International Business Machines Corporation

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December 8, 1972

Reference: Contract NAS 5-21716
NMC # 161
PR 514

Mr. Arthur Fihelly
Technical Monitor
Code 430
Goddard Space Flight Center
NASA
Greenbelt, Maryland 20771

Dear Mr. Fihelly:

Subject: All Digital Precision Processing of ERTS Images

The following constitutes the Type I Progress Report (Article II, Item 3 of Referenced Contract) for the period ending November 30, 1972:

Problems

No problems have been encountered to date.

Accomplishments for This Reporting Period

An internal design review was held. No significant design, implementation, or procedural problems were identified.

A meeting was held at GSFC with representatives of NASA and GE to discuss RBV radiometric correction. At this meeting, information required by IBM for computing RBV radiometric corrections was received. Development of routines to zone an image and generate correction tables on the basis of calibration data is now underway.

Testing against real RBV images revealed that IBM's original reseau detection scheme, which was designed for "ideal" reseau, was inadequate. A new reseau detection scheme has been developed and tested. The new scheme is as efficient as the old one and has shown 100 percent success in detecting reseau and rejecting all false targets.

CCT's for approximately 30 scenes have been received and catalogued. From these scenes, eight have been selected for full precision processing.

The SSDA was applied to MSS data from overlapping images in the Chesapeake Bay area with very encouraging results. Eight different features were tested, and all eight were located successfully in all bands. The results show that band 5 is best for locating man-made targets such as airports and that band 6 is superior for locating targets involving a land-water interface. Average feature location time was 4.1 seconds. It should be noted that the SSDA program used for these tests was an experimental and relatively inefficient version and that some reduction in feature location time is to be anticipated when an efficient version of the program is used.

An error analysis of the correction algorithms has been started and is well underway.

A team from IBM's Data Processing Division has been selected to do the alternative configuration analysis. Several meetings have been held with them, and a set of sample problems is being run for them.

Several technical exchanges have been held with representatives of USGS. These have been quite useful in establishing UTM co-ordinates for distinctive features visible in the ERTS images.

Plans for the Next Reporting Period

It is anticipated that the following objectives will be accomplished during the next reporting period:

- Corrected images will be produced.
- These images will be submitted to USGS for an independent geometric accuracy evaluation.
- Testing of the SSDA will be extended to other areas and targets for which multiple coverage is available.
- The error analysis will be completed.

Other Comments

- The project is within projected budget for the work done. However, due to unexpected difficulties in accomplishing some of the technical tasks as well as late receipt of required images and technical data, the project is now behind schedule.

- o A Data Analysis Plan has been prepared and will be submitted shortly. This plan will identify planned data processing and analysis techniques and procedures to be used in conducting the remaining portion of this contract, along with an implementation schedule and required resources.

- o There have been no papers, articles, reports, tables, etc. produced in connection with this work.

Very truly yours,

Ralph Bernstein
Principal Investigator

RB:vbb

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