

HEIGHT OF CIRRUS CLOUD TOPS IN TROPICS

by

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The recent Sabre ferry operations through Darwin brought to light some interesting observations on the height of tops of Cirrus cloud layers in the tropics, especially in the Intertropic Convergence Zone.

In the period 9-16 February, 1959, inclusive daily high level flights were being made by RAAF jet aircraft through the Intertropic Convergence Zone from Darwin to Biak. The zone at this period extended approximately from Lat. 3°S to Lat. 9°S and all indications were that the zone was of average to slightly above average intensity.

During this period several low level flights (5000-15500 ft) were made through the zone without any great difficulty, by both service and civil aircraft.

On 10 February 1959 Qantas Flight 241 at 15500 ft reported 'between layers' at Lat. 3°S and 'on top' at Lat. 7°S.

On 14 February 1959 Qantas Flight 235 at 15500 ft reported 'on top' at Lat. 3°S and at Lat. 6°S.

On 16 February 1959 Qantas Flight 241 reported 'on top' at Lat. 1°S, 'in and out of cloud' at Lat. 4°S, and 'between layers' at Lat. 10°S.

These reports indicate that while there was plenty of cloud associated with the zone, most low level flights were conducted out of cloud.

As the Sabres were to fly in visual contact with each other and with the escorting Canberra, it was necessary that the flight be conducted free of cloud. As the aircraft were to fly at 40000 ft it was thought that no difficulty would be experienced apart from occasional avoidable Cb tops which are known to reach 65000 ft in the tropics. This was not the case. On the five occasions on which the flight was attempted it was never possible to fly clear of cloud at 40000 ft. The lowest tops of the Cirrus layer reported was 43000 ft and the highest 54000 ft. On one occasion the escorting Canberra was in continuous cloud on the ascent out of Darwin from 1000 ft to

50000 ft with only two breaks between layers of a few thousand feet. A copy of a typical Airep received from an aircraft is as follows:

0148Z 17 February 1959

Airep-Reached 0700⁰S. 0120Z E.T.A. Darwin 0203Z
Ci clouds up to 54000 ft MS71 087 $\frac{1}{2}$ 32. Line of Cu
running E-W well defined. Beginning of I.T.F. at
0530⁰S. Stronger activity to E of track. Moderate
Cu developing to 18000 ft.
The belt of high Cirrus tops was usually about
300 miles wide.

During the November flight of the Sabres the Intertropic Zone was between Labuan and Butterworth, and a report was received that the tops of the Cirrus in the zone was 53000 ft.

Pilots estimated that in the Cirrus cloud the visibility was approximately 1000 yards and on all occasions when flying in the Cirrus cloud in the Convergence Zone they encountered slight to moderate continuous turbulence. Even when flying over relatively thin Cirrus with no other cloud below, the ground was not visible.

CONCLUSIONS

- (1) In the Tropics, especially in the Intertropic Convergence zone, layer cloud to above 50000 ft is not uncommon.
- (2) The operating or projected civil jet aircraft will not be able to "fly above the weather" either as regards cloud or turbulence in the tropics.
- (3) It is difficult to see where the moisture comes from to maintain continuous layer cloud up to 50000 ft.
- (4) Some revision of the generally accepted upper limits of layer cloud are necessary.