. I haven't had much luck with this



The first bending step is to push the edge of the bottom half of the skin over to the stops that are clamped to the edge that is against the table. Note that the table is carpeted.

Here we have worked the 2x4 back close to the radiused area. Pressing down at this point is where the radius gets formed. The caring person on the far end is Rev. Dave Fortuna who is building the Sonex that these skins are for.



This is a leading edge skin for an ACRO II after an un-educated helper just couldn't resist a little push by hand. Instruct your help before you start!

method. First of all, the metal is hard to pierce and second, it scrapes all the coating from the glue-coated nails. How often have you heard of the nails in aluminum leading edges working up? The condition is somewhat common on Pitts Specials, but I consider this to be a result of wing twist that occurs in some part due to the fact that the Pitts doesn't have flying wires on the rear spar. The Acro Sport series of biplanes have a very rigid wing platform. Anyway, I drill the aluminum skins for the nails in hopes of the glue coating doing its job.

There is one other thing to consider when installing the leading edge. Now don't laugh, I know some old timers who swear by this. If at all possible, install the skin during the heat of summer, and only after leaving the skins out in the sun for a couple of hours. The theory is to attempt to expand the skin to its maximum length just before installation to minimize the slight buckling that can sometimes be seen on airplanes that are parked in the sun for long periods of time. I have seen this occur, and airplanes with dark colors on the leading edge are more prone to this condition. You decide if it is worth the trouble.