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MONTHLY REPORT

for

MAY 1978

VISSR Atmospheric Sounder (VAS)  
Development and Performance Evaluation

Contract No.: NAS5-21965

Prepared by

Space Science and Engineering Center  
University of Wisconsin  
Madison, WI

for

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

## I. General

On May 1, 1978, P. Menzel of SSEC went to Santa Barbara, California to implement software for calibration coefficient determination into the Santa Barbara Research Center Dartmouth Time Sharing System. This was done. Real time determination of coefficients and associated uncertainties can now be performed during the VAS Acceptance and Calibration Test in late August 1978.

On May 11, 1978, P. Menzel of SSEC travelled to Suitland, Maryland at the expense of the NESS Research and Development Council Meeting to present recent results from the man interactive technique for specifying cloud heights from sounding radiance data. Implementation on the NESS VIRGS system was discussed.

## II. Data Processing System Development

Preliminary determination of an upper limit to the videocassette archive bit error rate has been made. Comparison of real time and archive images showed differences of approximately 1 bit in  $10^5$ . Part of these differences is caused by videocassette errors, and thus this number represents an upper limit to the actual bit error rate. More accurate estimates of the videocassette bit error rate must wait until a signal simulator is available.

Work on the TIROS-N receiving system continues. Construction of the antennas on the roof of the SSEC building is nearly complete. Antenna control interface boards have been wired and testing is nearly complete. Mock up testing of antenna pointing capability is next. Software has been written and successfully tested in the microprocessor for orbit determination and antenna pointing. The construction of the interface between the microprocessor and the attached magnetic tape unit is nearly complete, and testing is scheduled for the next weeks.

### III. Development of VAS Data Processing Techniques

Phased implementation of a mesoscale laboratory has begun. This effort is aimed at evaluation of VAS processing techniques in a real time pseudo-operational environment. Data sets of meteorologically interesting situations will be produced. Currently we are using real time inputs from one VISSR and conventional weather data to produce wind sets. Incorporation of TIROS-N data and input from another VISSR is planned.

The number of case studies of Nimbus 6 polar orbiter data on McIDAS is increasing. A total of five studies have been undertaken. In addition, software has been written for remapping polar orbiter brightness temperature determinations into geostationary coordinates for coincident display with VISSR brightness temperature determinations.

Research is being done to infer surface temperatures from VISSR data. Methods for eliminating the influence of clouds, atmospheric attenuation, and instrument noise are under investigation. Software has been written and is being tested. In addition, a study is underway for determination of low level water vapor content from polar orbiter data. Using  $8.2\mu$  and  $11\mu$  data, determinations of the atmospheric optical depth seem possible. Testing is now planned.

### IV. VAS Instrument Support

The SBRC response to the questions concerning the out of specification IR FOV situation on VAS D was reviewed. It seems that the detector package is out of spec for physical reasons and not because of measurement errors. SSEC recommends that the waiver requested by SBRC should be granted.



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10 June 1978

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 May 1978.

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

Sincerely,

Paul Menzel  
Program Manager

WPM/rmk

Enclosure

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