

## N O T I C E

THIS DOCUMENT HAS BEEN REPRODUCED FROM  
MICROFICHE. ALTHOUGH IT IS RECOGNIZED THAT  
CERTAIN PORTIONS ARE ILLEGIBLE, IT IS BEING RELEASED  
IN THE INTEREST OF MAKING AVAILABLE AS MUCH  
INFORMATION AS POSSIBLE



Department of  
Geological Sciences

915/747-5501  
EL PASO, TEXAS 79968

Quarterly Report  
Contract NAS 5-26326

"Made available under NASA sponsorship  
in the interest of the wide dis-  
semination of Earth Resources Survey  
Program information without liability  
for any use made thereof."

Reporting Period - 3/1/81 to 6/30/81

Submitted to  
National Aeronautics and Space Administration  
Goddard Space Flight Center  
Greenbelt, MD. 20771

Principal Investigators  
G. R. Keller  
E. G. Lidiak

Work during this reporting period has proceeded on several fronts. The geologic studies have concentrated on the characterization of the structural/tectonic blocks shown in figure 1. Blocks 21, 22, 24, and 25 have been stressed so far. Block 21 (the Guayana shield) is reasonably well studied, and although the data are sparse, Block 22 (the central Brazillian shield) is similar to Block 21. Blocks 24 and 25 (the Amazon and Parnaiba basins) seem to be related to an aulacogen structure.

The geophysical studies have concentrated on the collection of crustal structure information and the generation of new measurements of surface wave dispersion in the shield areas. Long-period seismograms have been obtained from the international data center and work to digitize and analyze these data has begun. An index of existing crustal (and upper mantle) studies has also been prepared.

RECEIVED

JUL 14, 1981

SIS/902.6

M-011

TYPE II

ORIGINAL PAGE IS  
OF POOR QUALITY

ORIGINAL PAGE IS  
OF POOR QUALITY

Quarterly Report (con't)  
Page 2

A coordination meeting was held at Purdue University on June 28 - July 1 whose goals were to make final preparations for the IAGA meeting in Edinboro and plan our next stage of work. A copy of the abstract of the paper to be presented is attached.

ORIGINAL PAGE IS  
OF POOR QUALITY



PRELIMINARY GEOLOGIC/TECTONIC MAP OF SOUTH AMERICA

Figure 2

ORIGINAL PAGE IS  
OF POOR QUALITY

SATELLITE ELEVATION MAGNETIC AND GRAVITY MODELS OF MAJOR SOUTH  
AMERICAN PLATE TECTONIC FEATURES

- M.B. Longacre, W.J. Hinze, R.R.B. von Freese and L.W. Braille, (Dept.  
of Geosciences, Purdue University, West Lafayette, IN 47907,  
U.S.A.)  
E.G. Lidiak (Dept. of Earth & Planetary Sciences, University of  
Pittsburgh, Pittsburgh, PA 15260, U.S.A.)  
G.R. Keller (Dept. of Geological Sciences, University of Texas at  
El Paso, El Paso, TX 79968, U.S.A.)

Magsat scalar and vector magnetic anomaly data together with regional gravity anomaly data are being used to investigate the regional tectonic features of the South American Plate. An initial step in this analysis is three-dimensional modeling of magnetic and gravity anomalies of major structures such as the Andean subduction zone and the Amazon River Aulacogen at satellite elevations over an appropriate range of physical properties using Gauss-Legendre quadrature integration method. In addition, one degree average free-air gravity anomalies of South America and adjacent marine areas are projected to satellite elevations assuming a spherical earth and available Magsat data are processed to obtain compatible data sets for correlation. Correlation of these data sets is enhanced by reduction of the Magsat data to radial polarization because of the profound effect of the variation of the magnetic inclination over South America. The results of the modeling and correlation of magnetic and gravity anomalies are used with other regional geophysical data and geologic information to illustrate the utility of satellite magnetic data in characterizing the properties and structure of the South American Plate.

1. Prof. William J. Hinze  
Department of Geosciences  
Purdue University  
West Lafayette, IN 47907
2. II - "Scientific Results from the Magsat Missions: Main Field"
3. Dr. Robert A. Langel
4. Present before August 6th
5. Either oral or poster