

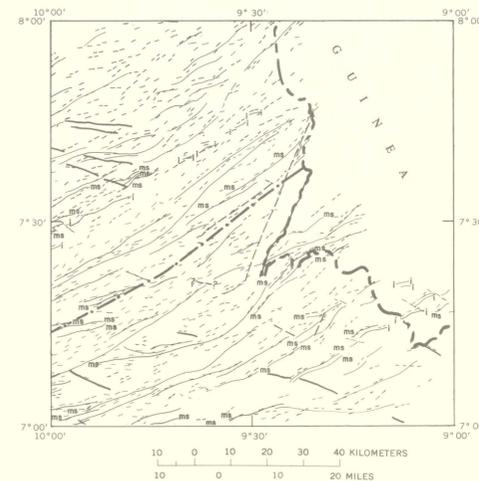
EXPLANATION



MAGNETIC CONTOURS - Showing total intensity magnetic field of the earth in gammas relative to arbitrary datum. Regional magnetic gradient not removed. Hachured to indicate closed areas of lower magnetic intensity. Contour intervals are 10, 50, 250, and 1,000 gammas. Selected contour values shown in larger type

FLIGHT PATH

Aeromagnetic survey flown by Lockheed, Kessler, and Bartlett, Inc. at 150 meters above terrain, 1967-68. Flight-line spacing of 0.8 kilometers over land. Geophysical data reduced from original compilation at 1:40,000-scale by Lockheed, Kessler, and Bartlett, Inc., with minor modifications to improve legibility.



INDEX MAP OF LIBERIA - Showing location of quadrangle and miscellaneous geologic investigations maps published by the U.S. Geological Survey. Area of I-773 shaded.

EXPLANATION

TREND DIRECTION OF SHORT-WAVELENGTH MAGNETIC ANOMALIES - Assumed to be associated with near-surface geology and interpreted as indicative of rock foliation directions

LOCATION OF LONG LINEAR MAGNETIC ANOMALIES - Interpreted as being caused by diabase dikes, p, dike inferred from positive anomaly

SIGNIFICANT CHANGE IN MAGNETIC AND (OR) RADIOMETRIC CONTOURS - Inferred to be a geologic boundary of unspecified origin or type. Queried where uncertain

POSSIBLE FAULT - Suggested by linear change in magnetic or radiometric contour

LINEAR MAGNETIC ANOMALIES - Caused by magnetization contrasts interpreted as geologic structures that may include folds, faults, and contacts

MAGNETICALLY DETERMINED LINEAR STRUCTURE - Inferred to be locally associated with magnetic metasedimentary rocks including schist, quartzite, amphibolites, iron-formation, paragneiss, and migmatite. May include folds, faults, and contacts

MAGNETICALLY DETERMINED LINEAR STRUCTURE - With anomaly greater than 1,000 gammas interpreted as being caused by magnetite iron-formation. May include folds, faults, and contacts

FIGURE 1 - Tectonic map, Zorzor quadrangle. Construction is based primarily on magnetic data.

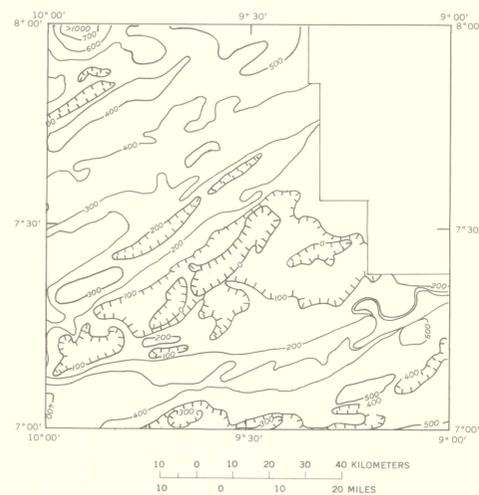


FIGURE 2 - Residual total magnetic intensity map. Compiled by removing the main earth from the map and smoothing to generalized short wavelength anomalies. G. Andrasen and P. Zabel assisted in computer processing. Contour interval 100 gammas, except for areas of extreme anomaly.

Coordinates based on Hotines rectified skew orthomorphic projection, U.S. Coast and Geodetic Survey, 1956

SCALE 1:250,000

1970 MAGNETIC DECLINATION VARIES FROM 12°40' WESTERLY FOR THE CENTER OF THE WEST EDGE TO 12°10' WESTERLY FOR THE CENTER OF THE EAST EDGE. MEAN ANNUAL CHANGE IS 0'06" EASTERLY

NOTE: Country boundaries indefinite

INTERPRETATION
By John C. Behrendt, U.S. Geological Survey, and
Cletus S. Woterson, Liberian Geological Survey

INTRODUCTION

Aeromagnetic and total-count gamma radiation surveys were flown simultaneously over Liberia during the 1967-68 dry season. These geophysical surveys were designed to contribute to the geologic mapping program undertaken cooperatively by the Liberian Geological Survey and the U.S. Geological Survey under the auspices of the Liberian Government and the Agency for International Development, U.S. Department of State. The surveys were flown by Lockheed, Kessler, and Bartlett under contract to the Liberian Geological Survey. The geology of the Zorzor quadrangle has been mapped by Seitz (in press) as part of the cooperative program.

The entire country of Liberia is heavily forested, access is difficult, outcrops are sparse, and thick laterite is widespread. Accordingly, throughout large areas aeromagnetic and aeroradiometric surveys are the only feasible means of gathering virtually continuous data which can be related to near-surface geology, and they are useful in extrapolating geologic observations and in locating potential targets for mineral exploration.

The airborne surveys, which cover the entire country, required approximately 140,000 km of traverse, mostly along north-south lines 0.8 km apart over land and 4 km apart over the continental shelf. Continuous photography and Doppler navigation provided horizontal control; flight altitude was 150 m above mean terrain. Temporal variations in the magnetic field measured with a fluxgate magnetometer were removed by adjustment at crossings of east-west control lines. Varied contour intervals of 10, 50, 250, and 1,000 gammas were used, depending on horizontal gradient.

GEOLOGY

The geophysical data obtained from these airborne surveys are presented, by quadrangle, in these folios of 1:250,000-scale maps that show on separate sheets geographic, geologic, aeromagnetic, and total-count gamma radiation data for each of 10 quadrangles. The index map shows the locations of these quadrangles and their folio number designations. The total-count gamma radiation map of the Zorzor quadrangle (Behrendt and Woterson, 1974, a) should be used in conjunction with this aeromagnetic map.

AEROMAGNETIC INTERPRETATION

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The interpretation is based primarily on aeromagnetic data, but partly on aeroradiometric data and readily available geologic information (White and Leo, 1969; Liberian Geol. Survey, unpub. data). Figure 2 shows part of the residual total magnetic intensity map of Liberia obtained by digitizing the data from the map area on a 1-minute grid, tying to an absolute survey (Lowrie and Eacowitz, 1969) by a constant of +25,980±35 gammas, and removing Cain's "Field G" (Cain and others, 1965).

Bedrock in the Zorzor quadrangle has been mapped as predominantly granitic gneiss, which has the northeast-trending foliation typical of the Liberian age province (about 2,700 m.y.) (White and Leo, 1969; Hurley and others, 1971). Also mapped are areas of metasedimentary rocks, iron-formation (titanite), amphibolite, and diabase dikes.

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AEROMAGNETIC MAP OF THE ZORZOR QUADRANGLE, LIBERIA

By
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