ADVENTURES FROM THE POND

The official newsletter of the Rise Off Water (ROW) R/C flying club.

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SEPTEMBER ISSUE

FROM THE PRESIDENTS WORKSHOP

Under Pressure from others the time has come to commit to more communications, so here we go.

This is our first formal newsletter, I keep the Presidents workshop sections short, and let's get down what we are all doing with Groundhog Day. Like the movie it's a great chance to learn new skills or brush the cobwebs away and pull down the kit, lift the lid and roll out the plans.

Here's what happening in my little workspace.

Found the bench and I have started building a ¼ scale Kingfisher with David Kennedy, was supposed to be a joint effort but with the lock down this is starting to look it will be a plug and play. More images later in the newsletter.

Progress has been steady and I'll have it finished, along with two or three others before this lockdown ends.

Everyone stay safe and have some fun…

A Tim Nolan monster with 12 foot wingspan. Construction of the fuselage comprises 36 metres of 6 mm diameter stainless steel tubing with a ½ mm wall thickness. Joints by T.I.G. welding. The wing ribs are 6 mm balsa, and you can just sneak three per 1200 mm sheet. Model is scaled version of Phil Dalhuntey's VH DUL Super Cub. Power is modified Tartan Twin. Winch photo at Sydney Float Fly.

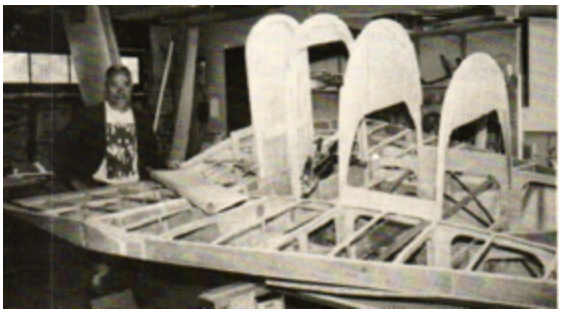
SEA- ERA S.S.

The October 1989 issue of MAN had a kit review of the SEA-ERA done by Ed Westwood. The SEA-ERA looked quite similar to my SS except for the tail. It had a conventional cross tail on the end of a boom which contoured into the fuselage. By contrast, the SS has an inverted V-tail mounted on two booms extending from the wings.

The SEA-ERA was a quarter scale model of a proposed two place tandem full-size amphibian (see photo). The kit parts were all molded fiberglass/foam sandwich shells over a lite-ply frame. Kit production was discontinued after seventeen were made because the margin between cost and selling price would not support advertising.

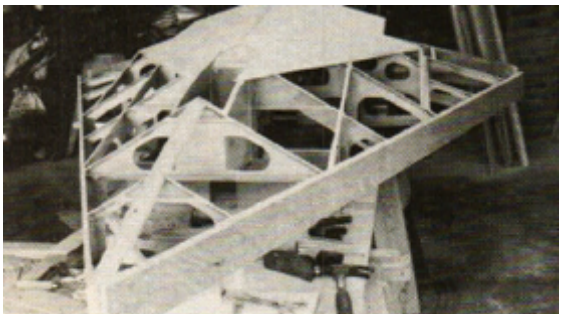
The original model with normal cruciform tail.

I had planned to build a full size SEA-ERA but the project was too overwhelming for my limited resources (mental, emotional, and otherwise). So I downscaled my ambition and decided to do a light single place version; hence the SS.



Either model or full size construction is basically the same. Carbon tube spars and epoxy and glass.

The design evolved around the 80 hp Rotax 912 four cylinder, 4-stroke engine. Design parameters include a gross weight under 800 pounds. This will allow transportation on a small boat trailer -— with the wings removed of course. The ship has no compound curves like the SEA-ERA, save the canopy and fillets and will have retractable tricycle gear, conventional controls, and a construction system compatible with scratch-building in a garage using wood, fiberglass, resin, and foam. The plane should have reasonable cross-country capability with no unusual flight characteristics.



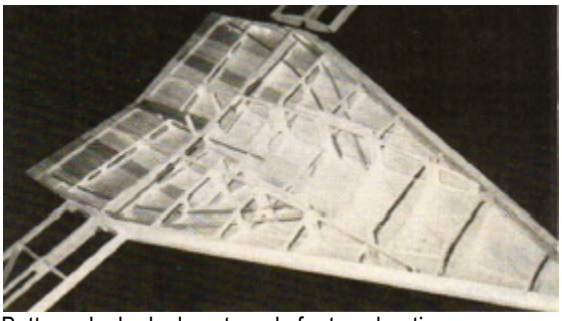
Nothing too difficult here, basic boat building 101

As any modeler can tell you, WC test pilots always walk away from unsuccessful first flights. To minimize the chance of this occurring, I proceeded with a quarter scale model, Stan Hall, an aeronautical engineer, wrote an article on dynamic modeling for Sport Aviation (July 1987), in which he presented a table of scaling factors which if followed carefully, allows a model to be configured to simulate full scale performance.

I had to add three pounds of lead to the model and fly at half throttle or less to conform to the scaling factors Stan presented. The ship still flew well even at the higher weight and gave me the boost I needed to proceed with the full-size plane.

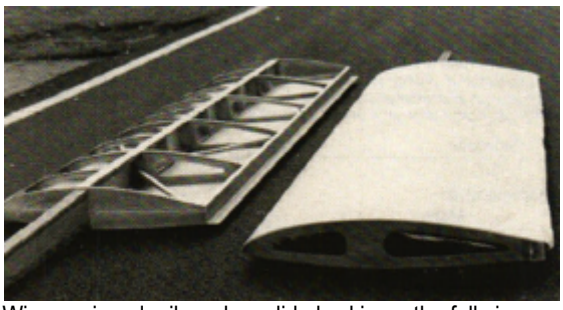
Let me digress a moment and outline the design parameters that were verified or indicated a change needed, by flying the model.

First and foremost, the Center of Gravity. On a conventional aircraft, this is quite straight tforward; but on a ship using a canard as part of the lifting surface, some assumptions had to be tried. I first calculated the C.G. by assuming that the delta area forward contributed 60% of the lift of the wing. This put the C.G. right at the leading edge of the wing.



Bottom planked, almost ready for top sheeting

Our testing quickly showed however, that the C.G. based on this premise was too far aft. Thus, we kept adding weight until the ship flew comfortably. On the model, this testing put the C.G. 1/2" ahead of the wing's leading edge.



Wings using ply rib and a solid ply skin on the full size

The original assumption of the delta's contribution to lift of 60%, was thus changed to 70%. Coupled with the early C.G. problems was the tendency of the model to spin out at lift-off. We deduced that inadequate vertical tail area was the culprit. Adding vertical area to the inverted “V" proved quite easy, we just put a surface on the top and varied its area until the ship flew without undue yaw. We also

determined that, unlike most seaplanes, this ship needed some water rudder left in the water to counteract the short afterbody.

Flying the model after these parameters were corrected indicated that the thrust line, dihedral, tail incidence, and control deflections were all within my self-imposed flight comfort expectations. The inverted V-tail was chosen for its strength, structural simplicity, and flight stability. Standard V-tails have an adverse roll moment when used as rudders but when inverted the roll moment is coordinated with the wing's dihedral resulting in greater roll stability than a conventional cross-tail.

The structural simplicity is that of a closed triangle. The model was built without the vertical fin on top of the V but early flight testing revealed some yaw instability. Several flights and fin area changes fixed the final configuration. Ed Westwood dubbed the extra fin a "Prayer Tail. "

Due to the lift generated by the delta area forward of the straight wing, the C.G. is located 1/2" in front of the wing's L.E. Thus, though at first glance the plane appears short coupled, it has a fairly standard tail moment arm (Lt) of 2 1/2 chord lengths of the straight wing.

The delta area acts like a canard and cancels most of the negative pitching moment of the airfoil thus reducing the tail 's down load and associated induced drag. The greatest use of the elevator is at take-off when the engine thrust is trying to push the nose down. For this reason dual rate on the elevator can reduce in-flight pitch sensitivity for flying comfort. How the full-size plane contends with this phenomena is yet to be determined.

What a pleasure to write about another of Paul Weston's magnificent amphibians. Since I have one of Paul's SEA-ERAs I was eager to see if this somewhat unorthodox looking machine would fly as well.

Well, candidly, at first it didn't. The problem was the C.G., a minor aeronautical parameter. Paul had it on the wing's L.E. where it is on the SEA-ERA but the ship would spin out on lift-off. We spent half a day adding weight and adjusting the additional fin area until the ship new right.

But then we had a winner! Another delight to fly and easier to land and take off than the two step procedure used on the SEA-ERA. The inverted V tail performed just as advertised and made roll much smoother when used with rudder. Paul's Enya .60 hauled the #7 ship in vertical maneuvers with a better power-to-weight ratio than its big brother.

And talk about looks! At Clearlake, Paul had a crowd after every flight asking numerous questions. Paul is currently building the full scale and it remains to be seen who will take him up on the offer to fly it first.

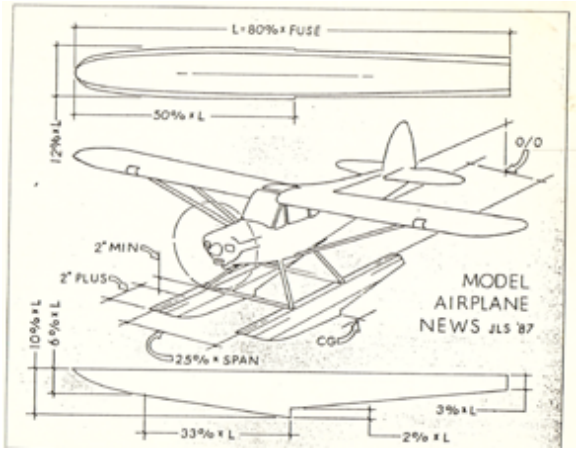
Ed Westwood

SETTING UP A SEAPLANE

I have been using this drawing for a long time to set up floats.

This will also let you custom design a set of floats, and with time on our hands here is a chance to build something for that unusual model hanging on the wall.

What about designing your own mono float aircraft, lots of scale choices or convert a low wing model from the garage. Just remember the mono float is 125% of the fuse length.



Here is the magic formula, for models the float span at 25% is very stable, 17-19% is much closer to scale and looks better as well.

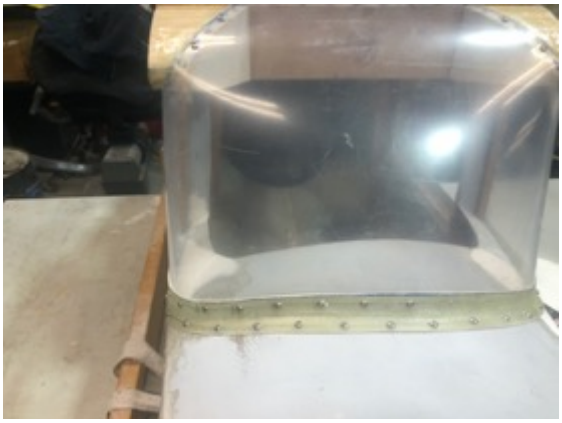
If you are interested in building some simple wooden floats I have a number of designs available for any members.

In closing here is our first effort… any feedback welcome and while we are lockdown what other projects have you all got on the building board?

I can report and you'll see from the images I have been progressing well on David's Kingfisher.

All covered and ready for final doping, standard construction with Coverall. Modified to have a slotted aileron, will be interesting to see how well they perform over standard top hinged.

Fuse ready for final undercoat, windscreen has been fitted just doing the anti-glare on the dashboard.



Screen fitted, it still has the protective film over it while I made the band at the bottom of the screen to secure it to the fuselage.

Side window, litho plate surround to hold the window in place