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FOURTH QUARTERLY REPORT
FOR
EQUIVALENT SOURCE MODELING OF THE
MAIN FIELD USING MAGSAT DATA

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TYPE II

During this quarterly period the following modeling and software development work has been done.

I. The software was considerably enhanced to accomodate a more comprehensive examination of data available for field modeling using the equivalent source method. These modifications included:

- (a) Implementing a dynamic core allocation capability into the software system for the automatic dimensioning of the normal matrix.
- (b) Implementing a time dependent model for the dipoles. This consists of considering each dipole component to vary linearly with time. This parametric model is available in both the "source only" and the "component" mode of operation.
- (c) Incorporation of the capability to input specialized data formats in a fashion similar to the models in spherical harmonics. These data formats include
 - 1. NOAA Survey data
 - 2. NOAA Observatory data
 - 3. Specialized POGO data.
- (d) Implementing the optional ability to simultaneously estimate observatory anomaly biases where annual means data is utilized. This modification uses an elimination/back substitution procedure to reduce core requirements. A dynamic core allocation procedure is implemented for this option.

II. The time dependence capability was demonstrated by estimating a component model of 21° resolution using the 14 day MAGSAT data set of Goddard's MGST(12/80). The equivalent source model reproduced both the constant and secular variation found in MGST(12/80).