

"TOO LOW AND TOO SLOW"

by Commander Ralph S. Barnaby, U. S. Navy

Late in August 1941, about a month after its delivery to the Navy, a two-place soaring plane piloted by a Naval Aviation Pilot with seven years of airplane experience and over ten hours flying time in that particular glider crashed on the field at Philadelphia. The pilot reported that after completing a last turn prior to landing the glider refused to respond to the controls, dropped its nose in landing. Fortunately the injuries to pilot and passengers were negligible. About two months later a similar crash occurred at Patterson Field, Dayton, Ohio. The personnel in this crash was not so fortunate. The pilot was killed, and the passengers spent an extended period in the hospital.

After our crash in Philadelphia, all the men who had been flying that type glider got together for a little round-table discussion of the matter. At that time it developed that all of us had had similar experiences at one time or another in the same glider. In all cases but the last, however, they happened at altitudes high enough so that there was plenty of time for recovery.

The circumstances were: a steep spiral was started at a normal gliding speed; recovery procedure tried; instead of proper response, the inner wing dropped further, the nose dropped and the spiral tightened. Recovery was actually achieved by applying forward stick and high rudder, normal spin recovery movements.

After some study, I am convinced that both the Navy and Army crashes as well as one which occurred at the Elmira contest in 1940 in which Youston Sekella and a passenger were involved were all of the same type. It will be noted that they all occurred during the last turn into the field for a landing.

I believe that the crash which occurred in each of these cases is the result of attempting a highly banked turn at too slow a speed at too low an altitude. It sounds silly, because any glider pilot should know better than to do that. Actually it isn't so silly as it sounds, because of the lack of definition of and determination of the "Too slow a speed." The speed that must be used for a high banked turn is considerably higher than that which can be safely used in straight flight or easy spirals. And I don't mean two or three miles an hour more, I mean ten or more.

Several factors are involved. First, the increased wing loading raises the stalling speed and increases the angle of attack. Second, because of the great span and small radius of turn, a loss of air speed at the inner wing tip is considerable. The use of corrective aileron movement further increases the angle of attack of the low wing, and finally the wing still lacking enough lift starts to drop some more, still further increasing its angle of attack, and somewhere along the line depending on the indicated air speed the inner wing stalls, and at a surprisingly high indicated air speed too. Although this may sound and be quite elementary, I feel that the danger arises from a lack of appreciation of the magnitude of the effect, and failure to make sufficient allowance for it. For one thing, a pilot cuts loose from a tow line; he settles down to a comfortable speed; he flies straight or in easy spirals; his ear becomes attuned to the sound of that speed, and by the time he gets down to where he must spend his sight in looking

over his landing prospect and not in watching his air speed he has been lulled into a false sense of security by his ears, and unconsciously assumes that the ear that has served him satisfactorily throughout the flight is satisfactory for the approach and landing. And it would be satisfactory if it was a long straight approach without turns. The cure for the condition discussed above, once it has developed, is obvious. It is the universal cure for most difficulties,—"Shove the stick forward." Once the speed has been built up a bit in that way rudder and ailerons become effective and all is well unless the ground rises up and smites you in the course of these proceedings. As I tell my students, "If the low wing won't come up with use of aileron and rudder, don't try to bring it up. Fly down to it!" It's a sure cure, unless as I have said, the ground gets you first.

Probably the basic cause of all the trouble centers around the natural desire to set the glider down as near the leeward corner of the field as possible, so it will not be necessary for the ground crew to drag it back so far for the next tow. This, coupled with the fact that even with the spoilers the pilot hesitates to get well back from the field for a long straight glide in, for fear of under-shooting, and prefers instead to play around in flipper turns and "S" turns right over the fence until he is almost on the ground.

If I had my way, I'd lay out glider training and practice fields with all runways of sufficient length for all means of take off, radiating from a central point from which all flights would start, and at which they would terminate. My list of glider crashes which, from my personal knowledge, have resulted from attempts to land in the down wind corner of the field is six right now, and I'm sure there must be many more.

History of Motorless Flight

When is a power plane not a power plane?

When it's a sailplane, according to Lieut. Thoret of the French Air Force, who on January 3, 1923 soared this Hanriot biplane for seven hours and three-quarters during a French glider contest held at Biskra, Africa.

