

T. Menzel

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MONTHLY REPORT

for

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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

On March 6, 1979 P. Menzel of UW attended a presentation at Camp Springs, Maryland on Surface Temperature Computation from VISSR and HIRS data. The evaluation of atmospheric radiation contributions in the 11 micron region was discussed.

On March 20, 1979 D. Johnson and P. Menzel of SSEC and W. Smith of NESS travelled to Washington, D.C. to attend the NASA Headquarters Review of the NASA VAS Assessment. D. Johnson spoke for V. Suomi on the role of VAS in mesoscale phenomena and W. Smith presented UW/NESS plans for parameter extraction and data validation during the VAS Demonstration. Mesoscale nowcasting evaluation was also discussed.

## II Data Processing System Development

Evaluation of the Data Base Manager - Applications Processors - User Terminals (DBM-2AP-4UT) performance over the last months in handling real time inputs (two VISSRS, conventional weather service A and C, TIROS-N) and near real time weather research has indicated several desirable improvements to prepare the system for the larger VAS task ahead. More compact and efficient ingestor software code is needed so that the DBM can readily accomodate simultaneous data streams from two VISSRS, VAS, two TIROS-N, conventional weather, numerical models, and playback from the cassette archive -redesigning of the software is underway. The communications link between the DBM and an AP must be improved to speed up data transfers - initial design work indicates that modification of bi-synch interface cards, addition of buffer cards, and changes in the operating system will allow a substantial improvement. Expansion of DBM and AP memory is necessary to accomodate increasing software loads - memory boards are being ordered. Faster frame loads at the UT will be required during the VAS

Demonstration - discussions of possible UT modifications are beginning.

The design of the computer to computer interface between SSEC and GSFC is complete and the appropriate hardware has been ordered. Parts of the system are already under construction. In addition the necessary components of the NESS user terminal have been ordered.

The problems with the ingestor hardware during simultaneous reception from two VISSRs have been fixed. Two faulty chips in the bimangler were replaced.

Data from the Weather Bureau Remote Radar (WBRR) will soon be coming into the DBM. A design for FM reception by phone link up with an auto dial up feature has been completed and appropriate hardware has been ordered. WBRR has a network of 37 stations distributed in the US east of the Rockies. Simultaneous viewing of severe weather from above (satellite) and below (radar) will now be possible.

The TIROS-N receiving system has been linked directly to the VAS Applications Processor. Near real time TIROS-N data processing is now more readily accomplished - magnetic tape transfers are no longer required.

### III. Development of VAS Data Processing Techniques

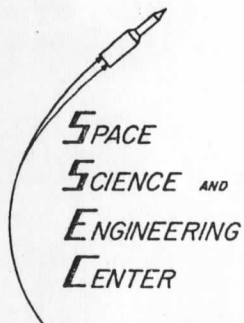
The generation of daily wind and sounding fields is continuing and the polaroid hardcopy archive is growing. Special attention is being given to the storm scale domain of the Sesame Regional Sub Program (400 km square centered on Oklahoma with 20 supplemental rawinsonde sites) so that the four dimensional analyses of mass, motion, and moisture obtained from amalgamations of VISSR, TIROS-N, and conventional data will be available for intercomparisons with other facilities.

A study of the relationship between the mass and momentum fields on a sub-synoptic scale has been initiated to determine the difficulty of coordinating

separate measurements made of each field by satellites. Large geostrophic imbalances due to measurement errors or sampling restrictions will render subsequent analyses useless. Interpolation to data void areas must be done carefully so that fictitious ageostrophic flow is not inserted. Data from the Atmospheric Variability Experiment in 1975 is being used to explore this problem.

#### IV VAS Instrument Support

Work has begun to study the opportunities for calibration of the VISSR radiances from intercomparison with TIROS-N data. Efforts are being made to understand the VISSR calibration software implemented at the SDB. Also programs for simulating satellite detection of outgoing earth and atmospheric radiation are under investigation. Statistical studies correlating VISSR IR window data to TIROS-N HIRS data are planned.



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THE UNIVERSITY OF WISCONSIN

10 April, 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 March 1979.

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

Sincerely,

Paul Menzel  
Program Manager

WPM/jal

Enclosure

xc: H. Montgomery Code 942 (10 copies)