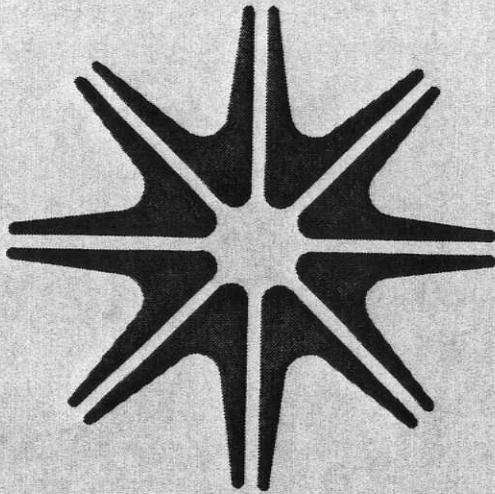


VES No. 0436



The
UNIDATA SYSTEM
for
**UNIVERSITY WEATHER
ANALYSIS AND MODELING**

University Corporation for Atmospheric Research

APPENDIX 1

RESULTS OF UCAR SURVEY OF ATMOSPHERIC SCIENCE DEPARTMENTS
ON WEATHER DATA COMMUNICATION AND INTERACTIVE SYSTEMS

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Washington, D.C.

A questionnaire was sent in December 1982 to all 50 University Corporation for Atmospheric Research (UCAR) member institutions and some 40 non-member academic institutions. Responses were received from 35 UCAR member and 21 non-member institutions, a 62 per cent response level. Attachment 1 is the questionnaire. It requested information on present and desired weather data services, available and planned computer data handling equipment, current communication costs, and current and planned, or interest in interactive computing systems.

Table 1 lists all UCAR member institutions and, for those responding to the questionnaire, the alphanumeric and facsimile data services they are now using. The same information for the responding non-member institutions is given in Table 2.

Weather Data Services

The following summarizes the present data services used by the 56 responding institutions.

<u>Type of Service</u>	<u>Institutions</u>		<u>Type of Service</u>	<u>Institutions</u>	
	<u>No.</u>	<u>per cent</u>		<u>No.</u>	<u>per cent</u>
A	17	30	GOES Pix	16	29
C	17	30	DIFAX	10	18
O	2	4	NAFAX	39	70
604	15	27	NMC Tap	1	2
None	4	7			

NAFAX is by far the most common data service used. Note that only two institutions use both DIFAX and NAFAX. Also, only four institutions indicated that they had no data services at all. One suspects that a larger percentage of those institutions not responding also are in the latter category. Only two institutions receiving FAA 604 also receive either Service C or both A and C. A significant number of institutions receive GOES pictures; more and higher quality satellite data was the most frequently mentioned category of additional data needed, followed by NMC grid-point data and "additional observations", including radar.

The general pattern is that most respondents (86 per cent) have either NAFAX, DIFAX or NMC output, and 61 per cent have some form of alphanumeric data-- usually either FAA 604 or Services A and C. Twenty respondents have either A or C, while 13 of these have both.

Computer Data Handling Equipment

Of those institutions responding, 73 per cent already have a micro- or mini-computer to handle weather data and an additional 9 per cent plan to acquire one. The distribution of responses follows.

Now have	Planning to Acquire			Now Have Total
	Mini	Micro	None	
Mini		2	18	20
Micro	2		11	13
Both			8	8
None	3	2	10	--

The vast majority of universities already have the capability or the potential of handling weather data in computer compatible form (e.g., ASCII), perhaps requiring only additional software. It is not clear from the responses, however, that the equipment is or could be used in all cases for this purpose.

Communication Costs

The information provided was insufficient to draw useful conclusions about current communication costs for receipt of weather data and connection to central computers. Many had no knowledge of the costs or provided a rough estimate. Some included the rental of terminal equipment (teletypewriters, facsimile machines, etc.) and others did not. In many cases, the charges for communicating with a central computer are paid by another party, so the costs aren't known to the respondent.

The average annual cost for weather data links is \$4,903, based on the 39 institutions giving this information. It must be remembered that in some cases this also included terminal equipment rent.

Only 15 institutions stated a cost for connecting with the NCAR computer facility, giving an average annual cost of \$4,950 and ranging from \$50 to \$25,000. Twelve institutions state an average annual communication cost of \$2,306 to connect with other central computers.

Since the total of the stated communication costs are in excess of \$500,000 (one institution alone reported an annual cost of \$250,000 but did not break it down into the categories discussed above), it may be reasonable to estimate that the total actual communication costs for the services received by the 56 respondents, regardless of who pays the bills, is in the neighborhood of \$1 million per year.

Interactive Data Handling System

The answers to questions 6 and 7 indicate that a majority of responding institutions have or are planning to obtain some form of interactive system (63 per cent for UCAR members, 43 per cent non-UCAR). The growing interest in interactive processing is reflected by 80 per cent of the respondents indicating an interest in exchanging information on or participating in a

cooperative network for interactive data processing. The following table sets forth the details of the responses.

<u>Interest in Network</u>	<u>Current System Status</u>			<u>Total, Interest</u>
	<u>Have</u>	<u>Planning</u>	<u>Neither</u>	
---UCAR Institutions---				
Exch. Info.		1	4	5
Participate	14	7	5	26
None			4	
Total, current	<u>14</u>	<u>8</u>		
--Non-UCAR Institutions--				
Exch. Info.	1	1	4	6
Participate	3	4	1	8
None			7	
Total, current	<u>4</u>	<u>5</u>		
---All Institutions---				
Exch. Info.	1	2	8	11
Participate	17	11	6	34
None			11	
Total, current	<u>18</u>	<u>13</u>		

It is interesting to note from the earlier section on computer data handling equipment that 81 per cent of the responding institutions have or are planning to obtain a micro- or mini-computer for handling weather data. Most, if not all of these units have the potential of being adapted for at least limited interactive data handling by the addition of disk storage, a display device and appropriate software. Micro-based systems can serve as "smart terminals" serviced by a larger computing and data storage system at another location. This technique already is used by the University of Wisconsin-Milwaukee, SUNY-Albany and others. A number of institutions already are using their mini-computer systems for both data handling and interactive processing, or are planning to upgrade their systems to facilitate such use.

A number of respondents expressing interest in interactive systems stated that they did not want to develop their own software or that they wished to purchase a complete hardware and software package.

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QUESTIONNAIRE
WEATHER DATA COMMUNICATION AND INTERACTIVE SYSTEMS

From:

(Please fill in name of university or college and contact person.)

1. Data services presently being used - please check appropriate box

Service A
FAA 604
GOES Pix

Service C
DIFAX
MNC Tap

Service O
NAFAX
(1800 baud)

Others, including private:

2. Present unsatisfied data needs - e.g., grid-point analyses, forecasts

3. Available computer data handling equipment:

mini

micro

Type:

4. Planning to purchase computer data handling equipment?

mini

micro

5. Annual telephone line cost (or other communication) for:

data links \$ _____

interconnect to NCAR computer \$ _____

interconnect planned to Goddard SFC computer \$ _____

other \$ _____

6. Do you have an interactive data handling system? Yes No

Details:

Are you planning to purchase or build an interactive system?

Yes No

Details, if available:

7. Is your department interested in being part of a cooperative network for interactive data processing?

Exchange of information only?

Participating in interactive network?

8. Other comments:

Please fold and staple this sheet (in thirds) so that address label shows.

FROM:

stamp

TO:
Stanley Ruttenberg
UCAR
P. O. Box 3000
Boulder, CO 80307

Table 1 - UCAR MEMBER INSTITUTIONS

	Service A	FAA 604	GOES Pix	Service C	DIFAX	NMC Tap	Service O	NAFAX
University of Alaska - Fairbanks, Alaska	x			x				
University of Arizona - Tucson, Arizona	x			x				x
* California Institute of Technology - Pasadena, California					x			
University of California - Los Angeles, California			x					x
University of Chicago - Chicago, Illinois								x
Colorado State University - Fort Collins, Colorado								x
University of Colorado - Boulder, Colorado								x
Cornell University - Ithaca, New York		x						
* University of Denver - Denver, Colorado					x			
Drexel University - Philadelphia, Pennsylvania								
Florida State University - Tallahassee, Florida		x						
* Harvard University - Cambridge, Massachusetts								
University of Hawaii - Honolulu, Hawaii			x					
University of Illinois at Urbana-Champaign - Urbana, Illinois		x						
Iowa State University - Ames, Iowa								x
* Johns Hopkins University - Baltimore, Maryland								
University of Maryland - College Park, Maryland	x			x				x
Massachusetts Institute of Technology - Cambridge, Massachusetts			x	x				
* McGill University - Montreal, P.Q., Canada								
University of Miami - Miami, Florida		x						
University of Michigan - Ann Arbor, Michigan								
University of Minnesota - Minneapolis, Minnesota	x							
University of Missouri - Columbia, Missouri				x				
University of Nebraska-Lincoln - Lincoln, Nebraska				x				
University of Nevada - Reno, Nevada	x							
* New Mexico Institute of Mining and Technology, Socorro, New Mexico								
University of New York at Albany - Albany, New York		x						
* New York University - New York, New York					x			
North Carolina State University - Raleigh, North Carolina	x							
* Ohio State University - Columbus, Ohio		x						
University of Oklahoma - Norman, Oklahoma			x					
Oregon State University - Corvallis, Oregon			x					
Pennsylvania State University - University Park, Pennsylvania	x		x	x				
* Princeton University - Princeton, New Jersey			x					
Purdue University - Lafayette, Indiana								
* Rice University - Houston, Texas								
Saint Louis University - St. Louis, Missouri		x						
Scripps Institution of Oceanography at the University of California at San Diego, La Jolla, California								
Stanford University - Stanford, California								
Texas A&M University - College Station, Texas	x							
* University of Texas at Austin - Austin, Texas								
University of Toronto - Toronto, Ontario, Canada								
* Utah State University - Logan, Utah								
University of Utah - Salt Lake City, Utah	x							
* University of Virginia - Charlottesville, Virginia								
University of Washington - Seattle, Washington		x						
University of Wisconsin at Madison - Madison, Wisconsin		x						
University of Wisconsin at Milwaukee - Milwaukee, Wisconsin		x						
* Woods Hole Oceanographic Institution - Woods Hole, Massachusetts								
University of Wyoming - Laramie, Wyoming	x							

*No response received

Table 2 - Other Institutions

Institution	Service A	FAA 604	GOES Pix	Service C	DIFAX	NMC Tap	Service O	NAFAX
University of California - Davis, California								
The City College - New York, New York	x							
Columbia University - New York, New York								
University of Delaware - Newark, Delaware								
Northern Illinois University - DeKalb, Illinois								
Jackson State University - Jackson, Mississippi								
University of Kansas - Lawrence, Kansas								
Kean College of New Jersey - Union, New Jersey								
Lowell University - Lowell, Massachusetts								
Lyndon State College - Lyndonville, Vermont								
Metropolitan State College - Denver, Colorado								
Millersville State College - Millersville, Pennsylvania								
Naval Postgraduate School - Monterey, California								
SUNY College at Brockport - Brockport, New York								
Plymouth State College - Plymouth, New Hampshire								
Rutgers University - New Brunswick, New Jersey								
San Jose State University - San Jose, California								
South Dakota School of Mines and Technology - Rapid City, South Dakota								
Texas Technological University - Lubbock, Texas								
U.S. Coast Guard Academy - New London, Connecticut								
Yale University, New Haven, Connecticut								