UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Aeromagnetic gridded data for a portion of the San Jose 1^{o} x 2^{o} Quadrangle, California

by

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INTRODUCTION

The grid was created from aeromagnetic data acquired by the U.S. Geological Survey as part of the National Geologic Mapping Program. Included in this report are a diskette containing the digital aeromagnetic data grid and a 35 mm color slide of an aeromagnetic map generated from the grid. The aeromagnetic survey addresses questions such as the geophysical mapping of faults, which are critical to the developement of a reliable geologic map. The survey area includes parts of the Santa Cruz Mountains, the Santa Clara Valley, the Diablo Range, and the San Joachin Valley (figure 2). The large magnetic anomalies are caused by magnetic rocks such as serpentinite, greenstones and mafic and ultra mafic rocks of the Franciscan formation.

DATA COLLECTION AND REDUCTION

The survey was flown by Charles Mitchell, Donald Rohret, Roy Kipfinger, Charles Thompson and Richard Sneddon during November, 1989, February, March, and April, 1990. The airplane flew an average speed of ninety nautical miles per hour, with a quarter-mile line spacing (approximately 400 meters) in a ENE-WSW direction. An attempt was made to drape the survey at a nominal elevation of five hundred feet above ground, however, over populated areas the airplane flew higher and over mountainous areas the airplane flew at various elevations above ground. A geoMetrics model G-813 proton precession magnetometer located on the right wingtip, with a sensitivity of .5 nanoTeslas and a cycle time of .5 seconds, recorded the earth's total magnetic field. The flight path was recovered using the LORAN navigation system. The raw flight-line data were reduced using unpublished computer programs (Robert Bracken, U.S. Geological Survey). The International Geomagnetic Reference

Field (1985), main field and secular change coefficients were removed from the grid using a program written by Sweeney (1990). The data was projected on a Universal Transverse Mercator projection (Central Meridian=123°W. Base latitude=0°) and gridded at a .15-km spacing, using a computer program written by Webring (1981) based on a minimum curvature algorithm (Briggs, 1974).

ENCLOSURES

35 mm SLIDE:

Color-Shaded-Relief Map made using an unpublished computer program (M. Webring, U.S. Geological Survey)

DISKETTE:

The 3-1/2 in, high density (1.44 M bytes) diskette in IBM-AT/DOS format contains 6 data files:

SJPOLYM	GRD	Binary data of San Jose survey
SANJOSE	DOC	Open-File title page
ASCII2SF	FOR	
ASCII2SF	EXE	80 column ASCII to standard binary grid
SF2ASCII	FOR	
SF2ASCII	EXE	Standard grid to 80 column ASCIII

GRIDHEADER:

id=AERO-MAG SAN JOSE CM= -123, BL=00, UTM, .15 km

columns=677 rows=454

xo,yo = 79.2 4090.3 dx&dy= .15 .15

The gridded data file (SJPOLYM.GRD) contains dummy values, or dvals to indicate areas within the grid that do not contain valid data and have a value of 0.10000000E +31.

Explanation of GRIDHEADER:

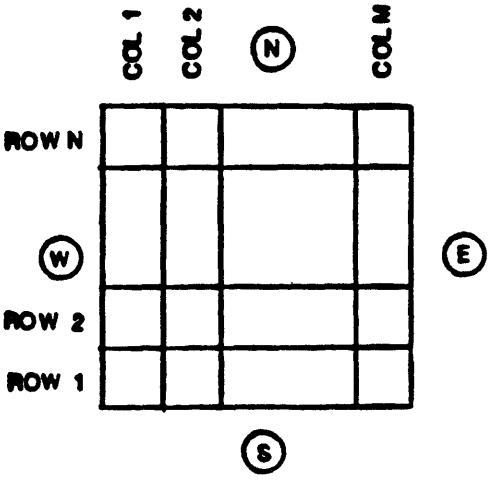

Figure 1 - Columns and rows of USGS grids

1st line

id = identification, name of project

CM = central meridian

BL = base latitude

UTM = projection of grid

.15 km = grid interval

2nd line

columns = number of columns in grid

rows = number of rows in grid

3rd line

xo = position of first column in km with respect to the central meridian

vo = position of first row in km with respect to the base latitude

dx & dy = equal spacing interval of columns and rows

REFERENCES CITED

Briggs, I.C., 1974, Machine contouring using minimum curvature: Geophysics, v. 39, no. 1, p. 39-48.

Sweeney, R.E., 1990, IGRFGRID--A program for creation of a total magnetic field (International Geomagnetic Reference Field) grid representing the earth's main magnetic field: U.S. Geological Survey Open-File Report 90-45A-B, 39 p.

Webring, M.W., 1981, MINC--A gridding program based on minimum curvature: U.S. Geological Survey Open-File Report 81-1224, 41 p.

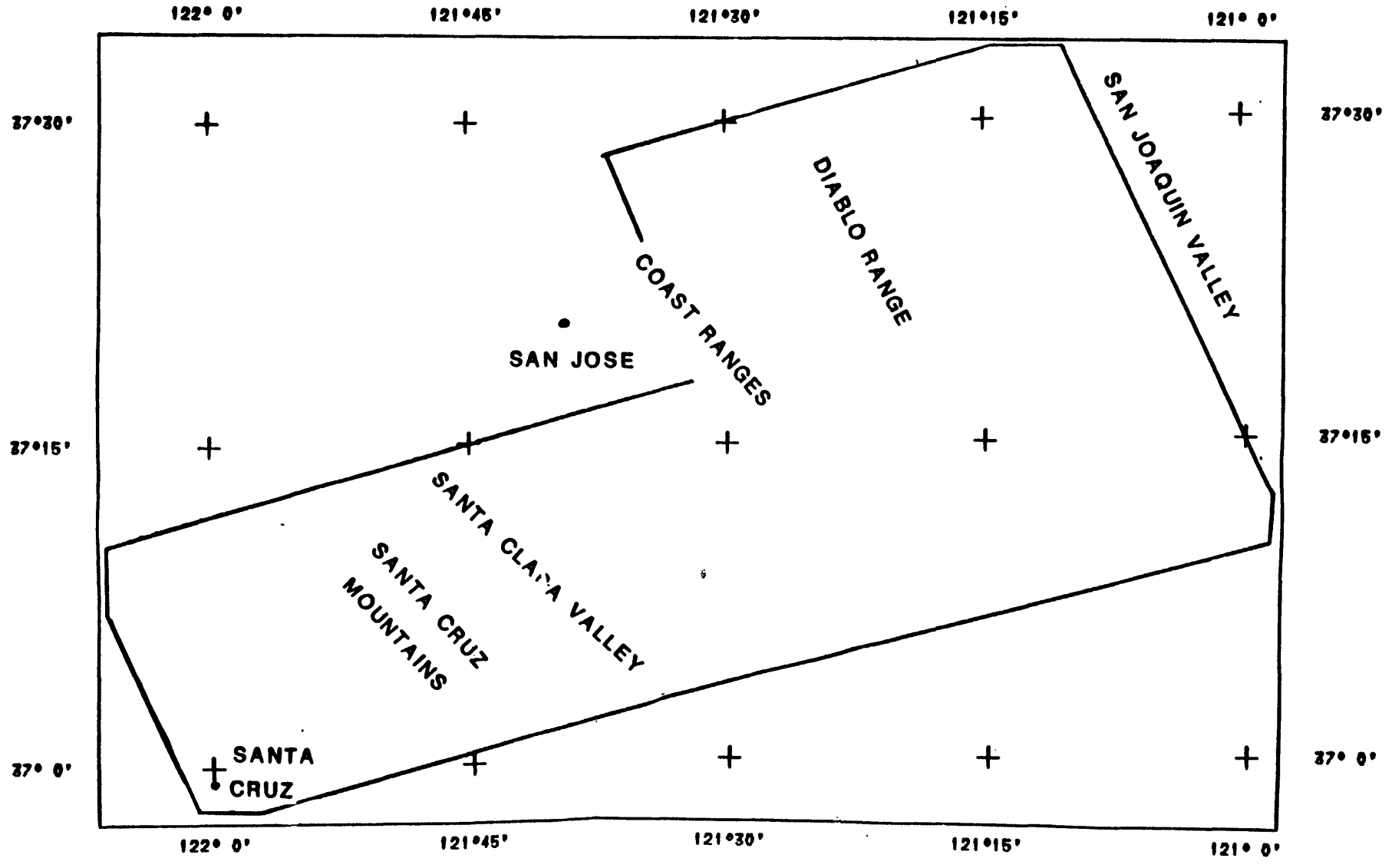

Figure 2. SAN JOSE Aeromagnetic Sur Area.