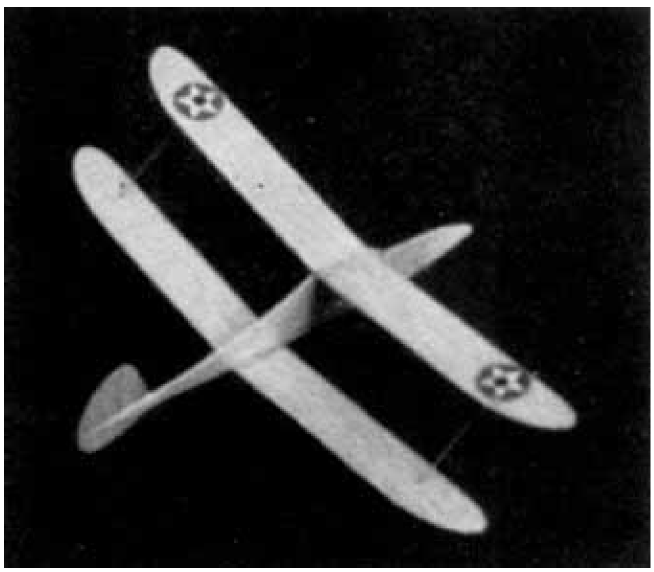
Whatsit?

Is It a Tailless Biplane or a Monoplane With a Large Stabilizer? -It Flies Perfectly

By FRANK EHLING



This plane without a stabilizer will fly better than any glider you have ever built.

THE main purpose of this article is to give a clear idea of longitudinal dihedral, how it works on an airplane and how you can adjust your present ship to perform better if you were having poor flights in the past.

While there isn't anything new in models except different setups of surfaces or sizes; deep down under the tissue and balsa the aerodynamic principles still remain constant. In any event to get a model to fly smoothly it must be in accordance with the set rules of long ago.

Penaud. in 1871, found that longitudinal dihedral was necessary if stable flights were to be constantly obtained. In order to get a clear idea of longitudinal dihedral we wish you would build one of these little ships to acquaint yourself with the forces that make this clever ship fly so well. Any way you look at this little ship remember the lower plane or wing should he thought of as a stabilizer and anything said or any setting given with reference to this surface can be worked out on the stabilizer of a normal model.

In this version of interesting aerodynamic design we will try to clear up the question of longitudinal dihedral and show how to maintain longitudinal stability. It simply means that the forward plane or wing is set at a greater angle of positive incidence than the lower or rear plane.

A simple explanation of stagger and decalage is that the main plane is set ahead and above the lower plane and the distance is reduced to the amount of stagger. And since the lower plane is set at a negative angle of incidence compared to the upper plane, then it will stall later and as the model goes into a steep climb the main plane will stall. (That is, when the lift of the wing is overcome by the drag; this comes when the angle of attack is too great.) Here the lower plane starts to work since it has the same airfoil as the main wing, only set at a negative angle. It will stall after the front plane has lost its lift. Here you can clearly see that when the front plane has lost its lift it will settle and since the rear one is still lifting, the ship (see figure No. 1 on drawing) will right itself and continue on its way. Here we have the effect of longitudinal dihedral and a lifting stabilizer.

Imagine the two planes set at the same angle to each other. The ship starts to climb and when the main plane stalls the rear plane also is stalling. As it is set

at the same angle here the ship will start to settle and go into a dive, and just as in a stall, the both planes set at the same angle will have the same lift and there will be no chance of recovery.

Here in the Whatsit we have used longitudinal dihedral to maintain longitudinal stability. The upper plane is set at zero degree incidence and the lower plane at a negative two degrees.

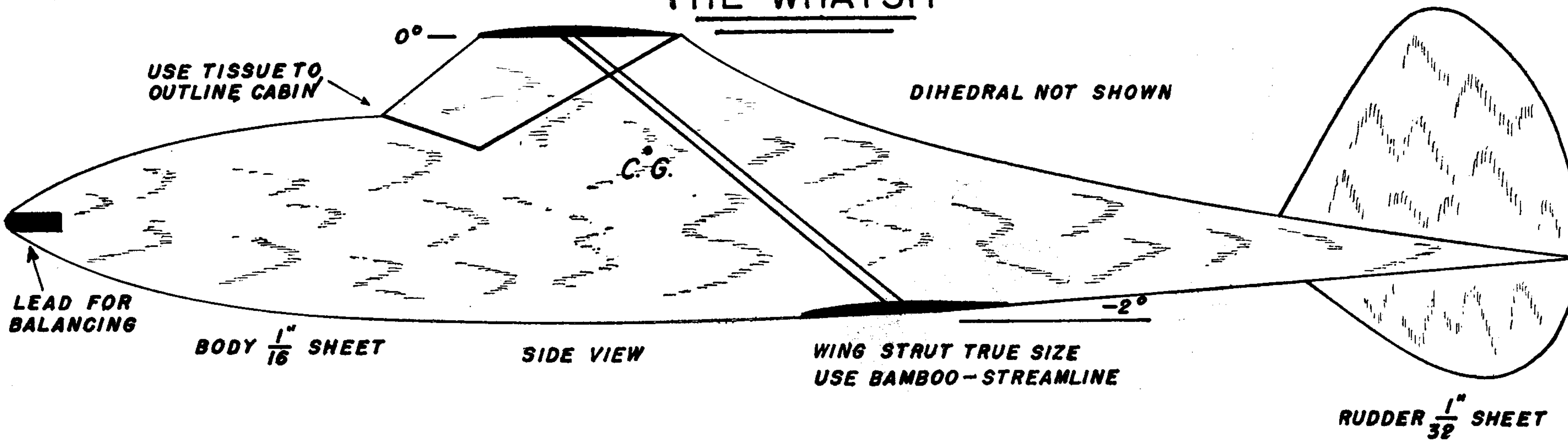
Now is the lower plane a wing or an oversized stabilizer? We will leave this up to you, call it what you may. It does the work of a stabilizer and it also contributes to the lift of the ship.

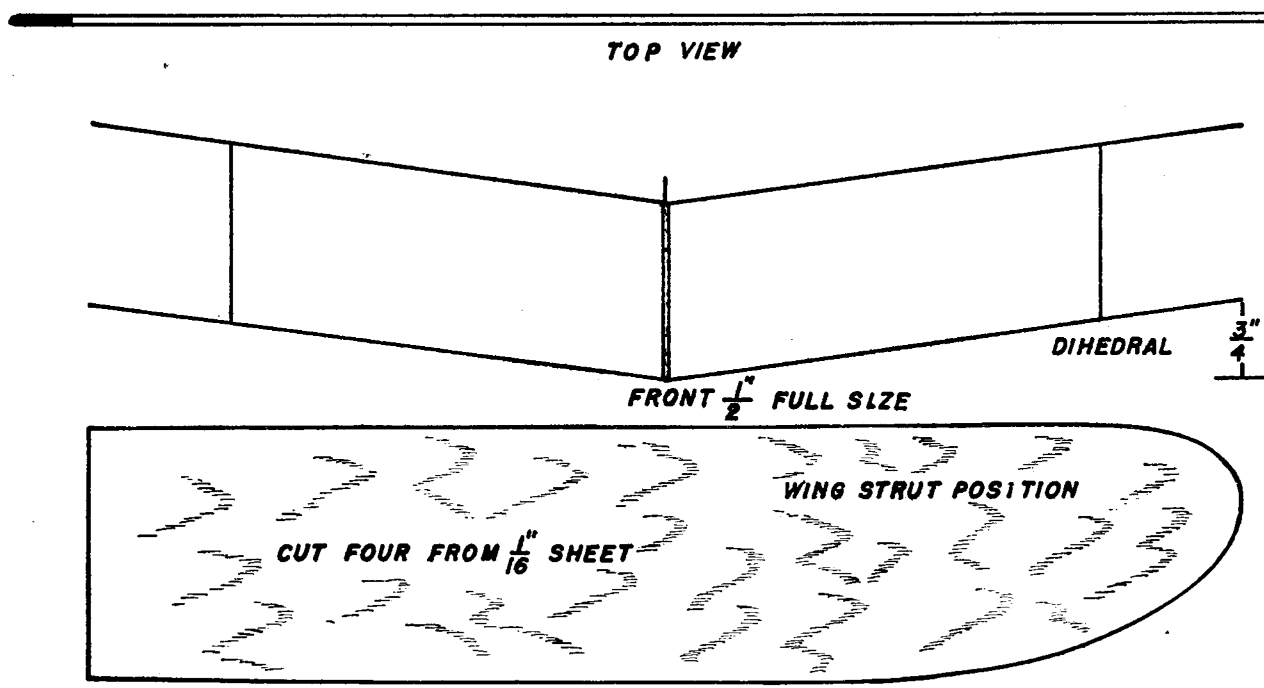
When adjusting this glider treat the lower plane as a stabilizer. Warp up the trailing edge of the lower plane to make it loop and warp it down to make it dive. However these adjustments will not be necessary if you build your ship according to the plans; several were built and they were all as stable as if they had stabilizers on all of them.

In constructing the Whatsit use hard balsa on all parts. Use lead for balancing the ship. Add or trim the lead to get the C.G. (center of gravity) as shown on the drawing. This little ship will give you flights that will amaze the expert fliers. Take one along when you go to the next meet and when Mother Nature blows up a good fuss take out your ship and show the boys some smooth flying.

Scanned From January 1942
Model Airplane News

THE WHATSIT





NOTES

SCALE FULL SIZE, EXCEPT WHEN SHOWN
USE HARD BALSA THROUGHOUT
DIHEDRAL SAME IN EACH WING
TREAT LOWER WING AS STABILIZER
DOPE ALL PARTS FOUR TIMES

A unique biplane glider with large positive stagger and a decalage. The stagger is so great that it is hard to determine whether the lower wing should be classified as part of the biplane combination, or a stabilizer. Structurally it is a biplane; functionally the lower wing is a stabilizer.

This plane is one of the steadiest fliers ever designed, believe it or not.

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