

Gliders for TRANSPORT

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WE are now applying the knowledge and experience gained in flying small sailplanes to the development of large troop and cargo carrying gliders as present weapons of modern warfare.

Airplane towing of gliders, which like most important developments in aeronautics was an American contribution, was first done as a method of launching a glider to a height and location where contact with rising air currents could be made for a soaring flight. After its practicability was proven, this method of launching gliders became a necessity at our annual national soaring contests at Elmira, N. Y. On those days when we had either no wind or an adverse wind direction other methods of launching such as winch and automobile towing were inadequate to reach thermal currents.

As a result a considerable amount of towing was done; definite techniques developed; and valuable knowledge gained—all of which are standing us in good stead today.

As the pilot of the glider on my first few airplane towed flights my principal impressions were these: First, it was usually an easier method of taking off and one which I instinctively felt subjected the glider to less stress than other methods of launching. Second, the ease of piloting in tow within the design speed range of the glider. Third, the pleasant sensation of continued straight and level flight without vibration and the only noise the swishing of the air past the cockpit.

As the pilot of the towing airplane, I was most impressed by the almost total lack of impressions. By this I mean that the take off was entirely normal, the run before the airplane became airborne only slightly longer than usual. Once in the air unless the pilot of the glider got some slack in the towline and took it up suddenly, I couldn't feel that I was towing anything at all. My principal concern was to keep a constant airspeed of 55-60 miles per hour to keep within the design speed of the glider. Several times I have towed a clean sailplane and had its pilot when ready, release his end of the towline without knowing it until I looked back and saw he was no longer there.

The towplanes we used at these contests were mostly slow biplanes such as the Waco F and Curtiss Fledgling with from 100 to 185 horsepower and wing loadings in the neighborhood of five to seven pounds per square foot. The wing loadings of the gliders towed was 3 to 4 pounds per square foot.

It is interesting to see what can happen on tow at speeds of 40-60 miles per hour with a light wing loading glider. To begin with the glider takes off well before the towplane. Usual technique has been to climb to about ten feet, level off and wait for the airplane to take off, then maintain five to ten feet above it. In cases where the field is limited it is well to pull the glider up to 15 or 20 feet and then dive down allowing slack in the towline so that the airplane can get off without any drag from the glider. I remember quite vividly once taking off from a small field in the Pocono Mountains in Pennsylvania towing the Chanute sailplane piloted by the late Jack O'Meara. If Jack hadn't used this technique, I would have hit a stone wall with the wheels of my Challenger powered Curtiss Robin monoplane. As it was, my wheels cleared the wall with inches to spare, as I went out literally between two trees.

In tow in quiet stable air, there is no real problem for the pilot of any glider provided he is towed within the glider's design speed range. All he has to do is a simplified formation flying, keeping behind and slightly above the towing plane. In rough unstable air, however, he is apt to have his hands full and soon finds out that he can quickly get into real trouble if he does not keep keenly alert.

The difficulties of towing in unstable air are due to vertical displacement of bodies of air—the warmer ascending air currents we know as thermals and the descending air going down to replace that which has just risen. One advantage the glider pilot has is that the length of the towline—which is usually about 300 feet—gives him time to make necessary corrections with his controls.

If the towplane flies into an ascending air current the glider pilot sees it rising suddenly in front of him and by immediately pulling back on the control stick can climb

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