# User's Guide to the MESOI Diffusion Model and to the Utility Programs UPDATE and LOGRVU

G. F. Athey K. J. Allwine J. V. Ramsdell

November 1981

Prepared for the U.S. Department of Energy under Contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
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#### ABSTRACT

MESOI is an interactive, Lagrangian puff trajectory diffusion model. The model is documented separately (Ramsdell and Athey, 1981); this report is intended to provide MESOI users with the information needed to successfully conduct model simulations. The user is also provided with guidance in the use of the data file maintenance and review programs; UPDATE and LOGRVU. Complete examples are given for the operation of all three programs and an appendix documents UPDATE and LUGRVU.

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# USER'S GUIDE TO THE MESOI DIFFUSION MODEL AND TO THE UTILITY PROGRAMS UPDATE AND LOGRVU

#### INTRODUCTION

MESOI is an interactive, Lagrangian puff trajectory diffusion model. It is an interactive version of the MESO model, and both models are direct derivatives of the Lagrangian puff trajectory model developed by Start and Wendell (1974) for the National Reactor Testing Station in Idaho. The MESOI model is documented separately (Ramsdell and Athey, 1981); this report is intended to provide MESOI users with the information needed to successfully conduct model simulations. The user is also provided with guidance in the use of the utility programs UPDATE and LOGRVU. UPDATE maintains files of meteorological observations and forecasts for use by MESOI, and LOGRVU provides a means of monitoring UPDATE use.

The user's guide is divided into two parts, the first deals with MESOI, and the second covers UPDATE and LOGRVU. Each part starts with a description of the program as it appears to the user in an interactive session. This discussion is followed by instruction in the details of program execution and covers accessing the computer, starting program execution, entering required information and signing-off the computer. Complete examples are given in each part. An appendix contains a short discussion of the UPDATE and LOGRVU programs and a complete listing of each program.

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#### MESOI (Version 1.0, October 1981)

MESOI is designed to operate on the Boeing Computer Services Richland (BCSR) UNIVAC 1100 with communication via a video display terminal and modem. The program uses video terminal cursor control that may be unique to a Televideo 912 terminal. However, no unusual output problems should occur with other terminals. No card input is required: all information is entered from the terminal keyboard. Once execution of MESOI is started, all the user must do is respond to prompts for information. The program contains a set of default conditions which can greatly simplify startup.

Interactive sessions with MESOI consist of three phases: initialization, simulation and output. In the initialization phase the user has the opportunity to modify the wind grid, specify model control parameters, enter off-grid receptors at positions of interest and specify source parameters. The simulation pauses at the end of each hour to give the user the opportunity to view the results. Several output options are available at this time. The user may also choose to continue the simulation for another hour or stop the simulation.

Figure 1 shows the general flow of MESOI. Most of the user-model interaction takes place during the initialization phase. Once an interactive session begins the user is led through the initialization phase by a series of computer prompts requesting information. The first set of prompts deals with the wind grid. MESOI has a default grid that consists of a  $16 \times 16$  array of points with a 5 km spacing between points. If the default grid is satisfactory, no change is necessary. Otherwise, a new spacing can be entered .

There are 22 predefined wind stations within the MESOI grid. If these stations are operational, their status is set to 0; a status other than 0 indicates that the station is not operational. The default status for the wind stations is 0. The user may add new wind stations to a total of 30. New stations may also be substituted for predefined stations.

When the user is satisfied with the wind stations, the program asks if the user wishes to change the wind interpolation radius. The interpolation radius

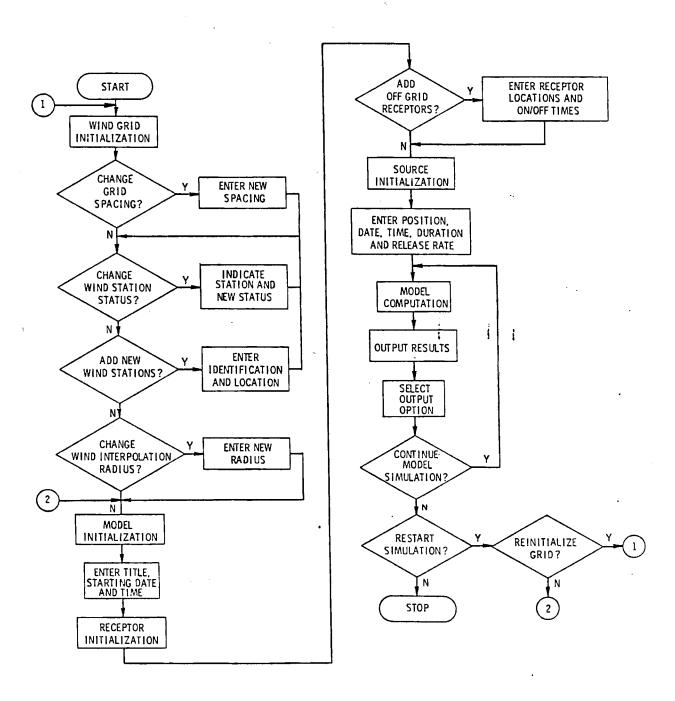


FIGURE 1. General Flow of MESOI

is the maximum distance, in grid units, that the program will normally search for wind stations for use in the wind interpolation at grid points. The default interpolation radius is 5 grid units (25 km with the default grid spacing). Increasing the radius corresponds to an implicit assumption that the wind stations are representative for larger distances. An increase may be required if low data recovery rates limit the number of stations for which data are available.

Once the wind grid initialization is complete, the computer requests information on the simulation to be completed. This information includes a descriptive title and the date and time for starting the wind field interpolation. Wind field interpolation takes place hourly, and may be begun prior to the time of release.

During the modification of MESO, provision was made for the addition of receptors at off-grid locations. As many as ten of these receptors can be added during the initialization phase by specifying the receptor locations and their time schedule. Exposures at the off-grid receptors are computed by interpolation from surrounding grid points. These exposures may cover periods from 1 to 24 hours in duration. The use of off-grid receptors is optional.

Source initialization completes the initialization phase. In source initialization, the user specifies the release position relative to the Hanford Meteorological Station and a date and time for the start of the release. If the release is of finite duration, the duration may be entered. If the duration of release is unknown, a continuous release is assumed as a default condition. If the release rate is known it may also be entered. In the event that the release rate is unknown (likely in most cases), a unit release rate is included as a default option.

As soon as the initialization phase is completed, the program automatically enters the simulation phase. The simulation is interrupted each hour to provide the user with an opportunity to view the results. Options available to the user at this time include a display on the terminal screen and/or printer output. If the display option is selected, the program pauses following the data presentation. The simulation resumes on user command. The user may also choose to exit at this point.

The instruction sequences needed to gain access to the UNIVAC computer, to start and stop MESOI execution and to terminate the connection with the UNIVAC are fully described in the next section. They are followed by an example that shows the computer prompts and user responses for an interactive session. The example is annotated to clarify the meaning of the prompts and responses where there might be confusion. Four data sets, assembled to provide users with practice in the use of MESOI, are described at the end of the discussion of MESOI.

#### UNIVAC CONTROL SEQUENCES FOR MESOI

Use of MESOI model requires access to the UNIVAC computer operated for the Department of Energy by BCSR. This section provides instructions on how to gain access to the computer, start program execution, terminate program execution and disconnect the computer. It consists of step-by-step instructions with both computer messages to the user and appropriate user responses.

Messages from the computer and responses are shown in upper case characters. Responses can be distinguished from messages because they end with a carriage return, which is indicated by the symbol <CR>. If an error is made in any response and is noticed before the <CR>, it can be corrected by using the backspace key and retyping the entry from the point of the error. The system prompt character ">" indicates that the computer expects a response from the user. Responses that indicate computer account numbers, project identifications, and terminal identifications, etc., show the proper form for the response. The numbers are, of course, fictitious. Each user must make arrangements with BCSR for a set of correct identification numbers.

Annotation interspersed with the computer messages and user responses can be identified by the normal combination of upper and lower case characters.

#### LOGIN Procedure

MESOI is available on System B of the BCSR UNIVAC via a dial-up connection. The following steps permit the user to gain access to the computer.

- 1. Check that modem and terminal are set for proper baud rate.
- 2. Dial the UNIVAC computer number (376-7676 for 1200 baud port).
- 3. When the carrier signal is heard, depress data button on phone and hang up. The computer should respond with:

```
PORT____SIGNON - SYSA(4x2) UP SYSB(4x2) UP TYPE TID or @@ HOST CARD
```

4. Type: @@HOST SYSB <u>TID</u> <CR>
where TID = terminal ID, e.g., CRT123
If SYSB is available the computer should respond:
ENTER USERID/PASSWORD

>

If the connection is terminated or there is no response, try again immediately. If there are continued problems, call BCSR Customer Service on 376-7804.

5. Type in ID and password, e.g., BCW122/ABC <CR>
Computer responds: ENTER PROJECT-ID

>

- 6. Type a <CR> unless your account requires a separate entry.
- 7. Type in user name and address, e.g., LJ JONES/BNW 622R <CR>
   The computer will respond with system bulletins and then give the system prompt '>'. You are now ready to run programs.

#### Starting MESOI Execution

The execution of MESOI, discussed in the following section, requires two data files. They are an observed meteorological data file (MDATA.) and a forecast data file (FDATA.). Programs UPDATE and LOGRVU may be used to make sure these files are available and contain current information. Once access to the UNIVAC has been established, a single command line @ADD MESOGO. starts the interactive session. The command @ADD MESOGO. initiates the following command sequence:

Lomman	n

Purpose

@ASG,A MDATA. @USE 10., MDATA. @ASG,A FDATA. @USE 11., FDATA.

Attaches the observation and forecast data files and assigns logical unit numbers  $% \left( 1\right) =\left( 1\right) +\left( 1\right) +$ 

@ASG,UP OUTL.
@USE 12., OUTL.
@ASG,UP TEMP7.
@USE 7., TEMP7.
@ASG UP TEMP9.
@USE 9., TEMP9.

Opens files for output listings and temporary data storage; assigns logical unit numbers

**@XQT MESOI.** 

Executes the absolute version of the MESOI. code

The system should respond with 10 READY messages, clear the screen, then display the MESOI header message.

#### Stopping MESOI Execution

The model execution stops normally under the following circumstances:

48 hours of simulation

user selected termination (output option=4)

various data or input errors

In these cases, messages make it clear that processing has stopped. They are followed by the system prompt '>'.

At some time it may become necessary to stop execution at a nonstandard point. If the program is producing output to the screen; hit the break key until the system responds with OUTPUT INTERRUPT. When the system is awaiting input, key in

@@X TIOC <CR>

This returns control to the user.

Following an abnormal termination of MESOI, the data files must be reset if an immediate restart is desired. This is accomplished with the command @ADD FREDEL. It frees all logical units and deletes all files created during the run. The command @ADD FREDEL adds the following string of commands:

@FREE 10.

@FREE 11.

0FREE 12.

@FREE 7.

@FREE 9.

@DELETE OUTL.

@DELETE TEMP7.

@DELETE TEMP9.

The @ADD FREDEL. command may also be used to delete printer output following normal program termination. To assure that all files are properly set for future model executions, after a normal termination the command @ADD MESOND1. <CR> is available. It adds the following sequence:

Command	Purpose
@FREE 7. @FREE 9. @FREE MDATA. @FREE FDATA. @FREE OUTL.	release all files in use
@SYM OUTL.,1, RMSUØ6	route output listing to 622R printer
@START CONTUR1.	submit a batch job to run the NEWCONTUR program
@ASG,A MSG1. @USE 20., MSG1. @XQT REMIND.	attach the proper message file and execute the reminder program

There are two versions of the end routines: MESOND1. and MESOND2. MESOND1. is designed to be used for practice or routine executions. MESOND2. routes output to both the 622R printer and the BCSR printer in the Federal Building. This second routine uses the '2' versions of CONTUR and MSG.

Each time the ending commands are added, a batch job is submitted to execute the NEWCONTUR program. Documentation of NEWCONTUR is not available. The command structure of the CONTUR file is shown as follows:

```
@RUN CONTUR, BCW /BCW /, BCW .
@IDENT. name/address
                                     Name of user/location of user
@ASG, A TEMP7.
@USE 7., TEMP7.
                                     attach the files created by MESOI and assign
@ASG,A TEMP9.
                                     logical unit numbers
@USE 9., TEMP9.
@ASG,UP TEMP.
                                     open an output file
@BRKPT PRINT$/TEMP
@XQT BCW643 * NEWCONTUR.
                                     execute NEWCONTUR, putting output into file
@BRKPT PRINT$
                                     marked TEMP
@FREE 7.
@FREE 9.
                                     release and delete the files
@DELETE TEMP9.
@DELETE TEMP7.
@FREE TEMP.
                                     release TEMP file and route to printer
@SYM TEMP., 1,RMSUO6
@END
```

After the batch job is entered, the REMIND program is executed. It displays the contents of the message file (MSG1. or MSG2.) on the terminal screen. It serves to acknowledge submission of the NEWCONTUR job and to remind the user of any further actions that might be required. The message files can be changed by editing the file. Lines of up to 80 characters are acceptable to the REMIND program.

After adding either version of MESOND, the user may start execution again with the @ADD MESOGO. command, proceed to other work, or logout.

Problems can occur when a user uses successive sequences of MESOGO and MESOND\_\_. or EXPGO\_\_. and EXPND\_\_. Each time execution is started, the output file OUTL. is created. Normally, the file is printed immediately and automatically deleted following program termination. If the printer is down or offline, the system retains the file, and an error message will occur when MESOI tries to write the existing OUTL. file. The error message will generally be:

FTN ERR ON UNIT 12

STATUS CODE XX

The program terminates upon this error. Before MESOI can be run again, the user must correct the problem by either having the file printed or removing it from the output queue.

#### Logout Procedures

When the user completes work on the system, the following sequence of commands is used to logout.

- If a summary of terminal session charges is desired, proceed to step #2.
   If not, enter
   @@SKIP 20 <CR>
  - System will respond with '>'
- Enter @FIN <CR>System responds with 'TERMINAL INACTIVE'
- 3. Enter @@TERM <CR>
  Phone connection should be broken automatically.

#### USER INTERACTION WITH MESOI

When the user enters the @ADD MESOGO. command the UNIVAC will attach the files needed by MESOI and assign the logical unit numbers to disk drives. Successful completion of these tasks is signaled by the 10 READY messages from the computer. The messages are cleared from the screen and the MESOI header message shown below is displayed. The prompt symbol indicates that the computer is ready to begin interactive data entry.

Data entry is relatively simple. If illegal characters are entered, the program prompts for input again. If more than one value is requested, the values may be entered with commas between values or individually in response to multiple prompts. Where possible (e.g., dates or times), checks are made to assure that realistic numbers have been entered. After extensive entry of information, user review usually occurs. However, with single parameter entries, only one opportunity for change is provided. If a bad value is entered and accepted by the program, the user may have no choice but to terminate execution and restart.

MESOI is set up with the following conditions as default:
wind grid size of 16 x 16
grid spacing of 5000 meters
22 wind stations; all active
interpolation radius of 5 grid units
no off-grid receptors

source term unknown--unit release

These conditions are used unless changed by the user. Dates, times and titles must be entered for each simulation.

The following example illustrates the prompts and responses during execution of MESOI. The grid size and spacing will remain the same. Two stations will be disabled and three new stations added. Simulation starts at 5 AM on June 3, 1981. Two off-grid receptors are set up to operate between 7 AM and 2 PM. A unit release of 4 hours duration beginning at 5 AM on June 3rd is simulated.

After entry of @ADD EXPGO1., the following sequence occurs: (carriage returns are assumed after all user entries and pauses). The @ADD EXPGO1. command is used to gain access to one of the sets of test data.

MESOI - THE INTERACTIVE VERSION OF MESO

VERSION 1.0 OCTOBER 1981

TIME = 093027 (current time)

DATE = 082681 (current date)

PAUSE HIT RETURN TO CONTINUE >

MESO--→GRID INITIALIZATION

THE CURRENT WIND GRID IS:

16 ROWS 16 COLUMNS

DELXY = 5000 METERS

DO YOU WANT A DIFFERENT GRID SPACING? Y OR N

>Y

SPECIFY NEW DELTA XY (IN METERS)

>1000

MESO--→STATION INITIALIZATION

THERE ARE CURRENTLY 22 STATIONS WITH O DISABLED

	STA NAME	GRIDX	GRIDY	STATUS
1	PROS	9.80	4.40	0
2	EOC	8.70	4.60	0
3	ARMY	8.30	6.00	0
4	RSPG	6.20	6.80	0
5	EDNA	10.10	7.90	0
6	200E	8.60	7.50	0
7	200W	7.20	7.20	0
8	WAHL	4.90	11.10	0

	STA NAME	GRIDX	GRIDY	STATUS
	(contd)	(contd)	(contd)	(contd)
9	FFTF	9.70	5.20	0
10	YAKB	6.00	7.90	0
11	300A	11.30	4.20	0
12	WYEB	9.90	5.90	0
13	100N	7.90	9.50	0
14	WPPS	11.10	5.60	0
15	FRNK	12.10	5.00	. 0
16	GABL	9.00	8.20	0
17	RING	11.60	7.10	0
18	RICH	11.20	3.10	0
19	SAGE	11.10	9.20	0
20	RMTN	7.70	3.60	0
21	H <b>M</b> S	7.50	7.50	0
22	PASC	13.80	2.10	0

ANY CHANGES TO STATUS FLAGS? Y OR N

>Y

HOW MANY STATIONS TO BE CHANGED?

>2

ENTER STATION NUMBERS TO BE CHANGED --- N,N,N...

>1,3

THERE ARE CURRENTLY 22 STATIONS WITH 2 DISABLED

(Station list is repeated; status of PROS and ARMY is now 1)

ANY CHANGES TO STATUS FLAGS? Y OR N

>N

ANY STATIONS TO BE ADDED? Y OR N

>Y

HOW MANY STATIONS TO BE ADDED?

>3

EACH STATION SPECIFICATION MUST INCLUDE:

STATION ID -- 4 CHARACTERS

X AND Y DISTANCES IN KILOMETERS FROM HMS

SPECIFY 4 CHARACTER NAME FOR STATION 1

>XYZ1

SPECIFY X AND Y DISTANCES FOR STATION 1

>134, -5.80

(The last two prompts will be repeated for each station to be added. Illegal entries, e.g., letters, blanks, etc., will cause a prompt to repeat) STRAY: STATION ARRAY SET UP FOR EACH GRID POINT 23 ACTIVE STATIONS (This message indicates that the final wind station changes have been completed) INTERPOLATION RADIUS IS 5.0 GRID UNITS DO YOU WANT TO CHANGE THE RADIUS? >N \*\*END GRID INITIALIZATION\*\* PAUSE HIT RETURN TO CONTINUE > MESO--→PRIMARY INITIALIZATION ENTER RUN IDENTIFICATION TITLE OF UP TO 50 CHARACTERS >MESO TEST ENTER DATE FOR START OF SIMULATION---→MMDDYY >060381 JULIAN DATE = 154 1981 ENTER HOUR FOR START OF SIMULATION >6 METEOROLOGICAL DATA FILE SEARCH--OBSV FILE POSITIONED AT: DAY 154 HOUR 6 RECORD 1 FORECAST FILE STARTS AT: DAY 155 HOUR 1 RECORD 1 PAUSE HIT RETURN TO CONTINUE > MESO---→RECEPTOR INITIALIZATION DO YOU WISH TO SET UP RECEPTORS? Y OR N >Y SPECIFY X AND Y COORDINATES OF RECEPTOR 1 IN KILOMETERS FROM HMS HIT A TO END INPUT MODE >-7.5, -7.5 SPECIFY X AND Y COORDINATES OF RECEPTOR 2 IN KILOMETERS FROM HMS HIT A TO END INPUT MODE

END RECEPTOR INITIALIZATION

>7.9

ENTER RECEPTOR ON AND OFF TIMES IN HOURS (01-24)

```
PAUSE HIT RETURN TO CONTINUE >
 MESO---→RELEASE INITIALIZATION
 SPECIFY COORDINATES (X,Y) OF SOURCE IN KILOMETERS FROM HMS
 >-12.5, 12.5
 ENTER DATE OF RELEASE--->MMDDYY
>060381
 HOUR OF RELEASE? 1-24
 >6
MINUTE OF RELEASE? 0-59
 >0
 DURATION OF RELEASE? HOURS, MINUTES IF CONTINUOUS ENTER C
 >1, 30
 9 PUFFS WILL BE RELEASED
 IS THE SOURCE TERM KNOWN? Y OR N
 >N
```

At this time, initialization is complete and simulation begins on an hourly basis. At the end of each hour the following information is displayed:

END OF SIMULATION HOUR 1 DATA: DAY 154 HOUR 6 6 PUFFS ACTIVE

SELECT OUTPUT OPTION FOR THIS HOUR---

0 = NO OUTPUT

1 = SCREEN ONLY

2 = PRINT FILE ONLY

3 = SCREEN AND PRINT FILE

4 = TERMINATE CURRENT SIMULATION

The user must select from this menu after each hour. The screen display shown gives a simple plot of the integrated concentrations (CHI array) using the numerical symbols below as a key. The X indicates the location of the source and M denotes the location of the meteorological tower.

Integrated Concentration	Symbol Displayed
$\chi$ < 1.0E-17	blank
$1.0E-17 \le \chi < 1.0E-16$	0
$1.0E-16 \le \chi < 1.0E-15$	1
$1.0E-15 \le \chi < 1.0E-14$	2
$1.0E-14 \le \chi < 1.0E-13$	3
$1.0E-13 \le \chi < 1.0E-12$	4
$1.0E-12 \le \chi < 1.0E-11$	5
$1.0E-11 \le \chi < 1.0E-10$	6
$1.0E-10 \le \chi < 1.0E-9$	7
1.0E-9 $\leq \chi < 1.0E-8$	8
1.0E-8 $\leq \chi < 1.0E-7$	9
1.0E-7 $\geq \chi$	+

### Example:

MESO TEST (title)	090181 (current date)	073041 (current time)
SIMULATION HOUR 1	DAY 154	HOUR 6
6 PUFFS ACTIVE		
* * * * * * * * * * *	* * * *	
*	*	
*	*	
*	*	
*	*	
* X	*	
* 888	*	
* 45654	*	
*	*	
*	*	
*	*	
*	*	
*	*	
*	*	
*	*	
*	*	
*	*	
* * * * * * * * * * * *	* * * * *	

#### PAUSE HIT RETURN TO CONTINUE >

When no further simulation is desired, terminate the session by selecting output option 4. The following message/response sequence will then occur:

END OF SIMULATION

MESO TERMINATED BY USER PRIOR TO 48 HOUR MAX

DO YOU WISH TO RESTART? Y OR N

>N

STOP END MESOI EXECUTION--ADD END FILE

Control has now been returned to the UNIVAC system. Any further simulation must begin with an @ADD . command.

If a response of  $\ensuremath{^{'}Y'}$  is given to the restart query, the system responds with:

DO YOU WISH TO REINITIALIZE THE GRID? Y OR N

A response of 'Y' returns the program to the beginning of the grid initialization. Any other response returns the program to the primary model initialization, skipping the grid initialization. Execution continues using the grid specifications of the previous run.

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	•	
		-

#### PRACTICE SESSIONS WITH MESOI

There are four data files and command groups available for use in testing the model or for use in practice sessions. Each group consists of a meteorological data file, a forecast data file, a start execution file, and a termination file. The characteristics of each group are summarized below.

 A very simple data set with spatially uniform and temporally constant conditions

stability = 6 mixing level = 400 meters wind direction = 0°

wind speed = 5 mph

Observed and forecast data files are identical: 48 hours of data beginning at hour 01 on 3 June, 1981.

Data file names: MDATA1. FDATA1.

Execution and termination file names: EXPGO1. EXPND1.

2. A simple data set that uses both the observed and forecast data files.

stability = 4 mixing level = 200

mixing level = 2000 meters

wind direction = 315°

wind speed = 10 mph

The observed data file begins at hour Ol on 3 June, 1981. After 36 hours, the day is set to = 888 to indicate no further observations. The forecast file begins at hour Ol on day 4 June 1981 and contains 48 hours of the described data.

Data file names: MDATA2. FDATA2. Execution and termination file names: EXPGO2. EXPND2.

3. A data set similar to number 2, except the wind direction shifts 90° after 24 hours.

stability = 4

mixing level = 200 meters

wind speed = 7 mph

wind direction = 315° during 1st 24 hours

= 225° during 2nd 24 hours

Observed and forecast data files are identical; 48 hours beginning at hour 01 on 29 July, 1981.

Data file names: MDATA3. FDATA3.

Execution and termination file names: EXPGO3. EXPND3.

4. A data set with 48 hours of actual meteorological observations. Observed and forecast data files are identical; beginning at hour 01 on 15 December, 1978.

Data file names: MDATA4. FDATA4.

Execution and termination file names: EXPGO4. EXPND4.

The sample display presentation shown in the previous section was obtained using the first practice data set. Sample simulations have been completed with the remaining three practice data sets. In each of the simulations the default wind grid was used, and the data sets were used without modification. Table I gives the values of the variable parameters used in each simulation. Terminal display presentations at selected times in the simulations are shown to provide users with a means for rapidly checking their results.

TABLE 1. MESOI Control Parameter Values for Practice Runs

Data Set	2	3	4
Starting Date	060381	072981	121578
Starting Time	01	22	01
Off-grid Receptors	N	Υ	Υ
		-15.25,.25	-20.25,20.25
		-2525	20.25,20.25
		10.25,10.25	-20.25,-20.25
			20.25,-20.25
Receptor Times (On/Of	f)	22/03	01/06
Source Point	-20.25,20.25	-25.25,10.25	-1.0,1.0
Release Date	060381	072981	121578
Release Hour	01	22	01
Release Minute	0	0	30
Duration of Release	1,0	С	3,30
Source Term	N	<b>N</b> '	N
Time of Output (Simulation hours)	3	3,6	6

1. Practice data set 2, Simulation hour 3

Day 154 Hour 4 6 Puffs Active

2. Practice Data Set 3, Simulation Hour 3

Day 211 Hour 1 18 Puffs Active Practice Data Set 3, Simulation Hour 6

```
5 4 2
                5
                5
                   5 5 4 2
              6
                                                     Day 211 Hour 4
             5 5 5 5 5 5 4 2
5 5 5 5 5 5 4 2
5 5 5 5 5 4 2
5 5 5 5 5 4 2
     4 7 6
                                                     36 Puffs Active
           6
  8 6 6
          6
          6
X 8 6 6
             5 5 5 4 1
     7 6
           6
     3 6 6 5M5 4
        4 6 5 4
           2 2
```

The exposures at the off-grid receptors at the end of their sampling period were: Receptor 1 --- 9.41 E-11  $hr/m^3$ , Receptor 2 --- 8.01 E-12  $hr/m^3$ , and Receptor 3 --- 5.73 E-12  $hr/m^3$ .

4. Practice Data Set 4, Simulation Hour 6.

The exposures at all off-grid receptors were less than  $10^{-17}$  hr/m<sup>3</sup>.

#### UPDATE AND LOGRVU USE

UPDATE is an interactive computer program used for building, reviewing and modifying the observation and forecast data files called by MESOI. Each file contains up to 48 hours of stability, mixing height and wind data.

Meteorological observations are entered into the observation file as they become available. Up to 48 hours of observations can be maintained in the file. The first observation in the file is always hour 1 of day 1 and the 25th observation is hour 1 of day 2. Upon entry of the 49th observation, the first day's data are written to a backup disk file named ARCHIV. A batch job is automatically submitted under the name ARCHUP. to update the archived data files. The first 24 hours of data are then dropped from the active observed data file and are replaced by the second day's data, and the new observation will then be entered as the 25th observation in the file (2nd day, 1st hour). Subsequent observations will be entered as observations 26 through 48 until another day is complete, at which time the cycle will repeat. Twenty-five hours of observed data will always be maintained on the file. Data will continue to accumulate in the archive file until deleted.

The forecast data file contains 48 hours of forecast stability, mixing height and wind data. This file can start at any hour of the day. For example, a forecast file starting at hour 9 on July 25 will end on hour 8 on July 27 (48 hours). Forty-eight hours of forecast data will always be maintained in file.

UPDATE is a highly user-oriented computer program installed on a UNIVAC 1100 system. Once the user starts UPDATE all that is necessary is to answer questions with "Y" (Yes) or "N" (No) and enter the appropriate meteorological data. The date and time, user ID and type of activity, i.e., "New Obs", "Rev Obs", "New Fcst" or "Rev Fcst", are automatically recorded in the appropriate log file. These files can be reviewed by running the program LOGRVU.

The logic flow chart for program UPDATE is given in Figure 2. Upon starting the program the user is asked to enter a user identification (e.g., user's last name). After this the user is asked "DO YOU WISH TO ENTER OR REVISE

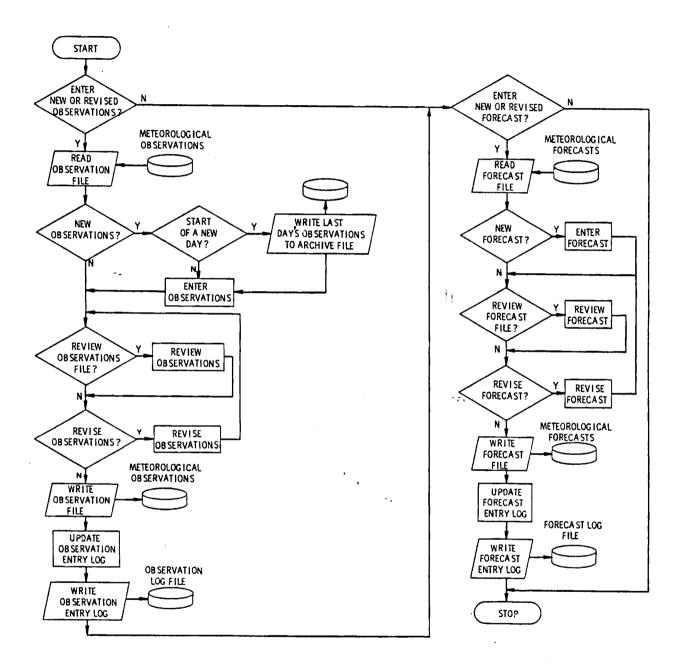


FIGURE 2. UPDATE Flow Chart

OBSERVED DATA?". If the answer is 'no', the program goes to the forecast half of the program. If the answer is 'yes', the question "DO YOU WISH TO ENTER A NEW SET OF OBSERVATIONS?" is displayed. A 'yes' causes control to pass to the new observation entry portion of the program. After entry of the new data, the user has the opportunity to review and revise the contents of the observed data file. The contents of the observed data file may also be reviewed and revised without initially entering a new set of observations. If revisions are made, the user is given the option to review the data at the completion of the revision session. This process of revise-review can occur as many times as the user wishes.

When the user no longer wishes to review or revise entries in the observed data file control passes to the forecast half of the program. The program logic in the forecast half is identical to the logic in the observation half.

In either the observation or the forecast portion of the program, once control is passed from the "NEW" entries section, it cannot be accessed again.

Additional new entries can be made by simply rerunning the UPDATE program.

The user's guide to UPDATE and LOGRVU is divided into two sections. The first describes the command sequences required to gain access to the UNIVAC computer, initiate program execution and disconnect the computer at the end of the session. Much of the material in this section is a review of information presented earlier. The second section of the guide is an example of the sequence of prompts and responses in a typical interactive session. The computer codes for UPDATE and LOGRVU are presented in Appendix A.

#### UNIVAC CONTROL SEQUENCES FOR UPDATE AND LOGRVU

The control sequence to gain access to the UNIVAC for a session with UPDATE or LOGRVU is the same as the sequence used for MESOI with the exception of the @ADD command. The sequence is reviewed here. The proper @ADD commands are given for normal use of the programs and for use with practice files.

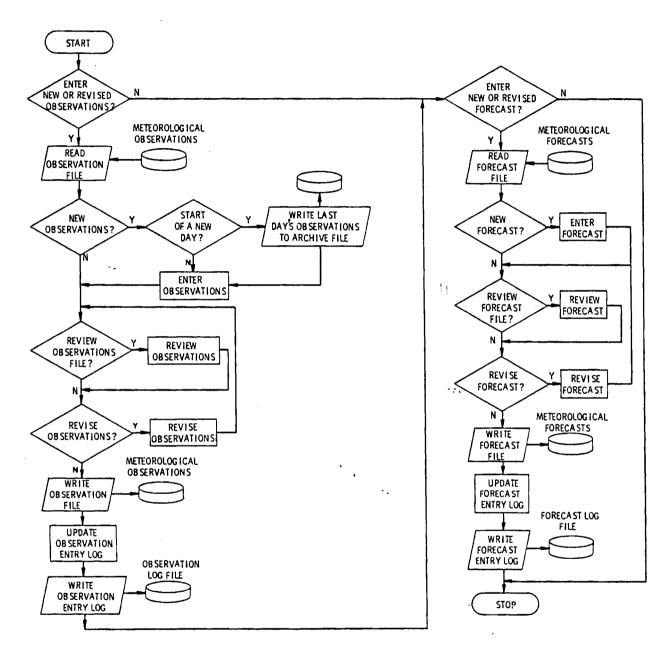


FIGURE 2. UPDATE Flow Chart

#### Starting Program Execution

To start the programs it is necessary to assign the data files and give an execute command. This can be accomplished with the following sequence. The first is for routine use, and the second is for practice.

- 1. Complete the login procedure
- 2. Key in:

@ADD UT. <CR>

3. To run UPDATE, key in:

@XQT MESOUT.UPDATE <CR> (A)

To run LOGRVU, key in:

@XQT MESOUT.LOGRVU <CR> (B)

UPDATE and LOGRVU can be run any number of times by simply re-entering steps (A) and (B).

4. Complete the logout procedure.

Dummy observation, forecast and log files (MDATAP., FDATAP., MDLP., FDLP.) have been set up so the user can practice using UPDATE and LOGVU without disturbing the working observation and forecast files.

These practice files are made available by using the following procedure:

- 1. Complete login
- 2. Key in:

@ADD UTPRA. <CR>; system resonds with 8 READY messages

3. To run UPDATE, key in:

To run LOGRVU, key in:

UPDATE and LOGRVU can be run any number of times by simply re-entering steps (A) or (B).

Complete logout procedure.

#### Logout Procedure

The procedure for disconnecting the terminal is the same for UPDATE and LOGVU as it was for MESOI. The sequence of commands is repeated here for completeness.

```
Key in
  @@SKIP 20 <CR> (to avoid the summary listing of terminal session charges)
  @FIN <CR> (deactivates terminal)
  @@TERM <CR> (terminates the communication link)
```

#### INTERACTIVE SESSIONS WITH UPDATE AND LOGRVU

The use of the interactive utility UPDATE and LOGRVU programs is straight-forward. It involves yes and no answers to control program options and entering data when requested. As in MESOI, Y and N can be substituted for yes and no.

#### Entering, Reviewing and Revising Observations

In order to demonstrate the use of UPDATE a step by step example is presented below. The example consists of entering new observations for one hour, reviewing the observations and correcting one entry. The data to be entered are:

```
date - July 25, 1981
time - hour 9
stability - 4
mixing height - 600 m (then corrected to 550 m)
winds at all 22 stations - 315 degrees at 7 mph
```

It is assumed that the existing observed data file is complete up to hour 8 of July 25, 1981.

The following sequence traces the computer requests and corresponding user responses once the execution of UPDATE has started. The user responses are to the left of the computer prompt symbol ">". All user entered values must be followed by pushing the console RETURN key. The RETURN, though, will be omitted for simplicity.

MESOUT VERSION 1.0 OCTOBER 1981

ENTER USER IDENTIFICATION. USE A MAXIMUM OF 8 CHARACTERS

>JONES

METEOROLOGICAL DATA ENTRY PROGRAM FOR MESOI

DO YOU WISH TO ENTER OR REVIEW OBSERVED DATA? ENTER Y OR N

>Y

ENTER YEAR OF OBSERVATION TO BE ENTERED: YY

>81

THE MONTH, DAY AND HOUR OF THE LAST OBSERVATION ENTERED ARE: 7 25 8 .

THE NEW ENTRIES MUST FOLLOW THIS TIME.

ENTER MONTH AND DAY OF OBSERVATION TO BE ENTERED: MM,DD (E.G. - 7,25).

>7,25

ENTER HOUR OF THE OBSERVATION: HH

>9

THE DATE AND HOUR FOR OBSERVATION TO BE ENTERED ARE; 72581 9 ARE THESE CORRECT? ENTER Y OR N.

>Y

THE JULIAN DATE OF THE DATA IS 206 ENTER STABILITY CLASS: 1 THROUGH 7.

>4

ENTER MIXING DEPTH IN TENS OF METERS:

1 THRU 300.

>60

ENTER WIND DATA AS DDDFF, WITH 00000=CALM and 99999=MISSING.

DO NOT USE LT/VAR, USE CALM, OR ESTIMATE THE AVERAGE SPEED AND DIRECTION.

ENTER WIND FOR PROS BAR

>31507

ENTER WIND FOR ARMY LPR

>31507

(and so on for the other stations.)

DO YOU WISH TO ENTER OBSERVATIONS FOR ANOTHER TIME?

>N

DO YOU WISH TO REVIEW THE OBSERVED DATA FILE

>Y

DO YOU WISH TO REVIEW THE ENTIRE OBSERVED DATA FILE?

>N

DO YOU WISH TO REVIEW DATA FOR SPECIFIC HOURS?

>Y

ENTER DATE OF DATA TO BE REVIEWED: MM,DD,YY

>7,25,81

ENTER HOUR OF THE DATA TO BE REVIEWED: HH

>9

DATA ARE DISPLAYED IN THE FOLLOWING ORDER:

JULIAN DATE, HOUR, STABILITY, MIXING DEPTH, WINDS.

THE ORDER OF THE WIND DATA IS:

PROS BAR EM RE CE ARMY LPR RATT SPR EDNA 200E
200W WAHL SLP FFTF YAK BARR 300 AREA WYE BARR
100N WPPSS FRANK CO GABLE MO RINGOLD RICH AP
SAGEHILL RATT MTN HA MT ST PASCO

"206 9 4 60 31507

TYPE N <CR>FOR NEXT RECORD OR JUST <CR> TO EXIT DO YOU WISH TO REVIEW ADDITIONAL HOURS?

>N

DO YOU WISH TO REVISE ANY DATA ENTRIES?

>Y

ENTER DATE OF OBSERVATION TO BE REVISED: MM,DD,YY. >7,25,81

THE JULIAN DATE FOR THE REVISION IS 206
ENTER HOUR OF THE OBSERVATION TO BE REVISED: HH.

A 99 CAN BE USED TO ESCAPE FROM THE DATA REVISION SUBROUTINE

>9

"206 9 4 60 31507

IS THIS THE RECORD TO BE REVISED? Y OR N

>Y

REVISIONS TO WIND DATA ONLY? Y OR N

>N

DO YOU WISH TO REVISE THE STABILITY?

>N

DO YOU WISH TO REVISE THE MIXING DEPTH?

>Y

ENTER REVISED MIXING DEPTH IN TENS OF METERS: 1 THRU 300.

>55

DO YOU WISH TO REVISE WIND DATA?

>Y

ENTER STATION NAME TO BE REVISED, 1 - 22 0 = EXIT

>4

ENTER REVISED WIND DATA FOR RATT SPR.

>34509

ENTER STATION NAME TO BE REVISED, 1 - 22 0 = EXIT

>0

DO YOU WISH TO REVISE ANOTHER RECORD?

>N

DO YOU WISH TO REVIEW THE OBSERVED DATA FILE?

>N

DO YOU WISH TO ENTER OR REVISE FORECAST DATA?

>N

THIS UPDATE SESSION IS OVER.

As can be seen from the preceeding example the use of UPDATE merely involves responding to a series of questions.

# Entering, Reviewing and Revising Forecasts

The following example demonstrates entering, reviewing and revising fore-cast data. The forecast starts with hour 10 of July 25, 1981 and ends at hour 9 of July 27, 1981.

```
The forecast is:

period - 1000 through 1600 July 25.

stability - 3

mixing height - 1000 m.

winds at all stations - 315 at 7.

period - 1700 July 25 through 0900 July 27

stability - 4

mixing height - 500 m

winds at all stations - 270 at 10.

The revision to be entered is:

period - 1500 July 25 through 400 July 26

stability - 5.

mixing height - 300 m

winds at all stations - no change.
```

The following sequence traces the computer requests and corresponding user responses for the example. The user responses are to the left of the computer prompt symbol ">". All user entered values must be followed by pushing the console RETURN key. The RETURN, though, will be omitted for simplicity.

```
MESOUT VERSION 1.0 OCTOBER 1981

ENTER USER IDENTIFICATION. USE A MAXIMUM OF 8 CHARACTERS.

>JONES

METEOROLOGICAL DATA ENTRY PROGRAM FOR MESOI

DO YOU WISH TO ENTER OR REVISE OBSERVED DATA?

>N

DO YOU WISH TO ENTER A NEW FORECAST?

>Y
```

ENTER START DATE OF NEW FORECAST: MM,DD,YY (E.G. - 7, 29, 81).

>7,25,81

ENTER START HOUR OF NEW FORECAST: HH.

>10

THE JULIAN DATE OF THE FORECAST IS 206.

ENTER STABILITY CLASS: 1 THROUGH 7.

>3

ENTER MIXING DEPTH IN TENS OF METERS: 1 THRU 300.

>100

ENTER WIND FCST AS DDDFF, WITH 00000=CALM AND 99999=MISSING.

DO NOT USE LT/VAR, USE CALM OR ESTIMATE THE AVERAGE SPEED AND DIRECTION. ENTER WIND FOR PROS BAR

>31507

ENTER WIND FOR EM RE CE

>31507

ENTER WIND FOR ARMY LPR

>31507

(and so on for the other stations.)

DO YOU WISH TO ENTER FORECASTS FOR ANOTHER TIME?

> Y

ENTER DATE OF FORECASTS TO BE ENTERED: MM,DD,YY

>7,25,81

ENTER HOUR OF THE FORECAST: HH

>17

THE JULIAN DATE OF THE FCST IS 206.

THE CURRENT STABILITY FCST IS 3 DO YOU WISH TO

REVISE THE FCST?

>Y

ENTER STABILITY CLASS: 1 THROUGH 7.

>4

THE CURRENT MIXING DEPTH FCST IS 100. DO YOU WISH TO REVISE THE FCST?

ENTER MIXING DEPTH IN TENS OF METERS: 1 THRU 300.

>50

ENTER WIND FCST AS DDDFF, WITH 00000=CALM AND 99999=MISSING DO NOT USE LT/VAR, USE CALM OR ESTIMATE THE AVERAGE SPEED AND DIRECTION. THE CURRENT WIND FCST FOR PROS BAR IS 31507. DO YOU WISH TO CHANGE IT?

>Y

ENTER WIND FOR PROS BAR >27010

(and so on for all wind stations.)

DO YOU WISH TO ENTER FORECASTS FOR ANOTHER TIME?

>N

DO YOU WISH TO REVIEW THE CURRENT FORECAST?

>Y

DO YOU WISH TO REVIEW THE ENTIRE FORECAST DATA FILE?

THE FORECAST FILE WILL BE DISPLAYED IN 6 HOUR BLOCKS.
HITTING RETURN WILL DISPLAY THE NEXT BLOCK. THE FORECAST
ORDER IS: JULIAN DATE, HOUR, STABILITY, MIXING DEPTH,
WINDS. THE WIND STATION ORDER IS:

PROS BAR EM RE CE ARMY LPR RATT SPR EDNA 200E
200W WAHL SLP FFTF YAK BARR 300 AREA WYE BARR
100N WPPSS FRANK CO GABLE MO RINGOLD RICH AP
SAGEHILL RATT MTN HA MT ST PASCO

206 10 3 100 31507

```
206 11 3 100 31507 31507 31507 ---
31507 31507 ---
```

206 12 3 100 31507 ---

---

(and so on through 6 hours of data.)

TYPE N <CR> FOR NEXT BLOCK OR JUST <CR> TO EXIT

> <CR>

DO YOU WISH TO REVIEW FORECASTS FOR SPECIFIC HOURS?

>N

DO YOU WISH TO REVISE THE FORECAST?

>Y

ENTER DATE OF FORECAST TO BE REVISED: MM,DD,YY >7,25,81

THE JULIAN DATE FOR THE REVISION IS 206
ENTER HOUR OF THE FORECAST TO BE REVISED: HH.
A 99 CAN BE USED TO ESCAPE FROM THE FCST REVISION SUBROUTINE

>15

ENTER FORECAST PERSISTENCE: HH (1 to 48).

>14

206 15 3 100 31507

IS THIS THE RECORD TO REVISE? Y OR N

>Y

REVISION TO WIND DATA ONLY? Y OR N

>N

DO YOU WISH TO REVISE THE STABILITY?

>Y

ENTER REVISED STABILITY: 1 THROUGH 7.

>5

```
DO YOU WISH TO REVISE THE MIXING DEPTH?

>Y

ENTER REVISED MIXING DEPTH IN TENS OF METERS:

1 THRU 300.

>30

DO YOU WISH TO REVISE WIND FCSTS?

>N

DO YOU WISH TO ENTER MORE REVISIONS?

>N

DO YOU WISH TO REVIEW THE CURRENT FORECAST?

>N

THIS UPDATE SESSION IS OVER.
```

When entering a new forecast the complete 48 hour period is filled with the initial entry. Each follow-on entry will fill the forecast from the hour of the forecast to the end of the forecast period. Any revision to the forecast will cause all the data, between the revision start hour and start hour plus hours of persistence, to be set to that specified in the revision.

### Reviewing Activity Logs

The observation and forecast activity logs can be reviewed by running program LOGRVU. These log files contain information on when, by whom and for what reason the observation or forecast data files were accessed. Upon execution of LOGRVU the question DO YOU WISH TO HAVE THE LOGS PRINTED IN ADDITION TO BEING DISPLAYED? will come across the screen. A yes will direct the logs to the printer, a no will simply continue with the console display of the logs. The next question will be DO YOU WISH TO REVIEW THE DATA ENTRY LOGS? A yes response will cause the log to be displayed on the console screen plus printed (if the answer to the first question was yes). A no will cause the observation log to be bypassed with the program then asking DO YOU WISH TO REVIEW THE FORECAST ENTRY LOG?. Yes or no responses will have the same consequences as with the observation file. The program execution terminates after the forecast log review. A final message THIS LOG REVIEW SESSION IS OVER is displayed.

### REFERENCES

- Ramsdell, J. V. and G. F. Athey, 1981. <u>MESOI: An Interactive Lagrangian Trajectory Puff Diffusion Model</u>. PNL-3998, Pacific Northwest Laboratory, Richland, WA.
- Start, G. E. and L. L. Wendell, 1974. <u>Regional Effluent Dispersion Calculations Considering Spatial and Temporal Meteorological Variations</u>, NOAA Tech. Memo., ERL ARL-44, 63 p.

			•
			•
			•
			•
			•
			•

# APPENDIX A

UPDATE AND LOGRVU PROGRAMS

#### APPENDIX A

#### UPDATE AND LOGRVU PROGRAMS

UPDATE and LOGRVU are utility programs to maintain observed and forecast meteorological data files for use by the MESOI diffusion model. UPDATE is used to enter new observations or forecasts and review and revise existing forecasts. It also keeps a record of changes in the data files by recording the time, person making the change and type of change in activity logs. The most recent 48 changes are documented at any time. The activity logs can be examined using the program LOGRVU.

The next section of this Appendix describes the organization of the programs, and the following sections contain listings of these programs.

#### PROGRAM STRUCTURE, DEFINITIONS AND FILES

UPDATE consists of the main program plus twelve subroutines. The main program MASTER calls subroutines: NUDAT, RVUDAT, REVDAT, NUFCST, RVUFST, REVFST and UPDATL. These seven subroutines, called by MASTER, in return call five subroutines as shown in Table A-1. Program LOGRVU calls no subroutines.

TABLE A-1. Subroutines Called by Main Subroutines in UPDATE

Calling	Called Subroutine						
Subroutine	JULIAN	CAL	INDEX	ADATE	ARCHIV		
NUDAT	Χ	Χ			X		
RVUDAT	Х	Χ					
REVDAT	X	Χ					
NUFCST	Х	Χ	Х				
RVUFST	Х	Χ	Х				
REVFST	Х	Χ	Х				
UPDATL				Χ			

Following are brief descriptions of each subroutine used by UPDATE:

NUDAT Enables the addition of new observations to the observation file. Any number of observations can be added.

RVUDAT Allows the observation file to be reviewed. Any record on the file can be reviewed or the entire file can be reviewed.

REVDAT Allows the observation file to be revised.

NUFCST same as NUDAT only for forecast file.

RVUFST same as RVUDAT only for forecast file

REVFST same as REVDAT only for forecast file. Also a number of hours can be revised at once by specifying the number of hours of persistences.

UPDATL enters date, time, user identification, and activity type to the appropriate log file (either observation or forecast log). The activity types are: New Obs, Rev Obs, New FCST and Rev FCST.

JULIAN converts month, day, year to Julian date 1 through 365 (1 through 366 for leap year).

CAL converts Julian date and year to month and day.

INDEX given the Julian date and hour INDEX determines the array index of where the forecast values are to be stored.

ADATE is a system subroutine which returns actual date and time to the program when called.

ARCHIV Writes the last 24 hours of meteorological data to a disk file; called when 1st hourly observation of a new day is entered.

Five disk files are used by UPDATE for input/output. The file names are MDATA, MDL, FDATA, FDL, and ARCHIV. MDATA is the 48 hour observation file assigned to logical unit 10, MDL is the observation log file assigned to unit 11, FDATA is the 48 hour forecast file assigned to unit 12, FDL is the forecast log assigned to unit 13, and ARCHIV is the storage file for observation data after they are deleted from MDATA. Four dummy files are assigned to allow practicing UPDATE and LOGRVU without disturbing the actual working files. These dummy files are MDATAP, MDLP, FDATAP and FDLP.

Two command files are set up for execution of UPDATE or LOGRVU. The command file named UT assigns the appropriate I/O files when working with the real observation or forecast files. The other command file UTPRA. is set up to assign the dummy files when practicing with UPDATE or LOGRVU. The file contents are:

#### 1. UT.

@ASG,A MDATA

QUSE 10, MDATA.

@ASG,A MDL.

@USE 11,MDL.

@ASG,A FDATA.

QUSE 12, FDATA.

@ASG,A FDL.

@USE 13,FDL.

#### 2. UTPRA.

@ASG,A MDATAP.

@USE 10, MDATAP.

@ASG,A MDLP.

@USE 11,MDLP.

@ASG, A FDATAP.

QUSE 12, FDATAP.

@ASG,A FDLP.

@USE 13,FDLP.

```
MESOUT ##
                             HASTER
        Ç
l
        C
2
                THIS IS THE MAIN PROGRAM OF THE DATA FILE MANAGEMENT
        С
 3
            *
 4
        C
                  PROGRAM ASSOCIATED WITH THE MESOI MODEL
5
        C
              INTEGER DARRAY (35,48)
7
              CHARACTER#1 SELECT+Y
А
              CHARACTER®A MOATE, RTIME, RTYPE (2), BLANK, UDLOG (5,48), STNAME (30)
              CHARACTER#8 FSTRID
Q
10
              COMMON/Dat1/Darray/LOGS/UDLOG;RTYPE;FSTRID;NR/NAMES/STNAME;NSTA
              DATA STNAMEZIPROS HARIFIEM RE CETFTARMY LPRIFIRATT SPRIF
11
                          " EDNA "." ZODE "." ZODW "."WAHL SLP".
12
                             FETE 1.1YAK BARRI, 1300 AREA! . IMYE BARRI.
1.3
                          1 100N 191 WPPSS 1. FRANK COTSIGABLE MOTE
14
15
                          THA ME STIFF PASCO THREE
                                                            1/
16
17
              MSTA=22
              Y= 1 Y 1
18
19
              HLANK= 1
              RTYPE(1)=HLANK
20
21
              HTYPE (2) =BLANK
22
              WRITE (6.9000)
23
         9000 FURMAT(1H1)
24
              WRITE (6.9011)
         9011 FURMAT (///5X+ ! MESOUT
                                      VERSION 1.0
                                                     OCTOBER 1981(*//)
25
26
            5 WRITE (6.9010)
27
         9010 FORMAT(/10X+*ENTER USER IDENTIFICATION. USE A MAXIMUM OF 8*,
             + ! CHARACTERS.!)
28
              READ (5.8004.END=5.ERR=5) FSTRID
20
30
         8004 FORMAT (A8)
31
              #RITE (6+9001)
         9001 FURMAT(/10×+* METEOROLOGICAL DATA ENTRY PROGRAM FOR MESOI*)
32
           10 MRITE(6+9002)
33
         9002 FURMAT(/)0x++DO YOU WISH TO ENTER OR REVISE ORSERVED DATA?+/
34
                    10X+ FRIER Y OR N. 1)
35
36
             READ(5.8000.END=10.ERR=10) SELECT
37
         8000 FURMAT(A1)
              IF (SELECT.NE.Y) GO TO 200
ЗA
39
40
        C
              HEAD IN OLD OBSERVED. DATA FILE AND OBSERVED DATA UPDATE LOG.
        С
41
              PLACING DATA IN ARRAYS.
42
        C
              DU 20 I=1.48
43
              MEAD(10+8001) (DARRAY(J+T)+J=1+15)
44
45
         8001 FURMAT([x+[3+12+]1+1x+]1+1x+13+10([x+[5])
46
              READ(10+8001) (DARRAY(J+1)+J=1+5)+(DARRAY(J+1)+J=16+25)
47
              HEAU(10,8001) (DARRAY(J+1)+J=1.5)+(DARRAY(J+1)+J=26.35)
48
           20 CUNTINUE
              REWIND 19
49
50
              HEAD(11,8002) NR
51
         8002 FURMAT (10X+15)
52
              00 30 1=1.48
53
              READ (11+8003) (UDLOG (J+1)+J=1+5)
54
         8003 FURMAT (10X+5A8)
55
           30 CONTINUE
              REWIND 11
56
```

MASTER Program

```
57
         C
                END OF INPUT OF OLD DATA FILES
 58
 59
         C
            35 WHITE (6:4003)
 60
          9003 FORMAT(/10x+100 YOU WISH TO ENTER A NEW SET OF ORSERVATIONS?1/
 61
 62
                       10X+ FRITER Y OR N. 1)
                READ (5.8000 + END=35 + ERR=35) SPLECT
 63
                IF (SELECT.NE.Y) GO TO 40
 64
 65
                RTYPE(1)= " NEW OBS"
 65
                CALL SUBROUTINE TO ENTER NEW UBSERVATIONS
 67
         С
 68
 69
                CALL NUDAT
 7.0
         C
 71
            40 CONTINUE
            45 WRITE (6.9004)
 72
          9004 FORMAT(/10x+100 YOU WISH TO REVIEW THE OBSERVED DATA FILE?1/
 73
 74
                       10X+*ENTER Y OR N. 1)
                READ (5.8000.END=45.ERR=45) SELECT
 75
 76
                IF (SELECT.NE.Y) GO TO SU
 77
         C.
                CALL SUBROUTINE TO REVIEW THE ORSERVED DATA FILE
         С
 78
         C
 80
         47
                CALL RVUDAT
 R1
         C
 82
            50 CONTINUE
 83
            55 WRITE (6.9005)
          9005 FURMATI/10x. UN YOU WISH TO REVISE ANY DATA ENTRIES? 1/
 A4
                       IOX+ ENTER Y OR N. !)
 85
 86
                READ (5,8000,END=55.ERR=55) SELECT
                [F(SELECT.NE.Y) GO TO 60
 87
                RIYPE(2)=! REV OBS!
 89
         C
                CALL SUBROUTINE TO REVISE OBSERVED DATA FILE
 90
         С
 91
         Ç
 42
                CALL REVUAT
 93
         C
 94
            57 WRITE (6.9004)
                HEAD (5,8000, END=57, ERR=57) SELECT
 95
 96
                IF (SELECT.EQ.Y) GO TO 47
 97
            60 CONTINUE
 98
         С
                UPDATE THE OBSERVED DATA ENTRY LOG
97
         C
100
         C
101
                CALL UPDATE
         С
102
                WRITE OUT NEW ORSERVED DATA FILE
103
         C
104
         С
               00 70 [=1.48
105
106
                1) APRAY (3 . 1) = 1
107
                WRITE(10.8001) (DARRAY(J+1)+J=1+15)
10A
                S=([.E)YARRAU
109
                #RITE(10.8001) (DARRAY(J.1).J=1.5).(DARRAY(J.1).J=16.25)
110
                DAPRAY (3+1)=3
                WRITE(10.8001) (DARHAY(J.1).J=1.5).(DARRAY(J.1).J=26.35)
111
112
            70 CONTINUE
                EMDETLE 10
113
```

MASTER Program (contd)

```
114
         Ç
                WRITE OUT UPDATED OBSERVED DATA ENTRY LOG
115
         C
116
                WRITE(11.8002) NR
117
118
                DO 80 I=1.48
113
                WRITE(11.8003) (UDLOG(J.T).J=1.5)
120
            BO CONTINUE
121
                ENDFILE 11
         C
155
                END OF SECTION TO ENTER OR REVISE OBSERVED DATA
123
         C
124
         C
125
            SOO CONTINUE
124
         C
                SECTION TO UPDATE FORECAST DATA
127
         С
128
129
           205 WRIFE (6+9006)
130
          9006 FURMAT(/10X+*UO YOU WISH TO ENTER OR REVISE FORECAST DATA?*/
                      INX. ENTER Y OR N. 1)
131
                READ (5.8000.END=205.ERR=205) SELECT
135
133
                IF (SELECT.NE.Y) GO TO 300
134
         С
               READ IN OLD FORECAST DATA FILE AND FORECAST UPDATE LOG AND
135
         C
136
         C
                PLACE IN AHRAYS
137
         C
               RIYPE(1)=RLANK
138
               RIYPE(2)=RLANK
139
140
                00 220 I=1+48
141
               READ(12+8001) (DARPAY(J+1)+J=1+15)
142
                READ(12.8001) (DARRAY(J.1).J=1.5).(DARRAY(J.1).J=16.25)
               READ(12.8001) (DARRAY(J.1).J=1.5).(DARRAY(J.1).J=26.35)
143
144
           220 CONTINUE
145
               PEMIND IS
146
                HEAD (13.8002) NR
147
                UO 230 I=1.48
148
                READ(13.8003) (UDLOG(J.I).J=1.5)
149
           S30 CONTINUE
150
                REWIND 13
151
         C
                END OF INPUT OF OLD FORECAST FILES
152
         С
153
         С
154
           235 WRITE (6.9007)
          9007 FURMAT(/10X++DO YOU WISH TO ENTER A NEW FORECAST?+/
155
                      10x . 'ENTER Y OR N. ')
156
               9EAD (5+8000+END=235+ERR=235) SELECT
157
158
                IF (SELECT.NE.Y) GO TO 240
159
               HTYPE(I) = ! NEW FCST!
160
         С
                CALL SUBROUTINE TO ENTER A NEW FORECAST
161
162
         c
163
               CALL NUFCST
164
165
           240 CONTINUE
166
           245 WHITE (6.90UR)
          9008 FORMAT(/10x+'DO YOU WISH TO REVIEW THE CURRENT FORECAST?'/
167
                      10X**ENTER Y OR N. !)
168
               READ (5.8000.END=245.ERR=245) SELECT
169
170
                IF (SELECT.NE.Y) GO TO 250
```

### MASTER Program (contd)

```
171
                CALL SUBROUTINE TO REVIEW FORECASTS
172
         С
         С
173
174
         247
                CALL RVUEST
175
         C
           250 CONTINUE
176
177
           255 WRITE (6+9009)
          9009 FORMAT(/)0x+100 YOU WISH TO REVISE THE FORECAST?1/
178
173
                       10x, FNTER Y OR N. 1)
                READ (5.8000.END=255.ERR=255) SELECT
180
                IF (SELECT.NE.Y) GO TO 260
181
                IF (HTYPE(1).EQ. BLANK) RTYPE(2) = 'REV FCST'
182
183
         С
                CALL SUBROUTINE TO REVISE THE FORECAST FILE
184
         C
         C
185
                CALL REVEST
186
         С
187
188
           257 WKITE (6.9008)
189
                READ (5.8000.END=257.ERR=257) SELECT
                IF (SELECT.EQ.Y) GO TO 247
190
191
           260 CONTINUE
192
         С
                UPDATE THE FORECAST DATA ENTRY LOG
193
         C
194
         С
195
                 CALL UPDATE
         С
196
                WRITE OUT THE FORECAST DATA FILE
197
         C
198
         C
199
                00 270 [=1,48
                DARRAY (3.1) = 1
005
                wRITE(12.8001) (DARRAY(J.1).J=1.15)
201
202
                DARRAY (3,1)=2
                HRITE(12,8001) (DARRAY(J,1),J=1,5), (DARRAY(J,1),J=16,25)
203
204
                DARRAY(3.1)=3
                WRITE(12.8001) (DARRAY(J.I).J=1.5).(DARRAY(J.I).J=26.35)
205
206
           270 CUNTINUE
207
                ENDFILE 12
208
                WRITE OUT UPDATED FORECAST DATA ENTRY LOG
209
         С
         c
210
211
                WRITE (13.8002) NR
                DO 280 I=1.4H
212
                WRITE(13,8003) (UDLOG(J+1)+J=1+5)
213
214
           SHO CONTINUE
                ENDFILE 13
215
216
         C
                END OF SECTION TO ENTER OR REVISE FORECAST DATA
217
         С
218
         С
219
           300 CONTINUE
220
                KHITE (5,9020)
          9020 FURNAT (//10X+ THIS UPDATE SESSION IS OVER. 1)
155
                EINI)
222
```

MASTER Program (contd)

```
SUBROUTINE NUDAT
               INTEGER DARRAY (35,48)
               CHARACTER*1 SELECT +Y
               CHARACTER#8 SINAME (30)
 5
               COMMON /DATI/UARRAY/NAMES/STNAME + NSTA
               Y= * Y *
 7
             1 WRITE (6+1025)
         1025 FORMAT (/10X+'ENTER YEAR OF OBSERVATION TO BE ENTERED: YY'/
 В
                     10x+*(E.G. - 81)+*)
              READ * . MY
10
11
             DETERMINE MONTH. DAY AND HOUR OF LAST ENTRY.
12
1.3
14
               IF (DARRAY (1.25), EQ. 0) GO TO 7
15
              00 2 J=25.48
16
              IF (DARRAY (2.J).GT.24) 60 TO 3
17
            2 CONTINUE
14
             3 CONTINUE
19
               J=J-1
               MOD=DARRAY (1 + J)
20
               CALL CAL(MY+MDD+MM+MD)
21
               WRITE(6.1026) MM.MU.DARRAY(2.J)
22
         1026 FURMAT (/10X+ THE MONTH: DAY AND HOUR OF THE LAST OBSERVATION!/
23
                      10x+' ENTERED ARE: '+313+' .1//
24
                      10x. "THE NEW ENTRIES MUST FOLLOW THIS TIME.")
25
              GU TO A
26
27
            7 CONTINUE
              WRITE (6+1027)
28
         1027 FORMAT(/10x+'NO OLD OBSERVATIONS ARE TABULATED. THE NEW ENTRIES+/
29
30
                      10X+ MUST START WITH HOUR 01.1)
            A CONTINUE
31
32
33
34
           10 WRITE (6.1000)
         1000 FURMAT(/)0x. ENTER MONTH AND DAY OF OBSERVATIONS TO BE ENTERED: 1/
35
                     10x, MM+DD (E.G. - 7.29).1)
36
              PEAD **HM**D
37
38
               IF (MM.LT.1.0H.MM.GT.12) GO TO TO
39
               IF (MO.LT.1.0R.MD.GT.31) GO TO 10
           20 WRITE (6:1002)
40
         1002 FORMAT (/10x . 'ENTER HOUR OF THE OBSERVATION: HH .
41
                                                                    99 MAY RE!/
                      TOX+ USED TO ESCAPE FROM THE DATA ENTRY ROUTINE. 1)
42
              HEAD #+MH
43
               IF (MH.EQ.99) GO TO 140
44
               1F (MH.LT.1.04.MH.GT.24) GO TO 20
45
46
            25 WRITE (6+1022) MM+MO+MY+MH
         1022 FURMATIVIOX. THE DATE AND HOUR FOR OBSERVATION TO RETAIN
47
                      TOX+ ENTERED ARE: 1.312.3X.12//
48
                      10x. TARE THESE CORRECT? ENTER Y OR N. !)
47
50
              READ (5.1011.END=25.ERR=25) SELECT
               IF (SELECT.NE.Y) GO TO TO
51
52
               CALL JULIAN (MY+MM+MD+JDATE)
53
        C
54
               IF (JDATE.LT. MDD.OR. JDATE.GT. (MDD+1)) THEN
55
                 WRITE (6.1001)
                 FORMATIZION + DATE MUST BE SAME OR +1 DAY TO THE !.
56
         1001
```

Subroutine NUDAT

```
+ *LAST OBSERVATION DAY*+/1
57
58
                  GOTO 10
59
                ENDIF
                MDD = JDATE
60
                WRITE(6-1012) MDD
61
          1012 FORMAT (/10X+ THE JULIAN DATE OF THE DATA IS + 2X+13)
62
 63
                SHIFT DATA IN ARRAY IF OBSERVATION TO BE ENTERED IS FIRST OF
         С
64
         С
                            OTHERWISE SKIP THE SHIFT.
65
         С
66
                IF DATA ARE SHIFTED FILL THE REMAINDER OF THE ARRAY WITH A88884.
         C
67
 68
         C
                IF (MH.GT.1) GO TO 50
 69
 70
         С
                CALL ARCHIV
 71
 12
         C
                DO 40 I=1.24
 73
                11=1+24
 74
 75
                00 30 J=1.35
 76
               DARRAY(J.I) = DARRAY(J.II)
 77
            30 CONTINUE
                00 35 J=6+35
 78
               DARRAY (J.II) =88888
79
 80
            35 CONTINUE
81
                DARRAY([, []) =888
               DARHAY (2 - 11) =88
82
 83
                DARRAY (4 . II) =8
                DARRAY (5, 11) =888
84
85
            40 CONTINUE
86
            50 CONTINUE
 87
         C
                ENTER DATE. TIME. STABILITY AND MIXING DEPTH IN DARRAY
88
         С
89
 90
                [H=MH+24
                DARRAY (1+IH) =MDD
91
                HM= (HI+S) YARRAG
92
 93
            60 WRITE (6+1003)
          1003 FORMAT(/10X+*ENTER STABILITY CLASS: 1 THROUGH 7 .*2X)
94
95
                PEAD # ISTA
96
                1F(ISIB.LT.1.OR.ISTB.GT.7) GU TO 60
97
                DARRAY (4+ [H) = ISTR
98
            70 WHITE (6+1004)
99
          1004 FURMAT (/10X+ TENTER MIXING DEPTH IN TENS OF METERS: 1/
                       10X++ 1 THRU 300 . ++2X)
100
101
                PEAD *, LDEPTH
          1005 FURMAT(415)
102
                IF (LOEPTH.LT.1.OR.LDEPTH.GT.300) GO TO 70
103
                DARRAY (5. IH) = LDEPTH
104
105
                ENTER WIND OBSERVATION BY STATIONS
         С
106
107
                #RITE(6.1086)
108
          1006 FORMAT(/10x+*ENTER WIND DATA AS DODFF+ WITH 00000=CALM AND*
109
                        ./IOX. 199999=MISSING. DO NOT USE LT/VAR. USE CALM'./
110
                     10x . TOR ESTIMATE THE AVEHAGE SPEED AND DIRECTION . T)
111
                00 120 J=6+5+HSTA
112
                J1=J-5
113
```

Subroutine NUDAT (contd)

```
114
             80 WRITE (6.1007) STNAME (J1)
115
          1007 FORMAT(/10X+"ENTER WIND FOR"+2X+A8+2X)
116
117
                HEAD *. IDDEF
                IF (IDDFF.E0.0.0R.IDDFF.E0.99999) GO TO 110
118
                100=100FF/100
119
120
                IFF=[DDFF-IDD#]00
                IF (IDD.LT.0.08.IDD.GT.360) 60 TO 90
121
122
                IF(IX.EQ.0.AND.IABS(IFF).GT.50) GO TO 100
123
                60 TO 110
124
             90 CONTINUE
125
                kRITE (6+1008)
           INDE FORMAT(/10x . WIND DIRECTION OUT OF RANGE!)
126
                1F (IX.EQ.0.AND.]ABS (IFF).GT.50) WRITE (6:1009)
127
           1009 FORMAT (/) OX + WIND SPEED ABNORMALLY HIGH!)
154
129
                [ X = ]
                GU TO 80
130
131
            100 CONTINUE
                WRITE (6+1009)
132
133
                [X=]
                GO TO 80
134
135
            110 CONTINUE
                DARRAY (J. IH) = IDDFF
136
           120 CONTINUE
137
           130 WHITE (6+1010)
138
          1010 FORMAT(/10X+*U0 YOU WISH TO ENTER ORSERVATIONS FOR ANOTHER TIME?*/
139
                       10X . LENTER Y OR N. !)
140
               READ (5+1011+END=130+ERR=130) SELECT
141
           1011 FORMAT(A1)
142
                IF (SELECT.EQ.Y) GO TO 10
143
144
            140 CONTINUE
                RETURN
145
146
                END
```

Subroutine NUDAT (contd)

```
SUBROUTINE JULIAN (IYR, MU. IDAY, JDATE)
 3
        С
        Ċ
               JULIAN CONVERTS YEAR. MONTH AND DAY TO JULIAN DATE
        С
               CHECK FOR MONTH INDEX IN RANGE
        С
        С
 7
               IF (MO.LE.0.09.MO.GE.13) GO TO 30
 H
        С
               CONVERT TO JULIAN DATE
        C
10
               GO TO (1.2.3.4.5.6.7.8.9.10.11.12).MO
11
            1 JDATE=IDAY
12
13
              60 TO 40
            2 JDATE=[DAY+31
] 4
              69 10 20
15
16
            3 JDATE=IDAY+59
17
              60 10 20
            4 JUATE=IDAY+90
18
19
              GU 10 20
            5 JUATE=IDAY+120
20
21
              05 01 00
55
            6 JUATE=IDAY+151
23
              60 10 20
            7 JUATE=[UAY+181
24
25
              GO TO 20
            A JDATE=IDAY+212
26
27
              GU 10 20
            EPS+YAGJ=3TAGE P
58
2.3
              GO TO 20
           10 JUATE=10AY+273
30
31
              60 10 20
            11 JDATE=1DAY+304
32
33
              60 TO 20
            12 JUATE=TDAY+334
34
35
           SU CONTINUE
36
        С
               ADJUST FOR LEAP YEAR
37
38
        C
               A=FLOAT(IYR)/4-IYR/4
39
               IF (A.EQ.A.AND.MO.GE.3) JDATE=JDATE+1
40
41
              GU TO 40
           30 CONTINUE
42
43
              JUATE=0
           40 CONTINUE
44
45
              RETURN
              ENT
```

Subroutine JULIAN

```
SUBROUTINE CALITYR. JDATE . MO. IDAY)
 2
3
        C
               CAL CONVERTS JULIAN DATE AND YEAR TO CALENDER MONTH AND DAY.
        С
 4
        С
 5
              DIMENSION ISTART(12) . ISTOP(12) . LSTART(12) . LSTOP(12)
               DATA ISTART/1+32+60+91+121+152+182+213+244+274+305+335/
              DATA [STOP/31+59+90+120+151+181+212+243+273+304+334+365/
 7
 А
               DATA LSTART/1+32+61+92+122+153+103+214+245+275+306+336/
               VATA LSTOP/31+60-91-121-152-182-213-244-274-305-335-366/
 Q
1 n
        С
               CHECK FOR JULIAN DATE OUT OF HANGE.
        C
11
12
        C
               IF (UDATE.LT.1.OR.JDATE.GT.366) GO TO 90
13
        C
14
15
              DETERMINE IF LEAP YEAR.
        С
16
        С
17
               A=FLOAT(IYR)/4 - IYR/4
               IF (A.EQ.n.) GO TO 25
18
19
        ¢
              DETERMINE MONTH AND DAY.
20
        C
21
        С
22
              00 10 J=1.12
               IF (JDATE.GE.ISTART (J).AND.JDATE.LE.ISTOP (J)) GO TO 20
23
           In CONTINUE
24
25
           L=0M 05
               1DAY=JDATE+(ISTART(J)-1)
26
27
               50 TO 100
        Ç
28
50
           25 00 30 0=1.12
               IF (JDATE.GE.LSTART (J).AND.JDATE.LE.LSTOP (J)) 60 TO 40
30
           30 CONTINUE
31
32
           40 MU=J
               IDAY=JDATE-(LSTART(J)-1)
33
34
               60 TO 100
35
           90 CONTINUE
36
               i = 0 = 0
               IDAY=0
37
3#
          100 CONTINUE
               RETURN
39
               END
40
```

Subroutine CAL

```
SUBROUTINE RYUDAT
               INTEGER DARRAY (35+48)
 3
              CHARACTER#1 SELECT+Y
              CHARACTER+8 SINAME (30)
              COMMON /DATI/DARRAY/NAMES/STNAME+NSTA
              Y= 1 Y 1
           10 381TE (6,1000)
 7
         1000 FURMAT(10x, TOO YOU WISH TO REVIEW THE ENTIRE ORSERVED DATA FILE?*/
 0
                      Inx, ENTER Y OR N. 1)
              READ (5.1001.END=10.ERR=10) SELECT
10
         1001 FURMAT(A1)
1.1
              IF (SELECT.NE.Y) GO TO 40
12
13
        С
              THIS SECTION PERMITS THE USER TO REVIEW THE ENTIRE OBSERVED DATA
14
              FILE IN 6 HOUR PLOCKS.
15
        С
16
              WPITE(6+1002) (STNAME(I)+1=I+NSTA)
17
         1002 FORMAT(/10X+*THE OBSERVED DATA FILE WILL BE DISPLAYED IN 6 HOUR*+
18
                 * BLOCKS*, /10x, *HITTING RETURN WILL DISPLAY THE NEXT BLOCK. *,
19
                  //10x, DATA ARE DISPLAYED IN THE FOLLOWING ORDER: JULIAN DATE, *,
20
                  /10x+ HOUR+ STABILITY+ MIXING DEPTH+ WINDS, ++/10X+
21
                     THE ORDER OF THE WIND STATIONS ARE: 1./5(10x.6(A8.2X)/)/)
22
              00 30 I=1.8
23
              II=(I-1)#6+1
24
25
              DO 20 J=[I+I1+5
              #RITE(6,1003) (DARRAY(K+J)+K=1+2)+(DARRAY(K+J)+K=4+NSTA+5)
26
         1003 FURMAT (5x,13,2x,[2,2x,11,2x,13,5x,8([5,1x)/3(25x,8([5,1x)/))
27
28
           SU CONTINUE
29
           22 WRITE (6.2000)
30
         2000 FURMAT(/5x++TYPE N <CR> FOR NEXT BLOCK OR JUST <CR> TO EXIT+)
31
              READ (5,1001,END=22,ERR=22) SELECT
32
              IF(SELECT.NE. 'N') GOTO 50
33
           30 CONTIMUE
34
35
           40 CONTINUE
36
        С
               THIS SECTION REVIEWS THE DATA ONE HOUR AT A TIME
37
38
           50 WRITE (6+1004)
39
         1004 FORMAT(/)0X+*DO YOU WISH TO REVIEW DATA FOR SPECIFIC HOURS?*/
40
41
                     10X+*ENTER Y OR N. !)
              READ (5.1001.END=50.ERR=50) SELECT
42
43
              IF (SELECT.NE.Y) GO TO 100
           60 WHITE (6+1005)
44
         1005 FURMAT(/10X+*ENTER DATE OF DATA TO BE REVIEWED: MM+DD+YY*/
45
46
                      10X+'E.G. - 7+29+81')
              READ # + MM + MD + MY
41
              IF (MM.LT.1.0H.MM.GT.12) GO TO 60
48
               IF (MD.LT.1.0R.MD.GT.31) GO TO 60
49
              CALL JULIAN (MY.MM. HD. MDU)
50
              1F (DARRAY(1+1).FU.U.AND.DARRAY(1+25).EQ.0) 60 TO 95
51
              IF (DARRAY(I)1).EQ.MDD.OR.DARPAY(1,25).EQ.MDD) GO TO 65
52
53
              CALL CAL (MY . DARRAY (1 . 1) . MOI . TDAY1)
              CALL CAL (MY+UARRAY (1+25)+MOZ+IDAY2)
54
               SYAGT (SOM - LYAGT + 10M (0501+6) STIRM
55
         1020 FORMAT (/10X++THIS DATE IS NOT ON RECORD.+/
56
```

Subroutine RVUDAT

```
+10X+*THE RECORDED MONTHS-DAYS (MMDD) ARE: *,212+* AND *,212)
 58
               GO TO 60
 59
            65 CONTINUE
 60
            70 WRITE (6+1007)
          1007 FURMAT(/10x+ LENTER HOUR OF THE DATA TO BE REVIEWED: HH+)
 61
 62
                HEAD WOME
                IF (MH.L.T.1.0H.MH.GT.24) GO TO 70
 63
 64
 65
                IF (MDD.EQ.DARRAY(1.25)) INDX=MH+24
 66
                WRITE (6+1008) (STNAME (1)+1=1+HSTA)
          1008 FORMATI//10X+'DATA ARE DISPLAYED IN THE FOLLOWING ORDER: 1/
 67
                       10x, JULIAN DATE, HOUR, STABILITY, MIXING DEPTH, WINDS. 1/
 68
                       10x+ THE ORDER OF THE WIND DATA IS: 1/5(10X+6(A8+2X)/)/)
 69
 7.0
          2005 WRITE(6+1003)(DARRAY(J+1NDX)+J=1+2)+(DARRAY(J+1NDX)+J=4+NSTA+5)
 71
 72
            72 3FITE (6.2010)
          2010 FURMAT(/5x, TYPE N <CR> FOR NEXT RECORD OR JUST <CR> TO EXIT!)
 73
 74
                READ (5+1001+END=72+ERR=72) SELECT
 75
                IF (SELECT.EU. 'N') THEN
 16
                  INDX = INDX + 1
 77
                  IF (INDX.GT.48) THEN
 78
                    (0502+6)3TIRW
 79
          2020
                    FORMAT (/5X+ 'END OF DATA')
 80
                    GOTO 80
A I
                  ENDIF
                  GOTO 2005
 82
 83
                END1F
 84
         C
 85
            80 WRITE (6+1009)
          1009 FORMAT(/10X+100 YOU WISH TO REVIEW ADDITIONAL HOURS?1/
 86
 87
                       lox. 'ENTER Y OR N. ')
 88
               READ (5,1001,END=80,ERR=80) SELECT
 н9
                IF (SELECT.NE.Y) GO TO 100
 90
            90 WHITE (6+1010)
          1010 FURMAT (/10x+ THE SAME DAY? ENTER Y OR N. +)
 91
 92
                REAU (5,1001,END=90,ERR=90) SELECT
 93
                IF (SELECT.EQ.Y) GO TO 70
 94
                GO TO 60
 95
            95 CONTINUE
                WRITE (6+1025)
 96
 97
          1025 FORMAT (/10x+ THIS OBSERVATION FILE IS EMPTY. 1)
 9 A
           100 CONTINUE
 99
                RETURN
                END
100
```

Subroutine RVUDAT (contd)

```
SURROUTINE REVOAT
              INTEGER DARRAY (35,48)
               CHARACTER®1 SELECT+Y
              CHARACTER®B SINAME (30)
              COMMON /DATI/DARRAY/NAMES/STNAME+NSTA
               Y = 1 Y 1
           1n HRITE (6+1000)
         1000 FURMAT(/10x+'ENTER DATE OF ORSERVATION TO BE REVISED: MM+DD+YY'/
 8
                      Inx_{1}(E.G. - 7,29.81).1)
              HEAD * , MM , MD . MY
1.0
               IF (MM.LT.1.0R.MM.6T.12) GO TO 10
11
12
               1F(MD.LT.1.OR.MD.GT.31) GO TO TO
              CALL JULIAN (MY , MM . MD . MDD)
13
              IF (DARRAY(1+1).EQ.O.AND.DARRAY(1+25).EQ.O) GO TO 175
14
               IF (DARRAY(1+1).E0.MDD.OR.DARPAY(1+25).E0.MDD) GO TO 15
15
               CALL CAL(MY DAPRAY(1+1) +MO1 + IDAY1)
16
17
              CALL CAL (MY+DARRAY (1+25)+MOZ+1DAYZ)
              SYAUT . SOM . LYAUT . 104 (2501 . 6) BITHW
18
         1022 FORMAT (/10X+ THIS DATE IS NOT ON RECORD. 1/
19
              + 10x+ THE RECORDED MONTHS-DAYS (MMDD) ARE: 1+212+ AND 1+212)
20
              60 10 10
21
           15 HRITE (6+1002) MOD
25
         1002 FURMAT(/10X++ THE JULIAN DATE FOR THE REVISION IS ++2X+13)
23
           20 WRITE (6+1003)
         1003 FORMAT(/10X+'ENTER HOUR OF THE OBSERVATION TO BE REVISED: HH . !/
25
                      10x . "A 99 CAN HE USED TO ESCAPE FROM THE DATA REVISION"/
26
                      10x, 'SUBROUTINE.',//)
              HEAD #+MH
28
               IF (MH.EQ.99) GO TO 180
29
               1F (MH.LT.1.0N.MH.GT.24) 60 TO 20
30
31
              IF (MDD.EQ.DARRAY(1,25)) INDX=MH+24
32
33
              WRITE (6,2000) (DARRAY (K.INDX) .K=1.2).
34
                             (DARRAY (K+INDX) +K=4+NSTA+5)
35
         2000 FURHAT(5X.13.2X.12.2X.11.2X.13.5X.8(15.1X)/3(25X.8(15.1X)/))
36
37
         2005 WRITE (6.2010)
         2010 FORMAT (/5X++15 THIS THE RECORD TO PE REVISED? Y OR N > +)
38
39
               READ(5+1005+END=2005+ERR=2005) SELECT
40
               IF (SELECT.NE.Y) GOTO 20
4]
              ENTER REVISIONS
42
43
           25 WRITE (6.2100)
44
         2100 FORMAT (/5x+*REVISIONS TO WIND DATA ONLY? Y OR N > 1)
45
46
               READ (5.1005.END=25.FRR=25) SELECT
47
               IF (SELECT.EG.Y) GOTO 1009
48
49
           30 WRITE (6+1004)
         1004 FORMAT(/10x++DO YOU WISH TO REVISE THE STABILITY?+/
50
                      TOX+ FENTER Y OR N. !)
51
              READ (5.1005.END=30.ERR=30) SELECT
52
         1005 FURMAT(A1)
              IF (SELECT.NE.Y) GO TO 50
54
55
           40 PRITE (6+1006)
         1006 FURNAT(/10x+'ENTER REVISED STARTLITY: 1 THROUGH 7 .1)
56
```

#### Subroutine REVDAT

```
HEAD *.ISTR
                IF (ISTR.LT.1.0R.ISTR.GT.7) GO TO 40
 5 A
 59
                DARRAY (4. INDX) = ISTB
            50 CONTINUE
 60
            60 WRITE (6,1007)
 61
          1007 FORMAT (/10x, *DO YOU WISH TO REVISE THE MIXING DEPTH? */
 62
                       10x+'ENTER Y OR N.')
 63
                READ (5+1005+END=60+ERR=60) SELECT
 64
                IF (SELECT.NE.Y) GO TO HO
 65
            70 WHITE (6+1008)
 66
          1008 FURMAT(/10x++ENTER REVISED MIXING DEPTH IN TENS OF METERS: !/
 67
                      10x++ 1 THRU 300 . ++2X)
 68
                HEAD #+LDEPTH
                IF (LDEPTH.LT.1.OR.LDEPTH.GT.300) GO TO 70
 70
 71
                UARRAY (5, INDX) = LUEPTH
 72
            BO CONTINUE
 73
            90 WRITE (6,1010)
          1010 FORMAT(/10X++DO YOU WISH TO REVISE WIND DATA?+/
                       10X+ !FNTER Y OR N.!)
 75
 76
                READ (5.1005.END=90.ERR=90) SELECT
 77
                IF (SELECT.NE.Y) GO TO 155
          1009 WRITE (6:1011)
 7 B
          1011 FORMAT(//10X+'FNTER WIND DATA AS DDDFF+ WITH 00000=CALM AND'/
 79
                       10x, 199999=MISSING. DO NOT USE LT/VAR, USE CALM ORI/
 80
                         10x. A GUESS AT THE AVERAGE SPEED AND DIRECTION. 1//)
 81
 82
          2040 WRITE (6+2050) NSTA
 8.3
          2050 FURMAT (/5%, 'ENTER STATION NUMBER TO BE REVISED !.
 84
 85
              + '1 - '+12+' 0 = EXIT > ')
               READ (5.4.END=2040.ERR=2040) U1
 86
 87
                IF (J1.GT.NSTA) GOTO 2040
                1F(J1.LT.1) GOTO 155
 88
 89
           110 WRITE (5.1013) STNAME (J1)
 90
 91
          1013 FURMAT(/10x+ ENTER REVISED WIND DATA FOR + 2X+AR)
 92
                HEAD **IDDEF
                IF(IDDFF.E0.0.OR.IDDFF.E0.99999) GO TO 140
 93
                IUD=IDDFF/100
 95
                IFF=IDDFF-IDD*100
 96
                IF (IDD.LT.0.0R.10D.GT.360) GO TO 120
                IF (IX.EQ.0.ANU.IABS(IFF).GT.50) GO TO 130
 97
 98
                60 TO 140
 99
           120 CONTINUE
100
                WRITF (6.1014)
          1014 FURMAT(/10X+ WIND DIRECTION OUT OF RANGE!)
101
                1F(IX.EQ.0.AND.IABS(IFF).GT.50) WRITE(6+1015)
102
          1015 FURMAT (/10X+ WIND SPEED ABNORMALLY HIGH!)
103
                1 1 2 1
104
105
                40 TO 11n
           130 CONTINUE
106
107
                WRITE (6+1015)
108
                1 \times = 1
109
                60 TO 110
110
           140 CONTINUE
                UARRAY (J1+5+INDx)=IDDFF
111
112
                GUTO 2040
           155 CONTINUE
113
```

Subroutine REVDAT (contd)

```
114
           160 WRITE (6-1016)
115
          1016 FORMAT(/10x++00 YOU WISH TO REVISE ANOTHER RECORDITY
                      10x . ENTER Y OR N. !)
116
               HEAD (5.1005.END=160.ERR=160) SELECT
117
118
               IF (SELECT.NE.Y) GO TO 180
           170 WRITE (6.1017)
119
          1017 FORMAT (/10X+ SAME DAY? ENTER Y OR N. +)
120
121
               READ (5.1005.END=170.ERR=170) SELECT
                IF (SELECT.EQ.Y) GO TO 20
122
123
               GO TO 10
124
           175 CONTINUE
125
               WRITE (6+1025)
126
          1025 FURMAT (/10X+ ! THIS OBSERVATION FILE IS EMPTY. !)
127
               RE LURN
128
129
               END
```

Subroutine REVDAT (contd)

```
SUBROUTINE NUFCST
               INTEGER DARRAY (35,48)
               CHARACTER®1 SELECT Y
 3
               CHARACTER#8 STNAME (30)
               COMMON /DATI/DARRAY/NAMES/SINAME.NSTA
               NE w = 1
               Y= 1 Y 1
           In wFITF (6.950)
 18
          950 FURNATIVIOX . TENTER START DATE OF NEW FORECAST: MM.DD.YY.
                     10x, (E.G. - 7,29,81), ()
10
          1000 FURMAT(/10x+'ENTER DATE OF FORECASTS TO RE ENTERED: MM+DD+YY'/
11
                      10x+1(E.G. - 7+29+81).1)
12
1.3
               HEAD # . MM . MD . MY
         1001 FORMAT(1012)
14
               JF (MM.LT.].OR.MM.GT.12) GO TO 10
15
16
               IF (MD.LT.1.0H.MD.GT.31) GO TO 10
17
           20 WRITE (6.951)
18
           951 FORMAT(/10x+'ENTER START HOUR OF NEW FORECAST: HH .1)
19
         1002 FURMAT(/10X. ENTER HOUR OF THE FORECAST: HH . 99 MAY BE //
                      10X. USED TO ESCAPE FRUM THE DATA ENTRY ROUTINE. 1)
20
               READ #.MH
21
22
               IF (MH.EQ.99) GO TO 140
               IF (MH.LT.1.0R.MH.GT.24) 60 TO 20
23
24
               CALL JULTAN (MY + MM + MD + MDD)
25
               WRITE(6+1012) MDD
         1012 FURMAT(/10X++THE JULIAN DATE OF THE FCST 15++2X+13++++1
25
27
        C
28
        С
               ENTER DATES AND TIMES INTO DARRAY
29
        C
               JUD=MDD
30
               KH=MH-1
31
               DO 40 I=1.48
32
               KH=KH+1
33
               IF (KH.LF.24) GO TO 30
34
35
               KH≕l
               J00=J00+1
36
37
               IF (JDD.LE.365) GU TO 30
               IF (JDD.EQ.366.AND.MOD(MY.4).EQ.Q.AND.MY.NE.0) GO TO 30
38
39
               JUĐ≃]
            30 CONTINUE
40
4 l
               DARRAY (1 + I) = JOD
               DARRAY (2.1) =KH
42
43
            40 CONTINUE
               60 TO 50
            42 CONTINUE
45
46
            44 WFITE (6+1000)
47
               READ # . MM . MD . MY
               IF (MM.LT.). UR. MM.GT.12) GO 10 44
48
49
               If (MD.LT.1.0R.MD.GT.31) GO TO 44
50
            46 WRITE (6+1002)
51
               HEAD P.MH
52
               IF (MH.EQ.99) GO TO 140
53
               IF (MH.LT.).0R.MH.GT.24) 60 TO 46
54
               CALL JULIAN (MY+MM+MD+MDD)
55
            SO CONTINUE
               CALL INDEX (MDD, MH, INDX)
56
```

Subroutine NUFCST

```
IF (INDX.NE.0) GO TO 54
57
                CALL CAL (MY + DARRAY (1+1) + MO + IDAY)
59
                WRITE (6.1030) MO. IDAY. DARRAY (2.1)
           1030 FURHAT (/10x+ "THE DATE AND TIME IS NOT WITHIN THE 48HR "/
 60
                        10x . FURECAST PERIOD. THE MONTH. DAY AND HOUR OF ! /
61
                        10X, FORECAST START ARE: 1,313)
62
                GO TO 42
63
             54 CONTINUE
64
 65
                ENTER STABILITY AND MIXING DEPTH IN DARRAY
66
         C
57
                If (NEW.EQ. I) GO TO 60
             55 WRITE (6.1019) DARRAY (4.1NOX)
           1019 FORMAT(/)0X+*1HF CURRENT STAHLLITY FCST IS*+2X+II+2X+ *100 YOU*/
 7 n
               + 10x . INTSH TO REVISE THE FCST? ENTER Y OR N. ! )
 71
                READ (5.1011, END=55, ERR=55) SELECT
 12
                IF (SELECT.NE.Y) GO TO 66
 13
             60 WRITE (6+1003)
 74
           1003 FURMAT (/10x . 'ENTER STABILITY CLASS: 1 THROUGH 7 . '2X)
 75
                READ *+15TR
 76
                IF (ISTR.LT.1.OR.ISTB.GT.7) 60 TO 60
 77
 78
                00 63 [=[NDX+48
 79
                DARRAY (4.1) = ISTR
             63 CONTINUE
80
 81
             66 CONTINUE
                IF (NEW.EG.1) GO TO 70
82
83
             68 WRITE (6,1013) DARRAY (5. INDX)
           1013 FURMAT (/10X, "THE CURRENT MIXING DEPTH FCST IS" 2X 14 14 . DO YOU"/
84
                  10x . WISH TO REVISE THE FCST? ENTER Y OR N. !)
85
 86
                READ (5.101), END=68. ERR=68) SELECT
87
                IF (SELECT, NE.Y) GO TO 77
             70 WRITE (6.1004)
AA
           1004 FORMATE/10X+ ENTER MIXING DEPTH IN TENS OF METERS: 1/
 89
                       10X+1 1 THRU 300 . 1+2X)
 90
                READ *.LDEPTH
91
 92
           1005 FURMAT (415)
                IF (LDEPTH.LT.1.OR.LDEPTH.GT.300) GO TO 70
 93
94
                DO 73 I=TNDX+48
45
                DARRAY (5 . J) = L DEPTH
96
             73 CUNTINUE
             77 CONTINUE
97
9я
         C
90
         С
                ENTER WIND OBSERVATION BY STATIONS
100
         C
101
                #RITE (6.1006)
           1006 FURNAT (/10x+'ENTER WIND FOST AS DODFF+ WITH 00000=CALM AND'
102
                         ./10x, 199999=MISSING. DO NOT USE LT/VAR. USE CALMI./
103
                      10x . OR ESTIMATE THE AVERAGE SPEED AND DIRECTION . ! )
104
                80 120 J=6.5+NSTA
105
106
                J1=J-5
107
                1 \times = 0
                1F (NEW.EQ.1) GO TO 80
108
             7A WRITE (6+1014) STNAME (J1)+DARRAY (J+TNDX)
109
           1014 FURMAT (/TOX+*THE CURRENT WIND FCST FOR *+48+* IS *+15+*-*/
+ 10x+*DO YOU WISH TO CHANGE IT? ENTER Y OR N.*)
110
111
                HEAD (5 - 1011 - END=78 - ERR= /8) SELECT
112
                1F (SELECT.NE.Y) GO TO 120
113
```

Subroutine NUFCST (contd)

```
80 WRITE (6.1007) STNAME (J1)
114
115
           1007 FURMAT (/10x+ TENTER WIND FOR + 2X+AA+2X)
                HEAD ** IDDEF
116
                IF (IDDFF.EQ.0.OR.IDDFF.E0.99999) GO TO 110
117
                IDD=1DDFF/100
118
110
                IFF=IDDFF-IDD+100
                IF(100.LT.0.0R.100.GT.360) GO TO 90
120
                IF (IX.EQ. 0. AND. TABS (IFF) . GT. 50) GO TO 100
121
122
                GO TO 110
            90 CONTINUE
153
124
                WRITE (6,1008)
125
          1008 FURMATIZIOX . MIND DIRECTION OUT OF RANGE!)
                1F(IX.EQ.O.AND.IABS(IFF).GT.50) WRITE(6+1009)
126
127
           1009 FURMAT(/10X+**IND SPEED ABNORMALLY HIGH!)
128
                1 \times = 1
                60 TO 80
129
130
           100 CUNTINUE
                wRITE (6.1009)
131
132
                ] X = ]
                GO TO 80
133
134
           110 CONTINUE
135
                00 115 I=JMDX+4A
136
                DARRAY(J.1) = IDDFF
137
           115 CONTINUE
] 3A
           120 CONTINUE
139
           130 WRITE (6-1010)
           1010 FURMAT(/10X+*DO YOU WISH TO ENTER FORECASTS FOR ANOTHER TIME?*/
140
141
                       10X FENTER Y OR N. !)
               HEAD (5+1011+END=130+ERR=130) SELECT
142
143
          INII FURMAT(AL)
                IF (SELECT.EQ.Y) NEW=0
144
145
                IF (SELECT.EQ.Y) GO TO 42
146
            140 CONTINUE
147
                RETURM
                END
148
```

Subroutine NUFCST (contd)

```
SUBROUTINE INDEX (MOD+MH+INDX)
 ?
3
               INTEGER DARRAY (35+48)
               CUMMON /DATI/DARRAY
 4
               × = 0
              DO 10 I=1.48
               IF (MOD.EQ.DARRAY(1.1)) GO TO 20
               K=K+]
           10 CONTINUE
 9
              IF (K.EQ.48) GO TO 50
           SU CONTINUE
] 0
               INDX=K
11
               [t=K+]
12
               1E=18+(24-DARRAY(2+18)+1)
13
               1F (IE.GT.48) IF=48
15
               n=1
               00 30 I=IH+IE
16
               IF (MH.EQ.DARRAY (2:1)) GO TO 40
17
IΑ
               K=K+1
19
           30 CONTINUE
              IF (K.GT.IE) GO TO 50
20
           40 CONTINUE
21
22
               INDX=INDX+K
2.3
              60 10 60
           50 CONTINUE
24
25
               INDX=0
26
           60 CONTINUE
               RETURN
27
28
               END)
```

Subroutine INDEX

```
SURROUTINE RVUEST
               INTEGER DARRAY (35.48)
 3
               CHARACTER#1 SELECT+Y
               CHARACTER® SINAME (30)
               CUMMON /DATI/DARRAY/NAMES/STNAME+NSTA
               Y= ' Y '
            10 PRITE (6+1000)
         1000 FORMAT(/10x++00 YOU WISH TO REVIEW THE ENTIRE FORECAST DATA FILE?*+
 Я
                      /10X+'ENTER Y OR N. ')
              READ (5.1001.END=10.ERR=10) SELECT
10
         1001 FURMAT(A1)
11
               IF (SELECT.NE.Y) GO TO 40
15
        C
13
               THIS SECTION PEPMITS THE USER TO REVIEW THE ENTIRE FORECAST DATA
        С
14
               FILE IN 6 HOUR PLOCKS.
15
        C
15
        С
               WRITE (6.1002) (STNAME (1). I=1.NSTA)
17
         1002 FORMATI/10X+ THE FORECAST FILE WILL HE DISPLAYED IN 6++
18
                                          HITTING RETURN WILL DISPLAY THE .
19
              ! HOUR BLOCKS.!*/IUX*!
              + 'NEXT BLOCK.',/10X.' THE FORECAST ORDER IS: JULIAN DATE.'/
+ 10X.'HOUR, STABILITY, MIXING DEPTH, WINDS. THE WIND!/
20
21
              + 10x+*STATION ORDER 15:*+/ 5(10x+6(A8+2X)/)/)
23
               DO 30 [=1.8
23
24
               [[=([-])+6+]
25
               00 20 J=II+II+5
26
               WRITE(6+1003)(DARRAY(K+J)+K=1+2)+(DARRAY(K+J)+K=4+NST4+5)
         1003 FURMAT(5x+13+2x+12+2x+11+2x+13+5x+8(15+1x)/3(25x+8(15+1x)/))
27
            20 CONTINUE
28
29
            22 WHITE (6.2000)
         2000 FURMAT(/5x+*TYPE N <CR> FOR MEXT BLOCK OR JUST <CR> TO EXIT*)
31
               PEAD(5+1001+END=22+ERR=22) SELECT
31
               IF (SELECT.NE.'N') GOTO 50
32
33
        C
            3n. CONTINUE
34
35
            40 CONTINUE
        C
36
               THIS SECTION REVIEWS THE DATA ONE HOUR AT A TIME
37
        C
38
        C
            50 %RITE(6.1004)
39
40
         1004 FORMAT(/10X+*UO YOU WISH TO REVIEW FORECASTS FOR SPECIFIC HOURS?*/
                      10x+*ENTER Y OR N. +)
41
               HEAD (5+1001+END=50+ERR=50) SELECT
42
43
               IF (SELECT.NE.Y) GO TO 100
44
               1F (DARRAY(1+1),FO.0) GO TO 95
            60 WRITE (6+1005)
45
46
          1005 FORMAT(/10X+*ENTER DATE OF FORECAST TO BE REVIEWED: MM+DD+YY*/
47
                      10x+'(E.G. - 7+29+81).')
4 H
               KEAD #+MM+MD+MY
49
               IF (MM.LT.1.04.MM.GT.12) GO TO 60
               1F (ND.LT.1.0R.MO.GT.31) GO TO 60
50
51
               CALL JULIAN (MY + MM + MI) + MDD)
52
            70 WPITE (6.1007)
          1007 FORMAT (/10x+'ENTER HOUR OF THE FORECAST TO BE PEVIEWED: HH .*)
53
54
               READ # . HH
               IF (MH.LT.1.0R.MH.GT.24) GO TO 70
55
               CALL INDEX (MDD+MH+INDX)
```

Subroutine RVUFST

```
1E (INDX.NE.0) GD TO 74
57
58
               CALL CAL (MY + DARRAY (1+1) + MO + IDAY)
               WHITE (6.1030) MO.IDAY, DARRAY (2.1)
59
          1030 FORMAT(/10x+**THE DATE AND TIVE IS NOT WITHIN THE 48HR FORECAST*/
60
              + 10X+ PERIOD. THE MONTH+ DAY AND HOUR OF FORECAST START ARE: 1/
61
              + 10X+3(3)
62
63
               GO TO 60
            74 CONTINUE
64
               WRITE (6 - 1008) (STNAME (1) - [=1 - NSTA)
65
         1008 FURMAT(/)0X, THE FOST IS DISPLAYED IN THE FOLLOWING DRDER: 1/
66
                      10x+ JULIAN DATE, HOUR, STABILITY, MIXING DEPTH, WINDS. 1/
67
                      10x. THE ORDER OF THE MIND FCST JS: 1/5(10x.6(A8.2X)/))
68
         2005 WRITE (6+1003) (DAPRAY (J+INDX) +J=1+2) + (DARRAY (J+INDX) +J=4+NSTA+5)
69
           72 WRITE (6+2010)
7.0
         2010 FORMAT(/5x, TYPE N <CR> FOR MEXT RECORD OR JUST <CR> TO EXIT!)
71
               READ(5.1001.END=/2.ERR=/2) SELECT
72
               IF (SELECT.EQ. 'N') THEN
73
74
                 INDX = INDX + I
75
                 IF(INDX.GT.48)
                   WRITE (6.2020)
76
                   FORMAT (/5X, FEND OF DATA+)
77
         2020
78
                   G0T0 80
                 ENDIF
79
H ()
                 GOTO 2005
81
               ENDIF
82
        C
ВВ
           80 WHITE (6,1009)
         1009 FORMAT(/10x+100 YOU WISH TO REVIEW ADDITIONAL HOURS?1/
84
                      10x . FRITEH Y OF H. ..
85
              HEAD (5.1001.END=HO.FRR=HO) SELECT
AG
               1F (SELECT.NE.T) 60 TO 100
#7
AA
           90 WRITE (6.1010)
         1010 FURMAT (/10X++THE SAME DAY? ENTER Y OR N. +)
49
               HEAD (5.1001.END=90.ERR=90) SELECT
91
               IF (SELECT.EQ#Y) GO TO 70
91
92
               60 TO 60
93
            95 CONTINUE
               WRITE (6+1025)
94
          1025 FORMAT (/10X, THIS FORECAST FILE IS EMPTY. 1)
95
96
          100 CUNTINUE
97
               RETURN
Q A
               END
```

Subroutine RVUFST (contd)

```
SUBROUTINE REVEST
 1
               INTEGER DARRAY (35.48)
 2
               CHARACTER*1 SELECT+Y
 3
 4
               CHARACTER## SINAME (30)
               COMMON /DATI/DARRAY/NAMES/STNAME+NSTA
 5
               Y= + Y +
               IF (DARHAY (1+1) .EQ.0) GO TO 175
 7
 B
            10 WRITE (6+1000)
         1000 FORMAT(/10x+ ENTER DATE OF FORECAST TO BE REVISED: MM+DD+YY+/
 q
                      10X+*(E.G. - 7,29,81).*)
10
               READ * . MM . MD . MY
11
               IF (MM.LT.1.09.MM.GT.12) GO TO 10
12
13
               IF (MD.LT.1.0R.MD.GT.31) GO TO 10
               CALL JULIAN (MY+MM+MU+MUD)
14
               wRITE(6,1002) MDD
15
         1002 FURMAT(/10X++ THE JULIAN DATE FOR THE REVISION IS ++2X+13)
16
           20 WRITE (6+1003)
17
          1003 FORMAT(/10X+ 'ENTER HOUR OF THE FORECAST TO BE REVISED! HH . . /
18
                      10x+1A 99 CAN RE USED TO ESCAPE FROM THE FCST REVISION!/
19
                      lox. + SURROUTINE. +)
20
               READ #+MH
21
               IF (MH.EQ.99) GO TO 180
22
               IF (MH.LT.1.0R.MH.GT.24) GU TO 20
23
               WRITE (6,1018)
24
25
          1018 FURMAT(/)0X. TENTER FORECAST PERSISTENCE: HH . (1 TO 48) )
26
               HEAD #+IP
27
               CALL INDEX (MDD . MH . INDX)
               IF (INDX.NF.0) GO TO 24
28
               CALL CAL (MY, DARRAY (), 1), MO, IDAY)
29
               (I.S) YAHRAD (YADI + OM (0E01+6) 3TIRW
30
          1030 FURMAT(/10x, THE DATE AND TIME IS NOT WITHIN THE 48HR FORECAST!/
31
              . 10x+*PERIOD. THE MONTH: DAY AND HOUR OF FORECAST START ARE: */
32
              + 10x+313)
33
               60 TO 10
34
            24 CONTINUE
35
               IND=INDX+IP-1
36
               IF (IND. GT. 48) IND=48
37
38
        C
               wRITE(6,2000) (DARRAY(K,INDX),K=1+2)+
30
                              (DARRAY (K+[NDX) +K=4+NSTA+5)
40
         2000 FURMAT (5x,13.2x.12.2x.11.2x.13.5x.8(15.1x)/3(25x.8(15.1x)/))
41
42
         2005 WHITE (6.2010)
         2010 FORMAT(/5X++15 THIS THE RECORD TO BE REVISED? Y OR N > +)
43
               READ (5+1005+END=2005+ERH=2005) SELECT
44
45
               IF (SELECT.NE.Y) GOTO 20
46
        С
47
               ENTER REVISIONS
4 A
           25 #RITE (6-2100)
49
50
         2100 FURMAT(/5X+*REVISIONS TO WIND DATA ONLY? Y OR N > 1)
               READ (5.1005.END=25.ERR=25) SELECT
51
52
               IF (SELECT.EQ.Y) GOID 1009
53
            30 WRITE(6.1004)
54
55
          1004 FURNATIVIOX. TOO YOU WISH TO REVISE THE STABILITY? !!
56
                      IOX. ENTER Y OR W. !)
```

#### Subroutine REVEST

```
0EAD (5.1005.END=30.EPR=30) SELECT
          1005 FURNATIAL)
58
               IF (SELECT.NE.Y) GO TO 50
50
            40 MRITE (6+1006)
          1006 FORMAT (/10x+*ENTER REVISED STABILITY: 1 THROUGH 7 .*)
61
               PEAD *. ISTR
62
                IF (ISTR. LT. 1. OR. ISTR. GT. 7) GO TO 40
63
               DO 45 I=INDX+IND
64
 65
               UARRAY (4.1) = ISTR
            45 CONTINUE
66
 67
            5n CONTINUE
            60 WRITE (6.1007)
68
          1007 FORMAT(/10X+*U0 YOU WISH TO REVISE THE MIXING DEPTH?*/
63
                      10x, ENTER Y OR N. !)
 70
               HEAD (5 . 1005 . END=60 . ERR=60) SELECT
 71
               IF (SELECT.NE.Y) GO TO BU
 72
            70 PRITE (6-1008)
 73
          1008 FORMAT(/10X+ ENTER PEVISED MIXING DEPTH IN TENS OF METERS: 1/
 74
                      10x+1 1 THRU 300 . 1+2X)
               HEAD * ** DEPTH
 76
                IF (LDEPTH.LI.1.OR.LDEPTH.GT.300) GO TO 70
 77
               00 75 I=IMDX+IND
 7.8
 79
               DARRAY (5.1) = LUEPTH
 80
            75 CONTINUE
            an CONTINUE
A 1
            9n *RITE(6,1010)
82
          1010 FURMAT (/10X+100 YOU WISH TO REVISE WIND FOSTST!/
83
                      10x+'ENTER Y OR N.')
H4
               READ (5,1005,END=90,ERR=90) SELECT
85
               IF (SELECT.NE.Y) GO TO 155
86
          1009 WRITE(6.1011)
87
          1011 FORMAT(//10x. ENTER WIND FOST AS DODFF. WITH 00000=CALM AND /
HB
                      10x, 199999=MISSING. DU NOT USE LT/VAR. USE CALM OR./
HQ
                         10X. A GUESS AT THE AVERAGE SPEED AND DIRECTION. 1//)
90
91
 92
          2040 WRITE (6+2050) NSTA
          2050 FURMATIVEX. PENTER STATION NUMBER TO BE REVISED ..
 93
              + ' 1 - ',TZ,' 0 = EXTT > ')
94
               READ(5.*.END=2040.ERR=2040) J1
95
                IF (J1.GT.NSTA) GOTO 2040
 96
                IF (J1.LT.1) GOTO 155
97
94
         C
99
           110 WRITE (6.1013) STNAME (J1)
100
101
          1013 FORMAT(/10X+'ENTER REVISED WIND FCS! FOR'+2X+AB)
               WEAD *, IDDFF
102
                IF (IDDEF.E0.0.OR.IDDEF.E0.99999) GO TO 140
103
                IUU=IDDFF/100
104
105
                IFF=IDDFF-IDD#100
                IF(IDD.LT.0.0R.TDD.GT.360) GO TO 120
105
                IF(IX.EQ.O.AND.IABS(IFF).GT.50) GO TO 130
107
108
               60 10 140
109
           120 CONTINUE
                ##1TE (6+1014)
110
          1014 FURMAT (/10x+ WIND DIRECTION OUT OF RANGE!)
111
112
                IF (IX.EQ.O.AND. [ABS (IFF).GT.50) WRITE (6:1015)
          1015 FORMAT (/ LOX+ WIMD SPEED ABRIORMALLY HIGH+)
113
```

Subroutine REVFST (contd)

```
114
                [X=]
115
                60 10 110
116
           130 CONTINUE
117
                WRITE (6.1015)
                1 \times = 1
118
119
                60 10 116
            140 CONTINUE
120
                DO 145 I=[HDK+IND
121
                DARRAY(J)+5+1)=IDDFF
122
            145 CUNTINUE
123
124
                GOTO 2040
125
           155 CONTINUE
126
           160 WHITE (6-1016)
           1016 FORMAT(/10X+100 YOU WISH TO ENTER MORE REVISIONS?1/
127
                      10X+'ENTER Y OR N.')
128
129
                WEAD (5.1005.END=160.ERR=160) SELECT
130
                IF (SELECT.NE.Y) GO TO 180
           170 WRITE (6+1017)
131
          1017 FORMAT(/IOX+'SAME DAY? ENTER Y OR N. !)
132
                HEAD (5,1005,END=170,ERR=170) SELECT
133
134
                IF (SELECT.EQ.Y) GO TO 20
                60 TO 10
135
136
           175 CONTINUE
137
                WRITE (6.1029)
          1029 FURHAT (/10X+*THIS FORECAST FILE IS EMPTY.*)
138
           180 CONTINUE
139
                RETURN
140
141
                END
```

Subroutine REVFST (contd)

```
SUBROUTINE UPDATE
               CHARACTER#8 PUATE + RTINE + BLANK + RTYPE (2) + UDLOG (5+48) + FSTRID
               COMMON /LOGS/UDLOG.RTYPE.FSTRID.NR
               HLANK= 1
              GET DATE AND TIME OF UPDATE
        C
               CALL ADATE (RUATE + RTIME)
        c
10
               DETERMINE NUMBER OF PREVIOUS UPDATES
        С
12
              11R=0
13
               DO 10 [=1,48
15
               IF (UDLOG(1+1).NE.BLANK) NR=NR+1
           In CONTINUE
16
17
              MOVE PREVIOUS ENTRIES DOWN IN LOG
IB
        С
        C
19
               IF (NR.LT.48) NR=NR+1
20
21
              110 30 N=1.NR-1
22
              111=NR-N
23
              1+1M=5N
              00 20 1=1.5
24
              UDL06(I+N2)=UDL06(I+N1)
25
           20 CONTINUE
26
           30 CONTINUE
27
28
        Ċ
               ENTER CURPENT TRANSACTION
30
               UDLOG(1,1) = HDATE
31
35
               UDLOG(2+1) =RTIME
               UDLOG (3+1) =RTYPE (1)
3.3
               UDL06(4+1)=RTYPE(2)
34
35
               UULOG(5+1)=FSTRID
              RETURN
36
37
               END
```

Subroutine UPDATL

```
С
                 ARCHIV ## MESOUT
 S
        C
 3
        C
             # #
                 THIS PROGRAM WRITE 24 HOURS OF METEOROLOGICAL DATA
                   TO AN ARCHIVE FILE REFORE IT IS DELETED FROM THE
        С
 4
 5
        С
                   ACTIVE DATA SET AVAILABLE TO MESOJ
 6
        C
               SUBROUTINE ARCHIV
 7
 Ω
        С
               INTEGER IDATA(15) - DARRAY(35,48)
 q
10
        C
               CUMMON/DATI/DARRAY
11
12
        С
               CALL FACSF (***ASG*A ARCHIV. . !)
13
               CALL FACSE ( MUSE 20. + ARCHIV. . +)
14
               CALL FACSE (1MASG+UP TEMP. . 1)
15
16
               CALL FACSE ( MUSE 21. TEMP. . !)
17
        С
18
               WRITE (6.1100)
         1100 FORMAT(/5x.*UATA ARCHIVE FILE OPENED**//5X.
19
              + 'COPYING LAST 24 HOURS OF OBSERVATIONS TO FILE TEMP. 1)
20
         1110 REAU(20.1120.END=1150.EHR=1130) IDATA
21
         1120 FURMAT(1x,[3.12,11.1x,11.13.10(1x,15))
22
23
               WRITE (21.1120) IDATA
24
25
               G010 1110
26
         1130 WHITE (6.1140)
27
28
         1140 FURMAT(/5x+'ERROR IN READING ARCHIVED DATA FILE:+//5x+
             + 'NO DATA TRANSFERRED OR COPIED !)
29
30
               RETURN
31
        ¢
32
         1150 \ 00 \ 1170 \ 1 = 1 \cdot 24
                 DAPRAY(3+1) = 1
33
                 WRITE(21,1120) (DARRAY(J,1)+J=1,15)
34
35
                 S = (I \cdot E) YARRAU
36
                 WHITE(21-1120) (DARRAY(J+I)+J=1+5)+(DARRAY(J+I)+J=16+25)
37
                 DARPAY(3 \cdot 1) = 3
34
                 WRITE(21+1120) = (DARRAY(J+1)+J=1+5) + (DARRAY(J+1)+J=26+35)
39
         1170 CONTINUE
40
               ENDFILE 21
41
        C
42
               WRITE (6.1180)
         1180 FORMAT(/5X++24 HOURS OF DATA ADDED TO ARCHIVES ++//5X+
43
             + *UPDATE WILL BE COMPLETED BY THE AUTOMATIC SUBMISSION *.
44
              + 75X+10F THE RATCH JOB ARCHUP.1+//)
45
46
        C
               CALL FACSF (THEREE 20. . !)
47
48
               CALL FACSF (*MEREE 21. . 1)
49
               CALL FACSE (**STAPT ARCHUP. . !)
50
        С
51
               RETURN
52
               EN()
```

Subroutine ARCHIV

```
PROGRAM TO REVIEW DATA AND FORECAST ENTRY LOGS
 Š
        С
 3
        C
               CHARACTER#1 SELECT+Y
 4
               CHAPACTER+8 UDLOG (5:48)
 5
               Y = 1 Y 1
              ~P=0
 7
           10 WRITE (6:1000)
         1000 FORMAT(10X+100 YOU WISH TO HAVE THE LOGS PRINTED IN ADDITION TO!.
 9
                     * REING DISPLAYED? .. / 10X . FNTER Y OR N. !)
1.0
              HEAD (5.1001.END=10.ERR=10) SELECT
12
         1001 FURMAT(AL)
               IF (SELECT.NE.Y) GO TO 20
1.3
               1:8=1
14
15
           20 CONTINUE
           30 WRITE (6+1002)
16
         1002 FURMAT(10x, 100 YOU WISH TO REVIEW THE DATA ENTRY LOG? 1.7
17
18
                     10X . TENTER Y OR N. !)
19
              READ (5.1001.END=30.ERR=30) SELECT
               IF (SELECT.NE.Y) GO TO 90
20
15
        C
              READ IN DATA ENTRY LOG
55
        С
23
24
              HEAD (11-1003) NR
25
         1003 FORMAT(10X+15)
26
              00 40 I=1.48
               HEAD (11,1004) (UOLOG (J.I) + J=1,5)
27
24
         1004 FORMAT (10X+5AB)
29
           40 CUNTINUE
30
              REWIND II
               1F (MP.NE.1) GU TO 60
31
32
        C
               OUTPUT DATA ENTRY LOG TO PRINTER
33
        С
34
               CALL FACSF('MASG, UP OUTL. . !)
35
               CALL FACSE ( MBRKPT PRINTS/OUT1 . 1)
36
               WRITE (6, 1005) NR
37
         1005 FORMAT (1H1. F10. MESO OBSERVED DATA UPDATE LOG. LAST' +13.
38
39
                     * ENTRIES!)
40
              WHITE (6.1006)
                                DATETARX
                                                TIME + . 2X . 1
                                                               TYPE! . ZX . !
                                                                             TYPE .
41
         1006 FURMAT (//19++
42
                      2x. 1
                                ID O
              DO 50 I=I+6R
43
               WRITE (6+1007) (HDLOG(J+I)+J=1+5)
44
45
         1007 FORMAT(T10+5(ZX+AA))
46 -
           50 CONTINUE
47
               CALL FACSE ( FINERKPT PRINTS . 1)
               48
               CALL FACSE ( "SYM OUT 1. . + RMSUN6 . !)
49
50
           60 CONTINUE
51
        C
52
              OUTPUT LOG TO DISPLAY
        С
53
        C
54
               wRITE(6.1008)
55
         1008 FORMAT (10X, "THE OBSERVED DATA ENTRY 1,06 WILL BE DISPLAYED IN"/
              + 10x+*HLOCKS OF 12 ENTRIES+ STARTING WITH THE MOST RECENT.*/
```

Subroutine LOGRVU

```
+ LOX+ "HITTING RETURN WILL DISPLAY THE NEXT BLOCK.")
 57
 5 A
                110 80 [=1.4
 59
                18=12*(1-1)+1
 60
                IE=18+11
 61
                WRITE (6.1006)
 62
                DO 70 []=[B:IE
                WRITE(6.1007) (UDLOG(J.11).J=1.5)
 63
 64
             70 CUNTINUE
                PAUSE THIT RETURN TO DISPLAY NEXT 12 ENTRIES!
 65
             80 CONTINUE
 66
 67
             90 CUNTINUE
 68
                SECTION TO REVIEW THE FORECAST ENTRY LOG
 69
 71
 71
           100 WRITE (6:1009)
          1009 FORMAT(10X+100 YOU WISH TO REVIEW THE FORECAST ENTRY LOG?!/
 72
                       INX, 'ENTER Y OR N. !)
 73
 74
               READ(5.1001) SELECT
 75
                IF (SELECT.NE.Y) GO TO 160
 76
         C
                READ IN FORECAST ENTRY LOG
 77
         С
 78
         C
                READ (13:1003) NR
 80
                00 110 I=1.48
                READ (13+1004) (UDLOG (J+I)+J=1+5)
 81
           110 CONTINUE
 82
 83
                REWIND 13
                IF (MP.NE.1) GO TO 130
 84
 85
         C
                OUTPUT LOG TO PRINTER
 86
         C
 87
                CALL FACSF (*MASG+UP OUT2. . !)
 AA
 89
                CALL FACSF ( * WBRKPT PRINTS / OUT ? . . . )
 90
                WRITE (6.1010) NP
          1010 FURMAT(1H1,T10, MESO FURECAST ENTRY LOG. LAST. 13. ENTRIFS.)
 91
 92
                WRITE (6+1006)
 93
                DO 120 [=1.NR
 94
                ₩RITE (6+1007) (HDLOG(J+1)+J=1+5)
 95
            120 CONTINUE
                CALL FACSE ( ! MARKET PRINTS . !)
 96
 97
                CALL FACSF (IMPREE OUTS. . I)
                CALL FACSE ( MSYM OUTS. , RMSU06 . *)
 98
 99
           130 CONTINUE
         С
100
                OUTPUT LOG TO DISPLAY
101
         C
102
         C
103
                #RITE (6 - 1011)
          1011 FORMAT(10x++THE FORECAST ENTRY LOG WILL BE DISPLAYED IN BLOCKS+/
104
                    10x+ OF 12 FHIRIES+ STARTING WITH THE MOST RECENT. HITTING!/
105
                    10X. FRETURN WILL DISPLAY THE NEXT BLOCK. 1)
106
               00 150 1=1.4
107
108
                [8=12*(T-1) +1
                [E=[H+11
109
110
                #RITE(6,1006)
                DO 140 11=IH+IF
111
                WRITE (6+1007) (HDLOG (J+[1]+J=1+5)
112
           140 CONTINUE
113
114
                PAUSE THIT RETURN TO DISPLAY NEXT 12 ENTRIES!
115
            150 CONTINUE
            160 CUNTINUE
116
117
                 WRITE (6.1020)
118
           1020 FORMAT(10x, THIS LOG REVIEW SESSION IS OVER. 1)
119
                 END
```

Subroutine LOGRVU (contd)

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