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A Joint Meteorological, Oceanographic and Sensor Evaluation Program

for Experiment S193 on Skylab

EPN 550

for the period from

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Submitted to:

Principal Investigators Management Office  
NASA Johnson Space Center  
Attn: Z.H. Byrns, Technical Monitor. Mail Code TF6  
Houston, Texas 77058

Principal Investigator:

Willard J. Pierson  
University Institute of Oceanography  
City College of New York

Co-investigators - R.K. Moore and E.P. McClain

Monthly Plans and Progress Report

### Skylab IV

As stated in the summary, conditions for winds of 40 knots and higher have not yet been measured. Further efforts during the Dec. 15 to 22 time frame will be made. The period from 1 January on seems to be ideal for passes over the North Atlantic. Additional efforts will be made during this period. Forecasting the intensity of an extratropical cyclone 48 hours in advance is not easy.

### Seasat A

Numerous questions concerning the results of S193 from Skylab in connection with the design of Seasat A were asked. They could not be answered even on completion of Skylab IV with the present limited data base. Problems have arisen concerning the alternate system for measuring winds over the ocean, namely a four frequency passive microwave system, because of the poor resolution and the difficulties of design in the lowest frequency to be used.

Summary

The reduction and analysis of Skylab II and Skylab III data is progressing satisfactorily as described in the last progress report. The present data base is adequate for winds up to 30 knots, or so.

All sorts of difficulties with Skylab IV have resulted in our getting only one valid pass for winds of about 30 knots. Continued effort on the part of Dr. Vincent Cardone and Prof. W. J. Pierson, in which more than 12 opportunities to obtain measurements for winds of 40 knots and higher were missed, have produced only a minimum return. The constraints on the use of S193 are of such a nature that the high priority given to obtaining data with it for high winds over the oceans is not being met. Correspondence with Mr. A. J. Calio has suggested ways to eliminate these difficulties. In particular the constraint that additional objectives for other programs have to be met on the same pass causes many opportunities to be missed.

A meeting of user agencies for the design of Seasat A was attended by Prof. W. J. Pierson on December 10, 1973. Adequate information on the results of Skylab and the analysis of S193 data, especially as to the upper limit of the range of wind speeds for which the backscatter measurements yield good wind velocity estimates, is becoming an increasingly important pacing item in the design of the instrument package for this spacecraft.

Analysis of Data

The data base for winds up to 30 knots is adequate. Computer programs have been developed to find  $\sigma_{VV}$ ,  $\sigma_{HH}$  and  $\sigma_{VH}$  for any wind speed, sea condition, wind direction relative to the radar beam, angle off vertical, and sea surface temperature. These theoretical values will be compared with the observed values for the available data. This aspect of the program is proceeding quite well, and the group from the University of Kansas has made significant progress in all of their tasks for this effort.