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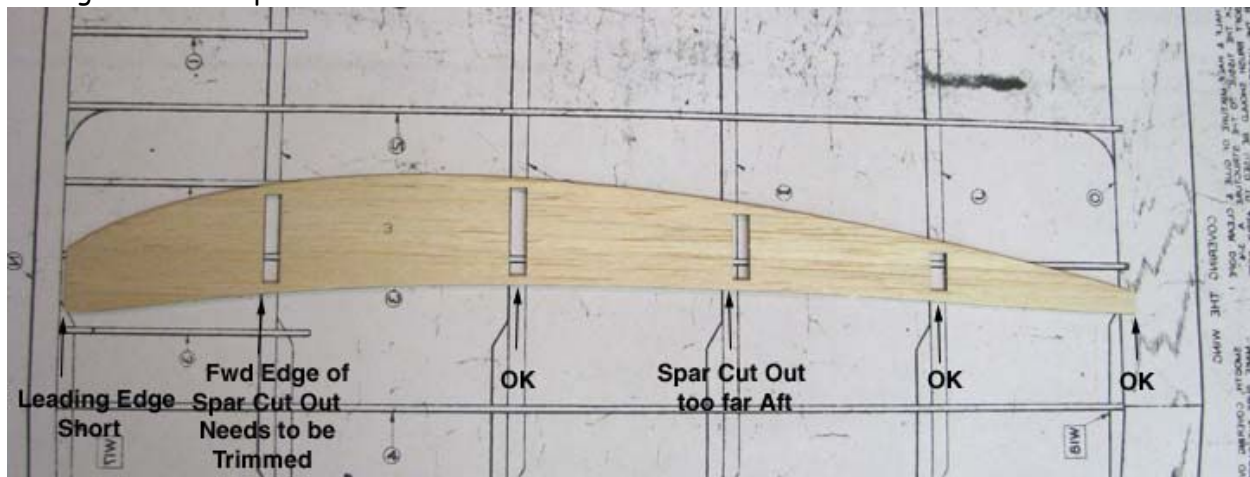
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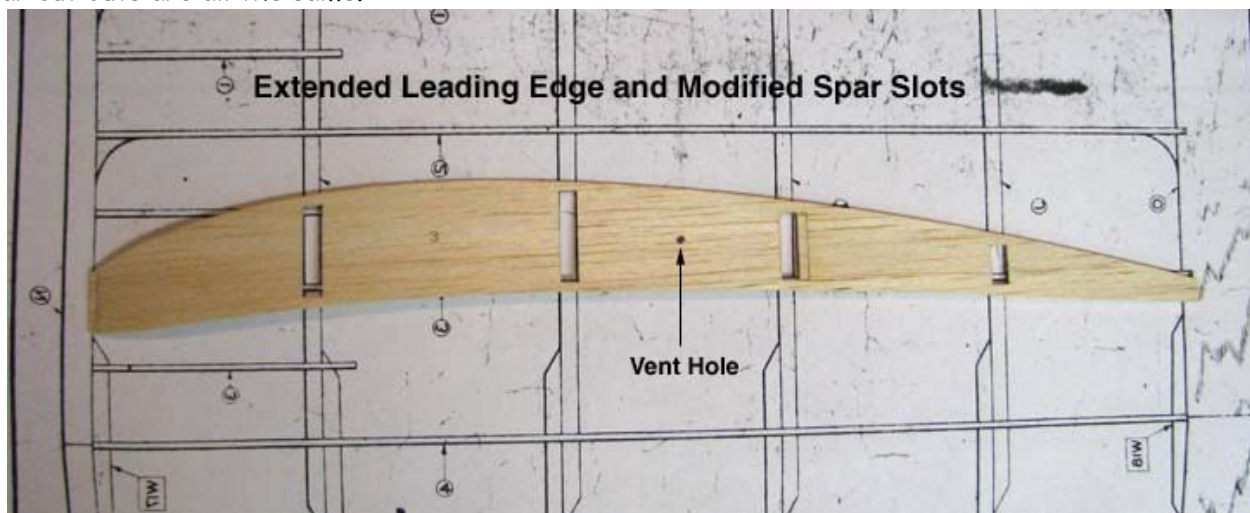
Subject: 110 Sailplane Building the Wing Center Section

Comet Sailplane Project

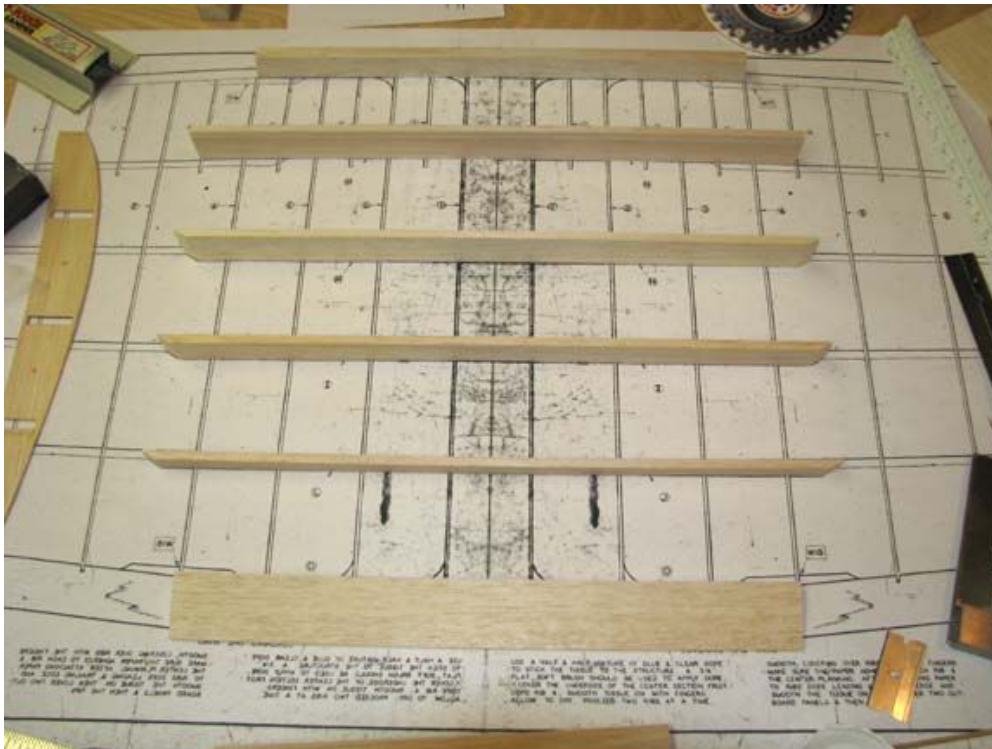
I began what I thought was going to be a relative simple and mundane fabrication of the Sailplane wing's center section. But as it turned out, the construction was neither simple or mundane! I first had to make a trip over to Roy's Hobby Shop in Hurst, Texas, to pick up a sheet of 5/16" balsa from which to make the leading edge. I used the laser cut rib No. 3 to check the rib fit with the plans as shown below. As you can see, the leading edge is too short, the first spar cut out is a little aft, and the third spar cut out is considerably aft. The second and fourth spar cut outs are OK as is the trailing edge. These misfits must be corrected in order for the ends of the four spar overlaps and leading and trailing edges to be correct for the interface with the wing's two inner panels.



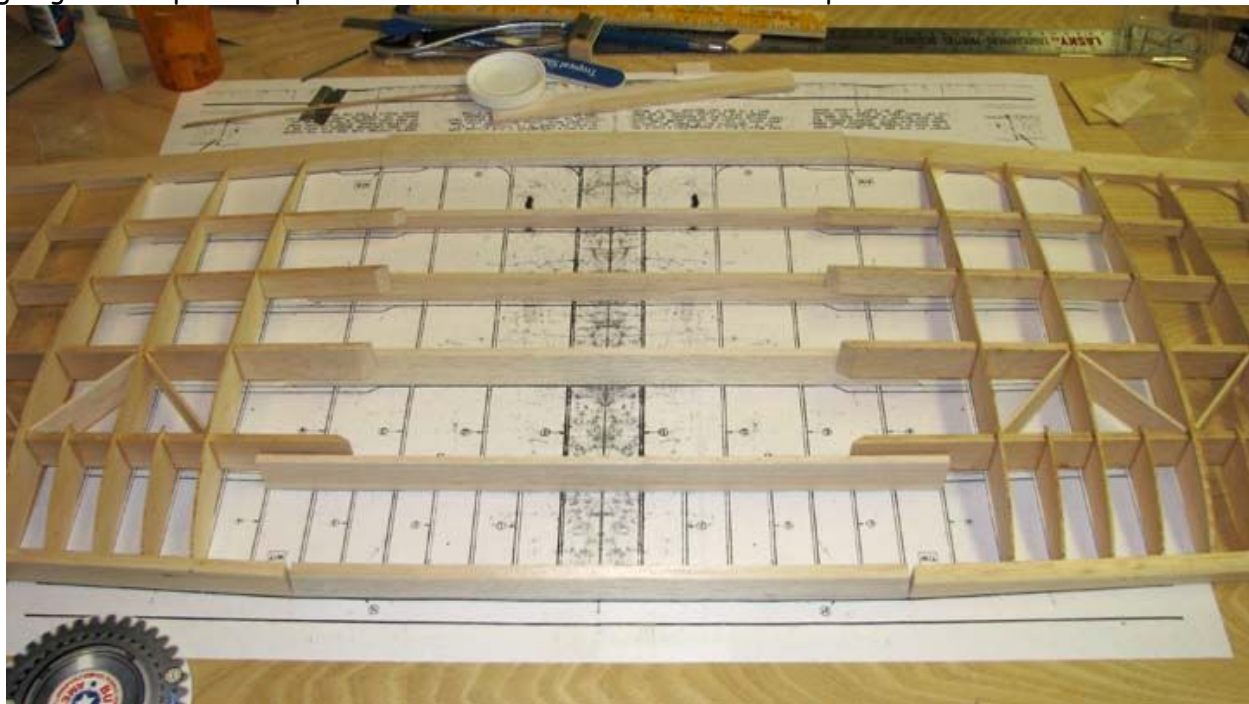
The No. 3 rib was modified to fit the plan as shown below and a vent hole was added for pressure equalization between rib bays. This was used as the master rib template to modify the other center section ribs since the spar cut outs are all the same.



The leading and trailing edges were cut to length and their ends beveled for the dihedral slope of 4.86 degrees. Bob Holman's laser cut parts for the Sailplane included all of the tapered spars for the wing's tip and inner panels. However, since the center section spars are not tapered, he left it up to the builder to cut his own. As you can see below, the four straight spars with heights of 1", 1", 3/4", and 5/16" were cut from medium hard 3/16" balsa sheet and placed on the plan along with the leading and trailing edges. Notice that all but the first spar has their ends tapered. The first spar was left untapered for the interface with the two outer sub ribs.



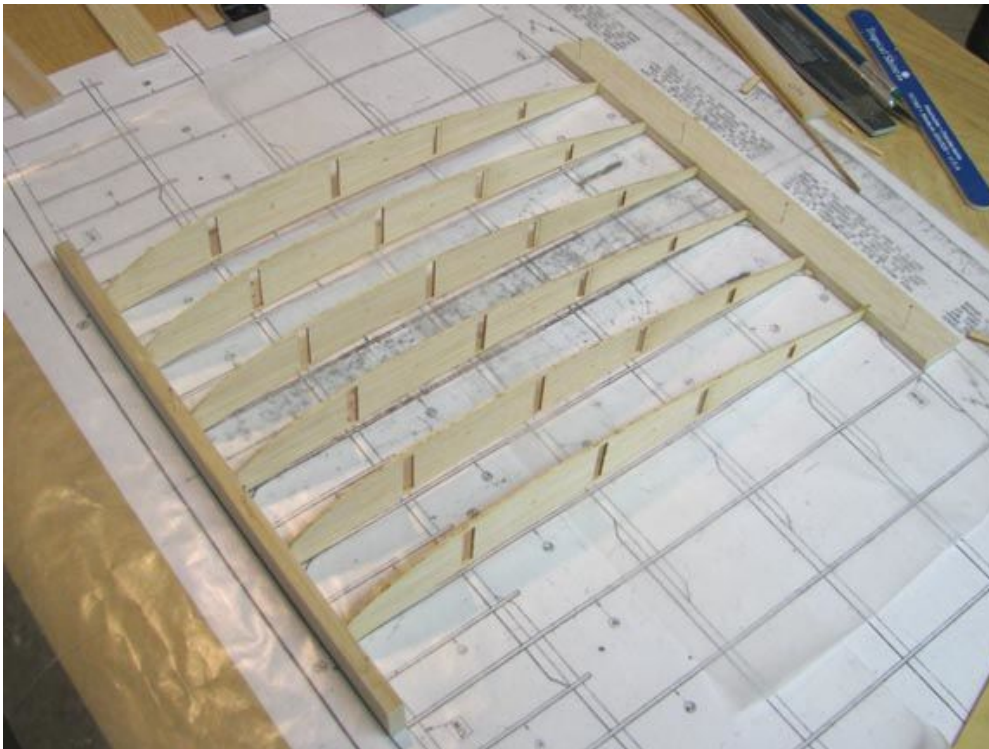
To insure alignment of the leading and trailing edges of the wing's left and right inner panels, the inner panels were pinned down on either side of the center section plan. Then the center section's leading and trailing edges were pinned in place such that all of the ends matched up as shown below.



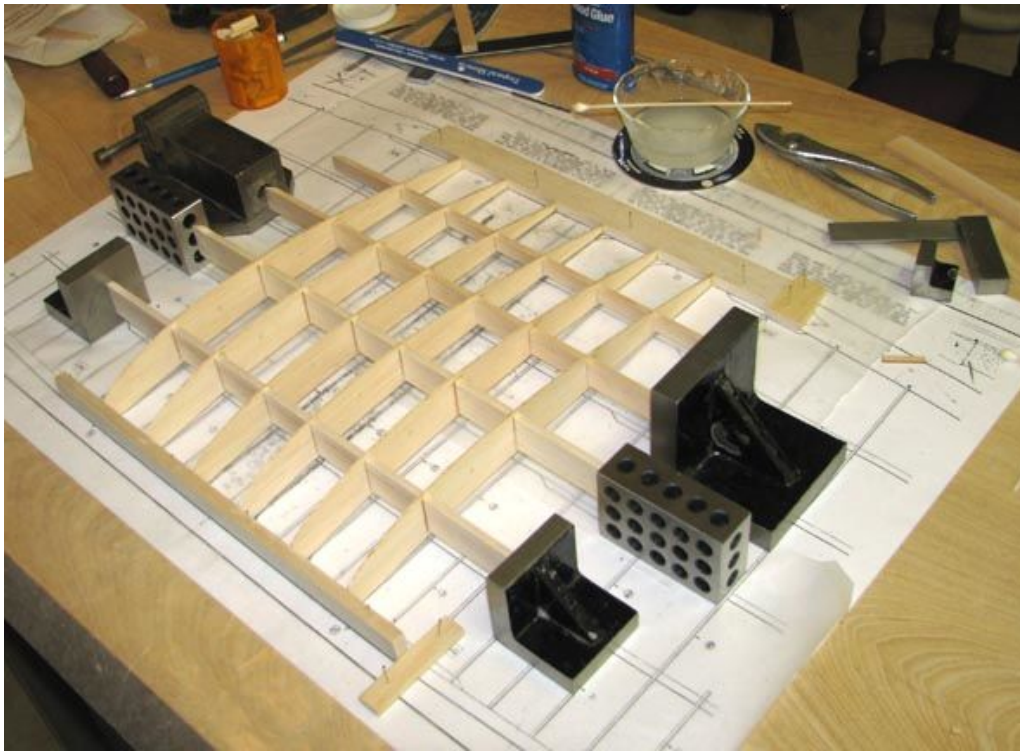
I took this picture to give you a feel for the size of the Sailplane wing will be.



Each of the center section's ribs were glued to the leading and trailing edges as shown below. These unsupported ribs are somewhat weak and flimsy at this point and care must be taken not to break them until the spars have been added.



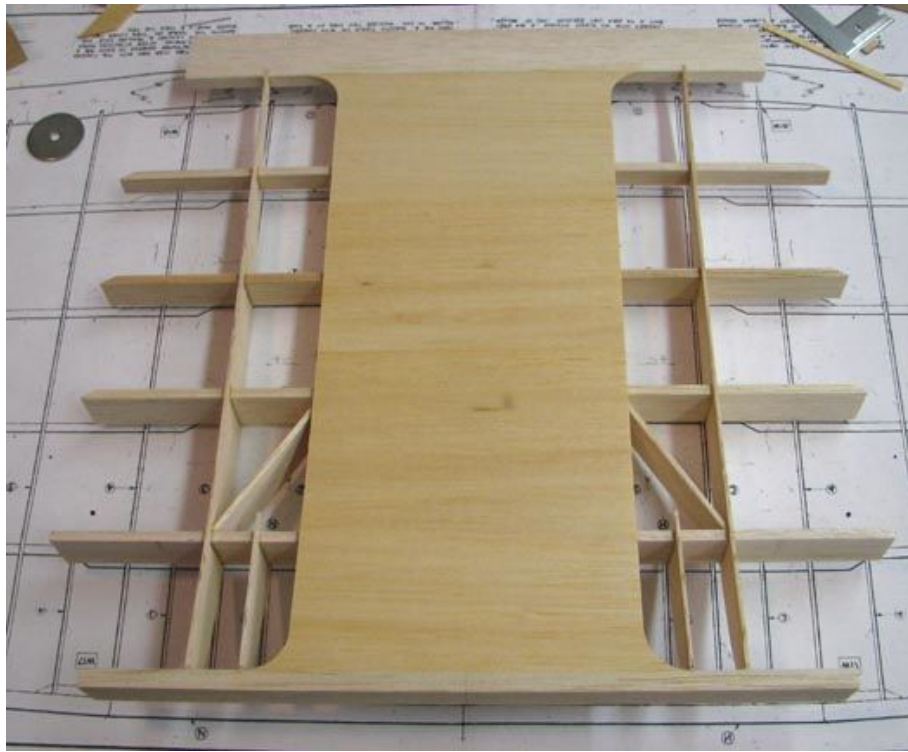
Once the ribs were fully dry, the second 1" deep spar was inserted and worked down through all of the rib cut outs. The second spar was positioned over the plan and held in place with steel squares against each end. Each rib/spar intersection on the second spar was adjusted over the plan, a square was used to align the rib vertically, and then it was glued in place. The second spar was installed first to stabilize the rather flimsy ribs in the middle so that the procedure for the other three spars would go more smoothly (*this spar-through-the-rib construction takes considerable time and patience*) as shown below.



Next sub ribs and diagonals were added the center section structural frame as shown below. As you can see, there is no diagonal required in the center bay since the center section is planked both on top and on bottom with 1/16" sheet balsa. The sub ribs and diagonals on each end are left off until the wing's inner panels have been attached to the center section and the dihedral joint completed.



I got into my older balsa supply and found some 6" wide 1/16" sheet balsa for planking the bottom of the Sailplane wing's center section. It is very consistent in thickness, but a little darker than the new wood as shown below. I was able to plank the entire bottom section with only two joints.



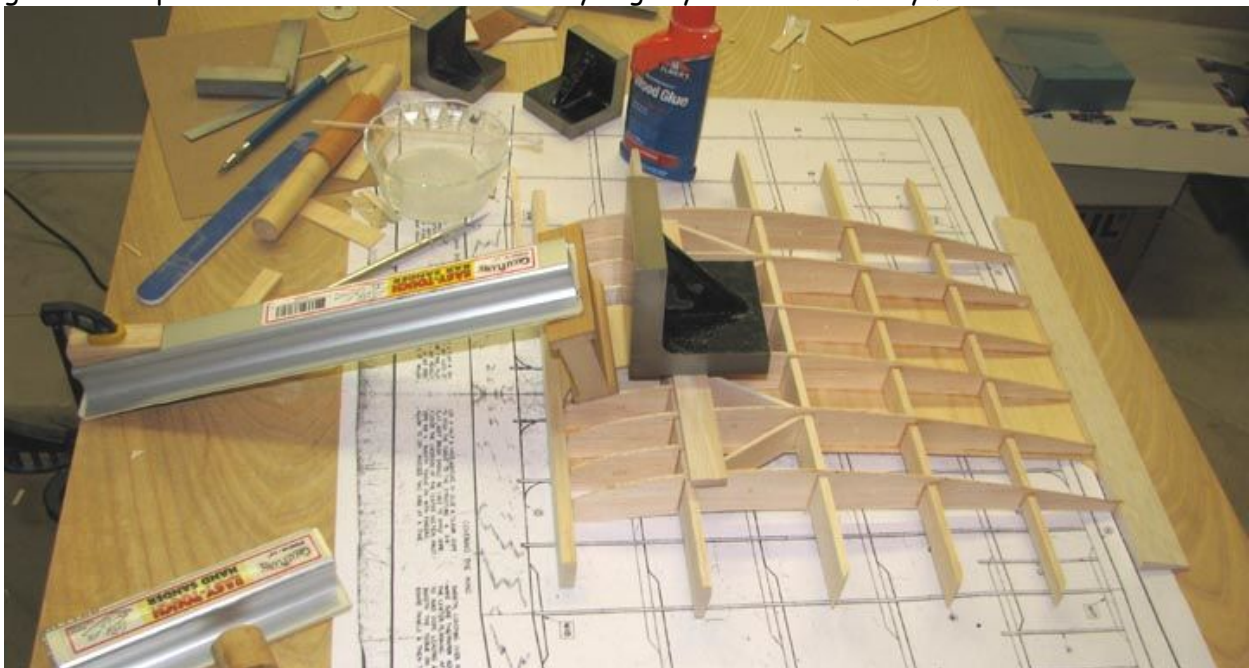
This is view of the bottom planking from the top side of the center section. As you can see, the bottom planking is quite wide, extending over three full rib bays according to the plans. This broad planked area will rest on the rather wide wing saddle.



In this close up, you can see that I have a label with my name, address, phone number, and date glued on the top side of the bottom planking inside the center rib bay with no diagonal. This label will be closed up inside when the center section's top planking is put on. This is like a "Time Capsule".



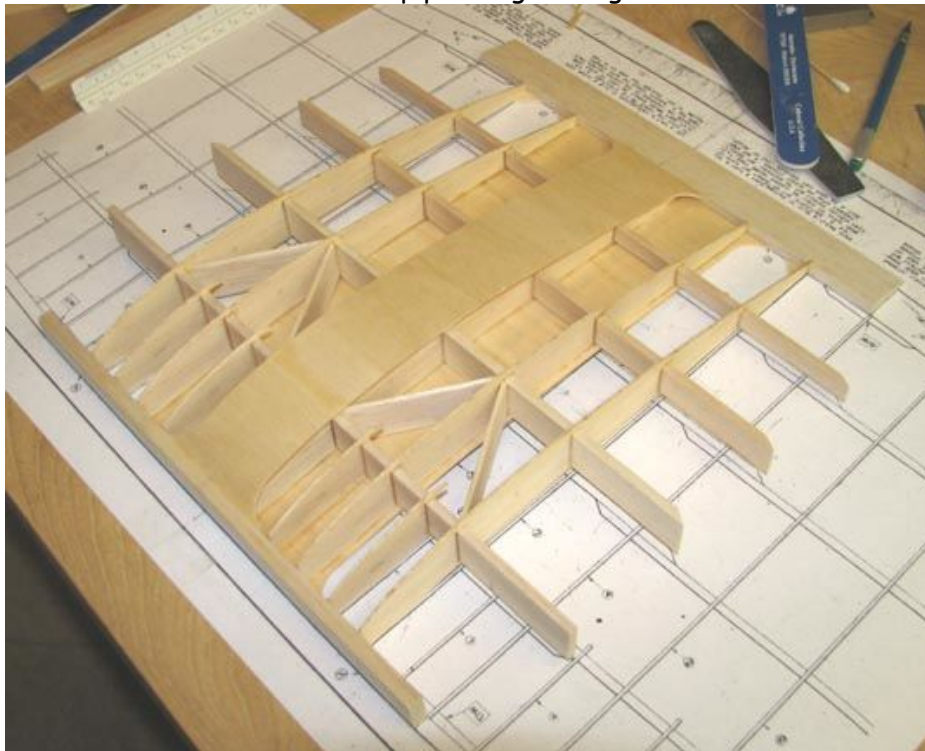
Positioning and gluing the center section's bottom planking was relative easy as there was open access to the glue joints from the structure's open top. However, this was not the case with the top planking. It has to be done in the blind, so to speak, because the bottom planking prevented any access at all. Therefore, Elmer's aliphatic glue was applied to the beveled leading edge of the pre-cut planking and to the top of the ribs after which the 1/16" sheet planking was put in place. The problem with aliphatic glue of course is that the planking has to be held down against the ribs until it dries. To accomplish this, support strip wood was put down and the weight of a large square steel block was used as a press on top of the planking. In the case of the radius on the leading edge, I places the slide sander, grit down, on the radius, and used a bar sander to press on the slide sander. The pressure on the bar sander was achieved with a slide clamp and a wooden wedge as shown below. Too many words I know, but the picture illustrates what I am trying to say. The remainder of the top planking was not a problem because the ribs are only slightly curved and fairly flat at the back.



The picture below shows the top of the center section's 1/16" planking completed. The top planking is narrower than the bottom planking, covering only the center rib bay according to the plans. This area will support the rubber bands that hold the wing on the pylon's wing saddle.



Here is a view of the top planking looking in from the side.



I will now put the center section aside and go back to work on the right wing panel. The four overlapped glued spars need to be trimmed, the polyhedral joint rib glued in, and the 1/16" trailing edge gussets added.....Tandy