FW:10 Class A Bomber LG

I finished up the landing gear (LG) this morning and shot a couple of pictures for you to see. The first picture shows the LG with 3/32" piano wire legs. The arched piece of .031" piano wire wrapped and soldered to each gear leg is an expanding "limiter" to prevent the LG from spreading out too far when a hard landing occurs. As the gear spreads, the arch goes into tension, flattening out, and at the limit restrains the spread of the LG. Notice that Ed Shilen’s Old Timer .19 radial mount shown at the top has machined 3/32" grooves to hold the LG against the firewall.

The second picture shows the LG installed using the Shilen radial mount. This installation is simple, but effective. What I like about it is that the LG can be easily removed, especially for covering and finishing............Tandy

FW:11 Class A Bomber Pylon Primary Structure

We had our Thanksgiving yesterday in order for Sue’s family to all be together. All her family are spending today with their other family members (inlaws, parents and so forth). So this morning, I cut out the pylon parts and pinned them down. This shows the lay up of the pylon primary structure out of 1/4" sheet balsa............Tandy
FW:12 Class A Bomber Pylon

I have finished the pylon structure and it is ready for bonding to the fuselage top longeron. The first picture below shows the pylon structure from the bottom. You can clearly see the groove in curved bottom portion of the structure. Once I glued the streamlining ribs on the pylon structure, I sanded them to shape so that the vertical 1/16" balsa planking will fit on properly. Notice the reflex in the rib contours resulting from the sanding. Going vertically, the pylon planking will be straight at the middle, but as you move either forward or aft, the planking becomes bowed (kind of hour glass shaped) due to the narrower chord of the pylon in the center. The second picture shows this pylon structure from the right side. The next step will be to glue the bottom groove to the top longeron of the fuselage shown in the third picture........Tandy
FW:13 Pylon Jig

Some time ago, Charlie Reich asked me to post pictures of how I jig the pylon to the fuselage on my Bombers when bonding them together. I just finished jigging the pylon to the fuselage on my little Bomber. The three pictures below show how I do this and are self explanatory............Tandy

FW:14 Pylon Planking Complete

The planking on the Class A Lanzo Bomber pylon structure has been completed and I finished up with the final sanding this morning. The hour glass shape and the pylon/fuselage juncture makes this undoubtedly one of the more difficult structures I have ever had to planked. I
have attached six pictures below, which show you the finished pylon. Notice the contour of the pylon planking as its beveled edge intersects the fuselage planking. This is an absolute nightmare to pre sand and bond in place each of the three pieces of sheeting required to cover the side of the pylon structure.............Tandy

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<tr>
<th>Planked Pylon 1.jpg</th>
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<td>Planked Pylon 3-2.jpg</td>
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FW:15 Class A Bomber Wing Saddle

Yesterday I made the wing saddle out of 1/8" sheet balsa and today I bonded it to the top of the contoured pylon. At this point, I will hang the fuselage on the wall and start building the wing so you will not be getting an update from me for a while.
FW:16 Class A Lanzo Bomber

Before I started the wing construction, I decided to check the alignment of wing saddle with the stab platform. I screwed the stab onto the stab platform and jigged up the fuselage so that the wing saddle was level. Bless my soul, the stab was in fact misaligned! @#$%$

So I have been busily going about developing a stab shim to tilt the stab and align it with the wing saddle. For reference, the first picture below shows the stab mounting platform glued onto the fuselage structure. I selected a piece of medium 1/32" balsa sheet, cut it into three pieces, and bonded it together cross grain. I mixed up some 45 minute epoxy and squeegeed it out into a thin layer over the stab mounting platform. The 1/32" balsa sheet I had made up was placed onto the the epoxy and moved around to smooth out and press out the excess epoxy. Some spruce strips were placed longitudinally on the top of the 1/32" balsa sheet near the edges and a row of cloths pins was used on each side to clamp the sheet to the platform and this was put up to dry overnight.

Next, the four mounting holes were drilled through the 1/32" balsa sheet and the sheet overhang was trimmed back to the platform edges. This is shown in the second picture below. Now for the tricky part. Since the stab was tilted right tip down, I placed a strip of masking tape along the right edge of the sheet to preserve 1/32" thickness. Using the fine side of one of these nail file made for sculpturing artificial nails, I began the long process of carefully sanding and working down the left side of the 1/32" balsa sheet, using the masking tape along the right edge as a sanding guide to preserve 1/32" thickness on the right side. Effectively, I was shaping a wedge across the entire stab mounting platform.

Once I got this stab shim worked down, I screwed the stab onto the stab platform, jigged up the fuselage, and checked the alignment. After some three iterations, I finally had the stab shim shaped to bring the stab into alignment. The last iteration was done with the masking tape removed so entire shim could be sanded as a unit. The final shim result can be seen in the last picture below.

Now, I must get on with building the wing!..................Tandy
FW:17 Class A Lanzo Bomber

The picture below shows the initial lay up of the wing center section. The L.E. and T.E. are pinned down and wing ribs have been positioned and glued in place.
FW:18 Class A Lanzo Bomber

I trimmed the spar, L.E., and T.E. tip over hang and sanded the edge ribs, which are inclined half the dihedral angle (11.76 degrees). This completed the center section and I will begin the wing tip panels today. However, I took a few pictures of the center section construction I want to share with you.
**FW:19 Class A Bomber Dihedral Angle**

A modeler responded:

OK, I give: how do you sand wood to 11.76 degrees? Hell, I can't even prop 'em up and glue 'em together to get 23.52 degrees very well. My guess is that the designer just said prop 'em up to 3" or whatever. Grins,.........Name

You got me, at least on the .01 degrees! I calculated the tip dihedral to be 23.52 degrees. I wanted the dihedral rib to split this angle, so the center section tip rib needed to inclined 11.76 degrees (a calculated number). Taking 90.00-11.76, you get 78.24 degrees. I went to the bottom of the wing plan and drew in an angle of 78.25 using my K&E protractor (see Picture 1). Your right, the best I could do was 78.25 degrees, by splitting the two division lines, which is .01 degrees too much. Then I cut a 78.25 degree template out of 1/4" balsa (see Picture 2). I used this template to jig the angle that the tip rib was glued in at. Once this was dry, I trimmed the spar, L.E., and T.E. tip over hang and sanded the edge ribs until every thing was flush and rechecked the tip rib angle with the template. (see Picture 3).

The truth of the matter is that the resulting angle is probably somewhere between 11.6 and 11.8 degrees, which is close enough for gluing purposes. My requirement was to get the angle of the ends of the spar, L.E., and T.E. as close as practical. When the tip panel is glued to center panel, angular measurement will not be used. Instead, a jig will be built to elevate the wing tip to the correct vertical or rise dimension. What little angular differences there are in the end joints will compensated for in the gluing process.................Tandy
FW:20 Response to Your Questions

Hi Alfredo,
I will answer your questions as follows:

Fine method Tandy, some considerations about it:

2) How do you assure that the tilted rib stay in a true flat plan when you insert it in the spars? I make two matched extra ribs per dihedral joint. This insures spar, L.E., and T.E. joint alignment when gluing the spar, L.E., and T.E. end joints. No attempt is made to glue the ribs themselves together.

3) Do you use same method for tip panel and butt glue two ribs at the dihedral? Once the
dihedral joints have all thoroughly dried, I then cut away the two extra end ribs.

4) After gluing, do you cut notches at rib to accept plywood reinforcements? I cut out plywood dihedral bracing and glue it in place either between the spars or overlapping the the spars, depending on the joint design. I do the same for the L.E. and T.E.

5) Another "second importance" problem with dihedral joints is that tilted rib for pronounced dihedral angles tends to be a little small ... I just forget it and use same rib. What about you? I carefully cut a standard rib into its sections and glue in each section, being careful to align it to the tilted dihedral joint and making sure the sections line up in a straight line chordwise. This rib is always "a little small" just as you said. I find that if I do not correct for this, the covering always bunches up due to rib not being flush with the spars. So I cut very thin strips (1/32") of rib balsa and glue on the top and bottom of the tilted rib. Then it is a matter of sanding to contour flush with the spars, L.E., and T.E. joints.

I have attached a few construction pictures of my Fuvar 57X wing to illustrate what I have just said.