Scale Hinges

By Roy Vaillancourt
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There are many ways to do "scale hinges", Some methods are easier than others. We must remember here that the ultimate goal of doing scale hinges is to give the appearance that we have replicated the full size bird in form and function. In our quest to perfect our model we sometimes design ourselves into a corner trying to be clever. Thus making this a very frustrating endeavor.

Rule number one when doing scale hinges: **When in doubt copy the full size bird....**
Rule number two when doing scale hinges: **Keep things as simple as possible....**

What I'll show you here is just one way I have attempted to replicate the hinging used on the Fairy FireFly. These techniques can be applied to many types of aircraft. Hope these pictures help.

"Hinge types"

Before we discuss how to make scale hinges, let's look at the three basic designs normally used.

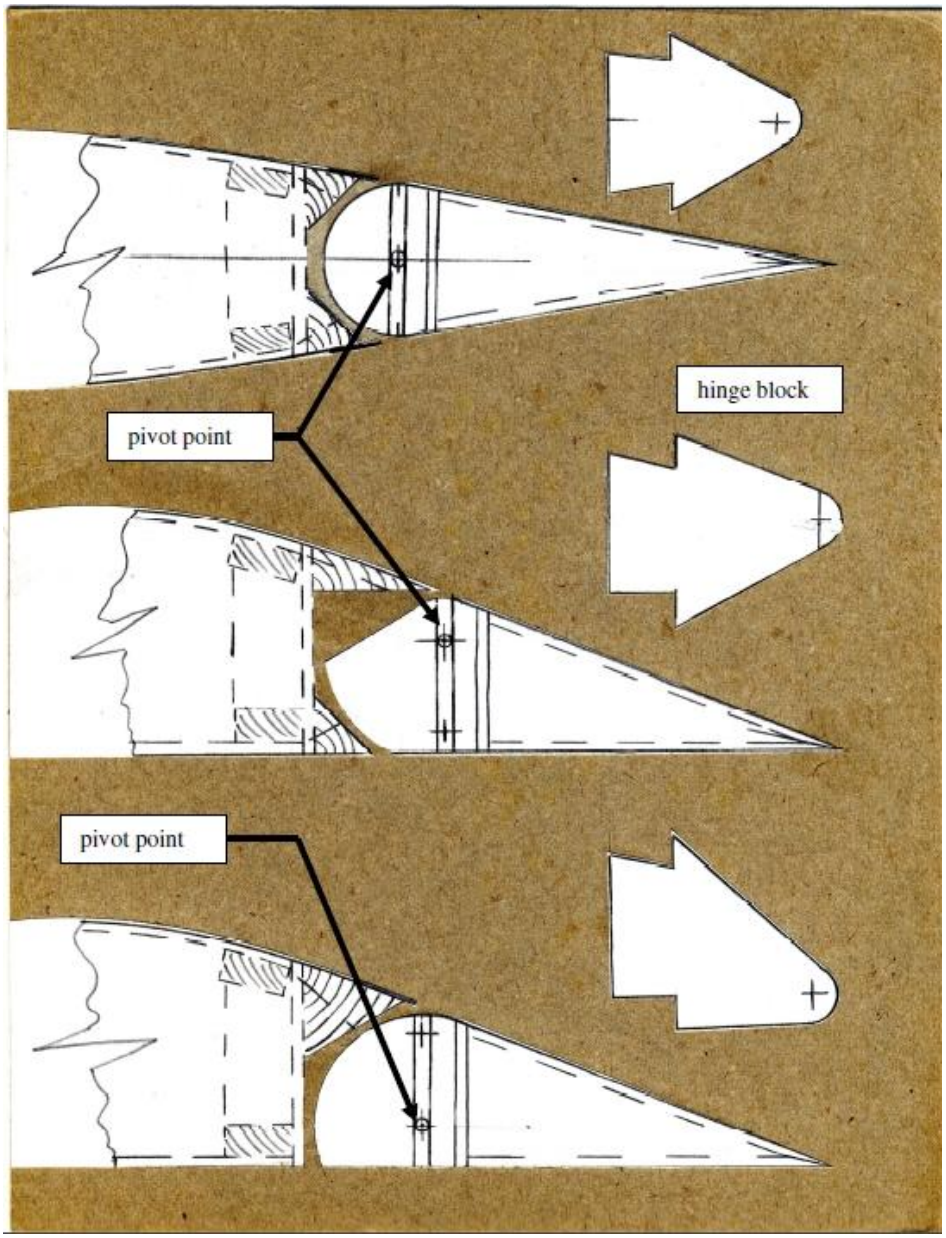
They are:
"Center hinged",
"Top hinged",
and "Bottom hinged".

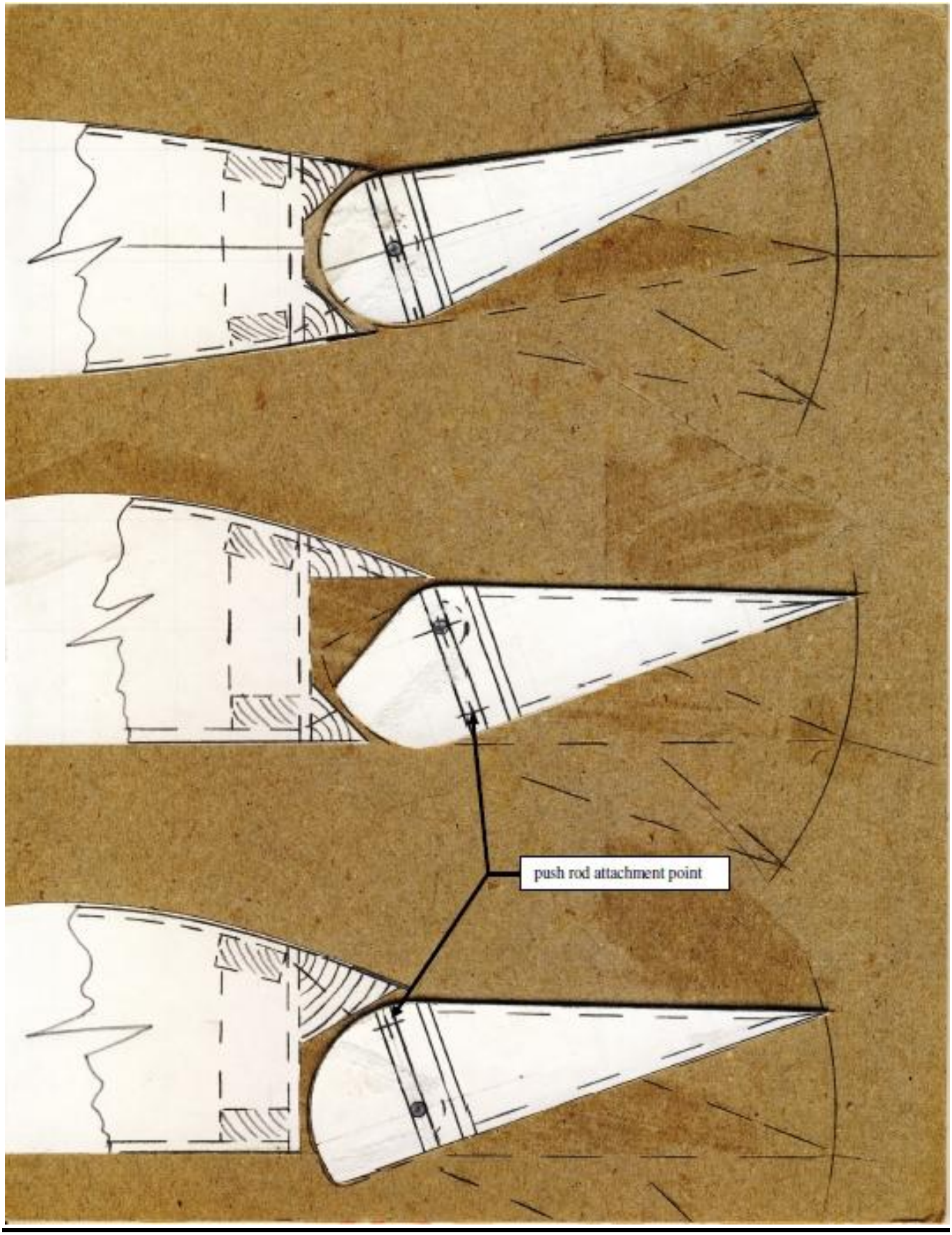
Center hinged: is typical for Elevators and Rudder use.

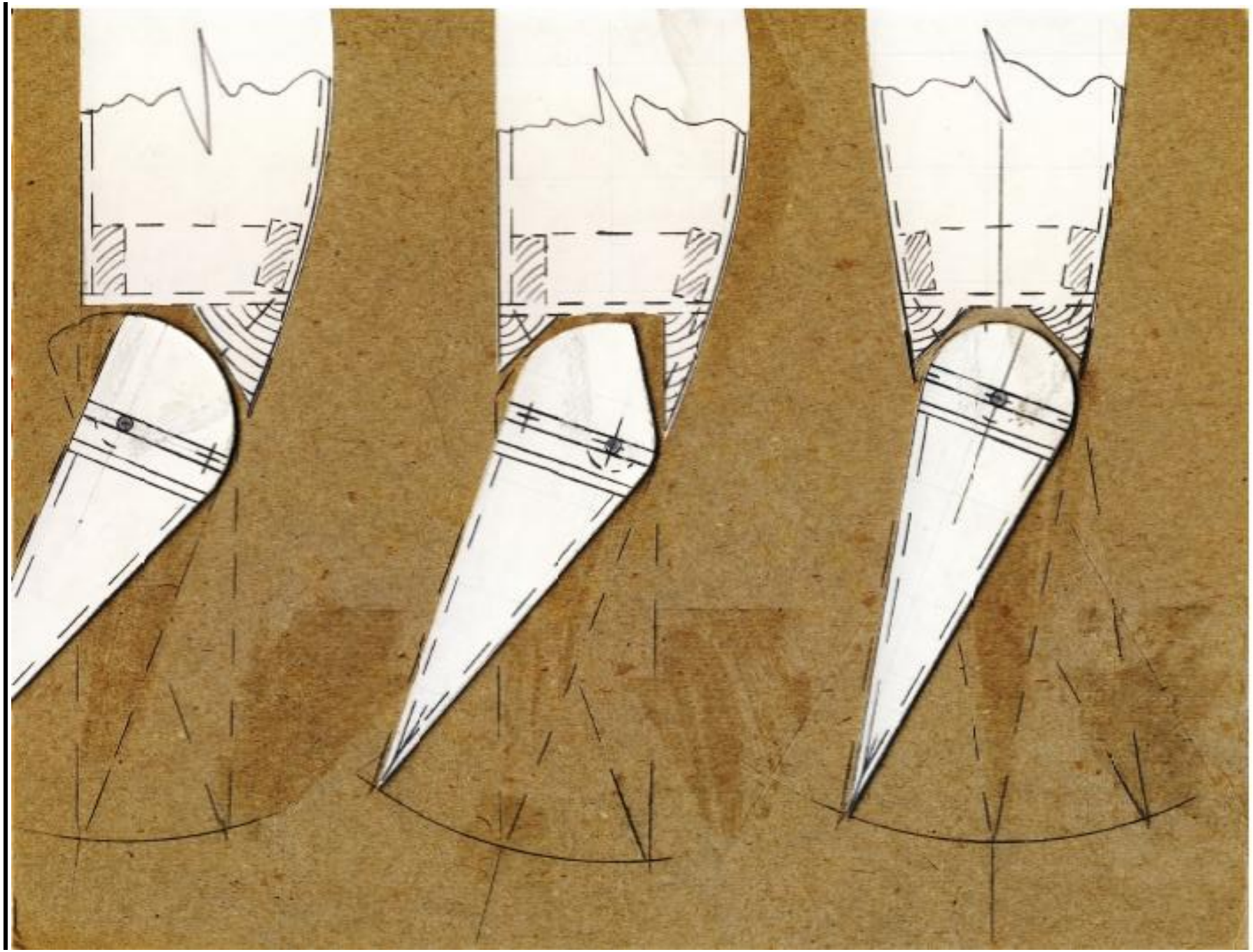
Top hinged: is an Aileron hinge.

Bottom hinged: is also an aileron use but is also used a lot for flaps or accessory doors.

The sketches at the right show the three basic designs along with a respective "hinge block" design that is aimed at keeping things simple to make, strong enough for the job and still provide scale functionality.

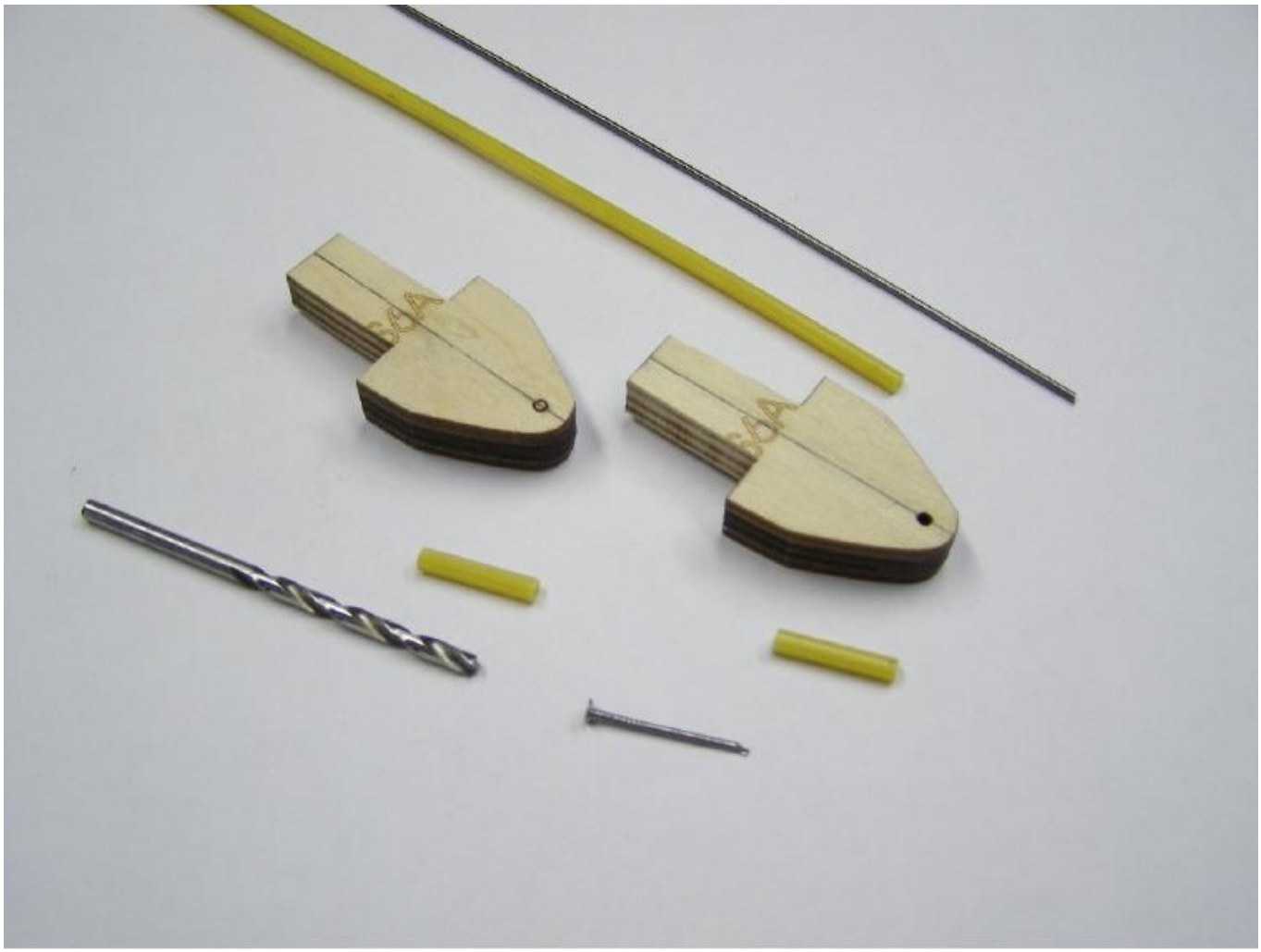



push rod attachment point



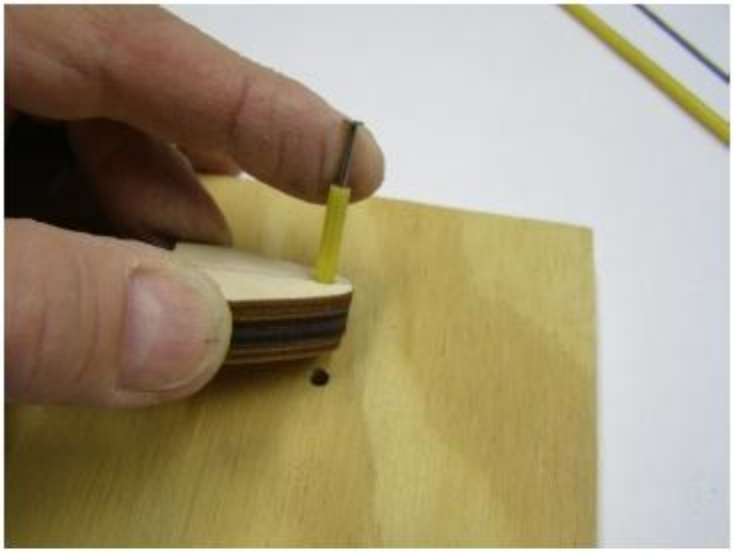
The “hinges”

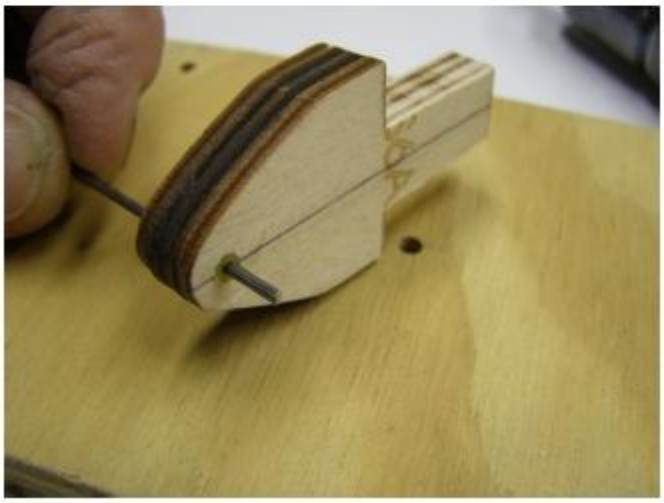
I like to make the hinges from aircraft grade plywood. In the Fire Fly’s case the thinnest hinge is 1/4 inch thick. (I have used 1/8 thickness on the Typhoon and the FW-190 with great success). The “bearing” material is the yellow inner part from a NY-ROD set. The “Hinge Pin” is a piece of .074 music wire. This fits the inside of the yellow NY-ROD with a slight slip fit with no slop.



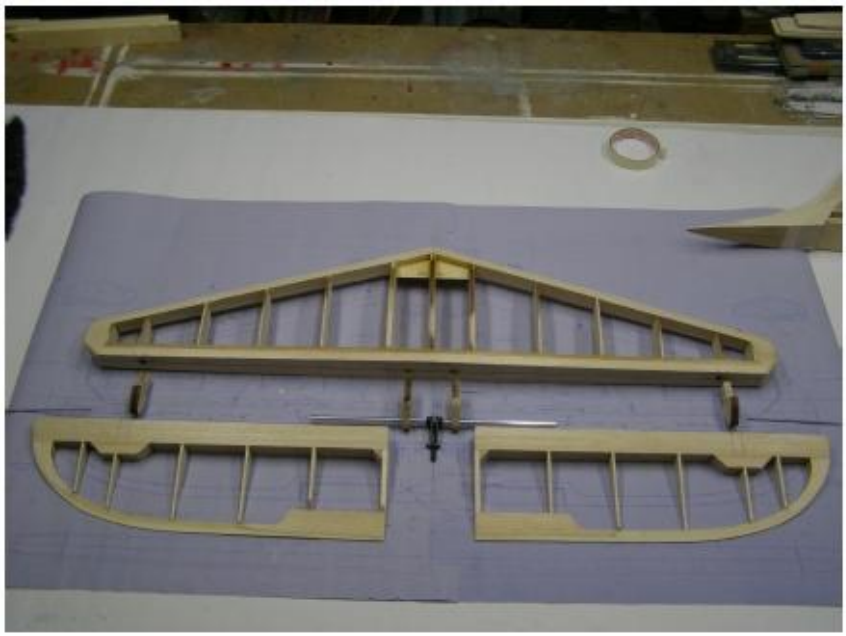
After cutting the hinges to shape they are drilled for a “press fit” of the yellow NY-ROD. The NY-ROD is driven into the hole using a small nail as a support and “pressing” tool. After the NY-ROD is installed it is trimmed flush to both sides of the hinge. DONE.....

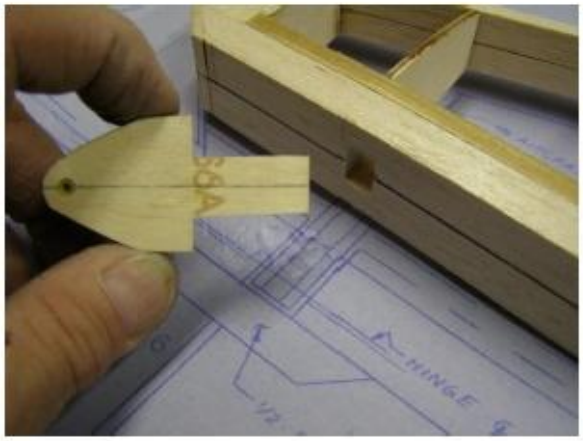
The beauty of this type of installation is that if the NY-ROD bushing ever wears out it can be replaced with very little effort even after the plane is all painted.

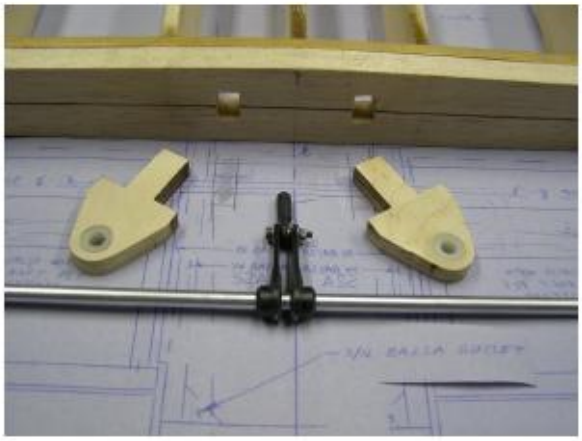


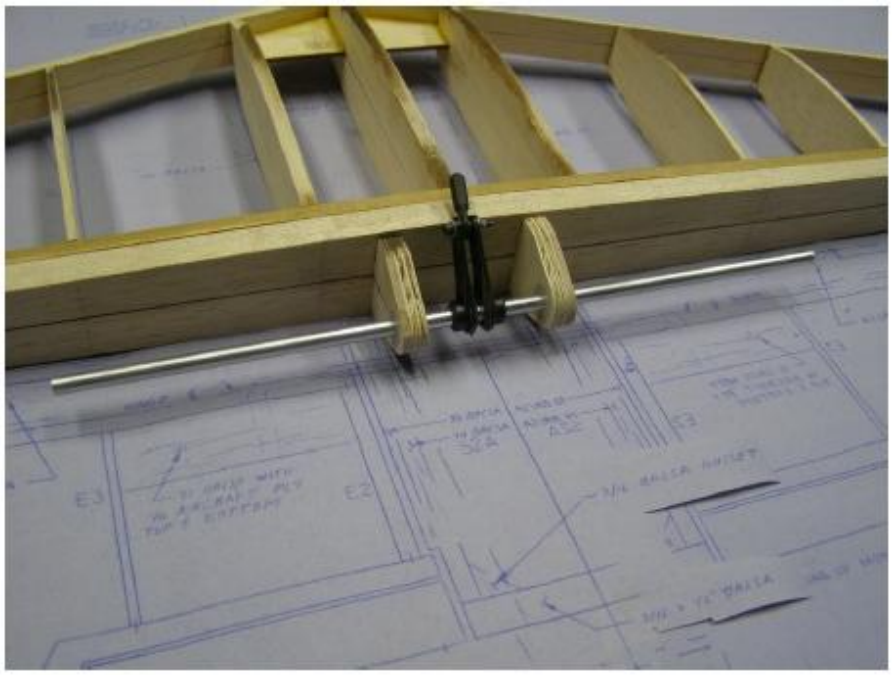


Stab and Elevators:





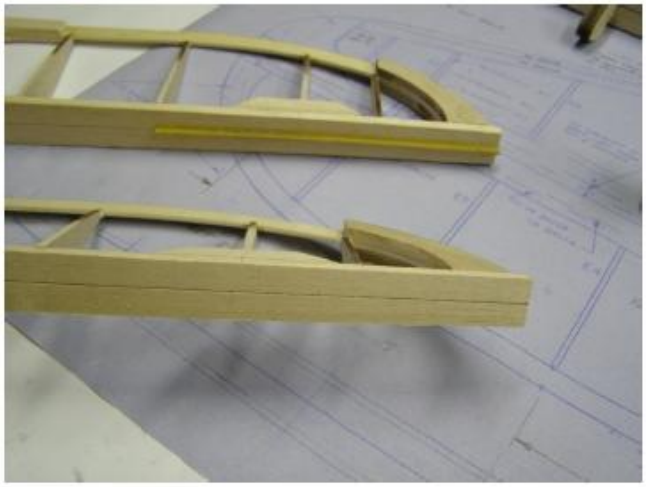


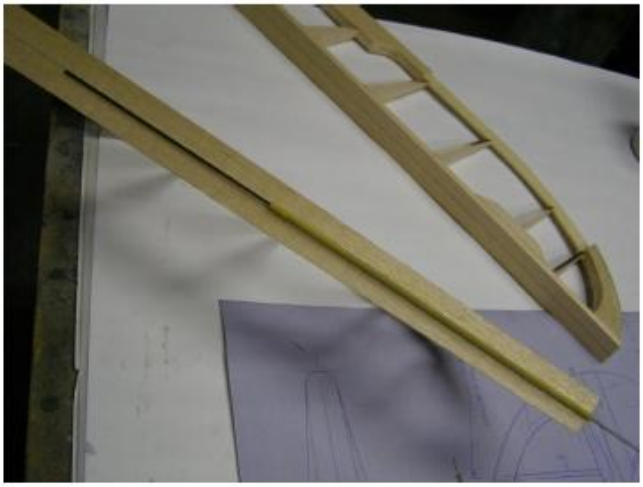


The Aluminum tube shown here is 12 inches long. It is 1/4" outside dia with a .049 thick wall. This will get epoxied into each elevator half.

1/4 dia Aluminum tubing is available in three different wall thickness. .015, .035 and .049. Solid Aluminum rod is also available but brings with it an increase in weight.

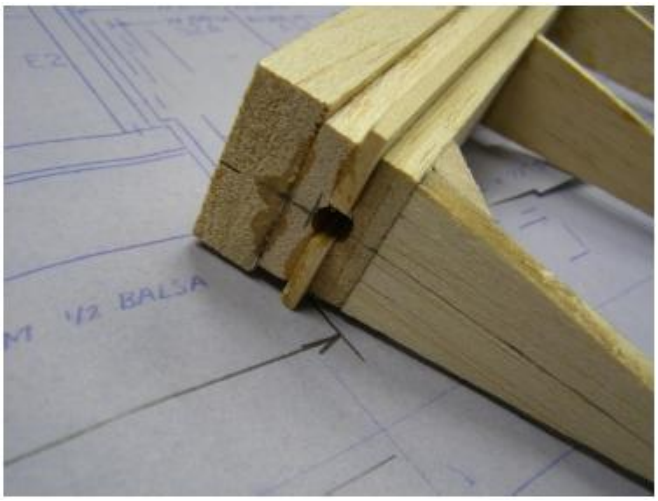
The "hinge blocks" that support the elevator shaft have nylon bushings pressed into them to provide a nice wear-free and slippery hinge.





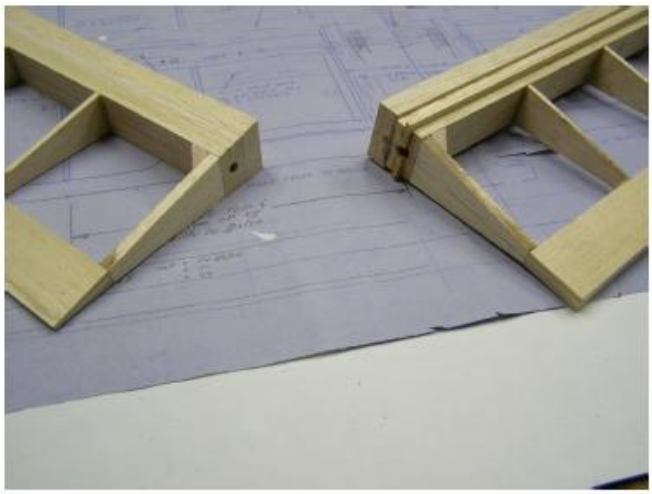
The wire is used to keep the Ny-Rod straight while gluing.

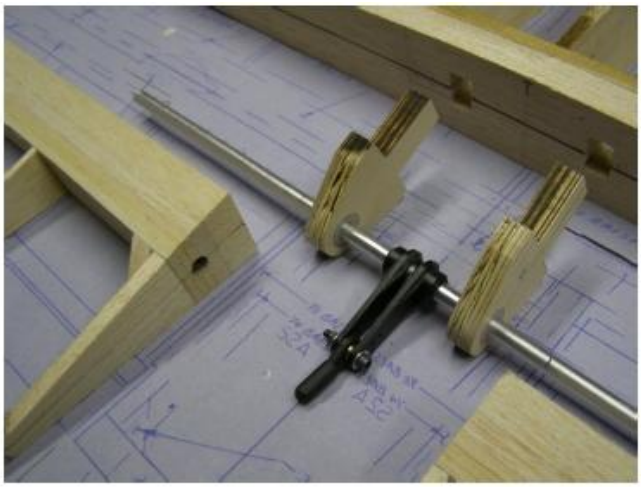
View from the elevator tip.

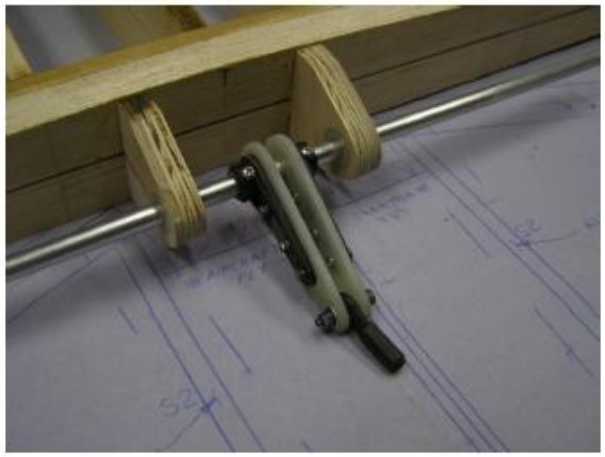


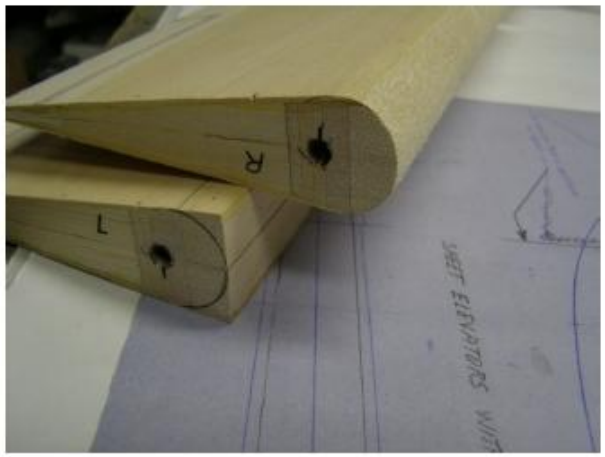
View of the inboard side of the elevator prior to shaping.

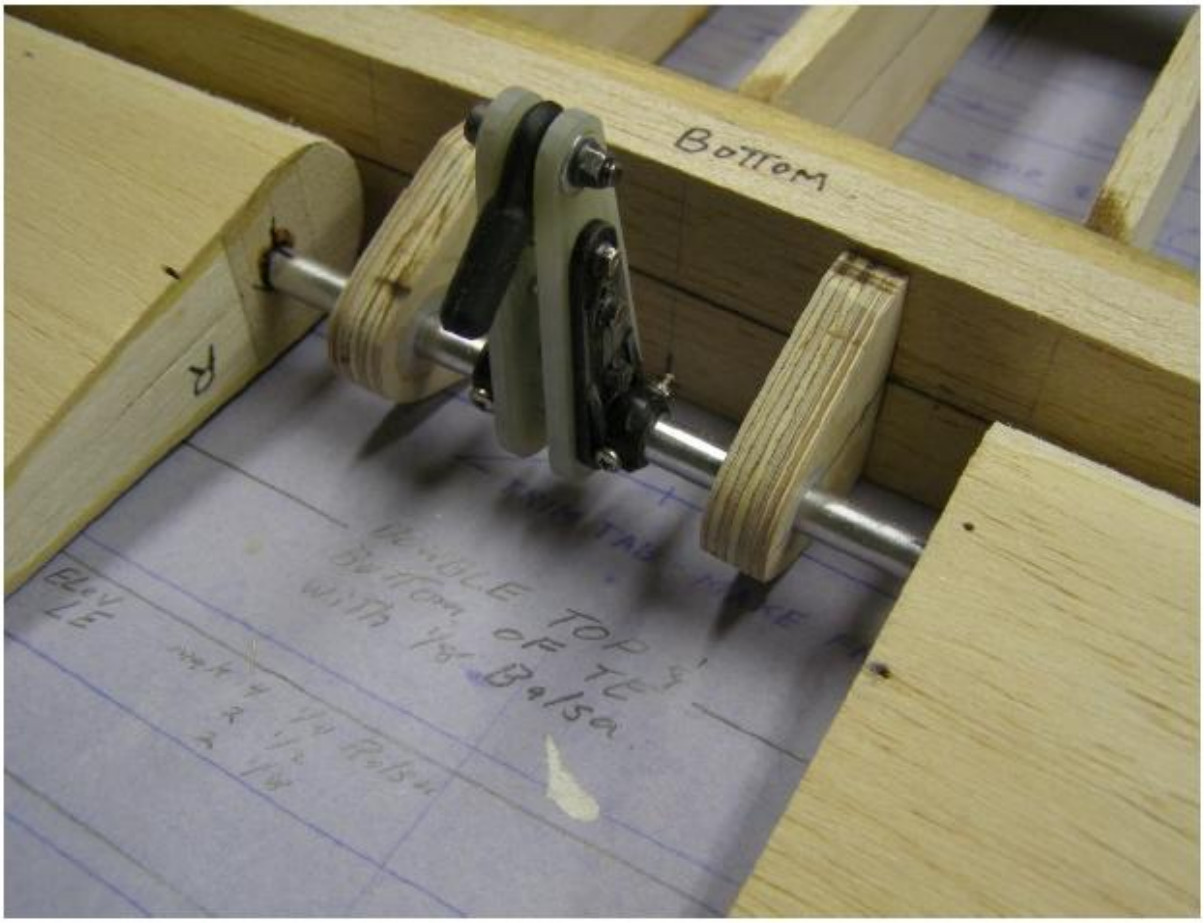
Note the use of “center lines” drawn on all parts.

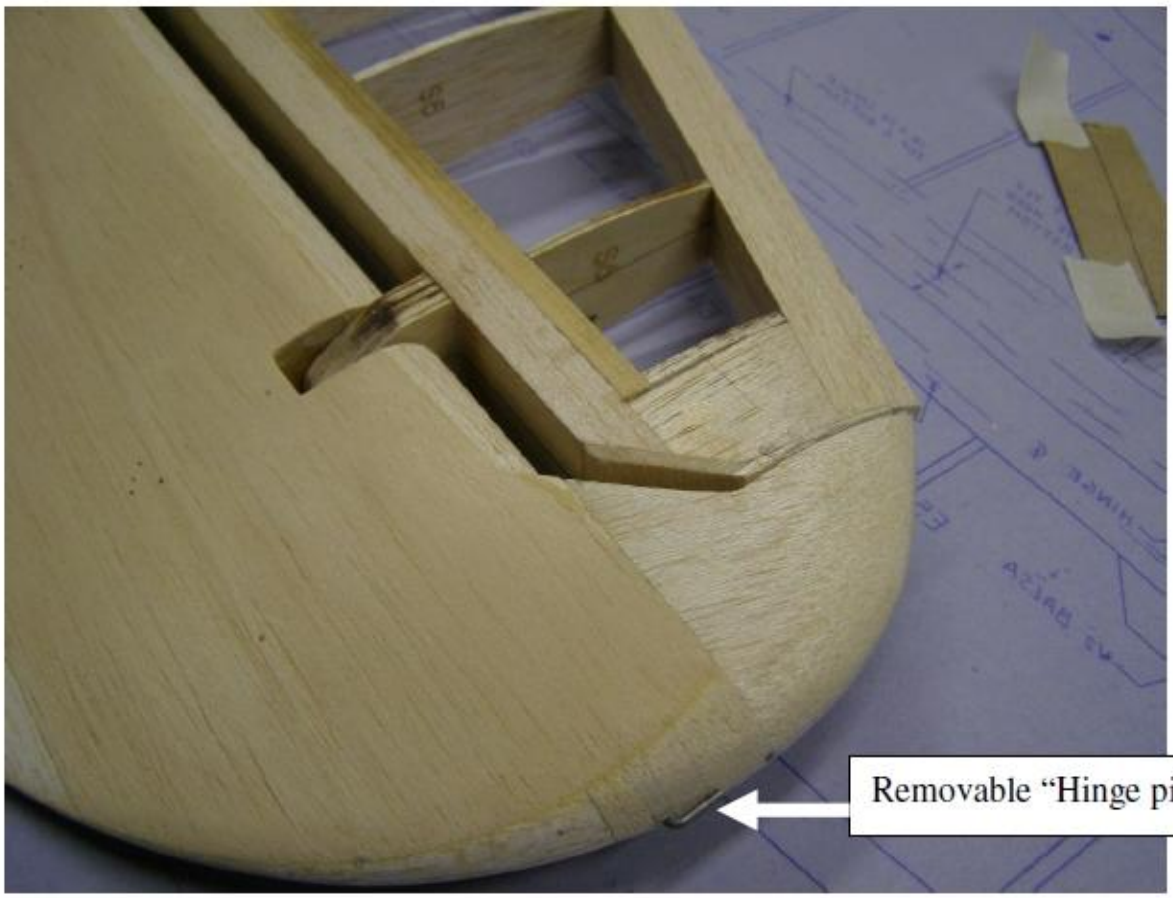






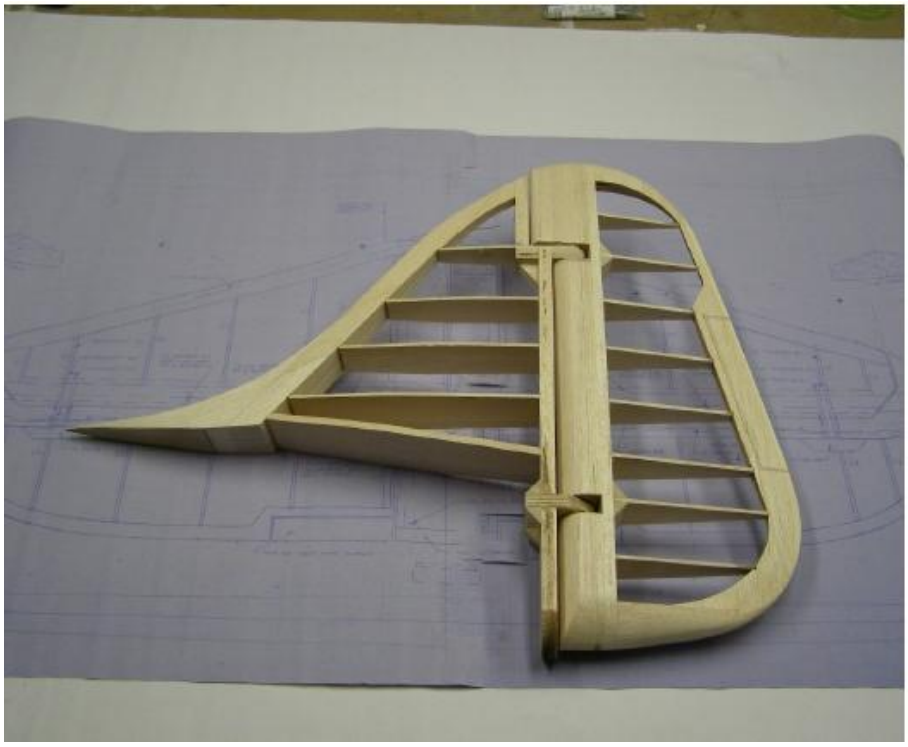

R
L


BOTTOM


Removable "Hinge pin"

Fin and Rudder:

This assembly utilizes all the methods presented for the Stab and Elevator but is a lot more simplified. You'll note that there are only TWO hinges, One top and one bottom. You'll also note that they are quite thick and heavy duty and are representative of the scale sizes and locations.



The top hinge is 3/4 of an inch

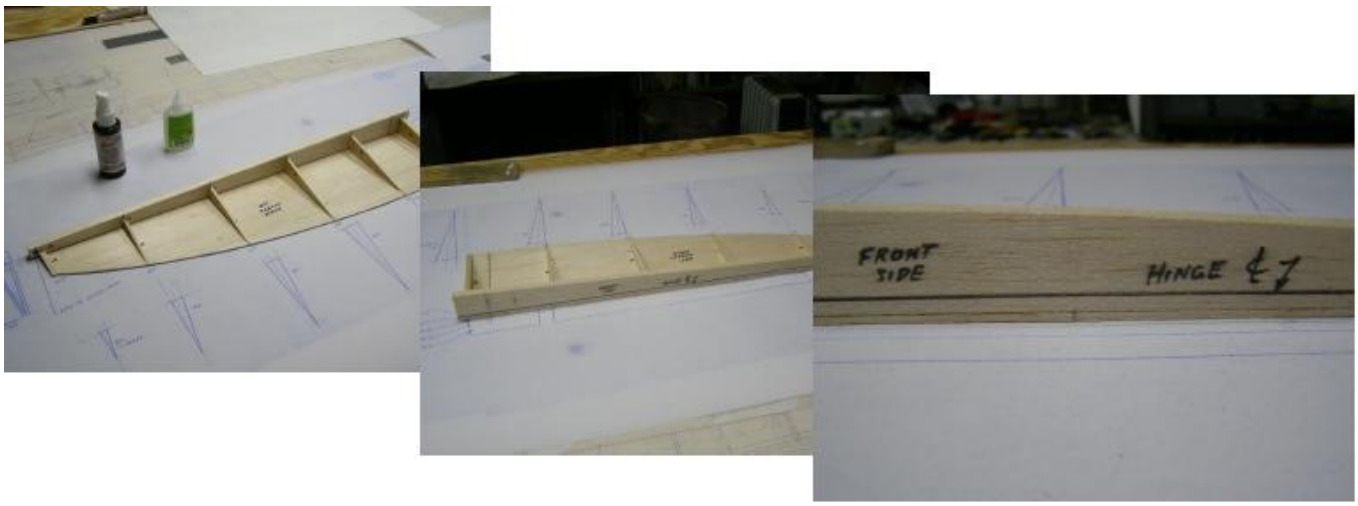
thick. While the bottom hinge is 1/2 inch thick

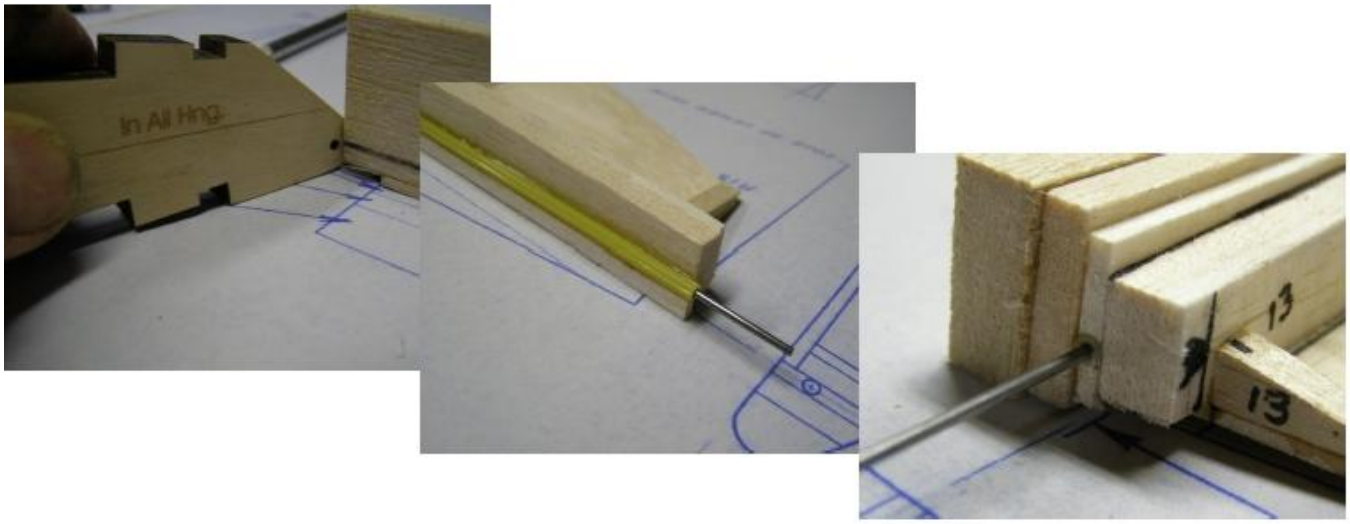
The applications shown above for the Stab – Elevator assembly and the Fin – Rudder assembly can be used for many different aircraft. The shapes may vary a little but the concepts will all be the same.

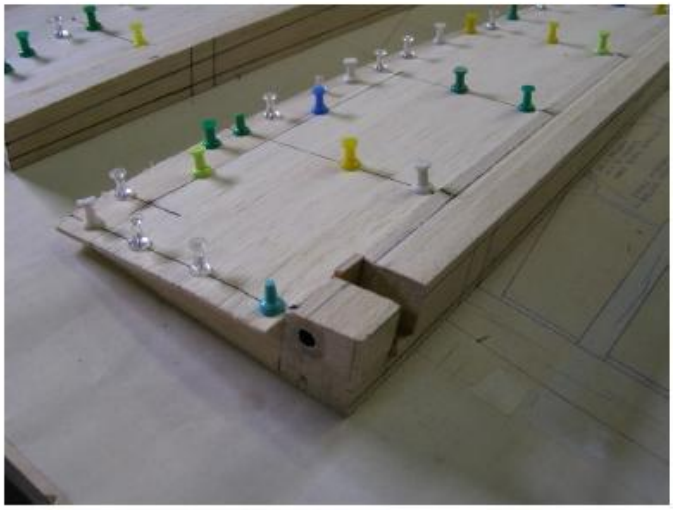
Here are a few pictures of the Typhoon rudder and fin just to give you the idea.

Aileron Hinges:

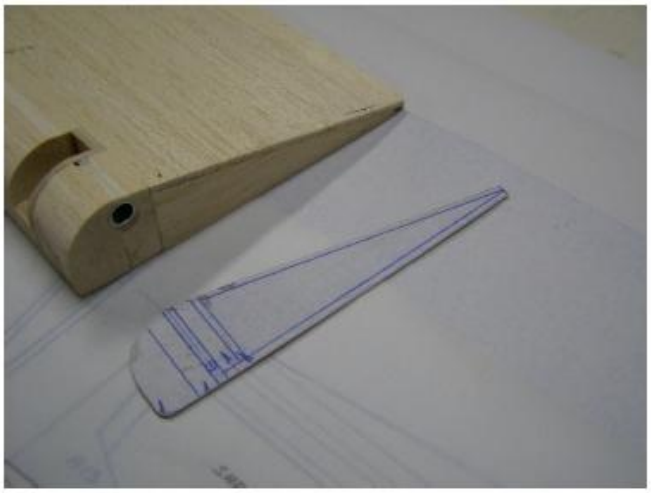
The hinges shown here are for the Fairy Firefly. They are of the "Bottom Hinge" variety.

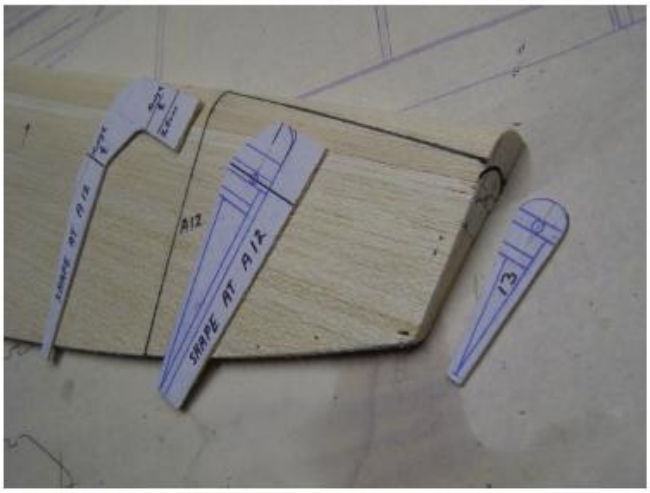




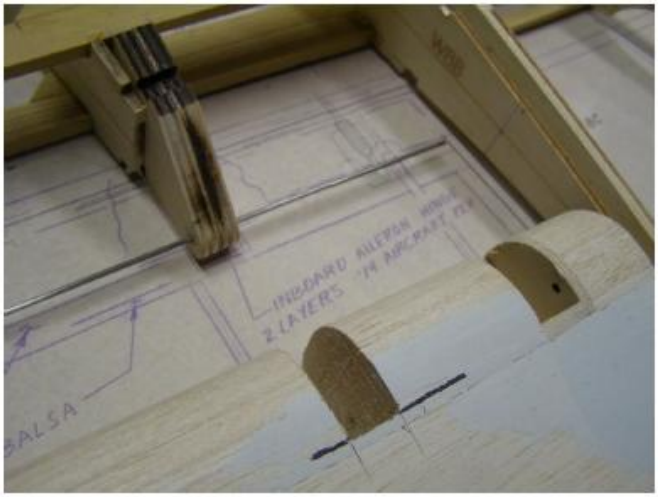


Both sides sheeted.





Template and shape at the root end. Templates and shapes at the tip end.


INBOARD AILERON
2 LAYERS
SALSA