

DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

Explanation

The aeromagnetic data set used to produce the attached aeromagnetic map consists of six discrete aeromagnetic surveys. Four of these surveys were digitally recorded. The remaining two surveys were converted into digital form by digitizing the original contour maps along flight lines. All surveys were flown draped with a nominal ground clearance of 300 feet (152.4 meters). Because of rugged topography encountered in the northwestern part of the quadrangle, deviations from the nominal 300 foot terrain clearance occur locally, particularly at steep mountain fronts. No corrections were made for these deviations.

For the purpose of generating a machine-drawn contour map, the aeromagnetic measurements were interpolated into a regularly spaced grid by minimum curvature routines in program MING (Wehring, 1981) using an equal orthogonal grid interval of 0.5 km.

In order to reduce magnetic field data to that component resulting from magnetic sources in the crust of the earth, the long wavelength regional component, whose sources lie primarily in the earth's core, was removed by subtracting a regional field, the International Geomagnetic Reference Field (IGRF).

For all data sets except C and D, the definitive IGRF was calculated at each grid intersection for the date of the surveys and the altitude above sea level using program IGRFGRID (unpublished program, 1986, R. Sweeney, USGS, Denver, CO) and then removed from the gridded magnetic data. The flight altitude above sea level was approximated for each grid intersection by production of a grid of terrain altitudes from digitized terrain data with the addition of the nominal survey terrain clearance. It is estimated that altitude errors in the digitized terrain data set do not exceed 3500 feet (+152.4 meters) which translates to an IGRF error of less than 25 nanoteslas (nT).

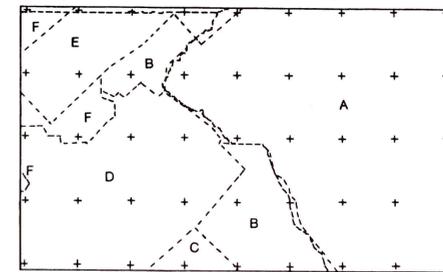
Because data set D was acquired in 1959, it was necessary to remove the 1965 IGRF since no definitive IGRF exists for dates prior to 1965. Data set C was digitized from a residual magnetic intensity contour map which had the 1965 IGRF (updated to 1973) removed by the contractor. No attempt was made to recreate the total field data by adding back the regional field removed.

Data set A, with the largest areal extent, was chosen to be the arbitrary datum to which all other surveys were adjusted and merged (unpublished programs, 1985, J. Phillips, USGS, Reston, VA). After removal of the IGRF, differences remaining between digitally recorded data sets may be attributed to calibration and data reduction differences between surveys. An alternative source of part of these differences may also be imperfections in calculation of the IGRF over the time span between acquisition of data sets. Overlapping grid intersections between adjacent data sets, beginning with A and B, were compared and the average difference removed from B. The two grids were then merged into one master grid. This process was repeated, using data sets E, D, C, and F successively, in that order, until all were adjusted and merged into the master grid. After merging all data, the original grid interval of 0.5 km was reduced to 0.25 km using cubic splines with program RESGRID (unpublished program, M. Wehring, USGS, Denver, CO) to produce smoother contours.

References

Wehring, Michael, MING: A gridding program based on minimum curvature: U.S. Geological Survey Open-File Report 81-1224, 12p.

INDEX OF SOURCES



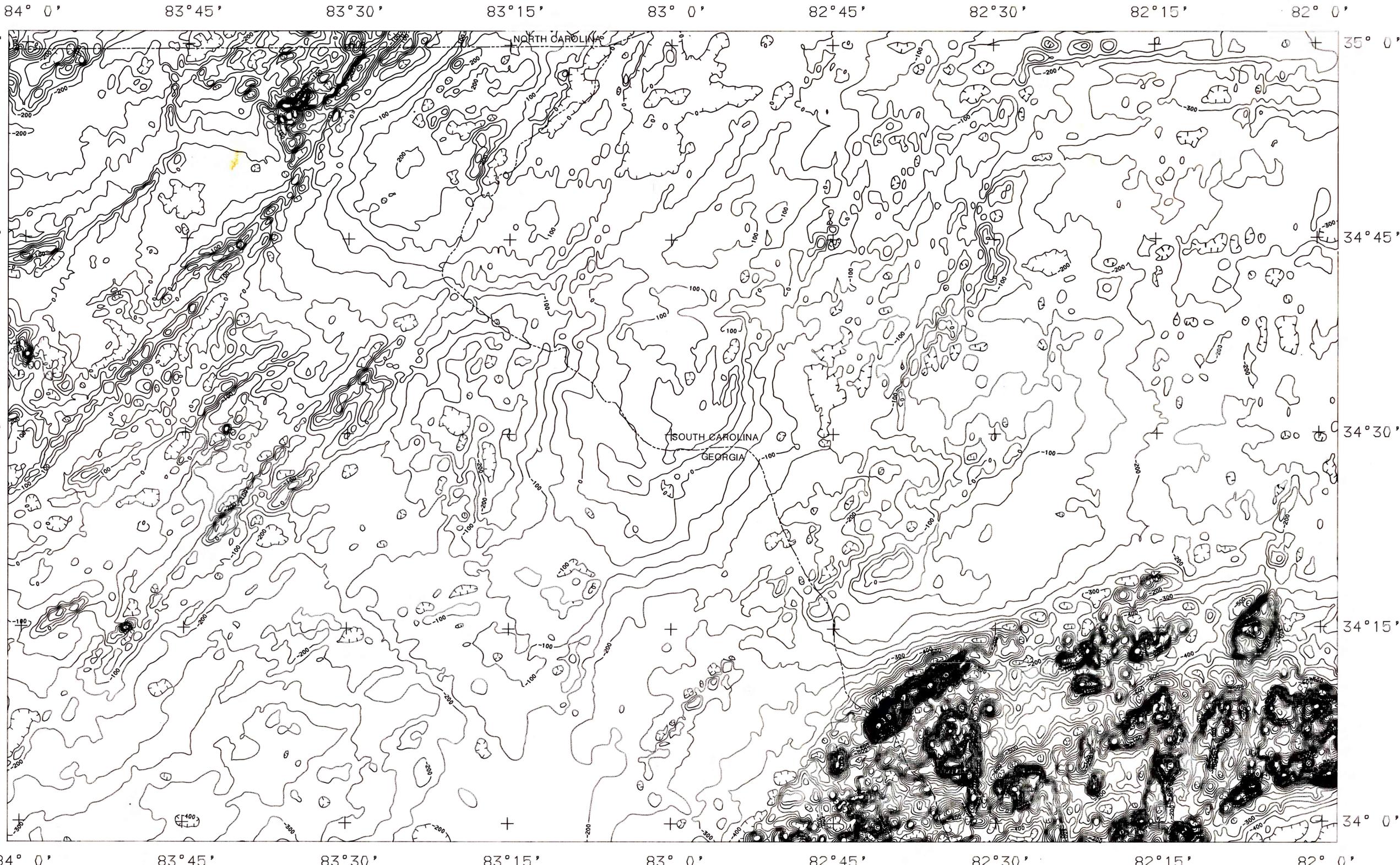
| data code | recorded digitally? | flight direction | flight spacing | source |
|-----------|---------------------|------------------|----------------|--|
| A | yes | E-W | 1 mile | Aeromagnetic map of northwestern South Carolina, USGS Open-File Map 78-847 |
| B | yes | NU-SE | 1 mile | Aeromagnetic map of part of northern Georgia, USGS Open-File Map 77-190 |
| C | no | NU-SE | 1 mile | Composite aeromagnetic map -- north-central Georgia, USGS Open-File Map 73-324 |
| D | no | NU-SE | 2 mile | Aeromagnetic map of the Georgia Nuclear Laboratory area, USGS Geophysical Investigations Map GP-488 |
| E | yes | NU-SE | .5 mile | Aeromagnetic map of the Blood Mountain - Chattahoochee area, Georgia and North Carolina, USGS Open-File Map 81-933 |
| F | yes | E-W | 1 mile | Aeromagnetic map of part of the Chattahoochee National Forest, Georgia, USGS Open-File Map 79-1371 |



scale 1:250,000

Universal Transverse Mercator Projection

CENTRAL MERIDIAN 83°



COMPOSITE MAGNETIC ANOMALY MAP OF THE GREENVILLE 1° x 2° QUADRANGLE,
GEORGIA AND SOUTH CAROLINA
BY KEVIN R. BOND

THIS MAP IS PRELIMINARY AND HAS NOT BEEN REVIEWED FOR CONFORMITY WITH USGS EDITORIAL STANDARDS