

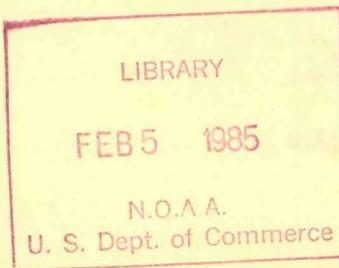
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no.43

NOAA Western Region Computer Programs and
Problems NWS WRCP - No. 43



OBLOG

Salt Lake City, Utah
December 1983



**U.S. DEPARTMENT OF
COMMERCE**

National Oceanic and
Atmospheric Administration

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Series analyzed.

PREFACE

This Western Region publication series is considered as a subset of our Technical Memorandum series. This series will be devoted exclusively to the exchange of information on and documentation of computer programs and related subjects. This series was initiated because it did not seem appropriate to publish computer program papers as Technical Memoranda; yet, we wanted to share this type of information with all Western Region forecasters in a systematic way. Another reason was our concern that in the developing AFOS-era there will be unnecessary and wasteful duplication of effort in writing computer programs in National Weather Service (NWS). Documentation and exchange of ideas and programs envisioned in this series hopefully will reduce such duplication. We also believe that by publishing the programming work of our forecasters, we will stimulate others to use these programs or develop their own programs to take advantage of the computing capabilities AFOS makes available.

We solicit computer-oriented papers and computer programs from forecasters for us to publish in this series. Simple and short programs should not be prejudged as unsuitable.

The great potential of the AFOS-era is strongly related to local computer facilities permitting meteorologists to practice in a more scientific environment. It is our hope that this new series will help in developing this potential into reality.

NOAA WESTERN REGION COMPUTER PROGRAMS AND PROBLEMS NWS WRCP

- 1 Standardized Format for Computer Series.
- 2 AFOS Crop and Soil Information Report Programs. Ken Mielke, July 1979.
- 3 Decoder for Significant Level Transmissions of Raobs. John A. Jannuzzi, August 1979.
- 4 Precipitable Water Estimate. Elizabeth Morse, October 1979.
- 5 Utah Recreational Temperature Program. Kenneth M. Labas, November 1979.
- 6 Normal Maximum/Minimum Temperature Program for Montana, Kenneth Mielke, December 1979.
- 7 Plotting of Ocean Wave Energy Spectral Data. John R. Zimmerman, December 1979.
- 8 Raob Plot and Analysis Routines. John A. Jannuzzi, January 1980.
- 9 The SWAB Program. Morris S. Webb, Jr., April 1980. (PB80-196041)
- 10 Flash-Flood Procedure. Donald P. Laurine and Ralph C. Hatch, April 1980. (PB80-298658)
- 11 Program to Forecast Probability of Summer Stratus in Seattle Using the Durst Objective Method. John R. Zimmerman, May 1980.
- 12 Probability of Sequences of Wet and Dry Days. Hazen H. Bedke, June 1980. (PB80-223340)
- 13 Automated Montana Hourly Weather Roundup. Joe L. Johnston, July 1980. (PB81-102576)
- 14 Lightning Activity Levels. Mark A. Mollner, July 1980. (PB81-108300)
- 15 Two Fortran Applications of Wind-Driven Ekman Water Transport Theory: Upwelling Index and Storm Tide. Kent S. Short, July 1980. (PB81-102568)
- 16 AFOS System Local Data Base Save and Rebuild Procedures or A Master Doomsday Program. Brian W. Finke, July 1980. (PB81-108342)
- 17 AFOS/RDOS Translator Subroutine. Morris S. Webb, Jr., August 1980. (PB81-108334)
- 18 AFOS Graphics Creation from Fortran. Alexander E. MacDonald, August 1980. (PB81-205304)
- 19 DATAKEYØ Repair Program. Paul D. Tolleson, August 1980. (PB81-102543)
- 20 Contiguous File Transfer from the DPCM to the DCM. Paul D. Tolleson, September 1980. (PB81-128035)
- 21 Freezing Level Program. Kenneth B. Mielke, September 1980. (PB81-128043)
- 22 Radar Boresighting Verification Program. Thomas E. Adler, November 1980.
- 23 Accessing the AFOS Data Base. Matthew Peroutka, January 1981.
- 24 AFOS Work Processor. Morris S. Webb, Jr., February 1981. (PB81-210007)
- 25 Automated Weather Log for Terminal Forecasting. John A. Jannuzzi, February 1981. (PB81-210999)
- 26 Program to Computer Downwind Concentrations from a Toxic Spill. John R. Zimmerman, February 1981. (PB81-205296)
- 27 Animation of AFOS Graphics. Joe Wakefield and Jim Fors, April 1981.
- 28 AFOS Interactive Graphics. Jim Fors, Don Laurine, and Sandy MacDonald, April 1981.
- 29 Computer Programs for Aviation Forecast Transmission. Kenneth B. Mielke and Matthew R. Peroutka, May 1981.
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- 31 Graphic Display of FOUS Output. Stephen D. Steenrod, September 1981.
- 32 Automation of Hourly Aviation Observation Calculations. W. Paul Duval, October 1981.
- 33 Mesoscale Objective Analysis. Andrew J. Spry and Jeffrey L. Anderson, December 1981.
- 34 Orographic Snowfall Rate Model for Alta, Utah. Steven K. Todd and Glenn E. Rasch, December 1981.
- 35 F-6 Monthly Climatic Summary Program for AFOS. Peter G. Mueller, May 1982.

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OBLOG

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Weather Service Forecast Office
Portland, Oregon

December 1983

*Former Temporary Employee, Spring/Summer 1983

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DEPARTMENT OF COMMERCE
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This technical publication has been
reviewed and is approved for
publication by Scientific Services
Division, Western Region.

A handwritten signature in black ink, appearing to read "Glenn E. Rasch".

Glenn E. Rasch, Chief
Scientific Services Division
Western Region Headquarters
Salt Lake City, Utah

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OBLOG

Nancy Larsen
Weather Service Forecast Office, Portland, Oregon

I. General Information

A. Summary

This program was designed to create and maintain a 49 hour observation log file for each user specified station. Observation information is drawn and decoded from the decoded observation file "SAODATA," which must first be created by the "SAODECODER" program. The following information is picked out of "SAODATA" and logged:

1. Cloud cover/sky condition
2. Visibility
3. Weather/obstruction to vision
4. Pressure
5. Temperature
6. Dewpoint
7. Relative humidity (computed by the program)
8. Wind speed and direction
9. Gusts

Each log file is set up with the most recent observation first and the oldest last. As the latest hour of data is added, the oldest observation is dropped, thus always maintaining the most current 49 hours of observations in the log file.

The existence of these log files offers several benefits. Each hour, the current observations are added to the log files in a formatted structure. This provides a visual table of the last 49 hours that is easily readable and organized. From these tables the user can readily follow trends over the last 48 hours or quickly pick out different parameters (temperature, pressure, etc.).

In addition, the log files can also be used by other programs. Often, extra time and coding is expended simply to find and separate a desired parameter from surrounding data. With a formatted log file any piece of data can quickly and easily be selected out for use by other programs. Also, having the capability of maintaining 49 hours worth of observations clears the way for creating other programs which compute 24 hour changes, plot trends, etc.

B. Environment

The program "OBLOG" was developed with Data General FORTRAN IV and designed to run in the background of AFOS. The utility libraries UTIL.LB and BG.LB are used, along with the standard FORTRAN Library FORT.LB and System Library AFOSE.LB.

C. References

Hudadoff, Pamela: "The Hovmoller Diagram," Western Region Computer Programs and Problems No. 38.

Thomas, Rich: "Surface Airways Observation Decoder."

II. Applications

A. Complete Description

The number of log files to be maintained is specified by the user. The desired stations are read into the program from the file "STATNS." This small file must be created manually with the 3 character station identifiers listed, one station per line. It is referenced each time the program "OBLOG" is run, therefore, it must reside on the disk at all times.

The stations are read in at the beginning of the program by the subroutine "GETSTNS." "GETSTNS" returns an array "STNLIST" (70) containing the station names (with a blank between each station) and an array "FILES" (105) containing the log file names (no blanks).

All the hourly observation information is taken (and decoded if necessary) from the file "SAODATA." If this file is not updated hourly then a "MISSING" message will appear in each log file for that hour. Therefore, it is important that the user regularly run the "SAODECODER" program to update the "SAODATA" file, otherwise, the log files will have sparse entries and be of little value. In addition, it is important that the node specifier for the desired stations be in the CCCLIST used for the "SAODECODER" program.

The program proceeds to open file "SAODATA" and use the utility subroutine "RDS" to read in one 96 byte record at a time into array "WORK" (105). Ninety-six bytes will cover all the information for each station. The first record is unique in that it contains the month, day, year, and hour of the observations contained in "SAODATA." This information is picked out and stored, if the date is successfully read in, a flag is set to true; if it is unsuccessfully read in, an error message is returned, and the program is terminated.

The station name is then picked out of the "WORK" array and compared against each station name from file "STATNS." If no match is found the program returns to read in the next record from "SAODATA." Once a match is found the program proceeds.

The program then initializes each log variable to a missing value. For integers they are set to -99, for characters they are set to blanks.

Each log parameter is then picked out of the "WORK" array according to their "WORK" array position and assigned (and decoded, if necessary) to its corresponding variable. See Appendix A.

Once all log variables have been assigned, the station name is compared to all the log file names. If no match is found, an error message is printed and the program returns to read in the next record. If a match is found, the log file is opened and the station name read from the header information in the log file. Once again, the station name is compared with that read in from the log file. If they do not match, an error message is printed, and the log file is rebuilt using the subroutine "REBUILD." The record is then dropped, and the program returns to read in the next record. If the log file can be opened and the station names match, the program proceeds to read in all the information in the log file into arrays. Array "LOGDAY" (49) holds all the day values, array "LOGTIME" (49) holds all the hour values, and array "LOGOBS" (49,32) holds each line of observation as one long 32 character string.

The next step is to check the most recent day and hour values in the log file and compare them with the date read in from "SAODATA." If the "SAODATA" date proves to be just one hour later than the log file date then no missing observations have occurred. Otherwise, the program must compute the number of missing hours.

This program is only capable of updating the log file with "MISSING" messages for the previous day up to the current day. In other words, the program compares the current day and the latest log day. If the log day is not equal to the "SAODATA" day and it is not equal to the day prior to the "SAODATA" day, a new OBS file is created.

When the number of missing observations, if any, is determined, then the log file is closed. A work file "NLOUT" is created and opened. All the header information is written out into this file followed by the current observation variables. Then the day, hour and a "MISSING" message is printed for each observation that is missing since the last observation. All the old log file information is then written back out, less the number of missing hours and less one for the addition of the current hour's observation.

This work file is then renamed back to the original log file name. The program then loops back up to read in the next record, until the end of "SAODATA" is reached.

B. Machine Requirements

This program runs in less than 27K of memory. The program run time is dependent on the number of log files and the number of missing observations, however, for 22 stations, it will take approximately 1 3/4 minutes. The maximum number of channels opened at one time is 2.

C. Software Structure

The program consists of a save file:

OBLOG.SV

and four subroutines:

GETSTNS.RB
JULIAN.RB
TOASCII.RB
REBUILD.RB

D. Data Base/Data Files

SAODATA	(containing the hourly observations)
STATNS	(file containing the names of all the stations to be logged)
XXXOBS	(XXX=STN identifier, must be one of these files for every STN to be logged)

All of these files must be resident on DPØ or linked to DPØ. The XXX obs files should not be permanent files but should be protected from a disk cleaning utilities.

III. Procedures

A. Initiation

IF RUN ON DASHER:	TYPE	OBLOG
IF RUN FROM AN AFOS ADM:	TYPE	RUN:OBLOG

B. Input

The only input required is the existence of files "STATNS" in order for the program to draw the station names, and the file "SAODATA" with the current observations. No manual input is necessary.

C. Output

Output is to the RDOS log files, "XXXOBS." Any other output, such as error messages, is printed to the dasher. If all processing is correctly completed, the message "END OF FILE REACHED FOR SAODATA. NORMAL TERMINATION" is printed to the dasher. The log files are created or updated and may be used by other programs. They may be displayed at an AFOS ADM by DSP:XXXOBS.

D. Cautions

1. It is recommended that this program be run automatically after the creation of the "SAODATA" file every hour. This will maintain updated and usable log files.
2. Maximum of 25 stations can be listed in "STATNS."
3. Visibility values over 100 miles are considered missing.
4. Many of the observations from automatic recording stations are not coded correctly by the program which creates the "SAODATA" file. Checks have been made at several points for unreasonable data values, however, often the weather/obstruction to vision variable gets through with garbled characters.

APPENDIX A

"OBLOG" VARIABLE	PARAMETER	METHOD OF ASSIGNMENT AND DECODING
ICLDAMT(3,2)	CLOUD AMOUNT FOR 3 LEVELS	SEE TABLE 1
ICLDCL(3)	CLOUD CEILING FOR 3 LEVELS	SEE TABLE 2
ICLDFLG(3)	THIN/VAR FLAG FOR 3 LEVELS	SEE TABLE 3
ICLDHT(3)	CLOUD HEIGHT FOR 3 LEVELS (100'S FT)	CHANGED FROM INTEGER VALUE TO CHARACTER
IWX(3)	OBSTRUCTION TO VISION	10 CHARACTER SYMBOLS AVAILABLE, BUT ONLY THE LAST 6 USED
VIS	VISIBILITY (MILES)	IF POSITIVE THEN DECODED INTO WHOLE MILES, IF NEGATIVE THEN DECODED INTO .001 MILES. IF COMPUTED DECIMAL VALUE HAS A ONES, TENTHS, HUNDRETHS, AND THOUSANDTH DIGITS, THEN IT IS TRUNCATED TO THE TENTHS DIGIT. (I.E. 1.275 WOULD BECOME 1.2)
IPRESS	PRESSURE	CONVERTED FROM PRESSURE IN TENTHS TO ABBREVIATED FORM (I.E. 1011.6 BECOMES 116)
IWDRSP	WIND DIRECTION AND SPEED	DECODED WIND DIRECTION IN WHOLE DEGREES AND SPEED IN KNOTS TO COMBINED FORM (I.E. 150 DEGREES AT 10 KNOTS BECOMES 1510). COMBINED FORM THEN CONVERTED TO CHARACTERS.
IGUST	WIND GUST	INTEGER VALUE CONVERTED TO A CHARACTER VALUE
ITEMP	TEMPERATURE	INTEGER IN DEGREES F
IDEWPT	DEWPPOINT	INTEGER IN DEGREES F
IRH	RELATIVE HUMIDITY	INTEGER VALUE COMPUTED BY PROGRAM

TABLE 1

 C - CLR
 S - SCT
 B - BKN
 O - OVC
 X - X

TABLE 2

 M - MEASURED
 E - ESTIMATED
 W - OBSCURED

TABLE 3

 0 - " " (NORMAL)
 1 - "--" (THIN OR PARTIAL)
 50 - "V" (VARIABLE)
 51 - "-V" (THIN AND VARIABLE)

IV, Section A

Example of File "STATNS"

AST
ONP
OTH
48K
PDX
HIO
TTD
SLE
EUG
RBG
SXT
MFR
CZK
DLS
RDM
LMT
4LU
PDT
MEH
BKE
P88
BNO

IV, Section B

Example of Portion of File "SAODATA"
(In Decimal)

month	day	year	hour	stn	stn	1 record		
7	29	83	1600	12055	21792	7	1536	27U
1	65437	65437	65437	32	0	0	0	32
32	0	0	32	32	0	0	0	32
65437	32	8224	8224	8224	8224	8224	8224	65437
68	54	65437	0	0	65437	65437	65437	20
12	8224	8224	8224	65437	65437	65437	65437	32
32	32	65437	0	16975	10720	1	1550	BOI
1	65437	65437	65437	83	1	250	0	32
32	0	0	32	32	0	0	0	32
30	32	8224	8224	8224	8224	8224	8224	10193
70	53	86	220	5	65437	3017	3017	21
12	13104	8224	8224	65437	65437	65437	65437	32
32	32	65437	0	16985	10720	1	1550	BYI
1	65437	65437	65437	67	0	0	0	32
32	0	0	32	32	0	0	0	32
30	32	8224	8224	8224	8224	8224	8224	10201
70	56	91	260	7	65437	3024	3024	21
13	13104	8224	8224	65437	65437	65437	65437	32
32	32	65437	0	17231	17696	1	1554	COE
1	65437	65437	65437	67	0	0	0	32
32	0	0	32	32	0	0	0	32
20	32	8224	8224	8224	8224	8224	8224	65437
64	54	65437	360	5	65437	3025	3025	18
12	12848	8224	8224	65437	65437	65437	65437	32
32	32	65437	0	18756	16672	1	1550	IDA
1	65437	65437	65437	83	0	00	00	32
32	0	0	32	32	0	0	0	32
60	32	8224	8224	8224	8224	8224	8224	10195
70	51	80	290	4	65437	3024	3024	21
11	13872	8224	8224	65437	65437	65437	65437	32
32	32	65437	0	19543	21200	1	1555	LWS
5	65437	65437	65437	67	0	0	0	32
32	0	0	32	32	0	0	0	32
223	32	8224	8224	8224	8224	8224	8239	65437
69	55	65437	10	3	65437	3021	3021	21
13	12850	13088	8224	65437	65437	65437	65437	32

IV, Section C

Example of Log File "PDXOBS"

PDX 49 HR WEATHER LOG

DA/HR	SKY	VSBY	WX	PRS	TMP	DP	RH	WIND	
29/16	8 SCT 250	-SCT 15.0		232	61	55	80	0105G	
29/15	8 SCT 250	-SCT 15.0		229	59	54	83	3403G	
29/14		8 SCT 15.0		226	57	54	89	0304G	
29/13		CLR 15.0		221	57	53	86	0000G	
29/12		CLR 15.0		217	58	53	83	0000G	
29/11		CLR 15.0		217	57	53	86	0000G	
29/10		CLR 15.0		217	59	53	80	0303G	
29/ 9		CLR 15.0		216	62	53	72	3106G	
29/ 8	MISSING								
29/ 7		250 -BKN	15.0	213	62	53	72	3007G	
29/ 6		60 SCT	250 15.0	211	66	54	65	3007G	
29/ 5		60 SCT 250	SCT 15.0	209	68	55	63	3307G	
29/ 4		60 SCT 250	SCT 20.0	201	70	55	58	3405G	
29/ 3	40 SCT	70 SCT 250	SCT 40.0	198	72	55	55	3006G	
29/ 2		40 SCT E 70	BKN 40.0	196	74	55	51	3005G	
29/ 1	40 SCT E 70	BKN 250	BKN 40.0	198	74	55	51	3108G	
29/ 0	40 SCT E 60	BKN 250	BKN 40.0	199	75	56	51	2908G	
28/23	MISSING								
28/22		38 SCT 70	SCT 30.0	205	74	55	51	3005G	
28/21	38 SCT E 60	BKN 250	BKN 30.0	206	72	53	51	2606G	
28/20		35 SCT E 60	OVC 25.0	206	71	53	52	3007G	
28/19	30 SCT E 60	BKN 250	BKN 25.0	204	71	55	56	2707G	
28/18	E 60 BKN 110	BKN 250	OVC 25.0	203	70	55	58	3207G	
28/17		E 50 OVC	20.0	202	67	56	67	3305G	
28/16		25 SCT E 50	OVC 20.0	199	64	56	75	3307G	
28/15		E 25 BKN 50	OVC 20.0	195	63	57	80	3404G	
28/14	E 25 BKN 45	BKN 90	OVC 20.0	191	62	57	83	3007G	
28/13		E 18 BKN 45	OVC 20.0	185	62	57	83	3306G	
28/12		E 20 BKN 45	OVC 15.0	183	63	58	83	3403G	
28/11		E 20 BKN 40	OVC 15.0	181	63	59	86	3005G	
28/10		20 SCT E 40	OVC 15.0	179	64	59	83	2905G	
28/ 9		20 SCT E 50	OVC 15.0	174	64	59	83	2603G	
28/ 8	20 SCT E 50	BKN 120	OVC 15.0	173	64	59	83	3304G	
28/ 7		25 SCT E 50	OVC 15.0	RW-	172	64	60	86	3606G
28/ 6	25 SCT E 50	BKN 120	OVC 15.0	RW-	171	67	60	78	3009G
28/ 5	27 SCT E 50	BKN 120	OVC 20.0		166	67	60	78	3107G
28/ 4	E 50 BKN 120	BKN 250	OVC 20.0		161	68	60	75	0404G
28/ 3	E 50 BKN 120	BKN 250	OVC 20.0		158	71	59	65	2110G
28/ 2	50 SCT E 120	BKN 250	BKN 20.0		159	71	59	65	1810G
28/ 1		33 SCT E 50	BKN 20.0		162	71	59	65	2308G
28/ 0		E 33 BKN 50	OVC 20.0		163	70	58	65	2111G
27/23	32 SCT E 46	BKN 75	OVC 40.0		162	71	59	65	1710G
27/22	26 SCT 50	SCT E 75	BKN 25.0		164	70	59	68	1810G
27/21	20 SCT 40	SCT E 70	OVC 25.0		165	67	59	75	1708G
27/20	18 SCT E 30	BKN 50	OVC 20.0		166	64	57	77	1612G
27/19	16 SCT E 25	BKN 35	OVC 10.0	L-	166	62	58	86	1607G
27/18		E 20 BKN 50	OVC 5.0	R-L-	161	62	57	83	1506G
27/17		E 18 BKN 50	OVC 10.0	R-	160	61	57	86	1205G
27/16		22 SCT E 50	OVC 8.0	R-	159	62	56	80	1506G

NOAA Computer Programs and Problems NWS WR (continued)

- 36 Soaring Forecast Program. David S. Toronto, July 1982.
- 37 Program to Work Up Climatic Summary Weather Service Forms (F-6, F-52). Peter G. Mueller, August 1982.
- 38 The Hovmöller Diagram. Pamela A. Hudadoff, September 1982.
- 39 850-Millibar Charts Derived from Surface Data. Jeffrey L. Anderson, December 1982.
- 40 AFOS Vector Graphic to Grid Point Program. James R. Fors, December 1982.
- 41 A Pilot Briefing Program for the Background Partition. Kenneth B. Mielke and Joe L. Johnston, March 1983
- 42 VERDAT and Four Local Verification Routines: TEM, BRI, REL, AV. Lawrence B. Dunn, September 1983.

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