

GETTING SUCKERED ON INCIDENCE

by George White

Have you ever built a new model, carefully following the plan instructions to mount the wing with X° of positive incidence, then when you try to trim it, find that it has a tendency to rotate 90° vertical to the flight path, even in the glide? All this in spite of the fact that you've got the thing static balanced right on the CG. Some solutions include hanging a weight on the nose the equivalent of an automotive lug nut, jacking up the leading edge of the stab and hoping you've got lots of downthrust, or taking the wing off and reducing the incidence. Ask me how I know about these things!!

I'm reminded of a column I used to read in a naval aviation safety magazine written by a guy who went under the name of Grandpaw Pettibone. He always cited a series of true confessions of stupid behavior each of which were signed "Anymouse." Here's my Anymouse.

While working with my mind in neutral, I built this nice biplane with $.5^\circ$ positive incidence in the lower wing, and 1.5° positive in the upper, just like the plan said. While working in a mentally handicapped state, and since the wings had flat bottoms, I used the bottom of the wings to determine the angles.

As anyone who's given more than 3 seconds of thought to the subject, we all know that the incidence angle of a wing is measured between the flight path and the cord of the wing. If you've got a flat plate wing or other flying surface, such as a stab, the incidence angle can be safely measured along the bottom edge. If the wing has any thickness to the airfoil, the angle of incidence is measured between the flight path and a line running from the leading edge **tip** of the airfoil to the **tip** of the trailing edge. If the leading edge of the wing is raised, which it almost always is, that's going to add to the angle of incidence compared to the flat bottom. In my case, the airfoil was rather thick, which resulted in an incidence angle at least 2° greater than the correct ones. There's my Anymouse confession. Just a little something more for you to think about to prevent you from becoming "too soon old, too late smart."