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Greenland ice cap aeromagnetic survey 1984: reconnaissance lines in southern Greenland

L. Thorning, M. Bower, C. D. Hardwick and P. J. Hood

No large-scale systematic operations over the Greenland ice cap were planned for 1984. However, in April 1984 the possibility arose of obtaining data along some reconnaissance lines in South Greenland, using the same aircraft and instrumentation as in 1983 (Thorning *et al.*, 1984). From bases at Keflavik in Iceland, and Søndre Strømfjord and Narssarssuaq in Greenland, four lines were flown in South Greenland, starting over the ice cap near Ivigtut and extending well offshore south-east of Kap Farvel (fig. 29). A long offshore tie-line was flown from the Denmark Strait around the south tip of Greenland and into the Davis Strait joining the tie-line flown there in 1983 (Thorning *et al.*, 1984). A planned flight line, starting well offshore south of Greenland and following the eastern rim of the ice cap north to the survey area of the 1983 operations (Thorning *et al.*, 1984) had to be abandoned because one engine of the Convair 580 developed a problem which effectively closed down further operations on this occasion.

The purpose of the reconnaissance lines was to evaluate the magnetic effect of major geological boundaries in South Greenland: the Ketilidian-Archaean boundary, the granite

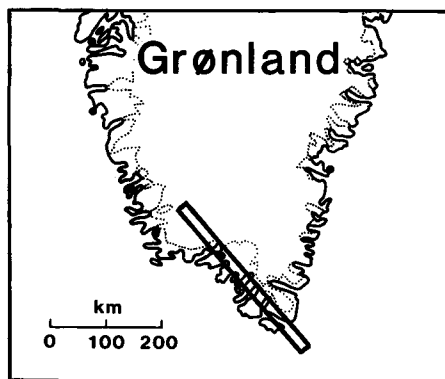


Fig. 29. Approximate position of four reconnaissance lines over South Greenland. Length of each profile c. 400 km. Distance between profiles c. 5 km. Altitude varies, but is 1000 ft. over the ice cap and offshore.

zone, and perhaps the Grenville front south of Greenland. The preliminary inspection of analogue inflight displays of the data shows many distinct anomalies as well as clear regional differences corresponding to major geological units. Thus there is no doubt that a systematic regional aeromagnetic survey over the southern part of the ice cap will make it possible to gain a fuller understanding of the geology of South Greenland. The data acquired in 1984 will be incorporated into plans for such a systematic survey which we hope will be carried out at a later date.

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Preparations for the South-East Greenland mapping project 1986–1987

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A major project in South-East Greenland is planned for 1986 and 1987 with the aim of mapping the area covered by the 1:500 000 sheet 14 (Skjoldungen) and studying the only sporadically investigated Precambrian areas between 66°45'N and 62°30'N (fig. 30). Logistic and geological reconnaissance work has been conducted in the area since 1981 (Escher & Nielsen, 1982, 1983). During August 1984 the two authors spent three days on an airborne photo-reconnaissance over most of the area. The objectives were:

1. To test a possible Twin Otter landing strip in Kagssortôq (63°15'N) in the Skjoldungen district and to observe other airstrip possibilities in the area.
2. To cover major aspects of the geology of the area with oblique photographs (more than 600 colour slides, 45 × 60 mm, are now available).
3. To gain more knowledge of the general structure of the Archaean block.

Logistics for the 1986–1987 field work

The logistic information has been assembled in an unpublished report 'SØ-Grønland 1984' (Escher & Nielsen, 1984b) which includes information on airstrips, camp sites and sketches