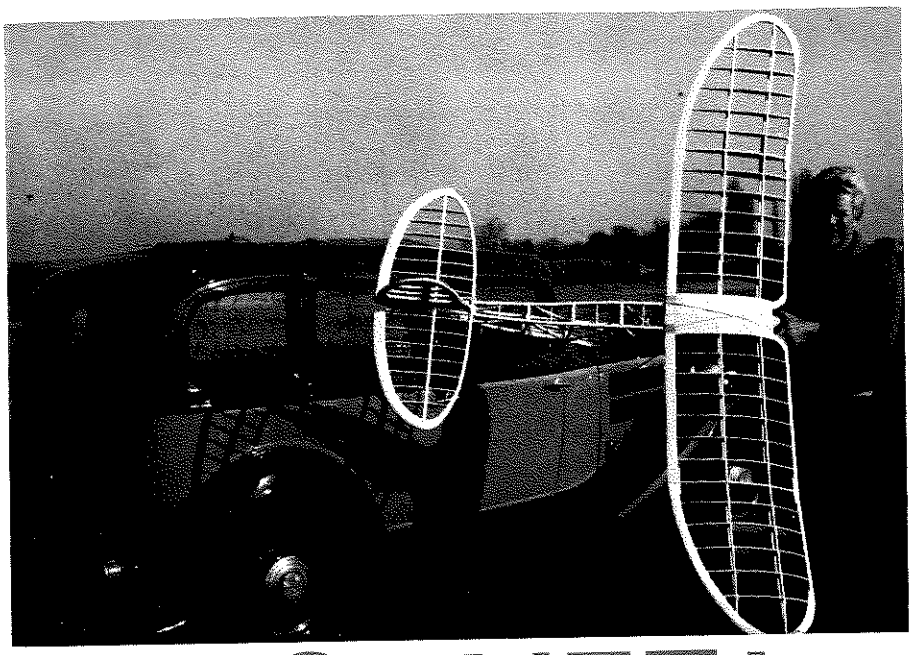


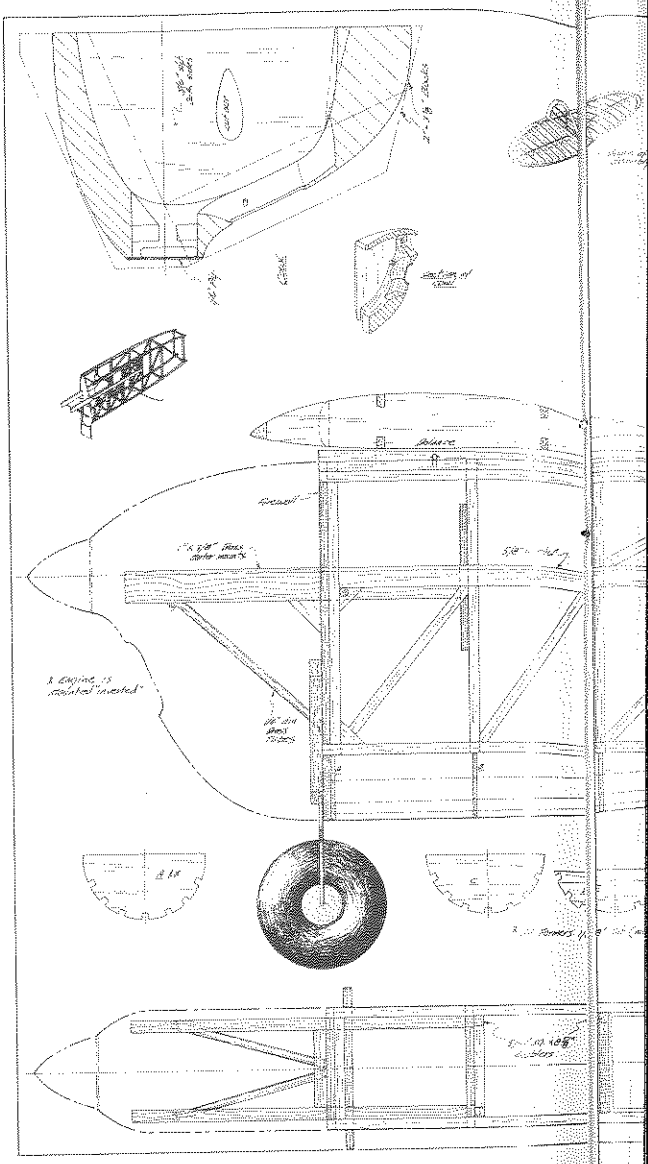
HORNET!

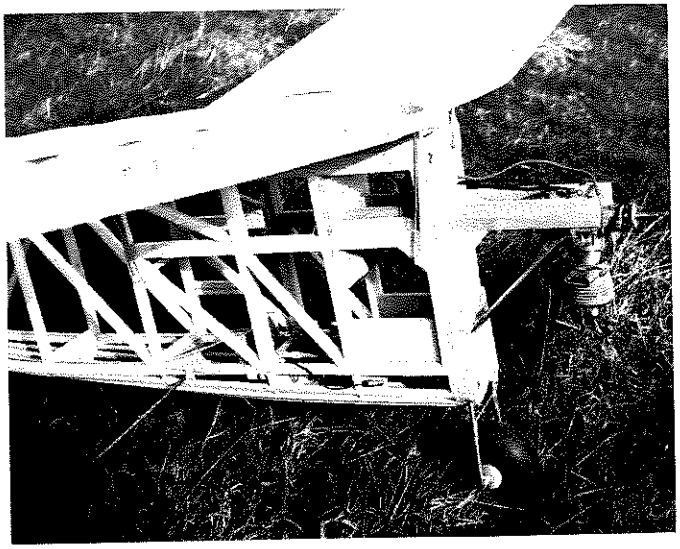
Designed by: Sal Taibi
Drawn by: Al Patterson
Text by: Bill Northrop

Just as in the July issue, where the OT Model of the Month was selected because of the receipt of some unique photos, so it is with the August OT Model of the Month. Along with his order for a subscription (thank you!) Sid Sutherland, of South Woodford, London, England, sent photos of his still uncovered Hornet, Sal Taibi's 1940 design for the Forster 99. What made the photos unique was the inclusion of a 1933 Hudson Essex Terraplane which Sid uses on those appropriate occasions when he goes out to fly old timers! Adding to the uniqueness of the photos was the fact that Sid is using a Super Cyclone engine in the Hornet that

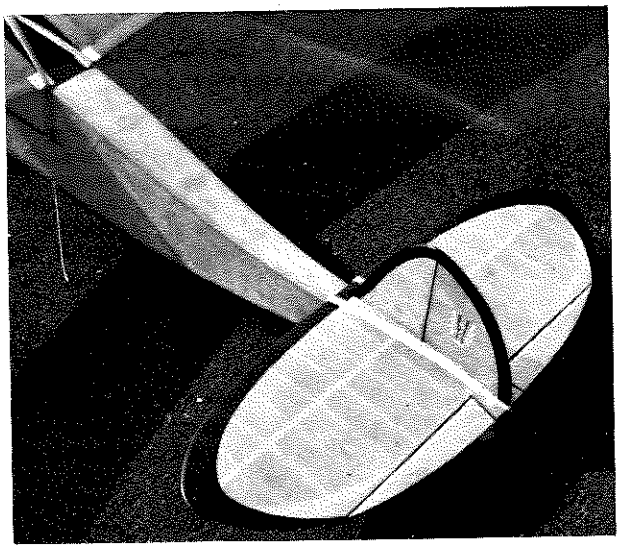
Continued on page 97

Sid Sutherland and his completed Hornet, on the famous Battle of Britain aerodrome.

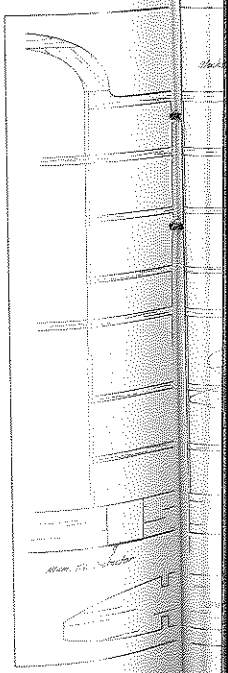


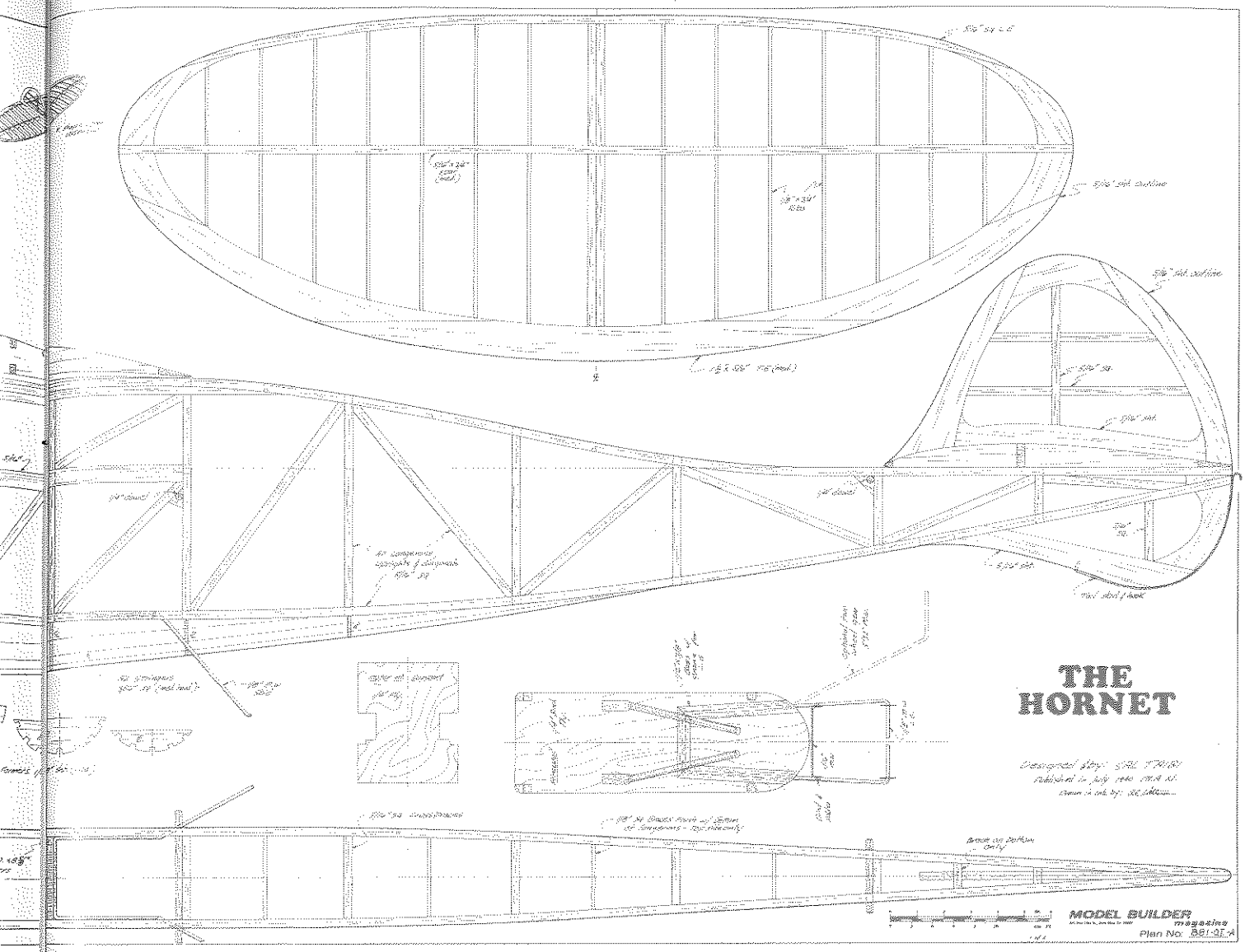


Close-up of Super Cyclone formerly owned by the late Eddie Keil of KeilKraft fame. Ballast needed to make up for 99!

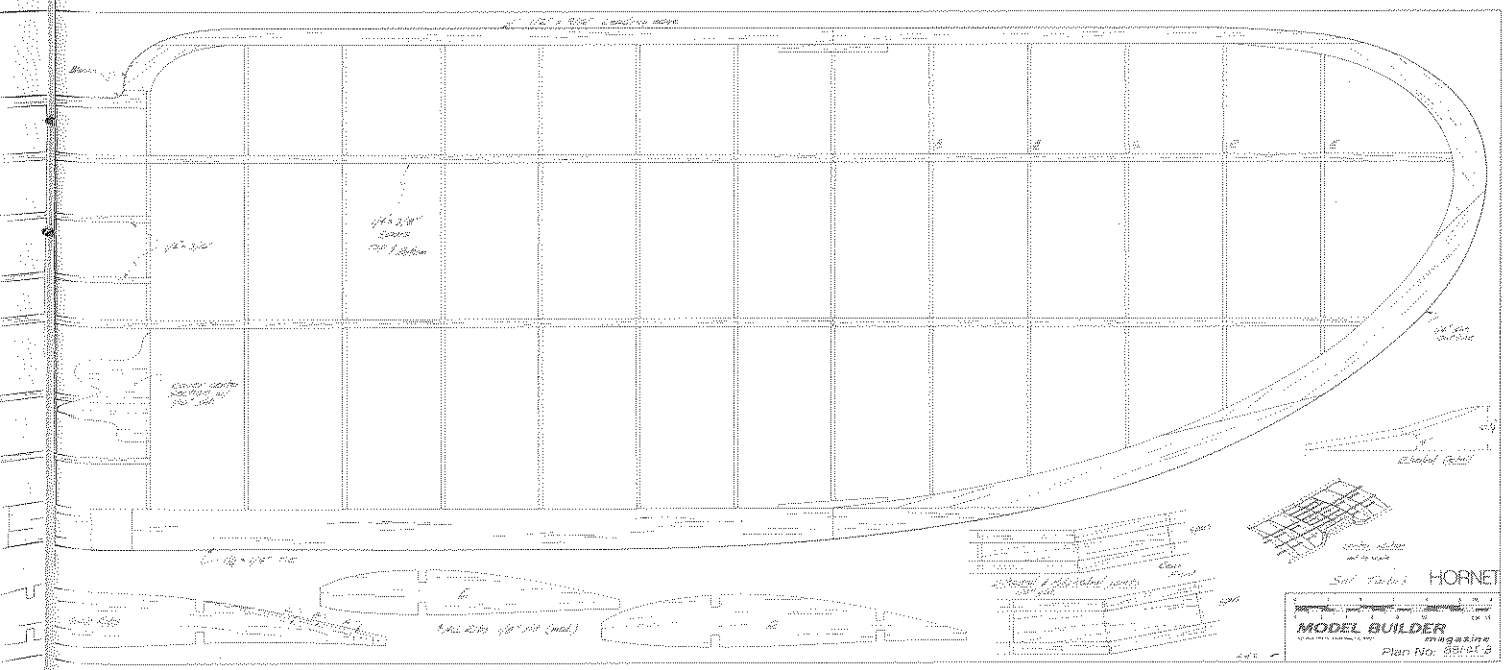


Shot of tail surfaces as modified for R/C. Taibi recommends two-wheel gear for better ground handling, R/C or F/F.





FULL SIZE PLANS AVAILABLE — SEE PAGE 100



means that the speed must scale directly with the size. That is to say, the one-tenth scale model must fly at one-tenth the full scale speed. For instance, a 3-foot model of a 30-foot lightplane that cruises at 85 mph will have to fly at 8.5 mph, or slower than mose people can run. (The visual scale model is almost always at the mercy of the wind!)

Table II shows the essential visual scaling factors. (The factor for area is determined from the dimensional factor.) In this case, weight, thrust, and lift/drag factor (typically, airfoils) can be varied to achieve visual scale speed.

Slower speed can be achieved by: a) decreasing the model's weight and thrust or, b) increasing the model's lift and drag. Increasing the wing area also does the trick at the expense of dimensional accuracy. Changes in weight and thrust have no visual effect and are easiest to accomplish. Changes in lift and drag involve changes in airfoils or the addition of drag inducing features such as greater fuselage frontal area. All of the lift/drag related factors compromise scale fidelity. By reducing weight, increasing lift, and drag, *and* reducing the thrust, a model can be made to fly at visual scale speed. In fact, weight reduction (and consequent thrust reduction) may be enough in many cases. This would certainly be the case for rubber powered scale.

With visual speed accomplished, the model's other flight characteristics will suffer. The probability of maneuvering as the full scale aircraft does is greatly reduced. Further, it may be necessary to reduce structural strength significantly to achieve low enough weight.

Use of a small motor is an attractive weight saver. This will accomplish weight and thrust reduction. If the motor size is chosen to reproduce visual cruise and top speed, the reserve power to do violent maneuvers will most probably not be available. Here we come close to another classical argument: should scale model flight performance be judged (as it is most often) by the model's ability to do violent maneuvers? It seems to us that a scale model should perform as its full scale equivalent does: no more, no less. *(Scale rules seem to have this fairly under control. wcn)*

CONCLUSION

Dynamic scaling must be done in accordance with the aerodynamic laws. The resulting model will not fly at visual scale speeds. Visual scale speeds can be accomplished by violating the aerodynamic scaling rules. However, the other flight characteristics achieved will not be scaleable to the full size aircraft. Typically, the model will not necessarily simulate the stall, turn, and spin characteristics.

Both dynamic and visual scale have their places. However, it must be remembered that they are different and serve different purposes.

ACKNOWLEDGEMENT

The assistance of Mr. Milenko Mitrovich, Aeronautical Engineer and Teacher of Aeronautical Design is gratefully acknowledged. It was Mr. Mitrovich's patient correspondence that answered the technical questions posed by the subject. Mr. Mitrovich has been long associated with man powered flight activities, and his name is linked to a number of well known full scale aircraft.•

Hornet ..... *Continued from page 32*

originally belonged to the late Eddie Keil of Keilkraft fame.

We immediately went to our old magazine files and dug out the July 1940 issue of *M.A.N.*, which featured Sal's construction article on the Hornet, and put Al Paterson to work on the full size drawings. We also sent a note to Sid, asking for photos of the model after covering and finishing. As you can see, Sid came through. By the way, we also had to call Sal and find out where he balances the Hornet. Typically, this info was not provided in the 1940 article or on the plans.

Construction of the Hornet is really simple, and any modeler who can build from scratch will have no problem. Watch your tail weight, however. Sid ended up having to add a pound (not a British pound, dummy, we mean 16 ounces!) of ballast to the nose in order to get the proper balance. (This was mostly due to his using the Super Cyclone engine, which could be almost a pound lighter than the Forster 99.)

Incidentally, Sid added a two-channel radio because of a shortage of free flight space (tell us about it!) in his area. He says the rudder is very effective with about 1-1/2 inch movement either side of center, and 3/4-inch up or down on the elevator is ample. Sid also noted a certain amount of dutch roll on the first flight, then realized the model was designed to spiral left while climbing. Setting the trims for a circular climb, allowing the model to fly the way it was intended, solved the whole problem!

We also learned from Sal that he himself went for the two-wheel gear on his last two Hornets. This eliminated ground-looping when winds were under 5 mph at takeoff. He uses a single strut of 5/32 music wire.

A comment from Sid about the photos of the finished model. "An interesting note. The photos were taken on nearby ex-RAF Battle of Britain aerodrome, North Weald Essex, which a group of us have access to. Whilst Taibi's Hornet was flying in the early 1940s, the Hurricanes and Spitfires were operating from this famous aerodrome . . . now all is quiet, and the Hornet is using those same runways. . ." •

Workbench .. *Continued from page 6*

not difficult to drive, handle well, are not equipped with governors (in our opinion, governors on a vehicle make them unsafe to use on public roads!), and about the only trick is backing up if