ual contours of the mountain range Like a straight barrier it continues right over Bishop and joins the waves far to the North. This is a rare condition and, due to a strong southerly wind component in the upper flow, not very favorable for downwind runs. There is a tremendous turbulence everywhere under the roll cloud reaching destructive force near the leading edge in the cloud puffs. Descent has to be made much farther upwind (West) of the roll cloud since the solid roll cloud deck lacks organized down-draft areas and prohibits descent in the wave downwind.

The most dangerous point in the Bishop area is near Coyote, Southwest of Bishop where there is a bend in the Sierra Range. Here, a few years ago, Bob Symons ran into a condition very similar to that encountered by Larry Edgar. This situation can be identified from the cloud picture. Great care must be taken to avoid towing into this zone since the glider speed in tow is too high to permit a gust of up to 100 knots. I am afraid that one day a glider will break apart right in wave tow if towpilots who are not as experienced in local conditions as Symons and Langenheim should fly the wrong pattern.

3) Larry Edgar, half dead on his parachute, provided us with more information for which we have been looking for a long time. The question was: "Is the counterflow (East wind) under the roll cloud just a shallow surface phenomena or is it a real 'rotor'?" Larry, after drifting East (while slipping his chute in an updraft) drifted back West in a deep layer of East wind about 4,000 ft. thick. He estimated this flow to be about 25mph in strength. The 'rotor' carries its name with justification.

4) The displacement of the tropopause over the mountain crest has been measured for the first time by the B-47 on April 1, 1955. The stratosphere was lifted about 5,000 ft. and stayed much higher all the way downward as compared to the windward side of the mountains. The change was a plateau-like step without indication of waves except an irregularity over the Inyo Mountains. The stratopheric wave system set up by such a tremendous displacement may be quite different from that in the troposphere. It will depend strongly upon the vertical wind profile. Further West the tropopause had descended over the ascending slope of the Sierras. A similar 'mirror image' behaviour of the tropopause can be detected over the coastal ranges and the White Mountains. This is a complete analogy to certain 'sub-critical' hydraulic flows.

5) It is obvious that the alternating packing and dilatation of the streamlines modify the vertical wind profile of the jet stream. This important part of the project is in the process of detailed evaluation and it will take some time before the influence of the mountains on the jet stream will be fully known. Strong changes in wind direction at high levels due to mountain effects were observed. The influence of the mountains reaches not only vertically very high but also far in horizontal directions. The displacements of the tropopause extended along the whole length of the 150-mile legs flown by the B-47 across the Sierras. Most properties of the jet stream will do the same.

6) The Sierra Wave Project had flown in largely the Independence area for reasons of tracking. This year we selected the area South of Big Pine near the Red Crater Mountain and the Tinemaha Reservoir about halfway between Independence and Bishop. In this section the distance between the Sierra and Inyo Mountains is a minimum and, with the prevailing SW flow, the updrafts are at a maximum. It is in this region that we reached an average of 40,000 ft. on many flights. Further South, near Manzanar, and especially near Lone Pine, height was generally limited to about 35,000 ft. with a slight improvement over Owens Lake. Return to the Big Pine area allowed a climb back to the tropopause.

Visual observations indicated that the wave tends to 'fit' into the valley and that variations in atmospheric conditions cause a discontinuous change of the wave numbers from 3 to 2 or from 2 to 1 between the Sierras and the Inyos. There is a possibility that the Inyo Mountains may be responsible not only for this discontinuous change but also for the intensity of the wave in the area. However there are some doubts (from a theoretical standpoint) that there can be such an 'upwind effect' on the first wave lift. The strength of the wave in the Big Pine area may have been a consequence of the unusually strong South component prevailing during this period. For any glider pilot venturing into the "Sierra Wave" it will be good to know that the maximum wave development is in the Big Pine area quite close to Bishop.

(Part 2 of this report will be continued in the next issue)

UNUSUAL GLIDERS

by PETER M. BOWERS

One of the most unusual gliders produced during World War II was the Cornelius XFG-1, the designation standing for Experimental Fuel Glider.

The configuration of the ship, a tailless with the wings swept forward instead of back, was unusual enough, but other features of the ship, which was built by the Cornelius Aircraft Corporation of Dayton, Ohio, were also out-of-the-ordinary. In addition to being swept forward, the wings were fitted with a variable-incidence device that made it possible to change the angle of incidence in order to trim the ship. The other oddity was the purpose for which the ship had been designed. As indicated by its basic designation, it was a flying gas tank.

In 1943, extending the range of existing bombers was a high-priority problem, and XFG-1 was one of the solutions that was tried. The glider, flying on automatic pilot, was to be towed behind the bomber. It could cary 677 gallons of fuel in its tank, which was transferred to the bomber through the combined fuel hose and towline. When all the fuel had been transfered to the bomber, the glider would be cut loose to crash into the sea or onto enemy territory as the case might be.

Only two XFG-1's were built. Span was 54 feet, just equal to that of a TG-3. Weight figures are not available, but assuming approximately the same empty weight as the TG-2 and 4062 pounds for the 667 gallons of gas, the gross weight must have been in the vicinity of 4800 pounds, about four times that of the trainer. The first XFG-1 spun in during test flights, and the Air Force used the second one for static displays after the war until it was trailered under a bridge that was a little too low for the high tail to get under.