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MONTHLY REPORT

for

JUNE 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

On June 11, 1979, H. Montgomery and L. Uccellini of GSFC visited the University of Wisconsin, in Madison, WI to discuss the Operational Satellite Improvement Program (OSIP) plan for the VAS Demonstration. The plan was updated to reflect the current status of and future plans for the UW participation in the VAS program. A schedule of anticipated accomplishments was also inserted.

On June 18, 1979, P. Menzel travelled to Santa Barbara, CA to observe some bench tests of the VAS instrument and to update software for analysis of thermal vacuum test calibration data at the Santa Barbara Research Center. Transfer of raw data from the vacuum test to UW was also discussed.

On June 27, 1979, the NOAA-6 spacecraft carrying the HIRS and MSU units was successfully launched. Satellite tracking and signal reception was accomplished at UW with the TIROS-N receiving system. After 20 days for NOAA-6 checkout, the two polar orbiting sounders (TIROS-N and NOAA-6) will provide U.S. coverage at six hour intervals.

II. Data Processing System Development

Installation of the improved wideband communications link from the Data Base Manager (DBM) and the Applications Processors (AP) is suffering some delays. Only half of the necessary hardware has arrived; in particular, delivery of integrated circuits is very slow. Construction of in-house items is nearly complete and testing can begin when a sufficient number of the ordered components have arrived.

The ADCCP buffers for the communications line from UW to GSFC have been constructed, and debugging is now underway. The NESS user terminal is nearly constructed and testing will soon begin.

Construction of the VAS video cassette archive continues. A transcribing

capability is being designed into the system. A recording unit connected to a playback unit will be capable of copying the contents of the player cassette onto the recorder cassette. This capability greatly facilitates the transfer of geosynchronous satellite data sets to various users.

The change to the VAS user terminal which will allow more image frames is in progress. Completion is expected next month. In addition, preliminary design work has been done which will convert some of the streamlining software into hardware to speed up this procedure. Given a uniform grid of winds, it will be possible to display flow streamlines within a few seconds (roughly three seconds).

The TIROS-N receiving system received some maintenance attention. Backup rotators were constructed and the rotater controller was redesigned. Signals from both TIROS-N and NOAA-6 are being received and processed daily.

III. Development of VAS Data Processing Techniques

A program has been developed for horizontally interpolating NMC LFM analysis data to the smaller region encompassing the University of Wisconsin's limited-area numerical weather prediction model (an adaptation of the Australian Numerical Meteorology Research Center model). The interpolated LFM fields furnish a first guess for the Wisconsin model's pre-initialization analysis.

The information content of the analysis display program has been considerably expanded. Contour plots of either preliminary or final analyzed scalar fields (e.g., wind components, temperature and height on constant-pressure surfaces, 1000-500 mb thickness, or sea level pressure) can be supplemented with overlaid station plots of the corresponding observed fields (absolute values, or deviations of the observations from the interpolated analyzed values), as well as with optional station

wind flags.

Preliminary forecasts for up to 12 hours have been run, mainly for the period beginning at 12Z on 14 March 1979 (dominated by a deep period storm center over southeast Canada). The current grid has a 67.6-km horizontal resolution on a Lambert conformal projection true at 20°N and 50°N, but with only 4 vertical levels rather than about 9 as will be used later. Diffusion and surface heating have been temporarily deleted for simplicity. Lower boundary topography has been provided for the model by interpolating a modified version of the 1° x 1° U.S. Air Force topography data. The preliminary forecasts have been initialized from the NMC LFM analysis alone until the past week, when rawinsonde and TIROS-N satellite data was used in the analysis. Model behavior appears reasonably stable except for very localized pressure oscillations over the Colorado Rockies (possibly a problem stemming from the introduction of topography) and excessive deepening of the Canadian storm (probably due to suppression of diffusion).

IV. VAS Instrument Support

The programs for on site calibration support at the Thermal vacuum test have been inserted into the computer at Hughes in Los Angeles, CA. Successful tests were conducted.

The bench test of the VAS instrument prior to vibration test was observed to be proceeding well. Problems with the IR channel MTF and shutter lockup were resolved. Vacuum test should begin Aug. 1, 1979 according to F. Malinowski.



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10 July 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 June 1979.

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

Sincerely,

Paul Menzel
Program Manager

WPM/kv

Enclosure

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