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MONTHLY REPORT

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VISSR Atmospheric Sounder (VAS)
Development and Performance Evaluation

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Prepared by

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for

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Goddard Space Flight Center
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I. General

Fred Mosher has been appointed the new SSEC project manager for the VAS program.

The Final Design Report on the UW VAS Data Processing System was sent to NASA in January.

Bob Schlesinger travelled to Boulder, CO on January 23, 1980 to attend the SESAME workshop and to work on the Numerical Prediction Model at NCAR.

II. Data Processing System Development

The wideband communications links (WCL) between the data base managers and the application processor computers were successfully installed during January. The effective data transfer rate between computers went up by a factor of 15 with the installation. The data transfer rate is now approximately 10 megabaud. This transfer rate now makes it as time effective for an applications processor to request data from the data base managers as from its own local disks. The McIDAS, TIROS, and VAS software are being rewritten to allow storage of common files on the data base managers. This will allow local disk space for complete software packages on all the applications processors, thus reducing the dependence of any particular task on any given computer.

The system reconfiguration to two data base managers, five applications processors and ten McIDAS terminals was completed in January. The terminals, except for the remote ones, are connected through the terminal communications switch. The new reconfiguration gives increased capacity and greater reliability.

The ADCCP communications equipment has been built and the microprocessor firmware has been written and is in the process of being debugged. Local loop back tests have been run. The first link up tests with GSFC will be run at the end of February 1980.

The only remaining hardware needed before the beginning of the VAS demonstration are the GOES frame sync modification, the VAS preprocessor, and the

TIROS APT system. The GOES frame sync will be modified at the end of February to handle the VAS mode AA in addition to being able to handle the normal mode A data. The VAS preprocessor hardware, which will average on the fly the multiple scans in the dwell sounding mode, is in the process of board fabrication. The electronic boards will be completed by early March. The programming of the microprocessor in the system will begin in March. The TIROS APT hardware is built, a signal has been acquired, and the final debugging should be completed during February.

The software for the link to the 360/195 at Suitland has been debugged and test programs have been submitted. This link will enable access to data on the 360 disk (such as the current LFM grids). The system uses the data base manager to submit a 360 job through an EM3780 emulator. The job output is monitored for special flags which denote data files that are stripped off onto the data base disks. Text output is routed to printers. The same remote job entry technique is being used for the link to NCAR. The modems and line to NCAR are in. The final debugging of the NCAR link will be finished in February.

The number and speed of graphics generation has been identified as a limiting factor in the VAS data processing and assimilation tasks. An effort was made last fall to develop more efficient objective analysis and contouring algorithms. This speeded up the process so that now graphics take between 2 and 20 seconds for generation and display. The McIDAS terminals have between one and four graphic frames available. The number and speed of the graphics are still insufficient. While the ultimate solution to this problem would be a redesigned terminal, funds for this are not available. As an interim solution to this problem, virtual graphics of penpoint motions are being developed. The pen point motions can be used to regenerate the graphic in less than .5 second. There will be 1024 virtual graphics for each terminal. Standard graphics, such as weather maps in a standard projection, will be prestaged on designated graphic frames. The

virtual graphic capability software has already demonstrated the feasibility of the approach. The implementation of the virtual graphics on operational terminals will take place this spring.

III. VAS Instrument Support

After reviewing the SBRC proposed changes in the test specifications, SSEC found no significant problems. The requested reduction in the required VAS visible channel signal to noise ratio will not degrade instrument performance dangerously. The need for a .5% non-linearity requirement in the VAS infrared channel response has been lessened since the S/DB has the capability to correct non linearities in the channel response; however an accurate determination of the non linearities within .1% should be written into the specifications. The measured center wavelengths of the spectral bands should be recorded; the method for determining center wavelength should be defined uniquely and adhered to by all involved parties.

IV. VAS Data Processing Technique Development

Snow cover continues to cause problems with the TIROS-N temperature processing because of large discrepancies which can occur between ground and air temperature. An experiment is underway to generate temperature soundings from brightness temperature measurements from which all surface contributions are removed. Regression coefficients for the retrievals will still be obtained from a sample of simulated brightness temperatures.

The effort to emulate the IBM 3780 with McIDAS so that NMC data fields from Suitland can be ingested directly is nearly complete. The first LFM field was successfully transferred and displayed this past month.