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MONTHLY REPORT

for

AUGUST 1979

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

Work on the VAS Program at SSEC in the past month has focussed in the following areas; implementation of the dial up radar into our processing system, testing of the wideband communications links between processors, and continued assimilation of data sets for initializing the high resolution numerical weather prediction model.

II. Data Processing System Development

Testing and debugging of the improved wideband communications link from the Data Base Manager (DBM) and the Applications Processors (AP) is continuing. Three days of continuous operation transferring small buffers at high rates were successfully completed. More recently problems have cropped up with the protocol interfacing the communications line with the CPU. Several corrective measures are being tried. Software supporting the faster communications has been written and is being rechecked. Software tests in the system will be started this month. Insertion of the faster communications network into the system is scheduled for January 1980.

The dial up link to the Weather Bureau Remote Radar is completely configured; reception of radar images will begin this month. Software for auto dialing, reception, and subsequent display is being tested. Various approaches to calibrate the radar data are being investigated; implementation of quantitative radar data into the VAS data assimilation system is still some months away.

The VAS preprocessor hardware has been ordered. The design includes a microprocessor with 2 RAM cards for buffering, an averaging card for implementing signal to noise reduction by multiple scanning, an interface card to the DBM, and a controller card. A mechanism for monitoring unphysical line by line changes in the response of the same filter on the same scan swath is still being worked into the design. Completion of the preprocessor construction and testing is expected early next year.

The ADDCP communications network from SSEC to GSFC and Wallops is still being

tested. Problems with the protocol chip have been overcome and incorrect wiring has been corrected. Software code is being implemented and tested; ADDCP protocol will be inserted at the same level as in the Westinghouse design for the VAS communications controller. The interface to the DBM (or assistant DBM) has been designed to allow system monitoring via a CRT. The data handler in the DBM remains to be written, and the appropriate user interface must still be decided. Expectations are that the network will be ready for final testing in early December.

The cassette archive has a new addition; an automatic recording retrigger to insure more reliable recording of all images. If a picture is available and the recorder has not been activated by the normal start up signal, then the auto retrigger tries to initiate recording every 8 seconds until successful start up is attained.

The Terminal Communications Switch has been constructed and will be implemented into our system this month. This switch will enable at any user terminal to schedule time on any applications processor.

III. Development of VAS Data Processing Techniques

Navigation of the VAS data will be done at SSEC in a backup mode to navigation at GSFC. Software listings from GSFC were studied, and tests between GSFC navigation and SSEC navigation are being coordinated. A comparison of landmark residuals has been suggested to insure that the appropriate backup capability exists at SSEC. Landmark residuals are the difference of landmark line and elements determined by direct measurement from those calculated by the navigation software. These tests will be conducted this fall.

Testing is continuing on the high-resolution numerical weather prediction model (NWP) using a 101 x 71 horizontal grid with 67.6-km resolution. A 4-level version has been run out up to 24 hours (144 10-min time steps), using August 25-26, 1975 (featuring a very deep cyclone over central Canada) as a test case, both with and without surface drag, while shorter runs have also been done with 10

levels, primarily for March 14, 1979. Comparison of the two 24-hour 4-level runs confirmed suspicions that surface drag acts importantly to check runaway deepening of cyclones. A minimum of physics is being carried in these early runs, temporarily excluding horizontal diffusion and surface heating while turning off the convective parameterization.

IV. Instrument Support

The Calibration and Acceptance Test of the GOES D VAS instrument will begin early September. Arrangements have been made for SSEC to attend.

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THE UNIVERSITY OF WISCONSIN

10 September 1979

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

Dear Mr. Connor;

In accordance with Article III of Contract NAS5-21965, I am submitting the required Progress Report for the month of August, 1979.

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

Sincerely,

Paul Menzel

Paul Menzel
Program Manager

WPM/kv

Enclosure

cc: H. Montgomery, Code 942 (10 copies)