

AVIATION

Long-Distance Plane Flights Will Go to High Altitudes

New Type Planes With Superchargers and Variable Pitch Propellers Make Possible 69 Per Cent. Speed Increase

HIGH-ALTITUDE flying is the only apparent way of reaching the high cruising speeds demanded of present passenger aviation and at the same time obtain economical operation, says W. Bailey Oswald of the Douglas Aircraft Co. in *The Journal of the Aeronautical Sciences* (Jan.)

The future promises high-speed flying at altitudes up to 40,000 feet with costs equal to or less than those of present day low-altitude flights, predicts Mr. Oswald.

In his extensive report showing that high-altitude flights are sound both from the engineering and economy sides, Mr. Oswald indicates that by using the newest type planes with superchargers and variable pitch propellers it is possible to obtain a 69 per cent. increase in cruising speed with an increase of only 6 per cent. in operating costs. This high ratio of speed gain to operating cost increase is possible for planes cruising at 40,000 feet.

Superchargers For Passengers, Too

Superchargers, compressing the rarefied air of stratospheric heights to densities usable by motors and passengers alike, is the key to high-altitude flying, reports Mr. Oswald. The capacity of present superchargers need only be increased some 15 per cent. to make possible flights at 40,000 feet. Such equipment will serve adequately the engines and at the same time will give a sufficient supply of air to passengers and pilots. In fact, he indicated, once the problem of supercharging a motor at 40,000 feet is solved the problem of passenger oxygen supply will be solved also.

Even the heating of the air from its average temperature of 55 degrees below zero will be taken care of, for the compressing of the atmosphere automatically warms it up to temperatures as high as 300 degrees.

When airlines use a high-altitude, ten-hour flying schedule from New York City to Los Angeles, the cost per passenger may be as low as \$100. A

fare of \$125 to the passenger would make such a problem economically sound, he says.

Discussing high-altitude flying from the passenger's viewpoint, Mr. Oswald said, "In high-altitude flying some passengers might find the darkened sky and reduced visibility of the earth objectionable; but high-altitude flying must be regarded purely as a means of transportation. Sightseeing will have to be done at low altitude with all the attendant evils."

High flying makes for safer flying, Mr. Oswald reports, for from an altitude of 40,000 feet an airplane can glide 120 miles and take an hour to do it. It might even be possible, in many cases, for mechanics on the plane to make the necessary repairs during this hour of descent.

Flights at high altitudes are economically feasible for distances greater than

600 miles, the aviation authority reports. For shorter trips the plane would spend all its time gaining altitude and then descending. The result would only be about the same as a level flight at half the maximum altitude.

By a study of existing aviation equipment Mr. Oswald shows that the trend to increase speed at lower altitudes by increasing engine horsepower is a losing fight. High altitudes for flying with suitable equipment is the economical solution of the problem.

What will such high flying cost the airlines? Figured on a plane costing \$40,000 the cost of additional supercharged equipment to reach 20,000 feet cruising altitude is \$3,000. To reach 40,000 feet for cruising, equipment would cost \$6,000.

"Although this increase in cost may seem large, the final operating cost of the airplane will be affected but little since depreciation of flying equipment forms a relatively small portion of the total operating cost," reports Mr. Oswald.

For flights as long as 1,500 miles the necessary of carrying great fuel loads cuts the pay load. This might be overcome by refueling in the air.

"Refueling in the air certainly deserves serious consideration for high-altitude flights," Mr. Oswald concludes.

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GREAT ALTAR

Visitors to the exhibit of the Carnegie Institution are viewing one of the finest sculptures ever found in the Mayan area, an altar from Quirigua. This was an important ceremonial center of what is now Guatemala at about the time Rome was succumbing to the Goths.