

From: "Tandy C. Walker" <tandyw@flash.net>

To: "Walker, Tandy C." <tandyw@flash.net>

Date: 2/24/2009 11:40:56 AM

Subject: 49 Sailplane Stab/Rudder Attachment to the Fuselage

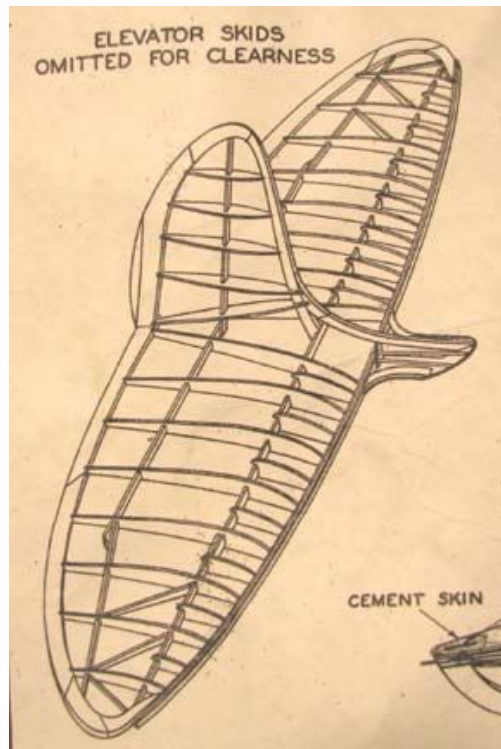
Comet Sailplane Project
(A Two-Part Report)

This two-part report is somewhat long with a lot of detailed, but I feel that it is necessary to understand my approach to the stab/rudder attachment to the fuselage. I want to begin by reviewing some Sailplane design features and recapping some of the construction I have completed so far and then discuss the modified installation of the stab platform and fuselage fairing.

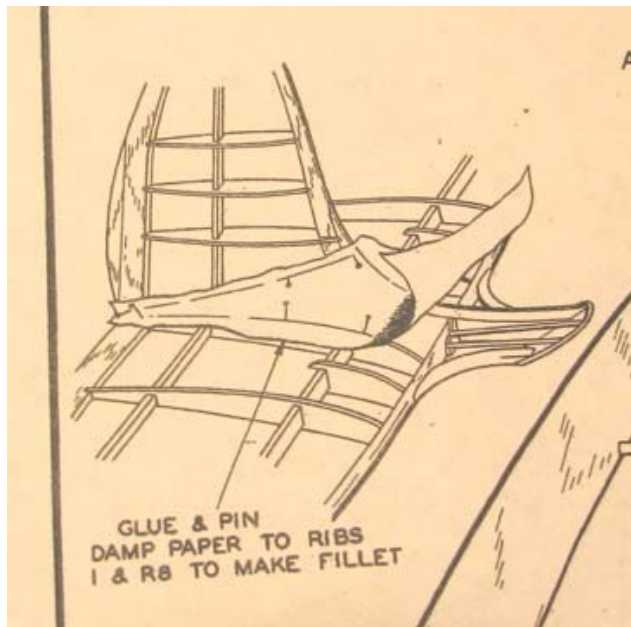
Part 1

Background and Recapping

The Sailplane stab/rudder structural assembly is shown in the sketch below taken from the Comet plan. As you can see, The structure is built extremely light for free flight and incorporates a fuselage fairing built onto the front of the assembly.



The kit designer shows a very large stab/rudder fillet made out of paper, which is dampened and glued in place as illustrated below. I simply could never accomplish this and besides, it would be too fragile to last for any length of time.



Tail structure modifications started when I built the stab shown below. To provide for removal, attachment hard points were designed into the center section and the center section was planked on top and bottom. In addition the stab was modified to incorporate a center slot for attaching the fin also shown below. No fuselage fairing was built onto the front of the stab.



However, the aft end of the fuselage structure was initially built according to plan with the structural incline shown below. This is for interfacing with the design fuselage fairing built onto the front of the stab, which I do not have.



A decision was made at this point to depart from the plans on how the stab/rudder structural assembly with its big paper fillet would interface or fair into the fuselage. The fuselage's structural incline was eliminated by squaring it off in front of the stab with 3/16" square longeron strips as shown below.



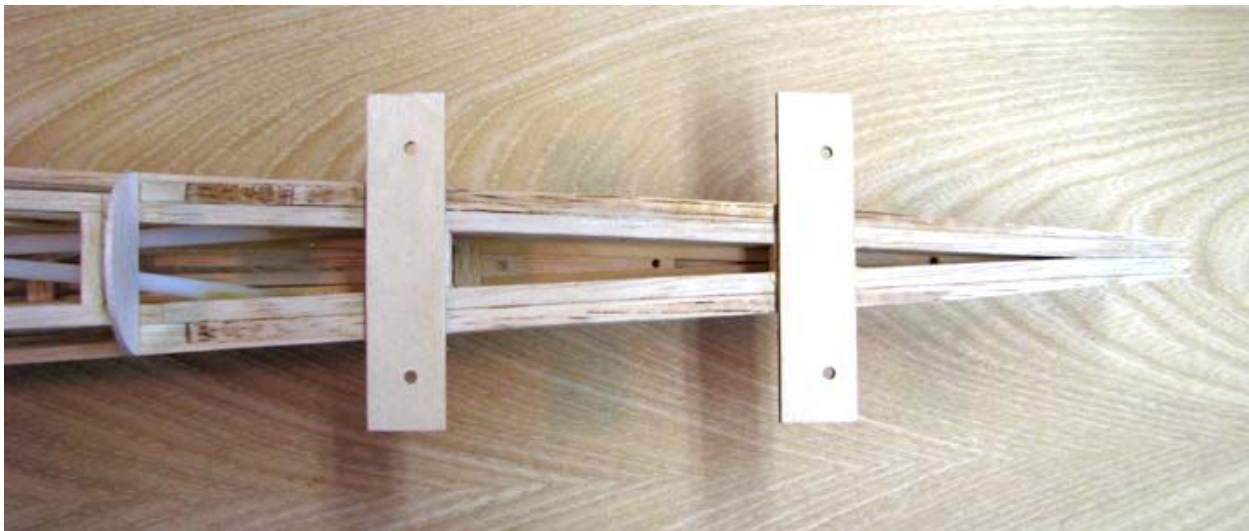
Then an aft bulkhead was made and glued to the rear face of the squared off aft fuselage structure as shown below.



Part 2

Stab Platform and Fuselage Fairing

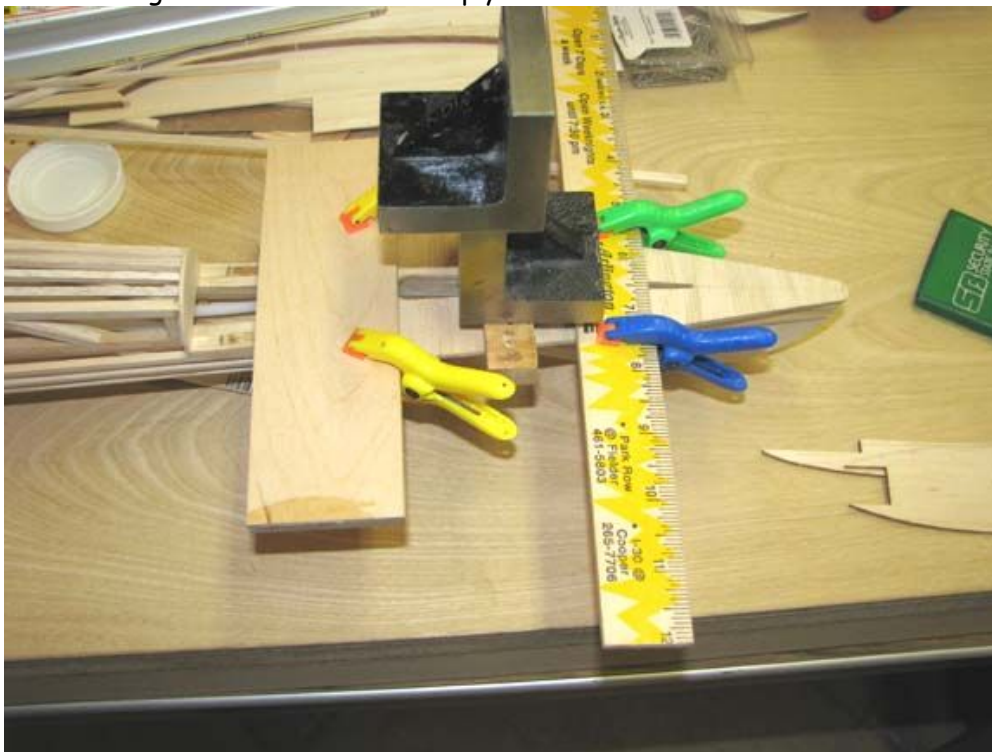
I have spent the last few of days working through the design and details of installing the stab platform on the fuselage. The stab platform 1/8" balsa sheeting will fill in forward, between, and aft of the two 1/8" plywood stab mounts shown below.



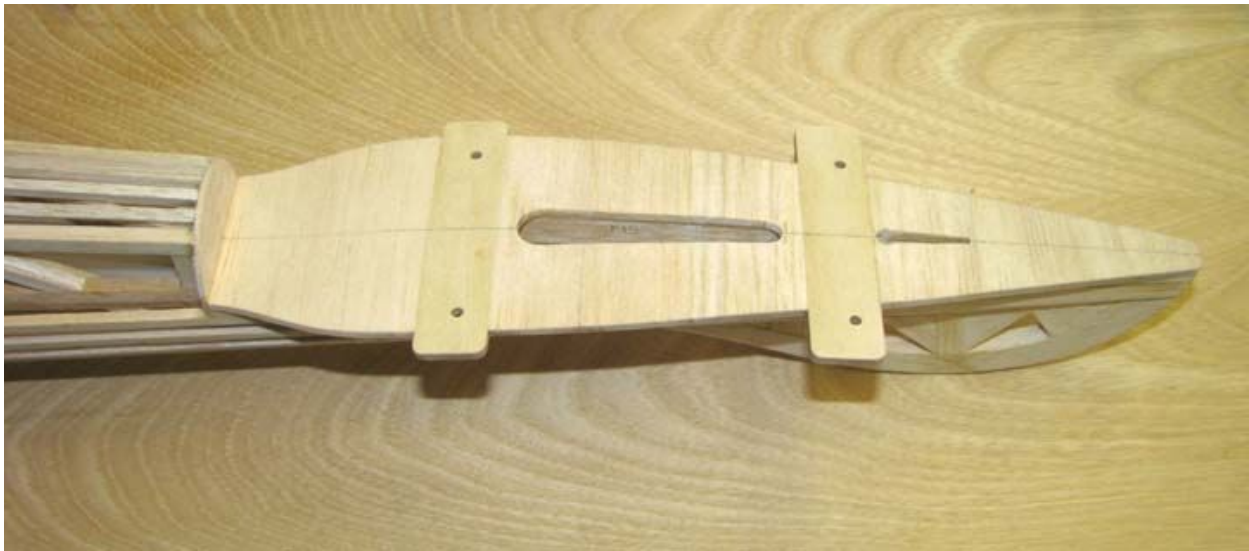
The picture below shows the fuselage jig set up used while the glue is drying on the segments of the stab platform 1/8" balsa sheeting.



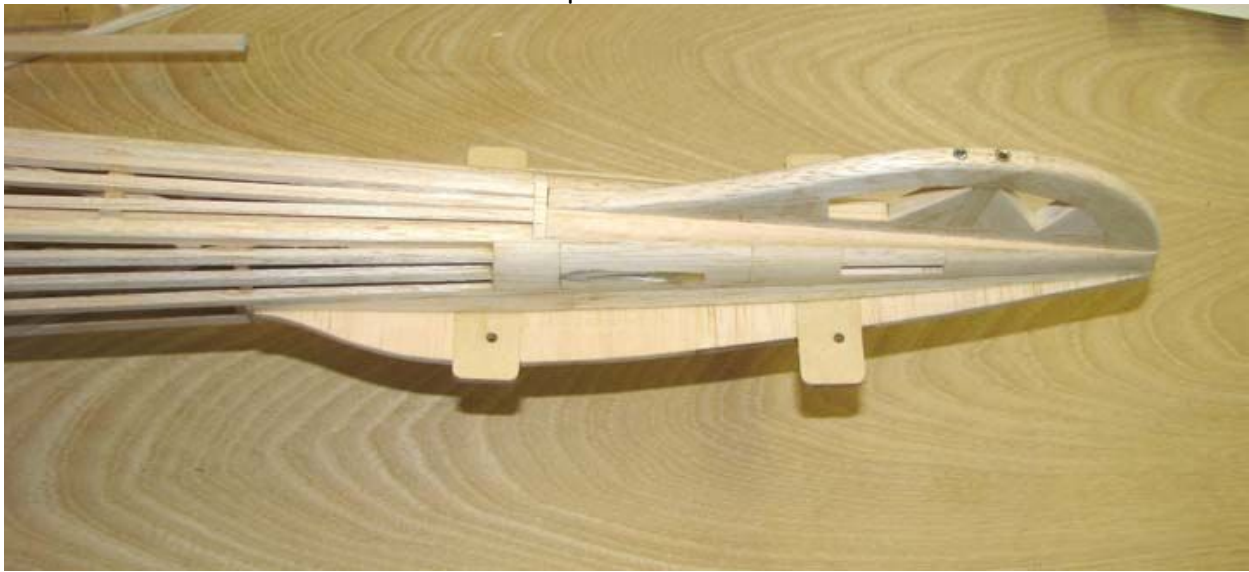
This picture shows a close up of both the clamping and weighting used on the center segment of the stab platform 1/8" balsa sheeting between the two 1/8" plywood stab mounts.



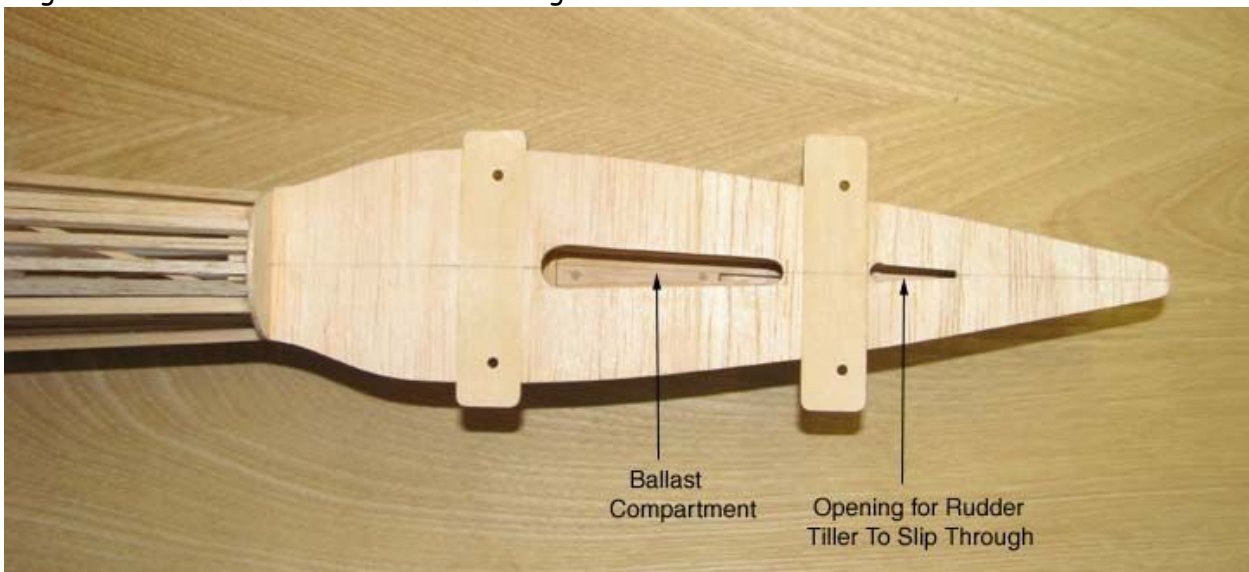
In the picture below, you see all three segments of the stab platform 1/8" balsa sheeting glued in place from a top view.



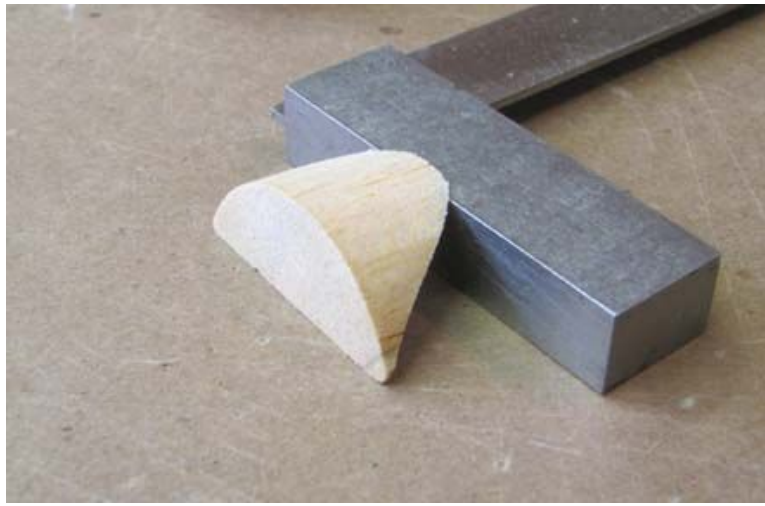
This shows the stab platform from a bottom view.



There are two openings in the stab platform shown below. The forward opening is a compartment for ballast weight in case the model is nose heavy. The aft opening is required for inserting the rudder tiller when assembling the stab and fin/rudder to the fuselage.



I spent considerable time carving, sanding, and shaping the complex balsa fairing from the fuselage to the stab. A view of the fairing from the top is shown below.



This is another shot of the balsa fairing from the bottom showing the concave surface that interfaces with the top of the stab planking.



This picture shows a trial fitting of the balsa fairing in place between the back of the fuselage and the stab. The fairing still has to have some final sanding done to it before it fits in properly. Also I have not decided just how to attach the fairing permanently, but maybe it can be glued to the stab after the stab and fairing have been covered.



In an attempt to flow the fin's leading edge line down onto the stab and give the perception of a continuous fairing forward, a small fillet was added to the fin's leading edge as shown below. The fin and rudder will gain

thickness when the symmetrical airfoil shaped ribs and spars are added.



There are probably other approaches to dealing with the Sailplane's complex stab/rudder structural assembly fairing issue that would lead to a more authentic replication of the design on the plan. However, while my modification approach does not replicate the large stab/rudder paper fillet and fuselage fairing shown on the plan, it is survivable, functional, and it is still within the "*Character of the Model*" as shown below.....Tandy

