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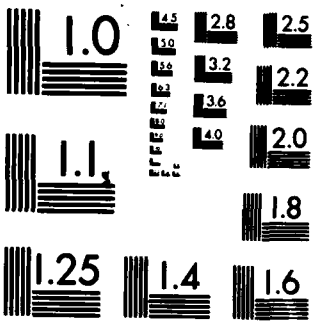

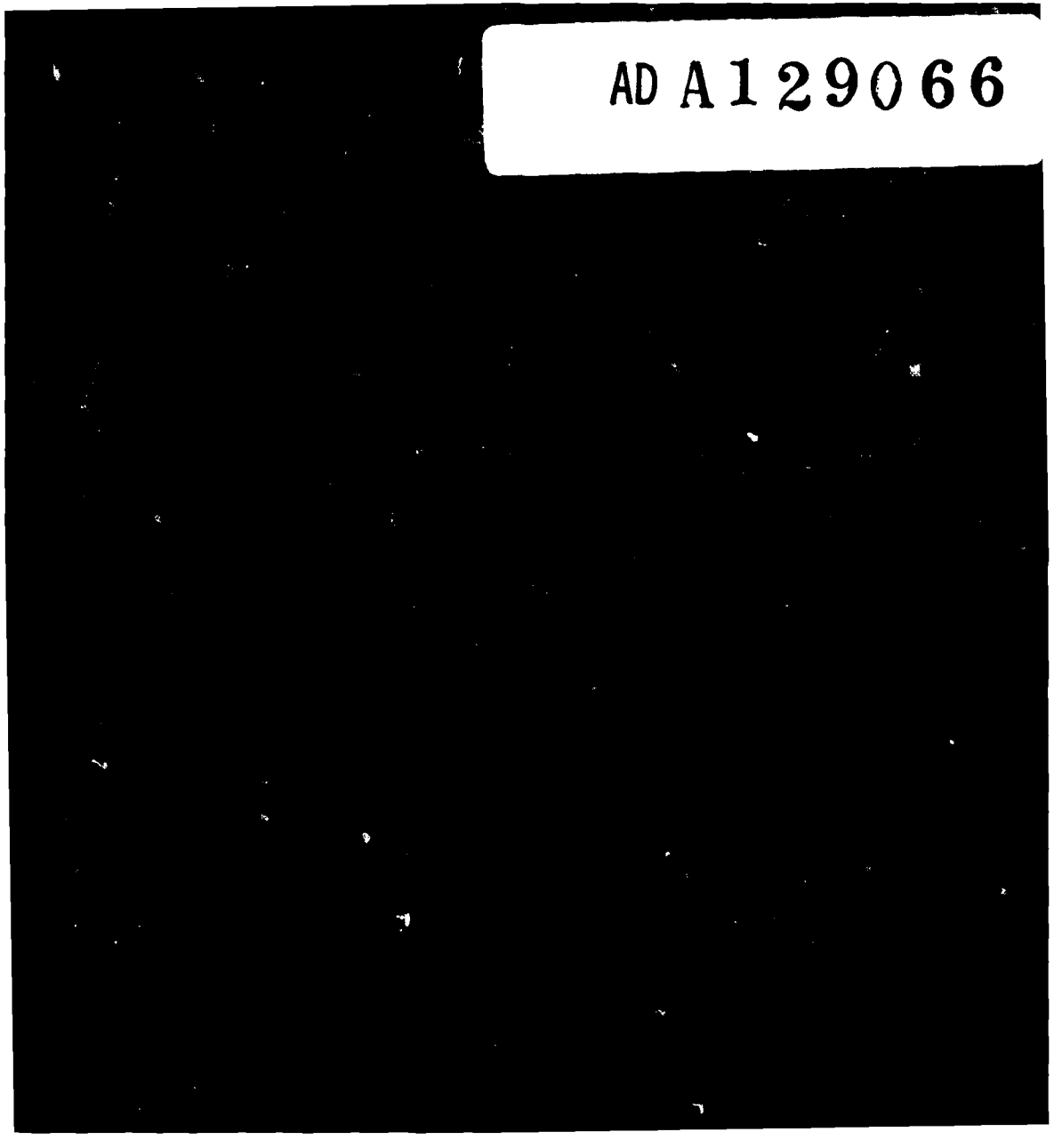
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TR-73-302-01

TECHNICAL REPORT

STUDY AND INVESTIGATION OF COMPUTER ALGORITHMS FOR THE SOLUTION OF THE SHALLOW-FLUID EQUATIONS AS A MEANS OF COMPUTING TERRAIN INFLUENCES ON WIND FIELDS

APPENDICES A, B, C AND D

By

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Final Report, Contract No. DAAD07-72-C-0309
With
ASL, ECOM
White Sands Missile Range, New Mexico 88002

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Salt Lake City, Utah 84109

ABSTRACT

This report describes the development and implementation of a computer algorithm, based on the shallow-fluid equations of oceanography, for calculating the wind field above complex terrain. The algorithm contains a two-dimensional shallow-fluid model in the form of a fully-documented computer program compatible with a UNIVAC 1108 machine. To guide the selection of initialization procedures and the optimum finite-differencing scheme applicable to numerical solutions of the algorithm, a detailed study was made of the analytical solution of the shallow-fluid equations for one-dimensional flows over an isolated ridge. The selected optimum finite-differencing procedure is a Lax-Wendroff scheme using nine grid points and two time levels in combination with a nine-point low-pass filter.

A comprehensive computational program, using an isolated symmetrical mountain, was carried out to provide guidelines as to the nature of two-dimensional solutions of the shallow-fluid equations for the wide variety of initial conditions encountered in the atmosphere. The model was initialized by impulsively accelerating the fluid to a constant velocity everywhere and, after a while, the flow near the mountain approaches a steady state. The results showed that the flow patterns could be divided into four major categories: Subcritical without hydraulic jumps; supercritical without upstream waves; critical with hydraulic jumps and wind-direction reversals; critical with hydraulic jumps but without wind-direction reversals. For the subcritical and supercritical flows, initialization procedures do not appear to pose a problem. For the critical flows, care must be taken in the selection of initialization procedures.

Comparisons of calculated wind field patterns with recent detailed observations of wind circulations above complex terrain show excellent qualitative agreement in the limited cases available for analysis. Additionally, the computer algorithm for the two-dimensional model, when applied to the terrain at White

Sands Missile Range, gave results that were consistent with limited observations available for two example situations.

The computer program containing the two-dimensional shallow-fluid model is written in FORTRAN V language and is fully documented in the four appendices to the report. The documentation includes user's instructions, a complete program listing, detailed flow diagrams, and a completely worked example problem.

FOREWORD

This report has been prepared by the H. E. Cramer Company, Inc. in partial fulfillment of the requirements under Contract No. DAAD07-72-C-0309 with the White Sands Missile Range. The assistance of Dr. Joseph Shinn and Mr. Ernie Stenmark of the Atmospheric Sciences Laboratory, White Sands Missile Range is gratefully acknowledged. Dr. Shinn provided excellent liaison with ASL personnel, while Mr. Stenmark provided technical assistance in adapting the computer program to ASL facilities. The authors wish to acknowledge the considerable benefit derived from numerous discussions of the mathematical properties of the model with their colleague Dr. Brian Lau who is also an Assistant Professor of Mathematics at the University of Utah, Salt Lake City.

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APPENDIX A

USER INSTRUCTIONS FOR THE ASL/WSMR WIND FIELD TERRAIN ADJUSTMENT MODEL COMPUTER PROGRAM

The ASL/WSMR Wind Field Terrain Adjustment Program is designed to adjust the wind speed and direction field to the terrain heights at each coordinate intersection over a reference grid system.

The computer program is written in the FORTRAN V language and is designed for use on a UNIVAC 1108 computer. The program requires 31390_{10} words of core storage including system and FORTRAN library routines. The computer program has the optional capability of printing the adjusted wind speed and direction fields and surface layer heights at specified time intervals. In addition, the wind fields and layer height information may be written on magnetic tape for subsequent graphical processing. The program uses FORTRAN Logical Tape 5 (Card Reader) and Logical Tape 6 (Printer) for standard input/output. The program also uses Logical Tape 1 as a file for optional output. The computer program construction is described in Section A. 1 and user instructions are given in Sections A. 2, A. 3 and A. 4. An example problem is given in Section A. 6 and a program listing is shown in Appendix B.

A. 1 COMPUTER PROGRAM CONSTRUCT

The Wind Field Terrain Adjustment Model Program consists of six subroutines including the main driver program MODEL. Program MODEL determines the number of problem cases to be executed in a single computer run and determines the core allocation of variable program arrays for each problem. The computer program uses object time-dimensioning techniques to accommodate different grid system sizes. The grid system is assumed to be the first quadrant of a Cartesian coordinate system with the positive y-axis oriented north and the positive x-axis

oriented east. The total size of the grid system matrix is limited by the equation:

$$N \geq 7*IDIM*JDIM+2*IDIM+2*JDIM$$

The parameter IDIM is the maximum size of the x dimension and JDIM is the maximum size of the y dimension of the grid system matrix. The parameter N is the DIMENSION'd size of a large array Q in MODEL containing all program variable arrays that depend on the grid system matrix. The parameter N is currently set to 18000, but it can be set to any value in order to accommodate the program to computer core storage limitations.

The first subroutine, Subroutine JACK, is the main calculation routine. This subroutine inputs the model data, determines the program options desired, sets the initial wind field conditions and then enters a time loop through the shallow-water model equations discussed in Section 4 of the main body of the report. The computer program uses a second-order central space and forward time differencing scheme to evaluate Equations (4-14) through (4-21). The wind speed and direction or the u and v components of the wind speed, as well as the surface layer heights, are printed and/or written to tape at selected points in the time loop. When the time loop is completed, the program stops or loops to the next problem in sequence.

The remaining subroutines are utility support programs for Subroutine JACK. Subroutine MISC determines the area of uniform grid spacing within the grid system and returns the indices of this area for tape output. Subroutine UVDIR converts the u and v components of the wind speed to wind speed and direction for printing. Subroutine MOUTNR inputs the terrain data into a specified area of the grid system. The program fills any remaining area of the grid with height values calculated from the minimum height and the height at the edge of the input area as a function of distance. Subroutine OUTPT is the tape output routine and uses the UNIVAC NTRAN routines.

A logic diagram of the computer program is given in Section A.5 and detailed flow charts of the computer program are given in Appendix D.

A.2 PROGRAM INPUT PARAMETERS

The data input parameters required for the computer program are listed in Table A-1. The information categories in the table are defined as follows:

CARD GROUP SEQUENCE NUMBER - Order of input of the three card groups.

NAMELIST - Name of the FORTRAN NAMELIST list to which the input parameters belong (Card Group 2 only).

FORTRAN - FORTRAN symbolic notation defining the program input.

MODEL - Mathematical notation corresponding to the FORTRAN notation.

UNITS - Dimensional units of the input parameters.

LIMITS - Numerical limits on input parameters.

VALUE - Default value substituted if the present value is zero (Card Group 2 only).

ARRAY SIZE - Maximum number of core locations reserved for the parameter.

CARD COLUMNS - Data card punch field.

FORMAT - FORTRAN input format.

TABLE A-1

PROGRAM INPUT PARAMETERS

Card Group Sequence Number	Namelist	FORTRAN	Model	Units	Limits	Value ②	Array Size (words)	Card Columns	Format
1	N/A	ND	N/A	N/A	N/A	N/A	1	1-2	I2
		NP	N/A	N/A	N/A	N/A	1	1-2	I2
		IDIM	N/A	N/A	≤ 80 ①	N/A	1	3-5	I3
		JDIM	N/A	N/A	≤ 80 ①	N/A	1	6-8	I3
2	QLST1	LL	N/A	N/A	≤ IDIM	IDIM ④	1	③	N/A
		JL	N/A	N/A	≤ JDIM	JDIM ④	1	③	N/A
		X	x	Meters	≥ 0.0	④	80	③	N/A
		Y	y	Meters	≥ 0.0	④	80	③	N/A
		ISKIP	N/A	N/A	⑤	⑤	10	③	N/A
		ABLK	N/A	Meters	≥ 0.0	50.0	1	③	N/A
		PRINT	N/A	Minutes	> 0.0	N/A	20	③	N/A
		ULT	u or $\bar{u}$	Meters sec^{-1}	N/A	N/A	1	③	N/A
		VLT	v or D	Meters sec^{-1} or Degrees	If D then $0.0 \leq D \leq 360.0$	N/A	1	③	N/A
		PLT	ϕ	Meters	≥ 0.0	N/A	1	③	N/A
		DTLMDA	λ	N/A	$0 < DTLMDA < 1$	0.95	1	③	N/A

TABLE A-1 (Continued)

Card Group Sequence Number	Namelist	FORTRAN	Model	Units	Limits	Value ②	Array Size (words)	Card Columns	Format
2	QLST1 (Cont.)	G1	g'	Meters sec^{-2}	$0 < G1 < 9.8$	0.1	1	③	N/A
		ISMOTH	N/A	N/A	≥ 0	10	1	③	N/A
		NCNT	N/A	N/A	≥ 0	2	1	③	N/A
		IUNIT	N/A	N/A	> 0	1	1	③	N/A
3 ⑦	N/A	IST	N/A	N/A	$1 \leq IST < LL$	N/A	1	1-4	I4
		IND	N/A	N/A	$1 < IND \leq LL$	N/A	1	5-8	I4
		JST	N/A	N/A	$1 \leq JST < JL$	N/A	1	9-12	I4
		JND	N/A	N/A	$1 < JND \leq JL$	N/A	1	13-16	I4
		HG	H	Meters	≥ 0.0	N/A	IDIM* JDIM	15-74	14x, 10 F6.1 ⑥

① The parameters IDIM and JDIM are limited by the equation N = (7*(IDIM*JDIM)+2*IDIM+2*JDIM) where N is less than or equal to the dimension of the variable Q in the main program MODEL. The dimension of Q in the program shown in Appendix B is 18000. Also, if IDIM or JDIM is set greater than 80, the dimension of x or y in subroutine JACK must be increased to the new value.

② The value column indicates which parameters have default values should they be set to zero. All parameters with an N/A in this column must have values specified on input.

③ All namelist input parameters must leave column one blank. See Section A.3.

TABLE A-1 (Continued)

④ The default values for LL and JL are IDIM and JDIM except when X(2) and Y(2) are zero. When X(2) and Y(2) are zero, LL and JL are both set to 41 and the X and Y arrays are automatically filled with the UTM coordinates of the standard WSMR terrain elevation data shown in Section A. 6. Also, when X(2) and Y(2) are set to zero, IDIM and JDIM must have values greater than or equal to 41. The UTM default coordinates in kilometers are:

X = 100, 180, 260, 300, 320, 330, 335, 340, ····, 470, 475, 480, 490, 510, 550, 630, 710

Y = 3340, 3420, 3500, 3540, 3560, 3570, 3575, 3580, 3585, ····, 3700, 3705, 3710, 3715, 3720, 3730, 3750, 3790, 3870, 3950

where the center of each axis is in 5-kilometer increments.

⑤ See Section A. 4. 2 for the allowable ISKIP values.

⑥ See Section A. 4. 3 for the input statements used to read the terrain elevation data.

⑦ Card Group No. 3 is read only if ISKIP(5) is zero.

A.3 DATA INPUT METHOD

This computer program uses formatted as well as namelist input statements. The parameters using a formatted read statement are self explained in Table A-1. The namelist input data must be in a specific form in order to be read using a NAMELIST list. The first character in each card to be read must be blank. The first card in the namelist list contains the namelist name preceded by the character $. The last card in each namelist list contains $END to terminate the list. The form of the remaining data items in the list may be:

a. *Variable Name = Constant* - The *variable name* may be a subscripted array name or a single variable name. Subscripts must be integer constants. The *constant* may be integer or real.

b. *Array Name = Set of Constants* (Separated by Commas) - The *array name* is not subscripted. The *set of constants* consists of constants of the type real or integer. The number of constants must be less than or equal to the array size. Successive occurrences of the same constant can be represented in the form *k* constant*.

The sequence of the input data parameters within the list is not significant. A more detailed explanation of the FORTRAN NAMELIST can be found in any Fortran Language Manual. The input parameters within the namelist that have default values in Table A-1 are initialized to zero prior to input of the first case. Parameters that are not used or have default values need not appear in the namelist list. When multiple cases are stacked, all parameters retain their values from the previous case and are changed only by input.

A.4 EXPLANATION OF PROGRAM INPUTS

The program input parameters are arranged into four card groups.

A.4.1 Card Group Number 1

This card group contains information specifying the number of cases to be executed and the size of program storage arrays.

ND - Number of times to loop through the entire program reading a new set of values for NP, IDIM and JDIM on each loop.

NP - Number of times to loop through the main calculation routine using constant values of IDIM and JDIM and reading Card Group 2 (also Card Group 3 if requested) on each loop.

IDIM - Maximum number of grid coordinates in the x direction for all cases within the NP loop.

JDIM - Maximum number of grid coordinates in the y direction for all cases within the NP loop.

(IDIM and JDIM are used to determine the size of program storage arrays at execution time. See Table A-1 for the limits on these parameters.)

A.4.2 Card Group Number 2

This data card group contains most of the program input data. The data parameters in this group are read using the Fortran Namelist QLST1 to simplify program input and reduce the number of input cards for similar cases stacked in sequence. Table A-1 gives default values for applicable parameters in

this card group. Also, all parameters in this card group retain the value set by the previous case unless changed by input.

LL - Number of grid coordinates in the x direction for the present case.

JL - Number of grid coordinates in the y direction for the present case.

X - Array containing the coordinates of the x-axis of the grid system in ascending order.

Y - Array containing the coordinates of the y-axis of the grid system in ascending order. See Table A-1 for default values for x and y.

ISKIP - Program option control flag. All ISKIP options are assumed initially zero.

a. If ISKIP(1) is set to 1, the calculated wind field and layer height values are printed at each time given in the array PRINT below.

b. If ISKIP(2) is set to 1, the wind field and layer height arrays are output to tape at each time given in the array PRINT. If ISKIP(1) and ISKIP(2) are both zero, then ISKIP(2) is set to 1.

c. If ISKIP(3) is set to 1, the terrain height matrix is output to tape (ISKIP(2) must equal 1 also).

d. If ISKIP(4) is set to zero, the program assumes ULT and VLT below are input as the initial u and v components of the wind speed and the adjusted u and v components are printed in the wind field output print file.

If ISKIP(4) is set to 1, the program assumes ULT and VLT are input as the initial u and v components of the wind speed and the adjusted wind speed and direction are printed in the wind field output print file.

If ISKIP(4) is set to 2, ULT and VLT are assumed to be the initial wind speed and direction and the adjusted u and v components of the wind speed are printed in the wind field output print file.

If ISKIP(4) is set to 3, ULT and VLT are assumed to be the initial wind speed and direction and the adjusted wind speed and direction are printed in the wind field output print file.

e. If ISKIP(5) is set to 0, the terrain height matrix is input in Card Group Number 3.

If ISKIP(5) is set to 1, the terrain height matrix used in the last executed case is used in the present case.

ABLK - Minimum layer depth. If the layer depth is found to be less than ABLK in any iteration, the layer depth is then set to ABLK. A value of 50 meters is assumed if zero is input.

PRINT - Array containing the iterative time step value in minutes at which the wind field and layer height values are to be printed and/or output to tape. Values are arranged in ascending order.

ULT - The initial u component of the wind speed if ISKIP(4) is set to 0 or 1. The initial mean wind speed if ISKIP(4) is set to 2 or 3.

VLT - The initial v component of the wind speed if ISKIP(4) is set to 0 or 1. The initial direction if ISKIP(4) is set to 2 or 3.

PLT - The initial surface layer height.

DTLMDA - Stability factor used in calculating the time step DT. This value should be as close to 1 as possible. The program assumes a general value of 0.95 if zero is input. Program instability is indicated by a program message IFLAG ERROR. When this occurs, either the value of DTLMDA or NCNT must be reduced.

G1 - Reduced gravity factor, where $G1 = g\left(1 - \frac{\rho_1}{\rho_0}\right) \simeq g\left(1 - \frac{\theta_0}{\theta_1}\right)$

g = the acceleration of gravity

θ_1 = the potential temperature at the top of the surface layer

θ_0 = the potential temperature at the bottom of the surface layer

ρ_1, ρ_0 = respective layer densities

The program assumes a value of 0.1 for G1 if zero is input.

ISMOTH - The number of time steps between the application of a nine-point filter to the adjusted values of the wind field. A value of 10 is assumed if zero is input. If no smoothing is desired, set ISMOTH to a large value, say, 10,000.

NCNT - The number of time steps between the recalculation of the time step time increment DT. A value of 2 is assumed if zero is input.

IUNIT - The Fortran logical output unit for tape output. The program uses NTRAN I/0 with unit 0 an illegal unit. The program assumes unit 1 if zero is input. If more than one reel of output is executed, a second reel must be assigned to IUNIT + 1. See Section A.7 for the output tape format.

A.4.3 Card Group No. 3

This card group contains the terrain heights and the starting and ending indices that define the area of storage of the terrain heights within the grid system. The terrain heights outside of the input areaaare calculated from the

minimum height and the height on the edge of the input terrain. The starting and ending indices of the x and y axes are input first, followed by the terrain heights.

IST - Starting index of the terrain height matrix in the x direction.

IND - Ending index of the terrain height matrix in the x direction.

JST - Starting index of the terrain height matrix in the y direction.

JND - Ending index of the terrain height matrix in the y direction.

HG - The matrix of terrain heights input by the following Fortran statements:

```
      DO 10 J = JST, JND
   10 READ (5, 2000) (HG(I, J), I=IST, IND)
 2000 FORMAT (14X, 10F6. 1)
```

A.5 SUBROUTINE LINKAGE FOR THE COMPUTER PROGRAM

The logical linkage for the computer program subroutines is shown in Figure A-1. Each connector represents a communication link between the subroutines.

A.6 EXAMPLE COMPUTER PROGRAM

This section explains the input data example shown in Figure A-2. The example consists of a problem with WSMR terrain elevation data. The example data shown here is a computer listing of the data. The data are stored in a program file as an element of the file.

The first card image shown is a system (@MAP, I) card starting in column one. This card is used to direct the system to link the program subroutines and form an absolute program deck. The second card image @XQT directs the system to load and execute the program using the data that follow.

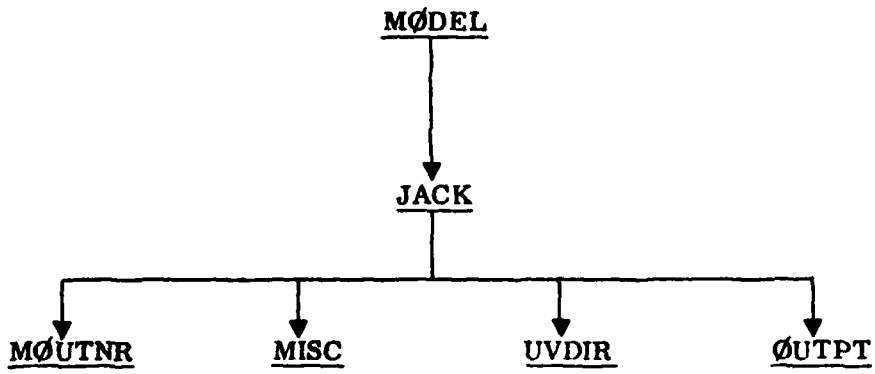

FIGURE A-1. Diagram of linkage between subroutines of the computer program.

```
@ELT,I.. DATA
ELT 80:-06/07-14:05
000001    000   $MAP,I
000002    000   $ADJT
000003    000    1
000004    000    1 41 41
000005    000    $OLST1
000006    000    ISKIP=1,1,1,1,0
000007    000    PRINT=180,300,
000008    000    ULT=7,
000009    000    VLT=7,
000010    000    PLT=2800,
000011    000    ISMOTH=5,
000012    000    IUNIT=1,
000013    000    $END
000014    000      6  36    6  36
000015    000                  1194.81197.91255.81341.11645.92133.51347.21249.71204.01219.2
000016    000                  1234.81243.61246.61258.81319.81338.11396.01411.21655.11588.0
000017    000                  1524.01493.51463.01444.81414.31432.61383.81304.51453.91432.6
000018    000                  1277.1
000019    000                  1188.71216.21493.51402.11706.92255.51402.11237.51219.21222.3
000020    000                  1237.51243.61246.61249.71280.21286.31335.01438.71603.31594.1
000021    000                  1533.11524.01487.41420.41365.51325.91310.61402.11463.01341.1
000022    000                  1274.1
000023    000                  1188.71288.21341.11444.81706.92438.61463.01219.21341.11200.9
000024    000                  1234.81240.51246.61249.71249.71268.81335.01432.61585.01606.3
000025    000                  1524.01505.71487.41463.01359.41316.71371.61897.21438.71432.6
000026    000                  1402.1
000027    000                  1219.21298.51347.21408.81706.91463.01316.71220.31287.01228.3
000028    000                  1234.81237.51249.71341.11283.21258.81292.41402.11824.61529.0
000029    000                  1468.01450.91469.11453.91420.41386.81605.91563.01824.01539.2
000030    000                  1468.8
000031    000                  1341.11359.41328.91399.01548.41600.21389.91219.21204.01225.3
000032    000                  1216.21225.31249.71524.01280.21255.81255.81341.11645.91478.3
000033    000                  1493.51524.01517.91527.11493.51767.81706.91536.21645.91706.9
000034    000                  1493.5
000035    000                  1463.01341.11328.91383.81527.12133.61524.01258.81207.01213.1
000036    000                  1216.21222.31234.41402.11264.91225.31246.61310.61402.11545.3
000037    000                  1548.41645.91328.91633.71905.01828.81706.91652.01737.41828.8
000038    000                  1524.0
000039    000                  1353.31325.91328.91389.91505.71828.81706.91341.11213.11213.1
000040    000                  1213.11219.21222.31237.51228.31228.31243.61304.51432.61706.9
000041    000                  1828.81828.81641.01758.71898.92072.61889.81737.41767.81767.8
000042    000                  1585.0
000043    000                  1328.91325.91325.91380.71487.42072.61889.81615.81213.11213.1
000044    000                  1216.21216.21219.21222.31234.41234.41249.71298.51402.11585.0
000045    000                  2072.61950.72011.71950.71935.52042.21859.31828.81816.61950.7
000046    000                  1981.2
000047    000                  1316.71322.81338.11389.91472.21828.81737.41286.51287.01210.1
000048    000                  1210.11216.21222.31225.31225.31222.31285.81301.51420.41828.8
000049    000                  2176.32139.72133.62164.12194.62090.91908.12109.21950.71898.9
000050    000                  1848.8
000051    000                  1335.01335.01350.31414.31530.12255.51371.61219.21207.01219.2
000052    000                  1240.11213.11219.21222.31219.21219.21243.61274.51508.81956.8
000053    000                  2133.62377.42590.82377.42194.62103.12011.71920.71920.21907.5
000054    000                  1828.8
000055    000                  1328.71341.11389.91444.81554.52316.51341.11210.51280.91194.5
```

FIGURE A-2. Computer listing of the example input data.

```
00U055  00U   1243.11213.11216.21280.21219.21222.31237.51280.72011.72237.2
00U057  00U   2456.42651.42621.42347.42255.52158.62072.61950.72042.21889.8
00U059  00U   1737.4
00U059  00U   1353.31340.71447.81502.71645.91767.81304.51216.71200.91200.9
00U0A0  00U   1207.01216.21216.21265.31231.41231.41249.71889.82133.62743.2
00U061  00U   2662.22743.22499.42499.42255.52103.12072.61981.72011.71889.8
00U062  00U   1635.5
00U0A3  00U   1309.91438.71521.01633.72036.11706.91271.01210.11197.91194.8
00U064  00U   1207.01216.21219.21234.41243.61246.61264.92072.62286.02880.4
00U065  00U   2811.42743.22560.42529.82164.12133.62036.12011.72011.71828.8
00U066  00U   1670.3
00U067  00U   1400.21443.01527.11645.91615.41645.91231.41185.71200.91194.8
00U063  00U   1213.11216.21222.31243.61249.71264.91316.71737.42011.72834.6
00U069  00U   2865.12621.32316.52316.52072.62133.62011.72011.72011.71804.4
00U070  00U   1961.2
00U071  00U   1438.71518.81585.01777.01706.91828.81213.11210.11194.81200.9
00U072  00U   1219.21216.21222.31246.61258.81286.31325.91630.72133.62804.2
00U073  00U   2662.22631.32560.32499.42301.22663.52103.11920.21950.71737.4
00U074  00U   1645.9
00U075  00U   1481.31563.61722.11737.41828.81524.01185.71200.91194.81197.9
00U076  00U   1213.11216.21231.41258.81280.21316.71371.61767.82072.62225.0
00U077  00U   2662.22712.72499.42493.32374.42142.72042.21920.21828.81828.8
00U078  00U   1767.8
00U079  00U   1524.01619.31706.91737.41767.81255.81185.71191.81185.71194.8
00U080  00U   1207.01219.21240.51264.91292.41335.01408.21585.01767.82072.6
00U0A1  00U   2621.32682.22529.82411.02161.02130.72087.91950.71798.31859.3
00U082  00U   1959.3
00U083  00U   1572.81767.81773.91645.91615.41237.51197.91204.81207.81210.1
00U0B4  00U   1243.11219.21249.71274.11310.61341.11469.11630.72133.62438.4
00U085  00U   2560.32468.92438.42243.02218.92072.62255.52011.71749.61889.8
00U0A6  00U   1869.8
00U087  00U   1594.11639.81869.81228.81899.81491.51207.81207.81213.11216.2
00U088  00U   1138.21234.41249.71269.21325.91380.71499.61645.92255.52194.6
00U089  00U   2621.32658.42468.92496.32407.92267.72209.81999.51920.21828.8
00U090  00U   1968.8
00U091  00U   1642.91810.51767.81767.81767.81289.31216.21207.81216.21222.3
00U092  00U   1262.31234.41252.71263.21328.91392.91514.91645.92042.22316.5
00U093  00U   2255.52438.62438.42499.42438.42135.62167.12087.91889.81920.2
00U094  00U   1867.5
00U095  00U   1662.51950.71968.11828.81706.91280.21234.41225.81222.31228.3
00U096  00U   1237.51246.61249.71266.31344.21417.31578.91950.71874.52255.5
00U097  00U   2104.12417.92468.12529.82286.02037.22103.12042.21920.21886.7
00U098  00U   1863.6
00U099  00U   1703.42811.72072.01706.91767.81765.51274.11225.81222.31240.5
00U1U0  00U   1252.71264.91200.21304.51344.21441.71645.91767.81889.82072.6
00U101  00U   2377.42417.42438.42377.42301.22191.52133.62042.21889.81889.8
00U102  00U   1861.4
00U1U3  00U   1706.91874.31950.72011.72240.31524.01371.61252.71237.51252.7
00U1U4  00U   1201.01211.21198.51246.31362.51463.01633.72133.61938.52042.2
00U105  00U   2668.72255.52477.42493.42374.42225.82133.62017.81859.31905.8
00U106  00U   1847.4
00U107  00U   1665.81874.81859.32042.71920.22133.62438.41371.61246.61246.6
00U1U8  00U   1201.01211.21198.51246.11377.71681.31815.42438.42194.62286.0
00U109  00U   2377.42417.42472.62103.12438.02011.72011.71950.71889.81761.7
00U110  00U   1767.4
00U111  00U   1565.41801.81706.91765.41767.81737.42133.62072.61292.41271.0
00U112  00U   1263.21274.51324.91358.11411.21502.71606.51737.02194.62230.2
```

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FIGURE A-2. (Continued)

```
00v113  000  2177.42133.62133.62072.62194.62087.92057.41920.91798.31767.8
00v114  000  1524.0
00v115  000  1544.91557.51585.01597.21633.71615.41664.21889.81341.11292.4
00v116  000  1544.51322.31332.01371.61444.81645.91706.91767.82621.33474.7
00v117  000  2641.32682.32225.02148.82133.61767.81920.21889.81767.81804.4
00v118  000  1752.6
00v119  000  1400.01466.11441.31502.71511.81530.11585.01493.51392.91344.2
00v120  000  1502.01341.11347.21527.11466.11708.91828.82011.72439.42621.3
00v121  000  2500.32635.52153.62153.62103.11828.81737.41956.91749.61740.4
00v122  000  1740.0
00v123  000  1463.01401.71429.01432.61450.91469.11951.71767.81472.21402.1
00v124  000  1402.11390.71300.71492.61487.41591.11767.61889.82194.62804.2
00v125  000  2499.42316.52153.62153.61920.21981.21956.81828.81804.41844.0
00v126  000  1798.3
00v127  000  1404.41460.01417.31432.61402.11432.61560.62133.61493.51481.3
00v128  000  1514.91439.71402.11402.11463.01563.61950.71828.82331.72499.4
00v129  000  2316.52133.62133.62072.61935.51950.71028.82072.62030.01889.8
00v130  000  1770.9
00v131  000  1401.31460.01441.71435.61435.61402.11463.01575.81691.61645.0
00v132  000  1645.91407.41460.01453.91460.01527.11585.01664.21807.51939.5
00v133  000  1993.41950.72133.62026.91950.72011.72072.62407.02377.42590.8
00v134  000  2194.6
00v135  000  1453.91456.91447.01441.71432.61420.41450.91539.21691.62042.2
00v136  000  1645.91536.21581.91407.41493.51524.01544.41636.81706.91767.8
00v137  000  1913.62133.62194.62133.62347.02347.02682.22590.82438.42133.6
00v138  000  1829.8
```

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FIGURE A-2. (Continued)

The first data card shows a 1 in column two. This value (ND) is the number of times the entire program is to be executed reading a new set of dimension parameters on each pass. The second data card sets NP to 1 and IDIM and JDIM both equal to 41. The parameter NP represents the number of times the program is to be executed using IDIM and JDIM set to 41. All following cards beginning with $QLST1 are repeated NP times. The third data card begins the namelist QLST1. The parameter ISKIP indicates:

(1) The adjusted wind field and layer heights are printed at each time given in the array PRINT

(2) The adjusted wind field and layer heights are output to tape

(3) The terrain heights are output to tape

(4) ULT and VLT are input as vector components and mean wind speed and direction are printed in the output listing

(5) The terrain height data will be input following the namelist QLST1.

The remaining parameters in QLST1 indicate that output is to take place at 180 and 300 seconds iteration time and the u and v components of the wind speed are set to 7 meters per second. Also, the initial surface layer is 2800 meters high and filtering is to be done on each fifth time step and the output unit is Unit 1. Several parameters from QLST1 do not appear in the data because default values are provided. The parameters and values are:

LL=41; JL = 41; X = UTM coordinates of terrain (see Table A-1);

Y = UTM coordinates of terrain (see Table A-1); ABLK = 50 meters;

DTLMDA = 0.95; G1 = 0.1; NCNT = 2.

The namelist is then ended with a $END card. The next card gives the starting and ending indices of the x and y axes, respectively, which define the area of storage for the terrain heights that follow. The terrain heights begin in Column 15 of the card and are read using the statements shown in Section A.4.3.

The above example problem executed in 302 seconds on the UNIVAC 1108 computer at the University of Utah. The computer output listing for the sample problem is shown in Appendix C.

A.7 OUTPUT TAPE FORMAT

The output tape produced by the program is a binary (odd parity) tape. The data are recorded in integer binary and floating point binary (real) form. The tape (tapes) is in multiple file form where each file represents the output from a single case. The records of each file are arranged as follows:

RECORD 1:

Word 1 - Number of times the arrays UL (u component), VL (v component) and PL (layer height) occur within the file (integer).

Word 2 - Flag where if set to 1 indicates record 4 contains the terrain height data HG. If set to zero, then record 4 contains the first occurrence of UL (integer).

Word 3 - IDIM or the I dimension of the arrays UL, VL, PL and HG (integer).

Word 4 - JDIM or the J dimension of the arrays UL, VL, PL and HG (integer).

Word 5 - LL or the number of values in the x axis in record 2 (integer).

Word 6 - JL or the number of values in the y axis in record 3 (integer).

Word 7 - IST or the starting index on the x axis of uniform grid spacing (integer).

Word 8 - IND or the ending index on the x axis of uniform grid spacing (integer).

Word 9 - JST or the starting index on the y axis of uniform grid spacing (integer).

Word 10 - JND or the ending index on the y axis of uniform grid spacing (integer).

RECORD 2: LL words consisting of the x axis in ascending order (real).

RECORD 3: JL words consisting of the y axis in ascending order (real).

RECORD 4: If Word 2 of Record 1 is set to 1, then Record 4 contains IDIM*JDIM words of terrain height data. The data are arranged as if the following statement were used to write it:

((HG(I,J),I=1,IDIM)J=1,JDIM) - HG is a real variable.

RECORD 5: The u component of the wind speed (real). These data are arranged as if they were written by the following statement:

(UL,(I,J,2),I=1,IDIM),J=1,JDIM)

RECORD 6: The v component of the wind speed (real).

(VL(I,J,2),I=1,IDIM),J=1,JDIM)

RECORD 7: The height of the surface layer (real).

(PL(I,J,2),I=1,IDIM),J=1,JDIM)

Records 5, 6 and 7 are repeated (4, 5 and 6 if word 2 of Record 1 is 0) the number of times indicated in Word 1 of Record 1. If more than one reel of output is written, an end-of-file is placed at the end of the first reel. This file mark will appear within the affected file and will indicate a switching of reels is necessary on input. (The program will rarely require more than one reel of 2400 foot tape, even with several stacked cases.) The program prints the contents of each output tape file at the end of each case loop.

APPENDIX B

COMPUTER PROGRAM LISTING

Appendix B contains a complete listing of the computer program. The program is written in the FORTRAN V language and has been run on a UNIVAC 1108 computer.

CFUN.US MODEL
FOR 01JL-06/11/75-11:27:21 (0.1)

MAIN PROGRAM

STORAGE USED: CODE(1) 000125; DATA(0) 043140; BLANK COMMON(2) 000000

COMMON BLOCKS:

0003 LIM 000003

EXTERNAL REFERENCES (BLOCK, NAME)

0004 JACK
0005 .INTRS
0006 .RDVS
0007 .IO2S
0010 .STOPS

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0001 000013 1106 0000 043133 30F 0000 I 043121 I 0003 I 000000 IDIM 0003 I 000001 JDIM
0000 A 043124 J1 0000 I 043122 J11 0000 I 043123 J12 0000 I 043125 J2 0000 I 043126 J4
0000 I 043127 J5 0000 I 043130 J6 0000 I 043131 J7 0000 I 043132 J8 0000 I 043120 ND
0003 I 000002 NP 0000 R 000000 G

```
00101      1*          DIMENSION G(18000)                                          MDL00100
00101      2*    C     THE DIMENSION OF G IS DETERMINED BY, SIZE MUST BE GREATER THAN OR MDL00200
00101      3*    C     EQUAL TO (3*(IDIM*JDIM*2)+(IDIM*JDIM)+2*IDIM+2*JDIM) WHERE IDIM   MDL00300
00101      4*    C     IS THE SIZE OF THE X DIMENSION AND JDIM IS THE SIZE OF THE Y       MDL00400
00101      5*    C     DIMENSION                                                         MDL00500
00101      6*    C-----------------------------------------------------------------------MDL00600
00101      7*    C     ND IS THE NO. OF TIMES TO EXECUTE ENTIRE PROGRAM                  MDL00700
00101      8*    C     NP IS THE NO. OF TIMES TO EXECUTE PROGRAM USING ONE SET OF        MDL00800
00101      9*    C     DIMENSIONS IDIM AND JDIM                                          MDL00900
00103     10*          COMMON/DIM/IDIM,JDIM,NP                                         MDL01000
00104     11*          READ (5,30) ND                                                  MDL01100
00107     12*          DO 20 I=1,ND                                                    MDL01200
00112     13*          READ (5,30) NP,IDIM,JDIM                                        MDL01300
00117     14*          J11 = IDIM*JDIM                                                 MDL01400
00120     15*          J12 = J11*2                                                     MDL01500
00121     16*          J1 = J12+1                                                      MDL01600
00122     17*          J2 = J1+J12                                                     MDL01700
00123     18*          J4 = J2+J12                                                     MDL01800
00124     19*          J5 = J4+J11                                                     MDL01900
00125     20*          J6 = J5+IDIM                                                    MDL02000
00126     21*          J7 = J6+IDIM                                                    MDL02100
00127     22*          J8 = J7+JDIM                                                    MDL02200
00130     23*          CALL JACK(G,G(J1),G(J2),G(J4),G(J5),G(J6),G(J7),G(J8),,G(J4),G, MDL02300
00130     24*         1G(J4),G(J2))                                                    MDL02400
00131     25*       20 CONTINUE                                                       MDL02500
00133     26*       30 FORMAT (I2,2I3)                                                MDL02600
```

```
00134      270          STOP                    MDLU2700
00135      280          END                     MDL02800

      END OF COMPILATION:        NO  DIAGNOSTICS.
```

QFORTRAN Jack
Run 010L-06/11/73-11:27:22 (0,1)

SUBROUTINE JACK ENTRY POINT 005307

STORAGE USED: CODE(1) 005367; DATA(0) 002261; BLANK COMMON(2) 000000

COMMON BLOCKS:

0003 DIM 000003

EXTERNAL REFERENCES (BLOCK, NAME)

0004 ROUTNR
0005 MISC
0006 XTRAN
0007 OUTPT
0010 UVDIR
0011 ERRLS
0012 SIN
0013 COS
0014 SQRT
0015 NADUS
0016 NIO2B
0017 NIO1B
0020 NERR3B

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0001	000160	10L	0001	003347	1010G	0001	004005	1030G	0001	004071	1033G	0001	004427	1050G
0001	004475	1063G	0001	004577	1116G	0001	004614	1121G	0001	005216	1242G	0001	005231	1251G
0001	000123	130G	0001	000471	140L	0001	000256	172G	0000	001036	2000F	0000	001056	2001F
0000	001227	2002F	0000	001244	2003F	0000	001315	2004F	0000	001367	2005F	0000	001402	2006F
0000	001424	2007F	0000	001445	2008F	0000	001512	2009F	0000	001557	2010F	0000	001627	2011F
0000	001647	2012F	0000	002003	2013F	0000	002013	2014F	0001	000326	212G	0001	000515	257G
0001	000556	274G	0001	001104	300L	0001	000604	304G	0001	000626	315G	0001	001112	320L
0001	000671	326G	0001	001130	340L	0001	000757	361G	0001	000764	365G	0001	001000	376G
0001	001162	380L	0001	000271	40L	0001	001210	400L	0001	001003	401G	0001	001325	440L
0001	001444	460L	0001	001244	476G	0001	001447	480L	0001	001347	517G	0001	002767	520L
0001	001412	531G	0001	003403	600L	0001	004526	680L	0001	004550	700L	0001	003230	760G
0001	004762	760L	0001	003303	773G	0001	005023	780L	0001	000335	80L	0001	005031	800L
0001	005047	820L	0001	005074	840L	0001	005153	880L	0001	005161	900L	0001	005254	920L
0000 R	000473	A0LR	0000 R	000631	A1	0000 R	000633	A10	0000 R	000635	A11	0000 R	000636	A12
0000 R	000721	A13	0000 R	000636	A14	0000 R	000733	A15	0000 R	000640	A16	0000 R	000641	A17
0000 R	000645	A18	0000 R	000647	A19	0000 R	000632	A2	0000 R	000651	A20	0000 R	000623	A21
0000 R	000654	A22	0000 R	000705	A23	0000 R	000714	A24	0000 R	000672	A25	0000 R	000713	A26
0000 R	000726	A27	0000 R	000657	A28	0000 R	000660	A29	0000 R	000637	A3	0000 R	000662	A30
0000 R	000664	A31	0000 R	000741	A32	0000 R	000653	A33	0000 R	000670	A34	0000 R	000671	A35
0000 R	000674	A36	0000 R	000676	A37	0000 R	000677	A38	0000 R	000620	A39	0000 R	000720	A4
0000 R	000665	A40	0000 R	000703	A41	0000 R	000704	A42	0000 R	000621	A43	0000 R	000724	A44
0000 R	000675	A45	0000 R	000642	A46	0000 R	000661	A47	0000 R	000733	A48	0000 R	000646	A49
0000 R	000710	A5	0000 R	000702	A50	0000 R	000644	A51	0000 R	000663	A52	0000 R	000650	A53
0000 R	000667	A54	0000 R	000707	A55	0000 R	000641	A56	0000 R	000712	A57	0000 R	000711	A58

```
00101     1*          SUBROUTINE JACK(UL,VL,PL,HG,  DELXI,DXPI,  DELYJ,DYPJ,CONTP,HGQ,ULJCK00100
00101     2*         1Q,VLQ,PLQ)                                                      JCK00200
00101     3*     C                                                                    JCK00300
00101     4*     C  *-*  PROGRAM INPUT AND CONTROL PARAMETERS - REFER TO THE NAMELIST *-*JCK00400
00101     5*     C  *-*  JLST1 BELOW FOR INPUTS TO THIS ROUTINE                      *-*JCK00500
00101     6*     C                                                                    JCK00600
00101     7*     C     DT -R- TIME INCREMENT (SECONDS).                               JCK00700
00101     8*     C     HG(I,J) -R- HEIGHT OF LAND AT COORDINATES (I,J).               JCK00800
00101     9*     C     IFLAG -I- FLAG TO INDICATE THE PROBLEM IS GROWING UNSTABLE     JCK00900
00101    10*     C     JL -I- NUMBER OF GRID POINTS IN J DIRECTION                    JCK01000
00101    11*     C     JLM -I- JL MINUS ONE.                                          JCK01100
00101    12*     C     LL -I- NUMBER OF GRID POINTS IN I DIRECTION                    JCK01200
00101    13*     C     LLM -I- LL MINUS ONE.                                          JCK01300
00101    14*     C     PL(I,J,K) -R- HEIGHT OF SURFACE LAYER                          JCK01400
00101    15*     C     PLT -R- INITIAL HEIGHT OF SURFACE LAYER                        JCK01500
00101    16*     C     UL(I,J,K) -R- U COMPONENT OF THE WIND IN THE LOWER LAYER       JCK01600
00101    17*     C     ULT -R- U COMPONENT OF LOWER LAYER WIND (INITIAL CONDITION)    JCK01700
00101    18*     C           OR MEAN WIND SPEED DEPENDING ON ISKIP(4)                 JCK01800
00101    19*     C     VL(I,J,K) -R- V COMPONENT OF THE WIND IN THE LOWER LAYER       JCK01900
00101    20*     C     VLT -R- V COMPONENT OF LOWER LAYER WIND (INITIAL CONDITION)    JCK02000
00101    21*     C           OR WIND DIRECTION DEPENDING ON ISKIP(4)                  JCK02100
00101    22*     C     X(I) -R- X COORDINATE VALUE I.                                 JCK02200
00101    23*     C     Y(I) -R- Y COORDINATE VALUE I.                                 JCK02300
```

```
00101  C     PRINT -R- ARRAY CONTAINING THE TIME IN MINUTES AT WHICH THE        JCK02400
00101  C               WIND FIELD AND LAYER HEIGHT ARRAYS ARE TO BE PRINTED     JCK02500
00101  C               AND/OR OUTPUT TO TAPE. THE VALUES ARE IN ASCENDING ORDER JCK02600
00101  C               AND THE MAXIMUM IS USED AS THE PROBLEM STOP VALUE.       JCK02700
00101  C     IST -I- INDEX OF THE FIRST POINT IN THE X ARRAY AT WHICH UNIFORM   JCK02800
00101  C             SPACING OCCURS ALONG THE AXIS                              JCK02900
00101  C     JST -I- INDEX OF THE FIRST POINT IN THE Y ARRAY AT WHICH UNIFORM   JCK03000
00101  C             SPACING OCCURS ALONG THE AXIS                              JCK03100
00101  C     INU AND JND -I- INDICES OF THE LAST POINT IN THE X AND Y ARRAYS AT JCK03200
00101  C             WHICH UNIFORM SPACING STOPS ALONG THE X AND Y AXES          JCK03300
00101  C     NCNT -I- NUMBER OF ITERATIVE TIME STEPS BETWEEN THE RECALCULATIONS JCK03400
00101  C             OF DT (TIME INCREMENT BETWEEN TIME STEPS)                   JCK03500
00101  C     DTLMDA -R- STABILITY FACTOR FOR CALCULATING THE TIME STEP DT.      JCK03600
00101  C               THIS VALUE SHOULD BE AS CLOSE TO 1 AS POSSIBLE AND       JCK03700
00101  C               STILL MAINTAIN PROGRAM STABILITY. THE PROGRAM ASSUMES    JCK03800
00101  C               .95 IF NO OTHER VALUE IS INPUT. IF AN IFLAG ERROR        JCK03900
00101  C               OCCURS DTLMDA SHOULD BE REDUCED                          JCK04000
00101  C     ISMOTH -I- NUMBER OF TIME STEPS BETWEEN THE APPLICATION OF A       JCK04100
00101  C               SMOOTHING FUNCTION IN SPACE                              JCK04200
00101  C     G1 -R- REDUCED GRAVITY FACTOR = G*(1-S) WHERE G = 9.8 M/SEC**2     JCK04300
00101  C               AND S IS THE RATIO OF THE POTENTIAL TEMP AT THE TOP      JCK04400
00101  C               OF THE LAYER OVER THE POTENTIAL TEMP AT THE BOTTOM       JCK04500
00101  C     ABLK - MINIMUM ALOWABLE LAYER DEPTH                                JCK04600
00101  C     ISKIP(1) -I- IF SET TO 1 THE CALCULATED WIND FIELD AND LAYER       JCK04700
00101  C                  HEIGHTS ARE PRINTED AT EACH TIME STEP IN THE ARRAY    JCK04800
00101  C                  PRINT                                                 JCK04900
00101  C     ISKIP(2) -I- IF SET TO 1 THE WIND FIELD AND LAYER HEIGHTS ARE      JCK05000
00101  C                  OUTPUT TO TAPE AT EACH TIME STEP IN THE ARRAY PRINT   JCK05100
00101  C     ISKIP(3) -I- IF SET TO 1 THE TERRAIN HEIGHT MATRIX IS OUTPUT TO    JCK05200
00101  C                  TAPE                                                  JCK05300
00101  C     ISKIP(4) - IF SET TO 0 THE PROGRAM ASSUMES ULT AND VLT ARE INPUT   JCK05400
00101  C                AS THE U AND V COMPONENTS OF THE WIND SPEED AND THE     JCK05500
00101  C                U AND V COMPONENTS ARE PRINTED IN THE WIND FIELD OUTPUT JCK05600
00101  C                IF SET TO 1 ULT AND VLT ARE THE U AND V COMPONENTS OF   JCK05700
00101  C                THE WIND SPEED AND WIND SPEED AND DIRECTION ARE PRINTED JCK05800
00101  C                IN THE WIND FIELD OUTPUT                                JCK05900
00101  C                IF SET TO 2 ULT AND VLT ARE THE WIND SPEED AND          JCK06000
00101  C                DIRECTION AND THE U AND V COMPONENTS OF THE WIND SPEED  JCK06100
00101  C                ARE PRINTED IN THE WIND FIELD OUTPUT                    JCK06200
00101  C                IF SET TO 3 ULT AND VLT ARE THE WIND SPEED AND          JCK06300
00101  C                DIRECTION AND THE WIND SPEED AND DIRECTION ARE PRINTED  JCK06400
00101  C                IN THE WIND FIELD OUTPUT                                JCK06500
00101  C                THE U AND V COMPONENTS ONLY ARE OUTPUT TO TAPE IF TAPE  JCK06600
00101  C                OUTPUT IS REQUESTED                                     JCK06700
00101  C     ISKIP(5) - IF SET TO 0 THE PROGRAM READS THE TERRAIN INDICES AND   JCK06800
00101  C                HEIGHTS VIA SUBROUTINE MOUTNR                           JCK06900
00101  C                IF SET TO 1 THE PROGRAM USES THE TERRAIN DATA USED IN   JCK07000
00101  C                THE PREVIOUS CASE                                       JCK07100
00101  C                REFER TO SUBROUTINE MOUTNR FOR TERRAIN INPUTS AND       JCK07200
00101  C                FORMAT                                                  JCK07300
00101  C     IUNIT -I- FORTRAN LOGICAL OUTPUT TAPE UNIT (CANNOT BE ZERO)        JCK07400
00101  C     THE PROGRAM ASSUMES LOGICAL UNIT 1 AS THE STARTING OUTPUT UNIT     JCK07500
00101  C     IF MORE THAN ONE REEL IS EXPECTED A SECOND UNIT MUST BE ASSIGNED   JCK07600
00101  C     AS IUNIT+1                                                         JCK07700
00101  C                                                                        JCK07800
00101  C     OUTPUT TAPE FILE FORMAT - TAPE IS BINARY, OUTPUT IS VIA NTRAN      JCK07900
00101  C             RECORD 1 - 7 WORDS OF INTEGER INFORMATION                  JCK08000
```

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00101   61*     C                       WORD 1 NUMBER OF TIMES THE ARRAYS UL, VL AND PL  JCK08100
00101   62*     C                              ARE OUTPUT                                JCK08200
00101   63*     C                       WORD 2 FLAG WHERE IF SET TO 1 TERRAIN HEIGHT DATAJCK08300
00101   64*     C                              IS ON THE TAPE. IF ZERO THERE IS NO       JCK08400
00101   65*     C                              TERRAIN DATA ON TAPE                      JCK08500
00101   66*     C                       WORD 3 IS IDIM (THE I DIMENSION OF UL, VL, PL    JCK08600
00101   67*     C                              AND HG (UL(IDIM,JDIM,2)) )                JCK08700
00101   68*     C                       WORD 4 IS JDIM (THE J DIMENSION OF UL, VL, PL    JCK08800
00101   69*     C                              AND HG                                    JCK08900
00101   70*     C                       WORD 5 IS LL (THE NO OF POINTS IN THE X AXIS OR  JCK09000
00101   71*     C                              NO OF WORDS USED WITHIN IDIM)             JCK09100
00101   72*     C                       WORD 6 IS JL (THE NO OF POINTS IN THE Y AXIS OR  JCK09200
00101   73*     C                              NO OF WORDS USED WITHIN JDIM)             JCK09300
00101   74*     C                       WORD 7 IS IST                                    JCK09400
00101   75*     C                       WORD 8 IS IND                                    JCK09500
00101   76*     C                       WORD 9 IS JST                                    JCK09600
00101   77*     C                       WORD 10 IS JND                                   JCK09700
00101   78*     C               RECORD 2 - THE X AXIS ARRAY  (X(I),I=1,LL)               JCK09800
00101   79*     C               RECORD 3 - THE Y AXIS ARRAY  (Y(J),J=1,JL)               JCK09900
00101   80*     C               RECORD 4 - THE TERRAIN HEIGHT ARRAY (HG0(I),I=1,IJDIM)   JCK10000
00101   81*     C                          ONLY IF ISKIP(3) OR WORD 2 OF RECORD 1 IS SET JCK10100
00101   82*     C                          TO 1. OTHERWISE HG IS NOT OUTPUT TO TAPE. THE JCK10200
00101   83*     C                          PARAMETER IJDIM ABOVE IS EQUAL TO IDIM*JDIM   JCK10300
00101   84*     C               RECORD 5 - THE U COMPONENT OF THE WIND SPEED             JCK10400
00101   85*     C                          (ULQ(I),I=1,IJDIM) THIS IS EQUIVALENT TO     JCK10500
00101   86*     C                          (((UL(I,J,1),I=1,IDIM),J=1,JDIM)             JCK10600
00101   87*     C               RECORD 6 - THE V COMPONENT OF THE WIND SPEED             JCK10700
00101   88*     C                          (VLQ(I),I=1,IJDIM)                           JCK10800
00101   89*     C               RECORD 7 - THE HEIGHT OF THE MIXING LAYER                JCK10900
00101   90*     C                          (PLQ(I),I=1,IJDIM)                           JCK11000
00101   91*     C               RECORDS 5,6,7 ARE REPEATED FOR EACH INDICATED TIME STEP  JCK11100
00101   92*     C       END OF FILE - THE FILE FORMAT IS REPEATED FOR EACH OUTPUT CASE   JCK11200
00101   93*     C        NOTE - IN THE CASE MORE THAN ONE REEL IS WRITTEN A FILE COULD   JCK11300
00101   94*     C        SPAN BOTH REELS. IN THIS CASE A FILE MARK WILL APPEAR WITHIN THE JCK11400
00101   95*     C        FILE THAT SPANS THE REELS AND WILL INDICATE END OF TAPE ONE.    JCK11500
00101   96*     C        THE PROGRAM WILL PRINT THE CONTENTS OF EACH FILE AT THE END OF A JCK11600
00101   97*     C        PROBLEM RUN AND WILL INDICATE IF ONE OR TWO REELS WERE WRITTEN  JCK11700
00101   98*     C                                                                        JCK11800
00101   99*     C                            *** PROGRAM INPUT UNITS ***                 JCK11900
00101  100*     C       ULT,VLT - METERS/SECOND OR (METERS/SECOND, DEGREES)              JCK12000
00101  101*     C       PLT,HG,X,Y,ABLK - METERS                                         JCK12100
00101  102*     C       PRINT - MINUTES                                                  JCK12200
00101  103*     C       G1 - METERS/SECOND**2                                            JCK12300
00101  104*     C                                                                        JCK12400
00101  105*     C                          *** PROGRAM DEFAULT VALUES ***                JCK12500
00101  106*     C       ABLK = 50, DTLMDA= .95, G1= 0.1, ISMOTH=10, NCNT= 2,             JCK12600
00101  107*     C       ISKIP(1) = 0, ISKIP(2) = 1 (ONLY IF ISKIP(1)=0), ISKIP(3)= 0,    JCK12700
00101  108*     C       ISKIP(4) = 0, ISKIP(5, = 0.IUNIT=1 (THEN 2 FOR SECOND REEL),     JCK12800
00101  109*     C       LL = IDIM, JL = JDIM (IF X(2)=0.0 AND Y(2)=0.0 THEN LL=41, JL=41 JCK12900
00101  110*     C         AND THE X AND Y ARRAYS ARE FILLED WITH THE WSMR UTM COORDINATES JCK13000
00101  111*     C         IN THE ARRAYS XPS AND YPS BELOW AND ARE CONVERTED TO METERS)    JCK13100
00101  112*     C                                                                        JCK13200
00101  113*     C***** DECLARATIONS. *****                                               JCK13300
00101  114*     C                                                                        JCK13400
00103  115*           COMMON/DIM/IDIM,JDIM,MP                                            JCK13500
00104  116*           DIMENSION UL(IDIM,JDIM,2),VL(IDIM,JDIM,2),PL(IDIM,JDIM,2),HG(IDIM,JCK13600
00104  117*          1JDIM),DELAI(IDIM),DXPI(IDIM),DELYJ(JDIM),DYPJ(JDIM),CONTP(IDIM,JDICK13700
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00104    1370          2M=2.3)                                                    JCK13800
00105    1380          DIMENSION ISKIP(10),X(80),Y(80)                            JCK13900
00106    1390          DIMENSION MOUT(10),XPS(41),YPS(41),PRINT(20),ISPS(2),ISAVE(20),  JCK14000
00106    1410         1TSAVE(20)                                                  JCK14100
00107    1420          EQUIVALENCE (MOUT(5),LL),(MOUT(6),JL),(MOUT(7),IST),(MOUT(8),IND),JCK14200
00107    1430         1(MOUT(9),JST),(MOUT(10),JND)                               JCK14300
00107    1440      C   STANDARD WHITE SANDS GRID IN UTM COORDINATES (KILOMETERS)    JCK14400
00110    1450          DATA XPS/100.,180.,260.,300.,320.,330.,335.,340.,345.,350.,355.,  JCK14500
00110    1460         1360.,365.,370.,375.,380.,385.,390.,395.,400.,405.,410.,415.,420.,  JCK14600
00110    1470         2425.,430.,435.,440.,445.,450.,455.,460.,465.,470.,475.,480.,490.,  JCK14700
00110    1480         3510.,550.,630.,710./                                       JCK14800
00112    1490          DATA YPS/3340.,3420.,3500.,3540.,3560.,3570.,3575.,3580.,3585.,  JCK14900
00112    1500         13590.,3595.,3600.,3605.,3610.,3615.,3620.,3625.,3630.,3635.,3640.,  JCK15000
00112    1510         23645.,3650.,3655.,3660.,3665.,3670.,3675.,3680.,3685.,3690.,3695.,  JCK15100
00112    1520         33700.,3705.,3710.,3715.,3720.,3730.,3750.,3790.,3870.,3950.,  JCK15200
00112    1530      C                                                              JCK15300
00114    1540          DATA ISPS/'0','1'/,RAD/.017453292/                         JCK15400
00117    1550          DIMENSION MGO(1),ULO(1),VLO(1),PLO(1)                      JCK15500
00120    1560          NAMELIST/OLST1/LL,JL,X,Y,ISKIP,ABLK,PRINT,ULT,VLT,PLT,DTLMDA,G1,  JCK15600
00120    1570         1ISMOTH,NCNT,IUNIT                                          JCK15700
00121    1580          SQ2I = .70710678                                           JCK15800
00121    1590      C                                                              JCK15900
00121    1600      C***** START OF EXECUTABLE STATEMENTS. *****                   JCK16000
00121    1610      C                                                              JCK16100
00122    1620          KDIM = 2                                                   JCK16200
00122    1630      C   IDIM,JDIM,KDIM ARE THE I,J,K DIMENSIONS IN THE ABOVE 3 DIMENSIONAL  JCK16300
00122    1640      C   PARAMETERS.  IDIM,JDIM ARE THE I,J DIMENSIONS OF MG, TSFC, CD.  JCK16400
00123    1650          IPIDIM = IDIM*IDIM                                         JCK16500
00125    1660          IJDIM = IDIM*JDIM                                          JCK16600
00126    1670          IJKDIM = IJDIM*KDIM                                        JCK16700
00126    1680          SS = 0.5                                                   JCK16800
00127    1690          DO 1000 NPSP=1,NP                                          JCK16900
00130    1700          IREC6 = 0                                                  JCK17000
00133    1710          READ (5,OLST1)                                             JCK17100
00134    1720          IF (ISKIP(4) .LT. 2) GO TO 10                              JCK17200
00140    1730          VLT = VLT*180.0                                            JCK17300
00141    1740          ULB = ULT*SIN(VLT*RAD)                                     JCK17400
00142    1750          VLB = ULT*COS(VLT*RAD)                                     JCK17500
00143    1760          ULT = ULB                                                  JCK17600
00144    1770          VLT = VLB                                                  JCK17700
00145    1780       10 CONTINUE                                                   JCK17800
00145    1790      C   PROVIDE DEFAULT PARAMETERS FOR VARIABLES NOT SET          JCK17900
00146    1800          IF (LL .LE. 0) LL = IDIM                                   JCK18000
00150    1810          IF (JL .LE. 0) JL = JDIM                                   JCK18100
00152    1820          JLM = JL-1                                                 JCK18200
00153    1830          LLM = LL-1                                                 JCK18300
00154    1840          IF (ISKIP(1) .EQ. 0.AND.ISKIP(2) .EQ. 0) ISKIP(2) = 1      JCK18400
00156    1850          IF (ABLK .LE. 0.0) ABLK = 50.0                             JCK18500
00160    1860          IF (DTLMDA .LE. 0.0) DTLMDA = .95                          JCK18600
00162    1870          IF (G1 .LE. 0.0) G1 = 0.1                                  JCK18700
00164    1880          IF (ISMOTH .LE. 0) ISMOTH = 10                             JCK18800
00166    1890          IF (NCNT .LE. 0  ) NCNT = 2                                JCK18900
00170    1900          MOUT(1) = 1                                                JCK19000
00171    1910          DO 20 I=1,19                                               JCK19100
00174    1920          IF (PRINT(I) .GT. PRINT(I+1)) GO TO 30                     JCK19200
00176    1930          MOUT(1) = MOUT(1)+1                                        JCK19300
00177    1940       20 CONTINUE                                                   JCK19400
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00201   190*        40 J13 = MOUT(1)                                          JCK19500
00202   191*           STOP = PRINT(J13)                                      JCK19600
00203   192*           IF (X(2) .GT. 0.0.AND.Y(2) .GT. 0.0) GO TO 80          JCK19700
00205   193*           LL = 41                                                JCK19800
00206   194*           LLM = LL-1                                             JCK19900
00207   195*           JL = 41                                                JCK20000
00210   196*           JLM = JL-1                                             JCK20100
00211   197*           DO 60 I=1,LL                                           JCK20200
00214   198*           X(I) = XPS(I)*1.0E3                                    JCK20300
00215   199*        60 Y(I) = YPS(I)*1.0E3                                    JCK20400
00217   200*        80 CONTINUE                                               JCK20500
00217   201*     C     INPUT TERRAIN HEIGHTS WITHIN THE GRID AREA             JCK20600
00220   202*           IF (ISKIP(5) .EQ. 0) CALL MOUTNR(HG,LL,JL,X,Y)         JCK20700
00220   203*     C     INITIALIZE OUTPUT TAPE DATA IF DESIRED                 JCK20800
00222   204*           ITAG1 = 0                                              JCK20900
00223   205*           IF (ISKIP(2) .NE. 1) GO TO 140                         JCK21000
00225   206*           MOUT(2) = ISKIP(3)                                     JCK21100
00226   207*           MOUT(3) = IDIM                                         JCK21200
00227   208*           MOUT(4) = JDIM                                         JCK21300
00227   209*     C     DETERMINE COORDINATE INDICES OF AREA OF UNIFORM GRID SPACING JCK21400
00227   210*     C     WITHIN THE GRID                                        JCK21500
00230   211*           CALL MISC(IST,IND,X,LL,LLM)                            JCK21600
00231   212*           CALL MISC(JST,JND,Y,JL,JLM)                            JCK21700
00232   213*           ITAG1=1                                                JCK21800
00233   214*           IF (IUNIT .LE. 0) IUNIT = 1                            JCK21900
00236   215*           CALL NTRAN(IUNIT,22)                                   JCK22000
00236   216*           J12 = 10                                               JCK22100
00237   217*           CALL OUTPT(IUNIT,J12,MOUT,NOGO)                        JCK22200
00240   218*           IF (NOGO .EQ. 1) GO TO 900                             JCK22300
00242   219*           CALL OUTPT(IUNIT,LL,X,NOGO)                            JCK22400
00243   220*           IF (NOGO .EQ. 1) GO TO 900                             JCK22500
00245   221*           CALL OUTPT(IUNIT,JL,Y,NOGO)                            JCK22600
00246   222*           IF (NOGO .EQ. 1) GO TO 900                             JCK22700
00250   223*           IF (ISKIP(3) .NE. 1) GO TO 140                         JCK22800
00252   224*           CALL OUTPT(IUNIT,IJDIM,HGO,NOGO)                       JCK22900
00255   225*           IF (NOGO .EQ. 1) GO TO 900                             JCK23000
00256   226*        140 CONTINUE                                              JCK23100
00256   227*     C     CALCULATE INITIAL VALUES OF WIND AND PRESSURE          JCK23200
00256   228*           DO 160 I=1,IJDIM                                       JCK23300
00261   229*           PLQ(I) = PLT-HGO(I)                                    JCK23400
00261   230*     C     TEST FOR TERRAIN PENETRATION OF LAYER                  JCK23500
00262   231*           IF (PLQ(I) .LT. ABLK) PLQ(I) = ABLK                    JCK23600
00264   232*           ULQ(I) = ULT*PLQ(I)                                    JCK23700
00265   233*           VLQ(I) = VLT*PLQ(I)                                    JCK23800
00266   234*        160 CONTINUE                                              JCK23900
00270   235*           JPR=1                                                  JCK24000
00271   236*           IFLAG=0                                                JCK24100
00271   237*     C                                                            JCK24200
00271   238*     C----- ELIMINATE DIVISIONS IN THE X DIRECTION.                JCK24300
00272   239*           DXPI(1) = 1.0/(X(2)-X(1))                              JCK24400
00273   240*           DO 180 I=2,LLM                                         JCK24500
00276   241*           DELXI(I)=1.0/(X(I+1)-X(I-1))                           JCK24600
00277   242*           DXPI(I)=1.0/(X(I+1)-X(I))                              JCK24700
00300   243*        180 CONTINUE                                              JCK24800
00300   244*     C                                                            JCK24900
00300   245*     C----- ELIMINATE DIVISIONS IN THE Y DIRECTION.                JCK25000
00302   246*           DYPJ(1) = 1.0/(Y(2)-Y(1))                              JCK25100
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00303   2540          DO 200 J=2,JLM                                          JCK25200
00304   2550          DELYJ(J)=1.0/(Y(J+1)-Y(J-1))                            JCK25300
00307   2560          DYPJ(J)=1.0/(Y(J+1)-Y(J))                               JCK25400
00310   2570      200 CONTINUE                                                JCK25500
00312   2580          XMIN = 1.0E5                                            JCK25600
00313   2590          XMAX = -1.0E5                                           JCK25700
00313   2600      C   CALCULATE INITIAL TIME INCREMENT (DT)                   JCK25800
00316   2610          DO 220 I=1,IJDIM                                        JCK25900
00317   2620          PKR = 1.0/PL0(I)                                        JCK26000
00320   2630          CHK = SQRT((UL0(I)*PKR)**2+(VL0(I)*PKR)**2)+SQRT(G1*PL0(I))  JCK26100
00321   2640          IF (CHK .GT. XMAX) XMAX = CHK                           JCK26200
00323   2650      220 CONTINUE                                                JCK26300
00325   2660          DO 240 I=1,LLM                                          JCK26400
00326   2670          CHK = X(I+1)-X(I)                                       JCK26500
00331   2680          IF (CHK .LT. XMIN) XMIN = CHK                           JCK26600
00333   2690      240 CONTINUE                                                JCK26700
00336   2700          DT = DTLMDA*XMIN/XMAX                                   JCK26800
00336   2710          IF (JL .GT. 3) DT = DT*S02I                             JCK26900
00340   2720          WRITE (6,2000)                                          JCK27000
00342   2730          WRITE (6,2001) IDIM,JDIM,LL,JL,ABLK,ULT,VLT,PLT,ISMOTH,NCNT,DT,  JCK27100
00342   2740         1DTLMDA,G1,PRINT,ISKIP                                   JCK27200
00371   2750          IF (ISKIP(1) .EQ. 0) GO TO 388                          JCK27300
00371   2760      C   OUTPUT INITIAL WINDFIELD, HEIGHT AND TERRAIN DATA       JCK27400
00373   2770          K = ISPS(1)                                             JCK27500
00376   2780          LINES = 60                                              JCK27600
00375   2790          DO 370 J=1,JL                                           JCK27700
00400   2800          DO 360 I=1,LL                                           JCK27800
00403   2810          PLB = 1.0/PL(I,J,1)                                     JCK27900
00404   2820          ULB = UL(I,J,1)*PLB                                     JCK28000
00406   2830          VLB = VL(I,J,1)*PLB                                     JCK28100
00406   2840          PLB = PL(I,J,1)+HG(I,J)                                 JCK28200
00407   2850          LINES = LINES+1                                         JCK28300
00410   2860          IF (LINES .LT. 58) GO TO 320                            JCK28400
00412   2870          LINES = 6                                               JCK28500
00413   2880          WRITE (6,2002)                                          JCK28600
00415   2890          IF (ISKIP(4) .EQ. 1.OR.ISKIP(4) .EQ. 3) GO TO 300       JCK28700
00417   2900          WRITE (6,2003) K                                        JCK28800
00422   2910          GO TO 320                                               JCK28900
00423   2920      300 WRITE (6,2004) K                                        JCK29000
00426   2930      320 IF (ISKIP(4) .EQ. 0.OR.ISKIP(4) .EQ. 2) GO TO 340       JCK29100
00430   2940          CALL UVDIR(ULB,VLB)                                     JCK29200
00431   2950      340 WRITE (6,2005) I,J,X(I),Y(J),ULB,VLB,PLB,HG(I,J)        JCK29300
00443   2960      360 CONTINUE                                                JCK29400
00446   2970          LINES = 60                                              JCK29500
00446   2980      370 CONTINUE                                                JCK29600
00450   2990      380 CONTINUE                                                JCK29700
00451   3000          ICNT = 0                                                JCK29800
00452   3010          TIM = 0.0                                               JCK29900
00453   3020          A9 = DT*DT*0.5                                          JCK30000
00456   3030          G2 = 0.5*G1                                             JCK30100
00456   3040          IBL2 = 0                                                JCK30200
00456   3050          IF (KDIM .GT. 2) IBL2 = IJDIM                           JCK30300
00460   3060          IJDIMP = 1-IBL2                                         JCK30400
00461   3070          IJDIMM = -1-IBL2                                        JCK30500
00462   3080          ISM = 0                                                 JCK30600
00463   3090          N = 0                                                   JCK30700
00464   3100      400 N = N+1                                                 JCK30800
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00465  3509*          IF (ISM .GE. ISMOTH) ISM = 0                                    JCK30900
00467  3510*          ISM = ISM+1                                                     JCK31000
00470  3511*          ICNT = ICNT+1                                                   JCK31100
00471  3512*          IF (ICNT .LT. NCNT) GO TO 440                                   JCK31200
00473  3513*          ICNT = 0                                                        JCK31300
00474  3514*          XMAX = -1.0E5                                                   JCK31400
00475  3515*          DO 420 I=1,IJDIM                                                JCK31500
00500  3516*          PKR = 1.0/PLQ(I)                                                JCK31600
00501  3517*          CHK = SQRT((ULQ(I)*PKR)**2+(VLQ(I)*PKR)**2)+SQRT(G1*PLJ(I))     JCK31700
00502  3518*          IF (CHK .GT. XMAX) XMAX = CHK                                   JCK31800
00504  3519*      420 CONTINUE                                                        JCK31900
00506  3520*          DT = DTLMDA*XMIN/XMAX                                           JCK32000
00507  3521*          IF (JL .GT. 3) DT = DT*SQ2I                                     JCK32100
00511  3522*          A9 = DT*DT*0.5                                                  JCK32200
00512  3523*      440 CONTINUE                                                        JCK32300
00513  3524*          TIM = TIM+DT                                                    JCK32400
00514  3525*          IF (IFLAG .GT. 0) GO TO 700                                     JCK32500
00514  3526*      C                                                                   JCK32600
00514  3527*      C                                                                   JCK32700
00514  3528*      C*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*JCK32800
00514  3529*      C***** GRID POINT CALCULATION LOOP. *****                           JCK32900
00514  3530*      C                                                                   JCK33000
00516  3531*          DO 500 J=2,JLM                                                  JCK33100
00521  3532*          JP12 = J*IDIM+1+IBL2                                            JCK33200
00522  3533*          JM12 = JP12-IPIDIM                                              JCK33300
00523  3534*          J12 = JP12-IDIM                                                 JCK33400
00524  3535*          J13 = IJDIM+J12                                                 JCK33500
00525  3536*          DELY = DELYJ(J)                                                 JCK33600
00526  3537*          DYP = DYPJ(J)                                                   JCK33700
00527  3538*          DYM = DYPJ(J-1)                                                 JCK33800
00530  3539*          DO 500 I=2,LLM                                                  JCK33900
00533  3540*          JP12 = JP12+1                                                   JCK34000
00534  3541*          JM12 = JM12+1                                                   JCK34100
00535  3542*          J12 = J12+1                                                     JCK34200
00536  3543*          J13 = J13+1                                                     JCK34300
00537  3544*          PLB = PLQ(J12)                                                  JCK34400
00537  3545*      C       TEST FOR STABLE SOLUTION.IF NOT-BRANCH                      JCK34500
00540  3546*          IF (IFLAG .GT. 0) GO TO 520                                     JCK34600
00542  3547*          IF (PLB .GT. 20000.0) GO TO 460                                 JCK34700
00544  3548*          GO TO 480                                                       JCK34800
00545  3549*      460 IFLAG = N                                                       JCK34900
00546  3550*          GO TO 520                                                       JCK35000
00547  3551*      480 CONTINUE                                                        JCK35100
00547  3552*      C                                                                   JCK35200
00547  3553*      C       THE FOLLOWING COMPUTATIONS DO NOT REFLECT THE FORM OF       JCK35300
00547  3554*      C       THE MODEL EQUATIONS DUE TO ALTERATIONS FOR CALCULATION EFFICIENCY JCK35400
00547  3555*      C                                                                   JCK35500
00550  3556*          ULB = ULQ(J12)                                                  JCK35600
00551  3557*          VLB = VLQ(J12)                                                  JCK35700
00552  3558*          ULXP = ULQ(J12+1)                                               JCK35800
00553  3559*          VLXP = VLQ(J12+1)                                               JCK35900
00554  3560*          PLXP = PLQ(J12+1)                                               JCK36000
00555  3561*          ULXM = ULQ(J12-1)                                               JCK36100
00556  3562*          VLXM = VLQ(J12-1)                                               JCK36200
00557  3563*          PLXM = PLQ(J12-1)                                               JCK36300
00560  3564*          ULYP = ULQ(JP12)                                                JCK36400
00561  3565*          VLYP = VLQ(JP12)                                                JCK36500
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00562   3698*          PLYP = PLQ(JP12)                                    JCK36600
00563   3697*          ULYM = ULQ(JM12)                                    JCK36700
00564   3698*          VLYM = VLQ(JM12)                                    JCK36800
00565   3699*          PLYM = PLQ(JM12)                                    JCK36900
00566   3700*          ULXYP = ULQ(JP12+1)                                 JCK37000
00567   3701*          VLXYP = VLQ(JP12+1)                                 JCK37100
00568   3702*          PLXYP = PLQ(JP12+1)                                 JCK37200
00569   3703*          ULXYM = ULQ(JM12-1)                                 JCK37300
00570   3704*          VLXYM = VLQ(JM12-1)                                 JCK37400
00571   3705*          PLXYM = PLQ(JM12-1)                                 JCK37500
00572   3706*          ULXMYP = ULQ(JP12-1)                                JCK37600
00573   3707*          VLXMYP = VLQ(JP12-1)                                JCK37700
00574   3708*          PLXMYP = PLQ(JP12-1)                                JCK37800
00575   3709*          ULXPYM = ULQ(JM12+1)                                JCK37900
00576   3710*          VLXPYM = VLQ(JM12+1)                                JCK38000
00577   3711*          PLXPYM = PLQ(JM12+1)                                JCK38100
00578   3712*          PLDI = 1.0/PLB                                      JCK38200
00579   3713*          PLXPI = 1.0/PLXP                                    JCK38300
00580   3714*          PLXMI = 1.0/PLXM                                    JCK38400
00581   3715*          PLYPI = 1.0/PLYP                                    JCK38500
00582   3716*          PLYMI = 1.0/PLYM                                    JCK38600
00583   3717*          PLXYPI = 1.0/PLXYP                                  JCK38700
00584   3718*          PLXYMI = 1.0/PLXYM                                  JCK38800
00585   3719*          PXMYPI = 1.0/PLXMYP                                 JCK38900
00586   3720*          PXPYMI = 1.0/PLXPYM                                 JCK39000
00587   3721*          A39 = HGQ(J12-IBL2)                                 JCK39100
00588   3722*          A43 = HGQ(JP12-IBL2)                                JCK39200
00589   3723*          A79 = HGQ(JM12-IBL2)                                JCK39300
00590   3724*          A21 = HGQ(J12+IJDIMP)                               JCK39400
00591   3725*          A75 = HGQ(JP12+IJDIMP)                              JCK39500
00592   3726*          A76 = HGQ(JM12+IJDIMP)                              JCK39600
00593   3727*          A77 = HGQ(JP12+IJDIMM)                              JCK39700
00594   3728*          A78 = HGQ(J12+IJDIMM)                               JCK39800
00595   3729*          A80 = HGQ(JM12+IJDIMM)                              JCK39900
00596   4000*          A1 = 2.0*DELXI(I)                                   JCK40000
00597   4001*          A2 = 2.0*DELY                                       JCK40100
00598   4002*          A10 = ULXP*PLXPI                                    JCK40200
00599   4003*          A12 = ULXP*A10                                      JCK40300
00600   4004*          A11 = ULQ*PLBI                                      JCK40400
00601   4005*          A14 = ULQ*A11                                       JCK40500
00602   4006*          A3 = PLXP*PLXP                                      JCK40600
00603   4007*          A15 = PLQ*PLB                                       JCK40700
00604   4008*          A53 = 0.5*DELLY                                     JCK40800
00605   4009*          A40 = ULXYP*PLXYPA                                  JCK40900
00606   4010*          A17 = A46*VLXYP                                     JCK41000
00607   4011*          A51 = ULXPYM*PXPYMI                                 JCK41100
00608   4012*          A18 = A51*VLXPYM                                    JCK41200
00609   4013*          A49 = ULYP*PLYPI                                    JCK41300
00610   4014*          A19 = A40*VLYP                                      JCK41400
00611   4015*          A52 = ULYM*PLYMI                                    JCK41500
00612   4016*          A20 = A53*VLYM                                      JCK41600
00613   4017*          A6 = A19-A26                                        JCK41700
00614   4018*          A33 = (PLXP+PLXM)*G2                                JCK41800
00615   4019*          A22 = A21-A39                                       JCK41900
00616   4020*          FP = DXPI(I)*((A14-A13+G2*(A3-A16))*A33*A22)+A56*(A17-A18+A6)  JCK42000
00617   4021*          A8 = ULXM*PLXMI                                     JCK42100
00618   4022*          A24 = ULXM*A8                                       JCK42200
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00653  4529*          A29 = PLXM*PLXM                                                    JCK42300
00654  4530*          A47 = ULXMYP*PXMYPI                                                JCK42400
00655  4531*          A30 = A47*VLXMYP                                                   JCK42500
00656  4532*          A52 = ULXYM*PLXYM                                                  JCK42600
00657  4533*          A31 = A52*VLXYM                                                    JCK42700
00660  4534*          A40 = (PLB+PLXM)*G2                                                JCK42800
00661  4535*          FM = DXPI(I-1)*((A14-A28+G2*(A16-A29))+A40*(A39-A78))+A56*(A6+A30-JCK42900
00661  4536*         1A31)                                                               JCK43000
00662  4537*          A54 = 0.5*DELXI(I)                                                 JCK43100
00663  4538*          A34 = A10*VLXP                                                     JCK43200
00664  4539*          A35 = A8*VLXM                                                      JCK43300
00665  4540*          A29 = A34-A35                                                      JCK43400
00666  4541*          A7 = VLYP*PLYPI                                                    JCK43500
00667  4542*          A36 = VLYP*A7                                                      JCK43600
00670  4543*          A43 = VLB*PLBI                                                     JCK43700
00671  4544*          A37 = A45*VLB                                                      JCK43800
00672  4545*          A38 = PLYP*PLYP                                                    JCK43900
00673  4546*          A65 = G2*(PLYP+PLB)                                                JCK44000
00674  4547*          GP = A54*(A17-A30+A25)+DYP*((A36-A37+G2*(A38-A16))+A65*(A43-A39))  JCK44100
00675  4548*          A50 = VLYM*PLYMI                                                   JCK44200
00676  4549*          A44 = VLYM*A50                                                     JCK44300
00677  4550*          A42 = PLYM*PLYM                                                    JCK44400
00700  4551*          A23 = G2*(PLB+PLYM)                                                JCK44500
00701  4552*          GM = A54*(A25+A18-A31)+DYM*((A37-A41+G2*(A16-A42))+A23*(A39-A79))  JCK44600
00702  4553*          A55 = A54+A54                                                      JCK44700
00703  4554*          A5 = A12-A26                                                       JCK44800
00704  4555*          A58 = A3-A29                                                       JCK44900
00705  4556*          A57 = A56+A56                                                      JCK45000
00706  4557*          A26 = G2*PLB                                                       JCK45100
00707  4558*          A24 = A21-A78                                                      JCK45200
00707  4559*    C     FIRST ORDER TERM OF U VELOCITY COMPONENT                           JCK45300
00710  4560*          U1 = DT*(A55*(A5+G2*A58)+A57*A6+A26*A1*A24)                        JCK45400
00711  4561*          A71 = VLXYP-VLXPYM                                                 JCK45500
00712  4562*          A59 = VLYP-VLYM                                                    JCK45600
00713  4563*          A4 = A14*PLBI                                                      JCK45700
00714  4564*          A13 = (ULXP-ULB)*DXPI(I)+A56*(A71+A59)                             JCK45800
00714  4565*    C     PART OF SECOND ORDER TERM OF U VELOCITY COMPONENT                  JCK45900
00715  4566*          U2P = (A10+A11)*FP+A13*(A33-0.5*(A12*PLXPI+A4))                    JCK46000
00716  4567*          A72 = VLXMYP-VLXYM                                                 JCK46100
00717  4568*          A46 = (ULB-ULXM)*DXPI(I-1)+A56*(A59+A72)                           JCK46200
00717  4569*    C     PART OF SECOND ORDER TERM OF U VELOCITY COMPONENT                  JCK46300
00720  4570*          U2M = (A11+A8)*FM+A44*(A40-0.5*(A4+A8*A8))                         JCK46400
00721  4571*          A27 = PLXYP*PLXYP                                                  JCK46500
00722  4572*          A62 = PLXMYP*PLXMYP                                                JCK46600
00723  4573*          A45 = A11*VLB                                                      JCK46700
00724  4574*          A74 = ULXYP-ULXMYP                                                 JCK46800
00725  4575*          A67 = ULXP-ULXM                                                    JCK46900
00726  4576*          A15 = (VLYP-VLB)*DYI*A54*(A73+A67)                                 JCK47000
00726  4577*    C     PART OF SECOND ORDER TERM OF U VELOCITY COMPONENT                  JCK47100
00727  4578*          U3P = 0.5*((A7+A45)*(A54*(A66*ULXYP-A47*ULXMYP+A5+G2*(A27-A62+A58)JCK47200
00727  4579*         1)+DYP*(A13-A48)+A65*A54*(A75-A77+A24))+(A49+A11)*GP-(A19*PLYPI+A43JCK47300
00727  4580*         2*PLBI)+A13)                                                        JCK47400
00730  4581*          A61 = PLXYM*PLXPY                                                  JCK47500
00731  4582*          A60 = PLXYM*PLXYM                                                  JCK47600
00732  4583*          A64 = A42*PLBI                                                     JCK47700
00733  4584*          A7A = ULXPYP-ULXYM                                                 JCK47800
00734  4585*          A3A = DYI*(VLB-VLYM)+A54*(A7A+A74)                                 JCK47900
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00734  4864      C     PART OF SECOND ORDER TERM OF U VELOCITY COMPONENT                    JCK48000
00735  4865            U3P = 0.5*((A45+A50)*(A54*(A5+A51*ULXPYM-A52*ULXYM+G2*(A58+A61-A63JCK48100
00736  4866            1))+VYM*(A48-A20)+A23*A54*(A24+A76-A80))+(A11+A53)*UM-(A64+A20*PLYMJCK48200
00736  4863            2I)*A32)                                                             JCK48300
00736  4869            A7U = A36-A41                                                        JCK48400
00737  4865            A66 = A38-A42                                                        JCK48500
00738  4866            A69 = A43-A79                                                        JCK48600
00740  4867      C     FIRST ORDER TERM OF V VELOCITY COMPONENT                             JCK48700
00741  4868            C1 = DT*(A55*A25+A57*(A70+G2*A68)+A26*A2*A69)                        JCK48800
00741  4869      C     PART OF SECOND ORDER TERM OF V VELOVITY COMPONENT                    JCK48900
00742  4900            C2P = 0.5*((VLXP*PLXPI+A45)*FP+(A10+A11)*(DXPI(I)*(A34-A48)+A56*(VJCK49000
00742  4901            1LXYP*VLXYP*PLXYPI-VLXPYM*VLXPYM*PXPYMI+A70+G2*(A27-A61+A68))+A33*AJCK49100
00742  4902            256*(A75-A76+A69))-(A34*PLXPI+A64)*A13)                              JCK49200
00742  4903      C     PART OF SECOND ORDER TERM OF V VELOCITY COMPONENT                    JCK49300
00743  4904            C2M = 0.5*((A45+VLXM*PLXMI)*FM+(A11+A8)*(DXPI(I-1)*(A43-A8*VLXM)+AJCK49400
00743  4905            156*(A70+VLXMYP*VLXMYP*PXMYPI-VLXYM*VLXYM*PLXYMI+G2*(A58+A62-A63))+JCK49500
00743  4906            2A40*A56*(A69+A77-A80))-(A64+A35*PLXMI)*A44)                         JCK49600
00744  4907            A66 = A45*A45                                                        JCK49700
00744  4908      C     PART OF SECOND ORDER TERM OF V VELOCITY COMPONENT                    JCK49800
00745  4909            C3P = (A7+A45)*GP+A15*(A65-0.5*(A7*A7+A66))                          JCK49900
00745  5000      C     PART OF SECOND ORDER TERM OF V VELOCITY COMPONENT                    JCK50000
00746  5001            C3M = (A45+A50)*GM+A32*(A25-0.5*(A66+A50*A50))                       JCK50100
00747  5002            A6V = A55*A67+A57*A59                                                JCK50200
00747  5003      C     U VELOCITY COMPONENT                                                 JCK50300
00748  5004            ULQ(J13) = ULQ(J12)-B1+A9*(A1*(B2P-B2M)+A2*(B3P-B3M)+G1*DELXI(I)*AJCK50400
00748  5005            12*A68)                                                              JCK50500
00750  5006      C     V VELOCITY COMPONENT                                                 JCK50600
00751  5007            VLQ(J13) = VLQ(J12)-C1+A9*(A1*(C2P-C2M)+A2*(C3P-C3M)+G1*DELY*A69*AJCK50700
00751  5008            168)                                                                 JCK50800
00751  5009      C     PHI IN THE LOWER LAYER                                               JCK50900
00752  5010            PLQ(J13) = PLQ(J12)-DT*A60+A9*(A1*(FP-FM)+A2*(GP-GM))                JCK51000
00752  5011      C                                                                          JCK51100
00753  5012        500 CONTINUE                                                             JCK51200
00756  5013        520 CONTINUE                                                             JCK51300
00756  5014      C                                                                          JCK51400
00756  5015      C     SET UP BOUNDARY CONDITIONS - THE OUTER MOST ROWS AND COLUMNS ARE     JCK51500
00756  5016      C     SET EQUAL TO THE SECOND TO OUTER MOST ROWS AND COLUMNS               JCK51600
00756  5017      C                                                                          JCK51700
00757  5018            DO 540 J=1,JL                                                        JCK51800
00762  5019            UL(1,J,KDIM) = UL(  2,J,KDIM)                                        JCK51900
00763  5020            VL(1,J,KDIM) = VL(  2,J,KDIM)                                        JCK52000
00764  5021            PL(1,J,KDIM) = PL(  2,J,KDIM)                                        JCK52100
00765  5022            UL(LL,J,KDIM) = UL(LLM,J,KDIM)                                       JCK52200
00766  5023            VL(LL,J,KDIM) = VL(LLM,J,KDIM)                                       JCK52300
00767  5024            PL(LL,J,KDIM) = PL(LLM,J,KDIM)                                       JCK52400
00770  5025        540 CONTINUE                                                             JCK52500
00772  5026            DO 560 I=1,LL                                                        JCK52600
00775  5027            UL(I,1,KDIM) = UL(I,  2,KDIM)                                        JCK52700
00776  5028            VL(I,1,KDIM) = VL(I,  2,KDIM)                                        JCK52800
00777  5029            PL(I,1,KDIM) = PL(I,  2,KDIM)                                        JCK52900
01000  5030            UL(I,JL,KDIM) = UL(I,JLM,KDIM)                                       JCK53000
01001  5031            VL(I,JL,KDIM) = VL(I,JLM,KDIM)                                       JCK53100
01002  5032            PL(I,JL,KDIM) = PL(I,JLM,KDIM)                                       JCK53200
01003  5033        560 CONTINUE                                                             JCK53300
01003  5034      C                                                                          JCK53400
01003  5035      C                    ***** END BOUNDARY CONDITION *****                    JCK53500
01003  5036      C                                                                          JCK53600
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                C----- PUSH PARAMETERS DOWN STACK. -----                                    JCK53700
                      IF (ISW .EQ. ISMOTH) GO TO 600                                       JCK53800
                      DO 580 I=1,IJDIM                                                     JCK53900
                C     CHECK FOR MINIMUM LAYER DEPTH                                        JCK54000
                      IF (PLG(I+IJDIM) .LT. ABLK) PLG(I+IJDIM) = ABLK                      JCK54100
                      ULG(I) = ULG(I+IJDIM)                                                JCK54200
                      VLG(I) = VLG(I+IJDIM)                                                JCK54300
                      PLG(I) = PLG(I+IJDIM)                                                JCK54400
                      IF (PLG(I) .GT. 20000.0) IFLAG = N                                   JCK54500
                  580 CONTINUE                                                             JCK54600
                      GO TO 680                                                            JCK54700
                  600 CONTINUE                                                             JCK54800
                      B1 = 0.5*SS*(1.0-SS)                                                 JCK54900
                      C1 = SS*SS*0.25                                                      JCK55000
                      DO 620 J=2,JLM                                                       JCK55100
                      DO 620 I=2,LLM                                                       JCK55200
                      UL(I,J,KDIM-1) = UL(I,J,KDIM)+B1*(UL(I+1,J,KDIM)+UL(I-1,J,KDIM)+UL JCK55300
                     1(I,J+1,KDIM)+UL(I,J-1,KDIM)-4.0*UL(I,J,KDIM))+C1*(UL(I-1,J-1,KDIM)JCK55400
                     2+UL(I-1,J+1,KDIM)+UL(I+1,J-1,KDIM)+UL(I+1,J+1,KDIM)-4.0*UL(I,J,KDIJCK55500
                     3M))                                                                  JCK55600
                      VL(I,J,KDIM-1) = VL(I,J,KDIM)+B1*(VL(I+1,J,KDIM)+VL(I-1,J,KDIM)+VL JCK55700
                     1(I,J+1,KDIM)+VL(I,J-1,KDIM)-4.0*VL(I,J,KDIM))+C1*(VL(I-1,J-1,KDIM)JCK55800
                     2+VL(I-1,J+1,KDIM)+VL(I+1,J-1,KDIM)+VL(I+1,J+1,KDIM)-4.0*VL(I,J,KDIJCK55900
                     3M))                                                                  JCK56000
                      PL(I,J,KDIM-1) = PL(I,J,KDIM)+B1*(PL(I+1,J,KDIM)+PL(I-1,J,KDIM)+PL JCK56100
                     1(I,J+1,KDIM)+PL(I,J-1,KDIM)-4.0*PL(I,J,KDIM))+C1*(PL(I-1,J-1,KDIM)JCK56200
                     2+PL(I-1,J+1,KDIM)+PL(I+1,J-1,KDIM)+PL(I+1,J+1,KDIM)-4.0*PL(I,J,KDIJCK56300
                     3M))                                                                  JCK56400
                      IF (PL(I,J,KDIM-1) .LT. ABLK) PL(I,J,KDIM-1) = ABLK                  JCK56500
                      IF (PL(I,J,KDIM-1) .GT. 20000.0) IFLAG = N                           JCK56600
                  620 CONTINUE                                                             JCK56700
                      DO 640 J=1,JL                                                        JCK56800
                      UL(1,J,KDIM-1) = UL(  2,J,KDIM-1)                                    JCK56900
                      VL(1,J,KDIM-1) = VL(  2,J,KDIM-1)                                    JCK57000
                      PL(1,J,KDIM-1) = PL(  2,J,KDIM-1)                                    JCK57100
                      UL(LL,J,KDIM-1) = UL(LLM,J,KDIM-1)                                   JCK57200
                      VL(LL,J,KDIM-1) = VL(LLM,J,KDIM-1)                                   JCK57300
                      PL(LL,J,KDIM-1) = PL(LLM,J,KDIM-1)                                   JCK57400
                  640 CONTINUE                                                             JCK57500
                      DO 660 I=1,LL                                                        JCK57600
                      UL(I,1,KDIM-1) = UL(I,  2,KDIM-1)                                    JCK57700
                      VL(I,1,KDIM-1) = VL(I,  2,KDIM-1)                                    JCK57800
                      PL(I,1,KDIM-1) = PL(I,  2,KDIM-1)                                    JCK57900
                      UL(I,JL,KDIM-1) = UL(I,JLM,KDIM-1)                                   JCK58000
                      VL(I,JL,KDIM-1) = VL(I,JLM,KDIM-1)                                   JCK58100
                      PL(I,JL,KDIM-1) = PL(I,JLM,KDIM-1)                                   JCK58200
                  660 CONTINUE                                                             JCK58300
                  680 CONTINUE                                                             JCK58400
                      IF (IFLAG .GT. 0) GO TO 700                                          JCK58500
                C                                                                          JCK58600
                C----- OUTPUT UL, VL, PL, TL, AND TIME AT SELECTED TIME STEPS. -----       JCK58700
                      IF (TIM .LT. PRINT(JPR)*60.0) GO TO 980                              JCK58800
                      JPR = JPR+1                                                          JCK58900
                      IF (ISKIP(1) .NE. 1) GO TO 860                                       JCK59000
                  700 CONTINUE                                                             JCK59100
                      IF (IFLAG .GT. 0) WRITE (6,2006) N                                   JCK59200
                      K = ISPC(1)                                                          JCK59300
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01113  590e          TIME = TIME+.2777777E-03                                  JCK59400
01114  598e          LINES = 60                                                JCK59500
01115  596e          DO 850 J=1,JL                                             JCK59600
01116  597e          DO 840 I=1,LL                                             JCK59700
01117  598e          PLB = 1.0/PL(I,J,1)                                       JCK59800
01118  599e          ULB = UL(I,J,1)*PLB                                       JCK59900
01119  600e          VLB = VL(I,J,1)*PLB                                       JCK60000
01120  601e          PLB = PL(I,J,1)*MG(I,J)                                   JCK60100
01121  602e          UL(I,J,2) = ULB                                           JCK60110
01122  603e          VL(I,J,2) = VLB                                           JCK60120
01123  604e          PL(I,J,2) = PLB                                           JCK60130
01124  605e          LINES = LINES+1                                           JCK60200
01125  606e          VORT = 0.0                                                JCK60300
01126  607e          IF (I .EQ. 1.OR.J .EQ. 1) GO TO 760                       JCK60400
01127  608e          IF (I .EQ. LL.OR.J .EQ. JL) GO TO 760                     JCK60500
01128  609e          VLXP = VL(I+1,J,1)/PL(I+1,J,1)                            JCK60600
01129  610e          VLXM = VL(I-1,J,1)/PL(I-1,J,1)                            JCK60700
01130  611e          ULYP = UL(I,J+1,1)/PL(I,J+1,1)                            JCK60800
01131  612e          ULYM = UL(I,J-1,1)/PL(I,J-1,1)                            JCK60900
01132  613e          VORT = (VLXP-VLXM)*DELXI(I)-(ULYP-ULYM)*DELYJ(J)          JCK61000
01133  614e      760 IF (LINES .LT. 58) GO TO 800                              JCK61100
01134  615e          LINES = 6                                                 JCK61200
01135  616e          WRITE (6,2007) N,TIME                                     JCK61300
01136  617e          IF (ISKIP(4) .EQ. 1.OR.ISKIP(4) .EQ. 3) GO TO 780         JCK61400
01137  618e          WRITE (6,2008) K                                          JCK61500
01138  619e          GO TO 800                                                 JCK61600
01139  620e      780 WRITE (6,2009) K                                          JCK61700
01140  621e      800 IF (ISKIP(4) .EQ. 0.OR.ISKIP(4) .EQ. 2) GO TO 820         JCK61800
01141  622e          CALL UVDIR(ULB,VLB)                                       JCK61900
01142  623e      820 WRITE (6,2005) I,J,X(I),Y(J),ULB,VLB,PLB,VORT             JCK62000
01143  624e      840 CONTINUE                                                  JCK62100
01144  625e          LINES = 60                                                JCK62200
01145  626e      850 CONTINUE                                                  JCK62300
01146  627e      860 CONTINUE                                                  JCK62400
01147  628e          IF (IFL46 .GT. 0) GO TO 900                               JCK62500
01148  629e          IF (ITAG1 .NE. 1) GO TO 880                               JCK62600
01149  630e    C     WRITE UL,VL AND PL TO OUTPUT TAPE                         JCK62700
01150  631e          ISAVE(JPR-1) = N                                          JCK62800
01151  632e          TSAVE(JPR-1) = TIM/60.0                                   JCK62900
01152  633e          CALL OUTPT(IUNIT,IJDIM,ULB(IJDIM+1),NOGO)                 JCK63000
01153  634e          IF (NOGO .EQ. 1) GO TO 900                                JCK63100
01154  635e          CALL OUTPT(IUNIT,IJDIM,VLB(IJDIM+1),NOGO)                 JCK63200
01155  636e          IF (NOGO .EQ. 1) GO TO 900                                JCK63300
01156  637e          CALL OUTPT(IUNIT,IJDIM,PLB(IJDIM+1),NOGO)                 JCK63400
01157  638e          IF (NOGO .EQ. 1) GO TO 900                                JCK63500
01158  639e          IREC6 = IREC6+1                                           JCK63600
01159  640e      880 CONTINUE                                                  JCK63700
01160  641e    C     CHECK FOR LAST TIME STEP                                  JCK63800
01161  642e          IF (TIM .LT. STOP+60.0) GO TO 400                         JCK63900
01162  643e    C                                                               JCK64000
01163  644e      900 IF (ITAG1 .NE. 1) GO TO 920                               JCK64100
01164  645e          CALL WTRAN(IUNIT,22,9,22)                                 JCK64200
01165  646e          WRITE (6,2010) NOUT(1),IREC6                              JCK64300
01166  647e          IF (IREC6 .GT. 0) WRITE (6,2011) (ISAVE(I),TSAVE(I),I=1,IREC6)  JCK64400
01167  648e          WRITE (6,2012) (NOUT(I),I=3,10)                           JCK64500
01168  649e          IF (ISKIP(3) .EQ. 1) WRITE (6,2013)                       JCK64600
01169  650e          WRITE (6,2014) IUNIT                                      JCK64700
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01266  651*       920 CONTINUE                                                          JCK64800
01267  652*      1000 CONTINUE                                                          JCK64900
01271  653*      2000 FORMAT ('1',28X,'**** THIS OUTPUT IS FROM THE WSMR WIND FIELD TERRJCK65000
01271  654*          1AIN ADJUSTMENT MODEL ****'//)                                     JCK65100
01272  655*      2001 FORMAT (49X,'** PROGRAM INITIALIZATION DATA **'/                  JCK65200
01272  656*          15X,'IDIM (X DIMENSION) =',I3,', JDIM (Y DIMENSION) =',I3,', LL (NOJCK65300
01272  657*          2, PNTS IN X AXIS) =',I3,', JL (NO. PNTS. IN Y AXIS) =',I3/        JCK65400
01272  658*          35X,'ABLK (MIN LAYER DEPTH) =',F8.3,', ULT (U WIND SPD COMPONENT) =JCK65500
01272  659*          4',F8.4,', VLT (V WIND SPD COMPONENT) =',F8.3/                     JCK65600
01272  660*          55X,'PLT (LAYER HEIGHT) =',F9.3,', ISMOTH (FILTER STEP NO.) =',I3,'JCK65700
01272  661*          6, NCNT (TIME STEP RECALC NO.) =',I3/5X,'DT (INITIAL TIME STEP INC)JCK65800
01272  662*          7 =',E12.6,', DTLMDA (STABILITY FACTOR) =',F5.3,', G1 (REDUCED GRAVJCK65900
01272  663*          8ITY FACTOR) =',F7.4/5X,'PRINT (OUTPUT ARRAY) =',11(F8.3,',')/27X,9JCK66000
01272  664*          9(F8.3,','))/5X,'ISKIP (OPTION ARRAY) =',10(I3,','))              JCK66100
01273  665*      2002 FORMAT ('1',36X,'** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN JCK66200
01273  666*          1HEIGHTS **')                                                      JCK66300
01274  667*      2003 FORMAT (A1,4X,'X INDEX  Y INDEX   X COORDINATE  Y COORDINATE   U CJCK66400
01274  668*          1OMPONENT   V COMPONENT    LAYER HEIGHT   TERRAIN HEIGHT'/8X,'I',8XJCK66500
01274  669*          2,'J',8X,'(METERS)',6X,'(METERS)',5X,'(METERS/SEC)  (METERS/SEC)   JCK66600
01274  670*          3 (METERS)',8X,'(METERS)'/1X,65('--'))                             JCK66700
01275  671*      2004 FORMAT (A1,4X,'X INDEX  Y INDEX   X COORDINATE  Y COORDINATE   WINJCK66800
01275  672*          1D SPEED     DIRECTION     LAYER HEIGHT   TERRAIN HEIGHT'/8X,'I',8XJCK66900
01275  673*          2,'J',8X,'(METERS)',6X,'(METERS)',4X,'(METERS/SEC)    (DEGREES)',6XJCK67000
01275  674*          3,'(METERS)',8X,'(METERS)'/1X,65('--'))                            JCK67100
01276  675*      2005 FORMAT (7X,I3,6X,I3,5X,F12.3,2X,F12.3,4X,F9.4,5X,F9.4,5X,F10.4,5X,JCK67200
01276  676*          1E12.6)                                                            JCK67300
01277  677*      2006 FORMAT ('0',5X,'**** PROBLEM GROWING UNSTABLE, PROGRAM PRINTS     JCK67400
01277  678*          1ENT TIME STEP (',I4,') AND STOPS ****'/)                          JCK67500
01300  679*      2007 FORMAT ('1',24X,'** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIMJCK67600
01300  680*          1E STEP ',I4,' (',F9.5,' HOURS) **')                               JCK67700
01301  681*      2008 FORMAT (A1,4X,'X INDEX  Y INDEX   X COORDINATE  Y COORDINATE   U CJCK67800
01301  682*          1OMPONENT   V COMPONENT    LAYER HEIGHT   VORTICITY'/8X,'I',8X,'J',JCK67900
01301  683*          28X,'(METERS)      (METERS)     (METERS/SEC)  (METERS/SEC)    (METEJCK68000
01301  684*          3RS)'/1X,64('--'))                                                 JCK68100
01302  685*      2009 FORMAT (A1,4X,'X INDEX  Y INDEX   X COORDINATE  Y COORDINATE   WINJCK68200
01302  686*          1D SPEED     DIRECTION     LAYER HEIGHT   VORTICITY'/8X,'I',8X,'J',JCK68300
01302  687*          28X,'(METERS)      (METERS)     (METERS/SEC)  (DEGREES)      (METEJCK68400
01302  688*          3RS)'/1X,64('--'))                                                 JCK68500
01303  689*      2010 FORMAT ('1',51X,'** OUTPUT TAPE INFORMATION **'//                 JCK68600
01303  690*          15X,'NUMBER OF TIMES OUTPUT OF THE U AND V WIND COMPONENTS AND LAYEJCK68700
01303  691*          2R HEIGHT ARE DESIRED =',I4/                                       JCK68800
01303  692*          35X,'NUMBER OF TIMES OUTPUT OF THE U AND V WIND COMPONENTS AND LAYEJCK68900
01303  693*          4R HEIGHT WAS COMPLETED =',I4)                                     JCK69000
01304  694*      2011 FORMAT (5X,'TIME STEP NUMBER AND TIME (MINUTES) OF EACH OUTPUT'//2JCK69100
01304  695*          10X,5(' (',I4,',',F8.4,'),'))                                      JCK69200
01305  696*      2012 FORMAT (5X,'SIZE OF I DIMENSION OF UL,VL,PL AND HG = ',I3/5X,'SIZEJCK69300
01305  697*          1 OF J DIMENSION OF UL,VL,PL AND HG = ',I3/5X,'NUMBER OF COORDINATEJCK69400
01305  698*          1S IN X AXIS (IN IDIM) = ',I3/5X,'NUMBER OF COORDINATES IN Y AXIS (JCK69500
01305  699*          2IN JDIM) = ',I3/5X,'INDEX OF THE BEGINNING COORDINATE ON THE X AXIJCK69600
01305  700*          3S OF UNIFORM GRID SPACING = ',I3/                                 JCK69700
01305  701*          45X,'INDEX OF THE ENDING COORDINATE ON THE X AXIS OF UNIFORM GRID SJCK69800
01305  702*          5PACING = ',I3/                                                    JCK69900
01305  703*          65X,'INDEX OF THE BEGINNING COORDINATE ON THE Y AXIS OF UNIFORM GRIJCK70000
01305  704*          7D SPACING = ',I3/                                                 JCK70100
01305  705*          85X,'INDEX OF THE ENDING COORDINATE ON THE Y AXIS OF UNIFORM GRID SJCK70200
01305  706*          9PACING = ',I3/)                                                   JCK70300
01306  707*      2013 FORMAT (5X,'TERRAIN HEIGHTS WERE WRITTEN TO TAPE')                JCK70400
```

```
01307    700*      2010 FORMAT ('0TAPE OUTPUT WAS WRITTEN TO UNIT',I3)          JCK70500
01310    709*           RETURN                                                  JCK70600
01311    710*           END                                                     JCK70700

      END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
OPUF,Is MOUTHR
FOR 01uL-08/07/75-14:03:25 (,,)

   SUBROUTINE MOUTHR    ENTRY POINT 000651

   STORAGE USED: CODE(1) 000702; DATA(0) 000111; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    00u3   DIM     000003

   EXTERNAL REFERENCES (BLOCK, NAME)

    00u4   WRDUS
    00u5   WIO1S
    00u6   WIO2S
    00u7   WERR3S

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    00u1    000125 1168      00u1   000132 1226      0001   000137 1276      0001   000166 1376      0001   000167 1426
    0001    000217 1528      0001   000220 1556      0000   000021 2000F     0000   000023 2001F     0001   000402 2026
    00u1    000413 2068      0001   000456 2176      0001   000467 2236      0001   000531 2346      0001   000540 2406
    00u1    000601 2516      00u1   000610 2556      0000 I 000006 I         0003 I 000000 IDIM      0000 I 000015 IL
    00u0 I  000010 IM1       0000 I 000011 IM2       0000 I 000012 IM3       0000 I 000013 IM4       0000 I 000001 IND
    00u0    000030 INJPS     0000 I 000020 IR        0000 I 000017 IS        0000 I 000000 IST       0000 I 000005 J
    0003 I  000001 JDIM      0000 I 000003 JND       0000 I 000002 JST       0000 I 000007 LLM       0003   000002 NP
    00u0 R  000004 XMIN      0000 R 000014 XM1       0000 R 000016 XM2

00101      1e          SUBROUTINE MOUTHR(HG,LL,JL,X,Y)                                  MTR00100
00103      2e          COMMON/DIM/IDIM,JDIM,NP                                          MTR00200
00104      3e          DIMENSION X(LL),Y(JL)                                            MTR00300
00105      4e          DIMENSION HG(IDIM,JDIM)                                          MTR00400
00105      5e      C   THIS SUBROUTINE READS THE TERRAIN DATA INTO A CENTRAL            MTR00500
00105      6e      C        AREA OF THE GRID SYSTEM DEFINED BY IST,IND,JST,JND          MTR00600
00105      7e      C   THE AREA OUTSIDE OF THE ABOVE AREA IS FILLED WITH TERRAIN        MTR00700
00105      8e      C   HEIGHTS THAT ARE REDUCED TO THE MINIMUM HEIGHT AS A FUNCTION OF  MTR00800
00105      9e      C   DISTANCE FROM THE EDGE OF THE INPUT AREA                         MTR00900
00105     10e      C   INPUT STARTING AND ENDING INDICES (OF THE TERRAIN) ON THE X      MTR01000
00105     11e      C        AXIS ARE (IST,IND)                                          MTR01100
00105     12e      C    INPUT STARTING AND ENDING INDICES ON THE Y AXIS ARE (JST,JND)   MTR01200
00106     13e          READ (5,2001) IST,IND,JST,JND                                    MTR01300
00106     14e      C   INPUT TERRAIN                                                    MTR01400
00110     15e          XMIN = 1.0E5                                                     MTR01500
00115     16e          DO 20 J=JST,JND                                                  MTR01600
00120     17e          READ (5,2000) (HG(I,J),I=IST,IND)                                MTR01700
00126     18e          DO 20 I=IST,IND                                                  MTR01800
00131     19e          IF (HG(I,J) .LT. XMIN) XMIN = HG(I,J)                            MTR01900
00134     20e       20 CONTINUE                                                         MTR02000
00137     21e      C   SET THREE OUTER MOST ROWS AND COLUMNS EQUAL TO THE MINIMUM FOR A MTR02100
```

```
00A33  42*      C     FLAT OUTER BOUNDARY                                  MTR02200
00A36  43*            DO 30 I=1,3                                          MTR02300
00A41  44*            DO 30 J=1,JL                                         MTR02400
00A44  45*            HG(I,J) = XMIN                                       MTR02500
00A45  46*         30 HG(I+LL-3,J) = XMIN                                  MTR02600
00A50  47*            LL4 = LL-4                                           MTR02700
00A51  48*            DO 40 I=4,LL4                                        MTR02800
00A54  49*            DO 40 J=1,3                                          MTR02900
00A57  50*            HG(I,J) = XMIN                                       MTR03000
00A60  51*         40 HG(I,J+JL-3) = XMIN                                  MTR03100
00A63  52*      C     CALCULATE HEIGHTS FROM THE THIRD ROW OR COLUMN IN TO THE SIXTH   MTR03200
00A66  53*      C     ROW OR COLUMN OR UNTIL THE INPUT AREA IS REACHED BY INTERPOLATION MTR03300
00A69  54*      C     BETWEEN THE MINIMUM AND THE INTERIOR TERRAIN HEIGHT TO PROVIDE A  MTR03400
00A70  55*      C     SMOOTH SLOPE FROM TERRAIN TO BOUNDARY                MTR03500
00A73  56*            IM1 = 6                                              MTR03600
00A76  57*            IF (IST .GT. 6) IM1 = IST                            MTR03700
00A76  58*            IM2 = 6                                              MTR03800
00A77  59*            IF (JST .GT. 6) IM2 = JST                            MTR03900
00A71  60*            AM3 = LL-5                                           MTR04000
00A72  61*            IF (IMO .LT. IM3) IM3 = IMO                          MTR04100
00A74  62*            AM4 = JL-5                                           MTR04200
00A75  63*            IF (JMO .LT. IM4) IM4 = JMO                          MTR04300
00A77  64*            AM1 = 1.0/(X(IM1)-X(3))                              MTR04400
00A00  65*            IL = IM1-1                                           MTR04500
00A01  66*            DO 50 I=4,IL                                         MTR04600
00A04  67*            XM2 = (X(I)-X(3))*XM1                                MTR04700
00A05  68*            DO 50 J=IM2,IM4                                      MTR04800
00A10  69*         50 HG(I,J) = (HG(IM1,J)-XMIN)*XM2+XMIN                  MTR04900
00A13  70*            AM1 = 1.0/(X(LL-2)-X(IM3))                           MTR05000
00A14  71*            IL = LL-3                                            MTR05100
00A15  72*            IS = IM3+1                                           MTR05200
00A16  73*            DO 60 I=IS,IL                                        MTR05300
00A21  74*            XM2 = (X(LL-2)-X(I))*XM1                             MTR05400
00A22  75*            DO 60 J=IM2,IM4                                      MTR05500
00A25  76*         60 HG(I,J) = (HG(IM3,J)-XMIN)*XM2+XMIN                  MTR05600
00A30  77*            AM1 = 1.0/(Y(IM2)-Y(3))                              MTR05700
00A31  78*            JL = JM2-1                                           MTR05800
00A32  79*            AR = LL-3                                            MTR05900
00A33  80*            DO 70 J=4,JL                                         MTR06000
00A36  81*            AM2 = (Y(J)-Y(3))*AM1                                MTR06100
00A37  82*            DO 70 I=4,AR                                         MTR06200
00A42  83*         70 HG(I,J) = (HG(I,IM2)-XMIN)*AM2+XMIN                  MTR06300
00A45  84*            AM1 = 1.0/(Y(JL-2)-Y(IM4))                           MTR06400
00A46  85*            JL = JL-3                                            MTR06500
00A47  86*            IS = IM4+1                                           MTR06600
00A50  87*            DO 80 J=IS,JL                                        MTR06700
00A53  88*            AM2 = (Y(JL-2)-Y(J))*AM1                             MTR06800
00A54  89*            DO 80 I=4,AR                                         MTR06900
00A57  90*         80 HG(I,J) = (HG(I,IM4)-XMIN)*XM2+XMIN                  MTR07000
00A62  91*       2000 FORMAT (1H0,'IFA,1)                                  MTR07100
00A63  92*       4000 FORMAT (4I4)                                         MTR07200
00A64  93*            RETURN                                               MTR07300
00A65  94*            END                                                  MTR07400
```

... NO COMPILATION ... NO DIAGNOSTICS.

```
DFOR.IS OUTPT
FOR 010L-00/07/73-14:03:28 (.0)

   SUBROUTINE OUTPT      ENTRY POINT 000117

   STORAGE USED: CODE(1) 000141; DATA(0) 000057; BLANK COMMON(2) 010000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   NTRAN
    0004   NWDUS
    0005   NIO2S
    0006   NERR3S

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001   000002 10L       0001   000011 20L       0000   000002 2000F     0000   000015 2001F     0000   000032 2002F
    0001   000041 30L       0001   000063 40L       0001   000106 50L       0001   000110 60L       0000   000052 INJPS
    0000 I 000001 ISTS      0000 I 000000 ITRY
```

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```
00001      1*          SUBROUTINE OUTPT(IUNIT,NWRD,ARRAY,NOGO)                          OPT00100
00003      2*          DIMENSION ARRAY(NWRD)                                            OPT00200
00103      3*    C     THIS SUBROUTINE OUTPUTS VIA NTRAN ALL TAPE DATA                  OPT00300
00104      4*          ITRY = 0                                                         OPT00400
00105      5*          NOGO = 0                                                         OPT00500
00106      6*       10 CALL NTRAN(IUNIT,1,NWRD,ARRAY,ISTS)                              OPT00600
00107      7*       20 CONTINUE                                                         OPT00700
00110      8*          IF (ISTS .EQ. -1) GO TO 20                                       OPT00800
00112      9*          IF (ISTS .GT. 0) GO TO 60                                        OPT00900
00114     10*          IF (ISTS .EQ. -2) GO TO 30                                       OPT01000
00116     11*          IF (ISTS .EQ. -3) GO TO 40                                       OPT01100
00120     12*          WRITE (6,2000) ISTS,IUNIT                                        OPT01200
00124     13*          GO TO 50                                                         OPT01300
00125     14*       30 CALL NTRAN(IUNIT,22,7,-1,9,11)                                   OPT01400
00126     15*          WRITE (6,2001) IUNIT                                             OPT01500
00131     16*          IUNIT = IUNIT+1                                                  OPT01600
00132     17*          GO TO 10                                                         OPT01700
00133     18*       40 CALL NTRAN(IUNIT,22,7,-1)                                        OPT01800
00134     19*          ITRY = ITRY+1                                                    OPT01900
00135     20*          IF (ITRY .LT. 5) GO TO 10                                        OPT02000
00137     21*          WRITE (6,2002) IUNIT                                             OPT02100
00142     22*       50 NOGO = 1                                                         OPT02200
00143     23*       60 RETURN                                                           OPT02300
00144     24*     2000 FORMAT (10H-***** IN OUTPT, TAPE STATUS CODE =,I4,*, TAPE UNIT =,I2/)  OPT02400
00145     25*     2001 FORMAT (10H-***** HAVE WRITTEN FULL REEL ON UNIT =,I2,*, RELOAD FOR  OPT02500
00145     26*         1NEXT REEL*)                                                    OPT02600
00146     27*     2002 FORMAT (10H-***** MAXIMUM OF PARITY ERROR O  UNIT =,I2)        OPT02700
00147     28*          END                                                              OPT02800
```

[illegible] OF COMPILATION: [illegible] DIAGNOSTICS.

```
@FOR,I3 MISC
FOR 01UL=08/07/73-14:05:29 (,0)

   SUBROUTINE MISC      ENTRY POINT 000100

   STORAGE USED: CODE(1) 000126; DATA(0) 000024; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   HERR35

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001   000020 1116      0001   000032 20L       0001   000036 21L       0001   000046 40L       0001   000051 50L
    0001   000065 60L       0000 R 000003 DIF       0000 I 000002 I         0000   000006 INJPS     0000 R 000000 XLST
    0000 R 000001 AMIN


00101     1*          SUBROUTINE MISC(IJST,IJND,XY,LLJL,LLJL1)                          MSC00100
00101     2*    C     THIS SUBROUTINE DETERMINES THE STARTING AND ENDING INDICES (IJST  MSC00200
00101     3*    C     AND IJND) OF THE AREA ON THE X OR Y AXIS OF UNIFORM GRID SPACING  MSC00300
00103     4*          DIMENSION XY(LLJL)                                                MSC00400
00104     5*          IJND = 0                                                          MSC00500
00105     6*          IJST = 0                                                          MSC00600
00106     7*          XLST = 1.0E6                                                      MSC00700
00107     8*          XMIN = 1.0E5                                                      MSC00800
00110     9*          DO 50 I=1,LLJL1                                                   MSC00900
00113    10*          DIF = XY(I+1)-XY(I)                                               MSC01000
00114    11*          IF (DIF-XMIN) 21,20,10                                            MSC01100
00117    12*       10 IJND = I                                                          MSC01200
00120    13*          GO TO 60                                                          MSC01300
00121    14*       20 IF (IJST .GT. 0) GO TO 50                                         MSC01400
00123    15*       21 XMIN = DIF                                                        MSC01500
00124    16*          IJST = I                                                          MSC01600
00125    17*          IF (XMIN-XLST) 30,40,30                                           MSC01700
00130    18*       30 XLST = XMIN                                                       MSC01800
00131    19*          GO TO 50                                                          MSC01900
00132    20*       40 IJST = I-1                                                        MSC02000
00133    21*       50 CONTINUE                                                          MSC02100
00135    22*          IF (IJST .EQ. 0) IJST = 1                                         MSC02200
00137    23*          IF (IJND .EQ. 0) IJND = LLJL                                      MSC02300
00141    24*       60 RETURN                                                            MSC02400
00142    25*          END                                                               MSC02500

   END OF COMPILATION:        NO DIAGNOSTICS.
```

```
@FOR,1s UVDIR
FOR 01UL-06/07/73-14:03:36 (,J)

   SUBROUTINE UVDIR     ENTRY POINT 000042

   STORAGE USED: CODE(1) 000050; DATA(0) 000012; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   ATAN2
    0004   SQRT
    0005   $ERR35

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0000 R 000001 DIR       0000   000004 INJPS     0000 R 000000 RAD


B-24
    00101      1.          SUBROUTINE UVDIR(X,Y)                                    UVD00100
    00101      2.      C   THIS SUBROUTINE CONVERTS THE U AND V COMPONENTS (X AND Y) OF THE  UVD00200
    00101      3.      C   WIND SPEED INTO WIND SPEED AND DIRECTION (X AND Y)       UVD00300
    00103      4.          DATA RAD/57.29582/                                       UVD00400
    00105      5.          DIR = 270.0-ATAN2(Y,X)*RAD                               UVD00500
    00106      6.          IF (DIR .GE. 360.0) DIR = DIR-360.0                      UVD00600
    00110      7.          X = SQRT(X*X+Y*Y)                                        UVD00700
    00111      8.          Y = DIR                                                  UVD00800
    00112      9.          RETURN                                                   UVD00900
    00113     10.          END                                                      UVD01000

        END OF COMPILATION:       NO  DIAGNOSTICS.
```

QMAP,I
MAP 0017-06/11-11:27

ADDRESS LIMITS 001000 023170 040000 113044
STARTING ADDRESS 021575

WORDS DECIMAL 9337 BLANK 22053 OCTAL

SEGMENT MAIN		001000 023170		040000 113044	
NSWTCS/FOR	1	001000 001021			
NHOLKS/FORO4	1	001022 001044			
NRWNDS/FORO4	1	001045 001124	2	040000 040011	
NWEFS/FORO4	1	001125 001326	2	040012 040031	
NBDCVS/FORO4	1	001327 001454	2	040032 040074	
NFTVS/FOR	1	001455 001477			
NFTCHS/FORO4	1	001500 001767	2	040075 040132	
NCLOSS/FORO4	1	001770 002143	2	040133 040163	
NWDLKS/FORO4	1	002144 002265			
NWSBLS/FORO4	1	002266 002342			
NAPDAS/FORO4	1	002343 002355			
NBFOOS/FOR			2	040164 042365	
NINPTS/FORO4	1	002356 003256	2	042366 042411	
NIKECS/UUCL67			0	042412 042465	
NOTINS/FORO4	1	003257 003533	4	042466 042471	
NOUTS/FORO4	1	003534 004536	4	042472 042520	
NFRTS/FORO4	1	004537 005406	4	042521 042575	
NCRVTS/FORO4	1	005407 005626	2	042576 042672	
NIOERS/FORO4	1	005627 005764	4	042673 042776	
NINTNS/FORO0	1	005765 006100	4	042777 043012	
NFCHKS/FORO4	1	006101 007040	2	043013 043150	
			4	043151 043222	
ENDS/67-02					
NTABS/UUCL			2	043223 043322	
ATANS/FORO3	1	007041 007244	4	043323 043354	
NIOUFS/FORO4	1	007245 007310	2	043355 043355	
MSHUNITON/MALP.I	1	007311 010350	2	043356 044100	
NERRS/FORO4	1	010351 010734	4	044101 044257	
NIENS/FORO4	1	010735 011034	2	044260 044321	
NOUUFS/FORO4	1	011035 011101			
SWITS/FORO3	1	011102 011142	2	044322 044333	
SINCOSS/FORO3	1	011143 011275	4	044334 044355	
NLINES/FORO4	1	011276 013011	2	044356 044541	
NTRANS/FORO4	1	013012 014205	2	044542 045172	
DIM (COMMON BLOCK)				045173 045175	
BLANK COMMON (COMMON BLOCK)					
JACK	1	014206 021574	0	045176 047456	
	3	OCT	2	BLANK COMMON	

MUUEL		1	021570 021721	0	047457 112616
		3	0[illegible]	2	BLANKSCOMMON
UVDIR		1	021722 021777	0	112617 112630
				2	BLANKSCOMMON
MISC		1	022000 022165	0	112631 112654
				2	BLANKSCOMMON
OUTPT		1	022126 022266	0	112655 112733
				2	BLANKSCOMMON
MUUTNR		1	022267 023170	0	112734 113044
		3	0[illegible]	2	BLANKSCOMMON

SYS$ORLIB$. LEVEL 07-02
END OF COLLECTION - TIME 1.052 SECONDS

APPENDIX C

COMPUTER PROGRAM EXAMPLE PROBLEM OUTPUT LISTING

The computer program output listing as shown here has several pages of output omitted because of the volume of the listing. Only important sections have been retained.

The first page of output gives all of the program initial input data except for the x and y axes and terrain heights. Pages C-3 through C-18 (computer listing pages 25 to 40) give the initial wind field, layer height and terrain values up to a J index of 16. This part of the listing was included by setting ISKIP(1) equal to 1. Also, by setting ISKIP(4) = 1, the program has printed the wind speed and direction rather than the u and v components. Pages C-19 through C-34 (computer listing pages 66 to 81) show a printout of the 79th time step at 3 hours up to a J index of 16. The listing was produced by setting ISKIP(1) equal to 1. This part of the listing gives the x and y coordinates, the wind speed and direction, the layer height and the vorticity, where vorticity is a measure of the rotation of the wind in units of sec^{-1}. Pages C-35 through C-50 (computer listing pages 107 through 122) printout of the 131st time step at 5 hours up to a J index of 16. This part of the listing has the same form as that given above for time step 79. This part of the listing also represents the final solution as the greatest time value input was 5 hours. Page C-51 (computer listing page 148) gives a summary of the contents of the output tape requested. The summary shows that output from two time steps (79 and 131) was desired and that both were written to tape. The listing then prints the time step and number of model seconds. The listing then shows the maximum index values of each output array and then gives the indices of the grid area of uniform spacing. Also, the summary shows the terrain height data were written to tape and the output tape was unit 1.

**** THIS OUTPUT IS FROM THE WSMR WIND FIELD TERRAIN ADJUSTMENT MODEL ****

** PROGRAM INITIALIZATION DATA **

IDIM (X DIMENSION) = 41, JDIM (Y DIMENSION) = 41, LL (NO. PNTS IN X AXIS) = 41, JL (NO. PNTS. IN Y AXIS) = 41
AJLK (MIN LAYER DEPTH) = 50.000, ULT (U WIND SPD COMPONENT) = 7.0000, VLT (V WIND SPD COMPONENT) = 7.000
PLT (LAYER HEIGHT) = 2300.000, ISMTH (FILTER STEP NO.) = 5, NCNT (TIME STEP RECALC NO.) = 2
DT (INITIAL TIME STEP INC) = .14748E+03, DTLADA (STABILITY FACTOR) = .950, G1 (REDUCED GRAVITY FACTOR) = .1000
PHIN (OUTPUT ARRAY) = 100.000, 300.000, .000, .000, .000, .000, .000, .000, .000, .000, .000,
.000 .000, .000, .000, .000, .000, .000, .000, .000,
ISKIP (OPTION ARRAY) = 1, 1, 1, 1, 0, 0, 0, 0, 0, 0,

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	1	1[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
2	1	1[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
3	1	2[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
4	1	3[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
5	1	3[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
6	1	3[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
7	1	3[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
8	1	3[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
9	1	3[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
10	1	3[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
11	1	3[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
12	1	3[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
13	1	3[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
14	1	3[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
15	1	3[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
16	1	3[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
17	1	3[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
18	1	3[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
19	1	3[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
20	1	4[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
21	1	4[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
22	1	4[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
23	1	4[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
24	1	4[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
25	1	4[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
26	1	4[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
27	1	4[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
28	1	4[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
29	1	4[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
30	1	4[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
31	1	4[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
32	1	4[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
33	1	4[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
34	1	4[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
35	1	4[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
36	1	4[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
37	1	4[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
38	1	5[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
39	1	5[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
40	1	5[illegible]0000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
41	1	5[illegible]5000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

I INDEX	J INDEX	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	2	100000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
2	2	150000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
3	2	200000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
4	2	300000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
5	2	350000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
6	2	400000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
7	2	450000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
8	2	500000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
9	2	550000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
10	2	600000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
11	2	650000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
12	2	700000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
13	2	750000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
14	2	800000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
15	2	850000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
16	2	900000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
17	2	950000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
18	2	1000000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
19	2	1050000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
20	2	1100000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
21	2	1150000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
22	2	1200000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
23	2	1250000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
24	2	1300000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
25	2	1350000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
26	2	1400000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
27	2	1450000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
28	2	1500000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
29	2	1550000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
30	2	1600000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
31	2	1650000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
32	2	1700000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
33	2	1750000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
34	2	1800000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
35	2	1850000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
36	2	1900000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
37	2	1950000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
38	2	2000000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
39	2	2050000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
40	2	2100000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
41	2	2150000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	3	100000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
2	3	150000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
3	3	200000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
4	3	250000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
5	3	300000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
6	3	350000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
7	3	400000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
8	3	450000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
9	3	500000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
10	3	550000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
11	3	600000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
12	3	650000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
13	3	700000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
14	3	750000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
15	3	800000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
16	3	850000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
17	3	900000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
18	3	950000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
19	3	1000000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
20	3	1050000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
21	3	1100000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
22	3	1150000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
23	3	1200000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
24	3	1250000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
25	3	1300000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
26	3	1350000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
27	3	1400000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
28	3	1450000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
29	3	1500000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
30	3	1550000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
31	3	1600000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
32	3	1650000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
33	3	1700000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
34	3	1750000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
35	3	1800000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
36	3	1850000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
37	3	1900000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
38	3	1950000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
39	3	2000000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
40	3	2050000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
41	3	2100000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX i	Y INDEX j	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
4	4	1[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.115820+04
5	4	1[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.115820+04
6	4	2[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.115820+04
7	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.117015+04
8	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.117613+04
9	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.117911+04
10	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.118089+04
11	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.121397+04
12	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.126271+04
13	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.143689+04
14	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.171557+04
15	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.126620+04
16	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.121049+04
17	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.116437+04
18	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.119306+04
19	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.120174+04
20	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.120700+04
21	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.120871+04
22	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.121569+04
23	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.125054+04
24	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.126100+04
25	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.129409+04
26	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.130277+04
27	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.144214+04
28	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.140380+04
29	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.136723+04
30	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.134980+04
31	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.133237+04
32	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.132197+04
33	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.130454+04
34	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.131500+04
35	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.126711+04
36	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.124180+04
37	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.132717+04
38	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.131500+04
39	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.122614+04
40	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.121694+04
41	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.119702+04
42	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.115820+04
43	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.115820+04
44	4	3[illegible]0.000	3540[illegible].000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	5	1000.000	350000.000	9.8995	225.0000	2800.0000	.115820+04
2	5	1500.000	350000.000	9.8995	225.0000	2800.0000	.115820+04
3	5	2000.000	350000.000	9.8995	225.0000	2800.0000	.115820+04
4	5	2500.000	350000.000	9.8995	225.0000	2800.0000	.117613+04
5	5	3000.000	350000.000	9.8995	225.0000	2800.0000	.118509+04
6	5	3500.000	350000.000	9.8995	225.0000	2800.0000	.118957+04
7	5	4000.000	350000.000	9.8995	225.0000	2800.0000	.119223+04
8	5	4500.000	350000.000	9.8995	225.0000	2800.0000	.124186+04
9	5	5000.000	350000.000	9.8995	225.0000	2800.0000	.131497+04
10	5	5500.000	350000.000	9.8995	225.0000	2800.0000	.157623+04
11	5	6000.000	350000.000	9.8995	225.0000	2800.0000	.199426+04
12	5	6500.000	350000.000	9.8995	225.0000	2800.0000	.132020+04
13	5	7000.000	350000.000	9.8995	225.0000	2800.0000	.123663+04
14	5	7500.000	350000.000	9.8995	225.0000	2800.0000	.119746+04
15	5	8000.000	350000.000	9.8995	225.0000	2800.0000	.121049+04
16	5	8500.000	350000.000	9.8995	225.0000	2800.0000	.122351+04
17	5	9000.000	350000.000	9.8995	225.0000	2800.0000	.123140+04
18	5	9500.000	350000.000	9.8995	225.0000	2800.0000	.123397+04
19	5	9950.000	350000.000	9.8995	225.0000	2800.0000	.124443+04
20	5	10000.000	350000.000	9.8995	225.0000	2800.0000	.129671+04
21	5	10500.000	350000.000	9.8995	225.0000	2800.0000	.131240+04
22	5	11000.000	350000.000	9.8995	225.0000	2800.0000	.136203+04
23	5	11500.000	350000.000	9.8995	225.0000	2800.0000	.137506+04
24	5	12000.000	350000.000	9.8995	225.0000	2800.0000	.158411+04
25	5	12500.000	350000.000	9.8995	225.0000	2800.0000	.152660+04
26	5	13000.000	350000.000	9.8995	225.0000	2800.0000	.147174+04
27	5	13500.000	350000.000	9.8995	225.0000	2800.0000	.144560+04
28	5	14000.000	350000.000	9.8995	225.0000	2800.0000	.141946+04
29	5	14500.000	350000.000	9.8995	225.0000	2800.0000	.140386+04
30	5	15000.000	350000.000	9.8995	225.0000	2800.0000	.137771+04
31	5	15500.000	350000.000	9.8995	225.0000	2800.0000	.139340+04
32	5	16000.000	350000.000	9.8995	225.0000	2800.0000	.135157+04
33	5	16500.000	350000.000	9.8995	225.0000	2800.0000	.128360+04
34	5	17000.000	350000.000	9.8995	225.0000	2800.0000	.141166+04
35	5	17500.000	350000.000	9.8995	225.0000	2800.0000	.139340+04
36	5	18000.000	350000.000	9.8995	225.0000	2800.0000	.126011+04
37	5	18500.000	350000.000	9.8995	225.0000	2800.0000	.124556+04
38	5	19000.000	350000.000	9.8995	225.0000	2800.0000	.121644+04
39	5	19500.000	350000.000	9.8995	225.0000	2800.0000	.115820+04
40	5	20000.000	350000.000	9.8995	225.0000	2800.0000	.115820+04
41	5	20500.000	350000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD LAYER HEIGHTS AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
4	6	160000.000	3578000.000	9.8995	225.0000	2800.0000	.115820+04
4	5	160000.000	3570000.000	9.8995	225.0000	2800.0000	.115820+04
5	5	240000.000	3570000.000	9.8995	225.0000	2800.0000	.115820+04
6	6	320000.000	3576000.000	9.8995	225.0000	2800.0000	.117911+04
6	5	320000.000	3570000.000	9.8995	225.0000	2800.0000	.118957+04
6	6	350000.000	3578000.000	9.8995	225.0000	2800.0000	.119480+04
7	5	355000.000	3570000.000	9.8995	225.0000	2800.0000	.119790+04
8	5	340000.000	3570000.000	9.8995	225.0000	2800.0000	.125580+04
9	5	345000.000	3570000.000	9.8995	225.0000	2800.0000	.134110+04
10	5	350000.000	3570000.000	9.8995	225.0000	2800.0000	.164590+04
14	6	355000.000	3578000.000	9.8995	225.0000	2800.0000	.213360+04
14	6	360000.000	3578000.000	9.8995	225.0000	2800.0000	.134720+04
13	6	365000.000	3578000.000	9.8995	225.0000	2800.0000	.124970+04
14	5	370000.000	3570000.000	9.8995	225.0000	2800.0000	.120400+04
15	5	375000.000	3570000.000	9.8995	225.0000	2800.0000	.121920+04
16	5	380000.000	3576000.000	9.8995	225.0000	2800.0000	.123440+04
17	6	385000.000	3578000.000	9.8995	225.0000	2800.0000	.124360+04
18	6	390000.000	3578000.000	9.8995	225.0000	2800.0000	.124660+04
19	6	395000.000	3578000.000	9.8995	225.0000	2800.0000	.125880+04
20	6	400000.000	3578000.000	9.8995	225.0000	2800.0000	.131980+04
21	5	405000.000	3570000.000	9.8995	225.0000	2800.0000	.133810+04
22	6	410000.000	3578000.000	9.8995	225.0000	2800.0000	.139600+04
23	6	415000.000	3578000.000	9.8995	225.0000	2800.0000	.141120+04
24	5	420000.000	3570000.000	9.8995	225.0000	2800.0000	.165510+04
25	6	425000.000	3578000.000	9.8995	225.0000	2800.0000	.158800+04
26	6	430000.000	3578000.000	9.8995	225.0000	2800.0000	.152400+04
27	5	435000.000	3570000.000	9.8995	225.0000	2800.0000	.149350+04
28	5	440000.000	3570000.000	9.8995	225.0000	2800.0000	.146300+04
29	6	445000.000	3578000.000	9.8995	225.0000	2800.0000	.144480+04
30	5	450000.000	3570000.000	9.8995	225.0000	2800.0000	.141430+04
30	6	455000.000	3578000.000	9.8995	225.0000	2800.0000	.143260+04
30	5	460000.000	3570000.000	9.8995	225.0000	2800.0000	.136380+04
32	5	465000.000	3570000.000	9.8995	225.0000	2800.0000	.130450+04
34	5	470000.000	3570000.000	9.8995	225.0000	2800.0000	.145390+04
35	5	475000.000	3570000.000	9.8995	225.0000	2800.0000	.143260+04
36	5	480000.000	3570000.000	9.8995	225.0000	2800.0000	.127710+04
37	6	485000.000	3578000.000	9.8995	225.0000	2800.0000	.126011+04
38	5	490000.000	3570000.000	9.8995	225.0000	2800.0000	.122614+04
39	5	495000.000	3570000.000	9.8995	225.0000	2800.0000	.115820+04
40	5	500000.000	3570000.000	9.8995	225.0000	2800.0000	.115820+04
41	6	505000.000	3578000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHTS AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
4	7	1.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.115820+04
5	7	1.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.115820+04
6	7	2.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.115820+04
7	7	2.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.117563+04
8	7	3.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.118434+04
9	7	3.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.118870+04
10	7	4.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.121620+04
11	7	4.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.149350+04
12	7	5.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.140210+04
13	7	5.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.170690+04
14	7	6.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.225550+04
15	7	6.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.140210+04
16	7	7.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.123750+04
17	7	7.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.121920+04
18	7	8.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.122230+04
19	7	8.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.123750+04
20	7	9.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.124360+04
21	7	9.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.124660+04
22	7	1.000E+06	3.575E+06	9.8995	225.0000	2800.0000	.124970+04
23	7	1.050E+06	3.575E+06	9.8995	225.0000	2800.0000	.128020+04
24	7	1.100E+06	3.575E+06	9.8995	225.0000	2800.0000	.128630+04
25	7	1.150E+06	3.575E+06	9.8995	225.0000	2800.0000	.133500+04
26	7	1.200E+06	3.575E+06	9.8995	225.0000	2800.0000	.143870+04
27	7	1.250E+06	3.575E+06	9.8995	225.0000	2800.0000	.160330+04
28	7	1.300E+06	3.575E+06	9.8995	225.0000	2800.0000	.159410+04
29	7	1.350E+06	3.575E+06	9.8995	225.0000	2800.0000	.153310+04
30	7	1.400E+06	3.575E+06	9.8995	225.0000	2800.0000	.152400+04
31	7	1.450E+06	3.575E+06	9.8995	225.0000	2800.0000	.146740+04
32	7	1.500E+06	3.575E+06	9.8995	225.0000	2800.0000	.142040+04
33	7	1.550E+06	3.575E+06	9.8995	225.0000	2800.0000	.136550+04
34	7	1.600E+06	3.575E+06	9.8995	225.0000	2800.0000	.132590+04
35	7	1.650E+06	3.575E+06	9.8995	225.0000	2800.0000	.131060+04
36	7	1.700E+06	3.575E+06	9.8995	225.0000	2800.0000	.140210+04
37	7	1.750E+06	3.575E+06	9.8995	225.0000	2800.0000	.146300+04
38	7	1.800E+06	3.575E+06	9.8995	225.0000	2800.0000	.134110+04
39	7	1.850E+06	3.575E+06	9.8995	225.0000	2800.0000	.127410+04
40	7	1.900E+06	3.575E+06	9.8995	225.0000	2800.0000	.125754+04
41	7	1.950E+06	3.575E+06	9.8995	225.0000	2800.0000	.122443+04
42	7	2.000E+06	3.575E+06	9.8995	225.0000	2800.0000	.115820+04
43	7	2.050E+06	3.575E+06	9.8995	225.0000	2800.0000	.115820+04
44	7	2.100E+06	3.575E+06	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELDS LAYER HEIGHTS AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
4	3	1x0000.000	35x0000.000	9.8995	225.0000	2800.0000	.115820+04
5	0	1x0000.000	35x0000.000	9.8995	225.0000	2800.0000	.115820+04
3	3	2x0000.000	35x0000.000	9.8995	225.0000	2800.0000	.115820+04
4	4	3x0000.000	35x0000.000	9.8995	225.0000	2800.0000	.117563+04
9	3	3x0000.000	35x0000.000	9.8995	225.0000	2800.0000	.118434+04
8	8	3x0000.000	35x0000.000	9.8995	225.0000	2800.0000	.118870+04
7	7	3x5000.000	35x0000.000	9.8995	225.0000	2800.0000	.126020+04
6	3	3x0000.000	35x0000.000	9.8995	225.0000	2800.0000	.134110+04
9	3	3x5000.000	35x0000.000	9.8995	225.0000	2800.0000	.144480+04
10	3	3x0000.000	35x0000.000	9.8995	225.0000	2800.0000	.170690+04
11	3	3x5000.000	35x0000.000	9.8995	225.0000	2800.0000	.243840+04
12	3	3x0000.000	35x0000.000	9.8995	225.0000	2800.0000	.146300+04
13	3	3x5000.000	35x0000.000	9.8995	225.0000	2800.0000	.121920+04
14	3	37000.000	35x0000.000	9.8995	225.0000	2800.0000	.134110+04
15	3	3750x0.000	35x0000.000	9.8995	225.0000	2800.0000	.120090+04
16	0	3x000.000	35x0000.000	9.8995	225.0000	2800.0000	.123440+04
17	0	3x500.000	35x0000.000	9.8995	225.0000	2800.0000	.124050+04
18	8	39000.000	35x0000.000	9.8995	225.0000	2800.0000	.124660+04
19	3	3950x0.000	35x0000.000	9.8995	225.0000	2800.0000	.124970+04
20	8	4x000.000	35x0000.000	9.8995	225.0000	2800.0000	.124970+04
21	3	4x500.000	35x0000.000	9.8995	225.0000	2800.0000	.126800+04
22	3	41000.000	35x0000.000	9.8995	225.0000	2800.0000	.133500+04
23	3	41500.000	35x0000.000	9.8995	225.0000	2800.0000	.143260+04
24	3	42000.000	35x0000.000	9.8995	225.0000	2800.0000	.158500+04
25	3	42500.000	35x0000.000	9.8995	225.0000	2800.0000	.160630+04
26	3	43000.000	35x0000.000	9.8995	225.0000	2800.0000	.152400+04
27	3	43500.000	35x0000.000	9.8995	225.0000	2800.0000	.150570+04
28	1	44000.000	35x0000.000	9.8995	225.0000	2800.0000	.148740+04
29	3	44500.000	35x0000.000	9.8995	225.0000	2800.0000	.146300+04
30	3	45000.000	35x0000.000	9.8995	225.0000	2800.0000	.135940+04
31	3	45500.000	35x0000.000	9.8995	225.0000	2800.0000	.131670+04
32	3	46000.000	35x0000.000	9.8995	225.0000	2800.0000	.137160+04
33	3	46500.000	35x0000.000	9.8995	225.0000	2800.0000	.159720+04
34	3	47000.000	35x0000.000	9.8995	225.0000	2800.0000	.143870+04
35	3	47500.000	35x0000.000	9.8995	225.0000	2800.0000	.143260+04
36	3	48000.000	35x0000.000	9.8995	225.0000	2800.0000	.140210+04
37	3	48500.000	35x0000.000	9.8995	225.0000	2800.0000	.136726+04
38	3	49000.000	35x0000.000	9.8995	225.0000	2800.0000	.129757+04
39	3	49500.000	35x0000.000	9.8995	225.0000	2800.0000	.115820+04
40	3	50000.000	35x0000.000	9.8995	225.0000	2800.0000	.115820+04
41	3	50500.000	35x0000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	9	1e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.115820+04
2	9	1e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.115820+04
3	9	2e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.115820+04
4	9	3e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.119306+04
5	9	3e9000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.121049+04
6	9	4e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.121920+04
7	9	4e5000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.129850+04
8	9	4e8000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.134720+04
9	9	5e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.140820+04
10	9	5e8000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.170690+04
11	9	5e9000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.146300+04
12	9	6e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.131670+04
13	9	6e8000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.122830+04
14	9	6e9000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.120700+04
15	9	7e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.122230+04
16	9	7e8000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.123140+04
17	9	7e9000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.123750+04
18	9	8e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.124970+04
19	9	8e8000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.134110+04
20	9	8e9000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.128320+04
21	9	9e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.125880+04
22	9	9e8000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.129240+04
23	9	9e9000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.140210+04
24	9	1e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.162460+04
25	9	1e5000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.152400+04
26	9	1e8000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.146300+04
27	9	1e9000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.145090+04
28	9	2e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.146910+04
29	9	2e5000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.145390+04
30	9	2e8000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.142040+04
31	9	2e9000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.138680+04
32	9	3e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.164590+04
33	9	3e5000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.156360+04
34	9	3e8000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.152400+04
35	9	3e9000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.153920+04
36	9	4e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.146300+04
37	9	4e8000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.141946+04
38	9	4e9000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.133237+04
39	9	5e0000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.115820+04
40	9	5e8000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.115820+04
41	9	5e9000.000	35e5[illegible]0.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELDS LAYER HEIGHTS AND TERRAIN HEIGHTS **

I INDEX	J INDEX	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	1	1000.000	3590000.000	9.8995	225.0000	2800.0000	.115820+04
2	1	1500.000	3590000.000	9.8995	225.0000	2800.0000	.115820+04
3	1	2000.000	3590000.000	9.8995	225.0000	2800.0000	.115820+04
4	1	2500.000	3590000.000	9.8995	225.0000	2800.0000	.120271+04
5	1	3000.000	3590000.000	9.8995	225.0000	2800.0000	.131497+04
6	1	3500.000	3590000.000	9.8995	225.0000	2800.0000	.134110+04
7	1	4000.000	3590000.000	9.8995	225.0000	2800.0000	.135940+04
8	1	4500.000	3590000.000	9.8995	225.0000	2800.0000	.132890+04
9	1	5000.000	3590000.000	9.8995	225.0000	2800.0000	.139980+04
10	1	5500.000	3590000.000	9.8995	225.0000	2800.0000	.154240+04
11	1	6000.000	3590000.000	9.8995	225.0000	2800.0000	.160020+04
12	1	6500.000	3590000.000	9.8995	225.0000	2800.0000	.136990+04
13	1	7000.000	3590000.000	9.8995	225.0000	2800.0000	.121920+04
14	1	7500.000	3590000.000	9.8995	225.0000	2800.0000	.120400+04
15	1	8000.000	3590000.000	9.8995	225.0000	2800.0000	.122530+04
16	1	8500.000	3590000.000	9.8995	225.0000	2800.0000	.121620+04
17	1	9000.000	3590000.000	9.8995	225.0000	2800.0000	.122530+04
18	1	9500.000	3590000.000	9.8995	225.0000	2800.0000	.124970+04
19	1	10000.000	3590000.000	9.8995	225.0000	2800.0000	.152400+04
20	1	10500.000	3590000.000	9.8995	225.0000	2800.0000	.128020+04
21	1	11000.000	3590000.000	9.8995	225.0000	2800.0000	.125580+04
22	1	11500.000	3590000.000	9.8995	225.0000	2800.0000	.125580+04
23	1	12000.000	3590000.000	9.8995	225.0000	2800.0000	.134110+04
24	1	12500.000	3590000.000	9.8995	225.0000	2800.0000	.164590+04
25	1	13000.000	3590000.000	9.8995	225.0000	2800.0000	.147630+04
26	1	13500.000	3590000.000	9.8995	225.0000	2800.0000	.149350+04
27	1	14000.000	3590000.000	9.8995	225.0000	2800.0000	.152400+04
28	1	14500.000	3590000.000	9.8995	225.0000	2800.0000	.151790+04
29	1	15000.000	3590000.000	9.8995	225.0000	2800.0000	.152710+04
30	1	15500.000	3590000.000	9.8995	225.0000	2800.0000	.149350+04
31	1	16000.000	3590000.000	9.8995	225.0000	2800.0000	.176780+04
32	1	16500.000	3590000.000	9.8995	225.0000	2800.0000	.170690+04
33	1	17000.000	3590000.000	9.8995	225.0000	2800.0000	.153620+04
34	1	17500.000	3590000.000	9.8995	225.0000	2800.0000	.164590+04
35	1	18000.000	3590000.000	9.8995	225.0000	2800.0000	.170690+04
36	1	18500.000	3590000.000	9.8995	225.0000	2800.0000	.149350+04
37	1	19000.000	3590000.000	9.8995	225.0000	2800.0000	.144560+04
38	1	19500.000	3590000.000	9.8995	225.0000	2800.0000	.134980+04
39	1	20000.000	3590000.000	9.8995	225.0000	2800.0000	.115820+04
40	1	20500.000	3590000.000	9.8995	225.0000	2800.0000	.115820+04
41	1	21000.000	3590000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
4	11	1x0000.000	3595000.000	9.8995	225.0000	2800.0000	.115820+04
6	11	1x0000.000	3595000.000	9.8995	225.0000	2800.0000	.115820+04
3	11	2x0000.000	3595000.000	9.8995	225.0000	2800.0000	.115820+04
4	11	3x0000.000	3595000.000	9.8995	225.0000	2800.0000	.133237+04
5	11	3x0000.000	3595000.000	9.8995	225.0000	2800.0000	.141946+04
6	11	3x0000.000	3595000.000	9.8995	225.0000	2800.0000	.146300+04
7	11	3x5000.000	3595000.000	9.8995	225.0000	2800.0000	.134110+04
8	11	3x0000.000	3595000.000	9.8995	225.0000	2800.0000	.132890+04
9	11	3x5000.000	3595000.000	9.8995	225.0000	2800.0000	.138380+04
10	11	3x0000.000	3595000.000	9.8995	225.0000	2800.0000	.152710+04
11	11	3x5000.000	3595000.000	9.8995	225.0000	2800.0000	.213360+04
12	11	3x0000.000	3595000.000	9.8995	225.0000	2800.0000	.152400+04
13	11	3x5000.000	3595000.000	9.8995	225.0000	2800.0000	.125880+04
14	11	3x7000.000	3595000.000	9.8995	225.0000	2800.0000	.120700+04
15	11	3x7500.000	3595000.000	9.8995	225.0000	2800.0000	.121310+04
16	11	3x8000.000	3595000.000	9.8995	225.0000	2800.0000	.121620+04
17	11	3x5000.000	3595000.000	9.8995	225.0000	2800.0000	.122230+04
18	11	3x9000.000	3595000.000	9.8995	225.0000	2800.0000	.123440+04
19	11	3x9500.000	3595000.000	9.8995	225.0000	2800.0000	.140210+04
20	11	4x0000.000	3595000.000	9.8995	225.0000	2800.0000	.[illegible]6490+04
21	11	4x0500.000	3595000.000	9.8995	225.0000	2800.0000	.12[illegible]530+04
22	11	4x1000.000	3595000.000	9.8995	225.0000	2800.0000	.124[illegible]50+04
23	11	4x1500.000	3595000.000	9.8995	225.0000	2800.0000	.131060+04
24	11	4x2000.000	3595000.000	9.8995	225.0000	2800.0000	.140210+04
25	11	4x2500.000	3595000.000	9.8995	225.0000	2800.0000	.15[illegible]30+04
26	11	4x3000.000	3595000.000	9.8995	225.0000	2800.0000	.154840+04
27	11	4x3500.000	3595000.000	9.8995	225.0000	2800.0000	.164590+04
28	11	4x4000.000	3595000.000	9.8995	225.0000	2800.0000	.132890+04
29	11	4x4500.000	3595000.000	9.8995	225.0000	2800.0000	.163370+04
30	11	4x5000.000	3595000.000	9.8995	225.0000	2800.0000	.190500+04
31	11	4x5500.000	3595000.000	9.8995	225.0000	2800.0000	.182880+04
32	11	4x6000.000	3595000.000	9.8995	225.0000	2800.0000	.170690+04
33	11	4x6500.000	3595000.000	9.8995	225.0000	2800.0000	.165200+04
34	11	4x7000.000	3595000.000	9.8995	225.0000	2800.0000	.173740+04
35	11	4x7500.000	3595000.000	9.8995	225.0000	2800.0000	.182880+04
36	11	4x8000.000	3595000.000	9.8995	225.0000	2800.0000	.152400+04
37	11	4x8500.000	3595000.000	9.8995	225.0000	2800.0000	.147174+04
38	11	4x9000.000	3595000.000	9.8995	225.0000	2800.0000	.136723+04
39	11	4x9500.000	3595000.000	9.8995	225.0000	2800.0000	.115820+04
40	11	5x0000.000	3595000.000	9.8995	225.0000	2800.0000	.115820+04
41	11	5x0500.000	3595000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD LAYER HEIGHTS AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
4	12	1J00e0.0e6	3600[0e.00[	9.9995	225.0000	2800.0000	.115820+04
4	12	1e0000.0e0	3600[0e.000	9.9995	225.0000	2800.0000	.115820+04
3	12	2e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.115820+04
4	12	2e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.126969+04
5	12	2e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.132543+04
6	12	2e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.135330+04
7	12	2e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.132590+04
8	12	2e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.132890+04
9	12	2e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.138990+04
10	12	2e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.150570+04
11	12	2e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.182880+04
12	12	3e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.170690+04
13	12	3e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.134110+04
14	12	3e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.121310+04
15	12	3e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.121310+04
16	12	3e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.121310+04
17	12	3e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.121920+04
18	12	3e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.122230+04
19	12	3e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.123750+04
20	12	3e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.122830+04
21	12	3e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.122830+04
22	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.124360+04
23	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.130450+04
24	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.143260+04
25	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.170690+04
26	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.182880+04
27	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.182880+04
28	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.184100+04
29	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.175870+04
30	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.189890+04
31	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.207260+04
32	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.188990+04
33	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.173740+04
34	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.176780+04
35	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.176780+04
36	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.158500+04
37	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.152403+04
38	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.140209+04
39	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.115820+04
40	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.115820+04
41	12	4e0000.0e0	3600e0e.000	9.9995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	13	1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.115620+04
2	13	1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.115820+04
3	13	2[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.115820+04
4	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.125574+04
5	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.130451+04
6	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.132890+04
7	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.132590+04
8	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.132590+04
9	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.138070+04
10	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.148740+04
11	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.207260+04
12	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.188980+04
13	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.161540+04
14	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.121310+04
15	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.121310+04
16	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.121620+04
17	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.121620+04
18	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.121920+04
19	13	3[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.122230+04
20	13	+0[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.123440+04
21	13	+0[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.123440+04
22	13	+0[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.124970+04
23	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.129850+04
24	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.140210+04
25	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.158500+04
26	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.207260+04
27	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.195070+04
28	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.201170+04
29	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.195070+04
30	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.193550+04
31	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.204220+04
32	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.185930+04
33	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.182880+04
34	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.181660+04
35	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.195070+04
36	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.198120+04
37	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.146363+04
38	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.162849+04
39	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.115820+04
40	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.115820+04
41	13	+1[illegible]0.000	3605[illegible].000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELDS LAYER HEIGHTS AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	14	1.00E+05	3.61E+06	9.8995	225.0000	2800.0000	.115820+04
2	14	1.50E+05	3.61E+06	9.8995	225.0000	2800.0000	.115820+04
3	14	2.00E+05	3.61E+06	9.8995	225.0000	2800.0000	.115820+04
4	14	2.50E+05	3.61E+06	9.8995	225.0000	2800.0000	.124877+04
5	14	3.00E+05	3.61E+06	9.8995	225.0000	2800.0000	.129406+04
6	14	3.50E+05	3.61E+06	9.8995	225.0000	2800.0000	.131670+04
7	14	4.00E+05	3.61E+06	9.8995	225.0000	2800.0000	.132280+04
8	14	4.50E+05	3.61E+06	9.8995	225.0000	2800.0000	.133810+04
9	14	5.00E+05	3.61E+06	9.8995	225.0000	2800.0000	.138990+04
10	14	5.50E+05	3.61E+06	9.8995	225.0000	2800.0000	.147220+04
11	14	6.00E+05	3.61E+06	9.8995	225.0000	2800.0000	.162880+04
12	14	6.50E+05	3.61E+06	9.8995	225.0000	2800.0000	.173740+04
13	14	7.00E+05	3.61E+06	9.8995	225.0000	2800.0000	.128630+04
14	14	7.50E+05	3.61E+06	9.8995	225.0000	2800.0000	.120700+04
15	14	8.00E+05	3.61E+06	9.8995	225.0000	2800.0000	.121010+04
16	14	8.50E+05	3.61E+06	9.8995	225.0000	2800.0000	.121010+04
17	14	9.00E+05	3.61E+06	9.8995	225.0000	2800.0000	.121620+04
18	14	9.50E+05	3.61E+06	9.8995	225.0000	2800.0000	.122230+04
19	14	1.00E+06	3.61E+06	9.8995	225.0000	2800.0000	.122530+04
20	14	1.05E+06	3.61E+06	9.8995	225.0000	2800.0000	.122530+04
21	14	1.10E+06	3.61E+06	9.8995	225.0000	2800.0000	.122230+04
22	14	1.15E+06	3.61E+06	9.8995	225.0000	2800.0000	.125580+04
23	14	1.20E+06	3.61E+06	9.8995	225.0000	2800.0000	.130150+04
24	14	1.25E+06	3.61E+06	9.8995	225.0000	2800.0000	.142040+04
25	14	1.30E+06	3.61E+06	9.8995	225.0000	2800.0000	.182880+04
26	14	1.35E+06	3.61E+06	9.8995	225.0000	2800.0000	.217630+04
27	14	1.40E+06	3.61E+06	9.8995	225.0000	2800.0000	.213970+04
28	14	1.45E+06	3.61E+06	9.8995	225.0000	2800.0000	.213560+04
29	14	1.50E+06	3.61E+06	9.8995	225.0000	2800.0000	.216410+04
30	14	1.55E+06	3.61E+06	9.8995	225.0000	2800.0000	.219460+04
31	14	1.60E+06	3.61E+06	9.8995	225.0000	2800.0000	.209090+04
32	14	1.65E+06	3.61E+06	9.8995	225.0000	2800.0000	.190810+04
33	14	1.70E+06	3.61E+06	9.8995	225.0000	2800.0000	.210920+04
34	14	1.75E+06	3.61E+06	9.8995	225.0000	2800.0000	.195070+04
35	14	1.80E+06	3.61E+06	9.8995	225.0000	2800.0000	.189890+04
36	14	1.85E+06	3.61E+06	9.8995	225.0000	2800.0000	.182880+04
37	14	1.90E+06	3.61E+06	9.8995	225.0000	2800.0000	.173300+04
38	14	1.95E+06	3.61E+06	9.8995	225.0000	2800.0000	.154140+04
39	14	2.00E+06	3.61E+06	9.8995	225.0000	2800.0000	.115820+04
40	14	2.05E+06	3.61E+06	9.8995	225.0000	2800.0000	.115820+04
41	14	2.10E+06	3.61E+06	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (FEET/M)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	15	1x0000.000	3615000.000	9.8995	225.0000	2800.0000	.115820+04
2	15	1x0000.000	3615000.000	9.8995	225.0000	2800.0000	.115820+04
3	15	2x0000.000	3615000.000	9.8995	225.0000	2800.0000	.115820+04
4	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.125923+04
5	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.130974+04
6	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.133500+04
7	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.133500+04
8	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.135030+04
9	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.141430+04
10	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.153010+04
11	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.225550+04
12	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.137160+04
13	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.121920+04
14	15	3x7000.000	3615000.000	9.8995	225.0000	2800.0000	.120700+04
15	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.121920+04
16	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.121010+04
17	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.121310+04
18	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.121920+04
19	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.122230+04
20	15	4x0000.000	3615000.000	9.8995	225.0000	2800.0000	.121920+04
21	15	4x5000.000	3615000.000	9.8995	225.0000	2800.0000	.121920+04
22	15	4x0000.000	3615000.000	9.8995	225.0000	2800.0000	.124360+04
23	15	4x5000.000	3615000.000	9.8995	225.0000	2800.0000	.127410+04
24	15	4x0000.000	3615000.000	9.8995	225.0000	2800.0000	.150880+04
25	15	4x5000.000	3615000.000	9.8995	225.0000	2800.0000	.195680+04
26	15	5x0000.000	3615000.000	9.8995	225.0000	2800.0000	.213360+04
27	15	5x5000.000	3615000.000	9.8995	225.0000	2800.0000	.237740+04
28	15	5x0000.000	3615000.000	9.8995	225.0000	2800.0000	.259690+04
29	15	5x5000.000	3615000.000	9.8995	225.0000	2800.0000	.237740+04
30	15	6x0000.000	3615000.000	9.8995	225.0000	2800.0000	.219460+04
31	15	6x5000.000	3615000.000	9.8995	225.0000	2800.0000	.210310+04
32	15	6x0000.000	3615000.000	9.8995	225.0000	2800.0000	.201170+04
33	15	6x5000.000	3615000.000	9.8995	225.0000	2800.0000	.192020+04
34	15	7x0000.000	3615000.000	9.8995	225.0000	2800.0000	.192020+04
35	15	7x5000.000	3615000.000	9.8995	225.0000	2800.0000	.180750+04
36	15	8x0000.000	3615000.000	9.8995	225.0000	2800.0000	.182880+04
37	15	8x5000.000	3615000.000	9.8995	225.0000	2800.0000	.173300+04
38	15	9x0000.000	3615000.000	9.8995	225.0000	2800.0000	.154140+04
39	15	9x5000.000	3615000.000	9.8995	225.0000	2800.0000	.115820+04
40	15	10x0000.000	3615000.000	9.8995	225.0000	2800.0000	.115820+04
41	15	10x5000.000	3615000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	1	1.0000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.115820+04
2	1	1.5000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.115820+04
3	1	2.0000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.115820+04
4	1	2.5000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.124877+04
5	1	3.0000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.129406+04
6	1	3.5000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.131670+04
7	1	4.0000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.134110+04
8	1	4.5000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.138990+04
9	1	5.0000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.144480+04
10	1	5.5000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.155450+04
11	1	6.0000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.231650+04
12	1	6.5000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.134110+04
13	1	7.0000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.121010+04
14	1	7.5000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.120090+04
15	1	8.0000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.119480+04
16	1	8.5000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.121310+04
17	1	9.0000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.121310+04
18	1	9.5000E+05	3.6200E+06	9.8995	225.0000	2800.0000	.121620+04
19	1	1.0000E+06	3.6200E+06	9.8995	225.0000	2800.0000	.128020+04
20	1	1.0500E+06	3.6200E+06	9.8995	225.0000	2800.0000	.121920+04
21	1	1.1000E+06	3.6200E+06	9.8995	225.0000	2800.0000	.122230+04
22	1	1.1500E+06	3.6200E+06	9.8995	225.0000	2800.0000	.123750+04
23	1	1.2000E+06	3.6200E+06	9.8995	225.0000	2800.0000	.128020+04
24	1	1.2500E+06	3.6200E+06	9.8995	225.0000	2800.0000	.201170+04
25	1	1.3000E+06	3.6200E+06	9.8995	225.0000	2800.0000	.223720+04
26	1	1.3500E+06	3.6200E+06	9.8995	225.0000	2800.0000	.243840+04
27	1	1.4000E+06	3.6200E+06	9.8995	225.0000	2800.0000	.265180+04
28	1	1.4500E+06	3.6200E+06	9.8995	225.0000	2800.0000	.262130+04
29	1	1.5000E+06	3.6200E+06	9.8995	225.0000	2800.0000	.234700+04
30	1	1.5500E+06	3.6200E+06	9.8995	225.0000	2800.0000	.225550+04
31	1	1.6000E+06	3.6200E+06	9.8995	225.0000	2800.0000	.215800+04
32	1	1.6500E+06	3.6200E+06	9.8995	225.0000	2800.0000	.207260+04
33	1	1.7000E+06	3.6200E+06	9.8995	225.0000	2800.0000	.195070+04
34	1	1.7500E+06	3.6200E+06	9.8995	225.0000	2800.0000	.204220+04
35	1	1.8000E+06	3.6200E+06	9.8995	225.0000	2800.0000	.188980+04
36	1	1.8500E+06	3.6200E+06	9.8995	225.0000	2800.0000	.173740+04
37	1	1.9000E+06	3.6200E+06	9.8995	225.0000	2800.0000	.165466+04
38	1	1.9500E+06	3.6200E+06	9.8995	225.0000	2800.0000	.148917+04
39	1	2.0000E+06	3.6200E+06	9.8995	225.0000	2800.0000	.115820+04
40	1	2.0500E+06	3.6200E+06	9.8995	225.0000	2800.0000	.115820+04
41	1	2.1000E+06	3.6200E+06	9.8995	225.0000	2800.0000	.115820+04

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX i	Y INDEX j	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
4	1	1x0000.000	334000.000	9.7036	224.8071	2825.0465	.000000
5	1	1x0000.000	334000.000	9.7036	224.8071	2825.0465	.000000
6	1	2x0000.000	334000.000	9.6386	224.7657	2832.5677	.000000
7	1	3x0000.000	334000.000	9.5649	224.9054	2838.6960	.000000
8	1	3x0000.000	334000.000	9.5636	225.5370	2830.4620	.000000
9	1	3x0000.000	334000.000	9.6603	226.6107	2806.0741	.000000
10	1	3x5000.000	334000.000	9.7693	227.4931	2784.7942	.000000
11	1	3x0000.000	334000.000	9.7857	226.0651	2774.9345	.000000
12	1	3x5000.000	334000.000	9.7700	226.4426	2772.0087	.000000
13	1	3x0000.000	334000.000	9.6969	226.4219	2781.4559	.000000
14	1	3x5000.000	334000.000	9.5960	227.9601	2803.3430	.000000
15	1	3x0000.000	334000.000	9.4453	227.4441	2823.2691	.000000
16	1	3x5000.000	334000.000	9.4044	227.2417	2829.1864	.000000
17	1	3x0000.000	334000.000	9.4168	227.2796	2823.5485	.000000
18	1	3x5000.000	334000.000	9.4540	227.3221	2815.4928	.000000
19	1	3x0000.000	334000.000	9.5003	227.3319	2808.5199	.000000
20	1	3x5000.000	334000.000	9.5411	227.3590	2801.3165	.000000
21	1	3x0000.000	334000.000	9.5721	227.4082	2793.1879	.000000
22	1	3x5000.000	334000.000	9.7043	227.4576	2784.6949	.000000
23	1	4x0000.000	334000.000	9.7694	227.4926	2777.4971	.000000
24	1	4x5000.000	334000.000	9.6216	227.5104	2771.7563	.000000
25	1	5x0000.000	334000.000	9.4524	227.4996	2768.4720	.000000
26	1	5x5000.000	334000.000	9.4816	227.4124	2769.0853	.000000
27	1	6x0000.000	334000.000	9.8138	227.2111	2774.7496	.000000
28	1	6x5000.000	334000.000	9.7584	226.9711	2783.0080	.000000
29	1	7x0000.000	334000.000	9.7201	226.8197	2789.7424	.000000
30	1	7x5000.000	334000.000	9.6513	226.8044	2792.0695	.000000
31	1	8x0000.000	334000.000	9.6103	226.8043	2792.9237	.000000
32	1	8x5000.000	334000.000	9.5733	227.0148	2792.1805	.000000
33	1	9x0000.000	334000.000	9.5405	227.1698	2791.1805	.000000
34	1	9x5000.000	334000.000	9.5122	227.3301	2790.1655	.000000
35	1	10x0000.000	334000.000	9.4938	227.4923	2789.1154	.000000
36	1	10x5000.000	334000.000	9.4868	227.6209	2788.4981	.000000
37	1	11x0000.000	334000.000	9.4916	227.6749	2789.8755	.000000
38	1	11x5000.000	334000.000	9.4136	227.6643	2793.0289	.000000
39	1	12x0000.000	334000.000	9.3771	227.6205	2794.6256	.000000
40	1	12x5000.000	334000.000	9.4306	227.3500	2796.9431	.000000
41	1	13x0000.000	334000.000	9.5563	226.8498	2800.2999	.000000
42	1	13x5000.000	334000.000	9.6897	226.2440	2801.9493	.000000
43	1	14x0000.000	334000.000	9.7732	225.8288	2799.8076	.000000
44	1	14x5000.000	334000.000	9.7732	225.8288	2794.8076	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	1	1.09630.000	3420000.000	9.7036	224.6071	2825.0465	.000000
2	1	1.00000.000	3420000.000	9.7036	224.8071	2825.0465	.187133-07
3	1	2.00000.000	3420000.000	9.6366	224.7057	2832.5077	-.413582-06
4	1	3.00000.000	3420000.000	9.5649	224.9054	2838.0960	-.144169-05
5	1	4.00000.000	3420000.000	9.5658	225.5370	2830.4620	-.295224-05
6	1	5.00000.000	3420000.000	9.6663	226.0107	2806.0741	-.494996-05
7	1	6.50000.000	3420000.000	9.7604	227.4931	2784.7942	-.792416-05
8	1	7.00000.000	3420000.000	9.7837	228.0051	2774.4345	-.978131-05
9	1	8.50000.000	3420000.000	9.7700	228.4426	2772.0007	-.108476-04
10	1	9.00000.000	3420000.000	9.6089	228.4219	2781.4559	-.107149-04
11	1	9.50000.000	3420000.000	9.5560	227.9001	2803.3430	-.797409-05
12	1	10.00000.000	3420000.000	9.4455	227.4441	2823.2691	-.280619-05
13	1	10.50000.000	3420000.000	9.4049	227.2417	2829.1864	.136149-05
14	1	11.00000.000	3420000.000	9.4108	227.2796	2823.5480	.376174-05
15	1	11.50000.000	3420000.000	9.4546	227.3221	2815.4928	.574693-05
16	1	12.00000.000	3420000.000	9.5003	227.3319	2808.5199	.755872-05
17	1	12.50000.000	3420000.000	9.5611	227.3590	2801.3165	.888418-05
18	1	13.00000.000	3420000.000	9.6321	227.4042	2793.1879	.952141-05
19	1	13.50000.000	3420000.000	9.7040	227.4576	2784.8949	.939269-05
20	1	14.00000.000	3420000.000	9.7694	227.4926	2777.4971	.845138-05
21	1	14.50000.000	3420000.000	9.8216	227.5104	2771.7563	.671041-05
22	1	15.00000.000	3420000.000	9.8524	227.4996	2768.4720	.440516-05
23	1	15.50000.000	3420000.000	9.8516	227.4124	2769.0853	.184041-05
24	1	16.00000.000	3420000.000	9.8158	227.2111	2774.7496	-.625241-06
25	1	16.50000.000	3420000.000	9.7584	226.9711	2783.0080	-.261855-05
26	1	17.00000.000	3420000.000	9.7101	226.8197	2789.7424	-.421725-05
27	1	17.50000.000	3420000.000	9.6513	226.6044	2792.6695	-.561887-05
28	1	18.00000.000	3420000.000	9.6105	226.8843	2792.9237	-.665619-05
29	1	18.50000.000	3420000.000	9.5738	227.0148	2792.1605	-.716587-05
30	1	19.00000.000	3420000.000	9.5406	227.1098	2791.1605	-.716335-05
31	1	19.50000.000	3420000.000	9.5122	227.3301	2790.1655	-.679570-05
32	1	20.00000.000	3420000.000	9.4808	227.4923	2789.1154	-.612471-05
33	1	20.50000.000	3420000.000	9.4606	227.6269	2788.4981	-.522033-05
34	1	21.00000.000	3420000.000	9.4416	227.6749	2789.6755	-.449539-05
35	1	21.50000.000	3420000.000	9.4150	227.6043	2793.0289	-.309298-05
36	1	22.00000.000	3420000.000	9.3971	227.6205	2794.8256	.311899-05
37	1	22.50000.000	3420000.000	9.4368	227.3500	2796.9431	.617793-05
38	1	23.00000.000	3420000.000	9.5563	226.8498	2800.2999	.443322-05
39	1	23.50000.000	3420000.000	9.6987	226.2449	2800.9493	.170660-05
40	1	24.00000.000	3420000.000	9.7742	225.8289	2799.6076	.300692-06
41	1	24.50000.000	3420000.000	9.7752	225.3288	2799.6075	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

I INDEX	J INDEX	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	1	100000.000	3500000.000	9.6379	224.8242	2833.0771	.000000
2	1	150000.000	3500000.000	9.6379	224.8242	2833.0771	.521516-06
3	1	200000.000	3500000.000	9.5272	224.7481	2845.9979	.182674-06
4	1	300000.000	3500000.000	9.3647	224.6257	2862.5535	-.879750-06
5	1	400000.000	3500000.000	9.2569	225.3327	2867.8166	-.267382-05
6	1	550000.000	3500000.000	9.2549	226.3119	2855.3884	-.543385-05
7	1	525000.000	3500000.000	9.3144	227.3659	2836.3454	-.105304-04
8	1	550000.000	3500000.000	9.3666	228.5765	2816.7391	-.133047-04
9	1	575000.000	3500000.000	9.4832	230.2170	2784.6248	-.129242-04
10	1	600000.000	3500000.000	9.6934	232.0760	2740.5415	-.128285-04
11	1	625000.000	3500000.000	9.6963	232.7065	2723.7896	-.234786-05
12	1	650000.000	3500000.000	9.4968	229.7697	2701.0995	.713559-05
13	1	675000.000	3500000.000	9.1907	227.4310	2808.3173	.113469-04
14	1	700000.000	3500000.000	9.1416	227.0869	2822.7929	.123550-04
15	1	725000.000	3500000.000	9.2625	227.3587	2821.0350	.127175-04
16	1	750000.000	3500000.000	9.3356	227.3422	2818.8560	.127322-04
17	1	775000.000	3500000.000	9.3862	227.2282	2815.4428	.124939-04
18	1	800000.000	3500000.000	9.4355	227.1675	2810.8597	.118341-04
19	1	825000.000	3500000.000	9.4990	227.2204	2804.4132	.102874-04
20	1	850000.000	3500000.000	9.5729	227.3785	2797.1064	.819035-05
21	1	875000.000	3500000.000	9.5609	227.5192	2790.0936	.500921-05
22	1	900000.000	3500000.000	9.5602	227.7625	2783.4337	.213306-05
23	1	925000.000	3500000.000	9.5917	228.1483	2773.3787	-.136612-05
24	1	950000.000	3500000.000	9.5683	228.5997	2766.8994	-.383272-05
25	1	975000.000	3500000.000	9.4704	228.2967	2772.4439	-.556038-05
26	1	1000000.000	3500000.000	9.3193	227.8267	2785.6805	-.783866-05
27	1	1025000.000	3500000.000	9.2100	227.7954	2794.5629	-.996835-05
28	1	1050000.000	3500000.000	9.1642	228.0937	2795.4588	-.113308-04
29	1	1075000.000	3500000.000	9.1733	228.4869	2800.8974	-.115927-04
30	1	1100000.000	3500000.000	9.2037	228.9111	2801.7232	-.109990-04
31	1	1125000.000	3500000.000	9.2794	229.3354	2802.3528	-.100937-04
32	1	1150000.000	3500000.000	9.3611	229.6367	2803.9515	-.876740-05
33	1	1175000.000	3500000.000	9.4642	230.0536	2801.6559	-.766319-05
34	1	1200000.000	3500000.000	9.1340	230.7062	2795.5054	-.542039-05
35	1	1225000.000	3500000.000	9.1417	230.7585	2796.8908	-.136656-05
36	1	1250000.000	3500000.000	9.1143	231.2321	2804.7290	.607307-05
37	1	1275000.000	3500000.000	9.2074	229.7534	2820.2237	.923477-05
38	1	1300000.000	3500000.000	9.4105	228.7809	2826.2210	.616893-05
39	1	1325000.000	3500000.000	9.6305	227.3970	2819.2419	.188204-05
40	1	1350000.000	3500000.000	9.7446	226.4815	2810.9105	-.157182-06
41	1	1375000.000	3500000.000	9.7446	226.4815	2810.9105	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	1	1x0000.000	3540000.000	9.5406	224.8079	2844.4371	.000000
2	1	1x0000.000	3540000.000	9.5406	224.8079	2844.4371	.163181-05
3	1	1x0000.000	3540000.000	9.3513	224.6559	2866.4621	.168802-05
4	1	1x0000.000	3540000.000	9.0317	224.5071	2912.2709	.103672-05
5	1	1x0000.000	3540000.000	8.7408	224.8275	2947.0551	-.584411-06
6	1	1x0000.000	3540000.000	8.5541	225.3918	2964.7041	-.391230-05
7	1	1x5000.000	3540000.000	8.4332	225.8766	2974.6536	-.113084-04
8	1	1x0000.000	3540000.000	8.2549	226.6928	2989.6554	-.131815-04
9	1	1x5000.000	3540000.000	8.1546	226.2150	3005.2698	-.651876-05
10	1	1x0000.000	3540000.000	8.2269	230.2785	3006.7565	-.771155-05
11	1	1x5000.000	3540000.000	10.0822	240.0961	2863.8677	.137719-04
12	1	1x0000.000	3540000.000	11.2979	239.5816	2595.2401	.184132-04
13	1	1x5000.000	3540000.000	9.4853	233.7019	2855.7814	.240631-04
14	1	1x0000.000	3540000.000	9.0736	227.5175	2886.0127	.239162-04
15	1	1x5000.000	3540000.000	9.0825	226.9917	2881.1770	.208349-04
16	1	1x0000.000	3540000.000	9.1292	226.7721	2882.0079	.185135-04
17	1	1x5000.000	3540000.000	9.1165	226.3801	2886.9000	.165743-04
18	1	1x0000.000	3540000.000	9.0655	225.9883	2896.4985	.146045-04
19	1	1x5000.000	3540000.000	8.9651	225.5493	2912.7836	.114991-04
20	1	1x0000.000	3540000.000	8.8928	225.7042	2929.6931	.829125-05
21	1	1x5000.000	3540000.000	8.8233	226.9639	2938.2088	.303791-05
22	1	1x0000.000	3540000.000	8.7130	226.5067	2963.0195	.653774-07
23	1	1x5000.000	3540000.000	8.5471	226.5306	2981.0087	-.236479-05
24	1	1x0000.000	3540000.000	8.6162	228.6969	3000.2047	-.436131-05
25	1	1x5000.000	3540000.000	8.9272	230.9268	2950.6609	-.832081-05
26	1	1x0000.000	3540000.000	8.6914	230.5305	2963.4621	-.141548-04
27	1	1x5000.000	3540000.000	8.5192	230.7978	2997.6113	-.173755-04
28	1	1x0000.000	3540000.000	8.4634	231.6432	2992.7116	-.183642-04
29	1	1x5000.000	3540000.000	8.4362	232.5919	2989.7772	-.173331-04
30	1	1x0000.000	3540000.000	8.4106	233.3229	2984.9766	-.150870-04
31	1	1x5000.000	3540000.000	8.4536	234.2010	2979.3028	-.136715-04
32	1	1x0000.000	3540000.000	8.5706	235.2512	2959.9430	-.116325-04
33	1	1x5000.000	3540000.000	8.8444	234.8679	2968.0426	-.984219-05
34	1	1x0000.000	3540000.000	8.5463	235.9698	2973.4790	-.611843-05
35	1	1x5000.000	3540000.000	9.0714	237.8024	2905.5177	.174229-05
36	1	1x0000.000	3540000.000	9.3430	236.4967	2898.0927	.908862-05
37	1	1x5000.000	3540000.000	8.8824	234.8009	2928.6746	.125008-04
38	1	1x0000.000	3540000.000	9.2972	232.4344	2910.9672	.765424-05
39	1	1x5000.000	3540000.000	9.5939	229.3417	2847.6340	.117843-05
40	1	1x0000.000	3540000.000	9.7395	227.4058	2824.4864	-.149290-05
41	1	1x0000.000	3540000.000	9.7395	227.4058	2824.4864	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	5	100000.000	350000.000	9.4626	224.6666	2852.0190	.000000
2	5	150000.000	350000.000	9.4626	224.6666	2852.0190	.314019-05
3	5	200000.000	350000.000	9.1903	224.4641	2863.7929	.386321-05
4	5	250000.000	350000.000	8.7277	224.2270	2953.2590	.414956-05
5	5	300000.000	350000.000	8.2743	224.1410	3013.1443	.349067-05
6	5	350000.000	350000.000	7.9398	224.1892	3054.6591	.291401-06
7	5	400000.000	350000.000	7.6879	224.1154	3080.4676	-.930289-05
8	5	450000.000	350000.000	7.5030	225.0524	3106.9336	-.550148-05
9	5	500000.000	350000.000	7.4502	226.2738	3123.7161	.814105-05
10	5	550000.000	350000.000	7.5064	228.1982	3113.6201	-.337614-05
11	5	600000.000	350000.000	10.7505	243.7297	2881.7798	.301725-04
12	5	650000.000	350000.000	13.2793	244.2686	2359.0495	.258644-04
13	5	700000.000	350000.000	9.9290	231.0319	2762.2978	.393602-04
14	5	750000.000	350000.000	8.9846	225.2998	2889.1001	.340047-04
15	5	800000.000	350000.000	8.9337	224.9383	2899.5314	.260364-04
16	5	850000.000	350000.000	8.9423	224.9624	2912.6490	.221368-04
17	5	900000.000	350000.000	8.8138	224.4790	2935.7918	.183456-04
18	5	950000.000	350000.000	8.6050	223.9969	2967.1693	.148196-04
19	5	1000000.000	350000.000	8.3436	223.5112	3006.2961	.114551-04
20	5	1050000.000	350000.000	8.1526	223.9182	3041.9966	.805381-05
21	5	1100000.000	350000.000	7.9710	224.5075	3064.8363	.225803-05
22	5	1150000.000	350000.000	7.7723	225.5916	3105.2036	-.631751-06
23	5	1200000.000	350000.000	7.5467	225.9879	3128.7249	.246145-05
24	5	1250000.000	350000.000	7.7752	229.5749	3140.5374	-.242283-05
25	5	1300000.000	350000.000	8.2316	233.2611	3069.3496	-.937148-05
26	5	1350000.000	350000.000	7.8043	233.0069	3116.3167	-.168123-04
27	5	1400000.000	350000.000	7.7037	233.9543	3131.4633	-.183166-04
28	5	1450000.000	350000.000	7.7204	235.5428	3121.1696	-.170460-04
29	5	1500000.000	350000.000	7.7817	237.0542	3114.3011	-.147716-04
30	5	1550000.000	350000.000	7.8258	238.1654	3104.9265	-.116765-04
31	5	1600000.000	350000.000	7.9539	239.4208	3092.3466	-.123001-04
32	5	1650000.000	350000.000	8.1490	240.7030	3062.4581	-.141439-04
33	5	1700000.000	350000.000	7.9902	240.2985	3075.7597	-.931628-05
34	5	1750000.000	350000.000	8.3137	241.4499	3069.9967	-.336925-05
35	5	1800000.000	350000.000	9.2030	243.3977	2955.8154	.382602-05
36	5	1850000.000	350000.000	9.7560	241.5509	2944.7602	.105387-04
37	5	1900000.000	350000.000	8.9150	236.8378	2999.7744	.140495-04
38	5	1950000.000	350000.000	9.3100	235.4169	2965.2215	.718504-05
39	5	2000000.000	350000.000	9.6607	235.7462	2860.0713	-.951211-06
40	5	2050000.000	350000.000	9.8352	227.7801	2820.9614	-.369033-05
41	5	2100000.000	350000.000	9.8352	227.7801	2820.9614	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X GRID INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
4	3	1e0000.000	3570000.000	9.4292	224.4006	2852.8770	.000000
5	3	1e0000.000	3570000.000	9.4292	224.4006	2852.8770	.501409-05
3	6	2e0000.000	3570000.000	9.3915	224.1875	2892.8349	.670659-05
4	3	3e0000.000	3570000.000	8.5265	223.8217	2978.4284	.854585-05
5	6	4e0000.000	3570000.000	7.9915	223.4544	3051.8921	.966849-05
6	3	5e0000.000	3570000.000	7.6478	223.2555	3093.7204	.120769-04
7	6	535000.000	3570000.000	7.4877	223.2803	3108.8285	.170633-05
8	3	540000.000	3570000.000	7.1490	225.1301	3149.8969	-.608563-05
9	3	545000.000	3570000.000	7.3401	224.1981	3145.4397	.266013-04
10	6	550000.000	3570000.000	7.4427	224.8810	3124.6506	-.836892-05
11	6	555000.000	3570000.000	11.0049	244.3791	2880.9592	.352235-04
12	6	560000.000	3570000.000	14.6469	246.3590	2197.7381	.358131-04
13	6	565000.000	3570000.000	10.1839	230.1903	2713.5499	.817114-04
14	6	570000.000	3570000.000	8.6535	225.0787	2908.4280	.587706-04
15	6	575000.000	3570000.000	8.5893	223.2278	2928.9828	.411535-04
16	6	580000.000	3570000.000	8.5029	223.7107	2962.0417	.315852-04
17	6	585000.000	3570000.000	8.1989	223.4470	3013.6607	.235523-04
18	6	590000.000	3570000.000	7.8297	223.2917	3071.0643	.183364-04
19	6	595000.000	3570000.000	7.4530	223.2170	3130.2909	.188686-04
20	6	600000.000	3570000.000	7.2535	223.8375	3170.8926	.159226-04
21	6	605000.000	3570000.000	7.0479	224.9019	3197.2862	.145721-04
22	6	610000.000	3570000.000	6.9259	226.4135	3231.6770	.105409-04
23	6	615000.000	3570000.000	6.6663	227.7799	3259.6269	.147631-04
24	3	620000.000	3570000.000	7.1567	231.3154	3244.3641	.890393-05
25	3	625000.000	3570000.000	7.5906	236.1914	3170.6520	-.150203-05
26	3	630000.000	3570000.000	7.2760	236.2549	3213.9077	-.466150-05
27	3	635000.000	3570000.000	7.1906	237.4050	3218.6832	-.791974-05
28	6	640000.000	3570000.000	7.2768	238.9530	3199.0563	-.823447-05
29	3	645000.000	3570000.000	7.4116	239.9374	3184.5821	-.725942-05
30	3	650000.000	3570000.000	7.4921	240.8613	3170.9564	-.754597-05
31	3	655000.000	3570000.000	7.7161	242.0142	3148.3130	-.684028-05
32	6	660000.000	3570000.000	8.0196	243.9401	3104.7494	-.145733-04
33	3	665000.000	3570000.000	7.8019	244.8747	3129.5775	-.893245-05
34	3	670000.000	3570000.000	8.5313	244.0316	3095.7348	.322265-06
35	3	675000.000	3570000.000	9.5009	244.6184	2953.4973	-.285929-05
36	3	680000.000	3570000.000	9.1493	243.8357	2965.9695	.677341-05
37	3	685000.000	3570000.000	9.7490	240.5401	3019.6975	.135457-04
38	3	690000.000	3570000.000	9.5106	236.1497	2967.3969	.406545-05
39	3	695000.000	3570000.000	9.3924	230.5409	2835.0426	-.468419-05
40	6	700000.000	3570000.000	10.0732	227.0528	2767.5548	-.665094-05
41	3	700000.000	3570000.000	10.0732	227.0528	2767.5548	.000000

** WIND FIELDS LAYER HEIGHT AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

I	J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
4	7	[illegible]	3575000.000	9.4111	224.1601	2851.9786	.000000
5	7	[illegible]	3575000.000	9.4111	224.1601	2851.9786	.755945-05
6	7	[illegible]	3575000.000	9.0326	223.9063	2896.4842	.105825-04
7	7	[illegible]	3575000.000	8.4006	223.4753	2991.1309	.139025-04
8	7	[illegible]	3575000.000	7.8336	222.8360	3068.7532	.155875-04
9	7	[illegible]	3575000.000	7.5212	221.6968	3110.1408	.130760-04
10	7	[illegible]	3575000.000	7.1156	220.0526	3159.8359	.214280-04
11	7	[illegible]	3575000.000	7.5803	222.2246	3118.3499	.979418-05
12	7	[illegible]	3575000.000	7.7362	223.1612	3093.7733	.193386-04
13	7	[illegible]	3575000.000	7.6120	221.0144	3119.7139	.380786-04
14	7	[illegible]	3575000.000	11.1193	244.2638	2887.7846	.517085-05
15	7	[illegible]	3575000.000	15.2113	247.6589	2111.5345	.120101-03
16	7	[illegible]	3575000.000	9.3576	229.9719	2731.0289	.239748-03
17	7	[illegible]	3575000.000	7.5273	222.7824	3014.6630	.175986-03
18	7	[illegible]	3575000.000	7.9321	223.2135	3001.2274	.120259-03
19	7	[illegible]	3575000.000	7.7208	224.1943	3054.7084	.760770-04
20	7	[illegible]	3575000.000	7.5930	224.1471	3120.1172	.575259-04
21	7	[illegible]	3575000.000	7.0545	224.1174	3175.0088	.411465-04
22	7	[illegible]	3575000.000	6.7593	224.6934	3224.8187	.387376-04
23	7	[illegible]	3575000.000	6.7497	224.8136	3237.0726	.316034-04
24	7	[illegible]	3575000.000	6.5646	225.5185	3257.5523	.301884-04
25	7	[illegible]	3575000.000	6.4430	225.9065	3266.6154	.265592-04
26	7	[illegible]	3575000.000	6.3849	226.1131	3269.6148	.204273-04
27	7	[illegible]	3575000.000	6.9219	231.1535	3254.6069	.235566-04
28	7	[illegible]	3575000.000	7.1926	236.1368	3206.5227	.950165-05
29	7	[illegible]	3575000.000	7.2134	236.3385	3229.7316	.114103-04
30	7	[illegible]	3575000.000	8.9923	237.8397	3226.5338	.575350-05
31	7	[illegible]	3575000.000	7.2376	240.0543	3191.5134	-.106245-05
32	7	[illegible]	3575000.000	7.3709	241.4081	3179.3049	-.837293-05
33	7	[illegible]	3575000.000	7.4941	242.2540	3167.3185	-.869326-05
34	7	[illegible]	3575000.000	7.5834	243.1583	3146.4090	-.356192-05
35	7	[illegible]	3575000.000	7.6416	244.9692	3150.8987	.553349-05
36	7	[illegible]	3575000.000	8.0171	247.2460	3156.4770	-.127511-04
37	7	[illegible]	3575000.000	9.3307	245.9154	2995.4189	-.748546-05
38	7	[illegible]	3575000.000	9.6116	245.1222	2924.3531	-.116174-04
39	7	[illegible]	3575000.000	9.0895	245.0124	2962.8110	.112755-04
40	7	[illegible]	3575000.000	9.2239	240.9217	2999.0908	.126116-04
41	7	[illegible]	3575000.000	9.7334	235.8946	2941.8537	-.119422-05
42	7	[illegible]	3575000.000	10.1978	229.4213	2790.8578	-.959586-05
43	7	[illegible]	3575000.000	10.3334	226.0054	2746.8873	-.102450-04
44	7	[illegible]	3575000.000	10.3334	226.0054	2746.8873	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (5.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	1	100000.000	3580000.000	9.3746	223.9520	2853.5653	.000000
2	2	150000.000	3580000.000	9.3746	223.9520	2853.5653	.903944-05
3	3	200000.000	3580000.000	8.9785	223.4648	2898.5776	.122027-04
4	4	250000.000	3580000.000	8.2520	223.1065	3008.1719	.141747-04
5	5	300000.000	3580000.000	7.6943	222.3207	3089.0383	.125382-04
6	6	350000.000	3580000.000	7.5193	220.7817	3117.1686	.624553-05
7	7	400000.000	3580000.000	7.6294	220.8526	3124.5103	-.124978-05
8	8	450000.000	3580000.000	8.1594	219.5301	3050.0957	.255086-04
9	9	500000.000	3580000.000	8.0399	218.5257	3096.1508	.777513-05
10	10	550000.000	3580000.000	7.7244	211.6768	3143.2553	-.557990-04
11	11	600000.000	3580000.000	12.7103	231.1756	2742.1143	-.237140-03
12	12	650000.000	3580000.000	14.3447	249.1574	2058.7470	.303995-03
13	13	700000.000	3580000.000	8.7940	229.5164	2892.8089	.349586-03
14	14	750000.000	3580000.000	8.2115	219.0469	3071.9234	.282498-03
15	15	800000.000	3580000.000	8.8798	223.0379	3050.4172	.196874-03
16	16	850000.000	3580000.000	8.7875	223.1122	3148.8072	.137346-03
17	17	900000.000	3580000.000	8.5848	223.4606	3192.4805	.102304-03
18	18	950000.000	3580000.000	8.5571	222.9145	3222.0219	.581487-04
19	19	1000000.000	3580000.000	8.2918	224.7542	3274.9845	.453091-04
20	20	1050000.000	3580000.000	8.4533	224.1508	3269.2004	.422101-04
21	21	1100000.000	3580000.000	8.2698	224.1629	3266.0524	.332603-04
22	1	1150000.000	3580000.000	8.2522	224.9144	3298.4241	.296501-04
23	2	1200000.000	3580000.000	8.3032	226.7675	3278.3316	.179324-04
24	3	1250000.000	3580000.000	8.5424	231.1549	3286.2221	.145089-04
25	4	1300000.000	3580000.000	7.0336	234.8050	3213.5762	.108679-04
26	5	1350000.000	3580000.000	8.7498	236.3300	3228.3243	.367550-05
27	6	1400000.000	3580000.000	8.7384	236.1068	3238.6600	.680091-05
28	7	1450000.000	3580000.000	8.2209	240.8783	3213.3471	.517607-05
29	8	1500000.000	3580000.000	7.1323	243.2640	3198.4119	.555825-05
30	9	1550000.000	3580000.000	7.2077	245.1020	3181.6999	-.404840-05
31	10	1600000.000	3580000.000	7.2330	245.9597	3202.3808	.308073-05
32	11	1650000.000	3580000.000	7.3542	246.0490	3216.3667	-.819308-06
33	12	1700000.000	3580000.000	8.9038	243.9661	3059.0237	.537651-05
34	13	1750000.000	3580000.000	9.5916	244.9219	2933.2204	-.214491-05
35	14	1800000.000	3580000.000	9.2034	246.4223	3015.8584	-.226048-05
36	15	1850000.000	3580000.000	9.2687	244.8791	2961.2753	.204991-04
37	16	1900000.000	3580000.000	9.5399	240.5792	2975.1807	.143614-04
38	17	1950000.000	3580000.000	10.0420	235.4803	2923.5839	-.124036-05
39	18	2000000.000	3580000.000	10.4923	230.6548	2750.9358	-.107683-04
40	19	2050000.000	3580000.000	10.5538	225.3651	2717.2184	-.117273-04
41	20	2100000.000	3580000.000	10.5538	225.3651	2717.2184	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	9	1000e0.000	35e5000.000	9.3240	223.7828	2857.2843	.000000
2	9	1e0000.000	35e5000.000	9.3240	223.7828	2857.2843	.100304-04
3	9	2e0000.000	35e5000.000	8.9492	222.8094	2896.2784	.124733-04
4	9	3e0000.000	35e5000.000	8.1003	222.7675	3029.5456	.112351-04
5	9	3e0000.000	35e5000.000	7.6026	222.0327	3109.9677	.376412-05
6	9	4e0000.000	35e5000.000	7.5625	221.3381	3129.5858	-.468367-05
7	9	4e5000.000	35e5000.000	7.9972	221.0955	3092.8206	.109097-04
8	9	5e0000.000	35e5000.000	8.3482	220.5325	3067.8965	.291669-04
9	9	5e5000.000	35e5000.000	8.6950	219.1931	3049.7159	-.151879-04
10	9	6e0000.000	35e5000.000	10.2226	225.0584	2885.4371	-.231295-04
11	9	6e5000.000	35e5000.000	14.8828	227.1887	2306.0805	-.211798-03
12	9	7e0000.000	35e5000.000	8.7931	236.1389	2559.2e75	-.141581-03
13	9	7e5000.000	35e5000.000	4.6506	226.7930	3005.1566	.771924-05
14	9	8e0000.000	35e5000.000	4.9052	216.3169	3082.5488	.168957-03
15	9	8e5000.000	35e5000.000	5.4326	221.1309	3135.0359	.188449-03
16	9	9e0000.000	35e5000.000	5.3555	220.9281	3189.5465	.168909-03
17	9	9e5000.000	35e5000.000	5.9951	221.5123	3222.7824	.139183-03
18	9	9e0000.000	35e5000.000	6.1173	220.2802	3247.3213	.929172-04
19	9	9e5000.000	35e5000.000	5.9631	223.9189	3296.1514	.515613-04
20	9	1e0000.000	35e5000.000	6.4409	222.6625	3257.0230	.517773-04
21	9	1e5000.000	35e5000.000	6.1356	222.5357	3284.5916	.219715-04
22	9	1e0000.000	35e5000.000	6.0615	223.2169	3296.4748	.331966-04
23	9	1e5000.000	35e5000.000	6.0399	224.7207	3293.2266	.380860-04
24	9	2e0000.000	35e5000.000	6.3822	231.3376	3275.5891	-.969439-06
25	9	2e5000.000	35e5000.000	6.7445	234.9915	3216.9471	.112475-04
26	9	3e0000.000	35e5000.000	6.2735	237.7517	3264.7111	-.240535-05
27	9	3e5000.000	35e5000.000	6.2914	240.6102	3277.7795	.157013-04
28	9	4e0000.000	35e5000.000	6.6242	242.3591	3231.3470	.321153-05
29	9	4e5000.000	35e5000.000	6.6914	245.1274	3222.3891	-.836015-05
30	9	4e0000.000	35e5000.000	6.9463	247.1668	3211.9742	.188811-05
31	9	4e5000.000	35e5000.000	6.8919	249.4168	3241.2100	.151913-05
32	9	5e0000.000	35e5000.000	8.2702	248.8583	3140.1579	.607836-05
33	9	5e5000.000	35e5000.000	9.6762	243.4242	2925.8210	.199960-04
34	9	6e0000.000	35e5000.000	9.3069	243.3608	2980.7138	-.353733-05
35	9	6e5000.000	35e5000.000	9.3802	246.6463	3009.6140	.948926-05
36	9	7e0000.000	35e5000.000	9.9267	242.5536	2909.1561	.242826-04
37	9	7e0000.000	35e5000.000	9.9837	236.5958	2917.7960	.159854-04
38	9	8e0000.000	35e5000.000	10.4110	234.2147	2881.1099	-.446189-06
39	9	8e0000.000	35e5000.000	10.7556	228.0322	2712.5482	-.111396-04
40	9	9e0000.000	35e5000.000	10.7752	224.7431	2687.3387	-.126025-04
41	9	9e0000.000	35e5000.000	10.7752	224.7431	2687.3387	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	13	100000.000	3590000.000	9.2620	223.6728	2863.3120	.000000
2	13	125000.000	3590000.000	9.2620	223.6728	2863.3120	.104436-04
3	13	150000.000	3590000.000	8.9309	222.0691	2891.9985	.119539-04
4	13	175000.000	3590000.000	8.0618	221.6016	3043.0832	.823323-05
5	13	200000.000	3590000.000	7.7006	221.0127	3114.5013	-.310478-05
6	13	225000.000	3590000.000	7.7692	221.6308	3122.2500	-.130633-04
7	13	250000.000	3590000.000	8.3572	221.5970	3051.2115	.103420-04
8	13	275000.000	3590000.000	8.5726	221.5765	3033.9784	.567811-05
9	13	300000.000	3590000.000	8.8124	223.2294	3031.3126	.221522-04
10	13	325000.000	3590000.000	10.3247	227.9185	2832.4517	-.178252-04
11	13	350000.000	3590000.000	10.5576	243.4645	2876.2423	-.135086-03
12	13	375000.000	3590000.000	8.6174	240.3173	2879.9845	-.386862-03
13	13	400000.000	3590000.000	5.3861	234.7781	3066.8284	-.239130-03
14	13	425000.000	3590000.000	4.6096	222.7895	3177.4396	-.409028-04
15	13	450000.000	3590000.000	4.8553	222.5375	3186.6625	.859911-04
16	13	475000.000	3590000.000	5.1763	220.2663	3215.6018	.132706-03
17	13	500000.000	3590000.000	5.4707	219.0853	3248.0089	.135910-03
18	13	525000.000	3590000.000	5.6505	218.2124	3276.9062	.121892-03
19	13	550000.000	3590000.000	6.1434	220.1106	3236.8832	.734331-04
20	13	575000.000	3590000.000	6.3367	221.5544	3229.6397	.521447-04
21	13	600000.000	3590000.000	5.9084	220.4020	3305.5829	.328293-04
22	13	625000.000	3590000.000	5.7923	221.6967	3316.2103	.227377-04
23	13	650000.000	3590000.000	5.5902	222.5641	3332.9716	.278964-04
24	13	675000.000	3590000.000	6.2285	228.7509	3253.1255	.136834-04
25	13	700000.000	3590000.000	5.9869	230.5853	3273.2664	.134088-05
26	13	725000.000	3590000.000	5.7419	230.4469	3337.5714	.179791-05
27	13	750000.000	3590000.000	5.9584	242.5972	3305.5983	-.967664-05
28	13	775000.000	3590000.000	6.5071	241.7770	3234.8255	.257624-04
29	13	800000.000	3590000.000	6.5885	247.2471	3238.7758	.371564-05
30	13	825000.000	3590000.000	6.5072	250.4335	3270.8909	.431602-05
31	13	850000.000	3590000.000	7.7283	247.5217	3202.4722	.951499-05
32	13	875000.000	3590000.000	9.6279	244.2404	2948.7292	.297108-05
33	13	900000.000	3590000.000	9.5831	243.4007	2943.6460	.149037-04
34	13	925000.000	3590000.000	9.0475	243.7179	3047.5252	.140907-04
35	13	950000.000	3590000.000	9.8186	246.3234	2952.7589	.313525-04
36	13	975000.000	3590000.000	10.4132	241.5603	2831.3698	.239674-04
37	13	1000000.000	3590000.000	10.2027	238.0016	2897.0429	.162354-04
38	13	1025000.000	3590000.000	10.5347	233.9759	2863.3735	-.109797-05
39	13	1050000.000	3590000.000	10.9959	227.5918	2675.7655	-.123980-04
40	13	1075000.000	3590000.000	11.2206	224.0659	2654.1479	-.135415-04
41	13	1100000.000	3590000.000	11.0209	224.0659	2654.1479	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (5.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	11	100000.000	3595000.000	9.2090	223.5838	2870.2609	.000000
2	11	160000.000	3595000.000	9.2090	223.5838	2870.2609	.101371-04
3	11	260000.000	3595000.000	8.8618	221.7819	2894.1284	.100498-04
4	11	300000.000	3595000.000	8.2895	219.5808	3028.3329	.479587-05
5	11	320000.000	3595000.000	8.1403	218.3776	3079.2355	-.412900-05
6	11	330000.000	3595000.000	8.3590	220.4077	3061.3252	-.978341-05
7	11	335000.000	3595000.000	8.5245	221.9049	3023.0253	.230513-05
8	11	340000.000	3595000.000	8.2623	222.1029	3071.9480	-.520744-05
9	11	345000.000	3595000.000	8.2367	224.5641	3086.1403	-.535231-05
10	11	350000.000	3595000.000	8.0505	225.1745	3105.9618	.374618-04
11	11	355000.000	3595000.000	10.0135	241.6284	3011.1777	-.357616-04
12	11	360000.000	3595000.000	10.6142	246.4194	2702.7391	-.203832-03
13	11	365000.000	3595000.000	7.0339	234.1650	3084.8313	-.208127-03
14	11	370000.000	3595000.000	5.4221	224.2588	3213.7335	-.122492-03
15	11	375000.000	3595000.000	4.8737	222.2888	3213.6143	-.118452-04
16	11	380000.000	3595000.000	4.9492	219.9481	3230.5970	.721770-04
17	11	385000.000	3595000.000	5.2629	217.8535	3252.1080	.982841-04
18	11	390000.000	3595000.000	5.4737	216.0175	3274.7604	.990324-04
19	11	395000.000	3595000.000	6.0483	216.2915	3212.8994	.936197-04
20	11	400000.000	3595000.000	5.7500	218.9372	3261.1011	.647152-04
21	11	405000.000	3595000.000	5.5466	217.8418	3321.4734	.573090-04
22	11	410000.000	3595000.000	5.4839	220.2215	3317.8562	.264006-04
23	11	415000.000	3595000.000	5.3857	224.1703	3324.5088	.253255-04
24	11	420000.000	3595000.000	5.5251	226.7803	3313.6165	.475979-04
25	11	425000.000	3595000.000	5.2508	237.0018	3327.9807	-.133926-04
26	11	430000.000	3595000.000	5.3722	241.7673	3337.7123	.720723-05
27	11	435000.000	3595000.000	6.2650	244.4212	3240.8189	-.306188-04
28	11	440000.000	3595000.000	5.8838	247.0077	3292.8290	-.195482-04
29	11	445000.000	3595000.000	5.7384	243.3009	3346.9135	.568253-04
30	11	450000.000	3595000.000	7.3717	240.6014	3172.6977	.175513-04
31	11	455000.000	3595000.000	9.0049	240.2166	3011.3163	-.745509-05
32	11	460000.000	3595000.000	9.3949	245.3684	2942.7207	-.607556-06
33	11	465000.000	3595000.000	9.3681	242.7510	2993.1761	.113425-04
34	11	470000.000	3595000.000	9.1350	240.7557	3016.5874	.859193-05
35	11	475000.000	3595000.000	10.3930	242.8834	2876.0431	.410693-05
36	11	480000.000	3595000.000	10.7102	241.9414	2767.6145	.178635-04
37	11	485000.000	3595000.000	10.3178	238.8574	2904.0051	.224468-04
38	11	490000.000	3595000.000	10.8839	235.6763	2856.0241	.454727-05
39	11	495000.000	3595000.000	11.3012	226.9545	2831.6425	-.114107-04
40	11	500000.000	3595000.000	11.2994	223.3175	2616.4085	-.142112-04
41	11	505000.000	3595000.000	11.2994	223.3175	2616.4085	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	12	1e0000.000	3600[00.000	9.1533	223.4154	2874.7415	.000000
2	12	1e0060.000	3600200.000	9.1533	223.4154	2874.7415	.935487-05
3	12	2e0000.000	3600[00.800	8.7568	222.0176	2902.4736	.852485-05
4	12	3e0000.000	3600000.000	8.3644	219.2122	3015.0033	.377528-05
5	12	3e0000.000	3600300.000	8.1958	218.3e72	3059.6298	-.197703-05
6	12	3e0600.000	3600600.000	8.2058	219.6391	3056.1617	-.123639-05
7	12	3e5000.000	3600[00.000	7.9722	221.5748	3078.8948	-.330771-05
8	12	3+0000.000	3600000.000	7.9445	222.1578	3105.0280	-.405504-05
9	12	3+5000.000	3600600.000	7.9281	225.2901	3097.6149	.424463-05
10	12	3e0000.000	3600[00.000	8.2900	228.1d18	3070.1461	.372061-04
11	12	3e5000.000	3600[00.000	9.9571	237.2459	2932.4712	.305270-04
12	12	3e0000.000	3600[00.000	10.3372	243.9637	2787.7392	-.955172-04
13	12	3+5000.000	3600600.000	7.5905	233.e736	3060.3376	-.110908-03
14	12	3700J0.000	3600000.000	5.7714	221.7571	3234.3900	-.120246-03
15	12	375000.000	3600[00.000	5.0412	221.0679	3234.2719	-.685574-04
16	12	3e0000.000	3600[00.000	5.0049	219.3799	3238.8085	.155492-04
17	12	3e5000.000	3600000.000	5.1326	217.1480	3257.9826	.581421-04
18	12	3+0000.000	3600[00.000	5.2053	216.1520	3270.6544	.836278-04
19	12	3+5000.000	3600000.000	5.4603	214.4567	3281.0636	.862055-04
20	12	+e0000.000	3600[00.000	5.2053	216.0231	3305.3737	.609735-04
21	12	+e5000.000	3600000.000	5.1591	215.1636	3328.8081	.562422-04
22	12	++0000.000	3600[00.000	5.0592	217.3e49	3335.6800	.287444-04
23	12	+150e0.000	3600000.000	4.8226	220.3795	3354.4563	.295628-04
24	12	+e5000.000	3600000.000	4.6648	223.4285	3390.7061	.494599-04
25	12	+e5000.000	3600000.000	4.9905	231.3388	3340.e887	.374811-04
26	12	+300e0.000	3600000.000	5.1806	244.1684	3347.0011	-.184344-04
27	12	+350e0.000	3600000.000	6.0240	242.e865	3293.1523	.172055-04
28	12	++00e0.000	3600000.000	6.2471	240.2487	3266.8297	-.30e983-04
29	12	++50e0.000	3600000.000	6.8034	244.4765	3244.6051	-.463497-04
30	12	+500e0.000	3600[00.000	7.6041	242.0861	3172.1893	.398108-05
31	12	+e5e0.000	3600[00.000	9.1382	240.4130	3059.7958	.344107-04
32	12	+e00e0.000	3600[00.000	10.6340	244.8250	2872.9614	-.264927-05
33	12	+e50e0.000	3600[00.000	9.9673	242.3829	2919.5708	-.312866-05
34	12	+700e0.000	3600000.000	9.8902	239.7815	2949.1951	.165614-04
35	12	+750e0.000	3600[00.000	10.7713	242.2199	2835.3881	.657797-06
36	12	+800e0.000	3600[00.000	10.3286	240.0763	2816.1033	.342790-04
37	12	+860e0.000	3600[00.000	10.1995	240.6046	2694.5916	.342932-04
38	12	3100e0.000	3600[00.000	11.9126	234.2769	2837.1668	.954422-05
39	12	3e0e0.000	3600[00.000	12.7742	225.5721,	2564.8477	-.965426-05
40	12	3900e0.000	3600000.000	11.5932	222.5366	2576.2e56	-.135915-04
41	12	3900e0.000	3600000.000	11.5932	222.5366	2576.2e56	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	13	100000.000	3605000.000	9.1279	223.1289	2874.9834	.000000
2	13	100000.000	3605000.000	9.1279	223.1289	2874.9834	.856115-05
3	13	200000.000	3605000.000	8.6785	221.9846	2908.5369	.792325-05
4	13	300000.000	3605000.000	8.1370	220.0001	3052.0646	.468322-05
5	13	350000.000	3605000.000	7.3186	219.9406	3115.0825	.133374-05
6	13	330000.000	3605000.000	7.7770	221.2070	3124.9257	-.181349-05
7	13	335000.000	3605000.000	7.7059	222.6730	3116.4383	-.103032-04
8	13	340000.000	3605000.000	7.6107	222.9911	3123.8445	-.106655-04
9	13	345000.000	3605000.000	7.6941	225.0965	3134.4996	-.133312-04
10	13	350000.000	3605000.000	7.3951	224.1110	3134.0166	-.739328-05
11	13	355000.000	3605000.000	9.0166	236.4226	3118.8487	.297853-04
12	13	360000.000	3605000.000	10.9899	243.0446	2807.0004	.798420-05
13	13	365000.000	3605000.000	8.2638	232.8032	3008.3268	.337307-05
14	13	370000.000	3605000.000	6.0856	224.7879	3255.6957	-.384188-04
15	13	375000.000	3605000.000	5.4130	220.6773	3293.5862	-.319743-04
16	13	380000.000	3605000.000	5.2656	218.9858	3257.5786	-.202623-06
17	13	385000.000	3605000.000	5.1005	215.7912	3275.7673	.309443-04
18	13	390000.000	3605000.000	5.0065	213.9860	3282.1827	.635904-04
19	13	395000.000	3605000.000	5.0990	212.2982	3313.0361	.662796-04
20	13	400000.000	3605000.000	4.9961	212.9070	3309.6295	.542595-04
21	13	405000.000	3605000.000	4.9500	212.3718	3323.9182	.473081-04
22	13	410000.000	3605000.000	4.8060	214.3222	3343.8848	.323427-04
23	13	415000.000	3605000.000	4.6474	217.4340	3347.4414	.348135-04
24	13	420000.000	3605000.000	4.4984	221.3077	3369.1909	.462825-04
25	13	425000.000	3605000.000	4.1244	224.7491	3396.4806	.569083-04
26	13	430000.000	3605000.000	3.2864	239.8347	3319.5739	.327979-05
27	13	435000.000	3605000.000	6.2242	242.6162	3257.7108	-.216963-04
28	13	440000.000	3605000.000	6.5263	244.4595	3257.1163	-.186851-04
29	13	445000.000	3605000.000	7.4485	245.8614	3179.7913	-.252773-04
30	13	450000.000	3605000.000	8.2152	245.1067	3138.0504	-.152069-04
31	13	455000.000	3605000.000	9.9624	244.3609	2979.4225	.235138-04
32	13	460000.000	3605000.000	11.1434	242.7399	2774.6054	.215490-04
33	13	465000.000	3605000.000	9.9360	245.0542	2914.5654	.200967-04
34	13	470000.000	3605000.000	9.6284	238.4476	2955.3803	-.344245-05
35	13	475000.000	3605000.000	9.9948	238.2539	2948.5153	-.718493-05
36	13	480000.000	3605000.000	10.4219	240.8990.	2859.5656	.251458-04
37	13	485000.000	3605000.000	11.1765	235.2075	2833.9527	.331967-04
38	13	490000.000	3605000.000	11.9926	230.3303	2765.7981	.127593-04
39	13	495000.000	3605000.000	12.3025	225.9067,	2476.1336	-.585313-05
40	13	500000.000	3605000.000	11.8930	221.9363	2543.4858	-.119154-04
41	13	705000.000	3605000.000	11.6330	221.9363	2543.4858	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	14	100000.000	3610000.000	9.1197	222.7645	2871.8103	.000000
2	14	180000.000	3610000.000	9.1197	222.7645	2871.8103	.790805-05
3	14	260000.000	3610000.000	8.6625	221.5702	2908.5193	.747004-05
4	14	340000.000	3610000.000	8.0621	219.8407	3054.6898	.506773-05
5	14	420000.000	3610000.000	7.7116	219.8926	3118.8681	.182723-05
6	14	500000.000	3610000.000	7.6544	221.1136	3128.8082	-.323107-05
7	14	580000.000	3610000.000	7.5992	222.2944	3121.1253	-.863320-05
8	14	660000.000	3610000.000	7.5202	223.0899	3128.4737	-.104892-04
9	14	740000.000	3610000.000	7.6628	225.9333	3130.0542	.795134-05
10	14	820000.000	3610000.000	7.9050	227.2795	3064.8180	-.127981-04
11	14	900000.000	3610000.000	9.1033	238.3355	3060.8795	-.256741-04
12	14	980000.000	3610000.000	11.0688	236.3967	2711.8418	.874129-04
13	14	1060000.000	3610000.000	7.1705	229.1490	3043.5818	.770641-04
14	14	1140000.000	3610000.000	5.2884	219.1250	3341.0885	.951170-04
15	14	1220000.000	3610000.000	5.5894	217.5362	3273.8726	.500802-04
16	14	1300000.000	3610000.000	5.4257	216.2662	3259.3493	.123151-04
17	14	1380000.000	3610000.000	5.1977	213.2307	3285.0121	.203477-04
18	14	1460000.000	3610000.000	5.0641	210.9951	3287.2036	.371117-04
19	14	1540000.000	3610000.000	5.0188	209.5233	3303.4216	.454935-04
20	14	1620000.000	3610000.000	4.9262	209.0147	3306.7291	.461131-04
21	14	1700000.000	3610000.000	4.7836	208.3673	3331.5827	.389334-04
22	14	1780000.000	3610000.000	4.5964	209.4213	3350.8758	.386786-04
23	14	1860000.000	3610000.000	4.3821	210.2289	3360.1550	.303403-04
24	14	1940000.000	3610000.000	3.7781	211.6560	3424.7132	.342659-04
25	14	2020000.000	3610000.000	3.7524	223.8004	3421.4300	.733621-05
26	14	2100000.000	3610000.000	5.5351	235.1881	3309.5063	.432948-04
27	14	2180000.000	3610000.000	6.1931	247.6428	3277.1328	-.164429-04
28	14	2260000.000	3610000.000	6.5022	252.6294	3289.8828	.673608-05
29	14	2340000.000	3610000.000	7.6153	247.4524	3192.9157	.220444-04
30	14	2420000.000	3610000.000	9.1005	243.1894	3063.6000	.147095-05
31	14	2500000.000	3610000.000	11.0082	242.7272	2859.7500	-.537637-05
32	14	2580000.000	3610000.000	10.8441	241.7855	2815.1315	.182723-04
33	14	2660000.000	3610000.000	10.1670	237.4125	2945.1671	.186373-04
34	14	2740000.000	3610000.000	11.1025	236.9481	2814.0781	.761533-05
35	14	2820000.000	3610000.000	11.8820	234.1588	2746.2723	-.185891-05
36	14	2900000.000	3610000.000	12.4190	233.1492	2615.8157	.360690-04
37	14	2980000.000	3610000.000	12.8191	227.2720	2556.1241	.230039-04
38	14	3060000.000	3610000.000	13.1905	224.3899	2545.3429	.647636-05
39	14	3140000.000	3610000.000	12.5927	222.7272	2415.5300	-.416225-05
40	14	3220000.000	3610000.000	11.9368	221.7705	2528.6012	-.983127-05
41	14	3300000.000	3610000.000	11.9368	221.7705	2528.6012	.886700

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	15	1e0000.000	3615000.000	9.1251	222.3544	2866.6118	.000000
2	15	1e0000.000	3615000.000	9.1251	222.3544	2866.6118	.733376-05
3	15	2e0000.000	3615000.000	8.6659	221.0278	2906.0916	.701363-05
4	15	3e0000.000	3615000.000	8.0405	219.2357	3056.1795	.494505-05
5	15	3200e0.000	3615000.000	7.6902	219.1968	3123.0123	.192042-05
6	15	330000.000	3615000.000	7.6340	220.5067	3129.5850	-.165537-05
7	15	335000.000	3615000.000	7.5677	221.7020	3128.4057	-.934768-05
8	15	340000.000	3615000.000	7.4167	222.[illegible]12	3143.9346	-.187575-04
9	15	345000.000	3615000.000	7.4146	224.9806	3158.4393	.178534-04
10	15	350000.000	3615000.000	7.1053	221.6778	3153.0305	.670475-04
11	15	355000.000	3615000.000	9.607	242.6334	3071.7971	-.607807-04
12	15	360000.000	3615000.000	10.3700	238.4091	2686.6994	.965319-04
13	15	365000.000	3615000.000	5.1377	227.5121	3343.8580	.110346-03
14	15	370000.000	3615000.000	5.0798	217.7327	3332.3725	.164746-03
15	15	375000.000	3615000.000	5.6367	215.8274	3253.6782	.106357-03
16	15	380000.000	3615000.000	5.5533	213.9272	3274.1169	.437333-04
17	15	385000.000	3615000.000	5.3548	210.84[illegible]	3291.8868	.294782-04
18	15	390000.000	3615000.000	5.1825	208.1743	3291.4188	.244441-04
19	15	395000.000	3615000.000	4.9669	206.7614	3310.5234	.265078-04
20	15	400000.000	3615000.000	4.8948	205.3430	3317.5850	.310879-04
21	15	405000.000	3615000.000	4.7106	204.5429	3336.8783	.189181-04
22	15	410000.000	3615000.000	4.5213	204.3695	3331.5677	.536352-04
23	15	415000.000	3615000.000	4.2320	204.1867	3382.5772	.385679-04
24	15	420000.000	3615000.000	3.2441	209.2153	3434.0257	-.840450-04
25	15	425000.000	3615000.000	3.9116	225.1696	3381.2510	-.811316-05
26	15	430000.000	3615000.000	4.6960	233.8723	3357.3821	.272674-04
27	15	435000.000	3615000.000	4.9153	245.7744	3363.3665	.418165-04
28	15	440000.000	3615000.000	6.8926	247.6988	3277.8616	.723513-[illegible]
29	15	445000.000	3615000.000	9.7032	243.6781	3013.4135	.331043-0[illegible]
30	15	450000.000	3615000.000	10.0942	240.4221	2860.4315	-.762140-05
31	15	455000.000	3615000.000	11.7016	239.2592	2768.0482	-.104403-04
32	15	460000.000	3615000.000	11.7011	240.1814	2727.6301	.200097-04
33	15	465000.000	3615000.000	12.0085	243.0117	2675.9772	-.772293-05
34	15	470000.000	3615000.000	11.9131	243.7754	2688.5690	.197292-04
35	15	475000.000	3615000.000	12.4740	242.5110	2619.9976	-.800143-05
36	15	480000.000	3615000.000	12.7221	241.1365	2586.0569	.200599-04
37	15	485000.000	3615000.000	13.1391	240.9908	2520.2339	.169964-04
38	15	490000.000	3615000.000	13.3241	224.0262	2525.3098	.460111-05
39	15	495000.000	3615000.000	12.5503	222.8160	2397.3529	-.168042-05
40	15	500000.000	3615000.000	11.9192	222.0108	2529.9891	-.548529-05
41	15	505000.000	3615000.000	11.9192	222.0108	2529.9891	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	16	1e0000.000	3620000.000	9.1438	221.8950	2859.8105	.000000
2	16	1e0000.000	3620000.000	9.1438	221.8950	2859.8105	.586928-05
3	16	2e0000.000	3620000.000	8.6813	220.4724	2901.0587	.679448-05
4	16	3e0000.000	3620000.000	8.0130	218.7841	3055.9366	.476762-05
5	16	3e0000.000	3620000.000	7.6486	218.7316	3125.8490	.131353-05
6	16	330000.000	3620000.000	7.5694	219.7816	3133.5764	-.237659-05
7	16	335000.000	3620000.000	7.4924	220.5852	3139.6952	-.181771-04
8	16	340000.000	3620000.000	7.4341	221.4339	3146.8271	-.191303-04
9	16	345000.000	3620000.000	7.6308	222.5765	3150.4572	-.254027-04
10	16	350000.000	3620000.000	7.0843	217.4581	3188.5203	.225277-04
11	16	355000.000	3620000.000	11.1769	229.3608	2885.3058	-.466685-04
12	16	3e0000.000	3620000.000	8.3203	241.4390	2830.5758	.576513-04
13	16	365000.000	3620000.000	4.3995	220.6500	3384.6480	.201601-03
14	16	370000.000	3620000.000	4.9392	214.3866	3276.7778	.220346-03
15	16	375000.000	3620000.000	5.5615	212.4003	3255.0017	.157241-03
16	16	3e0000.000	3620000.000	5.5995	209.9928	3284.6519	.840544-04
17	16	385000.000	3620000.000	5.4454	207.3999	3293.7141	.415560-04
18	16	390000.000	3620000.000	5.2609	204.7335	3298.7744	.263630-04
19	16	395000.000	3620000.000	5.1618	203.5624	3296.0796	.176324-04
20	16	4e0000.000	3620000.000	4.9605	202.8782	3314.1665	.125599-04
21	16	4e5000.000	3620000.000	4.7291	202.0893	3327.1826	.383570-04
22	16	410000.000	3620000.000	4.6967	198.5867	3343.3347	.401578-05
23	16	415000.000	3620000.000	3.2071	189.2108	3470.6797	.2412.0-04
24	16	4e0000.000	3620000.000	4.1716	204.3582	3359.0174	-.264173-04
25	16	4e5000.000	3620000.000	3.4577	229.0055	3403.9262	-.869408-04
26	16	430000.000	3620000.000	4.4147	233.1136	3398.7311	-.195353-04
27	16	435000.000	3620000.000	5.9146	240.3439	3322.8919	.400707-04
28	16	440000.000	3620000.000	9.2239	237.8293	3077.6139	.261040-04
29	16	445000.000	3620000.000	11.1773	241.6164	2830.7196	.502367-04
30	16	450000.000	3620000.000	11.5363	238.5094	2781.6886	.153438-04
31	16	455000.000	3620000.000	12.3106	236.6253	2691.2330	-.163890-04
32	16	4e0000.000	3620000.000	12.6086	237.2075	2627.9687	.852257-05
33	16	4e5000.000	3620000.000	12.3483	233.0268	2637.5508	-.118036-05
34	16	470000.000	3620000.000	11.9918	232.1993	2717.4291	.550256-05
35	16	475000.000	3620000.000	13.0625	234.6536	2573.3542	.244061-04
36	16	480000.000	3620000.000	13.7841	236.5962	2448.9803	.213116-04
37	16	490000.000	3620000.000	13.6833	225.6119	2422.8983	.155595-04
38	16	5100e0.000	3620000.000	13.3649	223.6308	2478.1602	-.461014-06
39	16	550000.000	3620000.000	12.3833	223.3091	2404.4378	-.134615-05
40	16	6e0000.000	3620000.000	11.8568	222.3405	2534.8304	-.248687-05
41	16	7100e0.000	3620000.000	11.8568	222.3405	2534.8304	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
4	1	1x0000.000	3340000.000	9.2781	225.4661	2874.5110	.000000
5	1	1600x0.000	3340000.000	9.2781	225.4661	2874.5110	.000000
6	1	2x0000.000	3340000.000	9.2385	225.6981	2876.0273	.000000
7	1	2400x0.000	3340000.000	9.1963	226.2236	2874.2185	.000000
8	1	3x0000.000	3340000.000	9.1954	227.0496	2864.2191	.000000
9	1	3200x0.000	3340000.000	9.2379	227.9753	2848.3952	.000000
10	1	3400x0.000	3340000.000	9.2709	228.7174	2835.8523	.000000
11	1	3600x0.000	3340000.000	9.2588	229.2684	2830.7369	.000000
12	1	3800x0.000	3340000.000	9.2763	229.6226	2833.1570	.000000
13	1	4x000x.000	3340000.000	9.0814	229.6024	2847.4533	.000000
14	1	4200x0.000	3340000.000	8.9031	229.1058	2872.0518	.000000
15	1	4400x0.000	3340000.000	8.7314	228.4823	2896.1615	.000000
16	1	4600x0.000	3340000.000	8.6209	228.2722	2906.1341	.000000
17	1	4800x0.000	3340000.000	8.5660	228.4975	2906.4457	.000000
18	1	5x000x.000	3340000.000	8.5360	228.8422	2905.7437	.000000
19	1	5200x0.000	3340000.000	8.5037	229.1861	2905.7028	.000000
20	1	5400x0.000	3340000.000	8.4939	229.5618	2904.1232	.000000
21	1	5600x0.000	3340000.000	8.4935	229.9875	2900.4490	.000000
22	1	5800x0.000	3340000.000	8.5108	230.4495	2895.1376	.000000
23	1	6x000x.000	3340000.000	8.5356	230.9236	2888.9006	.000000
24	1	6200x0.000	3340000.000	8.5664	231.3896	2882.1705	.000000
25	1	6400x0.000	3340000.000	8.5992	231.8492	2875.3804	.000000
26	-	6600x0.000	3340000.000	8.6279	232.1952	2869.8867	.000000
27	1	6800x0.000	3340000.000	8.6442	232.4147	2867.1483	.000000
28	1	7x000x.000	3340000.000	8.6449	232.4778	2866.8998	.000000
29	1	7200x0.000	3340000.000	8.6551	232.4895	2865.7043	.000000
30	1	7400x0.000	3340000.000	8.6714	232.5421	2862.9137	.000000
31	1	7600x0.000	3340000.000	8.6961	232.6356	2858.9758	.000000
32	1	7800x0.000	3340000.000	8.7226	232.7529	2854.4806	.000000
33	1	8x000x.000	3340000.000	8.7436	232.8712	2851.0506	.000000
34	1	8200x0.000	3340000.000	8.7705	233.0547	2847.3923	.000000
35	1	8400x0.000	3340000.000	8.7847	233.2515	2845.8232	.000000
36	1	8600x0.000	3340000.000	8.7861	233.4825	2845.4867	.000000
37	1	8800x0.000	3340000.000	8.7810	233.6902	2845.9944	.000000
38	1	9x000x.000	3340000.000	8.7737	233.8534	2846.9543	.000000
39	1	9200x0.000	3340000.000	8.7721	233.9842	2848.6099	.000000
40	1	9400x0.000	3340000.000	8.7736	234.0375	2849.6873	.000000
41	1	9600x0.000	3340000.000	8.7837	234.7283	2844.7526	.000000
42	-	9800x0.000	3340000.000	8.7990	231.2655	2841.5916	.000000
43	1	10x000.000	3340000.000	8.8107	230.2579	2837.3872	.000000
44	1	10200.000	3340000.000	8.8107	230.2579	2837.3872	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.09499 HOURS) **

I INDEX	J INDEX	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	2	1[illegible]0.000	34[illegible]0.000	9.2741	225.4661	2874.5110	.000000
2	2	2[illegible]0.000	34[illegible]0.000	9.2741	225.4661	2874.5110	.257611-07
3	2	2[illegible]0.000	34[illegible]0.000	9.2385	225.6981	2876.0273	-.628045-06
4	2	3[illegible]0.000	34[illegible]0.000	9.1963	226.2236	2874.2185	-.213740-05
5	2	3[illegible]0.000	34[illegible]0.000	9.1934	227.0496	2864.2191	-.441411-05
6	2	3[illegible]0.000	34[illegible]0.000	9.2379	227.9753	2848.3952	-.744703-05
7	2	3[illegible]0.000	34[illegible]0.000	9.2709	228.7178	2835.8523	-.119025-04
8	2	3[illegible]0.000	34[illegible]0.000	9.2965	229.2884	2830.7369	-.132478-04
9	2	3[illegible]0.000	34[illegible]0.000	9.2920	229.6226	2833.1570	-.139801-04
10	2	3[illegible]0.000	34[illegible]0.000	9.0914	229.5024	2847.4533	-.131711-04
11	2	3[illegible]0.000	34[illegible]0.000	8.7931	229.1058	2872.8518	-.107027-04
12	2	3[illegible]0.000	34[illegible]0.000	8.7314	228.4823	2898.1615	-.8[illegible]8130-05
13	2	3[illegible]0.000	34[illegible]0.000	8.6209	228.2722	2906.1341	-.[illegible]15793-05
14	2	3[illegible]0.000	34[illegible]0.000	8.5630	228.4975	2906.[illegible]457	-.[illegible]84493-05
15	2	3[illegible]0.000	34[illegible]0.000	8.5560	228.8422	2905.7637	-.964904-05
16	2	3[illegible]0.000	34[illegible]0.000	8.5767	229.1861	2905.7028	-.895913-05
17	2	3[illegible]0.000	34[illegible]0.000	8.6939	229.5618	2904.1232	-.806878-05
18	2	3[illegible]0.000	34[illegible]0.000	8.6955	229.9879	2900.4890	-.719335-05
19	2	3[illegible]0.000	34[illegible]0.000	8.5108	230.4495	2895.1376	-.641885-05
20	2	4[illegible]0.000	34[illegible]0.000	8.5551	230.9236	2888.9098	-.576217-05
21	2	4[illegible]0.000	34[illegible]0.000	8.5604	231.3896	2882.1785	-.518455-05
22	2	4100[illegible]0.000	34[illegible]0.000	8.5992	231.8292	2875.3849	-.467250-05
23	2	4150[illegible]0.000	34[illegible]0.000	8.6278	232.1952	2869.6067	-.341871-05
24	2	4200[illegible]0.000	34[illegible]0.000	8.6942	232.4147	2867.1883	-.195739-05
25	2	4250[illegible]0.000	34[illegible]0.000	8.6493	232.4776	2866.6948	-.630927-06
26	2	4300[illegible]0.000	34[illegible]0.000	8.6551	232.4895	2865.[illegible]643	.515801-06
27	2	4350[illegible]0.000	34[illegible]0.000	8.6714	232.5421	2862.9157	.772354-06
28	2	4400[illegible]0.000	34[illegible]0.000	8.6901	232.6356	2858.9758	.555846-06
29	2	4450[illegible]0.000	34[illegible]0.000	8.7225	232.7522	2854.9606	-.559870-07
30	2	4500[illegible]0.000	34[illegible]0.000	8.7460	232.8912	2851.0366	-.102080-05
31	2	4550[illegible]0.000	34[illegible]0.000	8.7705	233.0547	2847.3925	-.229481-05
32	2	4600[illegible]0.000	34[illegible]0.000	8.7837	233.2515	2843.8202	-.367771-05
33	2	4650[illegible]0.000	34[illegible]0.000	8.7963	233.4825	2840.4807	-.481092-05
34	2	4700[illegible]0.000	34[illegible]0.000	8.8100	233.6902	2838.9984	-.622656-05
35	2	4750[illegible]0.000	34[illegible]0.000	8.7976	233.8534	2839.9593	-.715983-05
36	2	4800[illegible]0.000	34[illegible]0.000	8.7776	233.9842	2841.6099	.887113-06
37	2	4850[illegible]0.000	34[illegible]0.000	8.8318	234.[illegible]	2843.8673	.854133-05
38	2	4900[illegible]0.000	34[illegible]0.000	9.0057	234.7233	2844.7886	.807544-05
39	2	4950[illegible]0.000	34[illegible]0.000	9.2241	234.2855	2841.5916	.370574-05
40	2	5000[illegible]0.000	34[illegible]0.000	9.3707	233.2570	2837.3872	.838258-06
41	2	5050[illegible]0.000	34[illegible]0.000	9.3707	233.2570	2837.3872	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	3	1e0060.000	3500000.000	9.1646	225.6649	2889.6422	.000000
2	3	1e0C90.000	3500000.000	9.1646	225.6649	2889.6422	.755634-06
3	3	2e0080.000	3500000.000	9.0818	225.8768	2896.1004	.176435-06
4	3	3J0000.000	3500000.000	8.9587	226.3591	2903.6470	-.142950-05
5	3	3e0000.000	3500000.000	8.8568	227.0926	2905.9774	-.411216-05
6	3	3e0000.000	3500000.000	8.8003	227.9135	2902.3677	-.889650-05
7	3	3J5000.000	3500000.000	8.7653	228.7073	2896.0970	-.154711-04
8	3	3e0840.000	3500000.000	8.7258	229.6373	2887.4025	-.168174-04
9	3	3e5060.000	3500000.000	8.7176	230.7599	2869.1575	-.152123-04
10	3	3e0000.000	3500000.000	8.7623	231.9538	2828.6881	-.990857-05
11	3	3e5000.000	3500000.000	8.7062	232.1594	2808.7255	-.349330-05
12	3	3e0000.000	3500000.000	8.4422	230.2894	2867.1515	-.614748-05
13	3	3e5000.000	3500000.000	8.1377	228.9663	2940.9450	-.940681-05
14	3	37 000.000	3500000.000	8.0257	229.1343	2962.4123	-.112407-04
15	3	375000.000	3500000.000	8.0010	229.7918	2960.4732	-.101584-04
16	3	3e00e0.000	3500000.000	7.9712	230.3477	2960.8595	-.860367-05
17	3	3e5000.000	3500000.000	7.9528	230.8838	2960.7581	-.694402-05
18	3	390000.000	3500000.000	7.9506	231.4345	2958.4631	-.550730-05
19	3	395000.000	3500000.000	7.9687	232.0441	2952.1288	-.438448-05
20	3	400000.000	3500000.000	8.0055	232.7188	2941.2222	-.355899-05
21	3	405000.000	3500000.000	8.0533	233.3785	2928.4532	-.338956-05
22	3	410000.000	3500000.000	8.1068	234.0618	2915.2185	-.259981-05
23	3	415000.000	3500000.000	8.1928	234.7883	2894.9011	-.120865-05
24	3	420000.000	3500000.000	8.2923	235.5013	2868.2817	.134078-05
25	3	425000.000	3500000.000	8.3494	235.6381	2856.2226	.214234-05
26	3	430000.000	3500000.000	8.3457	235.4636	2861.7697	.213272-05
27	3	435000.000	3500000.000	8.3531	235.4144	2865.9750	.164031-05
28	3	440000.000	3500000.000	8.3885	235.5051	2864.4555	.101784-05
29	3	445000.000	3500000.000	8.4295	235.6453	2862.1503	.250899-06
30	3	450000.000	3500000.000	8.4764	235.8242	2858.8545	-.762590-06
31	3	455000.000	3500000.000	8.5252	236.0519	2854.0113	-.201964-05
32	3	460000.000	3500000.000	8.5625	236.2343	2853.0180	-.369071-05
33	3	465000.000	3500000.000	8.6087	236.5047	2850.7670	-.483696-05
34	3	470000.000	3500000.000	8.6887	237.0045	2836.6967	-.474486-05
35	3	475000.000	3500000.000	8.7455	237.2097	2827.7728	-.307172-05
36	3	480000.000	3500000.000	8.7460	236.9301	2838.7945	.527713-05
37	3	490000.000	3500000.000	8.8136	236.1015	2852.8901	.114696-04
38	3	510000.000	3500000.000	9.0236	234.5275	2853.7531	.923428-05
39	3	550000.000	3500000.000	9.2827	232.0672	2843.7216	.334240-05
40	3	630000.000	3500000.000	9.4466	230.5320	2833.5071	-.636680-07
41	3	710000.000	3500000.000	9.4466	230.5320	2833.5071	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	4	100000.000	3540000.000	8.9953	225.9169	2911.7972	.000000
2	4	160000.000	3540000.000	8.9953	225.9169	2911.7972	.236327-05
3	4	220000.000	3540000.000	8.8423	226.0809	2926.2155	.216467-05
4	4	280000.000	3540000.000	8.5890	226.4572	2960.7509	.977378-06
5	4	340000.000	3540000.000	8.3263	226.9713	2989.7880	-.149934-05
6	4	400000.000	3540000.000	8.0998	227.4336	3012.7181	-.709795-05
7	4	460000.000	3540000.000	7.8992	227.8353	3027.2667	-.153787-04
8	4	520000.000	3540000.000	7.7180	228.6798	3052.6065	-.139996-04
9	4	580000.000	3540000.000	7.6044	229.8574	3058.9511	-.661050-05
10	4	640000.000	3540000.000	7.6721	231.7234	3070.6111	.279483-05
11	4	700000.000	3540000.000	8.5279	236.7607	3158.2848	.626090-05
12	4	760000.000	3540000.000	8.7687	236.2746	2901.7893	-.684257-05
13	4	820000.000	3540000.000	7.5496	230.8057	3046.3484	-.130563-04
14	4	880000.000	3540000.000	7.2850	230.7172	3092.4412	-.138095-04
15	4	940000.000	3540000.000	7.2283	231.6846	3090.5551	-.936497-05
16	4	1000000.000	3540000.000	7.1852	232.4736	3094.2642	-.478361-05
17	4	1060000.000	3540000.000	7.1664	233.1757	3098.3764	-.183114-05
18	4	1120000.000	3540000.000	7.1578	233.7634	3100.1190	.172040-05
19	4	1180000.000	3540000.000	7.1473	234.2468	3099.9271	.351776-05
20	4	1240000.000	3540000.000	7.1859	235.0053	3110.2535	.455719-05
21	4	1300000.000	3540000.000	7.2597	235.8281	3100.2932	.484327-05
22	4	1360000.000	3540000.000	7.3173	236.6472	3108.2560	.507831-05
23	4	1420000.000	3540000.000	7.3955	237.3414	3080.1576	.605499-06
24	4	1480000.000	3540000.000	7.6489	238.9417	3119.9255	.831518-05
25	4	1540000.000	3540000.000	8.0771	240.3578	3054.6393	.598305-05
26	4	1600000.000	3540000.000	8.0420	239.8947	3041.6612	.374152-05
27	4	1660000.000	3540000.000	8.0125	239.6908	3046.5854	.166992-05
28	4	1720000.000	3540000.000	8.0649	239.8544	3035.8311	.171978-06
29	4	1780000.000	3540000.000	8.1263	240.0827	3027.0657	-.752740-06
30	4	1840000.000	3540000.000	8.1920	240.2942	3010.2573	-.191752-05
31	4	1900000.000	3540000.000	8.2946	240.6582	3008.3702	-.355461-05
32	4	1960000.000	3540000.000	8.4079	241.0685	2988.6011	-.541827-05
33	4	2020000.000	3540000.000	8.3858	240.9207	2957.6583	-.596248-05
34	4	2080000.000	3540000.000	8.5251	241.5322	2985.2794	-.331347-05
35	4	2140000.000	3540000.000	8.9691	242.5737	2938.3340	.843447-06
36	4	2200000.000	3540000.000	8.9827	241.5818	2886.6598	.844091-05
37	4	2260000.000	3540000.000	8.9413	239.4949	2915.2321	.130411-04
38	4	2320000.000	3540000.000	9.1607	236.4572	2895.8206	.891951-05
39	4	2380000.000	3540000.000	9.4594	232.8491	2834.3116	.140983-05
40	4	2440000.000	3540000.000	9.6392	230.4888	2813.7545	-.230402-05
41	4	2500000.000	3540000.000	9.6392	230.4888	2813.7545	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
4	3	100000.000	350000.000	8.8610	225.9304	2927.2531	.000000
4	4	150000.000	350000.000	8.8610	225.9304	2927.2531	.464664-05
5	5	200000.000	350000.000	8.6404	226.0333	2949.5015	.516816-05
6	6	250000.000	350000.000	8.2681	226.2516	3004.5245	.506070-05
7	7	300000.000	350000.000	7.8646	226.4659	3055.6651	.381462-05
8	8	350000.000	350000.000	7.5033	226.4740	3100.5095	-.138046-05
9	9	400000.000	350000.000	7.1885	226.4429	3131.3890	-.110003-04
10	10	450000.000	350000.000	6.9403	227.1111	3173.0022	-.510647-05
11	11	500000.000	350000.000	6.8325	228.1330	3175.3459	.918808-05
12	12	550000.000	350000.000	6.9720	230.3015	3163.2728	.178257-04
13	13	600000.000	350000.000	6.4174	230.7363	3265.5215	.809247-05
14	14	650000.000	350000.000	8.7915	239.1052	2878.9442	-.645237-05
15	15	700000.000	350000.000	6.8773	231.5486	3119.1050	-.986587-05
16	16	750000.000	350000.000	6.5670	231.8046	3191.0448	-.687942-05
17	17	800000.000	350000.000	6.5545	233.3340	3164.2477	.160714-06
18	18	850000.000	350000.000	6.5964	234.2850	3187.4221	.662880-05
19	19	900000.000	350000.000	6.5467	235.0083	3192.3603	.113104-04
20	20	950000.000	350000.000	6.5526	235.4739	3195.0084	.146204-04
21	21	1000000.000	350000.000	6.5503	235.7148	3194.6461	.165878-04
22	22	1050000.000	350000.000	6.6138	236.3184	3208.9609	.169968-04
23	23	1100000.000	350000.000	6.7132	237.0320	3194.2170	.151101-04
24	24	1150000.000	350000.000	6.7811	237.8015	3208.1393	.145438-04
25	25	1200000.000	350000.000	6.8830	238.5075	3164.2646	.145306-04
26	26	1250000.000	350000.000	7.2916	240.7008	3216.1214	.134347-04
27	27	1300000.000	350000.000	7.9303	242.6928	3115.7861	.714893-05
28	28	1350000.000	350000.000	7.3339	242.4269	3104.0804	.348138-05
29	29	1400000.000	350000.000	7.7435	242.3199	3119.6126	.140695-05
30	30	1450000.000	350000.000	7.8302	242.7107	3109.0936	.407500-06
31	31	1500000.000	350000.000	7.9134	243.1200	3100.0202	-.108432-06
32	32	1550000.000	350000.000	8.0096	243.4903	3077.1349	-.181486-05
33	33	1600000.000	350000.000	8.1534	244.0763	3074.4827	-.602502-05
34	34	1650000.000	350000.000	8.3932	244.7919	3048.3305	-.979498-05
35	35	1700000.000	350000.000	8.3100	244.8301	3005.2936	-.670916-05
36	36	1750000.000	350000.000	8.6214	245.0948	3037.6772	-.385069-06
37	37	1800000.000	350000.000	9.3724	246.1146	2956.1004	.176231-05
38	38	1850000.000	350000.000	9.3521	244.6681	2884.8651	.694131-05
39	39	1900000.000	350000.000	9.2130	241.7189	2929.9815	.114409-04
40	40	1950000.000	350000.000	9.4404	237.5248	2897.1408	.583000-05
41	41	2000000.000	350000.000	9.7409	232.7140	2800.7069	-.243852-05
42	42	2050000.000	350000.000	9.9649	229.5969	2768.9140	-.574265-05
43	43	2100000.000	350000.000	9.9649	229.5969	2768.9140	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
4	3	1x0000.000	3570000.000	6.8175	225.5213	2927.3209	.000000
4	4	1x0000.000	3570000.000	6.8175	225.5213	2927.3209	.784813-05
5	4	4x6000.000	3570000.000	6.5483	225.5570	2955.3613	.950835-05
6	4	5x0000.000	3570000.000	6.0939	225.6037	3024.0564	.111902-04
7	4	5x0000.000	3570000.000	7.6023	225.4988	3089.1684	.122131-04
8	4	5x0000.000	3570000.000	7.1724	225.0918	3144.7810	.103464-04
9	4	5350x0.000	3570000.000	6.9955	224.9581	3164.3422	.195283-05
10	4	5x0000.000	3570000.000	6.5955	226.3130	3194.7994	.788539-05
11	4	5x50x0.000	3570000.000	6.5684	225.8779	3194.1022	.181396-04
12	4	5500x0.000	3570000.000	6.6620	227.5188	3174.[illegible]98	.339640-04
13	4	5x50x0.000	3570000.000	6.1839	230.3186	3311.[illegible]2	.119208-04
14	4	6x0000.000	3570000.000	6.3393	229.8522	2876.3078	.941954-05
15	4	6x50x0.000	3570000.000	6.2864	231.1320	3168.5248	.134984-04
16	4	6700x0.000	3570000.000	6.0442	231.9127	3234.2623	.198729-04
17	4	6750x0.000	3570000.000	6.1273	233.5934	3219.0694	.251048-04
18	4	6x0000.000	3570000.000	6.1959	234.5293	3222.5791	.295541-04
19	4	6x50x0.000	3570000.000	6.2864	235.1284	3226.9636	.313707-04
20	4	7x00x0.000	3570000.000	6.2533	235.4174	3228.7617	.320955-04
21	4	7x50x0.000	3570000.000	6.2774	235.4143	3228.9566	.319227-04
22	4	8x00x0.000	3570000.000	6.3962	235.6364	3247.0484	.300173-04
23	4	8x50x0.000	3570000.000	6.4849	236.1550	3234.0090	.277166-04
24	4	9x00x0.000	3570000.000	6.5739	236.6386	3248.0074	.241211-04
25	4	9x50x0.000	3570000.000	6.6600	238.1180	3194.1775	.241419-04
26	4	9x00x0.000	3570000.000	7.1511	240.1612	3252.3463	.160680-04
27	4	9x50x0.000	3570000.000	7.3043	243.4143	3143.7299	.131861-04
28	4	10x0000.000	3570000.000	7.6448	243.3286	3132.0805	.840899-05
29	4	10x50x.000	3570000.000	7.5519	243.6402	3150.1895	.765224-05
30	4	11x00x0.000	3570000.000	7.6360	244.2097	3140.0312	.521653-05
31	4	11x50x.000	3570000.000	7.7519	244.5670	3136.0227	.242516-05
32	4	12x0000.000	3570000.000	7.9595	245.0670	3120.3044	.104483-06
33	4	12x50x0.000	3570000.000	8.0323	245.7706	3125.9193	-.521570-05
34	4	13x00x0.000	3570000.000	8.3011	247.1266	3090.4417	-.803048-05
35	4	13x50x0.000	3570000.000	8.4075	247.6226	3016.5919	-.161019-05
36	4	14x0000.000	3570000.000	8.9269	248.7418	3033.3802	-.585194-05
37	4	14x50x0.000	3570000.000	9.3912	249.9764	2947.1022	-.982052-05
38	4	15x0000.000	3570000.000	9.6657	248.0336	2877.3489	.357208-05
39	4	15x50x.000	3570000.000	9.4995	242.5663	2923.9818	.727621-05
40	4	16x0000.000	3570000.000	9.7775	237.4456	2874.4540	-.869052-06
41	4	16x50x0.000	3570000.000	10.1345	231.7555	2751.6451	-.874482-05
42	4	17x0000.000	3570000.000	10.3543	228.1509	2710.3424	-.105817-04
43	4	17x0000.000	3570000.000	10.3543	228.1309	2710.3424	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	7	1600000.000	3575000.000	8.8315	224.8717	2917.9299	.000000
2	7	1600000.000	3575000.000	8.8315	224.8717	2917.9299	.113026-04
3	7	2600000.000	3575000.000	8.5274	224.8297	2950.0573	.140481-04
4	7	3000000.000	3575000.000	8.0124	224.7490	3025.2989	.166976-04
5	7	3200000.000	3575000.000	7.4669	224.3406	3098.2922	.179750-04
6	7	3300000.000	3575000.000	7.0328	223.3637	3153.0619	.148586-04
7	7	3350000.000	3575000.000	6.6179	221.8845	3174.3890	.793322-05
8	7	3400000.000	3575000.000	6.6162	223.1129	3306.0009	.116224-04
9	7	3450000.000	3575000.000	6.7383	224.5993	3199.6614	.334887-04
10	7	3500000.000	3575000.000	6.5341	222.8393	3171.5656	.278940-04
11	7	3550000.000	3575000.000	7.7493	237.4642	3332.4193	.198018-04
12	7	3600000.000	3575000.000	7.8027	240.8250	2874.7438	.480887-04
13	7	3650000.000	3575000.000	5.8566	230.1104	3149.6356	.671082-04
14	7	3700000.000	3575000.000	5.6053	231.7276	3244.5797	.670966-04
15	7	3750000.000	3575000.000	5.3713	232.3167	3214.6683	.579508-04
16	7	3800000.000	3575000.000	5.9086	233.4658	3227.7084	.655107-04
17	7	3850000.000	3575000.000	5.9926	234.1150	3229.1538	.617405-04
18	7	3900000.000	3575000.000	6.0733	234.4182	3230.4210	.556085-04
19	7	3950000.000	3575000.000	6.1440	234.6490	3228.5334	.509953-04
20	7	4000000.000	3575000.000	6.2908	234.5212	3232.2811	.464454-04
21	7	4050000.000	3575000.000	6.3578	235.0072	3218.2271	.454287-04
22	7	4100000.000	3575000.000	6.3681	235.2936	3224.7308	.367076-04
23	7	4150000.000	3575000.000	6.4755	237.3191	3215.7402	.345189-04
24	7	4200000.000	3575000.000	7.0601	239.4563	3223.7206	.249251-04
25	7	4250000.000	3575000.000	7.4695	243.2746	3158.7590	.285086-04
26	7	4300000.000	3575000.000	7.3641	243.6182	3149.2967	.224498-04
27	7	4350000.000	3575000.000	7.2935	244.5461	3178.5240	.221208-04
28	7	4400000.000	3575000.000	7.5002	245.7960	3159.8025	.171177-04
29	7	4450000.000	3575000.000	7.6536	246.5074	3129.4131	.970469-05
30	7	4500000.000	3575000.000	7.7980	246.7721	3112.0125	.340807-05
31	7	4550000.000	3575000.000	7.8843	247.4366	3090.8736	.591851-05
32	7	4600000.000	3575000.000	8.0803	246.4615	3065.2731	.940689-06
33	7	4650000.000	3575000.000	8.4095	245.9968	3044.0759	.562816-05
34	7	4700000.000	3575000.000	9.5092	247.3089	2974.4647	-.238890-04
35	7	4750000.000	3575000.000	10.1738	247.5925	2861.0841	-.613161-05
36	7	4800000.000	3575000.000	9.7109	247.0543	2860.8517	.956735-05
37	7	4850000.000	3575000.000	9.7237	243.1013	2890.0200	.887670-05
38	7	4900000.000	3575000.000	10.3594	237.2092	2833.6382	-.753043-0
39	7	4950000.000	3575000.000	10.4695	230.7559	2704.6113	-.109942-04
40	7	5000000.000	3575000.000	10.5800	226.9222	2661.6293	-.153127-04
41	7	5050000.000	3575000.000	10.5800	226.9222	2661.6293	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

I INDEX	J INDEX	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	1	100000.000	3500000.000	8.4431	224.2005	2968.7427	.000000
2	2	150000.000	3500000.000	8.8431	224.2005	2908.7427	.124411-04
3	3	200000.000	3500000.000	8.5137	224.0079	2943.3083	.148424-04
4	3	250000.000	3500000.000	7.9277	223.9127	3027.9774	.153046-04
5	3	300000.000	3500000.000	7.3566	223.3501	3108.3573	.120585-04
6	3	350000.000	3500000.000	6.9669	221.9180	3155.1596	.272652-05
7	3	400000.000	3500000.000	6.7734	221.6508	3196.7939	.158959-04
8	3	450000.000	3500000.000	7.0535	219.8965	3200.5949	.978570-05
9	3	500000.000	3500000.000	6.7634	219.9347	3197.3967	-.221763-05
10	3	550000.000	3500000.000	6.5112	218.0687	3166.4165	-.574640-04
11	3	600000.000	3500000.000	7.8702	227.1976	3454.2321	-.887529-04
12	3	650000.000	3500000.000	7.2103	240.9384	2953.6226	.440962-04
13	3	700000.000	3500000.000	5.1792	228.7128	3145.0794	.906044-04
14	3	750000.000	3500000.000	5.2408	225.3334	3294.9679	.897567-04
15	3	800000.000	3500000.000	5.5706	231.9297	3202.4586	.884304-04
16	3	850000.000	3500000.000	5.4607	231.6396	3228.2027	.884788-04
17	3	900000.000	3500000.000	5.6482	232.8652	3232.5775	.896187-04
18	3	950000.000	3500000.000	5.7964	233.2722	3232.2149	.773345-04
19	3	1000000.000	3500000.000	5.8694	234.5100	3232.9649	.686314-04
20	4	50000.000	3500000.000	8.0498	233.9852	3226.1212	.593732-04
21	4	100000.000	3500000.000	6.0547	234.0745	3234.7362	.541023-04
22	4	150000.000	3500000.000	6.1987	234.6516	3250.1297	.488343-04
23	4	200000.000	3500000.000	6.3199	236.5344	3233.6644	.393960-04
24	4	250000.000	3500000.000	6.7071	240.1571	3236.0035	.297792-04
25	4	300000.000	3500000.000	7.1394	242.8957	3197.9034	.231031-04
26	4	350000.000	3500000.000	7.4645	244.6133	3179.2109	.278346-04
27	4	400000.000	3500000.000	7.1055	245.4305	3196.3629	.268351-04
28	4	450000.000	3500000.000	7.1993	245.9478	3180.4346	.232034-04
29	4	500000.000	3500000.000	7.4931	246.5132	3170.9293	.155367-04
30	4	550000.000	3500000.000	7.5722	246.7487	3136.4029	.126895-04
31	4	600000.000	3500000.000	7.6624	246.6673	3113.3035	.597646-05
32	4	650000.000	3500000.000	7.3445	245.1812	3076.7714	.185931-04
33	4	700000.000	3500000.000	8.0534	247.0021	3075.2495	.174479-05
34	4	750000.000	3500000.000	10.1009	248.1545	2892.0135	-.256282-05
35	4	800000.000	3500000.000	9.9335	248.0858	2896.8457	.810169-05
36	4	850000.000	3500000.000	9.9737	247.2016	2905.2404	.189592-04
37	4	900000.000	3500000.000	10.0950	246.8678	2898.0877	.964149-05
38	4	950000.000	3500000.000	10.3945	246.7770	2829.8044	-.484672-05
39	4	1000000.000	3500000.000	10.7948	246.0168	2658.4975	-.148002-04
40	4	1050000.000	3500000.000	10.9592	246.1702	2625.7036	-.162537-04
41	4	1100000.000	3500000.000	10.9592	246.1702	2625.7036	.000000

AD-A129 066 STUDY AND INVESTIGATION OF COMPUTER ALGORITHMS FOR THE SOLUTION OF THE SH..(U) CRAMER (H E) CO INC SALT LAKE CITY UT A G TINGLE ET AL. JUL 73 TR-73-302-01-APP 2/2

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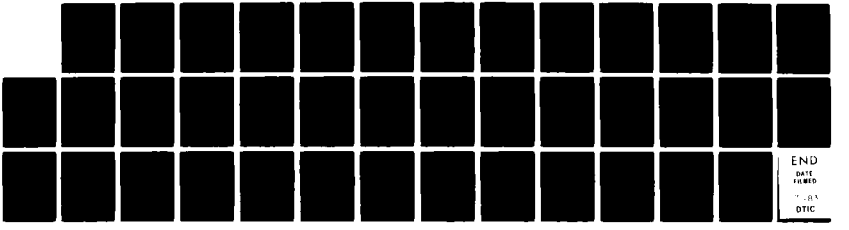

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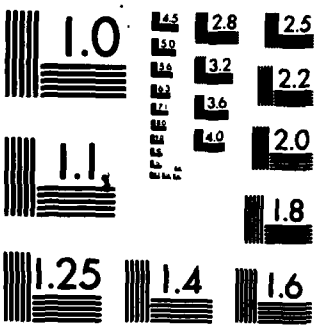


** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	1	1300[illegible].000	3585[illegible].000	6.8477	223.5225	2900.5620	.000000
2	1	1350000.000	3585000.000	6.8477	223.5225	2900.5620	.135286-04
3	1	2000[illegible].000	3585[illegible].000	6.5142	223.0404	2931.4376	.151655-04
4	1	3000000.000	3585000.000	7.8529	223.0307	3030.2775	.127282-04
5	1	3500000.000	3585000.000	7.2836	222.5246	3113.0088	.479255-05
6	1	4000000.000	3585000.000	6.9603	221.4782	3152.9750	-.714894-06
7	1	4500000.000	3585000.000	6.8000	220.4832	3196.1368	.605597-05
8	1	5000000.000	3585000.000	6.9805	220.0496	3196.6444	.134211-04
9	1	5500000.000	3585000.000	6.9824	219.7848	3174.5742	-.190253-04
10	1	6000000.000	3585000.000	7.4024	224.4421	3192.1053	-.885199-04
11	1	6500000.000	3585000.000	7.9540	226.9950	2952.4480	-.154050-03
12	1	7000000.000	3585000.000	5.5320	233.3387	3007.5067	-.770850-04
13	1	7500000.000	3585000.000	4.7829	228.2864	3176.7322	.213553-04
14	1	8000000.000	3585000.000	4.9440	225.4050	3242.4062	.537173-04
15	1	8500000.000	3585000.000	4.8305	229.2081	3215.8638	.760602-04
16	1	9000000.000	3585000.000	4.9957	229.9043	3234.7890	.926883-04
17	1	9500000.000	3585000.000	5.1741	231.1232	3240.5549	.107924-03
18	1	9900000.000	3585000.000	5.3401	231.1540	3227.4188	.991269-04
19	1	9950000.000	3585000.000	5.4355	230.4823	3267.7318	.900654-04
20	1	10000000.000	3585000.000	5.8529	233.0758	3229.3117	.705345-04
21	1	10500000.000	3585000.000	5.7862	232.9765	3245.2727	.664096-04
22	1	11000000.000	3585000.000	5.8219	233.4692	3253.8127	.579108-04
23	1	11500000.000	3585000.000	5.9601	234.9053	3234.1909	.488130-04
24	1	12000000.000	3585000.000	6.3598	240.7792	3263.1907	.389805-04
25	1	12500000.000	3585000.000	6.8620	243.2872	3182.4063	.226458-04
26	1	13000000.000	3585000.000	6.5683	245.7827	3187.7074	.308522-04
27	1	13500000.000	3585000.000	6.6157	247.4000	3196.1189	.303304-04
28	1	14000000.000	3585000.000	6.8758	248.7509	3187.2439	.294479-04
29	1	14500000.000	3585000.000	7.0703	250.2183	3178.0551	.217914-04
30	1	15000000.000	3585000.000	7.2091	251.2322	3155.0753	.133332-04
31	1	15500000.000	3585000.000	7.5214	252.5643	3094.0730	.200822-04
32	1	16000000.000	3585000.000	8.4478	256.1869	3117.7708	.150479-04
33	1	16500000.000	3585000.000	9.2657	260.8815	2940.8999	.368637-05
34	1	17000000.000	3585000.000	9.0213	260.3022	2886.5141	.188387-04
35	1	17500000.000	3585000.000	9.0877	260.7319	2907.3745	.206370-04
36	1	18000000.000	3585000.000	10.3574	262.4825	2850.1647	.227122-04
37	1	18500000.000	3585000.000	10.4971	261.1666	2847.2131	.112627-04
38	1	19000000.000	3585000.000	10.7757	259.6396	2792.6614	-.441490-05
39	1	19500000.000	3585000.000	11.0001	259.3532	2612.1879	-.158799-04
40	1	20000000.000	3585000.000	11.2313	259.5004	2590.5179	-.176246-04
41	1	20500000.000	3585000.000	11.2313	259.5004	2590.5179	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	10	100000.000	3590000.000	8.3469	222.8606	2893.6743	.000000
2	10	150000.000	3590000.000	8.3469	222.8606	2893.6743	.140935-04
3	10	200000.000	3590000.000	8.5381	221.9455	2910.4636	.146517-04
4	10	250000.000	3590000.000	7.8687	221.6426	3042.7995	.105430-04
5	10	300000.000	3590000.000	7.3471	221.0709	3127.3105	.159913-05
6	10	350000.000	3590000.000	7.0341	220.7044	3177.5793	-.902154-06
7	10	400000.000	3590000.000	7.0603	219.8082	3200.2530	.438950-05
8	10	450000.000	3590000.000	6.9827	220.1336	3192.9721	.894904-05
9	10	500000.000	3590000.000	6.8591	221.2581	3191.3888	.913499-05
10	10	550000.000	3590000.000	7.1711	223.7564	3179.9778	-.618061-04
11	10	600000.000	3590000.000	6.3271	237.5198	3177.9197	-.114513-03
12	10	650000.000	3590000.000	5.8693	235.4833	3136.3818	-.147624-03
13	10	700000.000	3590000.000	5.1013	223.9358	3185.5876	-.689100-04
14	10	750000.000	3590000.000	4.6510	226.2687	3227.2909	-.176787-04
15	10	800000.000	3590000.000	4.5706	227.5266	3235.4772	.269891-04
16	10	850000.000	3590000.000	4.6135	228.2390	3234.7945	.663211-04
17	10	900000.000	3590000.000	4.7220	228.9180	3243.0977	.933208-04
18	10	950000.000	3590000.000	4.8903	227.7537	3223.8115	.100589-03
19	10	1000000.000	3590000.000	5.1965	231.1844	3346.0849	.996176-04
20	10	1050000.000	3590000.000	5.6686	232.8050	3217.1274	.896315-04
21	10	1100000.000	3590000.000	5.3779	231.1221	3255.7454	.761261-04
22	10	1150000.000	3590000.000	5.4663	232.6821	3261.6660	.641660-04
23	10	1200000.000	3590000.000	5.4852	233.7729	3244.9880	.573398-04
24	10	1250000.000	3590000.000	6.0002	237.8710	3335.4864	.411356-04
25	10	1300000.000	3590000.000	6.2883	245.3776	3206.3260	.389794-04
26	10	1350000.000	3590000.000	6.9217	248.7244	3232.4995	.217355-04
27	10	1400000.000	3590000.000	6.2614	249.5011	3255.0885	.297519-04
28	10	1450000.000	3590000.000	6.6846	247.6173	3226.5170	.236771-04
29	10	1500000.000	3590000.000	6.8649	251.8935	3213.4120	.457292-04
30	10	1550000.000	3590000.000	7.0835	253.5612	3119.9646	.260310-04
31	10	1600000.000	3590000.000	7.3996	251.4825	3165.0848	.166564-04
32	10	1650000.000	3590000.000	9.7518	247.8058	3001.0306	.779384-05
33	10	1700000.000	3590000.000	10.6866	248.6261	2841.3779	.213661-04
34	10	1750000.000	3590000.000	9.6799	248.7998	2922.5004	.140778-04
35	10	1800000.000	3590000.000	10.3386	248.0364	2925.1765	.326975-04
36	10	1850000.000	3590000.000	10.8858	244.6841	2762.0156	.247630-04
37	10	1900000.000	3590000.000	10.9110	240.5972	2806.7899	.146862-04
38	10	1950000.000	3590000.000	11.0623	235.2664	2765.3088	-.296376-05
39	10	2000000.000	3590000.000	11.3840	228.8435	2571.2782	-.169675-04
40	10	2050000.000	3590000.000	11.5316	224.7802	2551.1939	-.190132-04
41	10	2100000.000	3590000.000	11.5316	224.7802	2551.1939	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	11	100000.000	3595000.000	8.8760	222.2633	2888.4480	.000000
2	11	150000.000	3595000.000	8.9380	222.2603	2888.4480	.142499-04
3	11	200000.000	3595000.000	8.5463	221.0645	2893.3056	.140246-04
4	11	300000.000	3595000.000	8.0431	219.5186	3055.7259	.108455-04
5	11	400000.000	3595000.000	7.6062	218.3864	3143.2050	.657019-05
6	11	450000.000	3595000.000	7.2965	218.5302	3212.2643	.524596-05
7	11	500000.000	3595000.000	7.1967	218.7425	3179.5739	.151038-05
8	11	550000.000	3595000.000	6.7019	218.6267	3208.5316	.343834-05
9	11	600000.000	3595000.000	6.5947	220.1247	3227.2509	.187890-04
10	11	650000.000	3595000.000	6.3730	219.4041	3201.3625	-.363822-06
11	11	700000.000	3595000.000	6.6682	229.9991	3474.5125	-.746700-04
12	11	750000.000	3595000.000	7.0724	230.0573	3127.1510	-.119085-03
13	11	800000.000	3595000.000	5.6062	227.7344	3146.0074	-.105311-03
14	11	850000.000	3595000.000	4.9025	224.4412	3221.3878	-.673489-04
15	11	900000.000	3595000.000	4.5538	225.5250	3237.7964	-.261999-04
16	11	950000.000	3595000.000	4.3847	226.3949	3238.8329	.205429-04
17	11	1000000.000	3595000.000	4.4329	227.1404	3246.3331	.542639-04
18	11	1050000.000	3595000.000	4.4969	227.2909	3223.0874	.818044-04
19	11	1100000.000	3595000.000	4.9821	226.7282	3294.3545	.877564-04
20	11	1150000.000	3595000.000	5.0063	231.2715	3229.9060	.989938-04
21	11	1200000.000	3595000.000	4.9116	229.7172	3261.8084	.871726-04
22	11	1250000.000	3595000.000	5.0137	231.1364	3279.0898	.709679-04
23	11	1300000.000	3595000.000	5.1494	234.4973	3265.7933	.697588-04
24	11	1350000.000	3595000.000	5.4236	236.3978	3246.0164	.580409-04
25	11	1400000.000	3595000.000	5.3921	245.9788	3262.6577	.517401-04
26	11	1450000.000	3595000.000	5.7727	249.0874	3225.1123	.256338-04
27	11	1500000.000	3595000.000	6.3376	250.5555	3253.9728	.159541-04
28	11	1550000.000	3595000.000	6.4555	251.1840	3064.9453	.215120-04
29	11	1600000.000	3595000.000	6.0942	248.3594	3215.2134	.223200-04
30	11	1650000.000	3595000.000	7.4026	251.6418	3241.2372	.431941-04
31	11	1700000.000	3595000.000	9.2145	250.5464	3019.1270	.222318-04
32	11	1750000.000	3595000.000	10.0901	247.8698	2851.2150	.318397-05
33	11	1800000.000	3595000.000	9.9351	248.0742	2854.1995	.153927-04
34	11	1850000.000	3595000.000	9.9141	248.0632	2921.5677	.114306-04
35	11	1900000.000	3595000.000	10.7861	245.5907	2914.2671	.147198-04
36	11	1950000.000	3595000.000	11.1742	245.1111	2705.7097	.312384-04
37	11	2000000.000	3595000.000	10.9609	241.1272	2794.1579	.254319-04
38	11	2050000.000	3595000.000	11.2996	239.2926	2750.0330	.339923-05
39	11	2100000.000	3595000.000	11.7143	228.2623	2527.4547	-.156544-04
40	11	2150000.000	3595000.000	11.5843	223.9231	2504.5806	-.197021-04
41	11	2200000.000	3595000.000	11.5843	223.9231	2504.5806	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	12	100000.000	3600000.000	8.8274	221.6738	2882.9248	.000000
2	12	150000.000	3600000.000	8.8274	221.6738	2882.9248	.143982-04
3	12	200000.000	3600000.000	8.5110	220.6003	2893.0649	.145576-04
4	12	300000.000	3600000.000	8.0923	218.5231	3015.5426	.139199-04
5	12	320000.000	3600000.000	7.6172	217.1089	3091.0474	.130576-04
6	12	330000.000	3600000.000	7.1828	216.3215	3163.9418	.345166-05
7	12	335000.000	3600000.000	6.7140	216.9517	3194.2566	-.461531-05
8	12	340000.000	3600000.000	6.4916	217.2320	3228.1849	.838822-06
9	12	345000.000	3600000.000	6.4349	218.6769	3245.6982	.160604-04
10	12	350000.000	3600000.000	6.5639	220.2959	3168.0933	.367216-04
11	12	355000.000	3600000.000	7.2395	224.6838	3218.3701	-.349993-04
12	12	360000.000	3600000.000	7.0000	231.9344	3118.6109	-.100671-03
13	12	365000.000	3600000.000	5.9971	227.9123	3108.7383	-.956832-04
14	12	370000.000	3600000.000	5.2032	221.6150	3188.7484	-.950000-04
15	12	375000.000	3600000.000	4.6114	223.2064	3239.1486	-.635534-04
16	12	380000.000	3600000.000	4.3364	224.8710	3240.0445	-.242072-04
17	12	385000.000	3600000.000	4.2545	225.6666	3247.9610	.142260-04
18	12	390000.000	3600000.000	4.2687	227.2630	3241.3203	.501125-04
19	12	395000.000	3600000.000	4.4639	226.6383	3247.2307	.714481-04
20	12	400000.000	3600000.000	4.3820	228.5851	3253.5641	.869606-04
21	12	405000.000	3600000.000	4.4613	228.2321	3281.4547	.868781-04
22	12	410000.000	3600000.000	4.5728	229.0241	3291.6798	.773649-04
23	12	415000.000	3600000.000	4.5816	231.4451	3300.3574	.708313-04
24	12	420000.000	3600000.000	4.5227	235.1250	3309.1996	.809188-04
25	12	425000.000	3600000.000	4.4768	240.3977	3357.9653	.650447-04
26	12	430000.000	3600000.000	5.4941	250.8486	3318.5531	.505406-04
27	12	435000.000	3600000.000	6.1554	248.9536	3259.1216	.909777-06
28	12	440000.000	3600000.000	6.3541	253.7385	3262.5338	.163109-04
29	12	445000.000	3600000.000	7.0105	249.1450	3169.1520	.294229-06
30	12	450000.000	3600000.000	7.8610	246.1017	3118.5269	.667017-05
31	12	455000.000	3600000.000	9.3526	249.1087	3069.5483	.337469-04
32	12	460000.000	3600000.000	10.7200	248.1747	2863.8696	.164346-04
33	12	465000.000	3600000.000	10.4597	245.3615	2820.4304	.177205-04
34	12	470000.000	3600000.000	10.3204	245.1898	2863.6818	.112995-04
35	12	475000.000	3600000.000	10.3529	244.6644	2802.0855	.783399-05
36	12	480000.000	3600000.000	10.9659	248.8758	2670.9350	.454175-04
37	12	485000.000	3600000.000	11.0004	242.3116	2736.4253	.380524-04
38	12	490000.000	3600000.000	11.5583	235.0586	2690.4943	.101515-04
39	12	495000.000	3600000.000	12.1717	227.0213	2452.9033	-.117785-04
40	12	500000.000	3600000.000	12.3043	222.8464	2448.3318	-.188335-04
41	12	505000.000	3600000.000	12.3043	222.8464	2448.3318	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	13	1x0000.000	3605000.000	8.9249	221.0147	2875.2413	.000000
2	13	1x0000.000	3605000.000	8.9249	221.0147	2875.2413	.148222-04
3	13	2x0000.000	3605000.000	8.4562	220.0875	2898.4539	.153660-04
4	13	3x0000.000	3605000.000	7.9847	218.5548	3034.3564	.155275-04
5	13	3200x0.000	3605000.000	7.2919	217.2975	3129.8821	.135363-04
6	13	3300x0.000	3605000.000	6.8153	216.3328	3200.3529	.327533-05
7	13	3350x0.000	3605000.000	6.5396	216.3398	3228.0957	-.591534-05
8	13	3400x0.000	3605000.000	6.4066	216.7519	3236.9874	-.154540-05
9	13	3450x0.000	3605000.000	6.3796	217.6261	3245.9593	.610811-05
10	13	3500x0.000	3605000.000	6.2835	217.0303	3191.0605	-.427443-06
11	13	3550x0.000	3605000.000	6.7948	224.5604	3392.5936	-.334764-05
12	13	3600x0.000	3605000.000	7.5625	229.6329	3210.3935	-.356175-04
13	13	3650x0.000	3605000.000	6.6235	224.9529	3211.9758	-.732899-04
14	13	3700x0.000	3605000.000	5.5349	222.2871	3177.2498	-.827911-04
15	13	3750x0.000	3605000.000	4.6951	220.8269	3242.0426	-.808072-04
16	13	3x0000.000	3605000.000	4.4008	223.4736	3246.7262	-.521851-04
17	13	3850x0.000	3605000.000	4.1772	224.5574	3251.4457	-.155553-04
18	13	3900x0.000	3605000.000	4.0677	225.4279	3258.9152	.211858-04
19	13	3950x0.000	3605000.000	4.0585	225.9084	3266.5242	.504103-04
20	13	4000x0.000	3605000.000	4.0985	226.0653	3281.9366	.696950-04
21	13	4050x0.000	3605000.000	4.1731	225.5271	3292.1973	.786852-04
22	13	4100x0.000	3605000.000	4.1893	226.0096	3300.1956	.790516-04
23	13	4150x0.000	3605000.000	4.1582	227.6118	3309.7998	.784654-04
24	13	4200x0.000	3605000.000	4.1918	231.0859	3299.9954	.839979-04
25	13	4250x0.000	3605000.000	4.2276	235.6677	3251.7377	.737401-04
26	13	4300x0.000	3605000.000	5.0769	240.1087	3373.1664	.458847-04
27	13	4350x0.000	3605000.000	6.3273	249.9517	3194.4240	.221258-04
28	13	4400x0.000	3605000.000	6.6647	249.2555	3229.1228	.716023-05
29	13	4450x0.000	3605000.000	7.5102	249.8851	3139.3812	.261901-05
30	13	4500x0.000	3605000.000	8.4031	248.1366	3017.8291	.116845-04
31	13	4550x0.000	3605000.000	9.3775	246.5616	2945.8521	.259217-04
32	13	4600x0.000	3605000.000	11.1733	245.9647	2735.1176	.241629-04
33	13	4650x0.000	3605000.000	10.5390	245.2534	2704.9079	.282631-04
34	13	4700x0.000	3605000.000	10.3941	241.9396	2811.8046	-.887522-05
35	13	4750x0.000	3605000.000	10.6620	241.7863	2869.3190	-.941432-06
36	13	4800x0.000	3605000.000	11.1606	243.1704	2852.9225	.414405-04
37	13	4850x0.000	3605000.000	11.7037	238.5769	2807.4930	.379240-04
38	13	4900x0.000	3605000.000	12.3726	231.7064	2699.5860	.134475-04
39	13	4950x0.000	3605000.000	12.8078	225.0151	2342.9382	-.679363-05
40	13	5000x0.000	3605000.000	12.7902	221.6903	2388.4892	-.166050-04
41	13	5050x0.000	3605000.000	12.7902	221.6903	2388.4892	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	14	1000.000	3610000.000	8.8330	220.2678	2865.7363	.000000
2	14	1500.000	3610000.000	8.8330	220.2678	2865.7363	.153676-04
3	14	2000.000	3610000.000	8.4340	219.3181	2895.9941	.163932-04
4	14	3000.000	3610000.000	7.7892	217.7795	3041.0376	.168640-04
5	14	3500.000	3610000.000	7.1526	216.3067	3145.8813	.132643-04
6	14	4000.000	3610000.000	6.7082	215.2515	3212.3957	.223729-05
7	14	4500.000	3610000.000	6.4851	215.1988	3234.0855	-.822830-05
8	14	5000.000	3610000.000	6.3416	216.0078	3242.8461	-.241652-05
9	14	5500.000	3610000.000	6.3200	217.4536	3248.9793	.141485-04
10	14	6000.000	3610000.000	6.4376	218.6480	3159.3247	.331852-04
11	14	6500.000	3610000.000	7.0892	225.1507	3217.8434	.239356-04
12	14	7000.000	3610000.000	8.1102	224.7867	3065.4691	-.236454-04
13	14	7500.000	3610000.000	8.7184	223.6813	3050.0592	-.642509-04
14	14	8000.000	3610000.000	5.1253	217.9060	3194.0817	-.809028-04
15	14	8500.000	3610000.000	4.8048	219.6232	3245.9700	-.786237-04
16	14	9000.000	3610000.000	4.4994	221.9021	3244.1413	-.642080-04
17	14	9500.000	3610000.000	4.1948	223.0488	3253.2154	-.355785-04
18	14	10000.000	3610000.000	4.0276	223.4693	3264.1880	-.126706-05
19	14	10500.000	3610000.000	3.9675	223.3476	3273.8168	.300941-04
20	14	11000.000	3610000.000	3.9614	222.7497	3282.6512	.539137-04
21	14	11500.000	3610000.000	3.9367	221.5703	3288.7205	.690458-04
22	14	12000.000	3610000.000	3.8719	221.0254	3312.0424	.785920-04
23	14	12500.000	3610000.000	3.8051	221.5069	3323.0293	.733591-04
24	14	13000.000	3610000.000	3.5722	223.3362	3311.7472	.507132-04
25	14	13500.000	3610000.000	3.6004	234.3567	3365.4278	.480411-04
26	14	14000.000	3610000.000	5.1269	241.8255	3377.8567	.376646-04
27	14	14500.000	3610000.000	6.1186	252.3320	3219.6213	.448996-04
28	14	15000.000	3610000.000	6.6971	254.1977	3159.8326	.417037-04
29	14	15500.000	3610000.000	7.7591	250.0533	3104.0901	.285103-04
30	14	16000.000	3610000.000	9.2918	246.7421	3031.1444	.189135-04
31	14	16500.000	3610000.000	10.9000	245.2670	2856.2975	.118968-04
32	14	17000.000	3610000.000	11.2569	244.4661	2688.3154	.251469-04
33	14	17500.000	3610000.000	10.8758	241.5075	2893.3159	.822387-05
34	14	18000.000	3610000.000	11.4331	240.2314	2776.8701	.190341-04
35	14	18500.000	3610000.000	11.9358	237.5311	2695.7834	.154167-04
36	14	19000.000	3610000.000	12.5050	235.0939	2582.7072	.433437-04
37	14	19500.000	3610000.000	13.0494	231.6527	2517.7067	.255143-04
38	14	20000.000	3610000.000	13.5133	228.6872	2469.9437	.550673-05
39	14	20500.000	3610000.000	13.3668	223.0693	2249.3380	-.635733-05
40	14	21000.000	3610000.000	13.1030	220.8037	2339.2195	-.138511-04
41	14	21500.000	3610000.000	13.1030	220.8037	2339.2195	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	15	1e0000.000	3615000.000	8.9482	219.4672	2855.5150	.000000
2	15	160000.000	3615000.000	8.8482	219.4672	2855.5150	.158946-04
3	15	2e0000.000	3615000.000	8.4245	218.4113	2889.3083	.171681-04
4	15	3e0000.000	3615000.000	7.7375	216.6509	3048.4140	.173573-04
5	15	3e0000.000	3615000.000	7.0878	214.8851	3161.1378	.132457-04
6	15	3e0000.000	3615000.000	6.6677	213.7637	3227.0963	.330988-05
7	15	3e5000.000	3615000.000	6.4602	213.9668	3239.6231	-.629385-05
8	15	3e0000.000	3615000.000	6.2932	214.6193	3245.8908	-.309167-05
9	15	3e5000.000	3615000.000	6.2320	215.7045	3260.4299	.176640-04
10	15	3e0000.000	3615000.000	6.1496	213.9550	3160.2948	.304600-04
11	15	3e5000.000	3615000.000	6.9943	226.9005	3442.2557	.544748-04
12	15	3e0000.000	3615000.000	8.2957	227.2772	2890.7097	-.728610-05
13	15	3e5000.000	3615000.000	5.7376	218.9908	3116.7492	-.511351-04
14	15	370000.000	3615000.000	5.1323	217.7313	3254.7400	-.658474-04
15	15	3750e0.000	3615000.000	4.9760	219.4340	3254.6342	-.702714-04
16	15	3e0000.000	3615000.000	4.6081	221.1371	3245.1006	-.634493-04
17	15	3e5000.000	3615000.000	4.2954	221.7594	3253.3698	-.416022-04
18	15	3e0000.000	3615000.000	4.1105	221.6734	3260.6682	-.120797-04
19	15	395000.000	3615000.000	3.9314	221.4009	3271.2403	.168800-04
20	15	4e0000.000	3615000.000	3.8931	219.3157	3278.6120	.403426-04
21	15	4e5000.000	3615000.000	3.8024	217.2119	3293.9802	.605853-04
22	15	410000.000	3615000.000	3.7097	215.0596	3319.4665	.698325-04
23	15	415000.000	3615000.000	3.6609	213.3909	3286.4636	.588872-04
24	15	420000.000	3615000.000	3.0440	221.1475	3287.4911	.199233-04
25	15	425000.000	3615000.000	3.6421	231.0210	3344.8459	-.108365-04
26	15	430000.000	3615000.000	4.5928	241.1688	3262.9456	.262360-04
27	15	435000.000	3615000.000	5.2137	250.0192	3274.3219	.563613-04
28	15	440000.000	3615000.000	6.9430	252.0804	3297.7318	.663934-04
29	15	445000.000	3615000.000	9.2961	247.5507	3021.1167	.465790-04
30	15	450000.000	3615000.000	10.6550	243.3500	2822.6364	.197860-04
31	15	455000.000	3615000.000	11.5857	242.2080	2720.9205	-.145956-05
32	15	460000.000	3615000.000	11.9535	242.2436	2652.0179	.313793-04
33	15	465000.000	3615000.000	12.2049	237.0874	2604.4930	.340806-05
34	15	470000.000	3615000.000	12.1746	236.9299	2618.0129	.198352-04
35	15	475000.000	3615000.000	12.7277	235.0884	2519.6696	.272456-05
36	15	480000.000	3615000.000	13.1622	234.0624	2515.8681	.271826-04
37	15	485000.000	3615000.000	13.6987	230.0307	2453.0059	.211498-04
38	15	490000.000	3615000.000	13.9855	225.3871	2403.7852	.402527-05
39	15	495000.000	3615000.000	13.6623	222.1956	2203.1852	-.560356-05
40	15	500000.000	3615000.000	13.5043	220.4319	2310.0185	-.113935-04
41	15	710000.000	3615000.000	13.5043	220.4319	2310.0185	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	1e	1e0000.000	36e0000.000	8.8682	21e.6276	2844.7975	.000000
2	1e	1e0000.000	36e0000.000	8.8682	218.6276	2844.7975	.164008-04
3	1e	2e0000.000	3620000.000	8.4168	217.4603	2882.4034	.179422-04
4	1e	3e0000.000	3620000.000	7.6878	215.5250	3041.4296	.175785-04
5	16	3e0000.000	3620000.000	7.0246	213.5389	3154.6446	.124257-04
6	1e	338000.000	3620000.000	6.6282	212.2248	3215.4731	.205155-05
7	1e	335000.000	36e0000.000	6.4336	212.2904	3233.8336	-.604343-05
8	16	3e0000.000	3620000.000	6.3344	213.1288	3249.1198	-.636961-05
9	16	3450e0.000	36e0000.000	6.3858	214.1924	3253.3985	-.160850-04
10	16	350000.000	3620000.000	6.1849	211.9250	3125.6031	-.258328-05
11	1e	355000.000	3620000.000	7.8093	219.8931	3437.5041	.107453-05
12	1e	3e0000.000	3620000.000	7.5153	22e.7224	2914.4924	.242522-04
13	16	3e5000.000	3620000.000	5.5242	21e.9054	3180.9863	-.124135-04
14	16	370000.000	36e0000.000	5.3009	217.0110	3261.5825	-.333321-04
15	16	375000.000	3620000.000	5.0866	218.6716	3235.9291	-.500474-04
16	1e	380000.000	36e0000.000	4.7090	219.5799	3246.6989	-.496800-04
17	1e	3e5000.000	3620000.000	4.4462	220.3126	3255.1843	-.331465-04
18	16	390000.000	3620000.000	4.1947	218.9404	3260.5274	-.107359-04
19	16	395000.000	3620000.000	4.0531	218.0160	3297.9158	.130063-04
20	16	4e0000.000	36e0000.000	3.9648	216.6166	3279.4136	.405224-04
21	1e	405000.000	3620000.000	3.8159	212.1788	3299.4791	.657115-04
22	1e	410000.000	36e0000.000	3.8613	208.9931	3285.7046	.644044-04
23	16	415000.000	3620000.000	3.8489	202.9417	3210.9254	.356429-04
24	16	420000.000	3620000.000	3.1173	208.4834	3419.8619	-.824764-05
25	16	425000.000	3620000.000	3.7129	232.7649	3355.6018	-.235520-04
26	16	430000.000	3620000.000	4.3301	239.8462	3315.8095	-.183213-04
27	1e	435000.000	36e0000.000	5.7773	243.8490	3304.7007	.407662-04
28	1e	440000.000	3620000.000	8.4711	242.9518	3107.6776	.471727-04
29	1e	445000.000	36e0000.000	10.5369	244.0038	2796.4747	.609803-04
30	16	450000.000	36e0000.000	11.4900	241.5392	2721.8178	.117787-04
31	1e	455000.000	36e0000.000	12.3501	240.0731	2644.8709	.610984-05
32	1e	460000.000	36e0000.000	12.7609	239.3045	2589.4755	.156313-04
33	1e	465000.000	36e0000.000	12.6572	238.8806	2527.4e58	.845901-05
34	1e	470000.000	36e0000.000	12.5499	238.5182	2640.6579	.100726-04
35	1e	475000.000	36e0000.000	13.3905	238.2209	2506.9677	.379418-04
36	1e	480000.000	36e0000.000	14.0940	233.0448	2375.8665	.348198-04
37	1e	485000.000	36e0000.000	14.2679	229.6890	2352.5346	.201234-04
38	1e	490000.000	36e0000.000	14.2292	224.7220	2338.0473	.124933-05
39	1e	495000.000	36e0000.000	13.7209	222.1341	2169.0634	-.668000-05
40	1e	500000.000	36e0000.000	13.3537	220.5222	2299.0638	-.984389-05
41	1e	505000.000	36e0000.000	13.3537	220.5222	2299.0638	.000000

** OUTPUT TAPE INFORMATION **

NUMBER OF TIMES OUTPUT OF THE U AND V WIND COMPONENTS AND LAYER HEIGHT ARE DESIRED - 2
NUMBER OF TIMES OUTPUT OF THE U AND V WIND COMPONENTS AND LAYER HEIGHT WAS COMPLETED - 2
TIME STEP NUMBER AND TIME (MINUTES) OF EACH OUTPUT
(79,180.3411), (131,300.2996), (
SIZE OF I DIMENSION OF UL,VL,PL AND HG - 41
SIZE OF J DIMENSION OF UL,VL,PL AND HG - 41
NUMBER OF COORDINATES IN X AXIS (IN IDIM) - 41
NUMBER OF COORDINATES IN Y AXIS (IN JDIM) - 41
INDEX OF THE BEGINNING COORDINATE ON THE X AXIS OF UNIFORM GRID SPACING - 6
INDEX OF THE ENDING COORDINATE ON THE X AXIS OF UNIFORM GRID SPACING - 36
INDEX OF THE BEGINNING COORDINATE ON THE Y AXIS OF UNIFORM GRID SPACING - 6
INDEX OF THE ENDING COORDINATE ON THE Y AXIS OF UNIFORM GRID SPACING - 36

TERRAIN HEIGHTS WERE WRITTEN TO TAPE

TAPE OUTPUT WAS WRITTEN TO UNIT 1

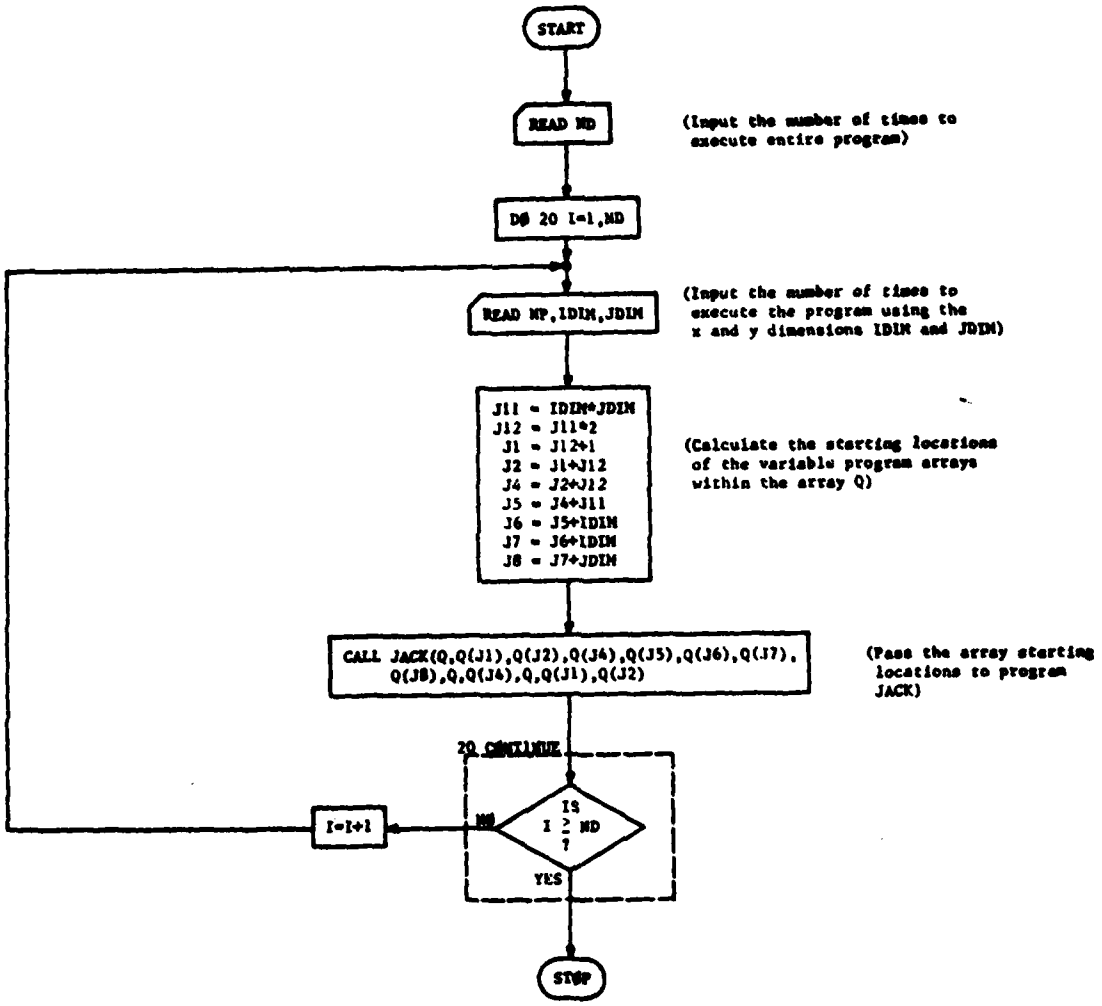
APPENDIX D

COMPUTER PROGRAM FLOW DIAGRAM

Appendix D contains detailed flow diagrams of the ASL/WSMR Wind Field Terrain Adjustment Program.

D.1 PROGRAM MODEL

This program reads the object time dimension limits and calculates the relative addresses of the program arrays that depend on grid size and passes the addresses to the main calculation routine JACK.



D.2 SUBROUTINE JACK(UL,VL,PL,NO,DELXI,DEPI,DELYJ,DYPJ,CONTP,NOQ,ULQ,VLQ,PLQ)

This is the main calculation routine. Subroutine JACK inputs the majority of the program control and model parameters. The program inputs the terrain via subroutine MOUTER, calculates and sets initial conditions and then enters the time loop that calculates the vector components of the wind speed and the surface layer heights. At the end of each time loop, the program checks to determine if printing or tape output of the wind field is desired for the present time step. When the time loop has been completed, the program loops to the next problem in sequence if present.

PROGRAM VARIABLES

DELXI - Array containing the inverse of [X(I+1) - X(I-1)] to minimize divisions in the time loop.

DELYJ - Array containing the inverse of [Y(J+1) - Y(J-1)] to minimize divisions in the time loop.

DXPI - Array containing the inverse of [X(I+1) - X(I)] to minimize divisions in the time loop.

DYPJ - Array containing the inverse of [Y(J+1) - Y(J)] to minimize divisions in the time loop.

DT - Time increment for the time loop.

TIM - Total time in seconds of the time loop.

HG=HGQ - Array containing the terrain heights.

JL - Number of grid points in the y-axis.

LL - Number of grid points in the x-axis.

LLM - LL-1

JLM - JL-1

UL(I,J,K) = ULQ(I+(J-1)*IDIM+(K-1)*IDIM*JDIM) - The u component of the wind speed times the layer depth where K = 2 is the present time step and K = 1 is the past time step.

VL(I,J,K) = VLQ(I+(J-1)*IDIM*(K-1)*IDIM*JDIM) - The v component of the wind speed times the layer depth.

PL(I,J,K) = PLQ(I+(J-1)*IDIM+(K-1)*IDIM*JDIM) - The surface layer depth.

ULT - The initial u component of the wind speed or the mean wind speed depending on ISKIP(4).

VLT - The initial v component of the wind speed or the direction depending on ISKIP(4).

PLT - The initial height of the surface layer.

X - Array containing the x-axis of the reference coordinate system.

Y - Array containing the y-axis of the reference coordinate system.

PRINT - Array containing the time in minutes at which the wind field and layer heights are to be output within the time loop. Values are in ascending order and the maximum is used as the stop value.

IST - Index of the first point in the x array at which uniform grid spacing occurs along the x-axis. This value and IND, JST, and JND below are output to tape for use in plotting the area of uniform grid spacing.

JST - Index of the first point in the y array at which uniform grid spacing occurs along the y axis.

IND,JND - The ending indices in the x and y arrays at which uniform grid spacing stops.

NCNT - Number of iterative time steps between the recalculation of the time step increment DT.

DTLMDA - Stability factor for calculating the time step DT and maintain DT at a critical value. This value should be as close to 1 as possible and still maintain program stability. Values of 0.90 to 0.95 generally maintain stability.

ISMØTH - Number of time steps between the applications of a nine point smoothing function.

G1 - Reduced gravity factor equal to g(1-S) where g is the acceleration of gravity (9.8 m/s^2) and S is the ratio of the potential temperature at the top of the layer over the potential temperature at the bottom of the layer.

ISKIP - Program control options. Refer to the user instructions or the program listing for details.

IUNIT - The Fortran logical tape unit for program tape output. If more than one reel is written, a 1 is added to IUNIT and a reel is assumed mounted on the next unit. A second reel will be required only if many time steps or many problems are being output. Refer to the user instructions or the program listing for the tape format.

ABLK - The minimum allowable layer depth.

XPS - Array containing the x axis of the standard WSMR grid in UTM (kilometers) coordinates.

YPS - Array containing the y axis of the standard WSMR grid in UTM (kilometers) coordinates..

SS - Constant used in the nine point smoothing function.

IRECG - Number of groups of UL, VL and PL output to tape in any one problem run.

MØUT - Array containing record one of each file output to tape.

STØP - Time of the last time step to process.

ITAG1 - Flag used to check if problem has tape output.

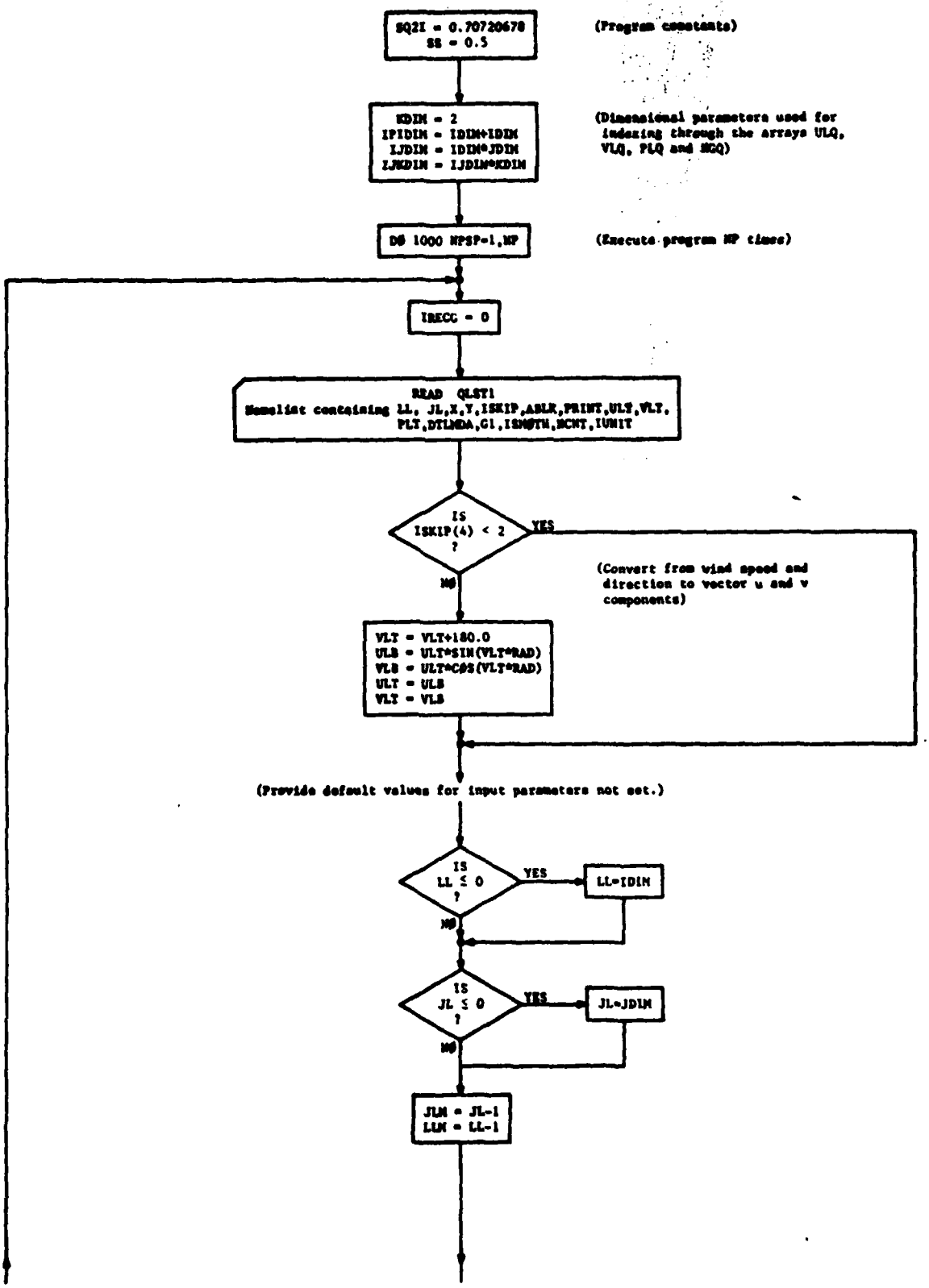
JPR - Counter for the PRINT array.

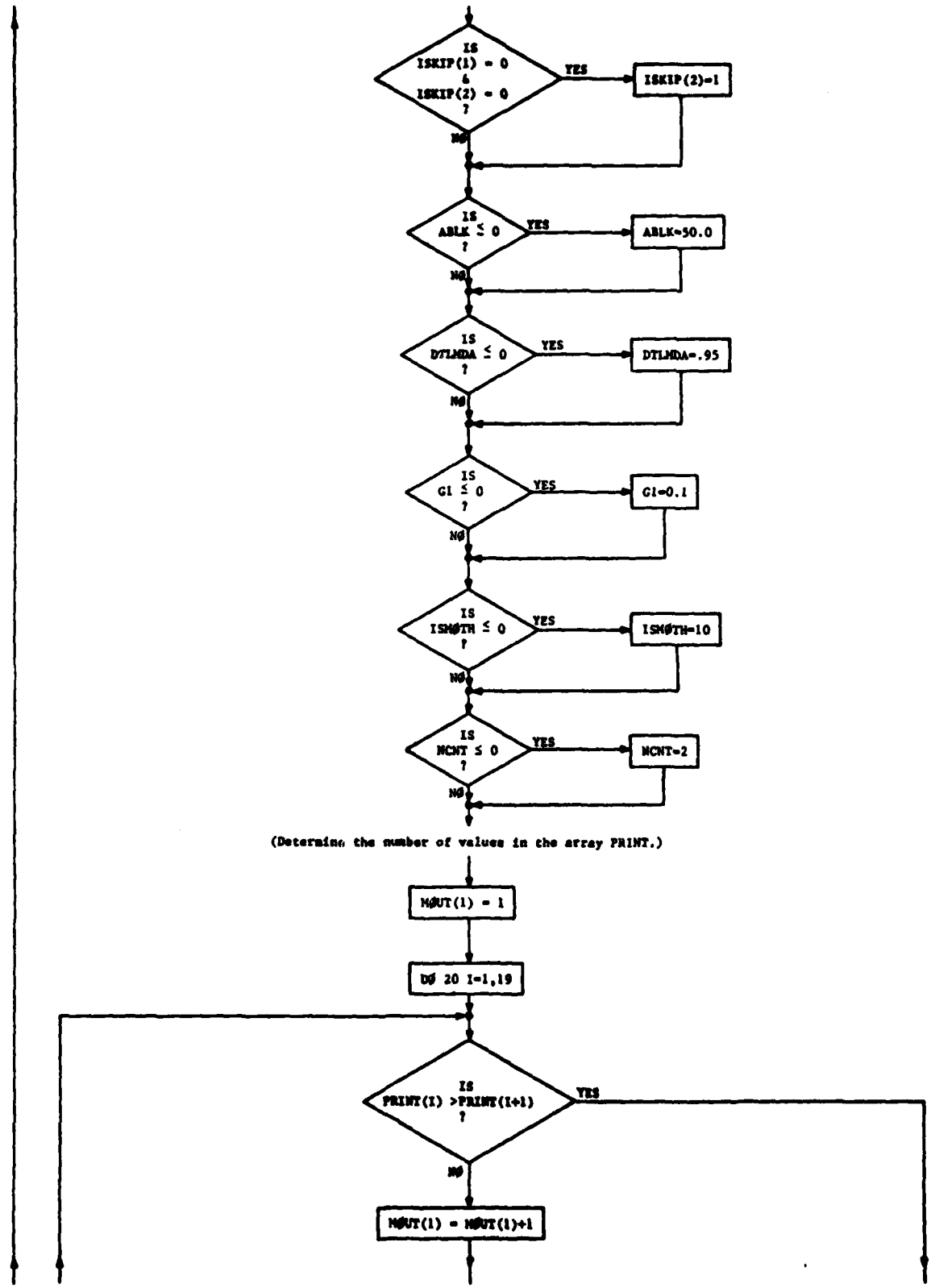
IFLAG - Program stability flag where if set to greater than zero the problem is stopped and the program goes to the next case.

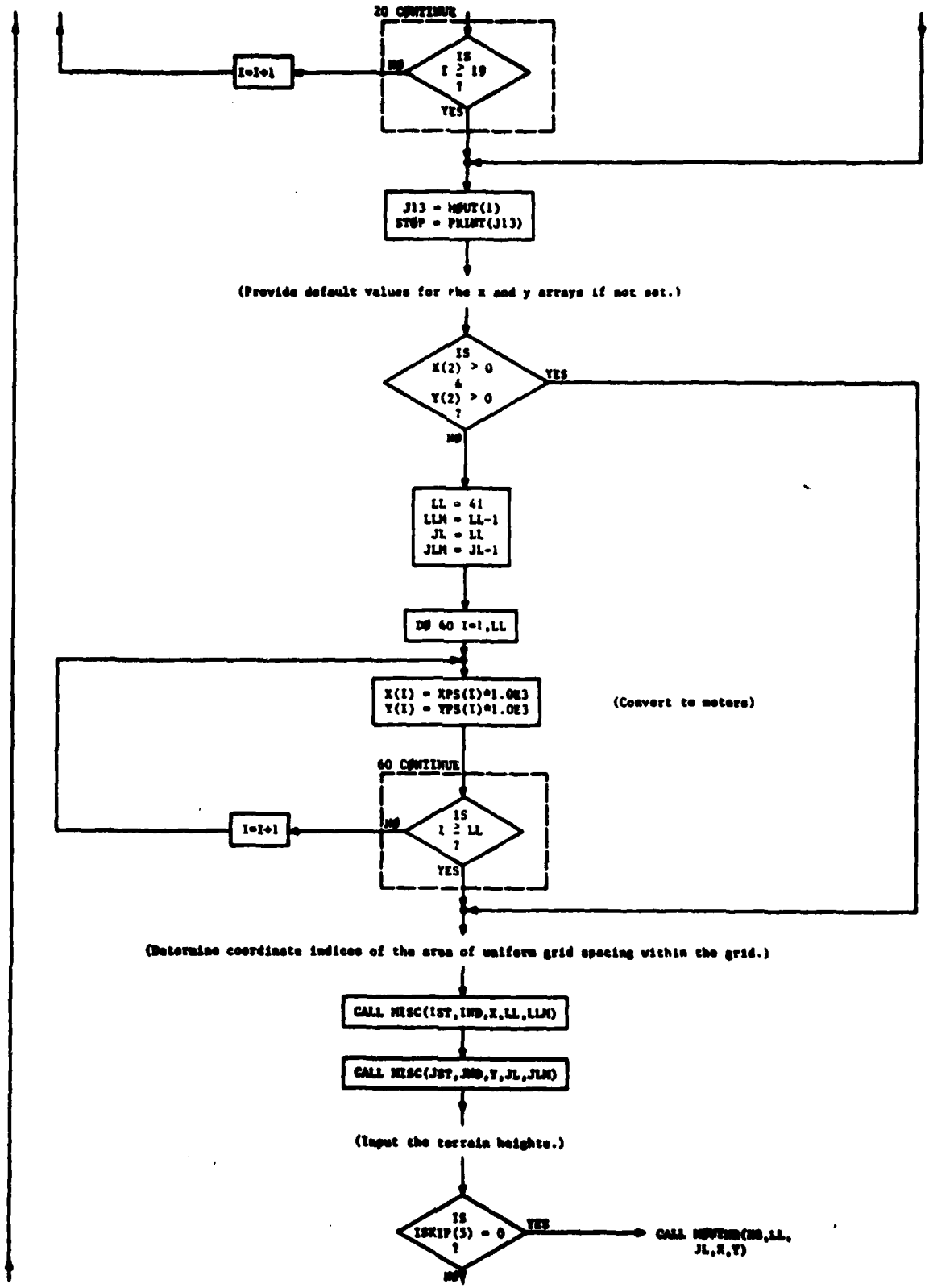
ISAVE - Time step number at which tape output occurs.

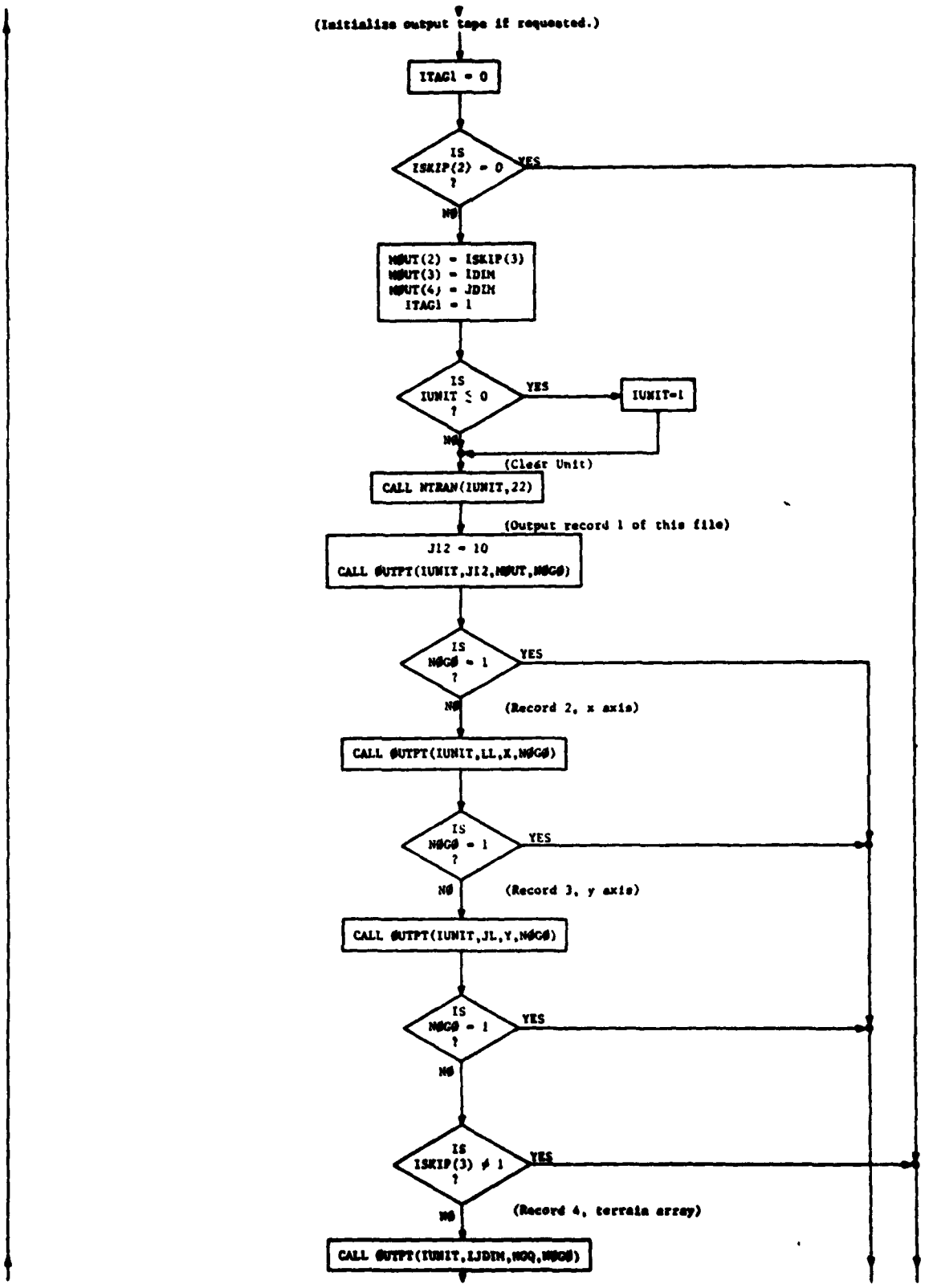
TSAVE - Time at which tape output occurs.

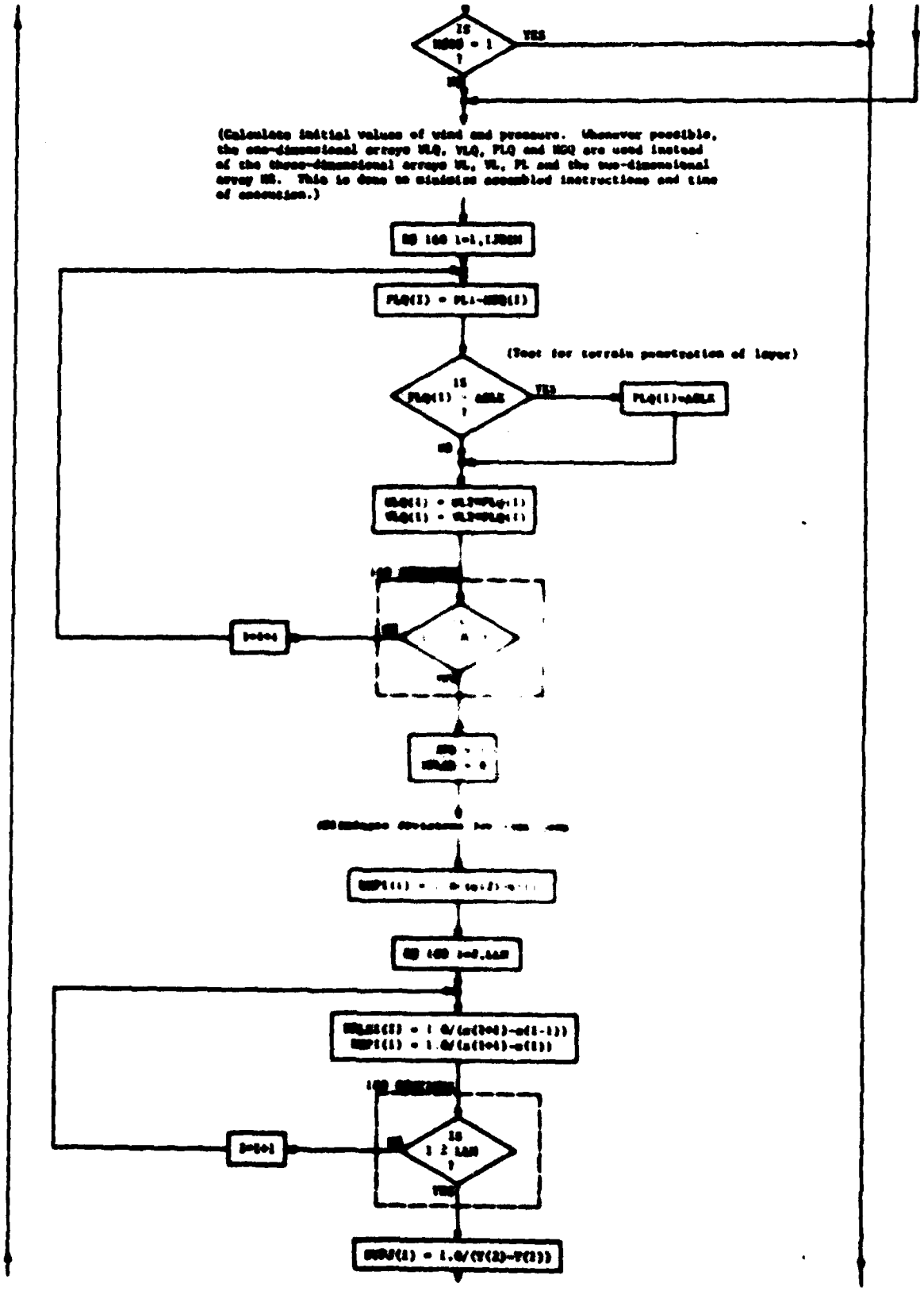
Other program variables are used for temporary storage and indexing.

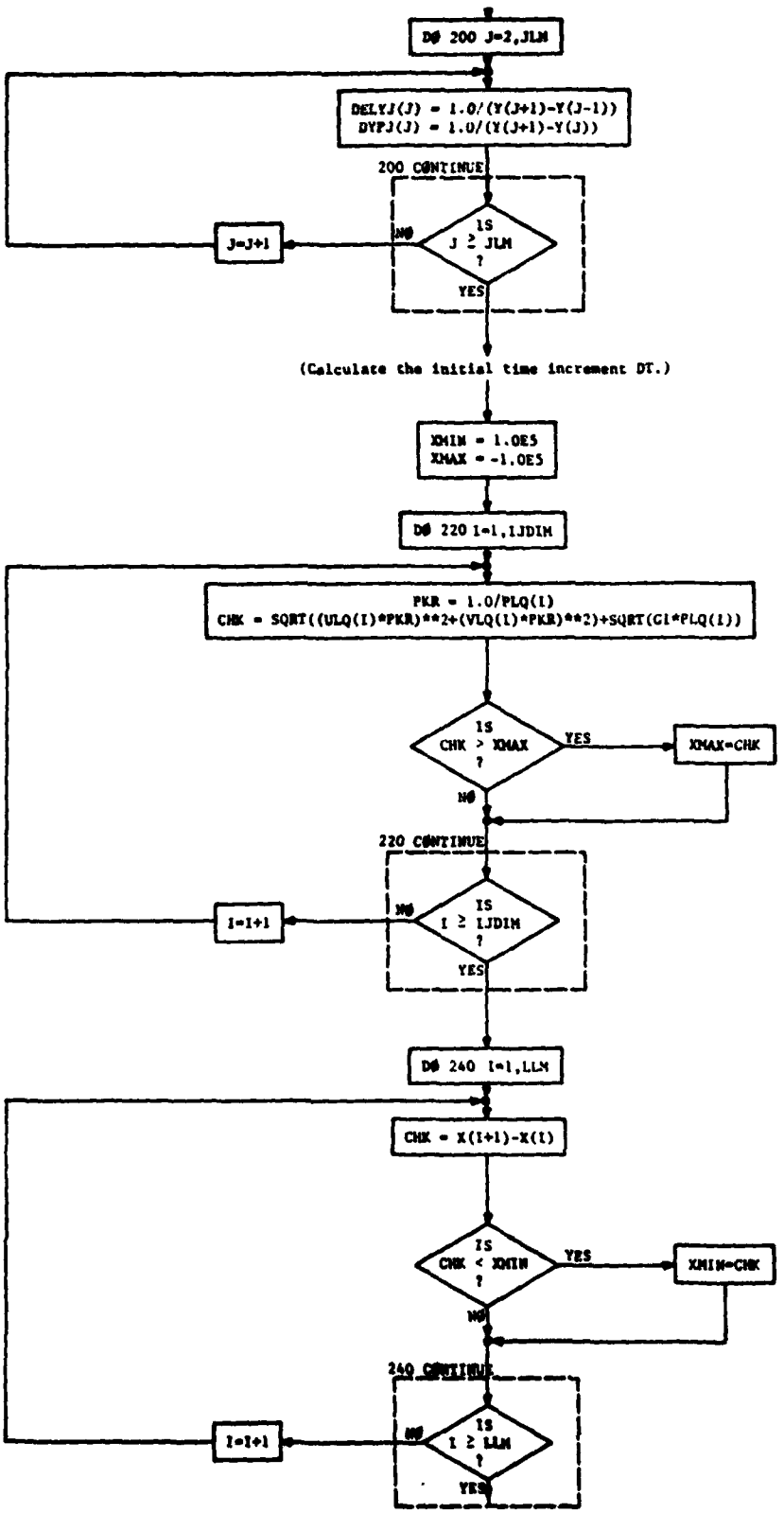

SQ2I = 0.70720678
SS = 0.5
(Program constants)
KDIM = 2
IPIDIM = IDIM+IDIM
IJDIM = IDIM*JDIM
IJKDIM = IJDIM*KDIM
(Dimensional parameters used for indexing through the arrays ULQ, VLQ, PLQ and MGQ)
DO 1000 NPSP=1,NP
(Execute program NP times)
IRECC = 0
READ QLST1
Namelist containing LL, JL,X,Y,ISKIP,ASLR,PRINT,ULT,VLT, PLT,DTLMDA,G1,ISMOTH,NCNT,IUNIT
IS ISKIP(4) < 2 ?
YES
NO
(Convert from wind speed and direction to vector u and v components)
VLT = VLT+180.0
ULS = ULT*SIN(VLT*RAD)
VLS = ULT*COS(VLT*RAD)
ULT = ULS
VLT = VLS
(Provide default values for input parameters not set.)
IS LL ≤ 0 ?
YES
LL=IDIM
NO
IS JL ≤ 0 ?
YES
JL=JDIM
NO
JLM = JL-1
LLM = LL-1

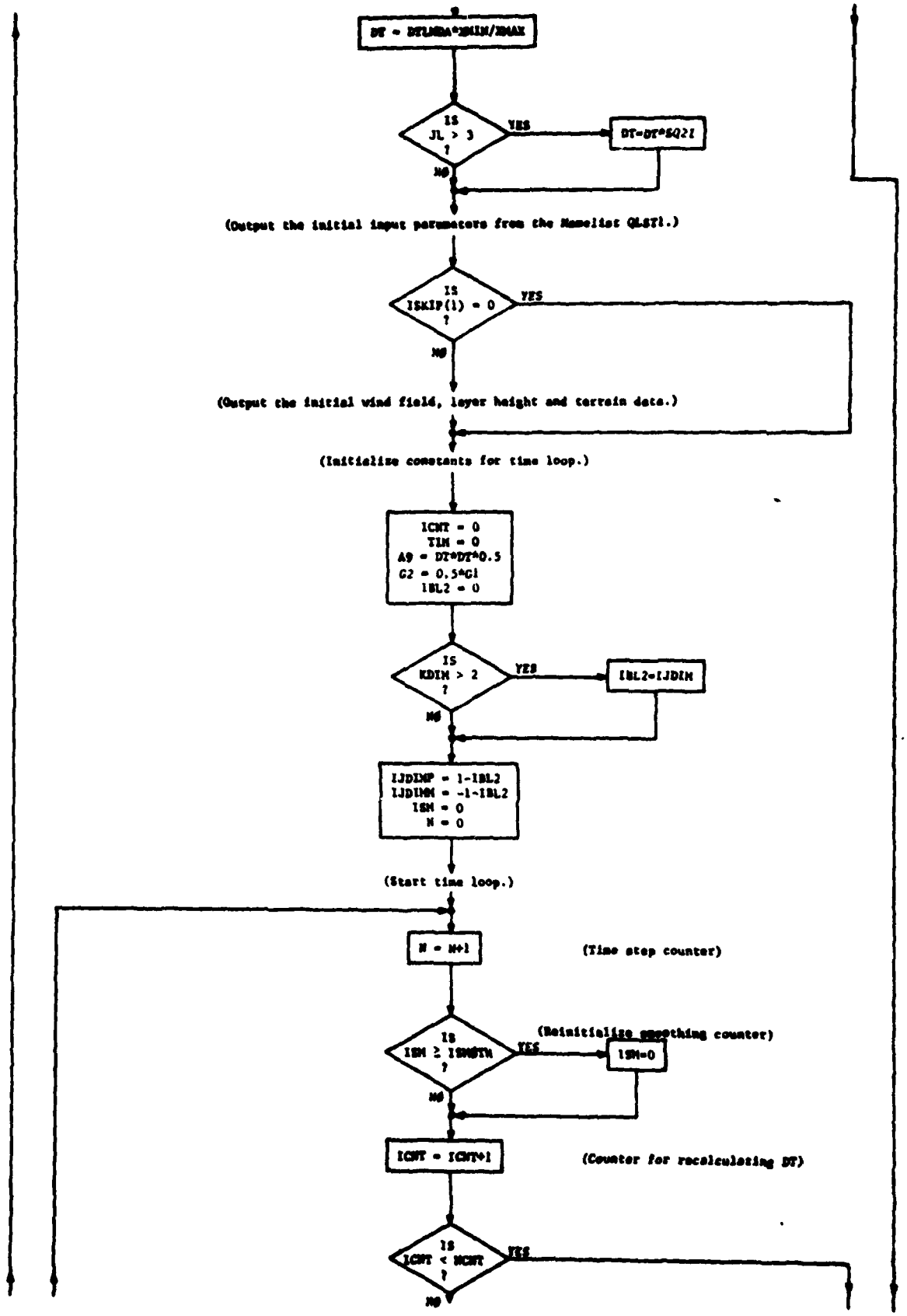

IS ISKIP(1) = 0 & ISKIP(2) = 0 ?
YES
ISKIP(2)=1
NØ
IS ABLK ≤ 0 ?
YES
ABLK=50.0
NØ
IS DTLMDA ≤ 0 ?
YES
DTLMDA=.95
NØ
IS G1 ≤ 0 ?
YES
G1=0.1
NØ
IS ISMØTH ≤ 0 ?
YES
ISMØTH=10
NØ
IS NCNT ≤ 0 ?
YES
NCNT=2
NØ
(Determine the number of values in the array PRINT.)
MØUT(1) = 1
DØ 20 I=1,19
IS PRINT(I) >PRINT(I+1) ?
YES
NØ
MØUT(1) = MØUT(1)+1

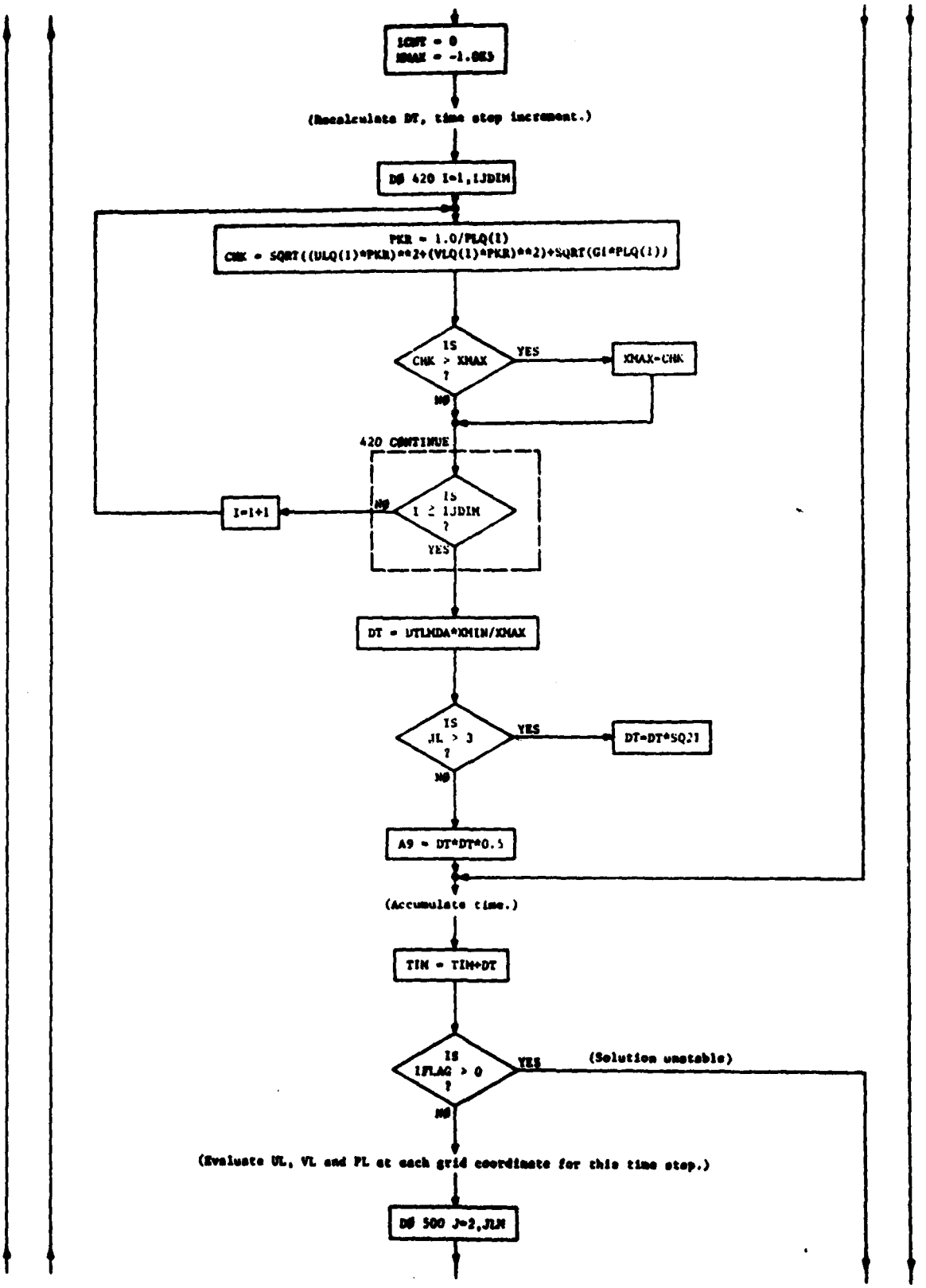

20 CONTINUE
IS I ≥ 19 ?
NO
YES
I=I+1
J13 = MOUT(1)
STOP = PRINT(J13)
(Provide default values for the x and y arrays if not set.)
IS X(2) > 0 & Y(2) > 0 ?
YES
NO
LL = 41
LLM = LL-1
JL = LL
JLM = JL-1
DO 60 I=1,LL
X(I) = XPS(I)*1.0E3
Y(I) = YPS(I)*1.0E3
(Convert to meters)
60 CONTINUE
IS I ≥ LL ?
NO
YES
I=I+1
(Determine coordinate indices of the area of uniform grid spacing within the grid.)
CALL MISC(IST,IND,X,LL,LLM)
CALL MISC(JST,JND,Y,JL,JLM)
(Input the terrain heights.)
IS ISKIP(5) = 0 ?
YES
NO
JL,X,Y)

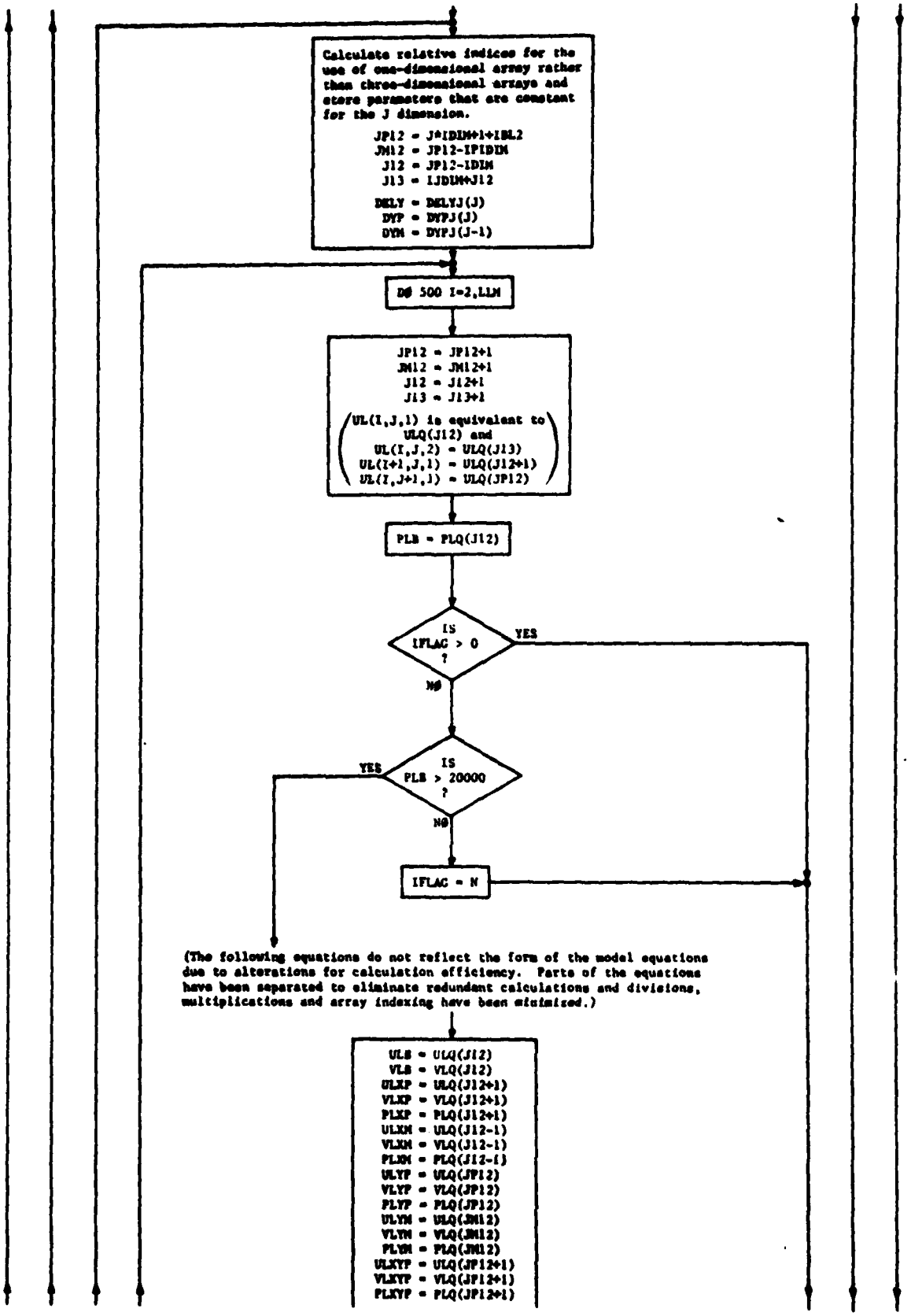

(Initialize output tape if requested.)
ITAG1 = 0
IS ISKIP(2) = 0 ?
YES
NO
NOUT(2) = ISKIP(3)
NOUT(3) = IDIM
NOUT(4) = JDIM
ITAG1 = 1
IS IUNIT ≤ 0 ?
YES
IUNIT=1
NO
(Clear Unit)
CALL NTRAN(IUNIT,22)
(Output record 1 of this file)
J12 = 10
CALL OUTPT(IUNIT,J12,NOUT,NOGO)
IS NOGO = 1 ?
YES
NO
(Record 2, x axis)
CALL OUTPT(IUNIT,LL,X,NOGO)
IS NOGO = 1 ?
YES
NO
(Record 3, y axis)
CALL OUTPT(IUNIT,JL,Y,NOGO)
IS NOGO = 1 ?
YES
NO
IS ISKIP(3) ≠ 1 ?
YES
NO
(Record 4, terrain array)
CALL OUTPT(IUNIT,LJDIM,HOQ,NOGO)


YES
(Calculate initial values of wind and pressure. Whenever possible, the one-dimensional arrays ULQ, VLQ, PLQ and HGQ are used instead of the three-dimensional arrays UL, VL, PL and the two-dimensional array HH. This is done to minimize assembled instructions and time of execution.)
(Test for terrain penetration of layer)
YES


DØ 200 J=2,JLM
DELYJ(J) = 1.0/(Y(J+1)-Y(J-1))
DYPJ(J) = 1.0/(Y(J+1)-Y(J))
200 CONTINUE
IS J ≥ JLM ?
NØ
YES
J=J+1
(Calculate the initial time increment DT.)
XMIN = 1.0E5
XMAX = -1.0E5
DØ 220 I=1,IJDIM
PKR = 1.0/PLQ(I)
CHK = SQRT((ULQ(I)*PKR)**2+(VLQ(I)*PKR)**2)+SQRT(GI*PLQ(I))
IS CHK > XMAX ?
YES
XMAX=CHK
NØ
220 CONTINUE
IS I ≥ IJDIM ?
NØ
YES
I=I+1
DØ 240 I=1,LLM
CHK = X(I+1)-X(I)
IS CHK < XMIN ?
YES
XMIN=CHK
NØ
240 CONTINUE
IS I ≥ LLM ?
NØ
YES
I=I+1


DT = DTLAMDA*DXMIN/XMAX
IS JL > 3 ?
YES
DT=DT*SQ2I
NO
(Output the initial input parameters from the Namelist QLSTI.)
IS ISKIP(1) = 0 ?
YES
NO
(Output the initial wind field, layer height and terrain data.)
(Initialize constants for time loop.)
ICNT = 0
TIM = 0
A9 = DT*DT*0.5
C2 = 0.5*C1
IBL2 = 0
IS KDIM > 2 ?
YES
IBL2=IJDIM
NO
IJDIMP = 1-IBL2
IJDIMM = -1-IBL2
ISM = 0
N = 0
(Start time loop.)
N = N+1
(Time step counter)
IS ISM ≥ ISMSTH ?
(Reinitialize smoothing counter)
YES
ISM=0
NO
ICNT = ICNT+1
(Counter for recalculating DT)
IS ICNT < NCNT ?
YES
NO


XMAX = -1.0E3
(Recalculate DT, time step increment.)
DO 420 I=1,IJDIM
PKR = 1.0/PLQ(I)
CHK = SQRT((ULQ(I)*PKR)**2+(VLQ(I)*PKR)**2)+SQRT(G1*PLQ(I))
IS CHK > XMAX ?
YES
XMAX=CHK
NO
420 CONTINUE
IS I ≥ IJDIM ?
NO
I=I+1
YES
DT = DTLMDA*XMIN/XMAX
IS JL > 3 ?
YES
DT=DT*SQ21
NO
A9 = DT*DT*0.5
(Accumulate time.)
TIM = TIM+DT
IS IFLAG > 0 ?
YES
(Solution unstable)
NO
(Evaluate UL, VL and PL at each grid coordinate for this time step.)
DO 500 J=2,JLM


Calculate relative indices for the use of one-dimensional array rather than three-dimensional arrays and store parameters that are constant for the J dimension.
JP12 = J*IDIM+1+IBL2
JM12 = JP12-IPIDIM
J12 = JP12-IDIM
J13 = IJDIM+J12
DELY = DELYJ(J)
DYP = DYPJ(J)
DYM = DYPJ(J-1)
DO 500 I=2,LLM
JP12 = JP12+1
JM12 = JM12+1
J12 = J12+1
J13 = J13+1
(UL(I,J,1) is equivalent to ULQ(J12) and
UL(I,J,2) = ULQ(J13)
UL(I+1,J,1) = ULQ(J12+1)
UL(I,J+1,J) = ULQ(JP12))
PLB = PLQ(J12)
IS IFLAG > 0 ?
YES
NO
IS PLB > 20000 ?
YES
NO
IFLAG = N
(The following equations do not reflect the form of the model equations due to alterations for calculation efficiency. Parts of the equations have been separated to eliminate redundant calculations and divisions, multiplications and array indexing have been minimized.)
ULB = ULQ(J12)
VLB = VLQ(J12)
ULXP = ULQ(J12+1)
VLXP = VLQ(J12+1)
PLXP = PLQ(J12+1)
ULXM = ULQ(J12-1)
VLXM = VLQ(J12-1)
PLXM = PLQ(J12-1)
ULYP = ULQ(JP12)
VLYP = VLQ(JP12)
PLYP = PLQ(JP12)
ULYM = ULQ(JM12)
VLYM = VLQ(JM12)
PLYM = PLQ(JM12)
ULXYP = ULQ(JP12+1)
VLXYP = VLQ(JP12+1)
PLXYP = PLQ(JP12+1)

```
ULXYM = ULQ(JM12-1)
VLXYM = VLQ(JM12-1)
PLXYM = PLQ(JM12-1)
ULXMYP = ULQ(JP12-1)
VLXMYP = VLQ(JP12-1)
PLXMYP = PLQ(JP12-1)
ULXPYM = ULQ(JM12+1)
VLXPYM = VLQ(JM12+1)
PLXPYM = PLQ(JM12+1)
PLBI = 1.0/PLB
PLXPI = 1.0/PLXP
PLXMI = 1.0/PLXM
PLYPI = 1.0/PLYP
PLYMI = 1.0/PLYM
PLXYPI = 1.0/PLXYP
PLXYMI = 1.0/PLXYM
PXMYPI = 1.0/PLXMYP
PXPYMI = 1.0/PLXPYM

A39 = HGQ(J12-IBL2)
A43 = HGQ(JP12-IBL2)
A79 = HGQ(JM12-IBL2)
A21 = HGQ(J12+IJDIMP)
A75 = HGQ(JP12+IJDIMP)
A76 = HGQ(JM12+IJDIMP)
A77 = HGQ(JP12+IJDIMM)
A78 = HGQ(J12+IJDIMM)
A80 = HGQ(JM12+IJDIMM)
A1 = 2.0*DELXI(I)
A2 = 2.0*DELY
A10 = ULXP*PLXPI
A12 = ULXP*A10
A11 = ULB*PLBI
A14 = ULB*A11
A3 = PLXP*PLXP
A16 = PLB*PLB
A56 = 0.5*DELY
A46 = ULXYP*PLXYPI
A17 = A46*VLXYP
A51 = ULXPYM*PXPYMI
A18 = A51*VLXPYM
A49 = ULYP*PLYPI
A19 = A49*VLYP
A53 = ULYM*PLYMI
A20 = A53*VLYM
A6 = A19-A20
A33 = (PLXP+PLB)*G2
A22 = A21-A39
```

(Part of second-order terms common to UL, VL and PL)

```
FP = DXPI(I)*((A12-A14+G2*(A3-A16))+A33*A22)+A56*(A17-A18+A6)
```

= (f^+) Equation (4-20) in Section 4.

```
A8 = ULXM*PLXMI
A28 = ULXM*A8
A29 = PLXM*PLXM
A47 = ULXMYP*PXMYPI
A30 = A47*VLXMYP
A52 = ULXYM*PLXYMI
A31 = A52*VLXYM
A40 = (PLB+PLXM)*G2
```

(Part of second-order terms common to UL, VL and PL)

```
FM = DXPI(I-1)*((A14-A28+G2*(A16-A29))+A40*(A39-A78))+A56*
     (A6+A30-A31)
```

= (f^-) Equation (4-20) in Section 4.

```
A54 = 0.5*DELXI(I)
A34 = A10*VLXP
A35 = A8*VLXM
A25 = A34-A35
A7 = VLYP*PLYPI
A36 = VLYP*A7
A45 = VLB*PLBI
A37 = A45*VLB
A38 = PLYP*PLYP
A65 = G2*(PLYP+PLB)
```

(Part of second-order terms common to UL, VL and PL)

```
GP = A54*(A17-A30+A25)+DYP*((A36-A37+G2*(A38-A16))+A65*
     (A43-A39))
```

= (g^+) Equation (4-21) in Section 4.

```
                A50 = VLXM*PLYMI
                A61 = VLXM*A50
                A42 = PLYM*PLYM
                A23 = G2*(PLB+PLYM)

(Part of second-order term common to UL, VL and PL)

GM = A54*(A25+A18-A31)+DYM*((A37-A41+G2*(A16-A42))+A23*
     (A39-A79)) - (g⁻) Equation (4-21) in Section 4.

                A55 = A54+A54
                 A5 = A12-A28
                A58 = A3-A29
                A57 = A56+A56
                A26 = G2*PLB
                A24 = A21-A78

    (First-order term of u component Equation (4-14))

      B1 = DT*(A55*(A5+G2*A58)+A57*A6+A26*A1*A24)

                A71 = VLXYP-VLXIYM
                A59 = VLYP-VLYM
                 A4 = A14*PLB1
                A13 = (ULXP-ULB)*DXPI(I)+A56*
                      (A71+A59)

(Part of second-order term of u component, Equation (4-17))

B2P = (A10+A11)*FP+A13*(A33-0.5*(A12*PLXPI+A4))

                A72 = VLXMYP-VLXYM
                A44 = (ULB-ULXM)*DXPI(I-1)+
                      A56*(A59+A72)

(Part of second-order term of u component, Equation (4-17))

B2M = (A11+A8)*FM+A44*(A40-0.5*(A4+A8*A8))

                A27 = PLXYP*PLXYP
                A62 = PLXMYP*PLXMYP
                A48 = A11*VLB
                A73 = ULXYP-ULXMYP
                A67 = ULXP-ULXM
                A15 = (VLYP-VLB)*DYP+A54*(A73+A67)

(Part of second-order term of u component, Equation (4-17))

B3P = 0.5*((A7+A45)*(A54*(A46*ULXYP-A47*ULXMYP+A54*G2*(A27-
      A62+A58))+DYP*(A19-A48)+A65*A54*(A75-A77+A24))+(A69+
      A11)*GP-(A19*PLYPI+A48*PLBI)*A15)

                A61 = PLXPYM*PLXPYM
                A63 = PLXYM*PLXYM
                A64 = A48*PLBI
                A74 = ULXPYM-ULXYM
                A32 = DYM*(VLB-VLYM)+A54*
                      (A67+A74)

(Part of second-order term of u component, Equation (4-17))

B3M = 0.5*((A45+A50)*(A54*(A5+A51*ULXPYM-A52*ULXYM+G2*(A58+
      A61-A63))+DYM*(A48-A20)+A23*A34*(A24+A76-A80))+(A11+A53)
      *GM-(A64+A20*PLYMI)*A32)

                A70 = A36-A41
                A68 = A36-A42
                A69 = A43-A79

    (First-order term of v component, Equation (4-15))

C1 = DT*(A55*A25+A57*(A70+G2*A68)+A26*A2*A69

(Part of second-order term of v component, Equation (4-18))

C2P = 0.5*((VLXP*PLXPI+A45)*FP+(A10+A11)*(DXPI(I)*(A34-A48)+
      A56*(VLXYP*VLXYP*PLXYP1-VLXPYM*VLXPYM*PXPYM(I+A70+G2*
      (A27-A61+A68))+A33*A56*(A75-A76+A69))-(A34*PLXPI+A44)
      *A13)

(Part of second-order term of v component, Equation (4-18))

C2M = 0.5*((A45+VLXM*PLXMI)*FM+(A11+A8)*(DXPI(I-1)*(A48-A8*
      VLXM)+A56*(A70+VLXMYP*VLXMYP*PXMYP1-VLXYM*VLXYM*PLXYM(I+
      G2*(A68+A62-A63))+A40*A56*(A69+A77-A80))-(A64+A35*PLXMI)
      *A44)
                A66 = A45*A45

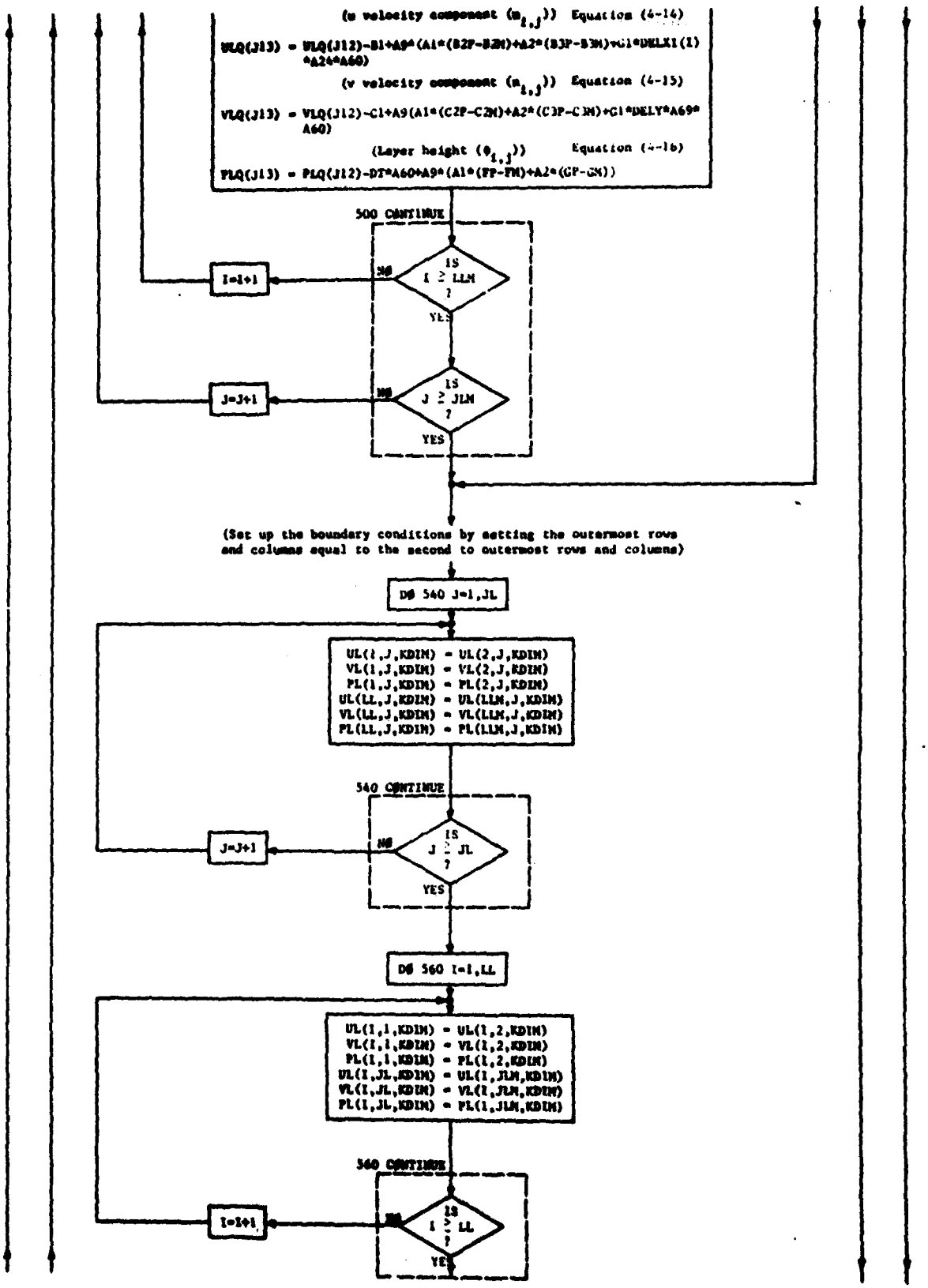
(Part of second-order term of v component, Equation (4-18))

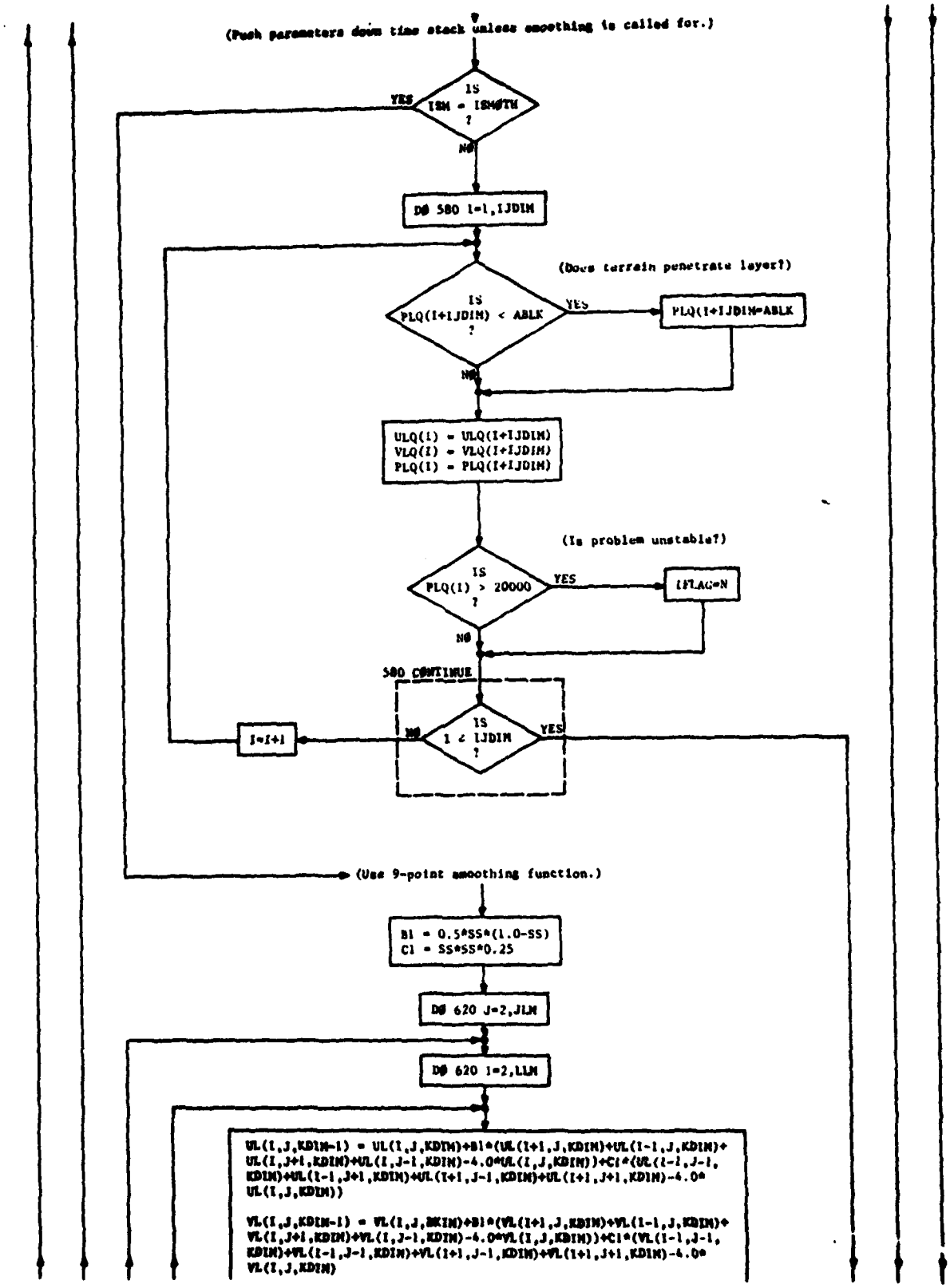
C3P = (A7+A43)*GP+A15*(A65-0.5*(A7*A7+A66))

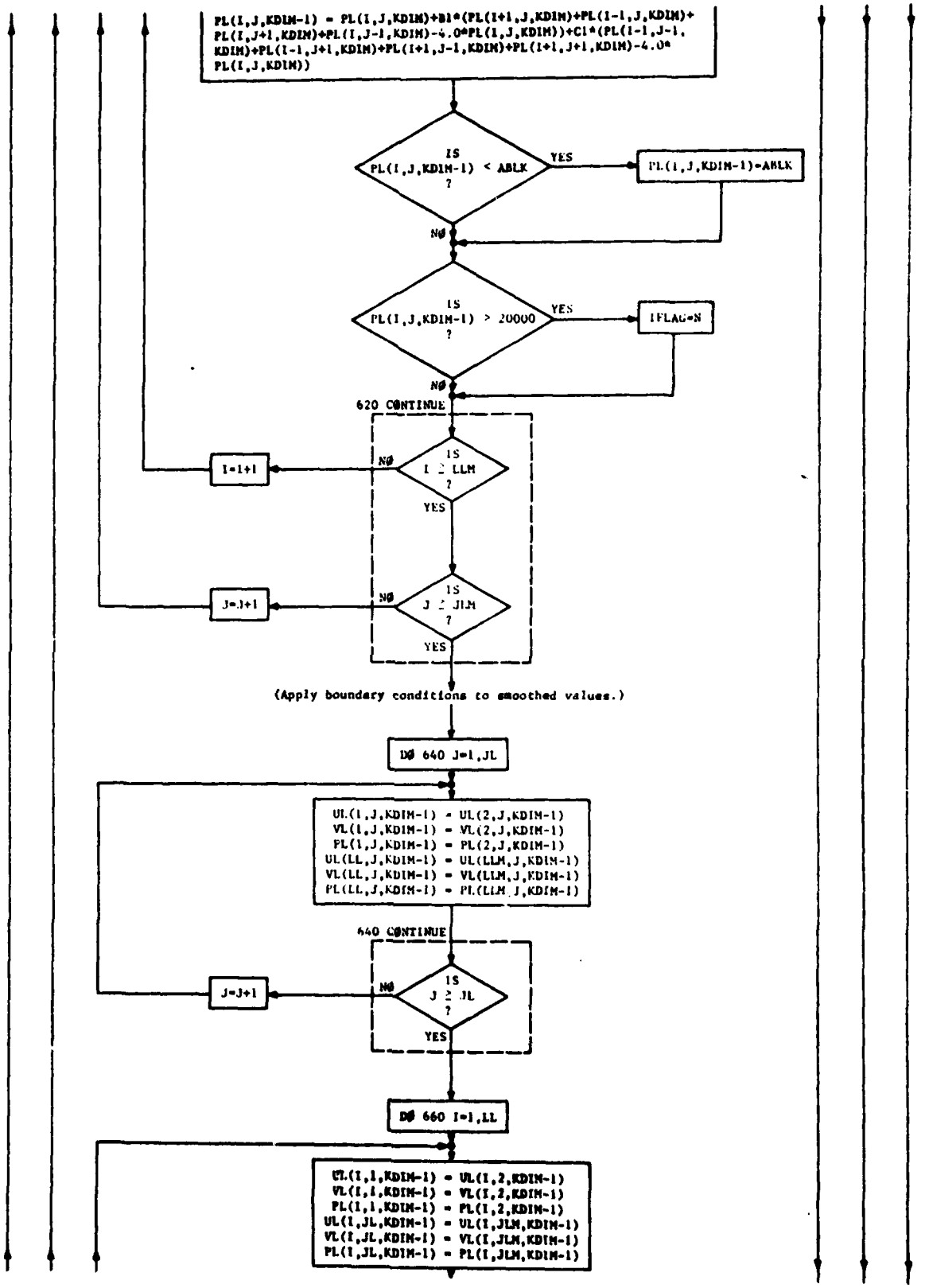
(Part of second order term of v component, Equation (4-18))

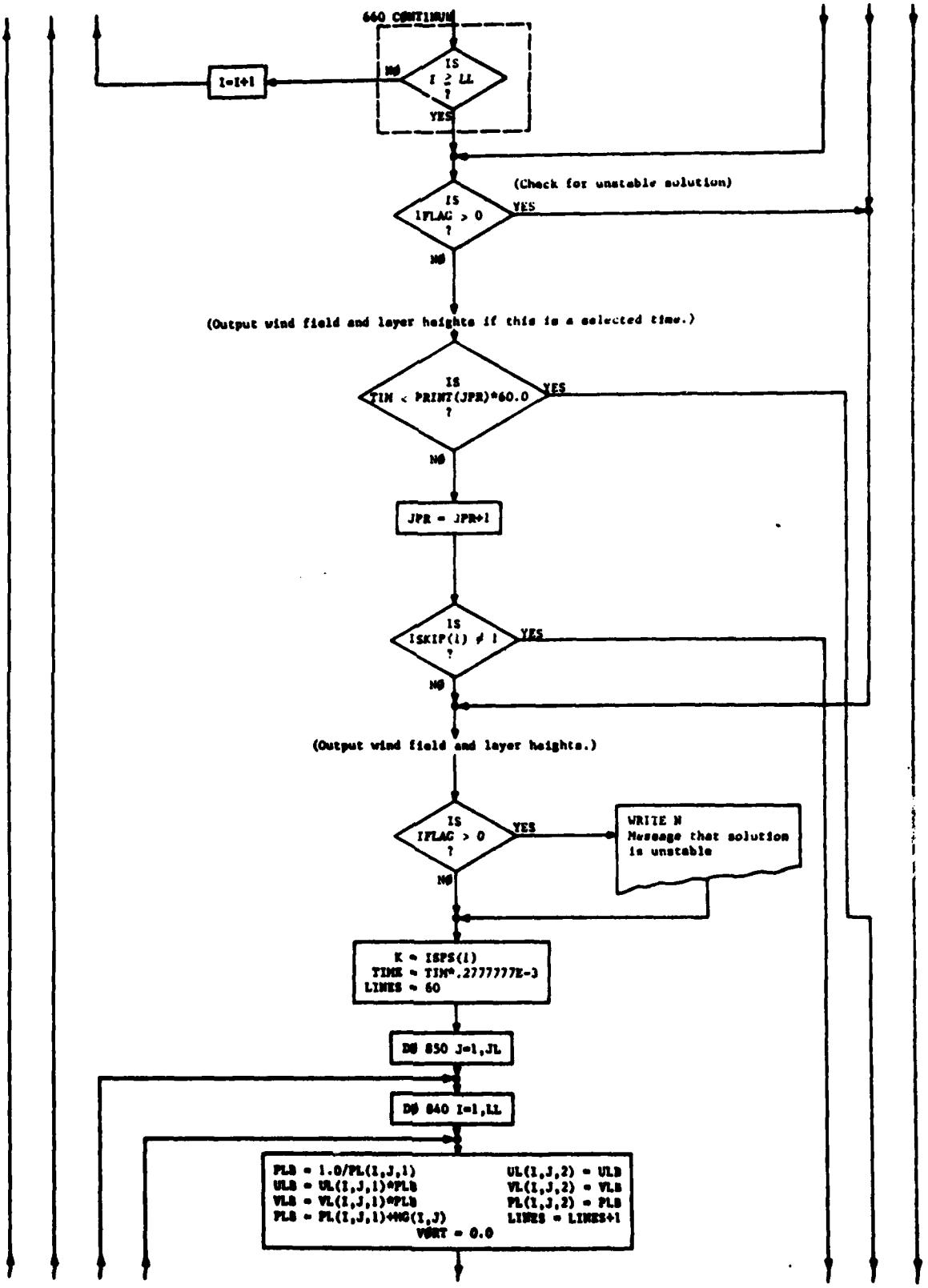
C3M = (A45+A50)*GM+A32*(A23-0.5*(A66+A50*A50))

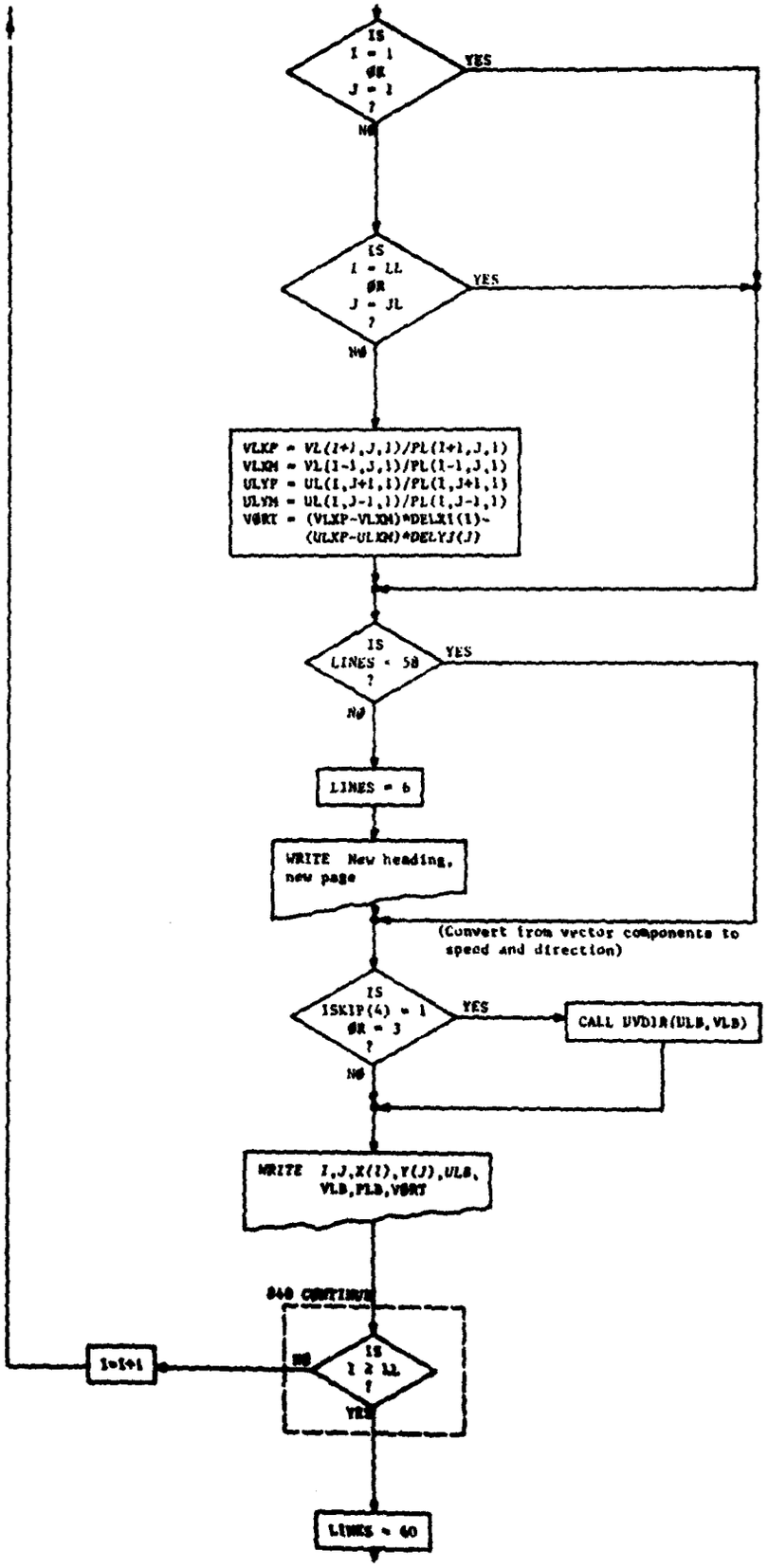
                A60 = A55*A67+A57*A59
```

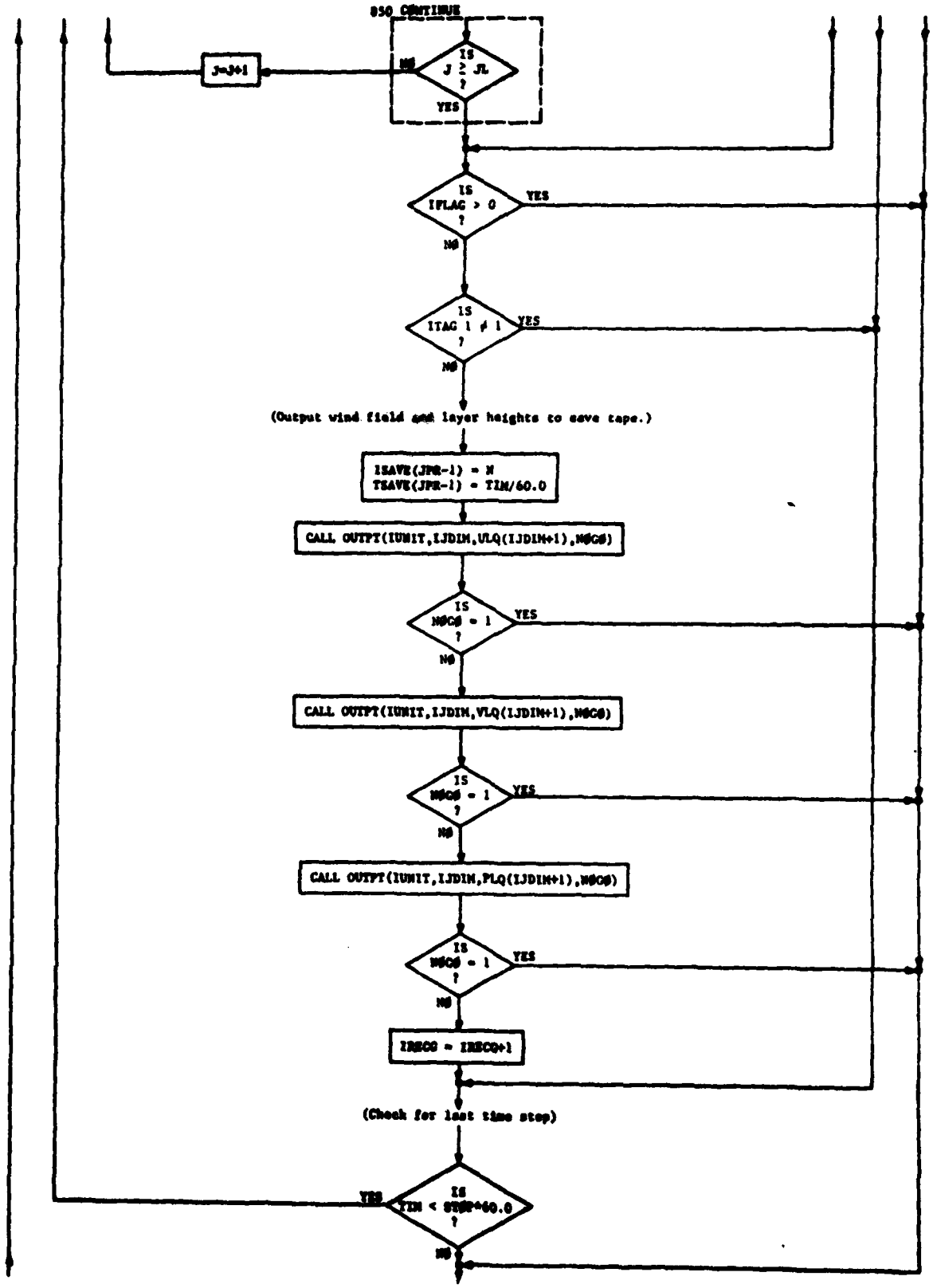

(u velocity component ($u_{i,j}$)) Equation (4-14)
ULQ(J13) = ULQ(J12)-B1*A9*(A1*(B2P-B2M)+A2*(B3P-B3M)+G1*DELX1(I)*A24*A60)
(v velocity component ($v_{i,j}$)) Equation (4-15)
VLQ(J13) = VLQ(J12)-C1*A9(A1*(C2P-C2M)+A2*(C3P-C3M)+G1*DELY*A69*A60)
(Layer height ($\phi_{i,j}$)) Equation (4-16)
PLQ(J13) = PLQ(J12)-DT*A60+A9*(A1*(FP-FM)+A2*(GP-GM))
500 CONTINUE
IS I ≥ LLM ?
NO
YES
I=I+1
IS J ≥ JLM ?
NO
YES
J=J+1
(Set up the boundary conditions by setting the outermost rows and columns equal to the second to outermost rows and columns)
DO 540 J=1,JL
UL(1,J,KDIM) = UL(2,J,KDIM)
VL(1,J,KDIM) = VL(2,J,KDIM)
PL(1,J,KDIM) = PL(2,J,KDIM)
UL(LL,J,KDIM) = UL(LLM,J,KDIM)
VL(LL,J,KDIM) = VL(LLM,J,KDIM)
PL(LL,J,KDIM) = PL(LLM,J,KDIM)
540 CONTINUE
IS J ≥ JL ?
NO
YES
J=J+1
DO 560 I=1,LL
UL(I,1,KDIM) = UL(I,2,KDIM)
VL(I,1,KDIM) = VL(I,2,KDIM)
PL(I,1,KDIM) = PL(I,2,KDIM)
UL(I,JL,KDIM) = UL(I,JLM,KDIM)
VL(I,JL,KDIM) = VL(I,JLM,KDIM)
PL(I,JL,KDIM) = PL(I,JLM,KDIM)
560 CONTINUE
IS I ≥ LL ?
NO
YES
I=I+1

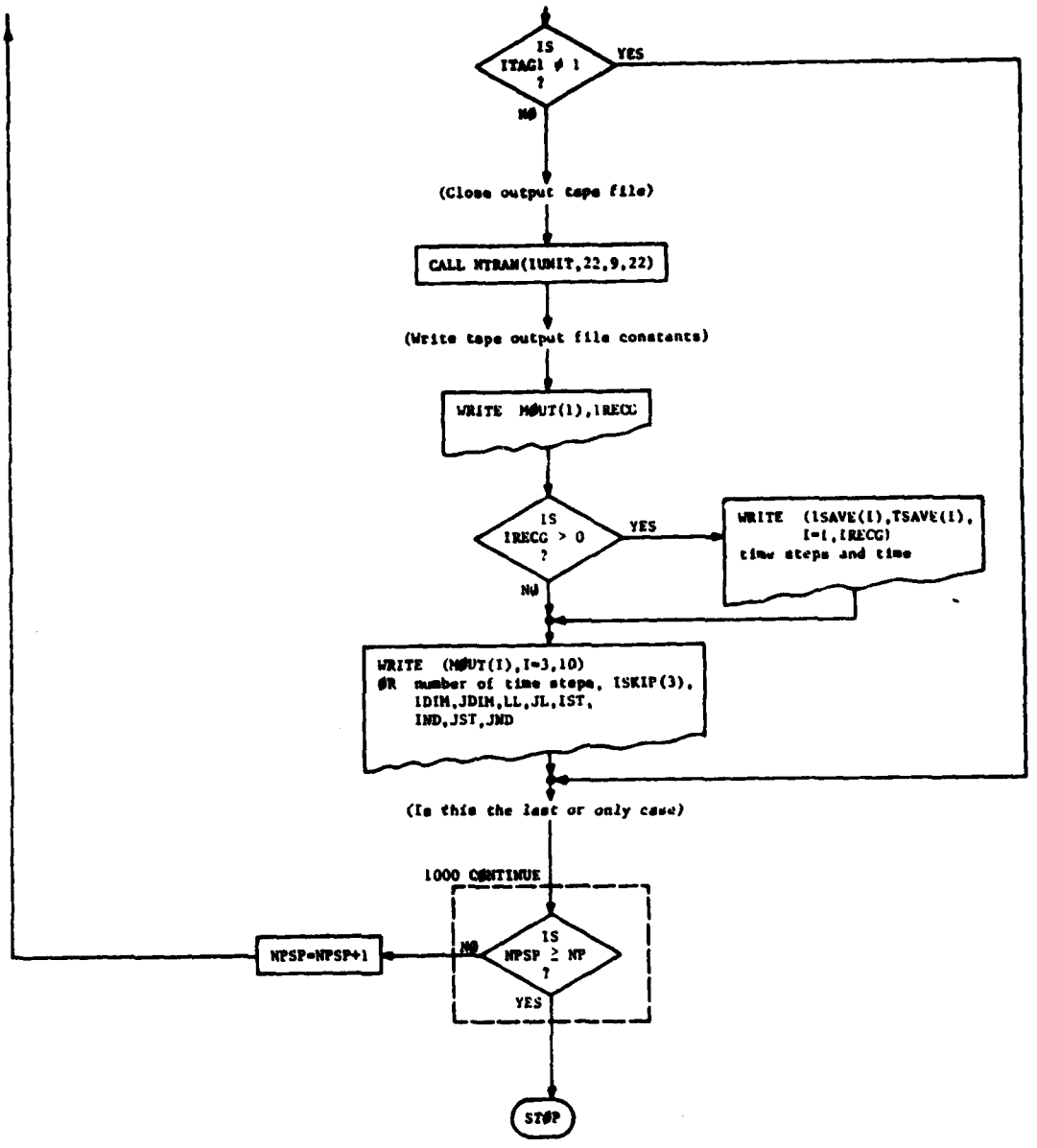

(Push parameters down time stack unless smoothing is called for.)
IS ISM = ISMOTH ?
YES
NO
DO 580 I=1,IJDIM
(Does terrain penetrate layer?)
IS PLQ(I+IJDIM) < ABLK ?
YES
PLQ(I+IJDIM=ABLK
NO
ULQ(I) = ULQ(I+IJDIM)
VLQ(I) = VLQ(I+IJDIM)
PLQ(I) = PLQ(I+IJDIM)
(Is problem unstable?)
IS PLQ(I) > 20000 ?
YES
IFLAG=N
NO
580 CONTINUE
IS I < IJDIM ?
NO
YES
I=I+1
(Use 9-point smoothing function.)
B1 = 0.5*SS*(1.0-SS)
C1 = SS*SS*0.25
DO 620 J=2,JLM
DO 620 I=2,LLM
UL(I,J,KDIM-1) = UL(I,J,KDIM)+B1*(UL(I+1,J,KDIM)+UL(I-1,J,KDIM)+
UL(I,J+1,KDIM)+UL(I,J-1,KDIM)-4.0*UL(I,J,KDIM))+C1*(UL(I-1,J-1,
KDIM)+UL(I-1,J+1,KDIM)+UL(I+1,J-1,KDIM)+UL(I+1,J+1,KDIM)-4.0*
UL(I,J,KDIM))
VL(I,J,KDIM-1) = VL(I,J,KDIM)+B1*(VL(I+1,J,KDIM)+VL(I-1,J,KDIM)+
VL(I,J+1,KDIM)+VL(I,J-1,KDIM)-4.0*VL(I,J,KDIM))+C1*(VL(I-1,J-1,
KDIM)+VL(I-1,J-1,KDIM)+VL(I+1,J-1,KDIM)+VL(I+1,J+1,KDIM)-4.0*
VL(I,J,KDIM)


PL(I,J,KDIM-1) = PL(I,J,KDIM)+B1*(PL(I+1,J,KDIM)+PL(I-1,J,KDIM)+ PL(I,J+1,KDIM)+PL(I,J-1,KDIM)-4.0*PL(I,J,KDIM))+C1*(PL(I-1,J-1, KDIM)+PL(I-1,J+1,KDIM)+PL(I+1,J-1,KDIM)+PL(I+1,J+1,KDIM)-4.0* PL(I,J,KDIM))
IS PL(I,J,KDIM-1) < ABLK ?
YES
PL(I,J,KDIM-1)=ABLK
NØ
IS PL(I,J,KDIM-1) > 20000 ?
YES
IFLAG=N
NØ
620 CONTINUE
IS I ≥ LLM ?
NØ
I=I+1
YES
IS J ≥ JLM ?
NØ
J=J+1
YES
(Apply boundary conditions to smoothed values.)
DØ 640 J=1,JL
UL(1,J,KDIM-1) = UL(2,J,KDIM-1)
VL(1,J,KDIM-1) = VL(2,J,KDIM-1)
PL(1,J,KDIM-1) = PL(2,J,KDIM-1)
UL(LL,J,KDIM-1) = UL(LLM,J,KDIM-1)
VL(LL,J,KDIM-1) = VL(LLM,J,KDIM-1)
PL(LL,J,KDIM-1) = PL(LLM,J,KDIM-1)
640 CONTINUE
IS J ≥ JL ?
NØ
J=J+1
YES
DØ 660 I=1,LL
UL(I,1,KDIM-1) = UL(I,2,KDIM-1)
VL(I,1,KDIM-1) = VL(I,2,KDIM-1)
PL(I,1,KDIM-1) = PL(I,2,KDIM-1)
UL(I,JL,KDIM-1) = UL(I,JLM,KDIM-1)
VL(I,JL,KDIM-1) = VL(I,JLM,KDIM-1)
PL(I,JL,KDIM-1) = PL(I,JLM,KDIM-1)


640 CONTINUE
IS I ≥ LL ?
NO
YES
I=I+1
(Check for unstable solution)
IS IFLAG > 0 ?
YES
NO
(Output wind field and layer heights if this is a selected time.)
IS TIM < PRINT(JPR)*60.0 ?
YES
NO
JPR = JPR+1
IS ISKIP(1) ≠ 1 ?
YES
NO
(Output wind field and layer heights.)
IS IFLAG > 0 ?
YES
NO
WRITE N
Message that solution is unstable
K = ISPS(1)
TIME = TIM*.2777777E-3
LINES = 60
DO 850 J=1,JL
DO 840 I=1,LL
PLB = 1.0/PL(I,J,1)
ULB = UL(I,J,1)*PLB
VLB = VL(I,J,1)*PLB
PLB = PL(I,J,1)+HG(I,J)
VERT = 0.0
UL(I,J,2) = ULB
VL(I,J,2) = VLB
PL(I,J,2) = PLB
LINES = LINES+1

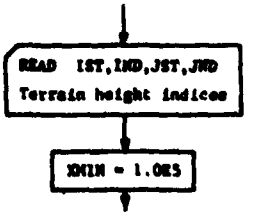

IS I = 1 ØR J = 1 ?
YES
NØ
IS I = LL ØR J = JL ?
YES
NØ
VLXP = VL(I+1,J,1)/PL(I+1,J,1)
VLXM = VL(I-1,J,1)/PL(I-1,J,1)
ULYP = UL(I,J+1,1)/PL(I,J+1,1)
ULYM = UL(I,J-1,1)/PL(I,J-1,1)
VØRT = (VLXP-VLXM)*DELX1(I)-
(ULXP-ULXM)*DELYJ(J)
IS LINES < 58 ?
YES
NØ
LINES = 6
WRITE New heading, new page
(Convert from vector components to speed and direction)
IS ISKIP(4) = 1 ØR = 3 ?
YES
CALL UVDIR(ULB,VLB)
NØ
WRITE I,J,X(I),Y(J),ULB, VLB,PLB,VØRT
840 CONTINUE
IS I ≥ LL ?
NØ
YES
I=I+1
LINES = 60

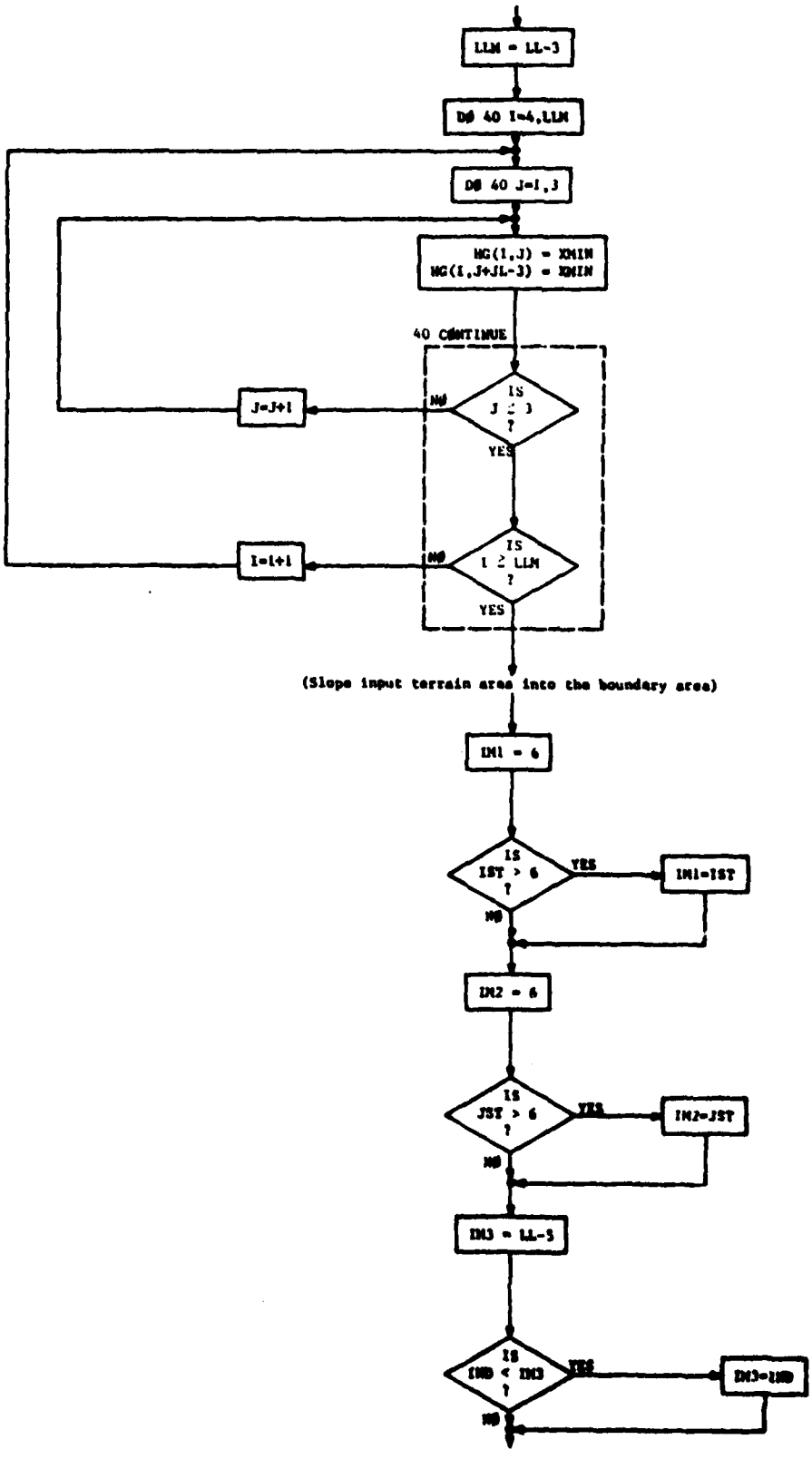

850 CONTINUE
IS J ≥ JL ?
NO
YES
J=J+1
IS IFLAG > 0 ?
YES
NO
IS ITAG 1 ≠ 1 ?
YES
NO
(Output wind field and layer heights to save tape.)
ISAVE(JPR-1) = N
TSAVE(JPR-1) = TIM/60.0
CALL OUTPT(IUNIT,IJDIM,ULQ(IJDIM+1),NGC0)
IS NGC0 = 1 ?
YES
NO
CALL OUTPT(IUNIT,IJDIM,VLQ(IJDIM+1),NGC0)
IS NGC0 = 1 ?
YES
NO
CALL OUTPT(IUNIT,IJDIM,PLQ(IJDIM+1),NGC0)
IS NGC0 = 1 ?
YES
NO
IREC0 = IREC0+1
(Check for last time step)
IS TIM < STOP*60.0 ?
YES
NO

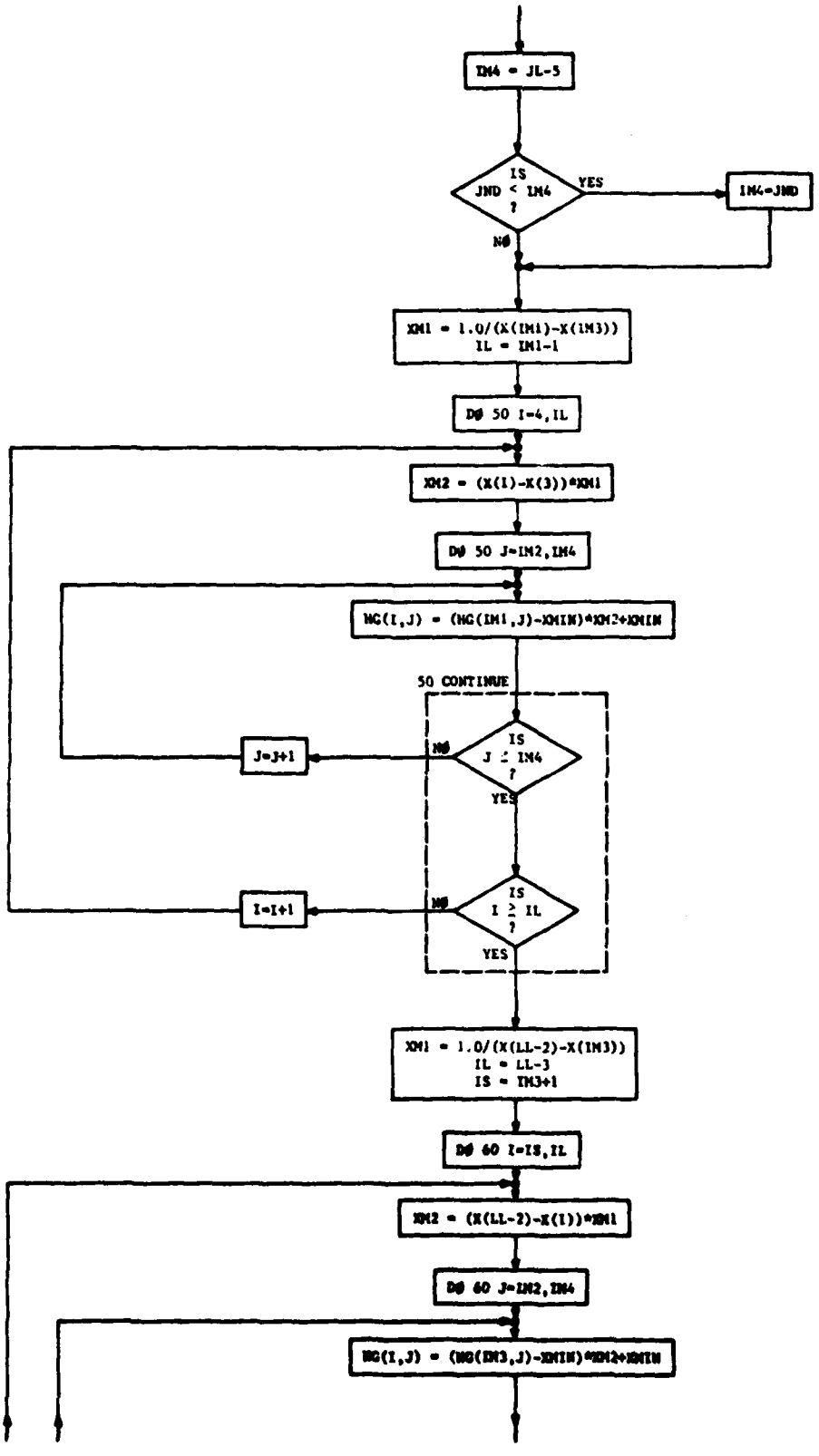


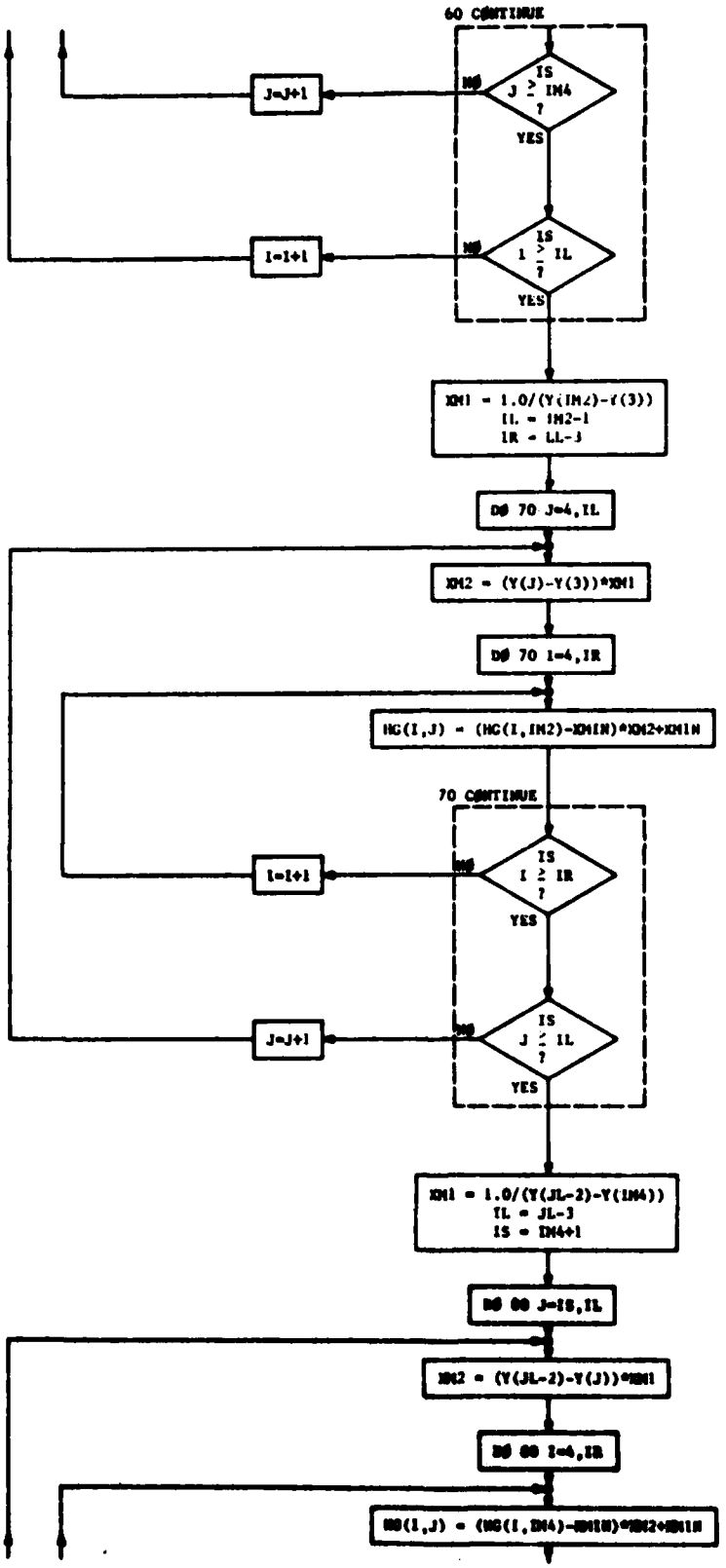
D.3 SUBROUTINE MØUTNR(NG,LL,JL,X,Y)

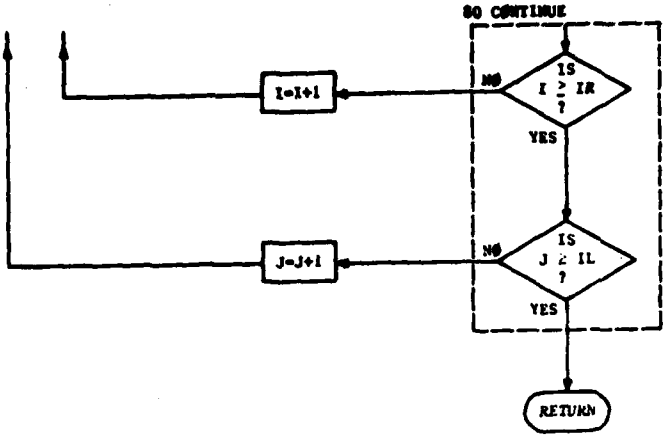
Subroutine MØUTNR reads the terrain data and the indices of the terrain data. The indices IST, IND, JST and JND of the starting and ending points on the x and y axes are input first. The terrain height data are then input. Areas of the grid that do not contain terrain height data and automatically the first (last) three rows and columns are filled by the program. These areas are filled with terrain heights that slope down to the minimum height at the boundary edges.




LLM = LL-3
DØ 40 I=4,LLM
DØ 40 J=1,3
MG(1,J) = XMIN
MG(I,J+JL-3) = XMIN
40 CONTINUE
IS J ≥ 3 ?
NØ
J=J+1
YES
IS I ≥ LLM ?
NØ
I=I+1
YES
(Slope input terrain area into the boundary area)
IM1 = 6
IS IST > 6 ?
YES
IM1=IST
NØ
IM2 = 6
IS JST > 6 ?
YES
IM2=JST
NØ
IM3 = LL-5
IS IMØ < IM3 ?
YES
IM3=IMØ
NØ

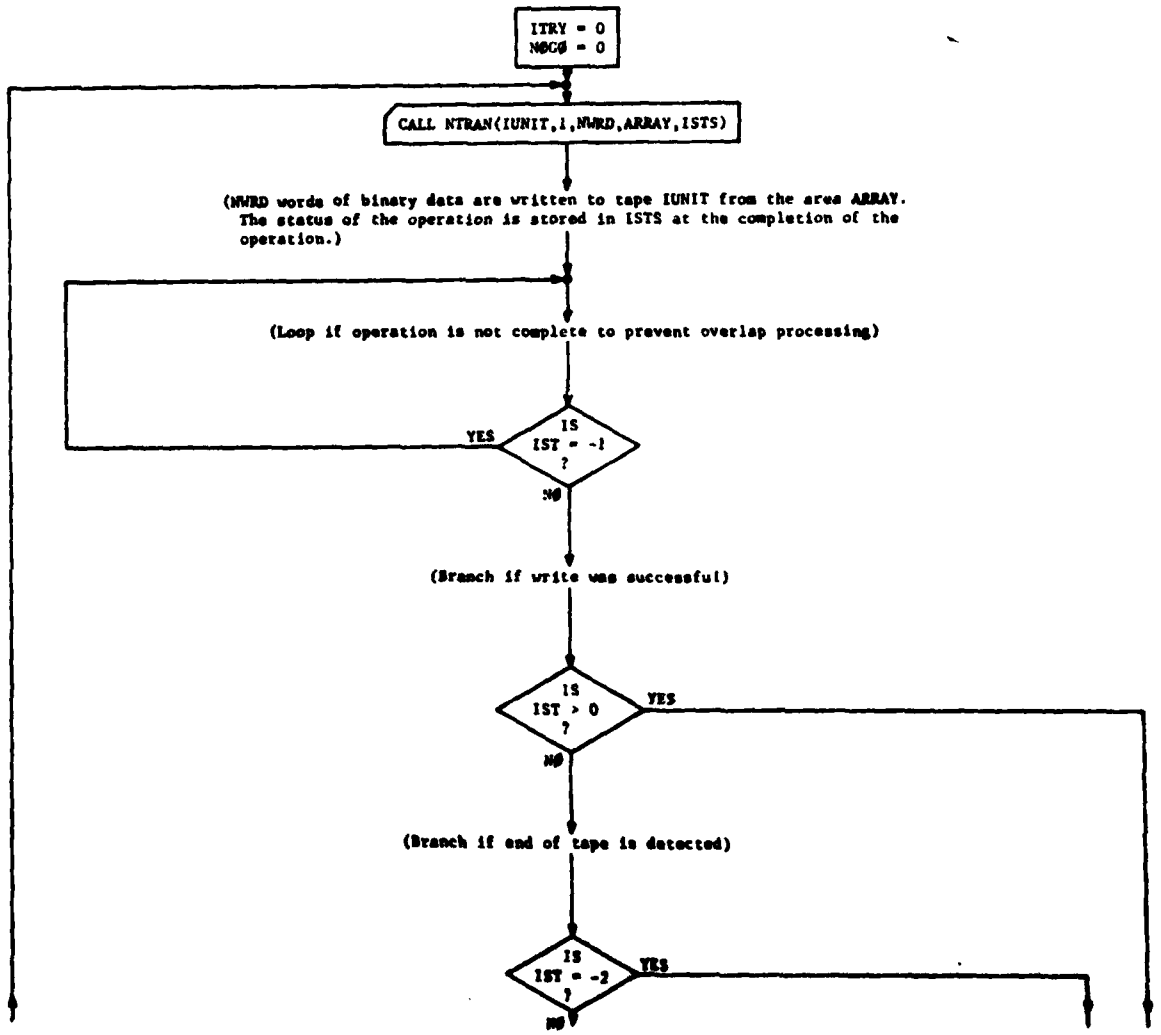

IM4 = JL-5
IS JND < IM4 ?
YES
NØ
IM4=JND
XM1 = 1.0/(X(IM1)-X(IM3))
IL = IM1-1
DØ 50 I=4,IL
XM2 = (X(I)-X(3))*XM1
DØ 50 J=IM2,IM4
NG(I,J) = (NG(IM1,J)-XMIN)*XM2+XMIN
50 CONTINUE
IS J ≥ IM4 ?
NØ
YES
J=J+1
IS I ≥ IL ?
NØ
YES
I=I+1
XM1 = 1.0/(X(LL-2)-X(IM3))
IL = LL-3
IS = IM3+1
DØ 60 I=IS,IL
XM2 = (X(LL-2)-X(I))*XM1
DØ 60 J=IM2,IM4
NG(I,J) = (NG(IM3,J)-XMIN)*XM2+XMIN

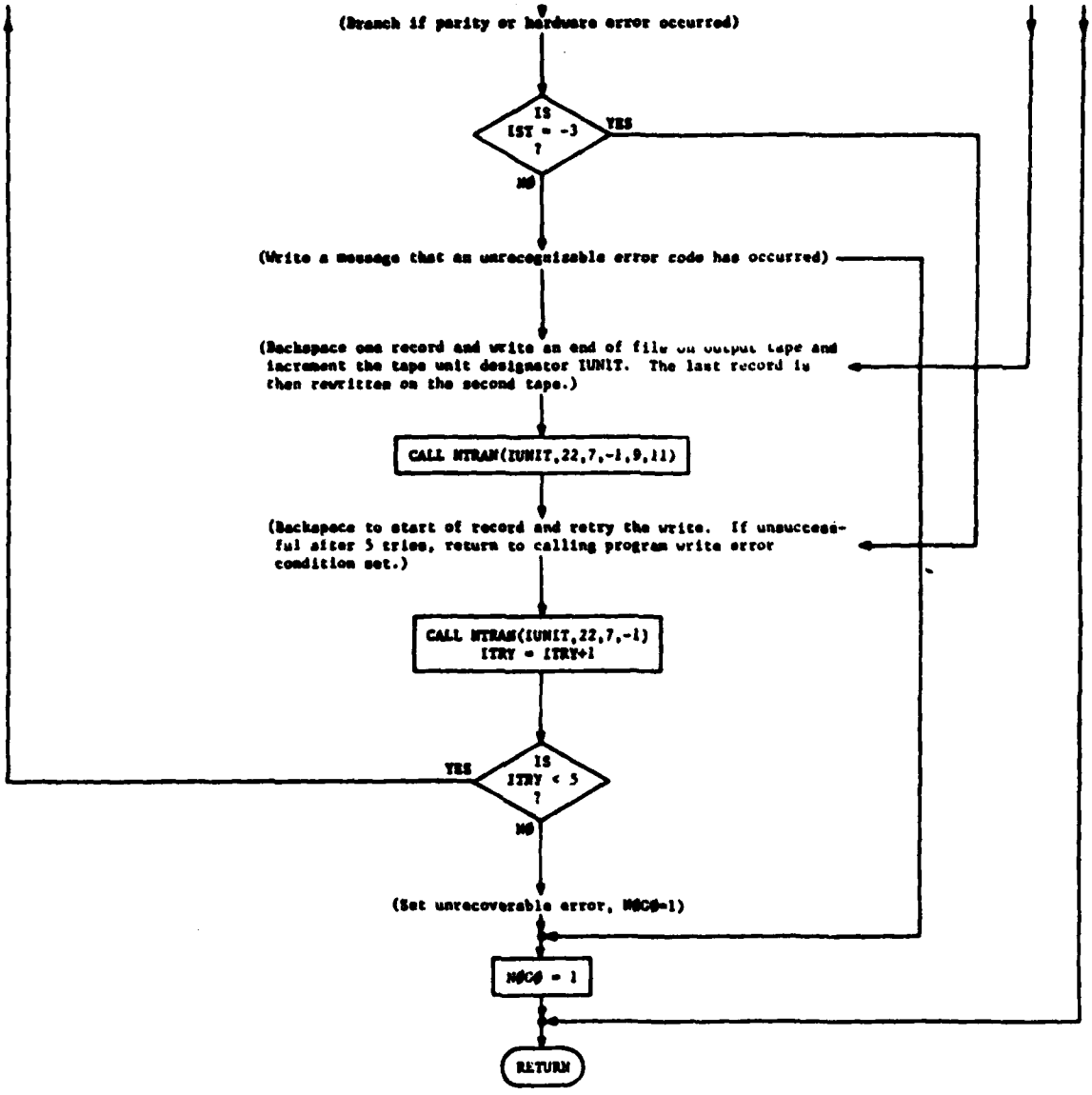

60 CONTINUE
IS J ≥ IM4 ?
NO
YES
J=J+1
IS I ≥ IL ?
NO
YES
I=I+1
XM1 = 1.0/(Y(IM2)-Y(3))
IL = IM2-1
IR = LL-3
DO 70 J=4,IL
XM2 = (Y(J)-Y(3))*XM1
DO 70 I=4,IR
HG(I,J) = (HG(I,IM2)-XM1N)*XM2+XM1N
70 CONTINUE
IS I ≥ IR ?
NO
YES
I=I+1
IS J ≥ IL ?
NO
YES
J=J+1
XM1 = 1.0/(Y(JL-2)-Y(IM4))
IL = JL-3
IS = IM4+1
DO 80 J=IS,IL
XM2 = (Y(JL-2)-Y(J))*XM1
DO 80 I=4,IR
HG(I,J) = (HG(I,IM4)-XM1N)*XM2+XM1N



D.4 SUBROUTINE ØUTPT(IUNIT,NWRD,ARRAY,NØCØ)

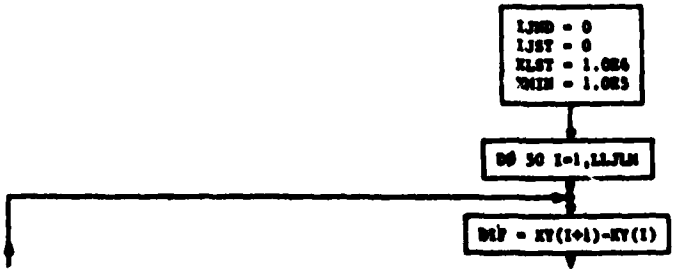
Subroutine ØUTPUT writes the wind field and layer height information to save tape. *This routine uses the* UNIVAC 1108 NTRAN subroutines for all output.

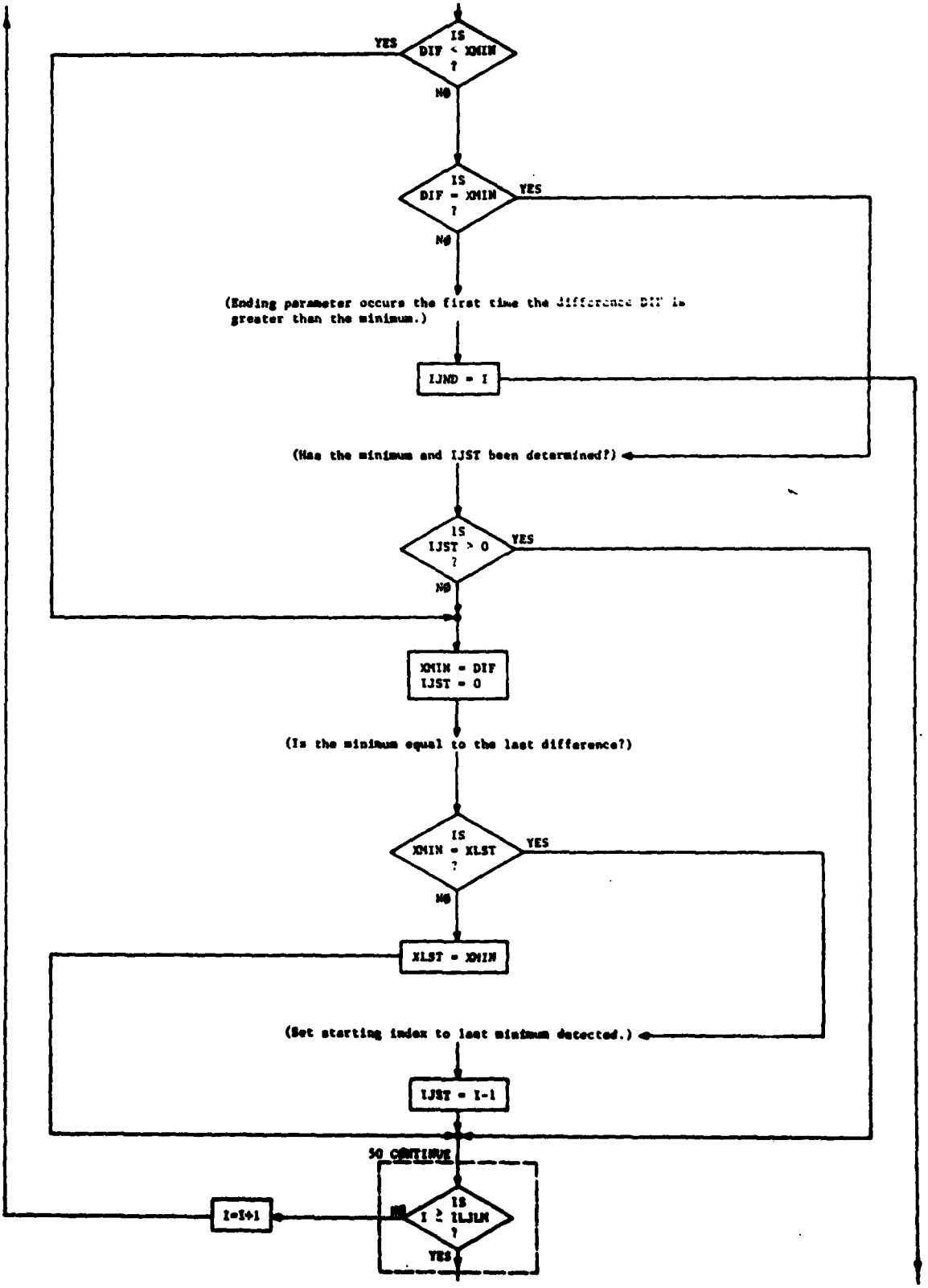


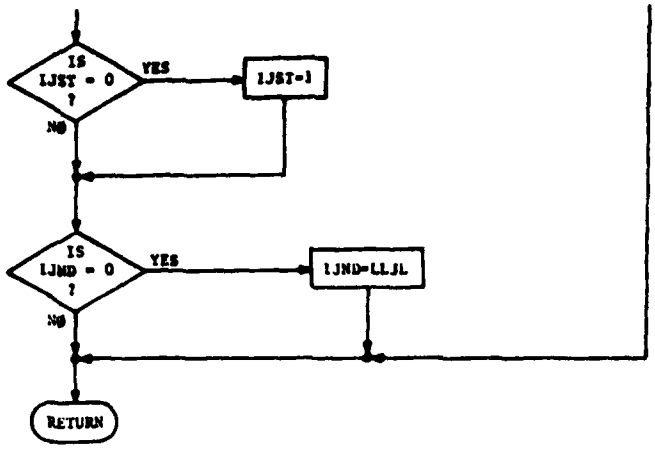


D.5 SUBROUTINE MISC(IJST,IJND,XY,LLJL,LLJLM)

Subroutine MISC determines the starting and ending indices on the x or y axis that determines the area within the grid over which uniform grid spacing occurs. These parameters IJST and IJND for both axes are output to the save tape for plotting of the grid dependent parameters.

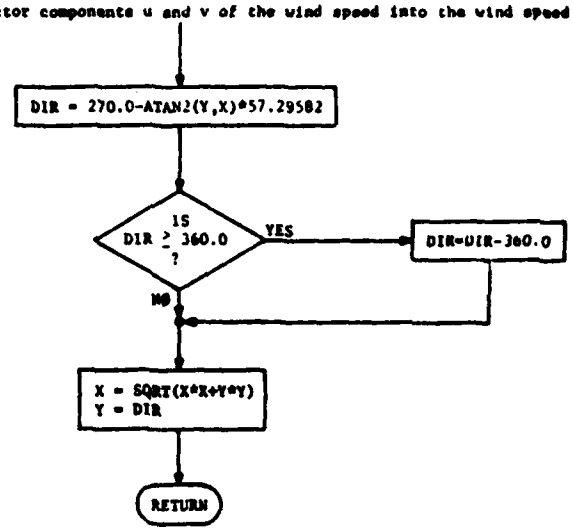



IS DIF < XMIN ?
YES
NO
IS DIF = XMIN ?
YES
NO
(Ending parameter occurs the first time the difference DIF is greater than the minimum.)
IJND = I
(Has the minimum and IJST been determined?)
IS IJST > 0 ?
YES
NO
XMIN = DIF
IJST = 0
(Is the minimum equal to the last difference?)
IS XMIN = XLST ?
YES
NO
XLST = XMIN
(Set starting index to last minimum detected.)
IJST = I-1
50 CONTINUE
IS I ≥ ILJM ?
NO
YES
I=I+1



D.6 SUBROUTINE UVDIR(X,Y)

Subroutine UVDIR converts the vector components u and v of the wind speed into the wind speed and direction.



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13. ABSTRACT

This report describes the development and documentation of a computer algorithm, containing a two-dimensional shallow-fluid model, for calculating the wind field above complex terrain. The optimum finite-differencing procedure employed for numerical solutions of the algorithm is a Lax-Wendroff scheme using the grid points and two time levels in combination with a nine-point low-pass filter.

A comprehensive computational program, using an isolated symmetrical mountain, was carried out to provide guidelines as to the nature of two-dimensional solutions of the shallow-fluid equations for the wide variety of initial conditions encountered in the atmosphere. The results showed that the flow patterns could be divided into four major categories: Subcritical without hydraulic jumps; supercritical without upstream waves; critical with hydraulic jumps and wind-direction reversals; critical with hydraulic jumps but without wind-direction reversals. For the subcritical and supercritical flows, initialization procedures do not appear to pose a problem. For the critical flows, care must be taken in the selection of initialization procedures.

Comparisons of calculated wind field patterns with recent detailed observations of wind circulations above complex terrain show excellent qualitative agreement in the limited cases available for analysis. Additionally, the computer algorithm for the two-dimensional model, when applied to the terrain at White Sands Missile Range, gave results that were consistent with the limited observations available for two example situations. The computer program containing the two-dimensional shallow-fluid model, written in Fortran V language and designed for use on a UNIVAC 1108 machine, is fully documented in the appendices to the report.

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
1. Mesoscale Model						
2. Shallow-Water Equations						
3. Wind Flow						
4. Complex Terrain						
5. Computer Calculations						


7-8
DTIC