

Blind Flying in ICING CONDITIONS

by John Robinson

Saturday, August 31, was the only day during the 1940 American Open Soaring Contest at Lockport, Illinois, that presented any opportunity for soaring to high altitudes. An occluded cold front was mixed up in the neighborhood, and when my turn for plane-tow came around, I told the pilot of the tow plane to take me under some clouds to the west of the airport.

I was flying a new Schweizer all metal two-plane sailplane and I usually took a passenger along on contest flights. This time there was no one ready to go at the moment, and I couldn't hold up the tow plane or pass my turn, so I took off alone. I released the tow line at about 1500 feet under some scud clouds two miles west of the airport. Locating a weak lift, I spiralled up and into one of these little clouds, noticing a large cloud higher and farther west, just before I entered the cloud and started flying blind on instruments. At this time L. D. Montgomery, who had taken the previous tow, was struggling to locate a very weak lift with the Wolf sailplane about a mile to the south at a lower altitude.

Emerging nearly at the top of this small cloud, I headed west toward the large one and took a quick look around. Having been drifting with the gentle northwest wind while thus spiralling blind, I found myself looking down from 3500 feet at the Lewis School of Aeronautics Airport from which I had taken off. I flew straight in to the side of this large cloud, again reverting to my blind flying instruments in order to keep the ship in normal flying position.

Soon I was climbing 5 feet per second so I started circling to the left, and when it increased to 8 feet I spiralled in a tighter turn in order to stay within this better region of lift. Before I reached 7,000 feet altitude, my airspeed indicator ceased to function due to water in the venturi tube operating it. I disconnected the rubber hose so that the water wouldn't enter the instrument itself. Although this instrument is very helpful and necessary for very efficient soaring, one *can* get along without it, especially if he has to.

Losing this lift, I endeavored to coax the compass to indicate that I was heading in a direction somewhere between south and east. It finally did, and immediately the variometers became pessimistic. They indicated that I was sinking at over ten feet per second. This mustn't last long! Would I come out of the cloud, or find another region of lift? Fortunately it was the latter. I started spiralling again, this time to the right just for variety, in a fairly smooth climb of 5 to 7 feet per second.

After a while it began to rain quite hard. The rate of climb varied from 5 to 10 feet per second, and was usually the strongest where it was raining the hardest. Climbing past the 10,000 feet level, the temperature dropped below freezing, all the water clinging to the ship froze, and the ice started building rapidly on all the leading edges of the ship. Then came a series of ups and downs taking me up over 14,000 feet and keeping me always above 10,000 feet. The temperature dropped as low as 20 degrees F. and the rate of change of altitude varied from 15 feet per second up, to the same down.

Although it was no longer smooth, it wasn't too rough, and I was really enjoying this battle with the elements.

I was fascinated watching the ice grow thicker on the leading edges of the wings and struts. The rudder started to stick in neutral position, and I knew from previous experiences of icing up with my sailplane "Zanonia," that the ice was starting to build across the gap between the leading edge of the vertical fin and the counter balance on the rudder itself. If this continued, the rudder would freeze solid, and I would be deprived of the use of this very necessary control surface. Therefore, I began a continual "fanning," of the rudder keeping it moving all the time and thus preventing its freezing solid.

I flew through considerable hail off and on. It was always less than the size of a large pea, and therefore did no harm, although making a terrific noise. Again, as with the heavy rain earlier, the strongest lift was coincidental with the thickest hail.

In between spiralling climbs, I kept gliding down in a south or southeast direction, bearing in mind that Lake Michigan lay to the northeast and east of my starting point. I had no way of judging the wind drift or how much speed I was averaging across-country, for I was still flying blind in this fast spreading storm cloud. I caught a brief glimpse of the sun once, but that didn't give me any indication of where I was, geographically.

The ice kept growing thicker all the time I was above 10,000 feet altitude in this cloud, because supercooled moisture freezes upon contact with a solid object. It was about two inches thick, opaque and very lumpy; and that type is known as "rime" ice. Because I was flying the sailplane at cruising speed, the wing had a comparatively high angle of attack, and the ice was building thicker and much farther back under the leading edge, than over it. Under these turbulent conditions, I could not detect any detriment to the performance of the ship, although it was without a doubt less efficient. The ice was a nuisance because I was still moving the rudder continuously, so my legs were tired, and of course I was bitterly cold!

It was very fortunate that I had the ship equipped with an electric turn-indicator, for the usual venturi driven type would long before this have ceased to function due to the thick ice. Blind flight cannot be accomplished for any length of time without an operating turn-indicator!

Continuing on my somewhat erratic course of south-east, I sank between two and ten feet per second. The ice was slowly melting when I flew through a heavy rain squall at about 7,000 feet altitude. The rain melted under the ice and it started blowing off in very large pieces, one of which came off the wing and hit the stabilizer, striking more ice there and so doing no damage to the ship. I thought of the farmers in the fields below, but it was raining so hard that they should all have been in their houses.

It rained intermittently for most of the remainder of my smooth glide down. I broke out of the cloud at 2,000

(Continued on page 5)