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MONTHLY REPORT

for

OCTOBER 1978

VISSR Atmospheric Sounder (VAS)
Development and Performance Evaluation

Contract No.: NAS5-21965

Prepared by

Space Science and Engineering Center
The University of Wisconsin
Madison, WI

for

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, MD

I. General

Two milestones in the UW VAS program were realized in October. TIROS-N was successfully launched on October 13, 1978 and real time signal reception and processing at SSEC began. Also the Data Base Manager (DBM), Applications Processor (AP), and User Terminal (UT) configuration of the VAS Ground System was tested with real time VISSR data.

II. Data Processing System Development

The DBM-AP-UT configuration was ingesting real time VISSR data during a recent test. All parts of the operating system were functioning properly. Applications software is being loaded into the system so that VAS needs for surface and upper air data can be met. Transfers between the DBM and the AP are running smoothly. The line between the AP and the UT is functioning adequately but improvements are under consideration.

The TIROS-N receiving system acquired signal shortly after launch. Signal reception with phase lock was accomplished in the manual mode of tracking (automatic tracking will begin next week with the installation of a modification in the antenna rotors); magnetic tape of the overpass was written (software problems with decoding the TIP minor frame were quickly overcome); and data from the microwave sensing unit was displayed at the user terminal on McIDAS shortly after overpass (HIRS data was not available until this week due to a problem at launch). All hardware is functioning properly. Testing of the existing applications software for HIRS and MSU data is proceeding daily with real time TIROS-N data.

III. VAS Instrument Support

The GOES D, E, and F Critical Design Review indicated some areas of concern which might affect the VAS Demonstration: (a) The thermal gradients in the VAS

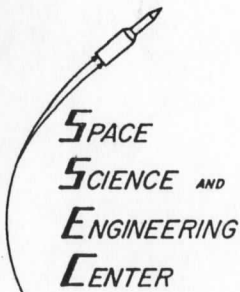
fore optics are larger than the specified 10°C during summer. After reviewing the data, it was found that the thermal gradients with respect to the internal blackbody (which affect the VAS calibration accuracy linearly) have a maximum of 7°C . The calibration error thus was found to be actually less than errors that could occur for some gradients within specifications, and hence SSEC felt that these gradients were acceptable. (b) Hughes intends to remove the VAS head cover before mounting the VAS instrument into the spacecraft. Since all tests and analyses will have been performed with the head cover on, SSEC believes that additional optical and thermal analyses should be done to verify that instrument performance is not degraded by this change of plans.

The VAS-D Scattering Data (summarized in the October 11, 1978 memorandum from H. Montgomery) was investigated. In the visible channel, the relative contribution of stray light is less than .01%; in the infrared $4\ \mu$ channel it is .16%. These amounts are believed acceptable.

IV. Development of VAS Data Processing Techniques

The testing of software on TIROS-N HIRS and MSU data in an operational scenario was begun with the launch of TIROS-N. Minor problems have almost all been found and are being corrected. It is anticipated that the real time production of soundings is less than a week away.

Preliminary work is underway toward implementing the Australian Numerical Meteorology Research Center's (ANMRC) semi-implicit numerical weather prediction model on the CRAY-1 computer at NCAR. The model is being adapted to high resolution (roughly 50 km in the horizontal) and topography over the mainland United States. NMC's LFM model and TIROS-N data will be used for initialization and comparison with post-initial ANMRC model output. Ultimately, it is hoped that the model will be initialized from time and space interpolated mesoscale VAS system data and post-initial model output.



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THE UNIVERSITY OF WISCONSIN

10 November 1978

Mr. J. B. Connor
Contracting Officer, Code 289
NASA/Goddard Space Flight Center
Greenbelt, Maryland 20771

Dear Mr. Connor:

In accordance with Article III of Contract NAS5-21965, I am submitting the required Progress Report for the month of October, 1978.

If you have any questions or desire further information, please contact me at (608) 262-0118.

Sincerely,

Paul Menzel
Program Manager

WPM:kmp

Enclosure

xc: H. Montgomery, Code 942