for distance. The Cinema's performance proved to me that I was on the right track in attempting to design a sailplane that would perform consistently and well for even a novice pilot. Experienced pilots with their high performance ships ran away from me between thermals, but I made up for it by out-climbing them in the thermals, and was able to continue my flight by working those thermals too weak for less maneuverable ships.

The Frankfort Sailplane Company was organized in 1939 and moved to Joliet, Illinois, in 1940, where the development work on the Cinema II began. This ship was the prototype of the TG-1A, which we developed for the Army Air Forces. Our objective was to produce a two-place sailplane which would be suitable for dual and solo instruction, and give performance comparable to the Cinema I. Specifications are:

Span	46 ft. 3¼ in.
Length	23 ft. 2¼ in.
Height	5 ft. 1 in.
Wing area	194.3 sq. ft.
Aspect ratio	10.7
Empty weight	500 lbs.
Gross weight	920 lbs.
Placard top speed	80 M.P.H.
Stalling speed	37 M.P.H.
Sinking speed	3.2 ft. per sec.
Gliding ratio	20 to 1

The Cinema II had secured the Class I CAA approval required by the Army, but it was designed for thermal soaring, not primarily for airplane towing. The Army was not interested in developing soaring pilots, as soaring has no tactical value; it wanted gliders specifically designed for airplane towing. Therefore, the stabilizer and fin were changed from their original small proportions to a conventional type empennage which gave greater stability at high speed. As soon as this change was approved by the CAA we began production on the TG-1A.

Each ship delivered was tested in flight, and every fifth one was given a thorough check in both forward and rearward CG conditions, with regards to directional, longitudinal, and lateral stability.

The tests consisted of three turn spins, both left and right, with recovery being made, hands and feet trols. All placard speeds were exceeded by 10 the function of all instruments and stall charac were checked.

As production of these ships was accomplishe the month of April to October, conditions permi launches to be made by winch tow, and soar sufficient altitude to conduct the necessary tests to a rather high angle of attack of the wing, th takes off after a comparatively short run. In th ticular ship, this is not considered dangerous, as t is very gentle. Very little pressure is necessary controls, which results in ease of maneuvering.

As was noted previously, the stall is excee gentle, which is a contributing factor to the di encountered in getting the ship to spin. The satisfactory method found in which to enter th is to approach a stall very gradually until the stic full back position, at which time full right or left is applied, depending upon the direction desired f spin. As soon as the glider begins to nose down, op aileron is given, which finally stalls the inboard at which time the ship will begin to rotate. Upon pletion of the first half turn or more, the aileron returned to neutral or even applied in the directi the spin, which results in a slight increase in the of rotation. The average speed in the spin is ap mately 55 miles per hour.

Upon completion of three turns of the spin, hand feet are removed from the controls and recov accomplished within one-half turn. The air reaches approximately 80 miles per hour on the out" and the ship goes into a stalled position fro excessive speed.

In checking the longitudinal stability with the trimmed at about 50 miles per hour, the speed is s gradually to 35 miles per hour; at which time the is released. This results in a slight dive—usually miles per hour—and gradual dampening out unt original 50 miles per hour trim speed is reached.

Directional stability is dead-beat, in other words applying full rudder and releasing, the craft straig out and resumes a straight course without oscillati

(*Continued on page.* 12)