

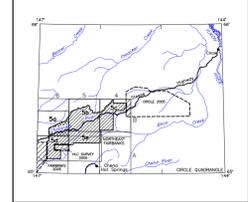
Base from U.S. Geological Survey Circle B-6, 1970, Fairbanks, Alaska.



## TOTAL MAGNETIC FIELD AND DETAILED ELECTROMAGNETIC ANOMALIES OF THE NORTHEAST FAIRBANKS AREA, FAIRBANKS AND CIRCLE MINING DISTRICTS, INTERIOR ALASKA

**PART OF CIRCLE B-6 QUADRANGLE**  
by  
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LOCATION INDEX FOR SCALE 1:31,680



**DESCRIPTIVE NOTES**

The geophysical data were acquired with a DIGHEM Electromagnetic (EM) system and a Scintrex cesium magnetometer. The EM and magnetic sensors were flown at a height of 100 feet. In addition to the survey recorded data from a radar altimeter, GPS navigation system, 50/60 Hz monitors and video camera. Flights were performed with an AS350B-2 Squirrel helicopter at a mean terrain clearance of 200 feet along N-S (C) survey flight lines with a spacing of a quarter of a mile. Tie lines were flown perpendicular to the flight lines at intervals of approximately 3 miles.

An Ashtech G24 NAVSTAR / GLONASS Global Positioning System was used for navigation. The helicopter position was derived every 0.5 seconds using post-flight differential positioning to a relative accuracy of better than 5 m. Flight path positions were projected onto the Clarke 1866 (UTM zone 8) spheroid, 1927 North American datum using a central meridian (CM) of 147° 0' north constant of 0 and an east constant of 500,000. Positional accuracy of the presented data is better than 10 m, with respect to the UTM grid.

**ELECTROMAGNETIC ANOMALIES**

●	Anomaly	○	Conductance
○	Area indicate the conductor type or thickness >10m	○	>100 siemens
○	Magnetic correction in nT	○	50-100 siemens
○	Dip direction	○	20-50 siemens
○		○	10-20 siemens
○		○	5-10 siemens
○		○	1-5 siemens
○		○	< 1 siemens
○		○	Questionable anomaly
○		○	EM magnetic response

○	Interpretive symbol	○	Conductor ("mode")
○		○	Bedrock conductor
○		○	Narrow bedrock conductor ("thin wire")
○		○	Conductive cover ("horizontal thin sheet")
○		○	Broad conductive rock unit, deep conductive weathering, thick conductive cover
○		○	Tell stack
○		○	Edge of broad conductor ("edge of roll space")
○		○	Culture, e.g., power line, metal building or fence

○	Depth is greater than	○	Interpretive symbol
○	15 m	○	
○	30 m	○	
○	45 m	○	
○	60 m	○	

**ELECTROMAGNETICS**

To determine the location of EM anomalies or their boundaries, the DIGHEM EM system measured inphase and quadrature components at five frequencies. Two vertical coaxial-coil pairs operated at 1000 and 5500 Hz while three horizontal coplanar-coil pairs operated at 300, 7500, and 56,000 Hz. EM data were sampled at 0.1 second intervals. The EM system responds to bedrock conductors, conductive overburden, and cultural sources. The type of conductor is indicated on the electromagnetic map by the interpretive symbol attached to each EM anomaly. Determination of the type of conductor is based on EM anomaly shapes of the coaxial and coplanar-coil responses, together with conductor and magnetic patterns and topography. The power line monitor and the flight track video were examined to locate cultural sources.

**TOTAL MAGNETIC FIELD**

The magnetic total field contours were produced using digitally recorded data from a Scintrex cesium CS2 magnetometer, with a sampling interval of 0.1 seconds. The magnetic data were (1) corrected for diurnal variations by subtraction of the digitally recorded base station magnetic data, (2) adjusted for regional variations (or IGRF gradient, 2005, updated to October 2005) using altimeter adjusted IGRF, (3) leveled to the tie line data, and 4) interpolated onto a regular 30 m grid using a modified Akima (1970) technique.

Akima, H., 1970, A new method of interpolation and smooth curve fitting based on local procedures, Journal of the Association of Computing Machinery, v. 17, no. 4, p. 589-602.

**SURVEY HISTORY**

This map has been compiled and drawn under contract between the State of Alaska, Department of Natural Resources, Division of Geological & Geophysical Surveys (DGGS), and Stevens Exploration Management Corp. Airborne geophysical data for the new area were acquired and processed by Fugro Airborne Surveys Corp. in 2005.

This map and other products from this survey are available by mail order in person from DGGS, 3354 College Road, Fairbanks, Alaska, 99709-3707. Published maps are also available for viewing or downloading as Adobe Acrobat Files (\*.pdf) on our Web site (<http://www.dggs.dnr.state.ak.us/pubs/>).