



# Powered Gliders

By Stanley R. Corcoran\* \*\*

**M**Y interest in the development of auxiliary power for gliders was aroused in Denver, Colorado, in January 1943. I had just piloted one of two gliders, which were towed behind a Waco from Chicago, an air line distance of approximately 1,000 miles. Shortly after my arrival in Denver, in the interest of obtaining Glider Tow Data, the C.A.A. granted permission to use a sixty-five horsepower Piper Cub for towing. Although Denver is above the 5,000 ft. mark, takeoffs were accomplished in a relatively short run and the average rate of climb was five feet per second at fifty-five miles per hour. This performance was accomplished with one person in the airplane and two in the glider, which indicates that the glider was not detracting from the airplane performance excessively. These results were very gratifying and proved to me that a fully loaded glider of this type created a minimum of drag at fifty to sixty miles per hour.

In November of 1943, two engine installations of six horsepower each were designed to mount on each lift strut of a Cinema Two-place Glider. This location of the engines was decided upon as it would not require any changes to the glider. As the strut is not braced fore and aft, it was static tested with a load of 600 pounds applied to simulate the engine thrust. Actual static thrust of each engine with twenty-six inch Contra Rotating Propellers is thirty-seven pounds, which gives an adequate safety factor.

Because there was no ship available at our plant, it was necessary to construct a mock up of the glider in order to make all parts fit. The engines, which weigh

twenty-seven pounds each, were mounted forward of the lift strut and the fuel tanks, one for each engine, were mounted directly behind, which helped balance out, thus eliminating twist to the strut and aiding in streamlining the unit. Proper cowling of the complete unit, would without a doubt have increased performance considerably, but time did not permit this being one. The capacity for each tank is slightly less than two gallons, which gives an engine running time of one hour and ten minutes at 3,800 r.p.m. Individual ignition and throttle controls were located in the center of the instrument panel. Although these two-cycle engines do not idle very readily, they could nevertheless be slowed down to the point where the thrust was negligible. When completed, the units were shipped to Kalamazoo, where they were mounted on a Cinema Glider owned by Mr. Wayne Blaisdell, a Professor at the Western Michigan College. After both engines were installed at the College Aviation Shop, the ship was disassembled and taken to the Municipal Airport where the flight tests were conducted. Directional control on the ground was obtained by throttling either of the engines. This was necessary as there was no propeller wash over the vertical stabilizer and rudder.

The first run down the field was intended only to test the acceleration. If a speed of fifty miles per hour could be attained, I knew that level flight would be possible. With a wind velocity of ten miles per hour, I attained fifty-five miles per hour after having run 500 feet and with ample run-way left in which to gain altitude, I decided to let the ship fly off and then proceeded to circle within the boundaries of the airport, gaining altitude all the while. Not knowing whether the ship had sufficient power for take-off made this flight the greatest thrill of

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