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MONTHLY REPORT

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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 June 26, 1980, Paul Menzel traveled to NASA/GSFC to attend the Spacecraft Operations Review.

## II. Data Processing System Development

The hardware for the VAS data processing system has been completed and checked out during the link tests. The problems with the preprocessor have been identified and fixed. The VAS ingest software works for the primitive level ingest and file. Work continues on the file management portions of the ingest software. The phone modem link to Wallops is being tested. While there are still some minor problems with the modem link, these should be solved by the end of July. The software for the VAS scientific processing (sounding retrievals, editing, analysis of sounding fields, etc.) will basically consist of the processing system developed for TIROS-N. The task of modifying the TIROS-N packages to the VAS formats and file structures will begin in July and should be completed by August.

## III. VAS Instrument Support

The scaled version of the parameters for calibration, detector geometry, and processor data load to be used in the VAS Synchronizer Data Buffer were calculated and distributed. Some updates were made upon discussion with Westinghouse.

An investigation of the spatial weighting functions for the 12 VAS-D spectral bands has begun. Resulting misregistration from one band to another will be catalogued.

## IV. VAS Data Processing Techniques

The new retrieval algorithm implemented at SSEC in May was duplicated

on the Suitland IBM 360-195. Soundings made there can be transferred back to McIDAS. A programming effort is underway to transfer direct readout polar orbiter data from SSEC to Suitland so that ingest through retrieval can be performed in the faster computer. The McIDAS interactive system would then be used only for editing and data amalgamation.

Software has been completed to select radiosonde data from the Suitland disk file data base for transfer to McIDAS. This gives us a global capability in dealing with radiosondes.

#### V. Data Analysis

In anticipation of the scientific use of the VAS data, investigations have been started evaluating the usefulness of remote sounding data for severe weather forecast applications.

The Total Totals, Lifted Index and K index were calculated for NOAA-6/TIROS-N retrievals for the period late May through mid July for orbits passing over areas with potential severe weather. In addition, gradient winds derived from the TIROS-N/NOAA-6 data were examined for this period.

The Total Totals, Lifted Index and K's calculated from TIROS-N/NOAA-6 data were very erratic. In some cases they correlated well with severe storm outbreaks but in other cases local regions of implied instability were out of phase with the RAOB data and also with the severe weather. The 3 severe weather indices are too dependent on temperature and dewpoint values at specific levels and the satellite retrieval technique is ill-suited for level specification of temperature and moisture. It is necessary to develop severe weather indices that depend on layered data (i.e precipitable water and thicknesses). Work has begun to develop such indices.

The gradient wind values agree well with RAOB data as far as maxima and

minima. In several cases the intersection of upper and lower level jet maxima (i.e 850 mb and 300 mb), determined from TIROS data, was found to be close to the area of squall line formation.