

left. The aircraft may have become inverted. . . Very high negative G then built up to such an extent as to cause damage to the pilot's eyes. This G was of sufficient value to cause complete failure of the left wing such that the wing swings downward and under the fuselage. In swinging under the fuselage the wing root damages tubes #1 and 2.

"Immediately the left wing fails the heavy down load on the right wing becomes unbalanced and produces a very rapid rate of roll to the right which is resisted as far as the nose section of the aircraft is concerned, by inertia. The structure applying this rolling force to the nose section is much weakened by the damage to tubes #1 and 2. The only tube now resisting this twisting force is tube #3. As a rough estimate its ability to resist this torsion is about one-sixth of the strength available when tube #1 is intact. The rolling acceleration is too much for tube #3 which fails in tension. There is now no triangulation of the structure and the remaining tubes fail in bending and tension. The nose section drops free."

These and other interpretations agree on the point that a considerable build-up of air-speed occurred after entry into the cloud puff. Larry estimates entering the cloud with about 65 knots indicated. Unless the plane makes a high speed stall, an acceleration of 10 G requires a minimal air speed of 10 times the stalling speed which had been measured previously to be slightly below 40 knots in this ship. It must then be expected that the airspeed increases to over 120, probably 150 knots in a severe horizontal gust. The corre-

sponding true gust velocity would lie somewhere between 60 and 100 mph with a vertical component of the same order.

Do gust velocities of 100 to 150 ft/sec really occur? Have they been considered in aircraft design? An answer to the first question may be found in the following.

By a 'fortunate' coincidence the

leading edge of the lee cloud did not follow the bend in the Coyote area towards Mt. Tom, but continued in a straight line right over Bishop towards the north-northeast, leaving a wide gap of 15 miles clear space upwind towards Mt. Tom (see Fig. 5). As mentioned earlier, this condition together with the tremendous downwind extension of the roll cloud is the most critical for turbulence in the Coyote-Bishop area."

"I now realized that the winds were so strong that the rapid descent in the Laws area might not allow return to Bishop where the leading edge of the roll-cloud had to be passed. With the spoilers back in and 90 mph indicated I penetrated very slowly over the roll-cloud near its break at the northern side. Rate of descent was 800 ft/min. and 35,000 ft was passed at 13:50 and -58°C. . . . At 20,000 ft the top of the roll-cloud was approached and the City of Bishop became visible while the airport was obscured by the roll-cloud. . . . Now I attempted to descend right around the leading edge of the roll-cloud to return downwind under the cloudbase to the airport. To my surprise severest turbulence was suddenly encountered.

At 14,000 ft., above Bishop Center, directly at the leading edge of the massive roll cloud some violent vertical motions both up and down occurred. Then the airspeed started increasing rapidly in an area of small cloud puff development while I was striving to keep the speed down to 45 mph. In spite of an increasing "nose-up" position the airspeed reached 80 mph indicated by which time control

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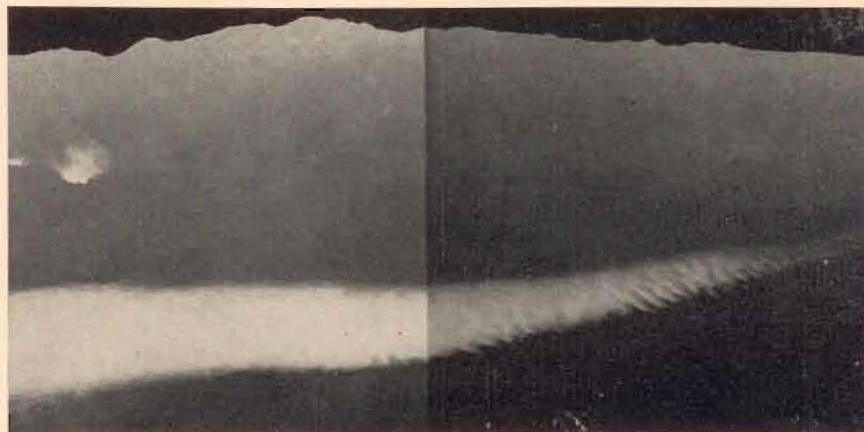
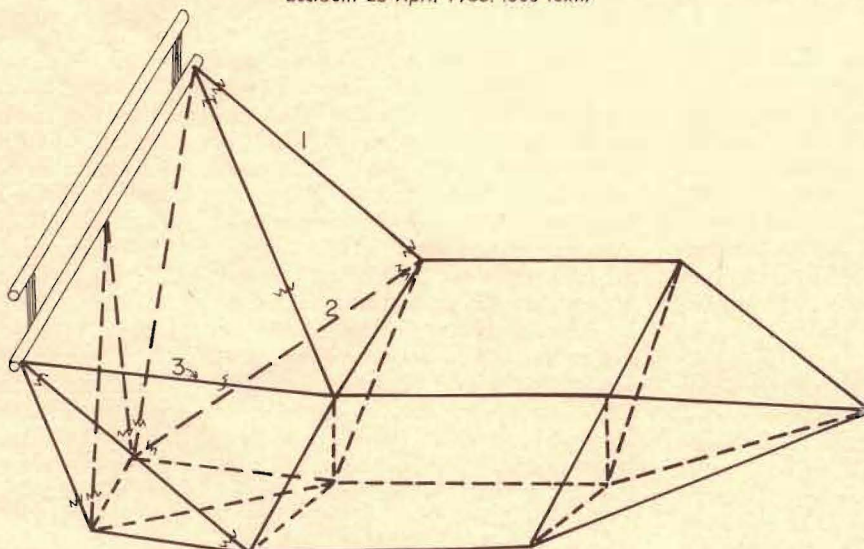


Fig. 3 — (Above) Cirrus band trailing from stationary lenticular cloud during intense jet stream, afternoon of 24 April 1955. Wind is parallel to cloud from right to left.

Fig. 4 — (Below) Nose section of Pratt-Read fuselage showing breaks of steel tubing in Edgar's accident 25 April 1955. (See text.)



2-25 had passed the specific area of turbulence 25 minutes before and 5 miles north of the accident location. Here is what I encountered descending from 40,000 ft on this unusual day, according to the flight report: "As the roll-cloud below me extended far to the east I flew northeastwards where a wide opening in the cloud layer appeared in the area of Laws, a few miles northeast of Bishop. In contrast to the morning conditions the