U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

OPEN FILE REPORT
93-520

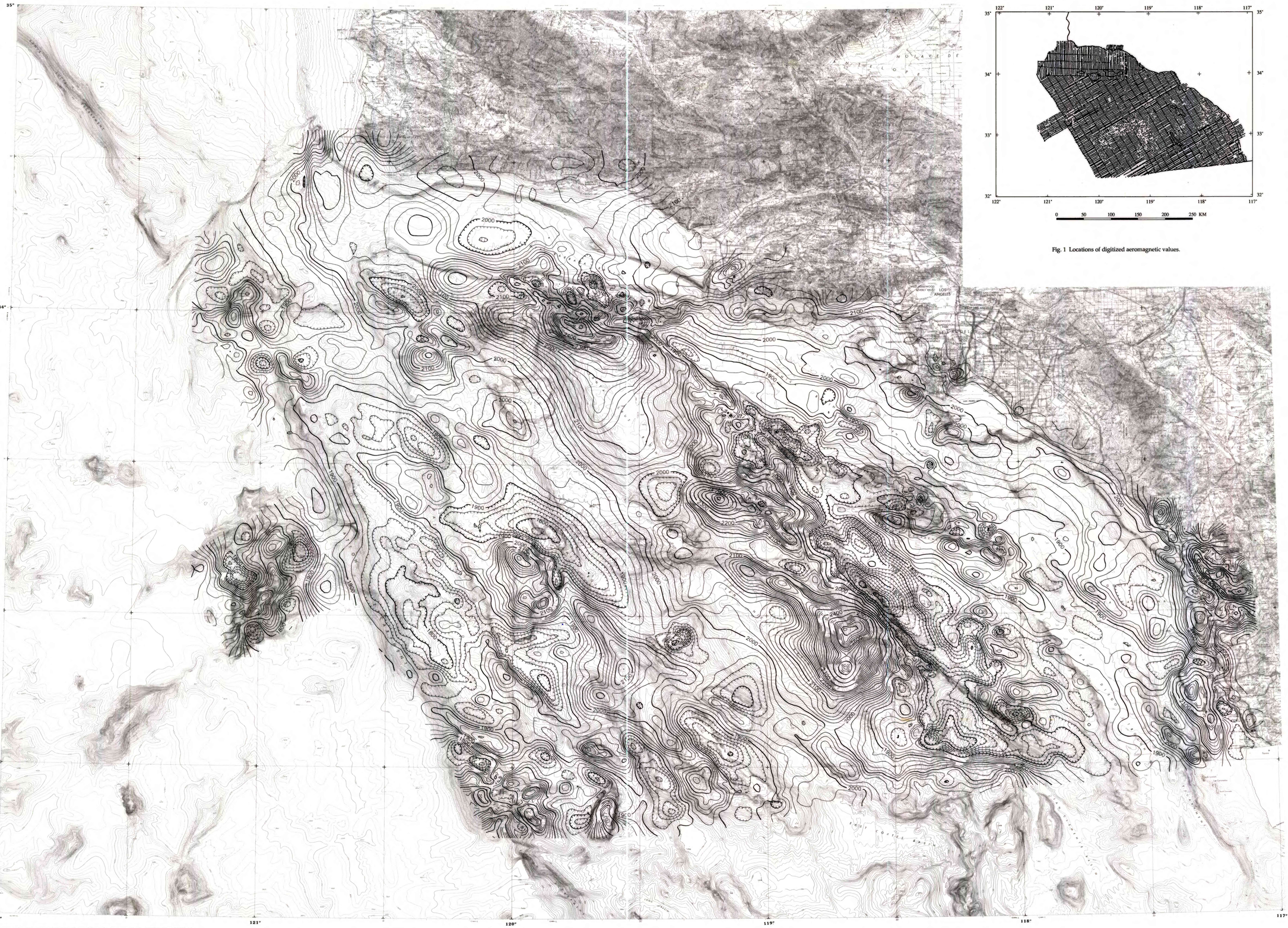






Fig. 1 Locations of digitized aeromagnetic values.

## DATA SOURCES AND ACCURACIES

The magnetic values contoured on this map were obtained by digitizing values from a paper copy of an aeromagnetic map provided by Shell Oil Company. Mylar enlargements of the paper map were made in order to facilitate digitization of often tiny, faint numbers. Particular care was exercised in areas where the values could not be read and flightline-contour intersections were used.

The aeromagnetic survey was flown in 1961 along predominantly northeast-southwest lines, except for the area north of lat 34° N., which was flown along north-south flightlines (fig. 1). The average flightline spacing is about 1.6 km (1 mile); the spacing between digitized values is about 1 km along the flightline, except in areas where the values were illegible and thus could not be determined. Values in these areas were based on flightline-contour intersections. Tieline spacing is about 12-15 km. A total of 24,158 values were digitized and were transformed to a Universal Transverse Mercator projection (central meridian of long 120° W and base latitude of 34° N) and gridded at a 1 km interval using the principle of minimum curvature (Briggs, 1974).

The flight elevation of the survey is unknown, but is estimated to be about 760 m (2500 ft) based on the comparison of magnetic gradients from the onshore profiles of this survey with those of the San Diego aeromagnetic survey (U.S. Geological Survey, 1990). The uncertainty in known flight elevation is probably no more than 150 m (500 ft). It is not known whether diurnal corrections have been applied to the data, although apparently a regional correction has been applied to the data, based on comparison with onshore magnetic surveys corrected for International Geomagnetic Reference Field. Positioning control of the flightlines is unknown, but was probably based on a combination of Loran and Doppler navigation systems. The positioning uncertainty probably ranges from about 100 m in areas between land masses to 1 to 2 km offshore where the flightline terminates over water. A comparison of the Pisciotto and others (1974) map with this map indicate that the positions of the anomalies are nearly identical, even in the farthest offshore regions, at the scale of this map.

Even with the uncertainties in the specifications of the survey used in this map, the resulting contour map shows more detail than does the map of Pisciotto and others (1974) in areas where the shiptrack data are widely spaced. Thus, this map supercedes the marine magnetic data used in creating the map of Pisciotto and others (1974), except for areas surrounding the Channel Islands and near the Palos Verdes peninsula, where the density of shiptrack data is comparable to the flightline density of this aeromagnetic survey.

## ACKNOWLEDGMENTS

We greatly appreciate the cooperation and help of Shell Oil Company, who graciously gave us permission to use this survey. We also appreciate the efforts of Anita Peace of Shell Oil Company to locate the map.

## REFERENCES

Briggs, I.C., 1974, Machine contouring using minimum curvature: Geophysics, v. 39, p. 39-48.

Pisciotto, K.A., Sasnett, N.B., and Beyer, L.A., 1974, Residual magnetic map of the California continental borderland in Preliminary report on the geology of the continental borderland of southern California: U.S. Geological Miscellaneous Field Investigations Map MF-624, sheet 8 of 9, scale 1:500,000.

U.S. Geological Survey, 1990, Aeromagnetic map of parts of the San Diego, Santa Ana, and adjacent 1°x2° quadrangles, California: U.S. Geological Survey Open-File Report 90-206, scale 1:250,000.

Composite Base from U.S. Coast and Geodetic Survey Charts 1206N-15, 1206N-16, 1306N-19, and 1306N-20 (offshore area), and U.S. Geological Survey Topographic Series (1:250,000) San Diego 1958, Santa Ana 1959, Long Beach 1957, Los Angeles 1959, Santa Maria 1962, and San Bernardino 1958 (onshore area).

BATHYMETRIC CONTOUR INTERVAL
10 METERS, 0-200 METER DEPTH
50 METERS, > 200 METER DEPTH

ONSHORE CONTOUR INTERVAL 200 FEET

Scale 1:500,000
1 inch equals approximately 8 miles
10 0 10 20 30 40 Miles
10 0 10 20 30 40 50 Kilometers


APPROXIMATE MEAN DECLINATION, 1993

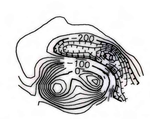
# AEROMAGNETIC MAP OF THE SOUTHERN CALIFORNIA BORDERLAND EAST OF THE PATTON ESCARPMENT

By

V.E. Langenheim, P.F. Halvorson, E.L. Castellanos, and R.C. Jachens

1993

INDEX MAP




Contours of total magnetic field intensity relative to an arbitrary datum see accompanying text). Contour interval 20 nanoteslas. Hachures indicate closed lows.