

# NASA Contractor Report 3647

## Program Listing for the REEDM (Rocket Exhaust Effluent Diffusion Model) Computer Program

J. R. Bjorklund, R. K. Dumbauld,  
C. S. Cheney, and H. V. Geary

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**NASA**

Computer Program  
Effluent Diffusion Model  
KEMDM (Rocket Exhaust  
Program Listing for the

J. K. Bjorklund, R. K. Dumbauld,  
J. E. Gentry, and H. F. Gentry

CONTRACTOR REPORT  
NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION

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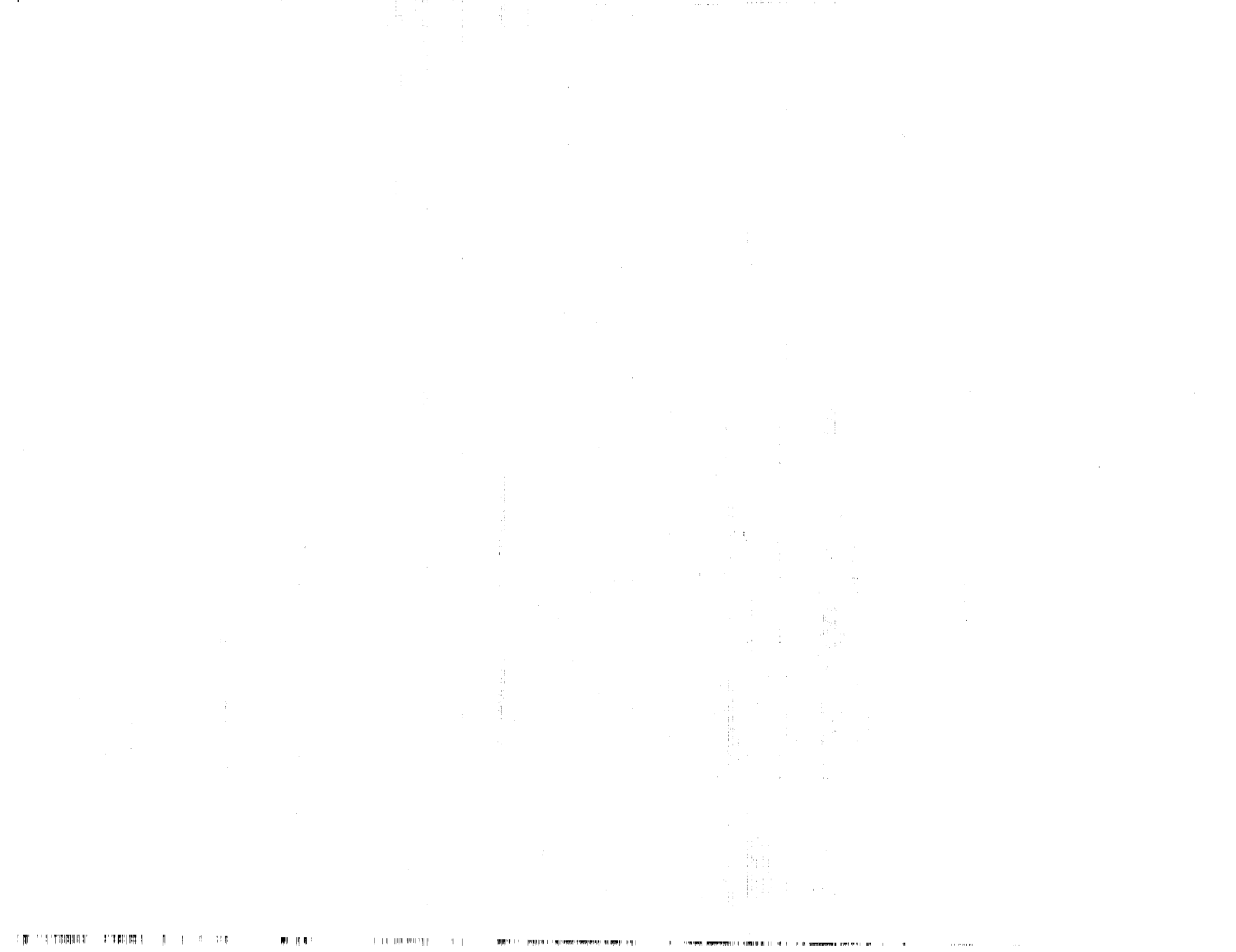
J. R. Bjorklund, R. K. Dumbauld,  
C. S. Cheney, and H. V. Geary  
*H. E. Cramer Company, Inc.*  
*Salt Lake City, Utah*

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Information Branch

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## FOREWORD

This final report is submitted to the Atmospheric Sciences Division, Space Science Laboratory, Marshall Space Flight Center, in partial fulfillment of the requirements of Contract No. NAS8-34132.

This report contains a listing of the REEDM computer program. The program was designed for and is operational on Hewlett Packard HP1000 Multiprogramming Systems at the Atmospheric Sciences Division, Space Science Laboratory, NASA/Marshall Space Flight Center; at NASA/Kennedy Space Center; and at H. E. Cramer Company, Inc.

A description of the models, model input parameters, user's instructions for the program, and worked example problems are contained in NASA CR-3646.

The H. E. Cramer Company, Inc. is indebted to Mr. Joseph C. Sloan and Dr. Briscoe Stephens of the Atmospheric Sciences Division at MSFC for technical guidance and helpful suggestions in the development of the REEDM program and in the design of output formats. Mr. Norman Reavis, Atmospheric Sciences Division, MSFC, and Mr. Joseph Parker, KSC, assisted in the implementation of the programs at MSFC and KSC.

REEDM SOURCE MODULE &REEDM

```

FTN4
PROGRAM REEDM(3,200)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C*****
C
C MAIN MODULE OF ROCKET EXHAUST EFFLUENT DIFFUSION ANALYSIS
C (MULTI-LAYER) PROGRAM
C
C*****
C
C TO REPORT PROGRAM ERRORS - CALL JAY R. BJORKLUND (801) 581-0220
C H.E. CRAMER CO. INC., SALT LAKE CITY, UTAH.
C
C*****
C
C THIS PROGRAM REQUIRES THE PROGRAM SEGMENTS READM, REDAM, RDATM,
C RCLDM, RDHMM, RCONM, RCNOM, RPDPM, RGDPM, RGPDM, RCIMM ALONG
C WITH THE MAIN REEDM PROGRAM FOR EXECUTION.
C
C THE REEDM SOURCE PROGRAMS ARE - &REEDM, &READM, &REDAM, &RDATM,
C &RDATN, &RCLDM, &RCLDN, &RMMRM, &RMMRN, &RDHMM, &RCONM, &RCNOM,
C &RCONN, &RPDPM, &RPDPN, &RGDPM, &RGPDM, &RGDPN, &RSUBM, &RCIMM,
C AND &RCIMN.
C
C*****
C
C ***** PREPARING PROGRAM FOR EXECUTION *****
C
C :TR,/RMAS,1G,2G,3G,4G
C
C The above command compiles the source code of REEDM where "1G"
C through "4G" respectively correspond to the FORTRAN compiler
C (FTN4 or FTN4X) options two through five.
C
C
C :TR,/RMLD,1G
C
C The above command loads the REEDM program for execution. Option
C "1G" is a logical unit number to which the load map listing is
C sent.
C
C
C :TR,/RMRP,SP,2G,3G
C
C Optionally, the above command may be used to save the REEDM
C program as a type 6 file on disc. The desired disc cartridge
C number is specified on option "2G". Transfer file ¼RMRP has
C other options which are described in the transfer file comments.

```

C			S0100500
C			S0100510
C	*****	PROGRAM EXECUTION	*****S0100520
C			S0100530
C		:RU, REEDM, 1G, 2G, 3G, 4G, 5G	S0100540
C			S0100550
C		The above command schedules REEDM where the user may pass upto	S0100560
C		five logical unit numbers having the following definitions:	S0100570
C			S0100580
C		1G - Input data logical unit number. This number is usually	S0100590
C		(as is the default) the terminal from which the user	S0100600
C		has scheduled the program. The user may enter a non-	S0100610
C		terminal number for "1G". In this case the program	S0100620
C		assumes a batch mode-type run which is discussed below.	S0100630
C		Moreover, if "1G" is set to 98 or 99, plot forms are	S0100640
C		generated. Refer to a section below for a discussion	S0100650
C		of this option.	S0100660
C		2G - Print output logical unit number. This number is	S0100670
C		usually the printer (logical unit 6).	S0100680
C		3G - Meteorological profile plot logical unit number. This	S0100690
C		number defaults to 12.	S0100700
C		4G - Maximum centerline profile plot logical unit number.	S0100710
C		5G - Isopleth plot logical unit number.	S0100720
C			S0100730
C			S0100740
C	*****	BATCH MODE PROGRAM EXECUTION	*****S0100750
C			S0100760
C		:RU, REEDM, 1G, 2G, 3G, 4G, 5G	S0100770
C			S0100780
C		As mentioned above if the first logical unit number passed in	S0100790
C		the program execution command ("1G") is not a terminal unit then	S0100800
C		the program executes in a batch mode. All input data required	S0100810
C		to execute the program are read from the entered logical unit	S0100820
C		number.	S0100830
C		In this mode, preparation of an input data file is necessary	S0100840
C		before scheduling the program. For example, if the input data	S0100850
C		file exists on magnetic tape that has been positioned to the	S0100860
C		correct file and is on tape drive unit 8 then "1G" may be set	S0100870
C		to 8 in the program execution command. Or if, for example,	S0100880
C		the input data exists on a disc file, the disc file must first	S0100890
C		be associated with a valid logical unit number by using the	S0100900
C		File Manager "SL" command (:SL,50,"file name"). Then set "1G"	S0100910
C		to the associated logical unit number (50) in the program	S0100920
C		execution command.	S0100930
C		The batch mode has no user interaction except in special cases.	S0100940
C		As noted in the discussion of input data records 18 through 22	S0100950
C		described in the next section, the user may indicate in the	S0100960
C		input data file that user interaction is desired. In these	S0100970
C		special cases the program prompts the user for input in the same	S0100980
C		manner as the interactive mode. When the program or user is	S0100990
C		done with that portion of input, the program returns to the	S0101000
C		input data file for input and resumes the batch mode.	S0101010

C	The following section is a description of the content, format	S0101020
C	and order of data expected in the input data file for batch mode	S0101030
C	execution.	S0101040
C		S0101050
C		S0101060
C	***** PLOT FORM GENERATOR PROGRAM EXECUTION *****	S0101070
C		S0101080
C	:RU,REEDM,98or99,,3G,4G	S0101090
C		S0101100
C	When 98 or 99 is passed in the first parameter ("1G") of the	S0101110
C	program execution command, REEDM enters a plot form generator	S0101120
C	mode. No model calculations or other processing is performed	S0101130
C	in this mode. Upon exit of this mode the program terminates.	S0101140
C	If the user enters 98 for "1G", the program will plot the	S0101150
C	meteorological profile form on the plot unit specified in	S0101160
C	parameter "3G" (default is 12). The program prompts the user	S0101170
C	to ready the plot device before plotting. Upon completion of	S0101180
C	plotting a form, the program again prompts the user to plot	S0101190
C	another form or stop.	S0101200
C	If the user enters 99 for "1G", the program will plot the	S0101210
C	maximum centerline form on the plot unit specified in parameter	S0101220
C	"4G". Again, the program prompts the user to ready the plot	S0101230
C	device, re-plot the form or stop.	S0101240
C		S0101250
C		S0101260
C	***** BATCH MODE INPUT PARAMETERS *****	S0101270
C		S0101280
C		S0101290
C	C*RECORD 01 (A2)	S0101300
C		S0101310
C	RUN TYPE - Enter "O" for operational and "P" for production run	S0101320
C	types. A blank record defaults to operational.	S0101330
C	Note that the batch mode does not allow a research	S0101340
C	run type.	S0101350
C		S0101360
C	C*RECORD 02 (3A2)	S0101370
C		S0101380
C	FILE NAME - Enter the meteorological data sounding file name.	S0101390
C	A blank record defaults to file name "RRSOND".	S0101400
C	If TAPE## is entered, the program assumes it is	S0101410
C	to read the sounding data from magnetic tape unit	S0101420
C	lu 8 in the KSC65 format starting at the sounding	S0101430
C	number given by ##.	S0101440
C		S0101450
C	C*RECORD 03 (*) This record is entered only for production ("P") runs.	S0101460
C		S0101470
C	NUMBER OF RUNS - Enter a value for the number of data cases to	S0101480
C	be processed under the production run type.	S0101490
C	Default is 1. The program assumes you have	S0101500
C	stacked this number of sounding data sets on	S0101510
C	file or magnetic tape and produces calculations	S0101520
C	for the specified number of data sets.	S0101530



C		S0101540
C	C*RECORD 04 (A2)	S0101550
C		S0101560
C	MODEL - Enter "C" for the concentration/dosage, "W" for the	S0101570
C	washout deposition and "G" for the gravitational	S0101580
C	deposition models. A blank record defaults to the	S0101590
C	concentration/dosage model.	S0101600
C		S0101610
C		S0101620
C	C*RECORD 05 (I4,1X,R1,A2,1X,I2,1X,A2,A1,1X,I4)	S0101630
C		S0101640
C	LAUNCH DATE - Enter the launch time and date. A blank record	S0101650
C	defaults to the date given on record 5 of data	S0101660
C	file ?LTIME. If data file ?LTIME does not exist,	S0101670
C	the default is the current time and date. Enter	S0101680
C	a four-digit hour, three-character time zone,	S0101690
C	two-digit day of the month, three-character month	S0101700
C	and four-digit year, where each item is separated	S0101710
C	by one blank space.	S0101720
C		S0101730
C		S0101740
C	C*RECORD 06 (A2)	S0101750
C		S0101760
C	LAUNCH VEHICLE - Enter "S" for Space Shuttle, "T" for Titan,	S0101770
C	"D2" for Delta 2914, and "D3" for Delta 3914	S0101780
C	vehicles. A blank record defaults to the	S0101790
C	Space Shuttle vehicle.	S0101800
C		S0101810
C		S0101820
C	C*RECORD 07 (A2)	S0101830
C		S0101840
C	LAUNCH TYPE - Enter "N" for normal, "S" for single engine,	S0101850
C	and "C" for conflagration launch types. A	S0101860
C	blank record defaults to a normal launch type.	S0101870
C		S0101880
C		S0101890
C		S0101900
C		S0101910
C		S0101920
C		S0101930
C		S0101940
C	C*RECORD 09 (12A2) This record is entered only for the concentration/	S0101950
C	dosage ("C") or washout deposition ("W") models.	S0101960
C		S0101970
C		S0101980
C	SPECIES - Enter "H" for HCl, "A" for Al2O3, "C2" for CO2, and	S0101990
C	"C" for CO species. Note that the CO2 and CO species	S0102000
C	applicable only to the concentration/dosage model.	S0102010
C	A blank record defaults to the HCl species.	S0102020
C		S0102030
C		S0102040
C	C*RECORD 10 (A2)	S0102050
C		
C	COMPLEX NUMBER - Enter the launch complex number. A blank record	
C	defaults to a number depending on the launch	

C	vehicle specified in record 6.	S0102060
C		S0102070
C*	RECORD 11 (A2) OR (*) This record is entered only for the	S0102080
C	concentration/dosage model.	S0102090
C		S0102100
C	CALCULATION HEIGHT - Enter "S" for surface and "ST" for cloud	S0102110
C	stabilization calculation heights.	S0102120
C	Additionally, the user may enter a value	S0102130
C	for the calculation height in meters.	S0102140
C	A zero value or blank record defaults to	S0102150
C	a surface calculation height.	S0102160
C		S0102170
C*	RECORD 12 (A2)	S0102180
C		S0102190
C	CLOUD SHAPE - Enter "E" for elliptical and "S" for spherical	S0102200
C	cloud shapes. A blank record defaults to an	S0102210
C	elliptical cloud shape.	S0102220
C		S0102230
C**	Note: Records 13 through 16 are entered only when the washout	S0102240
C**	deposition ("W") model is selected in record 4.	S0102250
C		S0102260
C*	RECORD 13 (A2)	S0102270
C		S0102280
C	MAXIMUM OR TIME-DEPENDENT - Enter "M" for maximum possible and	S0102290
C	"T" for time dependent washout	S0102300
C	deposition calculations. A blank	S0102310
C	record defaults to the maximum	S0102320
C	possible washout deposition.	S0102330
C		S0102340
C*	RECORD 14 (A2) OR (*)	S0102350
C		S0102360
C	RAINFALL RATE - Enter "H" for heavy (0.3), "M" for moderate (0.2)	S0102370
C	and "L" for light (0.1) rainfall rates in inches	S0102380
C	per hour. Additionally, the user may enter a	S0102390
C	value for the desired rainfall rate. A zero	S0102400
C	value or blank record defaults to a heavy	S0102410
C	rainfall rate.	S0102420
C		S0102430
C*	RECORD 15 (*) This record is entered only for time-dependent	S0102440
C	washout deposition.	S0102450
C		S0102460
C	TIME - Enter the time in seconds the rain starts after the	S0102470
C	launch. A blank record defaults to zero seconds.	S0102480
C		S0102490
C*	RECORD 16 (*)	S0102500
C		S0102510
C	RAIN DURATION - Enter the duration of the rain in hours after	S0102520
C	the launch. A blank record defaults to one	S0102530
C	hour.	S0102540
C		S0102550
C**	Note: For a production run type, specified in record 1, sets of	S0102560
C**	records 17 through 20 must be entered. The number of sets	S0102570

C**	equals the number of runs specified in record 3.	S0102580
C		S0102590
C*RECORD 17	(A2)	S0102600
C		S0102610
C	PLOT MET. PROFILE - Enter "Y" or "YE" for yes and "N" or "NO"	S0102620
C	for no regarding whether or not the meteor-	S0102630
C	ological profile is to be plotted.	S0102640
C	Enter "F" to indicate yes and to plot the	S0102650
C	profile form. This is the portion of the	S0102660
C	plot that is independent of the sounding	S0102670
C	data. A blank record defaults to yes with	S0102680
C	no form plotted.	S0102690
C		S0102700
C*RECORD 18	(A2)	S0102710
C		S0102720
C	BOUNDARY LAYERING - Because the default boundary layers values	S0102730
C	are not known apriori, enter "Y" or "YE" to	S0102740
C	display the default boundary layers values	S0102750
C	and interactively modify the values. Any	S0102760
C	other entry for this record causes the	S0102770
C	program to use the default boundary layers	S0102780
C	values.	S0102790
C		S0102800
C*RECORD 19	(A2)	S0102810
C		S0102820
C	SIGMA(A) - Because the default SIGMA(A) value is not known	S0102830
C	apriori, enter "A" to display the default SIGMA(A)	S0102840
C	value and interactively modify the value. Any	S0102850
C	other entry for this record causes the program to	S0102860
C	use the default SIGMA(A) value.	S0102870
C		S0102880
C*RECORD 20	(A2)	S0102890
C		S0102900
C	SIGMA(E) - Because the default SIGMA(E) value is not known	S0102910
C	apriori, enter "A" to display the default SIGMA(E)	S0102920
C	value and interactively modify the value. Any	S0102930
C	other entry for this record causes the program to	S0102940
C	use the current value of SIGMA(A) for SIGMA(E).	S0102950
C		S0102960
C**	Note: For a production run type, specified in record 1,	S0102970
C**	records 21, 22, 25 and 26 are not entered.	S0102980
C		S0102990
C*RECORD 21	(A2)	S0103000
C		S0103010
C	PLOT MAX. CENTERLINE - Enter "Y" or "YE" for yes and "N" or "NO"	S0103020
C	for no regarding whether or not the	S0103030
C	maximum centerline result values are to	S0103040
C	be plotted. Enter "F" to indicate yes	S0103050
C	and to plot the maximum centerline form.	S0103060
C	This is the portion of the plot that is	S0103070
C	independent of the calculated results.	S0103080
C	A blank record defaults to yes with no	S0103090

C		form plotted.	S0103100
C		Note: All plot options are interactive	S0103110
C		with the user.	S0103120
C			S0103130
C	C*RECORD 22 (A2)		S0103140
C			S0103150
C	PLOT ISOPLETHS -	Enter "y" or "YE" for yes and "N" or "NO" for	S0103160
C		no regarding whether or not the isopleths of	S0103170
C		the results are to be plotted. A blank record	S0103180
C		defaults to yes.	S0103190
C		Note: All plot options are interactive with	S0103200
C		the user.	S0103210
C			S0103220
C	C*RECORD 23 (A2)		S0103230
C			S0103240
C	DISCRETE RECEPTORS -	Enter "y" or "YE" or a logical unit number	S0103250
C		for yes and "N" or "NO" for no regarding	S0103260
C		regarding whether or not to make calcula-	S0103270
C		tions at user-entered discrete receptor	S0103280
C		locations. If a logical unit number is	S0103290
C		entered, the discrete receptor locations	S0103300
C		are read from that number. A blank record	S0103310
C		defaults to yes.	S0103320
C			S0103330
C	C*RECORD 24 (*)	This record is entered only if a yes response is	S0103340
C		given in record 23.	S0103350
C		Note: This record is repeated until a negative	S0103360
C		value is entered for the first parameter (RANGE)	S0103370
C		or upto a maximum of 60 times, whichever occurs	S0103380
C		first.	S0103390
C			S0103400
C	RANGE -	Enter the distance from the launch pad to the discrete	S0103410
C		receptor location in meters.	S0103420
C	BEARING -	Enter the bearing in degrees the discrete receptor	S0103430
C		is located with respect to North.	S0103440
C	HEIGHT -	Enter the height of the discrete receptor in meters	S0103450
C		(calculation height). Note: This parameter is entered	S0103460
C		only for the concentration/dosage model.	S0103470
C	COMMENTS -	Enter any comment information desired in input columns	S0103480
C		31 through 50. This information is printed on the	S0103490
C		output listing. Default is all blank.	S0103500
C			S0103510
C	C*RECORD 25 (A2)	This record is entered only for the concentration/	S0103520
C		dosage model.	S0103530
C			S0103540
C	CALCULATION HEIGHT -	Enter "y" or "YE" for yes and "N" or "NO"	S0103550
C		for no regarding whether or not to change	S0103560
C		the calculation height. For a yes response	S0103570
C		follow this record with a calculation	S0103580
C		height value and re-enter records 17	S0103590
C		through 24. A blank record defaults to yes.	S0103600
C			S0103610

C*RECORD 26 (A2)	This record is entered only for the washout	S0103620
C	deposition model.	S0103630
C		S0103640
C	WASHOUT DEP. CALCULATION - Enter "Y" or "YE" for yes and "N" or	S0103650
C	"NO" for no regarding whether or not	S0103660
C	to change the washout deposition	S0103670
C	calculations to maximum possible or	S0103680
C	time-dependent. For a yes response	S0103690
C	re-enter records 13, 15 (if	S0103700
C	applicable) and 17 through 24	S0103710
C	following this record. A blank	S0103720
C	record defaults to yes.	S0103730
C		S0103740
C*RECORD 27 (A2)		S0103750
C		S0103760
C	ANOTHER CASE - Enter "Y" or "YE" for yes and "N" or "NO" for no	S0103770
C	regarding whether or not to process another	S0103780
C	meteorological data case. For a yes response	S0103790
C	follow this record with another set of data	S0103800
C	input parameters beginning at record 1.	S0103810
C	Otherwise, the REEDM program terminates.	S0103820
C	A blank record defaults to yes.	S0103830
C		S0103840
C		S0103850
C*****	UPDATE 8213 INFORMATION	*****S0103860
C		S0103870
C		S0103880
C	This update replaces all previous updates of the REEDM programs	S0103890
C	and is not compatible with any previous updates. The following	S0103900
C	is a summary of the program changes from the previous update 8150.	S0103910
C		S0103920
C	The program now exists as a segmented program - one main program	S0103930
C	with twelve segments. The previous versions consisted of	S0103940
C	several independent programs. This change eliminates the need	S0103950
C	for a disc file containing the common information being passed	S0103960
C	among the programs.	S0103970
C		S0103980
C	Gravitational deposition results are calculated in particles per	S0103990
C	square meter in addition to the milligrams per square meter units.	S0104000
C	Moreover, for research type runs the particles calculated are	S0104010
C	printed for each settling category.	S0104020
C		S0104030
C	The default launch time and date are now on record 1 of file	S0104040
C	?LTIME rather than record 5 of ?R50CR or ?R50TY. Files ?R50CR	S0104050
C	and ?R50TY are not longer used (see record 05 above).	S0104060
C		S0104070
C	The maximum number of discrete receptors is 60 instead of 20.	S0104080
C		S0104090
C	The discrete receptor locations may be read by the program from	S0104100
C	a logical unit number specified by the user. In addition to	S0104110
C	entering "yes" or "no" in response to the calculation of discrete	S0104120
C	receptors prompt, the user may also enter a logical unit number.	S0104130

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C      In this case the program will read all discrete receptor loca-      S0104140
C      tions from the logical unit number entered.  The program will      S0104150
.
.      TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),      S0104480
.      FS(20),MDLNAM(12),DBAR(20)      S0104490
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES      S0104500
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,      S0104510
.      MODEL4,MODEL5,MODEL6      S0104520
INTEGER RUNNUM,RT,CL,CS      S0104530
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,OC,QT,HEAT,ZM,H,      S0104540
.      DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,      S0104550
.      SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP      S0104560
.      ,MIXING,MAXDEP,LAYBOT(3)      S0104570
.      ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,      S0104580
.      ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),      S0104590
.      MINUS1,MINUS9,MINS1,MINS9,      S0104600
.      MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,      S0104610
.      RT(24),TPROPC,IDXRT      S0104620
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.      S0104630
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,      S0104640
.      TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,      S0104650
.      CLRLNE,INSLNE,DELNE      S0104660
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),      S0104670
.      INVNDR(2),ULINE(2),      S0104680
.      TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,      S0104690
.      CLRLNE,INSLNE,DELNE,      S0104700
.      IESCAJ(3),NULL,IBLNK,      S0104710
.      IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)      S0104720
C-----VEHICLE PARAMETERS      S0104730
COMMON /VCLPR/ VPAR(17)      S0104740
C-----TIME PARAMETERS      S0104750
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,      S0104760
.      LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)      S0104770
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)      S0104780
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),      S0104790
.      RH(30),PTEMP(30),SIGEP(30),SIGAP(30)      S0104800
C-----LAYER PARAMETERS      S0104810
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),      S0104820
.      SIGYO(29)      S0104830
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)      S0104840
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)      S0104850
C-----CALCULATED NEW LAYER PARAMETERS      S0104860
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),      S0104870
.      SPEEDN(32)      S0104880
C-----CONVERSION FACTORS      S0104890
COMMON /CNVRT/ QCONV(4),QPDEPH      S0104900
C      S0104910
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S0104920
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)      S0104930
C-----READ/WRITE BUFFER      S0104940
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S0104950
C*****S0104960

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20	CONTINUE	S0105490
	IF (IFRMT(2) .LT. 0) IPAR(2) = IABS(IFRMT(2))	S0105500
C		S0105510
	ICU = 0	S0105520
	NCU = LOGLU(ICU)	S0105530
	CRT = .FALSE.	S0105540
	DO 30 I = 1,10	S0105550
30	IF(ICU .EQ. CRTARA(I)) CRT = .TRUE.	S0105560
	IF (IFRMT(2) .LT. 0) CRT = .FALSE.	S0105570
	IF (ICU .LT. 0.OR.ICU .GT. 15) ICU = NCU	S0105580
	IF(CRT) GOTO 50	S0105590
	DO 40 I = 1,28	S0105600
40	ALTSET(I) = NULL	S0105610
	TAB = 40B	S0105620
	TAB2 = NULL	S0105630
C*	CHECK FOR PLOT FORM GENERATION.	S0105640
50	IF(IIU .NE. 98) GOTO 60	S0105650
	I1 = IPU1	S0105660
	I2 = 4	S0105670
	GOTO 70	S0105680
60	IF(IIU .NE. 99) GOTO 80	S0105690
	I1 = IPU2	S0105700
	I2 = 10	S0105710
70	NNNEST = 5	S0105720
	CALL LOADS(I2,0,0,I1,0,BATCH)	S0105730
80	CONTINUE	S0105740
C*	CHECK FOR BATCH MODE DATA INPUT.	S0105750
	BATCH = IFTTY(IIU) .EQ. 0	S0105760
C		S0105770
C		S0105780
90	NNNTRY = 1	S0105790
	IERROR(1) = 0	S0105800
	GOTO 130	S0105810
C		S0105820
C****	CHECK FOR UNRECOVERABLE ERROR (NEGATIVE),	S0105830
C****	NORMAL RETURN (ZERO) OR	S0105840
C****	RESTART CONDITION (POSITIVE).	S0105850
C		S0105860
100	CONTINUE	S0105870
	IF(IERROR(1)) 110,120,90	S0105880
110	NNNTRY = 7	S0105890
	GOTO 140	S0105900
C		S0105910
C****	DETERMINE PROGRAM CALL LEVEL DEPTH (NNNEST).	S0105920
C		S0105930
120	CONTINUE	S0105940
	GOTO (130,150,220,280,330,140), NNNEST	S0105950
C		S0105960
C***	LOAD SEGMENT READM (NNNEST = 1).	S0105970
C		S0105980
130	CALL LOADS(1,0,0,0,0,BATCH)	S0105990
140	CALL LOADS(13,0,0,0,0,BATCH)	S0106000



C		S0106010
C***	LOAD ONE OF THE SEGMENTS SCHEDULED BY READM (NNNEST = 2).	S0106020
C		S0106030
150	CONTINUE	S0106040
	IF(NNNTRY .LT. 5) GOTO 210	S0106050
	IF(NNNTRY .NE. 5) GOTO 170	S0106060
C*	DETERMINE IF EXHAUST CLOUD CAN BE PLOTTED.	S0106070
	IF(GOOD .NE. 1) GOTO 160	S0106080
	NNNEST = 2	S0106090
	LLNTRY = 6	S0106100
	GOTO 210	S0106110
160	NNNTRY = 6	S0106120
170	IF(NNNTRY .NE. 6) GOTO 200	S0106130
	IF(BATCH) GOTO 190	S0106140
C*	CONTINUE WITH MODEL CALCULATIONS?	S0106150
	WRITE(ICU,9004) INVNDR,INV,OFF,ULINE,OFF	S0106160
	INPT1 = IBLNK	S0106170
	READ(IIU,9001) INPT1	S0106180
	WRITE(ICU,9002) IESCAJ	S0106190
	IF (INPT1 .EQ. INJ.OR.INPT1 .EQ. INOJ) GO TO 90	S0106200
	IF (INPT1.EQ.MINUS1 .OR. INPT1.EQ.MINUS9) GOTO 90	S0106210
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 180	S0106220
	WRITE (ICU,9003) INV,OFF,20,4	S0106230
	GO TO 170	S0106240
180	WRITE(ICU,9008) INV,OFF	S0106250
C*	GOTO MODEL SEGMENT.	S0106260
190	NNNTRY = MODEL + 2	S0106270
	LLNTRY = 0	S0106280
	GOTO 210	S0106290
C*	RETURN TO MODEL SEGMENT AFTER PLOTTING.	S0106300
200	NNNTRY = MODEL + 5	S0106310
	LLNTRY = 0	S0106320
210	CALL LOADS(NNNTRY,LLNTRY,1,0,0,BATCH)	S0106330
C		S0106340
C***	LOAD A SEGMENT SCHEDULED BY A SEGMENT IN LEVEL 2 (NNNEST = 3).	S0106350
C		S0106360
220	CONTINUE	S0106370
	IF(NNNTRY .LT. 4) GOTO 270	S0106380
	IF (IRUN .EQ. 1) GO TO 200	S0106390
	I2 = IFJ	S0106400
C*	PLOT MAXIMUM CENTERLINE?	S0106410
	IF(NNNTRY .NE. 4) GOTO 250	S0106420
230	IF(.NOT.BATCH)WRITE(ICU,9005) CURSUP,DELIN,INVNDR,INV,OFF,ULINE,	S0106430
	*OFF	S0106440
	INPT1 = IBLNK	S0106450
	READ(IIU,9001) INPT1	S0106460
	IF(INPT1 .EQ. MINUS9 .OR. INPT1 .EQ. MINUS1) GOTO 90	S0106470
	WRITE(ICU,9002) IESCAJ	S0106480
	IF(INPT1 .EQ. INJ .OR. INPT1 .EQ. INOJ) GOTO 250	S0106490
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 240	S0106500
	WRITE (ICU,9003) INV,OFF,21,0	S0106510
	GO TO 230	S0106520

240	NNNTRY = 4	S0106530
	LLNTRY = 7	S0106540
	GOTO 270	S0106550
C*	PLOT ISOPLETHS?	S0106560
250	IF(.NOT.BATCH) WRITE(ICU,9006) INVNDR,INV,OFF,ULINE,OFF	S0106570
	INPT1 = IBLNK	S0106580
	READ(IIU,9001) INPT1	S0106590
	IF(.NOT.BATCH) WRITE(ICU,9002) IESCAJ	S0106600
	IF(INPT1 .EQ. INJ .OR. INPT1 .EQ. INOJ) GOTO 200	S0106610
	IF(BATCH) GOTO 260	S0106620
	IF(INPT1 .EQ. MINUS1) GOTO 230	S0106630
	IF(INPT1 .EQ. MINUS9) GOTO 90	S0106640
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 260	S0106650
	WRITE (ICU,9003) INV,OFF,22,0	S0106660
	GO TO 250	S0106670
260	LLNTRY = MODEL + 5	S0106680
	NNNEST = 2	S0106690
	NNNTRY = 6	S0106700
270	CONTINUE	S0106710
	CALL LOADS(NNNTRY,LLNTRY,2,IPU2,I2,BATCH)	S0106720
C		S0106730
C***	LAST LEVEL (NNNEST = 4). CALL MET. PROFILE PLOT FORM	S0106740
C***	GENERATOR OR PLOT SOUNDING DATA.	S0106750
C		S0106760
280	CONTINUE	S0106770
	NNNEST = LLNEST	S0106780
	I2 = IFJ	S0106790
	IF(NNNTRY :NE. 1) GOTO 320	S0106800
	IF(BATCH) GOTO 310	S0106810
	WRITE(ICU,9007) CLRDSP,IPAR(3),INV,OFF,ULINE,OFF	S0106820
290	INPT1 = IBLNK	S0106830
	READ(IIU,9001) INPT1	S0106840
	WRITE(ICU,9002) IESCAJ,IESCAJ	S0106850
	IF(INPT1 .EQ. MINUS1 .OR. INPT1 .EQ. MINUS9) GOTO 90	S0106860
	WRITE(ICU,9002) IESCAJ	S0106870
	NNNTRY = 2	S0106880
	IF (INPT1 .EQ. IBLNK) GO TO 320	S0106890
	IF (INPT1 .EQ. IFJ) GO TO 300	S0106900
	WRITE (ICU,9003) INV,OFF,17,1	S0106910
	WRITE (ICU,9007) IBLNK,IPAR(3),INV,OFF,ULINE,OFF	S0106920
	GO TO 290	S0106930
300	CONTINUE	S0106940
	NNNTRY = 1	S0106950
310	NNNEST = 4	S0106960
320	CONTINUE	S0106970
	LLNTRY = 2	S0106980
	NNNTRY = NNNTRY + 3	S0106990
	CALL LOADS(NNNTRY,LLNTRY,0,IPU1,I2,BATCH)	S0107000
C		S0107010
C***	PROGRAM TERMINATION FROM PLOT FORM GENERATION.	S0107020
C		S0107030
330	CONTINUE	S0107040

STOP	S0107050
C	S0107060
C	S0107070
CF*** FORMAT STATEMENTS.	S0107080
CF	S0107090
9001 FORMAT(40A2)	S0107100
9002 FORMAT (2A2,A1)	S0107110
9003 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC. *,I2,1H.,I1/)	S0107120 S0107130
9004 FORMAT(55H DO YOU WISH TO CONTINUE WITH THE MODEL CALCULATIONS? ( 1 2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_)	S0107140 S0107150
9005 FORMAT(2A2,43H DO YOU WISH TO PLOT MAXIMUM CENTERLINES? ( 1 1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_)	S0107160 S0107170
9006 FORMAT(33H DO YOU WISH TO PLOT ISOPLETHS? ( 1 2A2,1H,,2A2,1HN,2A2,4HO):_)	S0107180 S0107190
9007 FORMAT(A2,51H MOUNT A METEOROLOGICAL PROFILE FORM ON PLOTTER LU , 1I2/32X,2A2,14HSPACE - RETURN,2A2,11H WHEN READY/ 2 32X,6HENTER ,2A2,1HF,2A2,19H TO PLOT THE FORM:_)	S0107200 S0107210 S0107220
9008 FORMAT(1X,2A2,11HPLEASE WAIT,2A2/)	S0107230
END	S0107240

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SUBROUTINE LOADS(NTRY,LTRY,INDEX,IPRAM1,IPRAM2,BATCH)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C
C THIS ROUTINE SCHEDULES THE SEGMENT INDICATED BY THE FORMAL
C ARGUMENT NTRY. NTRY AND INDEX ARE USED TO ACCESS THE ARRAY
C NAMER WHICH CONTAINS THE SEGMENT NAMES.
C IF A SEGMENT WAS NOT SUCCESSFULLY LOADED (IERR = 5), A "WAIT
C UNTIL LOADED LOOP" IS PERFORMED.
C ONCE THE SEGMENT NAME HAS BEEN DETERMINED, THE OLD ENTRY
C POINT IS REPLACED BY THE NEW ONE.
C
C
C
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
. FS(20),MDLNAM(12),DBAR(20)
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
. CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
. INVNDR(2),ULINE(2),
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
. CLRLNE,INSLNE,DELNE,
. IESCAJ(3),NULL,IBLNK,
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
C
C LOGICAL BATCH
C DIMENSION NAMER(3,13),NENTRY(11,2),IMESS(6)
C
C EQUIVALENCE (IIU,IPAR(1)),(IOU,IPAR(2))
DATA NAMER /2HRE,2HAD,1HM,2HRD,2HAT,1HM,2HRC,2HLD,1HM,
1 2HRM,2HMR,1HM,2HRM,2HMR,1HM,2HRC,2HON,1HM,
2 2HRP,2HDP,1HM,2HRG,2HDP,1HM,2HRD,2HHM,1HM,
3 2HRC,2HIM,1HM,2HRC,2HNO,1HM,2HRG,2HPD,1HM,
4 2HRE,2HDA,1HM/
DATA NENTRY /2,3,3,4,5,6,7,8,6,7,8,
1 9,9,9,10,10,10,10,4*0/
DATA IMESS/2HOF,2H , ,3*2H ,2H,8/
C
C

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IF (NTRY .LT. 0) GO TO 80	S0200510
I = 0	S0200520
J = 0	S0200530
IPRAM3 = 1	S0200540
NSEG = NTRY	S0200550
IF(INDEX .GT. 0) NSEG = NENTRY(NTRY,INDEX)	S0200560
IF(LTRY .EQ. 0) GOTO 10	S0200570
IF(NSEG.EQ.10.AND.NTRY.EQ.6.AND.INDEX.EQ.2) IPRAM3 = 2	S0200580
NTRY = LTRY	S0200590
LTRY = 0	S0200600
10 IF (NTRY .EQ. 9.AND.NSEG .EQ. 6) NSEG = 11	S0200610
IF (NTRY .EQ. 11.AND.NSEG .EQ. 8) NSEG = 12	S0200620
IF (NSEG .EQ. 5) IPRAM3 = 2	S0200630
LSTSEG = NSEG	S0200640
LPRAM1 = IPRAM1	S0200650
LPRAM2 = IPRAM2	S0200660
LPRAM3 = IPRAM3	S0200670
20 CONTINUE	S0200680
CALL SEGLD(NAMER(1,NSEG),IERR,IPRAM1,IPRAM2,IPRAM3)	S0200690
I = I+1	S0200700
IF (I .GT. 2) GO TO 30	S0200710
IF (IERR .NE. 5) GO TO 30	S0200720
IF (NTRY .LT. 0) GO TO 20	S0200730
GO TO 10	S0200740
30 IF (BATCH) GO TO 50	S0200750
J = J+1	S0200760
IF (J .GT. 3) GO TO 50	S0200770
WRITE (ICU,9001) INV,(NAMER(L,NSEG),L=1,3),OFF	S0200780
40 WRITE (ICU,9002) INV,(NAMER(L,NSEG),L=1,3),OFF,INV,NAMEP,OFF,INV,	S0200790
*NAMEP,OFF	S0200800
PAUSE	S0200810
IF (NTRY .LT. 0) GO TO 20	S0200820
GO TO 10	S0200830
50 WRITE (IOU,9003) (NAMER(I,NSEG),I=1,3)	S0200840
60 CONTINUE	S0200850
STOP	S0200860
70 RETURN	S0200870
80 NSEG = LSTSEG	S0200880
IPRAM1 = LPRAM1	S0200890
IPRAM2 = LPRAM2	S0200900
IPRAM3 = LPRAM3	S0200910
WRITE (IOU,9004) INV,(NAMER(I,NSEG),I=1,3),OFF,INV,IVERSN,OFF	S0200920
IF (BATCH) GO TO 60	S0200930
WRITE (ICU,9004) INV,(NAMER(I,NSEG),I=1,3),OFF,INV,IVERSN,OFF	S0200940
DO 90 I=1,3	S0200950
90 IMESS(I+2) = NAMER(I,NSEG)	S0200960
I = MESSS(IMESS,12)	S0200970
GO TO 40	S0200980
9001 FORMAT (2A2,41H*** REEDM ERROR 002, CANNOT LOAD SEGMENT ,5A2/)	S0200990
9002 FORMAT (13HEITHER TYPE ',2A2,3HRP,,5A2,22H' UNDER FMGR OR TYPE ',	S0201000
*2A2,3HOF,,3A2,2H,1,2A2,21H' UNDER RTE TO ABORT./6HTYPE ',2A2,	S0201010
*3HGO,,5A2,13H' TO CONTINUE)	S0201020

9003 FORMAT (////42H \*\*\* REEDM ERROR 002, CANNOT LOAD SEGMENT ,3A2) S0201030  
9004 FORMAT (2A2,30H \*\*\* REEDM ERROR 003, SEGMENT ,3A2,25H HAS WRONG UPS0201040  
\*DATE NUMBER,,2A2/2A2,23H MUST BE UPDATE NUMBER ,I4,2A2/) S0201050  
END S0201060

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BLOCK DATA
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
Cç
C****          B E G I N C O M M O N A R E A          ****S0300030
C      04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
.             ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
.             XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
.             IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
.             ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
.             ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)
.             ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
.             TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
.             FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,
.             MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
.             DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
.             SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP
.             ,MIXING,MAXDEP,LAYBOT(3)
.             ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
.             ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
.             MINUS1,MINUS9,MINS1,MINS9,
.             MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
.             RT(24),TPROPC,IDXRT
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
.             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.             CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
.             INVNDR(2),ULINE(2),
.             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.             CLRLNE,INSLNE,DELNE,
.             IESCAJ(3),NULL,IBLNK,
.             IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
C-----VEHICLE PARAMETERS
COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
.             LDAY,IYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
.             RH(30),PTEMP(30),SIGEP(30),SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),

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DATA RT/2H O,2HPE,2HRA,2HTI,2HON,2HAL,	S0301040
.       2H ,2H ,2HRE,2HSE,2HAR,2HCH,	S0301050
.       2H ,2HPR,2HOD,2HUC,2HTI,2HON,	S0301060
.       2H ,2HDI,2HAG,2HNO,2HST,2HIC/	S0301070
DATA CL/2H ,2H ,2H ,2H S,2HUR,2HFA,2HCE,	S0301080
.       2H S,2HTA,2HBI,2HLI,2HZA,2HTI,2HON/	S0301090
DATA CS/2HEL,2HLI,2HPT,2HIC,2HAL,	S0301100
.       2H S,2HPP,2HER,2HIC,2HAL/	S0301110
END	S0301120

	SUBROUTINE IFNBR(IBUF,NCHAR,IER,LU)	S0400000
	DIMENSION IBUF(40),JBUF(80),JCHAR(11)	S0400010
	DATA JCHAR/1H ,1H.,1H.,,1H-,1H+,1HE,1H/,1HO,1H9,1HA,1HZ/	S0400020
	IF (NCHAR .EQ. -1) GO TO 20	S0400030
	IF (NCHAR .LT. 0) GO TO 30	S0400040
	DO 10 I=1,40	S0400050
10	IBUF(I) = JCHAR(I)	S0400060
20	READ (LU,9001) IBUF	S0400070
30	CALL CODE(80)	S0400080
	READ (IBUF,9002) JBUF	S0400090
	IER = 1	S0400100
	N = IABS(NCHAR)	S0400110
	I = ITLOG(L)	S0400120
	IF (I .LT. N) N = I	S0400130
	IF (NCHAR .EQ. -1) N = 4	S0400140
	DO 50 L=1,N	S0400150
	DO 40 I=1,7	S0400160
C	CHECK FOR SPECIAL CHARACTER, PART OF NUMERIC DATA	S0400170
	IF (JBUF(L) .EQ. JCHAR(I)) GO TO 50	S0400180
40	CONTINUE	S0400190
C	CHECK FOR NUMERIC VALUE	S0400200
	IF (JBUF(L) .GE. JCHAR(8).AND.JBUF(L) .LE. JCHAR(9)) GO TO 50	S0400210
	GO TO 80	S0400220
50	CONTINUE	S0400230
	IER = 0	S0400240
	IF (NCHAR .NE. -1) GO TO 80	S0400250
	IER = 1	S0400260
	DO 70 I=6,20	S0400270
	IF (I.EQ.9.OR.I.EQ.12.OR.I.EQ.16) GO TO 70	S0400280
	IF (JBUF(I) .EQ. JCHAR(1)) GO TO 70	S0400290
	IF (I.GE.6.AND.I.LE.8) GO TO 60	S0400300
	IF (I.GE.13.AND.I.LE.15) GO TO 60	S0400310
C	CHECK FOR NUMERIC VALUE	S0400320
	IF (JBUF(I) .GE. JCHAR(8).AND.JBUF(I) .LE. JCHAR(9)) GO TO 70	S0400330
	GO TO 80	S0400340
C	CHECK FOR ALPHABETIC VALUE	S0400350
60	IF (JBUF(I) .GE. JCHAR(10).AND.JBUF(I) .LE. JCHAR(11)) GO TO 70	S0400360
	GO TO 80	S0400370
70	CONTINUE	S0400380
	IER = 0	S0400390
80	RETURN	S0400400
9001	FORMAT (40A2)	S0400410
9002	FORMAT (80A1)	S0400420
	END	S0400430

REEDM SOURCE MODULE & READM

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FTN4
PROGRAM READM(5)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C::::::::::: S0500000
C::::::::::: S0500010
C::::::::::: S0500020
C::::::::::: S0500030
C::::::::::: S0500040
C::: S0500050
C::: S0500060
C::: ORGANIZATION: H. E. CRAMER CO., INC. S0500070
C::: S0500080
C::: WORK FOR: DR. J. B. STEPHENS (ES84) S0500090
C::: S0500100
C::: PROGRAM CODE: REEDM S0500110
C::: S0500120
C::: PROGRAM DESCRIPTION: INPUT USER DATA FOR ROCKET EXHAUST S0500130
C::: EFFLUENT DIFFUSION ANALYSIS S0500140
C::: (MULTI-LAYER) S0500150
C::: S0500160
C::: INPUT: USER SPECIFIED OPTIONS S0500170
C::: S0500180
C::: OUTPUT: PRINTED AND DISPLAYED LISTING OF USER INPUT VALUES S0500190
C::: S0500200
C::::::::::: S0500210
C::::::::::: S0500220
C S0500230
Cc S0500240
C****          B E G I N C O M M O N A R E A          ****S0500250
C 04/02/82 S0500260
C-----MATH PARAMETERS AND CONSTANTS S0500270
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S0500280
C-----INPUT OPTIONS S0500290
REAL LAMBDA S0500300
INTEGER FILE,GOOD,TITLE S0500310
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S0500320
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S0500330
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S0500340
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S0500350
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S0500360
. ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2) S0500370
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S0500380
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S0500390
. FS(20),MDLNAM(12),DBAR(20) S0500400
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S0500410
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S0500420
. MODEL4,MODEL5,MODEL6 S0500430
INTEGER RUNNUM,RT,CL,CS S0500440
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H. S0500450
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S0500460
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S0500470
. ,MIXING,MAXDEP,LAYBOT(3) S0500480
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S0500490

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.          ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),      S0500500
.          MINUS1,MINUS9,MINS1,MINS9,                        S0500510
.          MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S0500520
.          RT(24),TPROPC,IDXRT                               S0500530
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S0500540
      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,           S0500550
.          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S0500560
.          CLRLNE,INSLNE,DELIN                               S0500570
      COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S0500580
.          INVNDR(2),ULINE(2),                              S0500590
.          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S0500600
.          CLRLNE,INSLNE,DELIN                               S0500610
.          IESCAJ(3),NULL,IBLNK,                            S0500620
.          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)         S0500630
C-----VEHICLE PARAMETERS                                   S0500640
      COMMON /VCLPR/ VPAR(17)                               S0500650
C-----TIME PARAMETERS                                    S0500660
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S0500670
.          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)      S0500680
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S0500690
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S0500700
.          RH(30),PTEMP(30),SIGEP(30),SIGAP(30)             S0500710
C-----LAYER PARAMETERS                                   S0500720
      COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S0500730
.          SIGYO(29)                                         S0500740
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)         S0500750
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)             S0500760
C-----CALCULATED NEW LAYER PARAMETERS                    S0500770
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S0500780
.          SPEEDN(32)                                        S0500790
C-----CONVERSION FACTORS                                 S0500800
      COMMON /CNVRT/ QCONV(4),QPDEPH                        S0500810
C                                                         S0500820
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION***** S0500830
      COMMON /EXTRA/   NCOM(1),   NTOTAL(1),   PLUS(900)     S0500840
C-----READ/WRITE BUFFER                                  S0500850
C-----A R R A Y   = 2077 + 1 + 1 + 2 * 900 = 3879 S0500860
C***** S0500870
C                                                         S0500880
C-----EQUIVALENCE STATEMENTS                             S0500890
      EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S0500900
.          ,(IPU2,IPAR(4)),(IPU3,IPAR(5))                   S0500910
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)       S0500920
      EQUIVALENCE (IDCB(1),PLUS(1)),(INPT(1),PLUS(73))     S0500930
C                                                         S0500940
C*****          E N D   O F   C O M M O N   A R E A          ***** S0500950
Cc                                                         S0500960
CF-----INPUT FORMAT STATEMENTS                           S0500970
      9001 FORMAT (40A2)                                     S0500980
      9002 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC. S0500990
.          *,I2,IH.,I2/)                                     S0501000
      9003 FORMAT (2A2,A1)                                  S0501010

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9004 FORMAT (I4,2A2,1X12,1XA2,A1,1X14) S0501020
9005 FORMAT (39H *** REEDM ERROR 004, CANNOT FIND FILE ,7A2) S0501030
9006 FORMAT(20A1) S0501040
9007 FORMAT (41H *** REEDM WARNING 005, CANNOT FIND FILE ,7A2,20H FOR LS0501050
*LAUNCH TIME AND/34H DATE, USING CURRENT TIME AND DATE/) S0501060
9008 FORMAT (44H *** REEDM WARNING 006, UNABLE TO OPEN FILE ,7A2,20H FOS0501070
*R LAUNCH TIME AND/34H DATE, USING CURRENT TIME AND DATE/) S0501080
CF-----OUTPUT FORMAT STATEMENTS S0501090
9009 FORMAT(40H GRAVITATIONAL SETTLING CATEGORIES DATA) S0501100
9010 FORMAT((6X,9(F5.4,1H,),F5.4)) S0501110
9011 FORMAT (1X,32(2H**)/1X,3(2H**),5X,42HNASA/MSFC MULTIPLE LAYER TECS0501120
IHNIQUE - REEDM,5X,3(2H**)/1X,3(2H**),12X,6HUPDATE,I5,14H LOCATIS0501130
2ON ,2A2,12X,3(2H**)) S0501140
9012 FORMAT(1X,3(2H**),5X,42HEnter '-1' to change previous input value.S0501150
1,5X,3(2H**)/1X,3(2H**),5X,44HEnter '-9' to start at beginning of ps0501160
2rogram.,3X,3(2H**)/1X,3(2H**),5X,41HEnter '-9' at beginning to aboS0501170
3rt program.,6X,3(2H**)) S0501180
9013 FORMAT(1X,3(2H**),15X,21HBATCH MODE DATA INPUT,16X,3(2H**)/ S0501190
1 1X,32(2H**)/) S0501200
9014 FORMAT (1X,3(2H**),5X,43Hthe first input option shown is the defaus0501210
11t,4X,3(2H**)) S0501220
9015 FORMAT(48H AVERAGE PARTICLE SIZE DIAMETERS (MICROMETERS) =, S0501230
1 12X,F5.2) S0501240
9016 FORMAT(6H ENTER,I3,47H AVERAGE PARTICLE SIZE DIAMETERS (MICROMETERS0501250
1S):) S0501260
9017 FORMAT(6H ENTER,I3,45H REFLECTION COEFFICIENT (NO REF. = 0) VALUESS0501270
1: ) S0501280
9018 FORMAT(33H FREQUENCY OF OCCURRENCE VALUES =,27X,F5.4) S0501290
9019 FORMAT(6H ENTER,I3,53H FREQUENCY OF OCCURRENCE VALUES (SUM MUST TOS0501300
1TAL 1.0):) S0501310
9020 FORMAT(73H *** REEDM WARNING 007, FREQUENCY OF OCCURRENCE VALUES DS0501320
10 NOT SUM TO 1.0,/35H TYPE "N" - RETURN TO NORMALIZE BY ,F8.5, S0501330
232H OR SPACE - RETURN TO CONTINUE:_) S0501340
9021 FORMAT (1X,32(2H**)/) S0501350
9022 FORMAT (I2,1X,I2,11X,I2,2X,A2,A1,3X,I4) S0501360
9023 FORMAT (78H *** REEDM WARNING 008, A CALCULATION HEIGHT ¶ 5 METERSSS0501370
* WILL PRODUCE ERRONEOUS/18H RESULTS FOR AL203//) S0501380
9024 FORMAT (55H DO YOU WISH TO ENTER A DIFFERENT CALCULATION HEIGHT? (S0501390
*,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S0501400
9025 FORMAT (//////////5A2) S0501410
9026 FORMAT(17H ENTER RUN TYPE (,2A2,1HO,2A2,10HPERATIONAL,2A2,1H,,2A2,S0501420
*1HR,2A2,8HESEARCH,,2A2,1HP,2A2,12HRODUCTION):_) S0501430
9027 FORMAT(2A2,10H RUN TYPE:,43X,6A2) S0501440
9028 FORMAT(38H ENTER METEOROLOGICAL DATA FILE NAME (,7A2,3H):_) S0501450
9029 FORMAT(2A2,31H METEOROLOGICAL DATA FILE NAME:,28X,3A2) S0501460
9030 FORMAT(34H ENTER NUMBER OF RUNS TO BE MADE (,2A2,I2,2A2,3H):_) S0501470
9031 FORMAT(2A2,27H NUMBER OF RUNS TO BE MADE:,34X,I4) S0501480
9032 FORMAT(19H ENTER MODEL TYPE (,2A2,1HC,2A2,17HONCENTRATION/DOS.,2A2S0501490
*,1H,,2A2,1HW,2A2,12HASHOUT DEP.,2A2,1HG,2A2,20HRVITATIONAL DEP.)S0501500
*:_) S0501510
9033 FFORMAT(2A2,12H MODEL TYPE:,29X,12A2) S0501520
9034 FORMAT(29H ENTER LAUNCH TIME AND DATE (,2A2,I4,2A2,1X,I2,1X,A2,A1,S0501530

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*1X,I4,2A2,2H):,23A2,1H_)	S0501540
9035 FORMAT (23H *** REEDM WARNING 009,/ *40H INVALID MONTH ENTERED - PLEASE RE-ENTER,12A2,1H_)	S0501550 S0501560
9036 FORMAT(3A2,22H LAUNCH TIME AND DATE:,23X,I4,2A2,1XI2,1XA2,A1,1XI4)	S0501570
9037 FORMAT(23H ENTER LAUNCH VEHICLE (,2A2,1HS,2A2,6HHUTTLE,2A2,1H,,2A2S0501580 *,1HT,2A2,5HITAN,,2A2,1HD,2A2,4HELTA,2A2,1H2,2A2,4H914,,2A2,1HD,2A2S0501590 *,4HELTA,2A2,1H3,2A2,6H914):_)	S0501600 S0501610
9038 FORMAT(2A2,16H LAUNCH VEHICLE:,35X,7A2)	S0501620
9039 FORMAT(20H ENTER LAUNCH TYPE (,2A2,1HN,2A2,5HORMAL,2A2,1H,,2A2,1HSS0501630 *,2A2,13HINGLE ENGINE,,2A2,1HC,2A2,15HONFLAGRATION):_)	S0501640
9040 FORMAT(2A2,13H LAUNCH TYPE:,38X,7A2)	S0501650
9041 FORMAT(45H ENTER PROPELLANT TEMPERATURE (30 DAY AVG.) (,2A2,F5.2, S0501660 *2A2,10H DEG. C):_)	S0501670
9042 FORMAT(2A2,33H PROPELLANT TEMPERATURE (DEG. C):,24X,F8.2)	S0501680
9043 FORMAT(28H ENTER ONE OR MORE SPECIES (,2A2,1HH,2A2,2HCL,2A2,1H,, S0501690 *2A2,1HA,2A2,5HL203,,2A2,1HC,2A2,1HO,2A2,1H2,2A2,1H,,2A2,1HC,2A2, *4HO):_)	S0501700 S0501710
9044 FORMAT(2A2,9H SPECIES:,32X,12A2)	S0501720
9045 FORMAT(31H ENTRAINMENT PARAMETERS GAMMAX=,F3.2,8H GAMMAY=,F3.2, S0501730 *8H GAMMAZ=,F3.2,9H CHANGE (,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2, *5HES):_)	S0501740
9046 FORMAT(2A2,50H THE PRODUCT OF GAMMAX*GAMMAY*GAMMAZ SHOULD EQUAL , S0501750 *F3.2,6H CUBED)	S0501760
9047 FORMAT(2A2,15H ENTER GAMMAX (,2A2,F3.2,2A2,3H):_)	S0501770
9048 FORMAT(2A2,15H ENTER GAMMAY (,2A2,F3.2,2A2,3H):_)	S0501780
9049 FORMAT(2A2,15H ENTER GAMMAZ (,2A2,F3.2,2A2,3H):_)	S0501790
9050 FORMAT (75H *** REEDM WARNING 010, THE PRODUCT OF THE GAMMA'S IS IS0501800 *NCORRECT, CONTINUE? /2H (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2, *4HO):_)	S0501810 S0501820
9051 FORMAT(2A2,32H ENTRAINMENT PARAMETERS GAMMAX=,F4.2,8H GAMMAY=, S0501830 *F4.2,8H GAMMAZ=,F4.2)	S0501840
9052 FORMAT(30H ENTER LAUNCH COMPLEX NUMBER (,2A2,3H39A,2A2,1H,,2A2, S0501850 *3H39B,2A2,1H,,2A2,3H39C,2A2,1H,,2A2,2H40,2A2,1H,,2A2,2H41,2A2,1H,, *2A2,2H17,2A2,3H):_)	S0501860 S0501870
9053 FORMAT(2A2,43H PLEASE CONFIRM - IS LAUNCH COMPLEX NUMBER ,A2,A1, S0501880 *6H OK? (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_)	S0501890
9054 FORMAT(2A2,23H LAUNCH COMPLEX NUMBER:,39X,A2,A1)	S0501900
9055 FORMAT(30H CALCULATIONS TO BE DONE AT? (,2A2,1HS,2A2,6HURFACE,2A2, S0501910 *1H,,2A2,2HST,2A2,12HABILIZATION,,2A2,1HA,2A2,9HNOTHER):_)	S0501920
9056 FORMAT(2A2,28H CALCULATIONS TO BE DONE AT:,23X,7A2)	S0501930
9057 FORMAT(2A2,36H ENTER CALCULATION HEIGHT (METERS) (,2A2,F8.2,2A2, S0501940 *10H METERS):_)	S0501950
9058 FORMAT(2A2,37H CALCULATIONS TO BE DONE AT (METERS):,20X,F8.2)	S0501960
9059 FORMAT(19H ENTER CLOUD SHAPE(,2A2,1HE,2A2,9HLLIPTICAL,2A2,1H,,2A2, S0501970 *1HS,2A2,11HPHERICAL):_)	S0501980 S0501990
9060 FORMAT(2A2,13H CLOUD SHAPE:,42X,5A2)	S0502000
9061 FORMAT(57H ENTER ABSORPTION COEFFICIENT FOR GASES ONLY (RNG:0 TO 1S0502010 *,,2A2,16HDEF. = NO ABS.=0,2A2,3H):_)	S0502020
9062 FORMAT(2A2,24H ABSORPTION COEFFICIENT:,37X,F4.2)	S0502030
9063 FORMAT(26H ENTER DECAY COEFFICIENT (,2A2,10HNO DECAY=0,2A2,3H):_)	S0502040
9064 FORMAT(2A2,19H DECAY COEFFICIENT:,42X,F4.2)	S0502050
9065 FORMAT(31H DIFFUSION COEFFICIENTS ALPHA=,F3.1,6H BETA=,F3.1,	

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*9H CHANGE (,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0502050
9066 FORMAT(2A2,15H ENTER ALPHA:_) S0502070
9067 FORMAT(2A2,14H ENTER BETA:_) S0502080
9068 FORMAT(2A2,24H DIFFUSION COEFFICIENTS: ,28X,6HALPHA=,F4.2,6H BETA=, S0502090
*F4.2) S0502100
9069 FORMAT(34H DOWNWIND EXPANSION DISTANCES XRY=,F5.1,5H XRZ=,F5.1, S0502110
*9H CHANGE (,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0502120
9070 FORMAT(2A2,12H ENTER XRY:_) S0502130
9071 FORMAT(2A2,12H ENTER XRZ:_) S0502140
9072 FORMAT(2A2,30H DOWNWIND EXPANSION DISTANCES: ,20X,4HXRY=,F8.2, S0502150
*5H XRZ=,F8.2) S0502160
9073 FORMAT(2A2,44H DISTANCE FROM PAD TO SIGXO MEASUREMENT PT.: ,15X, S0502170
*F8.2) S0502180
9074 FORMAT(38H CONCENTRATION AVERAGING TIME (TIMAV=,2A2,F5.1,2A2, S0502190
*15H SEC.) CHANGE (,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0502200
9075 FORMAT(2A2,14H ENTER TIMAV:_) S0502210
9076 FORMAT(2A2,36H CONCENTRATION AVERAGING TIME (SEC): ,21X,F8.2) S0502220
9077 FORMAT(32H NUMBER OF SETTLING CATEGORIES =,30X,I3/52H TERMINAL FALS S0502230
*L VELOCITY VALUES (METERS PER SECOND) =,8X,F5.4) S0502240
9078 FORMAT(56H DO YOU WISH TO CHANGE THE GRAVITATIONAL SETTLING DATA (S0502250
*,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0502260
9079 FORMAT(2A2,53H ENTER THE NUMBER OF SETTLING CATEGORIES (MAXIMUM ISS0502270
* ,I2,3H):_) S0502280
9080 FORMAT(2A2,6H ENTER,I3,52H TERMINAL FALL VELOCITY VALUES (METERS PS0502290
*ER SECOND):_) S0502300
9081 FORMAT(32H REFLECTION COEFFICIENT VALUES =,28X,F5.4) S0502310
9082 FORMAT(28H ENTER ONE OR MORE SPECIES (,2A2,1HH,2A2,2HCL,2A2,1H,, S0502320
*2A2,1HA,2A2,7HL2O3):_) S0502330
C-----TYPE AND DIMENSION STATEMENTS S0502340
INTEGER MONTHS(24),LV(28),LT(21),SP(12),LC(12) S0502350
DIMENSION VPARS(17,5),LMODEL(12,3),IDCB(144),NAMF(3) S0502360
DIMENSION INPT(10),AVTMP(12) S0502370
DIMENSION VSDEF(20),FSDEF(20),GAMDEF(20),DBRDEF(20) S0502380
DIMENSION NDX(2) S0502390
C S0502400
EQUIVALENCE (INPT(1),INPT1) S0502410
C-----DATA STATEMENTS S0502420
C-----VPARS( 1-17)=SHUTTLE (18-34)=TITAN (35-51)=DELTA 2914 S0502430
C (55-72)=DELTA 3914 (73-90)=MINUTEMAN S0502440
C ORDER OF DATA IS: QC1,QC2,QC3,QT1,QT2,QT3,A,B,C,HEATN,HEATM, S0502450
C HEATA,HCL%,CO2%,CO%,AL2O3% S0502460
C DATA VPARS/1.521923E7,3.84505682E6,9.887260711E5,1.251174E9, S0502470
. 5.075475E8,1.015095E9,.6522129891,.4680846, S0502480
. .375,1479.7,1062.35,1000.0,.1146,.25029,.00042,.18279, S0502490
. .0002, S0502500
. 5.437528E6,2.718764E6,1.359382E6,3.2625168E8, S0502510
. 1.6312584E8,3.2625168E8,.429580469,.5184223, S0502520
. 5.0,2021.1,1010.55,1000.0,.1932,.2665,.0222, S0502530
. .2819,.0002, S0502540
. 8.360685E5,9.09811E4,2.729434E5,2.887598E7, S0502550
. 3.14229E6,1.885373E7,.922156,.432703,.54,1766.0, S0502560
. 1000.0,690.0,.1218,.2055,.0156,.2214,.0002, S0502570

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.	1.057557E6,1.482923E5,3.70731E5,6.70269E7,	S0502580
.	9.398616E6,4.699308E7,1.245756,.4180947,	S0502590
.	0.0,1449.9,1000.0,411.18,.1589,.2783,.0331,.1936,	S0502600
.	.0002,	S0502610
.	4.684476E5,4.684476E5,1.171119E5,2.8106856E7,	S0502620
.	2.8106856E7,2.8106856E7,.469982,.463333,0.0,	S0502630
.	2055.9,2055.9,1000.0,.1866,.2055,.0156,.3391,	S0502640
.	.0002/	S0502650
.	DATA AVTMP/16.06,19.59,20.87,23.43,25.74,27.67,	S0502660
.	28.38,28.63,28.02,26.29,22.86,18.68/	S0502670
.	DATA MONTHS/2HJA,1HN,2HFE,1HB,2HMA,1HR,2HAP,1HR,2HMA,1HY,2HJU,1HN,	S0502680
.	2HJU,1HL,2HAU,1HG,2HSE,1HP,2HOC,1HT,2HNO,1HV,2HDE,1HC/S0502690	S0502690
.	DATA LV/2H S,2HPA,2HCE,2H S,2HHU,2HTT,2HLE,	S0502700
.	2H ,2H ,2H T,2HIT,2HAN,2H I,2HII,	S0502710
.	2H ,2H ,2HDE,2HLT,2HA ,2H29,2H14,	S0502720
.	2H ,2H ,2HDE,2HLT,2HA ,2H39,2H14/	S0502730
.	DATA LT/2H ,2H ,2H ,2H ,2HNO,2HRM,2HAL,	S0502740
.	2H S,2HIN,2HGL,2HE ,2HEN,2HGI,2HNE,	S0502750
.	2H C,2HON,2HFL,2HAG,2HRA,2HTI,2HON/	S0502760
.	DATA SP/2H ,2H H,2HCL,	S0502770
.	2H ,2H C,2HO2,	S0502780
.	2H ,2H ,2HCO,	S0502790
.	2H A,2HL2,2HO3/	S0502800
.	DATA LC/2H39,1HA,2H39,1HB,2H39,1HC,2H40,1H ,2H41,1H ,2H17,1H /	S0502810
.	DATA LMODEL/2H ,2H ,2HCO,2HNC,2HEN,2HTR,2HAT,2HIO,2HN/,	S0502820
1	2HDO,2HSA,2HGE,	S0502830
2	2H ,2H ,2H ,2HWA,2HSH,2HOU,2HT ,2HDE,2HPO,	S0502840
3	2HSI,2HTI,2HON,	S0502850
4	2HGR,2HAV,2HIT,2HAT,2HIO,2HNA,2HL ,2HDE,2HPO,	S0502860
5	2HSI,2HTI,2HON/	S0502870
.	DATA NVSDEF,VSDEF,GANDEF,FSDEF	S0502880
1	/10,10*.1078,10*0.0,20*0.0,.0002,.0151,.1182,.1175,.1724,.2358,	S0502890
2	.3130,.4240,.5818,.7266,10*0.0/	S0502900
.	DATA DBRDEF /115.,230.,350.,440.,500.,555.,610.,675.,750.,870.,	S0502910
1	10*0.0/, MAXNVS /10/	S0502920
.	DATA IHO/1HO/,IHP/1HP/,IHR/1HR/,IHD/1HD/,IH1/1H1/,IHC/1HC/,	S0502930
*	IHW/1HW/,IHG/1HG/,IHS/1HS/,IHT/1HT/,IHCMA/1H/,IHA/1HA/,	S0502940
*	IHH/1HH/,IHL/1HL/,IH2/1H2/,IH3/1H3/,IHM/1HM/,IHE/1HE/,	S0502950
*	IHB/1HB/,IHN/1HN/	S0502960
.	DATA IIHOP/2HOP/,IIHPR/2HPR/,IIHRE/2HRE/,IIHDI/2HDI/,IIHCO/2HCO/,	S0502970
*	IIHWA/2HWA/,IIHGR/2HGR/,IIHSH/2HSH/,IIHTI/2HTI/,IIHD2/2HD2/,	S0502980
*	IIHD3/2HD3/,IIHSI/2HSI/,IIHST/2HST/,IIHSU/2HSU/,IIHAN/2HAN/,	S0502990
*	IIHEL/2HEL/,IIHSP/2HSP/,IIHMA/2HMA/,IIHHE/2HHE/,IIHMO/2HMO/,	S0503000
*	IIHLI/2HLI/,IIHTA/2HTA/,IIHPE/2HPE/,IIHDA/2HDA/,IIHBE/2H E/,	S0503010
*	IIHBP/2H P/,IIHRR/2HRR/,IIHSO/2HSO/,IIHND/2HND/	S0503020
.	DATA IESA/15501B/,IESJ/15512B/,	S0503030
*	IESE/15505B/,IESH/15510B/,IESP/15451B/,IESD/15504B/,	S0503040
*	IESB/15502B/,INVL/62103B/,IAUN/2HA_/	S0503050
.	DATA NAMF/2H?L,2HTI,2HME/	S0503060
.	DATA NDX/2*1H /	S0503070
.	DATA JVERSN/8213/	S0503080
.		S0503090

C



C		S0503100
	IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S0503110
	IF (CRT) GO TO 10	S0503120
	IESA = NULL	S0503130
	IESJ = NULL	S0503140
	IESE = NULL	S0503150
	IAUN = IBLNK	S0503160
	IESH = NULL	S0503170
	IESP = NULL	S0503180
	IESD = NULL	S0503190
	IESB = NULL	S0503200
	INVBL = NULL	S0503210
	10 CONTINUE	S0503220
C		S0503230
C	-----DETERMINE ENTRY POINT.	S0503240
	NNNEST = 2	S0503250
	GOTO (20,2390,2390,2390,1620,2050,2140,1430,1530), NNNTRY	S0503260
C		S0503270
C		S0503280
C	-----INITIALIZE SOME INPUT VARIABLES	S0503290
	20 CONTINUE	S0503300
	IFLG=0	S0503310
	ALPHA=1.0	S0503320
	BETA=1.0	S0503330
	DECAY=0.0	S0503340
	TIMAV=600.0	S0503350
	XRY=100.0	S0503360
	XRZ=100.0	S0503370
	XLRY=0.0	S0503380
	CALHT=0.0	S0503390
	ICALC = 1	S0503400
	LSITE=0	S0503410
C	DEFAULT DATA FILE NAME	S0503420
	FILE(1)=IIHRR	S0503430
	FILE(2)=IIHSO	S0503440
	FILE(3)=IIHND	S0503450
	NUMRUN=1	S0503460
	IAGAIN=0	S0503470
	TIMI = 0.0	S0503480
	RAINRT = 0.3	S0503490
	DURAT = 1.0	S0503500
	NVS = 10	S0503510
	DO 30 I=1,NVS	S0503520
	30 VS(I) = VSDEF(I)	S0503530
C	DEFAULT ABSORPTION COEFFICIENT FOR GASES.	S0503540
	GAMMAP(21) = 0.0	S0503550
C	DEFAULT REFLECTION COEFFICIENT, FRACTION OF MATERIAL, DROP SIZE	S0503560
C	FOR AL2O3.	S0503570
	DO 40 I=1,NVS	S0503580
	GAMMAP(I) = GAMDEF(I)	S0503590
	FS(I) = FSDEF(I)	S0503600
	40 DBAR(I) = DBRDEF(I)	S0503610

KEEP = 0	S0503620
C-----WRITE THE HEADER OF THE CONSOLE	S0503630
WRITE(ICU,9025) IESE,IESH,IESJ,IESP,IAUN	S0503640
WRITE(ICU,9011) IVERSN,LOCATN	S0503650
IF (BATCH) GO TO 50	S0503660
WRITE(ICU,9012)	S0503670
IF(.NOT.CRT) WRITE (ICU,9014)	S0503680
WRITE (ICU,9021)	S0503690
50 CONTINUE	S0503700
IF(BATCH) WRITE(ICU,9013)	S0503710
C-----RUN TYPE - OPER. (=2),RESRCH(=3),PROD. (=1),DIAG. (=4)	S0503720
60 IF(BATCH) GOTO 70	S0503730
WRITE(ICU,9026) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF	S0503740
70 INPT1 = IBLNK	S0503750
READ(IIU,9001) INPT1	S0503760
IF (INPT1 .EQ. MINUS1.OR.INPT1 .EQ. MINUS9) GO TO 2420	S0503770
IF (INPT1 .EQ. IBLNK) INPT1 = IHO	S0503780
IF (INPT1 .EQ. IIHOP) INPT1 = IHO	S0503790
IF (INPT1 .EQ. IIHPR) INPT1 = IHP	S0503800
IF (INPT1 .EQ. IIHRE) INPT1 = IHR	S0503810
IF (INPT1 .EQ. IIHDI) INPT1 = IHD	S0503820
IF (INPT1.EQ.IHO.OR.INPT1.EQ.IHP) GO TO 90	S0503830
IF (BATCH) GO TO 80	S0503840
IF (INPT1.EQ.IHR.OR.INPT1.EQ.IHD) GO TO 90	S0503850
80 WRITE (ICU,9002) INV,OFF,1,0	S0503860
IF (BATCH) GO TO 2420	S0503870
GO TO 60	S0503880
90 CONTINUE	S0503890
IDXRT=6	S0503900
CALL ANSW(1,INPT,IRUN,IDXRT,IER)	S0503910
IF(BATCH .AND. IRUN .LT. 1) IRUN = 2	S0503920
IF(IRUN.LT.0) GO TO 2420	S0503930
IF(BATCH) GOTO 110	S0503940
WRITE(ICU,9027) IESA,IESJ,(RT(I),I=IDXRT,IDXRT+5)	S0503950
C-----READ IN THE MET SOUNDING DATA FILE NAME	S0503960
C USE FOUR CHARACTERS FOLLOWED BY TWO DIGITS	S0503970
100 WRITE(ICU,9028) INV,(FILE(I),I=1,3),OFF	S0503980
110 READ(IIU,9001) (INPT(I),I=1,3)	S0503990
IF(INPT1 .NE. IBLNK) GOTO 130	S0504000
DO 120 I = 1,3	S0504010
120 INPT(I) = FILE(I)	S0504020
130 IF(BATCH) GOTO 150	S0504030
IF(INPT1 .NE. MINUS1) GO TO 140	S0504040
WRITE(ICU,9003) IESCAJ,IESCAJ	S0504050
GO TO 60	S0504060
140 IF(INPT1 .EQ. MINUS9) GOTO 20	S0504070
150 IPLACE = 0	S0504080
IF(INPT1.EQ.IIHTA.AND. INPT(2).EQ.IIHPE) IPLACE = 2	S0504090
IF(INPT1.EQ.IIHDA.AND. INPT(2).EQ.IIHTA) IPLACE = 1	S0504100
IF (IPLACE .NE. 0) GO TO 170	S0504110
CALL OPEN(IDCDB,IER,INPT,1)	S0504120
IF (IER .NE. -6) GO TO 160	S0504130

WRITE (ICU,9002) INV,OFF,2,0	S0504140
WRITE (ICU,9005) INV,(INPT(I),I=1,3),OFF	S0504150
IF (BATCH) GO TO 2420	S0504160
GO TO 100	S0504170
160 CALL CLOSE(IDC B)	S0504180
170 CONTINUE	S0504190
IF(IPLACE.EQ.0) IPLACE=3	S0504200
180 DO 190 I=1,3	S0504210
190 FILE(I)=INPT(I)	S0504220
IF(BATCH) GOTO 200	S0504230
WRITE(ICU,9029) IESA,IESJ,(FILE(J),J=1,3)	S0504240
C-----READ THE NUMBER OF RUNS (PRODUCTION MODE ONLY)	S0504250
200 IF(IRUN.NE.1) GO TO 270	S0504260
IF(BATCH) GOTO 220	S0504270
210 WRITE(ICU,9030) INV,NUMRUN,OFF	S0504280
220 INPT1=IBLNK	S0504290
CALL IFNBR(IFRMT,10,IER,IIU)	S0504300
IF (IER .EQ. 0) GO TO 240	S0504310
WRITE (ICU,9002) INV,OFF,3,0	S0504320
IF (BATCH) GO TO 2420	S0504330
GO TO 210	S0504340
230 INPT1 = IH1	S0504350
240 CALL CODE(80)	S0504360
READ (IFRMT,*) INPT1	S0504370
IF (BATCH .AND. INPT1 .LT. 1) INPT1 = 1	S0504380
IF (INPT1 .EQ. MINS9) GO TO 20	S0504390
IF (INPT1 .EQ. MINS1) GO TO 250	S0504400
IF (INPT1 .EQ. 0) INPT1 = 1	S0504410
IF (INPT1 .GT. 0) GO TO 260	S0504420
WRITE (ICU,9002) INV,OFF,3,0	S0504430
IF (BATCH) GO TO 2420	S0504440
GO TO 210	S0504450
250 WRITE(ICU,9003)IESCAJ,IESCAJ	S0504460
GOTO 100	S0504470
260 IF(INPT.GT.0.AND.INPT.LT.100) NUMRUN=INPT	S0504480
IF(BATCH) GOTO 290	S0504490
WRITE(ICU,9031) IESA,IESJ,NUMRUN	S0504500
270 CONTINUE	S0504510
C-----MODEL TO BE USED	S0504520
IF(BATCH) GOTO 290	S0504530
280 WRITE(ICU,9032) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF	S0504540
290 INPT1 = IBLNK	S0504550
READ(IIU,9001) INPT1	S0504560
IDXLV = 12	S0504570
300 IF (INPT1 .EQ. IBLNK.OR.INPT1 .EQ. IIHCO) INPT1 = IHC	S0504580
IF (INPT1 .EQ. IIHWA) INPT1 = IHW	S0504590
IF (INPT1 .EQ. IIHGR) INPT1 = IHG	S0504600
IF (INPT1 .EQ. MINUS1) GO TO 320	S0504610
IF (INPT1 .EQ. MINUS9) GO TO 20	S0504620
IF (INPT1.EQ.IHC.OR.INPT1.EQ.IHW.OR.INPT1.EQ.IHG) GO TO 310	S0504630
WRITE (ICU,9002) INV,OFF,4,0	S0504640
IF (BATCH) GO TO 2420	S0504650

GO TO 280	S0504660
310 CONTINUE	S0504670
CALL ANSW(11,INPT,MODEL,IDXLV,IER)	S0504680
GO TO 330	S0504690
320 WRITE(ICU,9003) IESCAJ,IESCAJ	S0504700
IF (IRUN .EQ. 1) GO TO 200	S0504710
GO TO 100	S0504720
330 DO 340 I = 1,12	S0504730
340 MDLNAM(I) = LMODEL(I,MODEL)	S0504740
MODEL = MODEL + 3	S0504750
MODEL4 = MODEL .EQ. 4	S0504760
MODEL5 = MODEL .EQ. 5	S0504770
MODEL6 = MODEL .EQ. 6	S0504780
IF(BATCH) GOTO 350	S0504790
WRITE(ICU,9033) IESA,IESJ,MDLNAM	S0504800
C-----GET SYSTEM TIME AND DATE	S0504810
350 CALL FTIME(IFRMT)	S0504820
CALL CODE(80)	S0504830
READ (IFRMT,9022) INPT1,JTIME,JDAY,JMON,JYEAR	S0504840
JTIME = INPT1*100+JTIME	S0504850
360 LSDT(1) = IIHBE	S0504860
LSDT(2) = IIHST	S0504870
CALL CODE	S0504880
WRITE (IFRMT,9004) JTIME,(LSDT(I),I=1,2),JDAY,JMON,JYEAR	S0504890
C-----READ IN THE LAUNCH TIME AND DATE	S0504900
CALL OPEN(IDCIB,IER,NAMF,1)	S0504910
IF (IER .NE. -6) GO TO 370	S0504920
WRITE (ICU,9007) NAMF	S0504930
GO TO 390	S0504940
370 IF (IER .GE. 0) GO TO 380	S0504950
WRITE (ICU,9008) NAMF	S0504960
GO TO 390	S0504970
380 CALL READF(IDCIB,IER,IFRMT)	S0504980
CALL CLOSE(IDCIB)	S0504990
390 CONTINUE	S0505000
CALL CODE(20)	S0505010
READ(IFRMT,9004) LTIME,LSDT(1),LSDT(2),LDAY,LMON(1),LMON(2),LYEAR	S0505020
IF(IPLACE.EQ.1) LSDT(1)=IIHBP	S0505030
IF(BATCH) GOTO 400	S0505040
WRITE(ICU,9034) INV,LTIME,(LSDT(I),I=1,2),LDAY,(LMON(I),I=1,2),	S0505050
*LYEAR,OFF,IESB,(IESD,I=1,22)	S0505060
400 CALL IFNBR(IFRMT,-1,IER,IIU)	S0505070
IF (IER .EQ. 0) GO TO 420	S0505080
410 WRITE (ICU,9002) INV,OFF,5,0	S0505090
IF (BATCH) GO TO 2420	S0505100
GO TO 360	S0505110
420 INPT(1) = 0	S0505120
INPT(4) = 0	S0505130
INPT(7) = 0	S0505140
INPT(2) = IBLNK	S0505150
INPT(3) = IBLNK	S0505160
INPT(5) = IBLNK	S0505170

INPT(6) = IBLNK	S0505180
CALL CODE(80)	S0505190
READ (IFRMT,9004) (INPT(I),I=1,7)	S0505200
IF (IFRMT(1) .EQ. MINUS1) GO TO 430	S0505210
IF (IFRMT(1) .EQ. MINUS9) GO TO 20	S0505220
IF (INPT1 .GE. 0) GO TO 440	S0505230
GO TO 410	S0505240
430 WRITE(ICU,9003) (IESCAJ,I=1,3)	S0505250
GOTO 280	S0505260
440 IF(INPT1.GT.0) LTIME = INPT1	S0505270
IF (INPT(2).EQ. IBLNK.AND. INPT(3).EQ. IBLNK) GO TO 450	S0505280
LSDT(1) = INPT(2)	S0505290
LSDT(2) = INPT(3)	S0505300
450 IF (INPT(4) .GT. 0) LDAY = INPT(4)	S0505310
IF (INPT(5).EQ. IBLNK.AND. INPT(6).EQ. IBLNK) GO TO 460	S0505320
LMON(1) = INPT(5)	S0505330
LMON(2) = INPT(6)	S0505340
460 IF (INPT(7) .GT. 0) LYEAR = INPT(7)	S0505350
470 DO 480 I=1,12	S0505360
IF(LMON(1).EQ. MONTHS(2*I-1).AND. LMON(2).EQ. MONTHS(2*I)) GO TO 490	S0505370
480 CONTINUE	S0505380
WRITE(ICU,9035) IESA,(IESD,I=1,11)	S0505390
GO TO 400	S0505400
490 MMON=I	S0505410
IF(BATCH) GOTO 510	S0505420
WRITE(ICU,9036) IESA,IESA,IESJ,LTIME,LSDT(1),LSDT(2),LDAY,LMON(1),	S0505430
*LMON(2),LYEAR	S0505440
C-----READ IN THE LAUNCH VEHICLE	S0505450
C AND FILL THE VPAR ARRAY WITH THE	S0505460
C APPROPRIATE VEHICLE PARAMETERS	S0505470
500 WRITE(ICU,9037) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF,ULINE,OFF,	S0505480
*ULINE,OFF,ULINE,OFF	S0505490
510 DO 520 I=1,10	S0505500
520 INPT(I) = IBLNK	S0505510
READ(IIU,9001) INPT	S0505520
IF(BATCH .OR. INPT1 .NE. MINUS1) GOTO 530	S0505530
WRITE(ICU,9003) IESCAJ,IESCAJ	S0505540
GOTO 360	S0505550
530 IF (INPT1 .EQ. IBLNK.OR. INPT1 .EQ. IIHSH) INPT1 = IHS	S0505560
IF (INPT1 .EQ. IIHT1) INPT1 = IHT	S0505570
IF (INPT1 .EQ. MINUS9) GO TO 20	S0505580
IF (INPT1.EQ. IHS.OR. INPT1.EQ. IHT.OR. INPT1.EQ. IIHD2.OR. INPT1.EQ.	S0505590
*IIHD3) GO TO 630	S0505600
CALL CODE(20)	S0505610
READ (INPT,9006) (IFRMT(I),I=1,10)	S0505620
J = 0	S0505630
I = 0	S0505640
540 I = I+1	S0505650
IF (I .GT. 10) GO TO 620	S0505660
IF (IFRMT(I) .EQ. IBLNK.AND. J .EQ. 0) GO TO 540	S0505670
J = J+1	S0505680
GO TO (550,560,570,580,590,600),J	S0505690

550 IF (IFRMT(I) .EQ. IHD) GO TO 540	S0505700
GO TO 620	S0505710
560 IF (IFRMT(I) .EQ. IHE) GO TO 540	S0505720
GO TO 620	S0505730
570 IF (IFRMT(I) .EQ. IHL) GO TO 540	S0505740
GO TO 620	S0505750
580 IF (IFRMT(I) .EQ. IHT) GO TO 540	S0505760
GO TO 620	S0505770
590 IF (IFRMT(I) .EQ. IHA) GO TO 540	S0505780
GO TO 620	S0505790
600 IF (IFRMT(I) .EQ. IH2) GO TO 610	S0505800
IF (IFRMT(I) .NE. IH3) GO TO 620	S0505810
INPT1 = IIHD3	S0505820
GO TO 530	S0505830
610 INPT1 = IIHD2	S0505840
GO TO 530	S0505850
620 CONTINUE	S0505860
WRITE (ICU,9002) INV,OFF,6,0	S0505870
IF (BATCH) GO TO 2420	S0505880
GO TO 500	S0505890
630 IDXLV=7	S0505900
CALL ANSW(2,INPT,IVHICL,IDXLV,IER)	S0505910
IF(BATCH) GOTO 640	S0505920
WRITE(ICU,9038) IESA,IESJ,(LV(I),I=IDXLV,IDXLV+6)	S0505930
640 IDX=IDXLV	S0505940
DO 650 I=1,7	S0505950
TITLE(I)=LV(IDX)	S0505960
650 IDX=IDX+1	S0505970
I=IVHICL	S0505980
DO 660 J=1,17	S0505990
660 VPAR(J) = VPARS(J,I)	S0506000
C-----LAUNCH TYPE (NORMAL,SINGLE ENGINE,CONFLAGRATION)	S0506010
670 IF(BATCH) GOTO 680	S0506020
WRITE(ICU,9039) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF	S0506030
680 INPT1 = IBLNK	S0506040
READ(IIU,9001) INPT1	S0506050
IF(BATCH .OR. INPT1 .NE. MINUS1) GOTO 690	S0506060
WRITE(ICU,9003) IESCAJ,IESCAJ	S0506070
GOTO 500	S0506080
690 IF (INPT1 .EQ. IBLNK.OR.INPT1 .EQ. INOJ) INPT1 = INJ	S0506090
IF (INPT1 .EQ. IIHSI) INPT1 = IHS	S0506100
IF (INPT1 .EQ. IIHCO) INPT1 = IHC	S0506110
IF (INPT1 .EQ. MINUS9) GO TO 20	S0506120
IF (INPT1.EQ.INJ.OR.INPT1.EQ.IHS.OR.INPT1.EQ.IHC) GO TO 700	S0506130
WRITE (ICU,9002) INV,OFF,7,0	S0506140
IF (BATCH) GO TO 2420	S0506150
GO TO 670	S0506160
700 IDXLT=7	S0506170
CALL ANSW(3,INPT,NORMAL,IDXLT,IER)	S0506180
IF(BATCH) GOTO 710	S0506190
WRITE(ICU,9040) IESA,IESJ,(LT(I),I=IDXLT,IDXLT+6)	S0506200
710 IDX=IDXLT	S0506210

DO 720 I=1,7	S0506220
JDX=I+7	S0506230
TITLE(JDX)=LT(IDX)	S0506240
720 IDX=IDX+1	S0506250
C-----VEHICLE PROPELLANT TEMPERATURE	S0506260
730 RNPT=0.0	S0506270
TPROP=AVTMP(MMON)	S0506280
IF(BATCH) GOTO 740	S0506290
WRITE(ICU,9041) INV,TPROP,OFF	S0506300
740 CALL IFNBR(IFRMT,14,IER,IIU)	S0506310
IF (IER .EQ. 0) GO TO 750	S0506320
WRITE (ICU,9002) INV,OFF,8,0	S0506330
IF (BATCH) GO TO 2420	S0506340
GO TO 730	S0506350
750 CALL CODE(80)	S0506360
READ (IFRMT,*) RNPT	S0506370
IF(BATCH .AND. RNPT .LT. 0.0) RNPT = 0.0	S0506380
IF (RNPT .EQ. MINS1) GO TO 760	S0506390
IF (RNPT .EQ. MINS9) GO TO 20	S0506400
IF (RNPT .GE. 0.0) GO TO 770	S0506410
WRITE (ICU,9002) INV,OFF,8,0	S0506420
GO TO 730	S0506430
760 WRITE(ICU,9003) IESCAJ,IESCAJ	S0506440
GOTO 670	S0506450
770 IF(RNPT.GT.0.0) TPROP=RNPT	S0506460
IF(BATCH) GOTO 780	S0506470
WRITE(ICU,9042) IESA,IESJ,TPROP	S0506480
780 TPROPC=TPROP	S0506490
TPROP=TPROP+273.16	S0506500
IF(MODEL6) GOTO 1010	S0506510
C-----SPECIES TO COMPUTE CONCENTRATIONS AND DEPOSITIONS FOR	S0506520
790 DO 800 I=1,12	S0506530
ICHAR(I) = IBLNK	S0506540
IF (I .GT. 4) GO TO 800	S0506550
IPLNT(I) = 0	S0506560
800 CONTINUE	S0506570
IF (BATCH) GO TO 830	S0506580
IF (MODEL4) GO TO 810	S0506590
WRITE (ICU,9082) INVNDR,INV,OFF,ULINE,OFF	S0506600
GO TO 820	S0506610
810 WRITE (ICU,9043) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF,ULINE,OFF,	S0506620
*ULINE,OFF	S0506630
820 CONTINUE	S0506640
830 CALL IFNBR(IFRMT,20,IER,IIU)	S0506650
IF (BATCH) GO TO 850	S0506660
IF (IFRMT(1) .NE. MINUS1) GO TO 840	S0506670
WRITE (ICU,9003) IESCAJ,IESCAJ	S0506680
GO TO 730	S0506690
840 IF (IFRMT(1) .EQ. MINUS9) GO TO 20	S0506700
850 JJ = 1	S0506710
I = 20	S0506720
IF (IER .NE. 0) GO TO 860	S0506730

IPLLNT(1) = 1	S0506740
GO TO 980	S0506750
860 DO 870 I=40,60	S0506760
870 IFRMT(I) = IBLNK	S0506770
CALL CODE(80)	S0506780
READ (IFRMT,9006) (IFRMT(I+39),I=1,20)	S0506790
I = 0	S0506800
880 I = I+1	S0506810
IF (I .GT. 20) GO TO 1000	S0506820
IF (IFRMT(39+I) .EQ. IBLNK.OR.IFRMT(39+I) .EQ. IHCMA) GO TO 880	S0506830
IF (IFRMT(39+I) .EQ. IHC) GO TO 940	S0506840
IF (IFRMT(39+I) .EQ. IHA) GO TO 910	S0506850
IF (IFRMT(39+I) .EQ. IHH) GO TO 890	S0506860
WRITE (ICU,9002) INV,OFF,9,0	S0506870
IF (BATCH) GO TO 2420	S0506880
GO TO 790	S0506890
890 IPLLNT(JJ) = 1	S0506900
900 IF (IFRMT(40+I).NE.IHC.AND.IFRMT(40+I).NE.IHL) GO TO 980	S0506910
I = I+1	S0506920
GO TO 900	S0506930
910 IPLLNT(JJ) = 4	S0506940
920 IF (IFRMT(40+I).EQ.IHL.OR.IFRMT(40+I).EQ.IH2) GO TO 930	S0506950
IF (IFRMT(40+I).NE.IHO.AND.IFRMT(40+I).NE.IH3) GO TO 980	S0506960
930 I = I+1	S0506970
GO TO 920	S0506980
940 IF (IFRMT(40+I) .EQ. IHO) GO TO 970	S0506990
IF (IFRMT(40+I) .EQ. IH2) GO TO 960	S0507000
950 IPLLNT(JJ) = 3	S0507010
GO TO 980	S0507020
960 I = I+1	S0507030
IPLLNT(JJ) = 2	S0507040
GO TO 980	S0507050
970 I = I+1	S0507060
IF (IFRMT(40+I) .EQ. IH2) GO TO 960	S0507070
GO TO 950	S0507080
980 JJJ = JJ*3-3	S0507090
III = IPLLNT(JJ)*3-3	S0507100
DO 990 J=1,3	S0507110
990 ICHAR(J+JJJ) = SP(J+III)	S0507120
JJ = JJ+1	S0507130
GO TO 880	S0507140
1000 CONTINUE	S0507150
IF (JJ .EQ. 1.AND.IPLLNT(JJ) .EQ. 0) GO TO 850	S0507160
IF(BATCH) GOTO 1010	S0507170
WRITE(ICU,9044) IESA,IESJ,((ICAR(I+12-3*J),I=1,3),J=1,4)	S0507180
C-----ENTER ENTRAINMENT PARAMETERS	S0507190
1010 CONTINUE	S0507200
IF(NORMAL.EQ.1) GO TO 1020	S0507210
GAMMAX=GAMMAC	S0507220
GAMMAY=GAMMAC	S0507230
GAMMAZ=GAMMAC	S0507240
GO TO 1030	S0507250



1020	GAMMAX=GAMMAI	S0507260
	GAMMAY=GAMMAI	S0507270
	GAMMAZ=GAMMAI	S0507280
1030	CONTINUE	S0507290
	IF(IRUN.LT.3) GO TO 1280	S0507300
1040	WRITE(ICU,9045) GAMMAX,GAMMAY,GAMMAZ,INVNDR,INV,OFF,ULINE,OFF	S0507310
	INPT1 = IBLNK	S0507320
	READ(IIU,9001) INPT1	S0507330
	IF(INPT1 .NE. MINUS1) GOTO 1050	S0507340
	WRITE(ICU,9003) IESCAJ,IESCAJ	S0507350
	IF(MODEL6) GOTO 730	S0507360
	GOTO 790	S0507370
1050	IF(INPT1 .EQ. MINUS9) GOTO 20	S0507380
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 1270	S0507390
	IF (INPT1 .EQ. IYSJ.OR.INPT1.EQ.IYESJ) GO TO 1060	S0507400
	WRITE (ICU,9002) INV,OFF,9,1	S0507410
	IF (BATCH) GO TO 2420	S0507420
	GO TO 1040	S0507430
1060	IF (BATCH) GO TO 1080	S0507440
	WRITE(ICU,9046) IESA,IESJ,GAMMAX	S0507450
1070	WRITE(ICU,9047) IESA,IESJ,INV,GAMMAX,OFF	S0507460
1080	RNPT=0.0	S0507470
	CALL IFNBR(IFRMT,14,IER,IIU)	S0507480
	IF (IER .EQ. 0) GO TO 1100	S0507490
1090	WRITE (ICU,9002) INV,OFF,9,2	S0507500
	IF (BATCH) GO TO 2420	S0507510
	GO TO 1070	S0507520
1100	CALL CODE(80)	S0507530
	READ (IFRMT,*) RNPT	S0507540
	IF (RNPT .EQ. MINS1) GO TO 1110	S0507550
	IF (RNPT .EQ. MINS9) GO TO 20	S0507560
	IF (RNPT .GE. 0.0) GO TO 1120	S0507570
	GO TO 1090	S0507580
1110	WRITE(ICU,9003) IESCAJ	S0507590
	GOTO 1040	S0507600
1120	IF(RNPT.GT.0.0) GAMMAX=RNPT	S0507610
1130	IF (BATCH) GO TO 1140	S0507620
	WRITE(ICU,9048) IESA,IESJ,INV,GAMMAY,OFF	S0507630
1140	RNPT=0.0	S0507640
	CALL IFNBR(IFRMT,14,IER,IIU)	S0507650
	IF (IER .EQ. 0) GO TO 1160	S0507660
1150	WRITE (ICU,9002) INV,OFF,9,3	S0507670
	IF (BATCH) GO TO 2420	S0507680
	GO TO 1130	S0507690
1160	CALL CODE(80)	S0507700
	READ (IFRMT,*) RNPT	S0507710
	IF (RNPT .EQ. MINS1) GO TO 1070	S0507720
	IF (RNPT .EQ. MINS9) GO TO 20	S0507730
	IF (RNPT .GE. 0.0) GO TO 1170	S0507740
	GO TO 1150	S0507750
1170	IF(RNPT.GT.0.0) GAMMAY=RNPT	S0507760
1180	IF (BATCH) GO TO 1190	S0507770

WRITE(ICU,9049) IESA,IESJ,INV,GAMMAZ,OFF	S0507780
1190 RNPT=0.0	S0507790
CALL IFNBR(IFRMT,14,IER,IIU)	S0507800
IF (IER .EQ. 0) GO TO 1210	S0507810
1200 WRITE (ICU,9002) INV,OFF,9,4	S0507820
IF (BATCH) GO TO 2420	S0507830
GO TO 1180	S0507840
1210 CALL CODE(80)	S0507850
READ (IFRMT,*) RNPT	S0507860
IF (RNPT .EQ. MINS1) GO TO 1130	S0507870
IF (RNPT .EQ. MINS9) GO TO 20	S0507880
IF (RNPT .GE. 0.0) GO TO 1220	S0507890
GO TO 1200	S0507900
1220 IF(RNPT.GT.0) GAMMAZ=RNPT	S0507910
C-----CHECK PRODUCT OF GAMMA'S	S0507920
IF(NORMAL.GT.1) GO TO 1230	S0507930
PROD=ABS(GAMMAX*GAMMAY*GAMMAZ-.26214)	S0507940
GO TO 1240	S0507950
1230 PROD=ABS(GAMMAX*GAMMAY-.25)	S0507960
1240 CONTINUE	S0507970
IF(BATCH .OR. PROD.LE..0001) GO TO 1270	S0507980
1250 WRITE(ICU,9050) INVNDR,INV,OFF,ULINE,OFF	S0507990
INPT1 = IBLNK	S0508000
READ(IIU,9001) INPT1	S0508010
IF(INPT1 .NE. MINUS1) GOTO 1260	S0508020
WRITE(ICU,9003) IESCAJ,IESCAJ	S0508030
GOTO 1070	S0508040
1260 IF(INPT1 .EQ. MINUS9) GOTO 20	S0508050
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 1270	S0508060
IF (INPT1 .EQ. INJ.OR.INPT1 .EQ. INOJ) GO TO 1070	S0508070
WRITE (ICU,9002) INV,OFF,0,0	S0508080
GO TO 1250	S0508090
1270 CONTINUE	S0508100
WRITE(ICU,9051) IESA,IESJ,GAMMAX,GAMMAY,GAMMAZ	S0508110
1280 CONTINUE	S0508120
C-----ENTER LAUNCH COMPLEX NUMBER	S0508130
1290 CONTINUE	S0508140
DO 1300 I=1,6	S0508150
IFRMT(I*2-1) = ULINE(1)	S0508160
1300 IFRMT(I*2) = ULINE(2)	S0508170
GO TO (1310,1320,1330,1330) IVHICL	S0508180
1310 LDX=18	S0508190
MDX=IHS	S0508200
NDX(1) = LC(1)	S0508210
NDX(2) = IHA	S0508220
IFRMT(1) = INVNDR(1)	S0508230
IFRMT(2) = INVNDR(2)	S0508240
GO TO 1340	S0508250
1320 LDX=30	S0508260
MDX=IHT	S0508270
NDX(1) = LC(7)	S0508280
NDX(2)=IBLNK	S0508290

	IFRMT(7) = INVNDR(1)	S0508300
	IFRMT(8) = INVNDR(2)	S0508310
	GO TO 1340	S0508320
1330	LDX=24	S0508330
	MDX=IHD	S0508340
	NDX(1) = LC(11)	S0508350
	NDX(2)=IBLNK	S0508360
	IFRMT(11) = INVNDR(1)	S0508370
	IFRMT(12) = INVNDR(2)	S0508380
1340	CONTINUE	S0508390
	IF(.NOT.BATCH) WRITE(ICU,9052) (IFRMT(I*2-1),IFRMT(I*2),OFF,I=1,6)	S0508400
	INPT(1) = IBLNK	S0508410
	INPT(2) = IBLNK	S0508420
	READ(IIU,9001) INPT	S0508430
	IF(BATCH .OR. INPT1 .NE. MINUS1) GOTO 1350	S0508440
	WRITE(ICU,9003) IESCAJ,IESCAJ	S0508450
	IF (IRUN .LT. 3) GO TO 790	S0508460
	GO TO 1040	S0508470
1350	IF (INPT1 .EQ. MINUS9) GO TO 20	S0508480
	IF(INPT1.NE.IBLNK) GO TO 1360	S0508490
	INPT(1) = NDX(1)	S0508500
	INPT(2) = NDX(2)	S0508510
1360	LSITE = 1	S0508520
	CALL ANSW(5,INPT,IDX,LSITE,IER)	S0508530
	IF (IER .EQ. 0) GO TO 1380	S0508540
1370	IF (BATCH) GO TO 2420	S0508550
	WRITE (ICU,9002) INV,OFF,10,0	S0508560
	GO TO 1290	S0508570
1380	IF (LSITE .GT. 1) LSITE = LSITE+2	S0508580
	IF (LSITE .GT. 1) GO TO 1390	S0508590
	I = 0	S0508600
	IF (INPT(2) .EQ. IHA.OR.INPT(2) .EQ. IBLNK) I = 1	S0508610
	IF (INPT(2) .EQ. IHB) I = 2	S0508620
	IF (INPT(2) .EQ. IHC) I = 3	S0508630
	IF (I .EQ. 0) GO TO 1370	S0508640
	LSITE = I	S0508650
1390	CONTINUE	S0508660
	IF (BATCH) GO TO 1430	S0508670
	IF (IER .EQ. 0.AND.MDX.EQ. IDX) GO TO 1420	S0508680
1400	WRITE(ICU,9053) IESA,IESJ,INPT(1),INPT(2),INVNDR,INV,OFF,ULINE,OFFS	S0508690
	INPT1 = IBLNK	S0508700
	READ(IIU,9001) INPT1	S0508710
	IF(INPT1.NE.MINUS1) GOTO 1410	S0508720
	WRITE(ICU,9003) IESCAJ	S0508730
	GOTO 1290	S0508740
1410	IF(INPT1.EQ.MINUS9) GOTO 20	S0508750
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 1420	S0508760
	IF (INPT1 .EQ. INJ.OR.INPT1 .EQ. INOJ) GO TO 1290	S0508770
	WRITE (ICU,9002) INV,OFF,0,0	S0508780
	GO TO 1400	S0508790
1420	CONTINUE	S0508800
	WRITE(ICU,9054) IESA,IESJ,LC(LSITE*2-1),LC(LSITE*2)	S0508810

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1430 IF(.NOT.MODEL4) GOTO 1610 S0508820
C-----ENTER CALCULATION LOCATION (SURFACE,STABILIZATION,USER INPUTS)S0508830
IF(.NOT.BATCH) GOTO 1440 S0508840
INPT(1) = IBLNK S0508850
INPT(2) = IBLNK S0508860
INPT(3) = IBLNK S0508870
INPT(4) = IBLNK S0508880
INPT(5) = IBLNK S0508890
READ(IIU,9001) INPT S0508900
IF(INPT1.EQ.IHS .OR. INPT1.EQ.IIHST .OR. INPT1.EQ.IBLNK) GOTO 1460S0508910
CALHT = 0.0 S0508920
CALL CODE(20) S0508930
READ(INPT,*) CALHT S0508940
ICALC = 3 S0508950
CALHT = AMAX1(0.0,CALHT) S0508960
IF(IAGAIN .EQ. 1) GOTO 2400 S0508970
GOTO 1620 S0508980
1440 WRITE(ICU,9055) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF S0508990
INPT1 = IBLNK S0509000
READ(IIU,9001) INPT1 S0509010
IF(INPT1 .NE. MINUS1) GOTO 1460 S0509020
1450 WRITE(ICU,9003) IESCAJ,IESCAJ S0509030
GOTO 1290 S0509040
1460 IDXCL=7 S0509050
IF (INPT1 .EQ. MINUS9) GO TO 20 S0509060
IF (INPT1 .EQ. IBLNK.OR.INPT1 .EQ. IIHSU) INPT1 = IHS S0509070
IF (INPT1 .EQ. IIHAN) INPT1 = IHA S0509080
CALL ANSW(6,INPT,ICALC,IDXCL,IER) S0509090
IF (IER .EQ. 0) GO TO 1470 S0509100
WRITE (ICU,9002) INV,OFF,11,0 S0509110
GO TO 1440 S0509120
1470 IF (ICALC .NE. 2) GO TO 1520 S0509130
DO 1480 I=1,4 S0509140
IF (IPLLNT(I) .EQ. 4) GO TO 1490 S0509150
1480 CONTINUE S0509160
GO TO 1520 S0509170
1490 WRITE (ICU,9023) S0509180
C DO YOU WISH TO ENTER A DIFFERENT CALCULATION HEIGHT? S0509190
1500 WRITE (ICU,9024) INVNDR,INV,OFF,ULINE,OFF S0509200
INPT1 = IBLNK S0509210
READ (IIU,9001) INPT1 S0509220
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 1430 S0509230
IF (INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 1510 S0509240
IF (INPT1 .EQ. MINUS1) GO TO 1450 S0509250
IF (INPT1 .EQ. MINUS9) GO TO 20 S0509260
WRITE (ICU,9002) INV,OFF,24,0 S0509270
IF (BATCH) GO TO 2420 S0509280
GO TO 1500 S0509290
1510 CONTINUE S0509300
1520 CONTINUE S0509310
IF(ICALC.EQ.3) GO TO 1530 S0509320
IF(.NOT.BATCH)WRITE(ICU,9056) IESA,IESJ,(CL(I),I=IDXCL,IDXCL+6) S0509330

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GO TO 1620	S0509340
C-----ENTER CALCULATION HEIGHT CALHT	S0509350
1530 WRITE(ICU,9057) IESA,IESJ,INV,CALHT,OFF	S0509360
RNPT=CALHT	S0509370
CALL IFNBR(IFRMT,14,IER,IIU)	S0509380
IF (IER .EQ. 0) GO TO 1550	S0509390
1540 WRITE (ICU,9002) INV,OFF,11,1	S0509400
GO TO 1530	S0509410
1550 CALL CODE(80)	S0509420
READ (IFRMT,*) RNPT	S0509430
IF (RNPT .EQ. MINS1) GO TO 1560	S0509440
IF (RNPT .EQ. MINS9) GO TO 20	S0509450
IF (RNPT .GE. 0.0) GO TO 1570	S0509460
GO TO 1540	S0509470
1560 IF(IAGAIN .EQ. 1) GOTO 2410	S0509480
WRITE(ICU,9003) IESCAJ	S0509490
GOTO 1430	S0509500
1570 CALHT=RNPT	S0509510
WRITE(ICU,9058) IESA,IESJ,CALHT	S0509520
DO 1580 I=1,4	S0509530
IF (IPLLNT(I) .EQ. 4) GO TO 1590	S0509540
1580 CONTINUE	S0509550
GO TO 1610	S0509560
1590 IF (CALHT .LE. 5.0) GO TO 1610	S0509570
WRITE (ICU,9023)	S0509580
C    DO YOU WISH TO ENTER A DIFFERENT CALCULATION HEIGHT?	S0509590
1600 WRITE (ICU,9024) INVNDR,INV,OFF,ULINE,OFF	S0509600
INPT1 = IBLNK	S0509610
READ (IIU,9001) INPT1	S0509620
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 1430	S0509630
IF (INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 1610	S0509640
IF (INPT1 .EQ. MINUS1) GO TO 1450	S0509650
IF (INPT1 .EQ. MINUS9) GO TO 20	S0509660
WRITE (ICU,9002) INV,OFF,24,0	S0509670
IF (BATCH) GO TO 2420	S0509680
GO TO 1600	S0509690
1610 IF(IAGAIN.EQ.1) GO TO 2400	S0509700
1620 CONTINUE	S0509710
C-----ENTER CLOUD SHAPE	S0509720
NNTRY = 1	S0509730
IF(BATCH) GOTO 1630	S0509740
WRITE(ICU,9059) INVNDR,INV,OFF,ULINE,OFF	S0509750
1630 INPT1 = IBLNK	S0509760
READ(IIU,9001) INPT1	S0509770
IF(BATCH .OR. INPT1.NE.MINUS1) GOTO 1640	S0509780
WRITE(ICU,9003) IESCAJ,IESCAJ	S0509790
IF (MODEL .NE. 4) GO TO 1290	S0509800
GOTO 1430	S0509810
1640 IF (INPT1 .EQ. MINUS9) GO TO 20	S0509820
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IIHEL) INPT1 = IHE	S0509830
IF (INPT1 .EQ. IIHSP) INPT1 = IHS	S0509840
IDXCS=5	S0509850

CALL ANSW(7,INPT,ISHAPE,IDXCS,IER)	S0509860
IF(.NOT.BATCH .OR. ISHAPE .GT. 0) GOTO 1650	S0509870
ISHAPE = 1	S0509880
IDXCS = 5	S0509890
1650 CONTINUE	S0509900
IF (IER .EQ. 0) GO TO 1660	S0509910
WRITE (ICU,9002) INV,OFF,12,0	S0509920
IF (BATCH) GO TO 2420	S0509930
GO TO 1620	S0509940
1660 IF (BATCH) GO TO 1670	S0509950
WRITE(ICU,9060) IESA,IESJ,(CS(I),I=IDXCS,IDXCS+4)	S0509960
C-----DETERMINE IF GRAVITATIONAL SETTLING OCCURS.	S0509970
1670 GASSET = .FALSE.	S0509980
GRVSET = .FALSE.	S0509990
IF(MODEL5) GOTO 1690	S0510000
GRVSET = .TRUE.	S0510010
IF(MODEL6) GOTO 1690	S0510020
DO 1680 I = 1,4	S0510030
IF(IPLLNT(I) .EQ. 4) GOTO 1690	S0510040
GASSET = .TRUE.	S0510050
1680 CONTINUE	S0510060
GRVSET = .FALSE.	S0510070
C-----CHECK FOR PRODUCTION OR OPERATIONAL MODE.	S0510080
1690 IF (IRUN .LT. 3) GO TO 2390	S0510090
C-----ENTER ABSORPTION COEFFICIENT	S0510100
IF (MODEL5) GOTO 1810	S0510110
IF(.NOT. MODEL4 .OR. .NOT. GASSET) GOTO 1750	S0510120
1700 WRITE(ICU,9061) INV,OFF	S0510130
RNPT = GAMMAP(21)	S0510140
CALL IFNBR(IFRMT,14,IER,IIU)	S0510150
IF (IER .EQ. 0) GO TO 1720	S0510160
1710 WRITE (ICU,9002) INV,OFF,12,1	S0510170
IF (BATCH) GO TO 2420	S0510180
GO TO 1700	S0510190
1720 CALL CODE(80)	S0510200
READ (IFRMT,*) RNPT	S0510210
IF (RNPT .EQ. MINS1) GO TO 1730	S0510220
IF (RNPT .EQ. MINS9) GO TO 20	S0510230
IF (RNPT .GE. 0.0.AND.RNPT .LE. 1.0) GO TO 1740	S0510240
GO TO 1710	S0510250
1730 WRITE(ICU,9003) IESCAJ,IESCAJ	S0510260
GOTO 1620	S0510270
1740 IF(RNPT.GE.0.0.AND.RNPT.LE.1.0) GAMMAP(21)=RNPT	S0510280
WRITE(ICU,9062) IESA,IESJ,GAMMAP(21)	S0510290
C-----ENTER DECAY COEFFICIENT	S0510300
1750 IF(.NOT.MODEL4) GOTO 1810	S0510310
1760 WRITE(ICU,9063) INV,OFF	S0510320
RNPT=0.0	S0510330
CALL IFNBR(IFRMT,14,IER,IIU)	S0510340
IF (IER .EQ. 0) GO TO 1780	S0510350
1770 WRITE (ICU,9002) INV,OFF,12,2	S0510360
IF (BATCH) GO TO 2420	S0510370

GO TO 1760	S0510380
1780 CALL CODE(80)	S0510390
READ (IFRMT,*) RNPT	S0510400
IF (RNPT .EQ. MINS9) GO TO 20	S0510410
IF (RNPT .EQ. MINS1) GO TO 1790	S0510420
IF (RNPT .GE. 0.0) GO TO 1800	S0510430
GO TO 1770	S0510440
1790 WRITE(ICU,9003) IESCAJ,IESCAJ	S0510450
IF(GRVSET) GOTO 1620	S0510460
GOTO 1700	S0510470
1800 IF(RNPT.GT.0.0) DECAY=RNPT	S0510480
WRITE(ICU,9064) IESA,IESJ,DECAY	S0510490
C-----ENTER ALPHA AND BETA	S0510500
1810 WRITE(ICU,9065) ALPHA,BETA,INVNDR,INV,OFF,ULINE,OFF	S0510510
INPT1 = IBLNK	S0510520
READ(IIU,9001) INPT1	S0510530
IF(INPT1 .NE. MINUS1) GOTO 1820	S0510540
WRITE (ICU,9003) IESCAJ,IESCAJ	S0510550
IF(MODEL5) GOTO 1620	S0510560
IF(.NOT.MODEL4) GOTO 1700	S0510570
GOTO 1760	S0510580
1820 IF(INPT1 .EQ. MINUS9) GOTO 20	S0510590
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 1920	S0510600
IF (INPT1 .EQ. IYSJ.OR.INPT1 .EQ. IYESJ) GO TO 1830	S0510610
WRITE (ICU,9002) INV,OFF,12,3	S0510620
GO TO 1810	S0510630
1830 WRITE(ICU,9066) IESA,IESJ	S0510640
RNPT=0.0	S0510650
CALL IFNBR(IFRMT,14,IER,IIU)	S0510660
IF (IER .EQ. 0) GO TO 1850	S0510670
1840 WRITE (ICU,9002) INV,OFF,12,4	S0510680
IF (BATCH) GO TO 2420	S0510690
GO TO 1830	S0510700
1850 CALL CODE(80)	S0510710
READ (IFRMT,*) RNPT	S0510720
IF (RNPT .EQ. MINS1) GO TO 1860	S0510730
IF (RNPT .EQ. MINS9) GO TO 20	S0510740
IF (RNPT .GE. 0.0) GO TO 1870	S0510750
GO TO 1840	S0510760
1860 WRITE(ICU,9003) IESCAJ	S0510770
GOTO 1810	S0510780
1870 IF(RNPT.GT.0.0) ALPHA=RNPT	S0510790
1880 WRITE(ICU,9067) IESA,IESJ	S0510800
RNPT=0.0	S0510810
CALL IFNBR(IFRMT,14,IER,IIU)	S0510820
IF (IER .EQ. 0) GO TO 1900	S0510830
1890 WRITE (ICU,9002) INV,OFF,12,5	S0510840
IF (BATCH) GO TO 2420	S0510850
GO TO 1880	S0510860
1900 CALL CODE(80)	S0510870
READ (IFRMT,*) RNPT	S0510880
IF (RNPT .EQ. MINS1) GO TO 1830	S0510890

IF (RNPT .EQ. MINS9) GO TO 20	S0510900
IF (RNPT .GE. 0.0) GO TO 1910	S0510910
GO TO 1890	S0510920
1910 IF(RNPT.GT.0.0) BETA=RNPT	S0510930
1920 WRITE(ICU,9068) IESA,IESJ,ALPHA,BETA	S0510940
C-----ENTER DOWNWIND EXPANSION DISTANCES XRY,XRZ	S0510950
1930 WRITE(ICU,9069) XRY,XRZ,INVNDR,INV,OFF,ULINE,OFF	S0510960
INPT1 = IBLNK	S0510970
READ(IIU,9001) INPT1	S0510980
IF(INPT1 .NE. MINUS1) GOTO 1940	S0510990
WRITE(ICU,9003) IESCAJ,IESCAJ	S0511000
GOTO 1810	S0511010
1940 IF(INPT1 .EQ. MINUS9) GOTO 20	S0511020
IF (INPT1.EQ. IBLNK.OR. INPT1.EQ. INJ.OR. INPT1.EQ. INOJ) GO TO 2040	S0511030
IF (INPT1 .EQ. IYSJ.OR. INPT1.EQ. IYESJ) GO TO 1950	S0511040
WRITE (ICU,9002) INV,OFF,12,6	S0511050
IF (BATCH) GO TO 2420	S0511060
GO TO 1930	S0511070
1950 WRITE(ICU,9070) IESA,IESJ	S0511080
RNPT=0.0	S0511090
CALL IFNBR(IFRMT,14,IER,IIU)	S0511100
IF (IER .EQ. 0) GO TO 1970	S0511110
1960 WRITE (ICU,9002) INV,OFF,12,7	S0511120
IF (BATCH) GO TO 2420	S0511130
GO TO 1950	S0511140
1970 CALL CODE(80)	S0511150
READ (IFRMT,*) RNPT	S0511160
IF (RNPT .EQ. MINS1) GO TO 1980	S0511170
IF (RNPT .EQ. MINS9) GO TO 20	S0511180
IF (RNPT .GE. 0.0) GO TO 1990	S0511190
GO TO 1960	S0511200
1980 WRITE(ICU,9003) IESCAJ	S0511210
GOTO 1930	S0511220
1990 IF(RNPT.GT.0.0) XRY=RNPT	S0511230
2000 WRITE(ICU,9071) IESA,IESJ	S0511240
RNPT=0.0	S0511250
CALL IFNBR(IFRMT,14,IER,IIU)	S0511260
IF (IER .EQ. 0) GO TO 2020	S0511270
2010 WRITE (ICU,9002) INV,OFF,12,8	S0511280
IF (BATCH) GO TO 2420	S0511290
GO TO 2000	S0511300
2020 CALL CODE(80)	S0511310
READ (IFRMT,*) RNPT	S0511320
IF (RNPT .EQ. MINS1) GO TO 1950	S0511330
IF (RNPT .EQ. MINS9) GO TO 20	S0511340
IF (RNPT .GE. 0.0) GO TO 2030	S0511350
GO TO 2010	S0511360
2030 IF(RNPT.GT.0.0) XRZ=RNPT	S0511370
2040 WRITE(ICU,9072) IESA,IESJ,XRY,XRZ	S0511380
IF(.NOT.MODEL4) GOTO 2140	S0511390
C-----ENTER TIMAV	S0511400
2050 WRITE(ICU,9074) INV,TIMAV,OFF,INVNDR,INV,OFF,ULINE,OFF	S0511410



INPT1 = IBLNK	S0511420
READ(IIU,9001) INPT1	S0511430
IF(INPT1 .NE. MINUS1) GOTO 2070	S0511440
2060 WRITE(ICU,9003) IESCAJ,IESCAJ	S0511450
GOTO 1930	S0511460
2070 IF(INPT1 .EQ. MINUS9) GOTO 20	S0511470
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 2130	S0511480
IF (INPT1 .EQ. IYSJ.OR.INPT1 .EQ. IYESJ) GO TO 2080	S0511490
WRITE (ICU,9002) INV,OFF,12,9	S0511500
IF (BATCH) GO TO 2420	S0511510
GO TO 2050	S0511520
2080 WRITE(ICU,9075) IESA,IESJ	S0511530
RNPT=0.0	S0511540
CALL IFNBR(IFRMT,14,IER,IIU)	S0511550
IF (IER .EQ. 0) GO TO 2100	S0511560
2090 WRITE (ICU,9002) INV,OFF,12,10	S0511570
IF (BATCH) GO TO 2420	S0511580
GO TO 2080	S0511590
2100 CALL CODE(80)	S0511600
READ (IFRMT,*) RNPT	S0511610
IF (RNPT .EQ. MINS1) GO TO 2110	S0511620
IF (RNPT .EQ. MINS9) GO TO 20	S0511630
IF (RNPT .GE. 0.0) GO TO 2120	S0511640
GO TO 2090	S0511650
2110 WRITE(ICU,9003) IESCAJ	S0511660
GOTO 2050	S0511670
2120 IF(RNPT.GT.0.0) TIMAV=RNPT	S0511680
2130 WRITE(ICU,9076) IESA,IESJ,TIMAV	S0511690
2140 IF(.NOT.GRVSET) GOTO 2390	S0511700
C-----ENTER GRAVITATIONAL SETTLING DATA.	S0511710
DO 2150 I = 1,NVSDEF	S0511720
VS(I) = VSDEF(I)	S0511730
GAMMAP(I) = GAMDEF(I)	S0511740
FS(I) = FSDEF(I)	S0511750
2150 DBAR(I) = DBRDEF(I)	S0511760
NVS = NVSDEF	S0511770
2160 WRITE(ICU,9009)	S0511780
WRITE(ICU,9077) NVS,VS(1)	S0511790
IF(NVS .GT. 1) WRITE(ICU,9010) (VS(I),I=2,NVS)	S0511800
WRITE(ICU,9081) GAMMAP(1)	S0511810
IF(NVS .GT. 1) WRITE(ICU,9010) (GAMMAP(I),I=2,NVS)	S0511820
WRITE(ICU,9018) FS(1)	S0511830
IF(NVS .GT. 1) WRITE(ICU,9010) (FS(I),I=2,NVS)	S0511840
N = 3	S0511850
IF(.NOT.MODEL6) GOTO 2170	S0511860
N = 4	S0511870
WRITE(ICU,9015) DBAR(1)	S0511880
IF(NVS .GT. 1) WRITE(ICU,9010) (DBAR(I),I=2,NVS)	S0511890
2170 WRITE(ICU,9078) INVNDR,INV,OFF,ULINE,OFF	S0511900
INPT1 = IBLNK	S0511910
READ(ICU,9001) INPT1	S0511920
IF(INPT1 .EQ. MINUS9) GOTO 20	S0511930

NLINES = N + 2	S0511940
IF(NVS .GT. 1) NLINES = NLINES + N	S0511950
IF(NVS .GT. 11) NLINES = NLINES + N	S0511960
IF(INPT1 .NE. MINUS1) GOTO 2180	S0511970
WRITE (ICU,9003) (IESCAJ,I=-1,NLINES)	S0511980
IF(.NOT.MODEL4) GOTO 1930	S0511990
GOTO 2050	S0512000
2180 IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 2380	S0512010
IF (INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 2190	S0512020
WRITE (ICU,9002) INV,OFF,12,11	S0512030
IF (BATCH) GO TO 2420	S0512040
GO TO 2170	S0512050
2190 CONTINUE	S0512060
C ENTER THE NUMBER OF SETTLING CATEGORIES	S0512070
WRITE(ICU,9079) IESA,IESJ,MAXNVS	S0512080
CALL IFNBR(IFRMT,14,IER,IIU)	S0512090
IF (IER .EQ. 0) GO TO 2210	S0512100
2200 WRITE (ICU,9002) INV,OFF,12,12	S0512110
IF (BATCH) GO TO 2420	S0512120
GO TO 2190	S0512130
2210 CALL CODE(80)	S0512140
READ (IFRMT,*) INPT1	S0512150
IF (INPT1 .EQ. MINS1) GO TO 2220	S0512160
IF (INPT1 .EQ. MINS9) GO TO 20	S0512170
IF (INPT1 .GE. 0.AND.INPT1 .LE. MAXNVS) GO TO 2230	S0512180
GO TO 2200	S0512190
2220 NLINES = NLINES + 1	S0512200
GOTO 2370	S0512210
2230 IF (INPT1 .GT. 0) NVS = INPT1	S0512220
NVS = MAXO(1,MINO(NVS,MAXNVS))	S0512230
WRITE(ICU,9080) IESA,IESJ,NVS	S0512240
RNPT = VS(1)	S0512250
READ(IIU,*) (VS(I),I=1,NVS)	S0512260
NLINES = NLINES + 2	S0512270
IF(IFIX(VS(1))+1) 20,2240,2250	S0512280
2240 VS(1) = RNPT	S0512290
GO TO 2370	S0512300
2250 WRITE(ICU,9017) NVS	S0512310
RNPT = GAMMAP(1)	S0512320
READ(IIU,*) (GAMMAP(I),I=1,NVS)	S0512330
NLINES = NLINES + 2	S0512340
IF(IFIX(GAMMAP(1))+1) 20,2260,2270	S0512350
2260 GAMMAP(1) = RNPT	S0512360
GO TO 2370	S0512370
2270 WRITE(ICU,9019) NVS	S0512380
RNPT = FS(1)	S0512390
READ(IIU,*) (FS(I),I=1,NVS)	S0512400
NLINES = NLINES + 2	S0512410
IF(IFIX(FS(1))+1) 20,2280,2290	S0512420
2280 FS(1) = RNPT	S0512430
GO TO 2370	S0512440
2290 IF(.NOT.MODEL6) GOTO 2310	S0512450

WRITE(ICU,9016) NVS	S0512460
RNPT = DBAR(1)	S0512470
READ(IIU,*) (DBAR(I),I=1,NVS)	S0512480
NLINES = NLINES + 2	S0512490
IF(IFIX(DBAR(1))+1) 20,2300,2310	S0512500
2300 DBAR(1) = RNPT	S0512510
GO TO 2370	S0512520
2310 A1 = 0.0	S0512530
DO 2320 I = 1,NVS	S0512540
2320 A1 = A1 + FS(I)	S0512550
IF(ABS(A1-1.0) .LT. 0.01) GOTO 2370	S0512560
DO 2330 I=1,NVS	S0512570
IF (ABS(VS(I)-VSDEF(I)) .GT. 0.001) GO TO 2340	S0512580
IF (ABS(FS(I)-FSDEF(I)) .GT. 0.001) GO TO 2340	S0512590
2330 CONTINUE	S0512600
GO TO 2370	S0512610
2340 A1 = 1.0/A1	S0512620
WRITE(ICU,9020) A1	S0512630
INPT1 = IBLNK	S0512640
READ(ICU,9001) INPT1	S0512650
IF (INPT1 .EQ. MINUS9) GO TO 20	S0512660
IF (INPT1 .EQ. MINUS1) GO TO 2370	S0512670
NLINES = NLINES + 3	S0512680
IF (INPT1 .EQ. IBLNK) GO TO 2370	S0512690
IF (INPT1 .EQ. IHN) GO TO 2350	S0512700
WRITE (ICU,9002) INV,OFF,0,0	S0512710
GO TO 2310	S0512720
2350 DO 2360 I = 1,NVS	S0512730
2360 FS(I) = FS(I)*A1	S0512740
C	S0512750
2370 WRITE (ICU,9003) (IESCAJ,I=1,NLINES)	S0512760
GOTO 2160	S0512770
2380 WRITE(ICU,9003) IESCAJ	S0512780
C	S0512790
2390 CONTINUE	S0512800
GO TO 2430	S0512810
2400 NNNTRY = 5	S0512820
GO TO 2430	S0512830
2410 NNNTRY = 6	S0512840
GO TO 2430	S0512850
2420 NNNTRY = 7	S0512860
2430 NNNEST = 6	S0512870
CALL REEDM	S0512880
END	S0512890

SUBROUTINE ANSW(IDX,IALF,JDX,KDX,IER)	S0600000
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S0600010
INTEGER VARRAY(4,11),INTNMB(4,11)	S0600020
DATA VARRAY/1HO,1HR,1HP,1HD,	S0600030
.                   1HS,1HT,2HD2,2HD3,	S0600040
.                   1HN,1HS,1HC,2HXX,	S0600050
.                   1HH,1HO,1HC,1HA,	S0600060
.                   2H39,2H40,2H41,2H17,	S0600070
.                   1HS,2HST,1HA,2HXX,	S0600080
.                   1HE,1HS,2HXX,2HXX,	S0600090
.                   1HU,1HL,2HXX,2HXX,	S0600100
.                   1HN,1HY,2HXX,2HXX,	S0600110
.                   1HN,1HY,2HXX,2HXX,	S0600120
.                   1HC,1HW,1HG,2H-1/	S0600130
DATA INTNMB/2,3,1,4,	S0600140
.                   1,2,3,4,	S0600150
.                   1,2,3,0,	S0600160
.                   1,2,3,4,	S0600170
.                   1HS,1HT,1HT,1HD,	S0600180
.                   1,2,3,0,	S0600190
.                   2,1,0,0,	S0600200
.                   1,2,0,0,	S0600210
.                   2,1,0,0,	S0600220
.                   1,2,0,0,	S0600230
.                   1,2,3,0/	S0600240
DATA MINUS9/2H-9/	S0600250
IER = 0	S0600260
DO 10 I=1,4	S0600270
IF(IALF.EQ.VARRAY(I,IDX)) GO TO 40	S0600280
10 CONTINUE	S0600290
IF(IALF.EQ.MINUS9) GO TO 20	S0600300
IER = 1	S0600310
GO TO 30	S0600320
20 JDX=-1	S0600330
GO TO 50	S0600340
30 I=1	S0600350
40 JDX=INTNMB(I,IDX)	S0600360
KDX=KDX*I-KDX+1	S0600370
50 RETURN	S0600380
END	S0600390

REEDM SOURCE MODULE &REDAM

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FTN4
PROGRAM REDAM(5)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700000
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700010
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700020
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700030
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700040
C::: ::: S0700050
C::: ::: S0700060
C::: ORGANIZATION: H. E. CRAMER CO., INC. ::: S0700070
C::: ::: S0700080
C::: WORK FOR: DR. J. B. STEPHENS (ES84) ::: S0700090
C::: ::: S0700100
C::: PROGRAM CODE: REEDM ::: S0700110
C::: ::: S0700120
C::: PROGRAM DESCRIPTION: INPUT USER DATA FOR ROCKET EXHAUST ::: S0700130
C::: EFFLUENT DIFFUSION ANALYSIS ::: S0700140
C::: (MULTI-LAYER) ::: S0700150
C::: ::: S0700160
C::: INPUT: USER SPECIFIED OPTIONS ::: S0700170
C::: ::: S0700180
C::: OUTPUT: PRINTED AND DISPLAYED LISTING OF USER INPUT VALUES ::: S0700190
C::: ::: S0700200
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700210
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S0700220
C S0700230
Cc S0700240
C**** BEGIN COMMON AREA ****S0700250
C 04/02/82 S0700260
C-----MATH PARAMETERS AND CONSTANTS S0700270
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S0700280
C-----INPUT OPTIONS S0700290
REAL LAMBDA S0700300
INTEGER FILE,GOOD,TITLE S0700310
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S0700320
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S0700330
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S0700340
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S0700350
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S0700360
. ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2) S0700370
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S0700380
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S0700390
. FS(20),MDLNAM(12),DBAR(20) S0700400
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S0700410
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S0700420
. MODEL4,MODEL5,MODEL6 S0700430
INTEGER RUNNUM,RT,CL,CS S0700440
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S0700450
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S0700460
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S0700470
. ,MIXING,MAXDEP,LAYBOT(3) S0700480
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S0700490

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.          ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),          S0700500
.          MINUS1,MINUS9,MINS1,MINS9,                          S0700510
.          MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,   S0700520
.          RT(24),TPROPC,IDXRT                                  S0700530
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.  S0700540
.          INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,         S0700550
.          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S0700560
.          CLRLNE,INSLNE,DELINE                                 S0700570
.          COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S0700580
.          INVNDR(2),ULINE(2),                                 S0700590
.          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S0700600
.          CLRLNE,INSLNE,DELINE,                               S0700610
.          IESCAJ(3),NULL,IBLNK,                              S0700620
.          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)           S0700630
C-----VEHICLE PARAMETERS                                     S0700640
.          COMMON /VCLPR/ VPAR(17)                              S0700650
C-----TIME PARAMETERS                                       S0700660
.          COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S0700670
.          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)         S0700680
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S0700690
.          COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S0700700
.          RH(30),PTEMP(30),SIGEP(30),SIGAP(30)                S0700710
C-----LAYER PARAMETERS                                       S0700720
.          COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S0700730
.          SIGYO(29)                                           S0700740
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)             S0700750
.          COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)           S0700760
C-----CALCULATED NEW LAYER PARAMETERS                         S0700770
.          COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S0700780
.          SPEEDN(32)                                           S0700790
C-----CONVERSION FACTORS                                     S0700800
.          COMMON /CNVRT/ QCONV(4),QPDEPH                       S0700810
C                                                                S0700820
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S0700830
.          COMMON /EXTRA/   NCOM(1),   NTOTAL(1),   PLUS(900)   S0700840
C-----READ/WRITE BUFFER                                       S0700850
C-----A R R A Y   = 2077   +   1       +   1       +   2 * 900   = 3879S0700860
C*****S0700870
C                                                                S0700880
C-----EQUIVALENCE STATEMENTS                                   S0700890
.          EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S0700900
.          ,(IPU2,IPAR(4)),(IPU3,IPAR(5))                      S0700910
.          EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)     S0700920
.          EQUIVALENCE (INPT(1),PLUS(73))                      S0700930
C                                                                S0700940
C****          E N D   O F   C O M M O N   A R E A          ****S0700950
Cc                                                    S0700960
CF-----INPUT FORMAT STATEMENTS                               S0700970
.          9001 FORMAT (40A2)                                    S0700980
.          9002 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC. S0700990
.          *,I2,IH,,I1/)                                       S0701000
.          9003 FORMAT (2A2,A1)                                  S0701010

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CF-----OUTPUT FORMAT STATEMENTS

9004	FORMAT(1H1/1X,38(2H**)/1X,8(2H**),44X,8(2H**)/1X,8(2H**),	S0701020
	. 25H NASA/MSFC MULTIPLE LAYER	S0701030
	., 19H TECHNIQUE - REEDM ,8(2H**)/1X,8(2H**),8H UPDATE,I5,	S0701040
	.13H LOCATION ,2A2,14X,8(2H**)/1X,8(2H**),	S0701050
	.44X,8(2H**)/1X,38(2H**)/)	S0701060
9005	FORMAT(21X,14A2,7H LAUNCH/)	S0701070
9006	FORMAT(17X,17H LAUNCH TIME: ,I7,2A2,7H DATE: ,I2,1X,2A2,I4)	S0701080
9007	FORMAT(17X,20H TIME OF EXECUTION: ,I4,2A2,7H DATE: ,I2,1X,2A2,I4)	S0701090
9008	FORMAT(/1X,9(2H**),13X,15H MODEL OPTIONS ,12X,9(2H**)/)	S0701100
9009	FORMAT(1X,6H MODEL,46X,12A2)	S0701110
9010	FORMAT(1X,9H RUN TYPE,55X,6A2)	S0701120
9011	FORMAT(1X,15H LAUNCH VEHICLE,47X,7A2)	S0701130
9012	FORMAT(1X,12H LAUNCH TYPE,50X,7A2)	S0701140
9013	FORMAT(1X,22H LAUNCH COMPLEX NUMBER,51X,2A2)	S0701150
9014	FORMAT(1X,8H SPECIES,44X,12A2)	S0701160
9015	FORMAT(1X,12H CLOUD SHAPE,54X,5A2)	S0701170
9016	FORMAT(1X,19H CALCULATION HEIGHT,43X,7A2)	S0701180
9017	FORMAT(1X,28H CALCULATION HEIGHT (METERS),40X,F8.2)	S0701190
9018	FORMAT(1X,32H PROPELLANT TEMPERATURE (DEG. C),38X,F6.2)	S0701200
9019	FORMAT(/1X,9(2H**),11X,19H MODEL PARAMETERS ,10X,9(2H**)/)	S0701210
9020	FORMAT(1X,36H CONCENTRATION AVERAGING TIME (SEC.),34X,F6.2)	S0701220
9021	FORMAT(1X,18H DECAY COEFFICIENT,50X,F8.4)	S0701230
9022	FORMAT(54H ABSORPTION COEFFICIENT (RNG: 0 TO 1,NO ABSORPTION=0),	S0701240
	. 15X,F8.4)	S0701250
9023	FORMAT(1X,23H DIFFUSION COEFFICIENTS,34X,11HLATERAL ,F8.4/	S0701260
	. 58X,11HVERTICAL ,F8.4)	S0701270
9024	FORMAT(32H VEHICLE ENTRAINMENT PARAMETERS,26X,11HALONGWIND ,F8.4	S0701280
	. /58X,11HCROSSWIND ,F8.4/58X,11HVERTICAL ,F8.4)	S0701290
9025	FORMAT(1X,37H DOWNWIND EXPANSION DISTANCE (METERS),20X	S0701300
	., 11HLATERAL ,F8.2/58X,11HVERTICAL ,F8.2)	S0701310
9026	FORMAT(1H1/1H1)	S0701320
9027	FORMAT(33H RAINFALL RATE (INCHES PER HOUR),39X,F5.2)	S0701330
9028	FORMAT(33H RAINFALL SCAVENGING COEFFICIENT,32X,1PE12.5)	S0701340
9029	FORMAT(41H TIME RAIN STARTS AFTER LAUNCH (SECONDS),30X,F6.2)	S0701350
9030	FORMAT(23H RAIN DURATION (HOURS),48X,F6.2)	S0701360
9031	FORMAT(23H WASHOUT DEPOSITION IS,40X,14HTIME-DEPENDENT)	S0701370
9032	FORMAT(23H WASHOUT DEPOSITION IS,38X,16HMAXIMUM POSSIBLE)	S0701380
9033	FORMAT(7X,29HNUMBER OF SETTLING CATEGORIES,38X,I3/	S0701390
	17X,49HTERMINAL FALL VELOCITY VALUES (METERS PER SECOND),16X,F5.4)	S0701400
9034	FORMAT(7X,54HREFLECTION COEFFICIENT VALUES (RNG: 0 TO 1, NO REF.=0	S0701410
	1),11X,F5.4)	S0701420
9035	FORMAT(7X,30HFREQUENCY OF OCCURRENCE VALUES,35X,F5.4)	S0701430
9036	FORMAT(40H GRAVITATIONAL SETTLING CATEGORIES DATA)	S0701440
9037	FORMAT((22X,9(F5.4,1H,),F5.4))	S0701450
9038	FORMAT(30H METEOROLOGICAL DATA SOUNDING,41X,3A2)	S0701460
9039	FORMAT(7X,45HAVERAGE PARTICLE SIZE DIAMETERS (MICROMETERS),	S0701470
	1 20X,F5.2)	S0701480
		S0701490
CF-----QUESTION FORMAT STATEMENTS		S0701500
9040	FORMAT(33H PRINT DETAIL MODEL PARAMETERS? (,2A2,1HN,2A2,1HO,2A2,	S0701510
	*1H,,2A2,1HY,2A2,5HES): )	S0701520
9041	FORMAT(2A2,19H PRINT OUT WILL BE: ,38X,4A2)	S0701530

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9042 FORMAT(1H ,2A2,1HPLEASE WAIT,2A2,26H - TAPE SEARCH IN PROGRESS) S0701540
9043 FORMAT(2A2) S0701550
9044 FORMAT (2A2,53HDO YOU WISH RESULTS FOR ANOTHER CALCULATION HEIGHT? S0701560
* (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S0701570
9045 FORMAT (2A2,53HDO YOU WISH TO PROCESS ANOTHER METEOROLOGICAL CASE? S0701580
* (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S0701590
9046 FORMAT (2A2,30H REEDM HAS TERMINATED NORMALLY) S0701600
9047 FORMAT (2A2,39H NOTE: REEDM HAS TERMINATED ABNORMALLY) S0701610
9048 FORMAT(22H ENTER RAINFALL RATE (,2A2,1HH,2A2,8HEAVY=0.3,2A2,1H,, S0701620
*2A2,1HM,2A2,12HODERATE=0.2,,2A2,1HL,2A2,9HIGHT=0.1,,2A2,1HA,2A2, S0701630
*9HNOTHER):_) S0701640
9049 FORMAT(2A2,40H ENTER RAINFALL RATE (INCHES PER HOUR):_) S0701650
9050 FORMAT(2A2,33H RAINFALL RATE (INCHES PER HOUR):, 24X,F8.2) S0701660
9051 FORMAT(41H RAINFALL SCAVENGING COEFFICIENT (LAMBDA=,2A2,1PE12.5, S0701670
*2A2,10H) CHANGE (,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0701680
9052 FORMAT(2A2,16H ENTER LAMBDA:_) S0701690
9053 FORMAT(2A2,33H RAINFALL SCAVENGING COEFFICIENT:,20X,1PE12.5) S0701700
9054 FORMAT(37H TIME RAIN STARTS AFTER LAUNCH (TIM1=,2A2,F6.2,2A2, S0701710
*18H SECONDS) CHANGE?(,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0701720
9055 FORMAT(2A2,23H ENTER TIM1 (SECONDS):_) S0701730
9056 FORMAT(2A2,41H TIME RAIN STARTS AFTER LAUNCH (SECONDS):,18X,F6.2) S0701740
9057 FORMAT(22H RAIN DURATION (DURAT=,2A2,F6.2,2A2,17H HOURS) CHANGE? (S0701750
*,2A2,1HN,2A2,1HO,2A2,1H,,2A2,1HY,2A2,5HES):_) S0701760
9058 FORMAT(2A2,22H ENTER DURAT (HOURS):_) S0701770
9059 FORMAT(2A2,23H RAIN DURATION (HOURS):,36X,F6.2) S0701780
9060 FORMAT(12H CALCULATE (,2A2,1HM,2A2,15HAXIMUM POSSIBLE,2A2,1H,, S0701790
*2A2,1HT,2A2,36HIME-DEPENDENT) WASHOUT DEPOSITION?:_) S0701800
9061 FORMAT(2A2,23H WASHOUT DEPOSITION IS:,26X,16HMAXIMUM POSSIBLE) S0701810
9062 FORMAT(2A2,23H WASHOUT DEPOSITION IS:,28X,14HTIME-DEPENDENT) S0701820
9063 FORMAT(2A2,61H DO YOU WISH TO CHANGE WASHOUT DEPOSITION CALCULATIO S0701830
*N TYPE? (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S0701840
C-----TYPE AND DIMENSION STATEMENTS S0701850
INTEGER PO(8) S0701860
DIMENSION INPT(10),LC(12) S0701870
C S0701880
EQUIVALENCE (INPT(1),INPT1) S0701890
C-----DATA STATEMENTS S0701900
DATA LC/2H39,1HA,2H39,1HB,2H39,1HC,2H40,1H ,2H41,1H ,2H17,1H / S0701910
DATA PO/2H S,2HUM,2HMA,2HRY, S0701920
. 2HDE,2HTA,2HIL,2HED/ S0701930
DATA IHT/1HT/,IHA/1HA/, S0701940
* IHH/1HH/,IHL/1HL/,IHM/1HM/ S0701950
DATA IIHTI/2HTI/, S0701960
* IIHAN/2HAN/, S0701970
* IIHMA/2HMA/,IIHHE/2HHE/,IIHMO/2HMO/, S0701980
* IIHLI/2HLI/ S0701990
DATA IESM/15515B/,IESA/15501B/,IESJ/15512B/,IESD/15504B/, S0702000
* INVBL/62103B/ S0702010
DATA JVERSN/8213/ S0702020
C S0702030
C S0702040
IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH) S0702050

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	IF (PLUS(745) .NE. -9925.0) GO TO 30	S0702060
C	LOCK PRINT OUTPUT UNIT	S0702070
	I = 0	S0702080
	DO 20 K=2,5	S0702090
	IF (IPAR(K) .EQ. ICU.OR.IPAR(K) .LE. 0) GO TO 20	S0702100
	J = IFTTY(IPAR(K))	S0702110
	IF (J .LT. 0) GO TO 20	S0702120
	DO 10 J=2,K	S0702130
	IF (IPAR(K) .EQ. IPAR(J-1)) GO TO 20	S0702140
10	CONTINUE	S0702150
	I = I+1	S0702160
	IFRMT(I) = IPAR(K)	S0702170
20	CONTINUE	S0702180
	IF (I .GT. 0) CALL LURQ(1,IFRMT,I)	S0702190
	PLUS(745) = 0.0	S0702200
30	IF (CRT) GO TO 40	S0702210
	IESM = NULL	S0702220
	IESA = NULL	S0702230
	IESJ = NULL	S0702240
	IESD = NULL	S0702250
	INVBL = NULL	S0702260
40	CONTINUE	S0702270
C		S0702280
C	-----DETERMINE ENTRY POINT.	S0702290
	NNNEST = 2	S0702300
	GOTO (50,650,690,810,660,700,800), NNNTY	S0702310
50	CONTINUE	S0702320
C		S0702330
60	CONTINUE	S0702340
	IF(.NOT.MODEL5) GOTO 550	S0702350
C	-----ENTER INPUT PARAMETERS FOR MODEL 5 OPTION.	S0702360
C	-----ENTER MAXIMUM POSSIBLE WASHOUT DEPOSITION OPTION.	S0702370
	IF(.NOT.BATCH) GOTO 70	S0702380
	READ(IIU,9001) INPT1	S0702390
	GOTO 100	S0702400
70	WRITE(ICU,9060) INVNDR,INV,OFF,ULINE,OFF	S0702410
	INPT1 = IBLNK	S0702420
	READ(IIU,9001) INPT1	S0702430
	IF(INPT1 .NE. MINUS1) GOTO 90	S0702440
	IF(IAGAIN .EQ. 1) GOTO 730	S0702450
	WRITE(ICU,9003) IESCAJ,IESCAJ	S0702460
	IF(IRUN .LT. 3) GOTO 830	S0702470
80	IF(.NOT. GRVSET) GOTO 840	S0702480
	N = 4	S0702490
	IF(NVS .GT. 1) N = 5	S0702500
	IF(NVS .GT. 11) N = 6	S0702510
	WRITE (ICU,9003) (IESCAJ,I=1,N)	S0702520
	GOTO 850	S0702530
90	IF(INPT1 .EQ. MINUS9) GOTO 860	S0702540
100	IF (INPT1 .EQ. IHT.OR.INPT1 .EQ. IIHTI) GO TO 110	S0702550
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IHM.OR.INPT1.EQ.IIHMA) GO TO 120	S0702560
	WRITE (ICU,9002) INV,OFF,13,0	S0702570

IF (BATCH) GO TO 800	S0702580
GO TO 70	S0702590
110 IF(.NOT.BATCH) WRITE (ICU,9062) IESA,IESJ	S0702600
MAXDEP = .FALSE.	S0702610
GOTO 130	S0702620
120 IF(.NOT.BATCH) WRITE (ICU,9061) IESA,IESJ	S0702630
MAXDEP = .TRUE.	S0702640
130 CONTINUE	S0702650
IF(IAGAIN .EQ. 1) GOTO 370	S0702660
C-----ENTER RAINFALL RATE.	S0702670
IF(BATCH) GOTO 150	S0702680
140 WRITE(ICU,9048) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF,ULINE,OFF	S0702690
150 INPT1 = IBLNK	S0702700
CALL IFNBR(INPT,10,IER,IIU)	S0702710
IF(BATCH) GOTO 170	S0702720
IF(INPT1 .NE. MINUS1) GOTO 160	S0702730
WRITE(ICU,9003) IESCAJ,IESCAJ	S0702740
GOTO 70	S0702750
160 IF(INPT1 .EQ. MINUS9) GOTO 860	S0702760
170 IF (INPT1 .EQ. IBLNK.OR.INPT1 .EQ. IIHHE) INPT1 = IHH	S0702770
IF (INPT1 .EQ. IIHMO) INPT1 = IHM	S0702780
IF (INPT1 .EQ. IIHLI) INPT1 = IHL	S0702790
IF (INPT1 .EQ. IIHAN) INPT1 = IHA	S0702800
IF(INPT1 .EQ. IHH) GOTO 260	S0702810
IF(INPT .NE. IHM) GOTO 180	S0702820
RAINRT = 0.2	S0702830
GOTO 260	S0702840
180 IF(INPT .NE. IHL) GOTO 190	S0702850
RAINRT = 0.1	S0702860
GOTO 260	S0702870
190 IF (INPT1 .EQ. IHA) GO TO 210	S0702880
IF (IER .EQ. 0) GO TO 200	S0702890
WRITE (ICU,9002) INV,OFF,14,0	S0702900
IF (BATCH) GO TO 800	S0702910
GO TO 140	S0702920
200 CALL CODE(20)	S0702930
READ(INPT,*) RAINRT	S0702940
IF(RAINRT .LE. 0.0) RAINRT = 0.3	S0702950
IF (.NOT. BATCH) GO TO 270	S0702960
GOTO 280	S0702970
210 WRITE(ICU,9049) IESA,IESJ	S0702980
RNPT = 0.0	S0702990
CALL IFNBR(IFRMT,14,IER,IIU)	S0703000
IF (IER .EQ. 0) GO TO 230	S0703010
220 WRITE (ICU,9002) INV,OFF,14,1	S0703020
IF (BATCH) GO TO 800	S0703030
GO TO 210	S0703040
230 CALL CODE(80)	S0703050
READ (IFRMT,*) RNPT	S0703060
IF (RNPT .EQ. MINS1) GO TO 240	S0703070
IF (RNPT .EQ. MINS9) GO TO 860	S0703080
IF (RNPT .GE. 0.0) GO TO 250	S0703090

GO TO 220	S0703100
240 WRITE(ICU,9003) IESCAJ	S0703110
GOTO 140	S0703120
250 IF(RNPT .GT. 0.0) RAINRT = RNPT	S0703130
260 IF(BATCH) GOTO 280	S0703140
270 WRITE(ICU,9050) IESA,IESJ,RAINRT	S0703150
280 LAMBDA = 5.2E-4*RAINRT**.567	S0703160
IF(IRUN .LT. 3) GOTO 370	S0703170
C-----ENTER RAINFALL SCAVENGING COEFFICIENT.	S0703180
290 WRITE(ICU,9051) INV,LAMBDA,OFF,INVNDR,INV,OFF,ULINE,OFF	S0703190
INPT1 = IBLNK	S0703200
READ(IIU,9001) INPT1	S0703210
IF(INPT1 .NE. MINUS1) GOTO 300	S0703220
WRITE(ICU,9003) IESCAJ,IESCAJ	S0703230
GOTO 140	S0703240
300 IF(INPT1 .EQ. MINUS9) GOTO 860	S0703250
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 360	S0703260
IF (INPT1 .EQ. IYSJ.OR.INPT1 .EQ. IYESJ) GO TO 310	S0703270
WRITE (ICU,9002) INV,OFF,14,2	S0703280
IF (BATCH) GO TO 800	S0703290
GO TO 290	S0703300
310 WRITE(ICU,9052) IESA,IESJ	S0703310
RNPT = 0.0	S0703320
CALL IFNBR(IFRMT,14,IER,IIU)	S0703330
IF (IER .EQ. 0) GO TO 330	S0703340
320 WRITE (ICU,9002) INV,OFF,14,3	S0703350
IF (BATCH) GO TO 800	S0703360
GO TO 310	S0703370
330 CALL CODE(80)	S0703380
READ (IFRMT,*) RNPT	S0703390
IF (RNPT .EQ. MINS1) GO TO 340	S0703400
IF (RNPT .EQ. MINS9) GO TO 860	S0703410
IF (RNPT .GE. 0.0) GO TO 350	S0703420
GO TO 320	S0703430
340 WRITE(ICU,9003) IESCAJ	S0703440
GOTO 290	S0703450
350 IF(RNPT .GT. 0.0) LAMBDA = RNPT	S0703460
360 WRITE(ICU,9053) IESA,IESJ,LAMBDA	S0703470
370 CONTINUE	S0703480
IF(MAXDEP) GOTO 460	S0703490
C-----ENTER TIME RAIN STARTS AFTER LAUNCH.	S0703500
IF(.NOT.BATCH) GOTO 380	S0703510
TIM1 = 0.0	S0703520
READ(IIU,*) TIM1	S0703530
TIM1 = AMAX1(TIM1,0.0)	S0703540
GOTO 460	S0703550
380 WRITE(ICU,9054) INV,TIM1,OFF,INVNDR,INV,OFF,ULINE,OFF	S0703560
INPT1 = IBLNK	S0703570
READ(IIU,9001) INPT1	S0703580
IF(INPT1 .NE. MINUS1) GOTO 390	S0703590
WRITE(ICU,9003) IESCAJ,IESCAJ	S0703600
IF(IAGAIN .EQ. 1) GOTO 70	S0703610

IF(IRUN .LT. 3) GOTO 140	S0703620
GOTO 290	S0703630
390 IF(INPT1 .EQ. MINUS9) GOTO 860	S0703640
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 450	S0703650
IF (INPT1 .EQ. IYSJ.OR.INPT1 .EQ. IYESJ) GO TO 400	S0703660
WRITE (ICU,9002) INV,OFF,15,0	S0703670
IF (BATCH) GO TO 800	S0703680
GO TO 380	S0703690
400 WRITE(ICU,9055) IESA,IESJ	S0703700
RNPT = 0.0	S0703710
CALL IFNBR(IFRMT,14,IER,IIU)	S0703720
IF (IER .EQ. 0) GO TO 420	S0703730
410 WRITE (ICU,9002) INV,OFF,15,1	S0703740
IF (BATCH) GO TO 800	S0703750
GO TO 400	S0703760
420 CALL CODE(80)	S0703770
READ (IFRMT,*) RNPT	S0703780
IF (RNPT .EQ. MINS1) GO TO 430	S0703790
IF (RNPT .EQ. MINS9) GO TO 860	S0703800
IF (RNPT .GE. 0.0) GO TO 440	S0703810
GO TO 410	S0703820
430 WRITE(ICU,9003) IESCAJ	S0703830
IF(IAGIN .EQ. 1) GOTO 70	S0703840
GOTO 380	S0703850
440 IF(RNPT .GT. 0.0) TIM1 = RNPT	S0703860
450 WRITE(ICU,9056) IESA,IESJ,TIM1	S0703870
460 CONTINUE	S0703880
IF(IAGAIN .EQ. 1) GOTO 680	S0703890
C-----ENTER RAIN DURATION, DURAT.	S0703900
IF(.NOT.BATCH) GOTO 470	S0703910
READ(IIU,*) DURAT	S0703920
IF(DURAT .LE. 0.0) DURAT = 1.0	S0703930
GOTO 550	S0703940
470 WRITE(ICU,9057) INV,DURAT,OFF,INVNDR,INV,OFF,ULINE,OFF	S0703950
INPT1 = IBLNK	S0703960
READ(IIU,9001) INPT1	S0703970
IF(INPT1 .NE. MINUS1) GOTO 480	S0703980
WRITE(ICU,9003) IESCAJ,IESCAJ	S0703990
IF(.NOT.MAXDEP) GOTO 380	S0704000
IF(IRUN .LT. 3) GOTO 140	S0704010
GOTO 290	S0704020
480 IF(INPT1 .EQ. MINUS9) GOTO 860	S0704030
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 540	S0704040
IF (INPT1 .EQ. IYSJ.OR.INPT1 .EQ. IYESJ) GO TO 490	S0704050
WRITE (ICU,9002) INV,OFF,16,0	S0704060
IF (BATCH) GO TO 800	S0704070
GO TO 470	S0704080
490 WRITE(ICU,9058) IESA,IESJ	S0704090
RNPT = 0.0	S0704100
CALL IFNBR(IFRMT,14,IER,IIU)	S0704110
IF (IER .EQ. 0) GO TO 510	S0704120
500 WRITE (ICU,9002) INV,OFF,16,1	S0704130

IF (BATCH) GO TO 800	S0704140
GO TO 490	S0704150
510 CALL CODE(80)	S0704160
READ (IFRMT,*) RNPT	S0704170
IF (RNPT .EQ. MINS1) GO TO 520	S0704180
IF (RNPT .EQ. MINS9) GO TO 860	S0704190
IF (RNPT .GE. 0.0) GO TO 530	S0704200
GO TO 500	S0704210
520 WRITE(ICU,9003) IESCAJ	S0704220
GOTO 470	S0704230
530 IF(RNPT .GT. 0.0) DURAT = RNPT	S0704240
540 WRITE(ICU,9059) IESA,IESJ,DURAT	S0704250
550 CONTINUE	S0704260
IF(IRUN .LT. 3) GOTO 590	S0704270
C-----DETAILED OR SUMMARY PRINT OUT?	S0704280
560 WRITE(ICU,9040) INVNDR,INV,OFF,ULINE,OFF	S0704290
INPT1 = IBLNK	S0704300
READ(IIU,9001) INPT1	S0704310
IF(INPT1 .NE. MINUS1) GOTO 570	S0704320
WRITE(ICU,9003) IESCAJ,IESCAJ	S0704330
IF(MODEL5) GOTO 470	S0704340
GOTO 80	S0704350
570 IDXPO=4	S0704360
IF (INPT1 .EQ. MINUS9) GO TO 860	S0704370
IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.INOJ) INPT1 = INJ	S0704380
IF (INPT1.EQ.IYESJ) INPT1 = IYSJ	S0704390
CALL ANSW(9,INPT,IPRINT,IDXPO,IER)	S0704400
IF (IER .EQ. 0) GO TO 580	S0704410
WRITE (ICU,9002) INV,OFF,16,2	S0704420
IF (BATCH) GO TO 800	S0704430
GO TO 560	S0704440
580 WRITE(ICU,9041) IESA,IESJ,(PO(I),I=IDXPO,IDXPO+3)	S0704450
590 IF(IRUN.EQ.2) IPRINT=2	S0704460
C-----DO LOOP ON THE RUN NUMBER	S0704470
600 CONTINUE	S0704480
C LOCK OUTPUT DEVICE.	S0704490
WRITE(IOU,9004) IVERSN,LOCATN	S0704500
WRITE(IOU,9005) TITLE	S0704510
WRITE(IOU,9006) LTIME,LSDT(1),LSDT(2),LDAY,LMON(1),LMON(2),LYEAR	S0704520
WRITE(IOU,9007) JTIME,LSDT(1),LSDT(2),JDAY,JMON(1),JMON(2),JYEAR	S0704530
WRITE(IOU,9008)	S0704540
WRITE(IOU,9009) MDLNAM	S0704550
WRITE(IOU,9038) FILE	S0704560
WRITE(IOU,9010) (RT(I),I=IDXRT,IDXRT+5)	S0704570
WRITE(IOU,9011) (TITLE(I),I=1,7)	S0704580
WRITE(IOU,9012) (TITLE(I),I=8,14)	S0704590
I = 2*LSITE-1	S0704600
WRITE(IOU,9013) LC(I),LC(I+1)	S0704610
IF(.NOT.MODEL6) WRITE(IOU,9014)((ICHAR(I+12-3*J),I=1,3),J=1,4)	S0704620
WRITE(IOU,9015) (CS(I),I=IDXCS,IDXCS+4)	S0704630
IF(.NOT.MODEL4) GOTO 610	S0704640
IF(ICALC.LT.3) WRITE(IOU,9016) (CL(I),I=IDXCL,IDXCL+6)	S0704650

	IF(ICALC.EQ.3) WRITE(IOU,9017) CALHT	S0704660
610	CONTINUE	S0704670
	WRITE(IOU,9018) TPROPC	S0704680
	IF(.NOT.MODEL5) GOTO 620	S0704690
	IF(.NOT.MAXDEP) WRITE(IOU,9031)	S0704700
	IF(MAXDEP) WRITE(IOU,9032)	S0704710
	WRITE(IOU,9027) RAINRT	S0704720
	IF(.NOT.MAXDEP) WRITE(IOU,9029) TIM1	S0704730
	WRITE(IOU,9030) DURAT	S0704740
620	CONTINUE	S0704750
	IF(IPRINT.EQ.2) GO TO 630	S0704760
	WRITE(IOU,9019)	S0704770
	IF(MODEL4) WRITE(IOU,9020) TIMAV	S0704780
	IF(MODEL4) WRITE(IOU,9021) DECAY	S0704790
	IF(GASSET) WRITE(IOU,9022) GAMMAP(21)	S0704800
	WRITE(IOU,9023) ALPHA,BETA	S0704810
	WRITE(IOU,9024) GAMMAX,GAMMAY,GAMMAZ	S0704820
	WRITE(IOU,9025) XRY,XRZ	S0704830
	IF(MODEL5) WRITE(IOU,9028) LAMBDA	S0704840
	IF(MODEL5 .OR. .NOT.GRVSET) GOTO 630	S0704850
	WRITE(IOU,9036)	S0704860
	WRITE(IOU,9033) NVS,VS(1)	S0704870
	IF(NVS .GT. 1) WRITE(IOU,9037) (VS(I),I=2,NVS)	S0704880
	WRITE(IOU,9034) GAMMAP(1)	S0704890
	IF(NVS .GT. 1) WRITE(IOU,9037) (GAMMAP(I),I=2,NVS)	S0704900
	WRITE(IOU,9035) FS(1)	S0704910
	IF(NVS .GT. 1) WRITE(IOU,9037) (FS(I),I=2,NVS)	S0704920
	IF(.NOT.MODEL6) GOTO 630	S0704930
	WRITE(IOU,9039) DBAR(1)	S0704940
	IF(NVS .GT. 1) WRITE(IOU,9037) (DBAR(I),I=2,NVS)	S0704950
630	CONTINUE	S0704960
C	UNLOCK OUTPUT DEVICE.	S0704970
	IF(BATCH .OR. IPLACE.NE.2) GO TO 640	S0704980
	WRITE(ICU,9042) OFF(1),INVBL,OFF	S0704990
640	CONTINUE	S0705000
C	-----TRANSFER TO PROGRAM RDATM TO READ METEOROLOGICAL DATA	S0705010
	NNNTRY = 1	S0705020
	CALL REEDM	S0705030
C		S0705040
650	CONTINUE	S0705050
	ALTSV=ALT(1)	S0705060
	IF(IFLG.LT.0) GO TO 790	S0705070
C	-----TRANSFER TO THE PROGRAM RCLDM -- THE CLOUD RISE PROGRAM	S0705080
660	IF(IAGAIN.EQ.0) GO TO 670	S0705090
	IAGAIN=0	S0705100
	ALT(1)=ALTSV	S0705110
	ICALC=3	S0705120
670	NNNTRY = 2	S0705130
	CALL REEDM	S0705140
C		S0705150
680	NNNTRY = 6	S0705160
	CALL REEDM	S0705170

C		S0705180
690	RUNNUM = RUNNUM + 1	S0705190
	IF(RUNNUM .LE. NUMRUN) GOTO 600	S0705200
	IF(IRUN .EQ. 1) GOTO 770	S0705210
C-----	-----ANOTHER CALCULATION HEIGHT	S0705220
	IF(.NOT.MODEL4) GOTO 730	S0705230
	IF(BATCH) GOTO 710	S0705240
700	WRITE(ICU,9044) IESA, IESM, INVNDR, INV, OFF, ULINE, OFF	S0705250
710	INPT1 = IBLNK	S0705260
	READ(IIU,9001) INPT1	S0705270
	IF(.NOT.BATCH.AND. (INPT1.EQ.MINUS1.OR.INPT1.EQ.MINUS9)) GOTO 790	S0705280
	IF(INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 730	S0705290
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 720	S0705300
	IF (BATCH) GO TO 730	S0705310
	WRITE (ICU,9002) INV,OFF,24,0	S0705320
	GO TO 700	S0705330
720	IAGAIN=1	S0705340
	KEEP = 1	S0705350
	IF(BATCH) GOTO 870	S0705360
	GO TO 880	S0705370
730	CONTINUE	S0705380
	IF(.NOT.MODEL5) GOTO 770	S0705390
C-----	-----ANOTHER WASHOUT DEPOSITION CALULATION TYPE.	S0705400
	IAGAIN = 0	S0705410
	IF(BATCH) GOTO 750	S0705420
740	WRITE(ICU,9063) IESA, IESJ, INVNDR, INV, OFF, ULINE, OFF	S0705430
750	INPT1 = IBLNK	S0705440
	READ(IIU,9001) INPT1	S0705450
	IF(.NOT.BATCH.AND. (INPT1.EQ.MINUS1.OR.INPT1.EQ.MINUS9)) GOTO 790	S0705460
	IF(INPT1.EQ.INJ.OR.INPT1.EQ.INOJ) GO TO 770	S0705470
	IF (INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 760	S0705480
	WRITE (ICU,9002) INV,OFF,25,0	S0705490
	IF (BATCH) GO TO 800	S0705500
	GO TO 740	S0705510
760	IF (.NOT.BATCH) WRITE (ICU,9003) IESCAJ	S0705520
	IAGAIN = 1	S0705530
	IF(BATCH) GOTO 60	S0705540
	WRITE(ICU,9043) IESA, IESD	S0705550
	GOTO 60	S0705560
770	CONTINUE	S0705570
	IF(BATCH) GOTO 780	S0705580
	WRITE(ICU,9045) IESA, IESM, INVNDR, INV, OFF, ULINE, OFF	S0705590
780	INPT1 = IBLNK	S0705600
	READ(IIU,9001) INPT1	S0705610
	IF(.NOT.BATCH.AND. (INPT1.EQ.MINUS1.OR.INPT1.EQ.MINUS9)) GOTO 790	S0705620
	IF(INPT1.EQ.IBLNK.OR.INPT1.EQ.IYSJ.OR.INPT1.EQ.IYESJ) GO TO 860	S0705630
	GOTO 810	S0705640
C-----	PROGRAM RESTART - REWIND MET TAPE	S0705650
790	IF(IPLACE.EQ.2) CALL EXEC(3,410B)	S0705660
	GO TO 860	S0705670
800	IERROR(1) = MINS1	S0705680
	WRITE (ICU,9047) IESA, IESM	S0705690

```
GOTO 820
C-----PROGRAM TERMINATION.
810 WRITE (ICU,9046) IESA,IESM
C
820 CONTINUE
    WRITE(IOU,9026)
    STOP
830 NNTRY = 5
    GO TO 890
840 NNTRY = 6
    GO TO 890
850 NNTRY = 7
    GO TO 890
860 NNTRY = 1
    GO TO 890
870 NNTRY = 8
    GO TO 890
880 NNTRY = 9
890 NNTRY = 1
    CALL REEDM
    END
```

```
S0705700
S0705710
S0705720
S0705730
S0705740
S0705750
S0705760
S0705770
S0705780
S0705790
S0705800
S0705810
S0705820
S0705830
S0705840
S0705850
S0705860
S0705870
S0705880
S0705890
S0705900
```



SUBROUTINE ANSW(IDX,IALF,JDX,KDX,IER)	S0800000
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S0800010
INTEGER VARRAY(4,11),INTNMB(4,11)	S0800020
DATA VARRAY/1HO,1HR,1HP,1HD,	S0800030
.           1HS,1HT,2HD2,2HD3,	S0800040
.           1HN,1HS,1HC,2HXX,	S0800050
.           1HH,1HO,1HC,1HA,	S0800060
.           2H39,2H17,2H40,2H41,	S0800070
.           1HS,2HST,1HA,2HXX,	S0800080
.           1HE,1HS,2HXX,2HXX,	S0800090
.           1HU,1HL,2HXX,2HXX,	S0800100
.           1HN,1HY,2HXX,2HXX,	S0800110
.           1HN,1HY,2HXX,2HXX,	S0800120
.           1HC,1HW,1HG,2H-1/	S0800130
DATA INTNMB/2,3,1,4,	S0800140
.           1,2,3,4,	S0800150
.           1,2,3,0,	S0800160
.           1,2,3,4,	S0800170
.           1HS,1HD,1HT,1HT,	S0800180
.           1,2,3,0,	S0800190
.           2,1,0,0,	S0800200
.           1,2,0,0,	S0800210
.           2,1,0,0,	S0800220
.           1,2,0,0,	S0800230
.           1,2,3,0/	S0800240
DATA MINUS9/2H-9/	S0800250
IER = 0	S0800260
DO 10 I=1,4	S0800270
IF(IALF.EQ.VARRAY(I,IDX)) GO TO 40	S0800280
10 CONTINUE	S0800290
IF(IALF.EQ.MINUS9) GO TO 20	S0800300
IER = 1	S0800310
GO TO 30	S0800320
20 JDX=-1	S0800330
GO TO 50	S0800340
30 I=1	S0800350
40 JDX=INTNMB(I,IDX)	S0800360
KDX=KDX*I-KDX+1	S0800370
50 RETURN	S0800380
END	

REEDMSOURCE MODULE &RDATM

```

FTN4
PROGRAM RDATM(5)
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:
C:
C:
C: ORGANIZATION: H. E. CRAMER CO., INC.
C:
C: WORK FOR: DR. J. B. STEPHENS (ES84)
C:
C: PROGRAM CODE: RDATM
C:
C: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST
C: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER)
C:
C: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS
C:
C: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS
C:
C:
C:
C *****
C *
C * NASA/MSFC MULTILAYER DIFFUSION MODEL -- 30 OCT 1978 *
C *
C * METEOROLOGICAL INPUT PROGRAM -- RDATM *
C *
C *****
Cc
C**** BEGIN COMMON AREA *****
C 04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
. FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,
MODEL4,MODEL5,MODEL6

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S0900000  
S0900010  
S0900020  
S0900030  
S0900040  
S0900050  
S0900060  
S0900070  
S0900080  
S0900090  
S0900100  
S0900110  
S0900120  
S0900130  
S0900140  
S0900150  
S0900160  
S0900170  
S0900180  
S0900190  
S0900200  
S0900210  
S0900220  
S0900230  
S0900240  
S0900250  
S0900260  
S0900270  
S0900280  
S0900290  
S0900300  
S0900310  
S0900320  
S0900330  
S0900340  
S0900350  
S0900360  
S0900370  
S0900380  
S0900390  
S0900400  
S0900410  
S0900420  
S0900430  
S0900440  
S0900450  
S0900460  
S0900470  
S0900480  
S0900490

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INTEGER RUNNUM,RT,CL,CS                                S0900500
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S0900510
. DPZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,          S0900520
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP                  S0900530
. ,MIXING,MAXDEP,LAYBOT(3)                             S0900540
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, .         S0900550
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),          S0900560
. MINUS1,MINUS9,MINS1,MINS9,                          S0900570
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,   S0900580
. RT(24),TPROPC,IDXRT                                  S0900590
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S0900600
  INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,          S0900610
.   TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S0900620
.   CLRLNE,INSLNE,DELINE                               S0900630
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S0900640
.   INVNDR(2),ULINE(2),                               S0900650
.   TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S0900660
.   CLRLNE,INSLNE,DELINE,                             S0900670
.   IESCAJ(3),NULL,IBLNK,                             S0900680
.   IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)         S0900690
C-----VEHICLE PARAMETERS                                S0900700
COMMON /VCLPR/ VPAR(17)                               S0900710
C-----TIME PARAMETERS                                  S0900720
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S0900730
.   LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)       S0900740
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S0900750
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S0900760
.   RH(30),PTEMP(30),SIGEP(30),SIGAP(30)             S0900770
C-----LAYER PARAMETERS                                 S0900780
COMMON /LAYER/ DX,DY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S0900790
.   SIGYO(29)                                          S0900800
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)      S0900810
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)            S0900820
C-----CALCULATED NEW LAYER PARAMETERS                S0900830
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S0900840
.   SPEEDN(32)                                        S0900850
C-----CONVERSION FACTORS                              S0900860
COMMON /CNVRT/ QCONV(4),QPDEPH                       S0900870
C                                                       S0900880
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S0900890
COMMON /EXTRA/   NCOM(1),   NTOTAL(1),   PLUS(900)    S0900900
C-----READ/WRITE BUFFER                               S0900910
C-----A R R A Y   = 2077 + 1 + 1 + 2 * 900 = 3879S0900920
C*****S0900930
C                                                       S0900940
REAL MAXHGT                                          S0900950
C-----EQUIVALENCE STATEMENTS                          S0900960
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S0900970
.   ,(IPU2,IPAR(4)),(IPU3,IPAR(5))                  S0900980
EQUIVALENCE(MAXDEP,GRVSET),(IFRMT(1),IFRMT1)       S0900990
C                                                       S0901000
C**** END OF COMMON AREA ****S0901010

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Cc		S0901020
CF-----	INPUT FORMAT STATEMENTS	S0901030
9001	FORMAT (I4,3XI2,1XA2,A1,1XI4)	S0901040
9002	FORMAT (F6.0,1XF3.0,1X,F3.0,F6.1,F6.1,F8.2,1XF3.0,7XF7.2)	S0901050
9003	FORMAT (F6.2)	S0901060
9004	FORMAT (I2)	S0901070
9005	FORMAT (A2)	S0901080
CF		S0901090
CF-----	OUTPUT FORMAT STATEMENTS	S0901100
9006	FORMAT(1H1,22(1H*),11X,19HMETEOROLOGICAL DATA,10X,22(1H*)// .5X,11HRUN NUMBER:,I4,10X,33H USING METEOROLOGICAL DATA FILE: ,3A2/	S0901110 S0901120
9007	FORMAT(61H ** MAXIMUM DATA FILE NUMBER IS 99 - PROCESSING TERMINATS .ES **,5X,3A2)	S0901130 S0901150
9008	FORMAT (33H0*** REEDM ERROR 011, OPEN ERROR ,I4,18H ON SOUNDING FIS *LE ,3A2)	S0901160 S0901170
9009	FORMAT (34H0*** REEDM ERROR 012, READF ERROR ,I4,18H ON SOUNDING FS *ILE ,3A2)	S0901180 S0901190
9010	FORMAT (6X,40A2)	S0901200
9011	FORMAT (1H1,5X,6H TIME: ,I4,2A2,4X,6H DATE: ,I2,1X,A2,A1,1X,I4)	S0901210
9012	FORMAT(//1X,22(1H*),16X,8HSOUNDING,16X,22(1H*)//)	S0901220
9013	FORMAT(//1X,22(1H*),16X,8HFORECAST,16X,22(1H*)//)	S0901230
9014	FORMAT (28H0SURFACE DENSITY (GM/M**3): ,F8.2)	S0901240
9015	FORMAT (5H0 MET/ .48H LEVEL ALTITUDE DIR. SPEED TEMP, . 32H PTEMP DPTMP PRESS RH/ . 47H NO. (FT) (M) (DEG) (M/S) (KTS) . 33H (DEG. C) (MB.) (%)/ . ,44(2H--))	S0901250 S0901260 S0901270 S0901280 S0901290 S0901300
9016	FORMAT(2XI2,4XI5,2XF6.1,2XF5.1,2(1XF5.2),3XF5.1,2XF5.2,2XF4.1, .5XF6.1,4XF4.1,4XA2)	S0901310 S0901320
9017	FORMAT(//20(1H*),8X,22HMETEOROLOGICAL OPTIONS,9X,20(1H*)// .43H BOTTOM OF SURFACE LAYER HEIGHT (METERS):,9X,F8.3/ .43H MIXING LAYER HEIGHT (METERS):,9X,F8.3/ .42H STND. DEV OF WIND AZIMUTH ANGLE (DEGRS):,10X,F8.5)	S0901330 S0901340 S0901350 S0901360
9018	FORMAT(/1X,73H ** - INDICATES THAT DATA IS LINEARLY INTERPOLATED FS .ROM INPUT METEOROLOGY)	S0901370 S0901380
9019	FORMAT(67H0*** REEDM ERROR 013, CALCULATION HEIGHT IS ABOVE INPUT *MET. LEVELS)	S0901390 S0901400
9020	FORMAT(37H0* PROCESSING CONTINUES WITH NEXT RUN/1H1)	S0901410
9021	FORMAT (F6.0,1X,F3.0,1X,F3.0,2F6.1,F7.1,1X,F3.0)	S0901420
9022	FORMAT(66H0*** REEDM ERROR 014, NO VALID SOUNDING LEVELS WERE FOUNS *D ON FILE ,3A2/)	S0901430 S0901440
9023	FORMAT (49H0*** REEDM WARNING 024, ZERO WIND SPEED AT LEVEL ,I2, *27H, PROG. SUBSTITUTES 1.0 M/S/5X,39HDIRECTION NOT MODIFIED MAY BES * INCORRECT)	S0901450 S0901460 S0901470
9024	FORMAT (41H0*** REEDM WARNING 025, EOF READ IN FILE ,3A2, *50H, NNNN SHOULD BE LAST IMAGE, DATA MAY BE TRUNCATED)	S0901480 S0901490
C		S0901500
C-----	TYPE AND DIMENSION STATEMENTS	S0901510
	DIMENSION IDCB(272),IBUF(40),DPTMP(30),LEVELS(30),NTEST(5),	S0901520
	*ALTS(100),DIRS(100),SPEEDS(100),TEMPS(100),PRESSS(100),RHS(100),	S0901530

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*PTEMPS(100) S0901540
C S0901550
EQUIVALENCE (IFRMT,IBUF),(ALTS(1),PLUS(1)),(DIRS(1),PLUS(101)), S0901560
*(SPEEDS(1),PLUS(201)),(TEMPS(1),PLUS(301)),(PRESS(1),PLUS(401)), S0901570
*(RHS(1),PLUS(501)),(PTEMPS(1),PLUS(601)) S0901580
C S0901590
C-----DATA STATEMENTS S0901600
DATA LEVELS/30*2H / S0901610
DATA NTEST/2HTE,2HTR,2HMA,2HAL,2HSI/ S0901620
DATA MAXHGT/10000.0/,MAXLVS/100/ S0901630
DATA IIHNN/2HNN/,IIHTE/2HTE/,IIHRA/2HRA/,IIHFO/2HFO/,IIHST/2HST/, S0901640
*IIH00/2H00/,IIH99/2H99/ S0901650
DATA JVERSN/8213/ S0901660
C S0901670
C S0901680
C-----INITIALIZE I/O DEVICES,COMMON VARIABLES,CONSTANTS S0901690
C!!!! H.E.C ONLY. S0901700
C ONLY USE IF WANT MATERIAL FROM HIGH ALTITUDES WHEN CALCULATING S0901710
C DEPOSITION OR CONCENTRATION FROM AL203. S0901720
C IF (GRVSET .AND. .NOT. MODEL5) MAXHGT = 20000.0 S0901730
C!!!! S0901740
IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH) S0901750
IFLG=0 S0901760
ISNDFO = .FALSE. S0901770
H=0.0 S0901780
C S0901790
C-----SET UP THE FILE NAME FOR THIS RUN AND WRITE OUT THE HEADER S0901800
ISETS = 1 S0901810
IWANT = 0 S0901820
IINFN = 0 S0901830
C IF MAG. TAPE (TAPE##) S0901840
IF (IPLACE .EQ. 2) GO TO 10 S0901850
C DISC FILE S0901860
IF (IPLACE .EQ. 3) GO TO 20 S0901870
C SPECIAL DISC FILE (DATA##) OR TAPE (TAPE##) S0901880
10 IASFN = FILE(3) S0901890
CALL CODE(2) S0901900
READ (IASFN,9004) IINFN S0901910
IWANT = IINFN+RUNNUM S0901920
20 CONTINUE S0901930
IF (IPLACE .EQ. 3.AND.RUNNUM .GT. 1) IWANT = 0 S0901940
WRITE (IOU,9006) RUNNUM,(FILE(J),J=1,3) S0901950
C-----IF THE DATA IS ON A DISK FILE, READ FROM DISK -- IF IT S0901960
C IS ON TAPE, READ IT AS KSC 1965 DATA IN SUBROUTINE KSC65 S0901970
IF(IPLACE .NE. 2)GO TO 30 S0901980
CALL KSC65(IWANT,IEOF) S0901990
IF(IEOF) 420,240,170 S0902000
C-----OPEN THE DATA FILE FOR THIS RUN S0902010
30 CALL OPEN(IDCIB,IERR,FILE,1B) S0902020
IF(IERR .GT. 0) GO TO 40 S0902030
WRITE(IOU,9008) IERR,FILE S0902040
GO TO 420 S0902050

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40	CONTINUE	S0902060
C-----	READ THE HEADINGS FROM THE DATA FILE, SETTING UP THE	S0902070
C	APPROPRIATE PARAMETERS	S0902080
	CALL READF(IDCIB,IERR,IBUF,40,LEN)	S0902090
	IF(IERR .GE. 0)GO TO 60	S0902100
50	WRITE (IOU,9009) IERR,FILE	S0902110
	IF (.NOT.BATCH) WRITE (ICU,9009) IERR,FILE	S0902120
	GO TO 420	S0902130
60	IF (IWANT .LE. ISETS) GO TO 70	S0902140
	IF (IBUF(1).NE.IIHNN.OR.IBUF(2).NE.IIHNN) GO TO 40	S0902150
	ISETS = ISETS+1	S0902160
	GO TO 40	S0902170
70	IF(IBUF(1) .NE. IIHTE)GO TO 40	S0902180
80	WRITE (IOU,9010) (IBUF(I),I=1,LEN)	S0902190
90	CALL READF(IDCIB,IERR,IBUF,40,LEN)	S0902200
	IF(IERR .LT. 0)GO TO 50	S0902210
	IF(IBUF(1).NE.IIHRA.AND. IBUF(1).NE.IIHFO)GO TO 90	S0902220
	ISNDFO = .FALSE.	S0902230
	IF(IBUF(1) .EQ.IIHFO) ISNDFO = .TRUE.	S0902240
	WRITE (IOU,9010) (IBUF(I),I=1,LEN)	S0902250
	CALL READF(IDCIB,IERR,IBUF,40,LEN)	S0902260
	IF(IERR .LT. 0)GO TO 50	S0902270
	WRITE (IOU,9010) (IBUF(I),I=1,LEN)	S0902280
C-----	READ THE SOUNDING/FORECAST TIME	S0902290
	CALL READF(IDCIB,IERR,IBUF,9)	S0902300
	IF(IERR .LT. 0)GO TO 50	S0902310
	CALL CODE(80)	S0902320
	READ (IBUF,9001) ISTORE,ISDAY,ISMON(1),ISMON(2),ISYEAR	S0902330
C	CHANGE TO EST OR EDT DEPENDING ON LAUNCH TIME	S0902340
	ISTORE = ISTORE - 500	S0902350
	IF(IPLACE .EQ. 1)ISTORE = ISTORE - 300	S0902360
	IF(LSDT(2) .NE.IIHST)ISTORE = ISTORE + 100	S0902370
	IF(ISTORE .GT. 0)GO TO 100	S0902380
	ISTORE = 2400 + ISTORE	S0902390
	ISDAY = ISDAY - 1	S0902400
C	WRITE OUT THE NEXT LINE OF THE HEADER	S0902410
100	CALL READF(IDCIB,IERR,IBUF,40,LEN)	S0902420
	IF(IERR .LT. 0)GO TO 50	S0902430
	WRITE (IOU,9010) (IBUF(I),I=1,LEN)	S0902440
C-----	WRITE OUT THE SOUNDING/FORECAST TIME	S0902450
	WRITE (IOU,9011) ISTORE,LSDT(1),LSDT(2),ISDAY,ISMON(1),ISMON(2),	S0902460
	ISYEAR	S0902470
C-----	FIND THE FIRST DATA POINT WITH AN ALTITUDE OF 10 FEET	S0902480
C	OR ABOVE. TRY TO FIND A TOTAL OF MAXLEV POINTS WITH ALTITUDES	S0902490
C	BETWEEN 10 AND MAXHGT FEET INCLUSIVE	S0902500
	JJ = 0	S0902510
	DO 230 I=1,MAXLVS	S0902520
110	DO 120 K=1,40	S0902530
120	IBUF(K) = IBLNK	S0902540
	CALL READF(IDCIB,IERR,IBUF,40,LEN)	S0902550
	IF(I .GT. 1) GO TO 130	S0902560
	IF(IERR .LT. 0) GO TO 50	S0902570



230	NUM = I	S0903100
	GO TO 240	S0903110
C	SORT ALL THE DATA POINTS SO THEY APPEAR IN ASCENDING	S0903120
C	ORDER OF ALTITUDE	S0903130
240	NUM1 = NUM - 1	S0903140
	IF(NUM1) 250,290,260	S0903150
250	WRITE (IOU,9022) FILE	S0903160
	GOTO 420	S0903170
260	DO 280 I=1,NUM1	S0903180
	JJ = NUM - I	S0903190
	DO 270 J=1,JJ	S0903200
	J1 = J + 1	S0903210
	IF(ALTS(J) .LE. ALTS(J1))GO TO 270	S0903220
	ARG = ALTS(J)	S0903230
	ALTS(J) = ALTS(J1)	S0903240
	ALTS(J1) = ARG	S0903250
	ARG = DIRS(J)	S0903260
	DIRS(J) = DIRS(J1)	S0903270
	DIRS(J1) = ARG	S0903280
	ARG = SPEEDS(J)	S0903290
	SPEEDS(J) = SPEEDS(J1)	S0903300
	SPEEDS(J1) = ARG	S0903310
	ARG = TEMPS(J)	S0903320
	TEMPS(J) = TEMPS(J1)	S0903330
	TEMPS(J1) = ARG	S0903340
	ARG = PTEMPS(J)	S0903350
	PTEMPS(J) = PTEMPS(J1)	S0903360
	PTEMPS(J1) = ARG	S0903370
	ARG = PRESSS(J)	S0903380
	PRESSS(J) = PRESSS(J1)	S0903390
	PRESSS(J1) = ARG	S0903400
	ARG = RHS(J)	S0903410
	RHS(J) = RHS(J1)	S0903420
	RHS(J1) = ARG	S0903430
270	CONTINUE	S0903440
280	CONTINUE	S0903450
C	CALL ROUTINE INTERP TO SCAN SORTED DATA POINTS AND IF THE DIFFERENCE	S0903460
C	IN ALTITUDE BETWEEN ANY TWO POINTS IS % 1000 FT DO A LINEAR INTERPOL-	S0903470
C	ATION TO CREATE INTERMEDIATE LEVELS BETWEEN THE POINTS	S0903480
	CALL INTRP(LEVELS)	S0903490
C-----	ZERO OUT THE REMAINING ELEMENTS OF THE ARRAYS	S0903500
290	CONTINUE	S0903510
	NUM1 =NUM	S0903520
	IF (NUM1 .GT. MAXLEV) NUM1 = MAXLEV	S0903530
	DO 300 I=1,NUM1	S0903540
	ALT(I) = ALTS(I)	S0903550
	DIR(I) = DIRS(I)	S0903560
	SPEED(I) = SPEEDS(I)	S0903570
	TEMP(I) = TEMPS(I)	S0903580
	PRESS(I) = PRESSS(I)	S0903590
	PTEMP(I) = PTEMPS(I)	S0903600
300	RH(I) = RHS(I)	S0903610



IF (NUM1 .GE. MAXLEV) GO TO 320	S0903620
NUM1 = NUM1+1	S0903630
DO 310 I=NUM1,MAXLEV	S0903640
ALT(I) = 0.0	S0903650
DIR(I) = 0.0	S0903660
SPEED(I) = 0.0	S0903670
TEMP(I) = 0.0	S0903680
PRESS(I) = 0.0	S0903690
RH(I) = 0.0	S0903700
310 PTEMP(I) = 0.0	S0903710
GO TO 330	S0903720
320 IF (.NOT. GRVSET.OR.MODEL5) GO TO 330	S0903730
IF (MAXHGT .LT. 20000.0) GO TO 330	S0903740
ALT(NUM1) = ALTS(NUM)	S0903750
DIR(NUM1) = DIRS(NUM)	S0903760
SPEED(NUM1) = SPEEDS(NUM)	S0903770
TEMP(NUM1) = TEMPS(NUM)	S0903780
PRESS(NUM1) = PRESSS(NUM)	S0903790
RH(NUM1) = RHS(NUM)	S0903800
PTEMP(NUM1) = PTEMPS(NUM)	S0903810
330 IF (NUM .GT. MAXLEV) NUM = MAXLEV	S0903820
NLAYS = NUM-1	S0903830
C-----CONVERT TO METRIC UNITS	S0903840
DO 340 I=1,NUM	S0903850
ALT(I) = 0.3048 * ALT(I)	S0903860
TEMP(I) = TEMP(I) + 273.16	S0903870
SPEED(I) = 0.515 * SPEED(I)	S0903880
IF (SPEED(I) .GT. 0.0) GO TO 340	S0903890
WRITE (IOU,9023) I	S0903900
IF (.NOT.BATCH) WRITE (ICU,9023) I	S0903910
SPEED(I) = 1.0	S0903920
340 CONTINUE	S0903930
IF(ICALC.NE.3) GO TO 350	S0903940
IF(CALHT.LE.ALT(NUM)) GO TO 350	S0903950
WRITE(IOU,9019)	S0903960
WRITE(IOU,9020)	S0903970
IF (.NOT.BATCH) WRITE (ICU,9020)	S0903980
GO TO 420	S0903990
C-----SAVE DEW POINT TEMP AND CALCULATE POTENTIAL TEMPERATURE	S0904000
350 DO 360 I=1,NUM	S0904010
DPTEMP(I)=PTEMP(I)	S0904020
PTEMP(I)=0.0	S0904030
PTEMP(I) = POTMP(TEMP(I),RH(I),PRESS(I))	S0904040
360 CONTINUE	S0904050
C-----WRITE THE HEADER FOR SOUNDING OR FORECAST	S0904060
IF(ISNDFO) GO TO 370	S0904070
WRITE (IOU,9012)	S0904080
GO TO 380	S0904090
370 WRITE (IOU,9013)	S0904100
C-----WRITE THE SURFACE DENSITY AND ALL THE DATA POINTS	S0904110
380 WRITE (IOU,9014) SURDEN	S0904120
WRITE (IOU,9015)	S0904130

DO 390 I=1,NUM	S0904140
IALTF = 3.281 * ALT(I) + 0.5	SC904150
ALTM = ALT(I)	S0904160
SPDKNT=SPEED(I)*1.94175	S0904170
APTEMP = PTEMP(I) - 273.16	S0904180
TTEMP = TEMP(I) - 273.16	S0904190
390 WRITE (IOU,9016) I,IALTF,ALTM,DIR(I),SPEED(I),SPDKNT,TTEMP,	S0904200
APTEMP,DPTTEMP(I),PRESS(I),RH(I),LEVELS(I)	S0904210
WRITE(IOU,9018)	S0904220
C-----DEFAULT REFERENCE HEIGHT TO BOTTOM LEVEL	S0904230
ZRK=ALT(1)	S0904240
C-----DETERMINE THE DEFAULT VALUE OF SIGMA[R]	S0904250
J1=1	S0904260
J2=1	S0904270
J3=0	S0904280
DO 400 JJ=1,NUM-1	S0904290
IF(ABS(PRESS(JJ)-1000.)<.LT.ABS(PRESS(J2)-1000.)) J2=JJ	S0904300
IF(ALT(JJ).LE.304.8.AND.ALT(JJ+1).GT.304.8) J3=JJ	S0904310
400 CONTINUE	S0904320
CALL RSGAZ(J1,J2,J3,SIGMAR)	S0904330
410 CONTINUE	S0904340
GO TO 430	S0904350
C-----ERROR EXIT.	S0904360
420 IFLG=0	S0904370
IERROR(1) = 1	S0904380
WRITE(IOU,9020)	S0904390
C-----CLOSE THE DATA FILE	S0904400
430 CALL CLOSE(IDCBI)	S0904410
NNNEST = 1	S0904420
NNNTRY = 2	S0904430
CALL REEDM	S0904440
END	S0904450

REEDM SOURCE MODULE &RDATN

FTN4	S1000000
SUBROUTINE KSC65(IWANT,IEOF)	S1000010
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S1000020
C -----	S1000030
C -	S1000040
C - THIS SUBROUTINE READS IN DATA FOR THE REED DIFFUSION	S1000050
C - MODEL FROM MAG TAPE IN KSC 1965 FORMAT	S1000060
C -	S1000070
C -----	S1000080
Cc	S1000090
C**** BEGIN COMMON AREA	****S1000100
C 04/02/82	S1000110
C-----MATH PARAMETERS AND CONSTANTS	S1000120
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S1000130
C-----INPUT OPTIONS	S1000140
REAL LAMBDA	S1000150
INTEGER FILE,GOOD,TITLE	S1000160
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S1000170
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S1000180
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S1000190
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S1000200
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S1000210
. ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2)	S1000220
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S1000230
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S1000240
. FS(20),MDLNAM(12),DBAR(20)	S1000250
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S1000260
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S1000270
. MODEL4,MODEL5,MODEL6	S1000280
INTEGER RUNNUM,RT,CL,CS	S1000290
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S1000300
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S1000310
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S1000320
. ,MIXING,MAXDEP,LAYBOT(3)	S1000330
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S1000340
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S1000350
. MINUS1,MINUS9,MINS1,MINS9,	S1000360
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S1000370
. RT(24),TPROPC,IDXRT	S1000380
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S1000390
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S1000400
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S1000410
. CLRLNE,INSLNE,DELNE	S1000420
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S1000430
. INVNDR(2),ULINE(2),	S1000440
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S1000450
. CLRLNE,INSLNE,DELNE,	S1000460
. IESCAJ(3),NULL,IBLNK,	S1000470
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S1000480
C-----VEHICLE PARAMETERS	S1000490

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COMMON /VCLPR/ VPAR(17) S1000500
C-----TIME PARAMETERS S1000510
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2) S1000520
. S1000530
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S1000540
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
RH(30),PTEMP(30),SIGEP(30),SIGAP(30) S1000550
. S1000560
C-----LAYER PARAMETERS S1000570
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
SIGYO(29) S1000580
. S1000590
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS) S1000600
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6) S1000610
C-----CALCULATED NEW LAYER PARAMETERS S1000620
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
SPEEDN(32) S1000630
. S1000640
C-----CONVERSION FACTORS S1000650
COMMON /CNVRT/ QCONV(4),QPDEPH S1000660
C S1000670
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S1000680
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S1000690
C----READ/WRITE BUFFER S1000700
C----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S1000710
C*****S1000720
C S1000730
C-----EQUIVALENCE STATEMENTS S1000740
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S1000750
. ,(IPU2,IPAR(4)),(IPU3,IPAR(5)) S1000760
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1) S1000770
C S1000780
C**** END OF COMMON AREA ****S1000790
Cc S1000800
CF-----FORMAT STATEMENTS S1000810
9001 FORMAT (40A2) S1000820
9002 FORMAT (I4,3XI2,1XA2,A1,1XI4) S1000830
9003 FORMAT (F7.0,3XF3.0,5XF3.0,2XF5.1,3XF5.1,3XF6.1,2XF3.0,10XF6.1) S1000840
CF-----OUTPUT FORMAT STATEMENT S1000850
9004 FORMAT (1H1,5X,6HTIME: ,I4,1X,A1,A2,4X,6HDATE: ,I2,1X,A2,A1,1X,I4)S1000860
9005 FORMAT(71H0*** REEDM ERROR 015, UNEXPECTED END OF FILE OCCURRED ONS1000870
1 SOUNDING FILE ,3A2) S1000880
9006 FORMAT(41H0*** REEDM ERROR 016, SOUNDING DATA FILE ,3A2,33H HAS LES1000890
ISS THAN FIVE VALID LEVELS.) S1000900
C S1000910
REAL MAXHGT S1000920
C-----DIMENSION STATEMENT S1000930
C S1000940
DIMENSION IBUF(40),ALTS(100),DIRS(100),SPEEDS(100),TEMPS(100),
*PRESSS(100),RHS(100),PTEMPS(100),NTEST(7) S1000950
S1000960
C S1000970
EQUIVALENCE (ALTS(1),PLUS(1)),(DIRS(1),PLUS(101)), S1000980
*(SPEEDS(1),PLUS(201)),(TEMPS(1),PLUS(301)),(PRESSS(1),PLUS(401)), S1000990
*(RHS(1),PLUS(501)),(PTEMPS(1),PLUS(601)) S1001000
C S1001010

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DATA MAXLVS/100/,MAXHGT/10000.0/	S1001020
DATA NTEST/2HTE,2HST,2HCA,2HAL,2HOR,2H00,2H99/	S1001030
C	S1001040
C-----INITIALIZE THE COUNTER FOR THE NUMBER OF SETS OF DATA TO 0	S1001050
C	S1001060
ISETS = 0	S1001070
IF (GRVSET .AND. .NOT. MODEL5) MAXHGT = 20000.0	S1001080
C-----READ DATA FROM TAPE	S1001090
10 READ (8,9001) (IBUF(I),I=1,40)	S1001100
C-----IF AN EOF ON TAPE, SET THE EOF FLAG AND RETURN	S1001110
CALL EXEC(13,8,IEQT5)	S1001120
IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001130
IF(IEOF .EQ. 1) GOTO 160	S1001140
C-----KEEP READING UNTIL THE STANDARD LEVEL DATA IS FOUND	S1001150
IF(IBUF(1).NE.NTEST(1).OR.IBUF(2).NE.NTEST(2)) GO TO 10	S1001160
ISETS = ISETS+1	S1001170
IF (IWANT .GT. ISETS) GO TO 10	S1001180
20 READ (8,9001) (IBUF(I),I=1,40)	S1001190
CALL EXEC(13,8,IEQT5)	S1001200
IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001210
IF(IEOF .EQ. 1) GOTO 160	S1001220
IF(IBUF(1).NE.NTEST(3).OR. IBUF(2).EQ.NTEST(2))GO TO 20	S1001230
C-----READ THE SOUNDING/FORECAST TIME	S1001240
READ (8,9002) ISTM,ISDAY,ISMON(1),ISMON(2),ISYEAR	S1001250
CALL EXEC(13,8,IEQT5)	S1001260
IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001270
IF(IEOF .EQ. 1) GOTO 160	S1001280
C-----CHANGE TO EST OR EDT DEPENDING ON LAUNCH TIME	S1001290
ISTM = ISTM - 500	S1001300
IF(IPLACE .EQ. 1)ISTM = ISTM - 300	S1001310
IF(LSDT(2) .NE. NTEST(2))ISTM = ISTM + 100	S1001320
IF(ISTM .GT. 0)GO TO 30	S1001330
ISTM = 2400 + ISTM	S1001340
ISDAY = ISDAY - 1	S1001350
C-----FIND THE KEY WORD ALTITUDE (AL)	S1001360
30 READ (8,9001) (IBUF(I),I=1,40)	S1001370
CALL EXEC(13,8,IEQT5)	S1001380
IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001390
IF(IEOF .EQ. 1) GOTO 160	S1001400
IF(IBUF(2) .EQ. NTEST(2))GO TO 20	S1001410
IF(IBUF(1) .NE. NTEST(4))GO TO 30	S1001420
C-----LIMIT DATA TO 100 POINTS -- READ THE STANDARD LEVEL DATA	S1001430
DO 70 I=1,100	S1001440
40 READ(8,9001) (IBUF(J),J=1,40)	S1001450
CALL EXEC(13,8,IEQT5)	S1001460
IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001470
IF(IEOF .EQ. 1) GOTO 160	S1001480
CALL B2Z(IBUF(1),J)	S1001490
IF (IBUF(10) .EQ. NTEST(5)) GO TO 80	S1001500
IF (J .GE. NTEST(6).AND.J .LE. NTEST(7)) GO TO 50	S1001510
IF (IBUF(1) .EQ. NTEST(1)) GO TO 80	S1001520
GO TO 40	S1001530

50 CALL CODE(80)	S1001540
READ(IBUF,9003) ALTS(I),DIRS(I),SPEEDS(I),TEMPS(I),PTEMPS(I),	S1001550
IPRESSS(I),RHS(I),SURDN	S1001560
IF(DIRS(I) .GT. 360.0) GOTO 40	S1001570
IF(DIRS(I) .EQ. 360.0) DIRS(I) = 0.0	S1001580
IF(SPEEDS(I) .GE. 99.0) GOTO 40	S1001590
IF(TEMPS(I) .GE. 99.0) GOTO 40	S1001600
IF(PTEMPS(I) .GE. 99.0) GOTO 40	S1001610
IF(PRESSS(I) .GE. 9999.0) GOTO 40	S1001620
IF(RHS(I) .LE. 0.0 .OR. RHS(I) .GT. 100.0) CALL RELHH(TEMPS(I),	S1001630
1 PTEMPS(I),PRESSS(I),RHS(I))	S1001640
IF(I .EQ. 1)SURDEN = SURDN	S1001650
IF(I.GT.1.AND.ALTS(I).LT.ALTS(I-1)) SURDEN=SURDN	S1001660
IF(ALTS(I) .GT. MAXHGT)GO TO 80	S1001670
C CHECK FOR DUPLICATE LEVELS.	S1001680
IF(I .EQ. 1) GOTO 70	S1001690
J = I - 1	S1001700
DO 60 K = 1,J	S1001710
IF(ABS(ALTS(I)-ALTS(K))-1.0) 40,40,60	S1001720
60 CONTINUE	S1001730
70 CONTINUE	S1001740
80 NUM = I	S1001750
IF(NUM .GT. 100)GO TO 140	S1001760
C-----FIND THE KEY WORD MANDATORY	S1001770
90 IF (IBUF(10) .EQ. NTEST(5)) GO TO 100	S1001780
READ (8,9001) (IBUF(I),I=1,40)	S1001790
CALL EXEC(13,8,IEQT5)	S1001800
IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001810
IF(IEOF .EQ. 1) GOTO 160	S1001820
IF(IBUF(1) .EQ. NTEST(1).AND.IBUF(2) .EQ. NTEST(2))GO TO 150	S1001830
IF(IBUF(10).NE.NTEST(5))GO TO 90	S1001840
C-----LIMIT DATA TO 100 POINTS -- READ THE MANDATORY LEVEL DATA	S1001850
100 DO 130 I=NUM,100	S1001860
110 READ(8,9001) (IBUF(J),J=1,40)	S1001870
CALL EXEC(13,8,IEQT5)	S1001880
IEOF = IAND(ISHIF(IEQT5,-7),1)	S1001890
IF(IEOF .EQ. 1) GOTO 140	S1001900
CALL B2Z(IBUF(1),J)	S1001910
IF (IBUF(1).EQ.NTEST(1).OR.IBUF(2).EQ.NTEST(2)) GO TO 140	S1001920
IF(J .LT. NTEST(6).OR. J .GT. NTEST(7)) GOTO 110	S1001930
CALL CODE(80)	S1001940
READ(IBUF,9003) ALTS(I),DIRS(I),SPEEDS(I),TEMPS(I),PTEMPS(I),	S1001950
.                   PRESSS(I),RHS(I)	S1001960
IF(DIRS(I) .GT. 360.0) GOTO 110	S1001970
IF(TEMPS(I) .GE. 99.0) GOTO 110	S1001980
IF(PTEMPS(I) .GE. 99.0) GOTO 110	S1001990
IF(PRESSS(I) .GE. 9999.0) GOTO 110	S1002000
IF(RHS(I) .LE. 0.0 .OR. RHS(I) .GT. 100.0) CALL RELHH(TEMPS(I),	S1002010
1 PTEMPS(I),PRESSS(I),RHS(I))	S1002020
IF(DIRS(I) .EQ. 360.0)DIRS(I) = 0.0	S1002030
IF(ALTS(I) .GT. MAXHGT)GO TO 140	S1002040
IF(I .LE. 1) GOTO 130	S1002050

J = I - 1	S1002060
DO 120 K = 1,J	S1002070
IF(ABS(ALTS(I)-ALTS(K))-1.0) 110,110,120	S1002080
120 CONTINUE	S1002090
130 CONTINUE	S1002100
C-----NUM IS THE NUMBER OF DATA POINTS	S1002110
140 NUM = I - 1	S1002120
C-----INCREMENT THE COUNTER -- IF THIS IS THE SET OF DATA DESIRED,	S1002130
C-----WRITE OUT THE SOUNDING/FORECAST TIME -- OTHERWISE GET THE NEXT	S1002140
C-----SET	S1002150
150 IF (IBUF(1).EQ.NTEST(1).OR.IBUF(2).EQ.NTEST(2)) CALL EXEC(3,210B)	S1002160
C-----WRITE OUT THE SOUNDING/FORECAST TIME	S1002170
WRITE (IOU,9004) ISTEIME,LSDT(1),LSDT(2),ISDAY,ISMON(1),ISMON(2),	S1002180
ISYEAR	S1002190
C-----THERE MUST BE 5 OR MORE DATA POINTS FOR THIS TO BE A VALID SET	S1002200
C-----OF DATA -- IF THERE IS NOT, RETURN WITH IEOF = -2.	S1002210
IF(NUM .GT. 4) GOTO 170	S1002220
IEOF = -2	S1002230
WRITE(IOU,9006) FILE	S1002240
GOTO 170	S1002250
160 IEOF = -1	S1002260
WRITE(IOU,9005) FILE	S1002270
170 RETURN	S1002280
C-----END OF KSC65	S1002290
END	S1002300

	SUBROUTINE RELHH(T,DP,P,RH)	S1100000
	. , UPDATE: 8213 SOURCE: 17 FEB 81 LOCATION: KSC	S1100010
C	CALCULATE RELATIVE HUMIDITY	S1100020
	F(A) = 1013.25*EXP(A*(13.3185+A*(-1.976+A*(-.6445-.1299*A))))	S1100030
	Y = 373.16	S1100040
	IF (P .GT. 0.0) Y = (2326.853102-55.974*ALOGT(P))/(9.238574104-	S1100050
	1.15*ALOGT(P))	S1100060
	X = 1.0-Y/(T+273.16)	S1100070
	Y = 1.0-Y/(DP+273.16)	S1100080
	X = F(X)	S1100090
	Y = F(Y)	S1100100
	RH = 100.0*Y/X	S1100110
	IF (RH .GT. 100.0) RH = 100.0	S1100120
	RETURN	S1100130
	END	S1100140



	SUBROUTINE B2Z(IA,IB)	S1200000
	. , UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC	S1200010
C		S1200020
C	-----	S1200030
C	-	S1200040
C	- THIS SUBROUTINE CHANGES BLANK FILLED WORDS TO ZEROS. -	S1200050
C	-	S1200060
C	-----	S1200070
	IB = IAND(IA,177400B)	S1200080
	IF(IB .EQ. 020000B)IB = 030000B	S1200090
	IC = IAND(IA,000377B)	S1200100
	IF(IC .EQ. 000040B)IC = 000060B	S1200110
	IB = IOR(IB,IC)	S1200120
	RETURN	S1200130
	END	S1200140

	FUNCTION POTMP(TMP,RHM,PRSS)	S1300000
	. , UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC	S1300010
C		S1300020
C	-----	S1300030
C	-	S1300040
C	- THIS FUNCTION COMPUTES THE POTENTIAL TEMPERATURE GIVEN	S1300050
C	- AMBIENT AIR TEMPERATURE, RELATIVE HUMIDITY, AND THE	S1300060
C	- ATMOSPHERIC PRESSURE	S1300070
C	-	S1300080
C	-----	S1300090
C		S1300100
	PT = 1.0-373.16/TMP	S1300110
	PT = 1013.25*EXP(PT*(13.3185+PT*(-1.976+PT*(-.6445-.1299*PT))))	S1300120
	PT = RHM*.01*PT	S1300130
	PT = 0.622*PT/(PRSS-PT)	S1300140
	PT = TMP*(1.0+1.61*PT)/(1.0+PT)	S1300150
	POTMP = PT*(1000.0/PRSS)**0.288	S1300160
	RETURN	S1300170
	END	S1300180

	INTEGER FUNCTION ISHIF(IWRD,IPOS)	S1400000
	. , UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC	S1400010
C		S1400020
C	-----	S1400030
C	-	S1400040
C	- THIS FUNCTION SHIFTS BITS IN WORD IWRD BY THE NUMBER OF	S1400050
C	- POSTIONS IN THE VARIABLE IPOS. IF IPOS % 0 BITS ARE	S1400060
C	- SHIFTED TO THE LEFT AND IF IPOS \$ 0 BITS ARE SHIFTED TO	S1400070
C	- THE RIGHT. BITS SHIFTED OFF EITHER END ARE LOST. ALSO	S1400080
C	- THE SIGN OF IWRD IS NOT CHANGED. (LEFTMOST BIT = 16)	S1400090
C	-	S1400100
C	-----	S1400110
C		S1400120
	NPOS=IABS(IPOS)	S1400130
	DO 10 I=1,NPOS	S1400140
	IF(IPOS.LT.0) IWRD=IWRD/2	S1400150
10	IF(IPOS.GT.0) IWRD=IWRD*2	S1400160
	ISHIF=IWRD	S1400170
	RETURN	S1400180
	END	S1400190

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SUBROUTINE INTRP(LEVELS)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C-----S1500000
C-----S1500010
C-----S1500020
C-----S1500030
C - THIS ROUTINE CREATES INTERMEDIATE LEVELS OF MET DATA BETWEEN -S1500040
C - EXISTING LEVELS OF SPARSE DATA USING SIMPLE LINEAR INTERPOLATION -S1500050
C-----S1500060
C-----S1500070
C-----S1500080
C-----S1500090
C****          B E G I N   C O M M O N   A R E A          ****S1500100
C      04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
.             ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
.             XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
.             IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
.             ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
.             ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2)
.             ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
.             TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
.             FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,
.       MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
.             DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
.             SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP
.             ,MIXING,MAXDEP,LAYBOT(3)
.             ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
.             ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
.             MINUS1,MINUS9,MINS1,MINS9,
.             MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
.             RT(24),TPROPC,IDXRT
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
.       TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.       CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
.             INVNDR(2),ULINE(2),
.             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.             CLRLNE,INSLNE,DELNE,
.             IESCAJ(3),NULL,IBLNK,
.             IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
C-----VEHICLE PARAMETERS
COMMON /VCLPR/ VPAR(17)

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IF(K.LE.MAXLVS) GO TO 20	S1501030
GO TO 30	S1501040
20 ALTS(K) = ALTS(J)	S1501050
DIRS(K) = DIRS(J)	S1501060
SPEEDS(K) = SPEEDS(J)	S1501070
TEMPS(K) = TEMPS(J)	S1501080
PRESSS(K) = PRESSS(J)	S1501090
RHS(K) = RHS(J)	S1501100
PTEMPS(K) = PTEMPS(J)	S1501110
30 CONTINUE	S1501120
ALTINC=(ALTS(IP1)-ALTS(I))/NWLAYS	S1501130
SPDINC=(SPEEDS(IP1)-SPEEDS(I))/NWLAYS	S1501140
TMPINC=(TEMPS(IP1)-TEMPS(I))/NWLAYS	S1501150
PRSINC=(PRESSS(IP1)-PRESSS(I))/NWLAYS	S1501160
RHINC=(RHS(IP1)-RHS(I))/NWLAYS	S1501170
PTPINC=(PTEMPS(IP1)-PTEMPS(I))/NWLAYS	S1501180
A1=DIRS(I)	S1501190
A2=DIRS(IP1)	S1501200
ANGMIN=MIN1(A1,A2)	S1501210
ANGMAX=MAX1(A1,A2)	S1501220
AINC=360.0-ANGMAX+ANGMIN	S1501230
IF(AINC.LE.180.0.AND.A1.GT.A2) DRINC=AINC	S1501240
IF(AINC.LE.180.0.AND.A1.LE.A2) DRINC=-AINC	S1501250
IF(AINC.GT.180.0.AND.A1.GT.A2) DRINC=AINC-360.0	S1501260
IF(AINC.GT.180.0.AND.A1.LE.A2) DRINC=360.0-AINC	S1501270
DRINC=DRINC/NWLAYS	S1501280
K=I+NWLEVS	S1501290
DO 40 J = IP1,K	S1501300
JM1=J-1	S1501310
ALTS(J) = ALTS(JM1)+ALTINC	S1501320
SPEEDS(J) = SPEEDS(JM1)+SPDINC	S1501330
TEMPS(J) = TEMPS(JM1)+TMPINC	S1501340
PRESSS(J) = PRESSS(JM1)+PRSINC	S1501350
RHS(J) = RHS(JM1)+RHINC	S1501360
PTEMPS(J) = PTEMPS(JM1)+PTPINC	S1501370
DIRS(J) = DIRS(JM1)+DRINC	S1501380
IF(DIRS(J).GT.360.0) DIRS(J)=DIRS(J)-360.0	S1501390
IF(DIRS(J).LT.0.0) DIRS(J)=360.0+DIRS(J)	S1501400
LEVELS(J)=IIHAT	S1501410
40 CONTINUE	S1501420
NLAYS = NLAYS+NWLEVS	S1501430
IF (NLAYS .GT. MAXLVS-1) NLAYS = MAXLVS-1	S1501440
I = I+NLAYS	S1501450
GO TO 10	S1501460
50 CONTINUE	S1501470
NUM=NLAYS+1	S1501480
IF (NUM .GT. MAXLVS) NUM = MAXLVS	S1501490
RETURN	S1501500
END	S1501510



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.          CLRLNE, INSLNE, DELINE,          S1600510
.          IESCAJ(3), NULL, IBLNK,         S1600520
.          IPAR(5), ICU, IYSJ, IYESJ, INJ, INOJ, NAMEP(3) S1600530
C-----VEHICLE PARAMETERS                  S1600540
COMMON /VCLPR/ VPAR(17)                   S1600550
C-----TIME PARAMETERS                    S1600560
COMMON /TIME/ JTIME, JDAY, JYEAR, ISTIME, ISDAY, ISYEAR, LTIME, S1600570
.          LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2) S1600580
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S1600590
COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30), S1600600
.          RH(30), PTEMP(30), SIGEP(30), SIGAP(30) S1600610
C-----LAYER PARAMETERS                   S1600620
COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29), S1600630
.          SIGYO(29) S1600640
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS) S1600650
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6) S1600660
C-----CALCULATED NEW LAYER PARAMETERS S1600670
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32), S1600680
.          SPEEDN(32) S1600690
C-----CONVERSION FACTORS                 S1600700
COMMON /CNVRT/ QCONV(4), QPDEPH S1600710
C S1600720
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S1600730
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S1600740
C-----READ/WRITE BUFFER S1600750
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S1600760
C*****S1600770
C S1600780
C-----EQUIVALENCE STATEMENTS S1600790
EQUIVALENCE(IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3)) S1600800
.          , (IPU2, IPAR(4)), (IPU3, IPAR(5)) S1600810
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1) S1600820
C S1600830
C****          E N D O F C O M M O N A R E A ****S1600840
Cç S1600850
DATA C1, C2, C3, C4, C5, C6 / -0.008, -.00175, .0008, .50864522, .1132, S1600860
.          3.8163/ S1600870
DATA C7 / .029/ S1600880
C CALCULATION OF SIGAZ S1600890
C NEWTONS METHOD FOR SOLUTION OF F(X,B,D) = 0 S1600900
F(X,B,D) = (1.-X**4)/(16.*X*X*(D+C4-2.*ALOG(1.+X)) S1600910
1 - ALOG(1.+X*X)+2.*ATAN(X)**2) - B S1600920
FP(X,D) = (-X**4-1.)/(8.*X**3*(D+C4-2.*ALOG(1.+X)) S1600930
1 - ALOG(1.+X*X)+2.*ATAN(X)**2) + (1.-X**4)/(2.*(1.+X)) S1600940
1 *(1.+X*X)*(D+C4-2.*ALOG(1.+X)-ALOG(1.+X*X)+ S1600950
1 2.*ATAN(X)**3) S1600960
C S1600970
C S1600980
C S1600990
RSIG = 0.0 S1601000
C*** READ 1ST DATA LEVEL S1601010
Z1 = ALT(J1) S1601020

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IF(B) 10,120,40	S1601550
10 CONTINUE	S1601560
R = 1.5	S1601570
U = F(R,B,ZOZO)	S1601580
DO 30 I = 1,50	S1601590
R1 = R - F(R,B,ZOZO)/FP(R,ZOZO)	S1601600
IF(R1 .LE. -1.0) GOTO 220	S1601610
U=F(R1,B,ZOZO)	S1601620
IF(ABS(R1-R).LT.1.E-7) GO TO 80	S1601630
IF(I.EQ.49) USAV = U	S1601640
IF(I.NE.50) GO TO 20	S1601650
IF(USAV.LT.0..AND.U.GT.0..OR.USAV.GT.0..AND.U.LT.0.) GO TO 80	S1601660
20 CONTINUE	S1601670
30 R = R1	S1601680
RSIG = 30.	S1601690
GO TO 220	S1601700
40 AP = ZOZO - 1.	S1601710
ZOOL10=(C6*ZO)/(7.*Z)	S1601720
A1 = 7.*SQRT(B)*AP	S1601730
A2 = 1.	S1601740
A3 = -SQRT(B)*(AP-1.)	S1601750
RAD = A2**2 - 4.*A1*A3	S1601760
IF(RAD) 50,60,70	S1601770
50 CONTINUE	S1601780
RSIG = 30.	S1601790
GO TO 220	S1601800
60 RE11 = -A2/(2.*A1)	S1601810
S1 = 1. - 7.*RE11**2	S1601820
GO TO 130	S1601830
70 RE1 = (-A2 + SQRT(RAD))/(2.*A1)	S1601840
RI4 = RE1**2	S1601850
ZOOL4 = ZO*RI4/(Z*(1. -7.*RI4))	S1601860
IF(B.LT.C3) GO TO 170	S1601870
IF(B.GE.C3) GO TO 190	S1601880
80 RI1 = (1.-RI**4)/16.	S1601890
ZOOL1 = ZO*RI1/Z	S1601900
A = ZOZO +C4-2.*ALOG(1.+R1)-ALOG(1.+R1**2)+2.*ATAN(R1)	S1601910
IF(B.LT.C1) GO TO 90	S1601920
IF(B.GE.C1.AND.B.LT.C2) GO TO 100	S1601930
IF(B.GE.C2) GO TO 110	S1601940
90 RSIG = E*2.7/A	S1601950
GO TO 220	S1601960
100 FB2 = 2.7 + 112.*(-C1 + B)	S1601970
RSIG = E*FB2/A	S1601980
GO TO 220	S1601990
110 FB3 = 3.4 - 725.5*(-C2 +B)	S1602000
RSIG = E*FB3/A	S1602010
GO TO 220	S1602020
120 RI2 = 0	S1602030
ZOOL2 = 0	S1602040
RSIG = 48.816/ZOZO	S1602050
GO TO 220	S1602060

130	RI3 = (S1-1.)/(-7.)	S1602070
	ZOOL3 = Z0*RI3/(Z*(1. -7.*RI3))	S1602080
	IF(B.LT.C3) GO TO 140	S1602090
	IF(B.GE.C3) GO TO 160	S1602100
140	FB3 = 3.4 - 725.5*(-C2 + B)	S1602110
	RSIG = (E*FB3)/(7.*RI3/(1. -7.*RI3) + ZOZO)	S1602120
	SIGR20=(E*FB3)/(C6+ZOZO)	S1602130
	IF(RI3.GE.C5) GO TO 150	S1602140
	GO TO 220	S1602150
150	CONTINUE	S1602160
	RSIG = SIGR20	S1602170
	GO TO 220	S1602180
160	FB4 = 1.55 + 38.04*(B - .0008)	S1602190
	FB5 = 2.35 + 38.04*(B - .0008)	S1602200
	RSIG = (E*FB4)/(ZOZO -7.*RI3/(1. -7.*RI3))	S1602210
	IF(B.GE.C7)RSIG = (E*FB5)/(ZOZO - 7.*RI3/(1. - 7.*RI3))	S1602220
	SIGR21 = (E*FB4)/(C6+ZOZO)	S1602230
	SIGR22 = (E*FB5)/(C6+ZOZO)	S1602240
	IF(RI3.GE.C5.AND.B.LT.C7)RSIG=SIGR21	S1602250
	IF(RI3.GE.C5.AND.B.GE.C7)RSIG=SIGR22	S1602260
	GO TO 220	S1602270
170	FB3 = 3.4 - 725.5*(-C2+B)	S1602280
	RSIG = (E*FB3)/(7.*RI4/(1. - 7.*RI4) + ZOZO)	S1602290
	SIGR20=(E*FB3)/(C6+ZOZO)	S1602300
	IF(RI4.GE.C5) GO TO 180	S1602310
	GO TO 220	S1602320
180	CONTINUE	S1602330
	RSIG = SIGR20	S1602340
	GO TO 220	S1602350
190	FB4 = 1.55 + 38.04*(B - .0008)	S1602360
	FB5 = 2.35 + 5.43*(B - C7)	S1602370
	RSIG = (E*FB4)/(7.*RI4/(1. - 7.*RI4) + ZOZO)	S1602380
	IF(B.GE.C7)RSIG = (E*FB5)/(ZOZO - 7.*RI4/(1. - 7.*RI4))	S1602390
	SIGR21=(E*FB4)/(C6+ZOZO)	S1602400
	SIGR22 = (E*FB5)/(C6+ZOZO)	S1602410
	IF(RI4.GE.C5.AND.B.LT.C7) GO TO 200	S1602420
	IF(RI4.GE.C5.AND.B.GE.C7) GO TO 210	S1602430
	GO TO 220	S1602440
200	CONTINUE	S1602450
	RSIG = SIGR21	S1602460
	GO TO 220	S1602470
210	CONTINUE	S1602480
	RSIG = SIGR22	S1602490
	GO TO 220	S1602500
C***	CHECK FOR VALID SIGAZ VALUE	S1602510
220	CONTINUE	S1602520
	IF (RSIG.LE.0. .OR. RSIG.GT.30.) RSIG = 30.	S1602530
	RETURN	S1602540
	END	S1602550

REEDM SOURCE MODULE &RCLDM

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FTN4
PROGRAM RCLDM(5)
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700000
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700010
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700020
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700030
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700040
C::: ::: S1700050
C::: ::: S1700060
C::: ORGANIZATION: H. E. CRAMER CO., INC. ::: S1700070
C::: ::: S1700080
C::: WORK FOR: DR. J. B. STEPHENS (ES84) ::: S1700090
C::: ::: S1700100
C::: PROGRAM CODE: RCLDM ::: S1700110
C::: ::: S1700120
C::: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST ::: S1700130
C::: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER)::: S1700140
C::: ::: S1700150
C::: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS ::: S1700160
C::: ::: S1700170
C::: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS ::: S1700180
C::: ::: S1700190
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700200
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S1700210
C S1700220
C ***** S1700230
C * * S1700240
C * NASA/MSFC MULTILAYER DIFFUSION MODEL * S1700250
C * * S1700260
C * CLOUD RISE PROGRAM -- RCLDM * S1700270
C * * S1700280
C ***** S1700290
Cç S1700300
C**** B E G I N C O M M O N A R E A ****S1700310
C 04/02/82 S1700320
C-----MATH PARAMETERS AND CONSTANTS S1700330
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S1700340
C-----INPUT OPTIONS S1700350
REAL LAMBDA S1700360
INTEGER FILE,GOOD,TITLE S1700370
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S1700380
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S1700390
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S1700400
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S1700410
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S1700420
. ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2) S1700430
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S1700440
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S1700450
. FS(20),MDLNAM(12),DBAR(20) S1700460
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S1700470
LOGICAL ISNDFC,CRT,MAXDEP,BATCH,GASSET,GRVSET, S1700480
. MODEL4,MODEL5,MODEL6 S1700490

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INTEGER RUNNUM,RT,CL,CS                                S1700500
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S1700510
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,        S1700520
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP                S1700530
. ,MIXING,MAXDEP,LAYBOT(3)                            S1700540
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,          S1700550
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),        S1700560
. MINUS1,MINUS9,MINS1,MINS9,                          S1700570
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,  S1700580
. RT(24),TPROPC,IDXRT                                  S1700590
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S1700600
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,          S1700610
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S1700620
. CLRLNE,INSLNE,DELINE                                 S1700630
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S1700640
. INVNDR(2),ULINE(2),                                  S1700650
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S1700660
. CLRLNE,INSLNE,DELINE,                               S1700670
. IESCAJ(3),NULL,IBLNK,                               S1700680
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)          S1700690
C-----VEHICLE PARAMETERS                                S1700700
COMMON /VCLPR/ VPAR(17)                               S1700710
C-----TIME PARAMETERS                                  S1700720
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S1700730
. LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)        S1700740
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S1700750
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S1700760
. RH(30),PTEMP(30),SIGEP(30),SIGAP(30)              S1700770
C-----LAYER PARAMETERS                                 S1700780
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S1700790
. SIGYO(29)                                           S1700800
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)      S1700810
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)            S1700820
C-----CALCULATED NEW LAYER PARAMETERS                 S1700830
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S1700840
. SPEEDN(32)                                          S1700850
C-----CONVERSION FACTORS                              S1700860
COMMON /CNVRT/ QCONV(4),QPDEPH                       S1700870
C                                                       S1700880
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S1700890
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)        S1700900
C-----READ/WRITE BUFFER                               S1700910
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S1700920
C*****S1700930
C                                                       S1700940
C-----EQUIVALENCE STATEMENTS                          S1700950
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S1700960
. ,(IPU2,IPAR(4)),(IPU3,IPAR(5))                    S1700970
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)     S1700980
C                                                       S1700990
C**** END OF COMMON AREA ****S1701000
Cc S1701010

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NNNEST = 3	S1702060
NNNTRY = 1	S1702070
CALL REEDM	S1702080
C-----CALCULATE TURBULENCE PARAMETERS	S1702090
80 CALL TURB4	S1702100
C-----OUTPUT LAYER PARAMETERS	S1702110
WRITE(IOU,9014)	S1702120
GO TO (90,100) IPRINT	S1702130
90 WRITE(IOU,9002)	S1702140
WRITE(IOU,9003) QC,QT,HEAT,AA,BB,CC,CP,DPDZ	S1702150
C        LAYER PARAMETER OUTPUT	S1702160
100 WRITE(IOU,9004)	S1702170
GO TO (110,120) IPRINT	S1702180
110 WRITE(IOU,9005)	S1702190
GO TO 130	S1702200
120 WRITE(IOU,9012)	S1702210
130 CONTINUE	S1702220
DO 170 I=1,NLAYS	S1702230
ISTAR=IBLNK	S1702240
IP1=I+1	S1702250
T1=FLOAT(INT(TAUK*10.))*1	S1702260
T2=FLOAT(INT(RISTIM(I)*10.))*1	S1702270
IF(T1.EQ.T2) ISTAR=IIHBS	S1702280
TDX=DX(I)	S1702290
TDY=DY(I)	S1702300
IF(Q(I).GT.0.0) GO TO 140	S1702310
TDX=0.0	S1702320
TDY=0.0	S1702330
140 GO TO (150,160) IPRINT	S1702340
150 WRITE(IOU,9006) I,ALT(IP1),RISTIM(I),ISTAR,TDX,TDY,Q(I)	S1702350
, SIGLL(I),SIGPP(I),SIGXO(I),SIGYO(I),SIGAP(IP1),SIGEP(IP1)	S1702360
GO TO 170	S1702370
160 WRITE(IOU,9013) I,ALT(IP1),RISTIM(I),ISTAR,TDX,TDY	S1702380
170 CONTINUE	S1702390
IF(IRUN.NE.4) GO TO 180	S1702400
WRITE(IOU,9016) (J,ALT(J),DIR(J),SPEED(J),TEMP(J),PTEMP(J),PRESS(J)	S1702410
,RH(J),SIGAP(J),SIGEP(J),J=1,NUM)	S1702420
WRITE(IOU,9017) (J,Q(J),SIGXO(J),SIGYO(J),DX(J),DY(J),RISTIM(J),	S1702430
.J=1,NUM-1)	S1702440
9016 FORMAT(//12H DIAGNOSTICS//	S1702450
,52H LEVEL,ALT,DIR,SPEED,TEMP,PTEMP,PRESS,RH,SIGAP,SIGEP/	S1702460
,21(I4,1X,9F12.5/))	S1702470
9017 FORMAT(/33H LAYER,Q,SIGXO,SIGYO,DX,DY,RISTIM/	S1702480
,20(I4,1X,6F12.5/))	S1702490
180 CONTINUE	S1702500
WRITE(IOU,9010)	S1702510
WRITE(IOU,9007) CALHT,H,TAUK	S1702520
WRITE(IOU,9008) ALT(LAYTOP(1)+1),ALT(LAYBOT(1))	S1702530
IF(HM(2).NE.0.0) WRITE(IOU,9009) ALT(LAYTOP(2)+1),ALT(LAYBOT(2))	S1702540
WRITE(IOU,9011) SIGMAR,SIGMER	S1702550
C	S1702560
C-----COMPUTE LAYER BOUNDARIES PARAMETERS	S1702570



	EQUIVALENCE (AA,VPAR(7)),(BB,VPAR(8)),(CC,VPAR(9))	S1701020
C		S1701030
	DATA JVERSN/8213/	S1701040
	DATA IIHBS/2H */	S1701050
CF-----	FORMAT STATEMENTS.	S1701060
9001	FORMAT(88H0*** REEDM ERROR 017, NOT ENOUGH LAYERS, THE TOP OF THE	S1701070
	.LAST LAYER MUST BE GREATER THAN ,F10.5)	S1701080
9002	FORMAT(1X,20(1H*),12X,15HPLUME RISE DATA,13X,20(1H*)//)	S1701090
9003	FORMAT(/,1X,25HEXHAUST RATE OF MATERIAL:,16X,11H(GRAMS/SEC),9X,	S1701100
	.G12.9/1X,22HTOTAL MATERIAL OUTPUT:,19X,7H(GRAMS),13X,G12.9	S1701110
	./ 1X,21HHEAT OUTPUT PER GRAM:,20X,10H(CALORIES),13X,F9.4	S1701120
	./1X,29HVEHICLE RISE TIME PARAMETERS:,12X,15H(TK=(A*Z**B)+C)	S1701130
	.,	S1701140
	2X,2HA=,8X,F5.4	S1701150
	./	S1701160
	59X,2HB=,8X,F5.4	S1701170
	./	S1701180
	59X,2HC=,8X,F5.4	S1701190
	./ 1X,21HSPECIFIC HEAT OF AIR:,20X,13H(K CAL./GRAM),14X,F5.4	S1701200
	./	S1701210
	1X,36HVERTICAL GRADIENT OF POTENTIAL TEMP.	S1701220
	./ 12X,24HTO STABILIZATION HEIGHT:,6X,10H(DEG. K/M),17X,F5.4)	S1701230
9004	FORMAT(//1X,20(1H*),10X,20H EXHAUST CLOUD ,10X,20(1H*)//)	S1701240
9005	FORMAT(/62X,5HLAYER,8X,2(5HCLOUD,5X)/6X,4HMET.,7X,3HTOP,7X,	S1701250
	.5HCLOUD,7X,17HRANGE** BEARING,5X,6HSOURCE,8X,2(5HHALF-,5X)/5X,	S1701260
	.5HLAYER,4X,8HOF LAYER,3X,9HRISE TIME,	S1701270
	.2(3X,8HFROM PAD),4X,8HSTRENGTH,6X,6HLENGTH,5X,5HWIDTH,5X,5HSIGXO	S1701280
	.,5X,5HSIGYO,5X,5HSIGAP,5X,	S1701290
	.5HSIGEP/6X,3HNO.,5X,8H(METERS),3X,9H(SECONDS),3X,8H(METERS),	S1701300
	.3X,8H(METERS),5X,7H(GRAMS),5X,4(8H(METERS),2X),2(10H(DEGREES) )	S1701310
	./66(2H--)/)	S1701320
9006	FORMAT(7X,I2,6X,F6.1,6X,F6.1,A2,2X,F6.1,5X,F6.1,4X,G10.9,5X,F6.1	S1701330
	.,4X,F6.1,4X,F6.1,4X,F6.1,4X,F6.1,4X,F6.1)	S1701340
9007	FORMAT(//1X,20(1H*),10X,20H CLOUD STABILIZATION ,10X,20(1H*)//	S1701350
	. 2X,18HCALCULATION HEIGHT,22X,8H(METERS),14X,F10.2, /	S1701360
	. 2X,20HSTABILIZATION HEIGHT,20X,8H(METERS),14X,F10.2, /	S1701370
	. 2X,18HSTABILIZATION TIME,22X,6H(SECS),16X,F10.2)	S1701380
9008	FORMAT(2X,26HFIRST MIXING LAYER HEIGHT:,14X,8H(METERS),11X,5HTOP =	S1701390
	.,F8.2/61X,5HBASE=,F8.2)	S1701400
9009	FORMAT(2X,29HSECOND SELECTED LAYER HEIGHT:,11X,8H(METERS),11X,	S1701410
	.5HTOP =,F8.2/61X,5HBASE=,F8.2)	S1701420
9010	FORMAT(/5X,48H * - INDICATES CLOUD STABILIZATION TIME WAS USED/	S1701430
	.5X,50H** - RANGE FROM PAD IS AT CLOUD STABILIZATION TIME/)	S1701440
9011	FORMAT(//2X,25HSIGMAR(AZ) AT THE SURFACE,16X,9H(DEGREES),13X,F10.4S	S1701450
	1/2X,25HSIGMER(EL) AT THE SURFACE,16X,9H(DEGREES),13X,F10.4)	S1701460
9012	FORMAT(/59X,7HAZIMUTH,/16X,4HMET.,6X,3HTOP,7X,5HCLOUD,7X,5HRANGE,	S1701470
	.,5X,7HBEARING,/15X,5HLAYER,4X,8HOF LAYER,3X,9HRISE TIME,	S1701480
	.2(3X,8HFROM PAD),/16X,3HNO.,5X,8H(METERS),3X,9H(SECONDS),3X,	S1701490
	.8H(METERS),3X,8H(METERS),/10X,30(2H--)/)	S1701500
9013	FORMAT(16X,I2,6X,F6.1,6X,F6.1,A2,2X,F6.1,5X,F6.1,5X,F6.1)	S1701510
9014	FORMAT(1H1)	S1701520
9015	FORMAT(38H0* PROCESSING CONTINUES WITH NEXT RUN./1H1)	S1701530
C		S1701500
C		S1701510
	IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S1701520
C-----	CHECK SEGMENT ENTRY POINT.	S1701530



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IF(NNNTRY .EQ. 3) GOTO 80
C-----INITIAL CONSTANTS AND VARIABLES
ZM=0.0
G=9.8
IFLG=0
DPDZ=0.0
C-----COMPUTE BURN RATE FACTOR(RFACT),SOURCE OUTPUT RATE(QC),
C      TOTAL OUTPUT STRENGTH(QT),HEAT OUTPUT(HEAT) AND VEHICLE RISE
CC     PARAMETERS(AA,BB,CC)
10 RFACT = .001*((1.8*(TPROP-273.16)+32.0)-70.0)+1.0
20 QC = RFACT*VPAR(NORMAL)
QT = VPAR(NORMAL+3)
HEAT = VPAR(NORMAL+9)
C-----CALCULATE PLUME RISE - FOR DELTA LAUNCHES USE AVERAGE OF
C      INSTANTANEOUS AND CONTINUOUS PLUME RISE
C-----INSTANTEOUS PLUME RISE
30 LTYP = 1
IF(NORMAL.GT.1) GO TO 40
CALL PLUME(LTYP)
IF(IFLG.GT.0) GO TO 190
IF(IVHICL.LE.2) GO TO 70
C      DELTA LAUNCH - CALCULATE CONTINUOUS PLUME RISE FOR AVERAGE
ZMSV = ZM
GAMMAX = GAMMAC
GAMMAY = GAMMAC
GAMMAZ = GAMMAC
C-----CONTINUOUS PLUME RISE
40 LTYP = 2
CALL PLUME(LTYP)
IF(IFLG.GT.0) GO TO 190
IF(IVHICL.LE.2) GO TO 70
IF(NORMAL.GT.1) GO TO 70
GAMMAX = .5*(GAMMAI+GAMMAC)
GAMMAY = GAMMAX
GAMMAZ = GAMMAX
ZM = .5*(ZM+ZMSV)
DO 50 I = 2,NUM
IF(ALT(I).GE.ZM) GO TO 60
50 CONTINUE
60 CALL LEAST(ALT,PTEMP,DPDZ,I,0,0.0,0.0)
IF(DPDZ.LT.3.322E-4)DPDZ = 3.322E-4
C-----CALCULATE CLOUD TRAJECTORY AND RISE TIME USING DELXY
70 CALL DELXY
C-----CALCULATE SOURCE DISTRIBUTION
CALL DIST4
C-----CALCULATE SOURCE DIMENSION
CALL DIMS4
IFLG=0
ALT(1)=0.0
C      IF(RUNNUM.GT.1) GO TO 80
C-----CALL RDHMM
C

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S1701540
S1701550
S1701560
S1701570
S1701580
S1701590
S1701600
S1701610
S1701620
S1701630
S1701640
S1701650
S1701660
S1701670
S1701680
S1701690
S1701700
S1701710
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S1701950
S1701960
S1701970
S1701980
S1701990
S1702000
S1702010
S1702020
S1702030
S1702040
S1702050

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NNNEST = 3	S1702060
NNNTRY = 1	S1702070
CALL REEDM	S1702080
C-----CALCULATE TURBULENCE PARAMETERS	S1702090
80 CALL TURB4	S1702100
C-----OUTPUT LAYER PARAMETERS	S1702110
WRITE(IOU,9014)	S1702120
GO TO (90,100) IPRINT	S1702130
90 WRITE(IOU,9002)	S1702140
WRITE(IOU,9003) QC,QT,HEAT,AA,BB,CC,CP,DPDZ	S1702150
C LAYER PARAMETER OUTPUT	S1702160
100 WRITE(IOU,9004)	S1702170
GO TO (110,120) IPRINT	S1702180
110 WRITE(IOU,9005)	S1702190
GO TO 130	S1702200
120 WRITE(IOU,9012)	S1702210
130 CONTINUE	S1702220
DO 170 I=1,NLAYS	S1702230
ISTAR=IBLNK	S1702240
IP1=I+1	S1702250
T1=FLOAT(INT(TAUK*10.))*1	S1702260
T2=FLOAT(INT(RISTIM(I)*10.))*1	S1702270
IF(T1.EQ.T2) ISTAR=IIHBS	S1702280
TDX=DX(I)	S1702290
TDY=DY(I)	S1702300
IF(Q(I).GT.0.0) GO TO 140	S1702310
TDX=0.0	S1702320
TDY=0.0	S1702330
140 GO TO (150,160) IPRINT	S1702340
150 WRITE(IOU,9006) I,ALT(IP1),RISTIM(I),ISTAR,TDX,TDY,Q(I)	S1702350
. ,SIGLL(I),SIGPP(I),SIGXO(I),SIGYO(I),SIGAP(IP1),SIGEP(IP1)	S1702360
GO TO 170	S1702370
160 WRITE(IOU,9013) I,ALT(IP1),RISTIM(I),ISTAR,TDX,TDY	S1702380
170 CONTINUE	S1702390
IF(IRUN.NE.4) GO TO 180	S1702400
WRITE(IOU,9016) (J,ALT(J),DIR(J),SPEED(J),TEMP(J),PTEMP(J),PRESS(J)	S1702410
. ,RH(J),SIGAP(J),SIGEP(J),J=1,NUM)	S1702420
WRITE(IOU,9017) (J,Q(J),SIGXO(J),SIGYO(J),DX(J),DY(J),RISTIM(J),	S1702430
. J=1,NUM-1)	S1702440
9016 FORMAT(//12H DIAGNOSTICS//	S1702450
. ,52H LEVEL,ALT,DIR,SPEED,TEMP,PTEMP,PRESS,RH,SIGAP,SIGEP/	S1702460
. ,21(I4,1X,9F12.5/))	S1702470
9017 FORMAT(/33H LAYER,Q,SIGXO,SIGYO,DX,DY,RISTIM/	S1702480
. ,20(I4,1X,6F12.5/))	S1702490
180 CONTINUE	S1702500
WRITE(IOU,9010)	S1702510
WRITE(IOU,9007) CALHT,H,TAUK	S1702520
WRITE(IOU,9008) ALT(LAYTOP(1)+1),ALT(LAYBOT(1))	S1702530
IF(HM(2).NE.0.0) WRITE(IOU,9009) ALT(LAYTOP(2)+1),ALT(LAYBOT(2))	S1702540
WRITE(IOU,9011) SIGMAR,SIGMER	S1702550
C	S1702560
C-----COMPUTE LAYER BOUNDARIES PARAMETERS	S1702570

CALL RRDRM	S1702580
C	S1702590
C	S1702600
C	S1702610
190 IF(IFLG) 200,230,210	S1702620
200 WRITE(IOU,9001) ZM	S1702630
GOTO 220	S1702640
210 WRITE(IOU,9018) IFLG	S1702650
9018 FORMAT(59H *** REEDM ERROR 018, (RCLDM) PLUME RISE ERROR FLAG EQUAS	S1702660
*LS ,I2)	S1702670
C-----ERROR EXIT.	S1702680
220 IERROR(1) = 1	S1702690
WRITE(IOU,9015)	S1702700
230 CONTINUE	S1702710
NNNEST = 2	S1702720
NNNTRY = 5	S1702730
CALL REEDM	S1702740
END	S1702750

REEDM SOURCE MODULE &RCLDN

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FTN4
SUBROUTINE PLUME(LTYP)                                S1800010
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC      S1800020
C                                                     S1800030
C-----S1800040
C - S1800050
C - THIS SUBROUTINE CALCULATES CLOUD (PLUME) RISE FOR INSTANTANEOUS - S1800060
C - (NORMAL) AND CONTINUOUS (ABNORMAL) LAUNCHES - S1800070
C - S1800080
C-----S1800090
C S1800100
C S1800110
C****          B E G I N C O M M O N A R E A          ****S1800120
C 04/02/82 S1800130
C-----MATH PARAMETERS AND CONSTANTS S1800140
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S1800150
C-----INPUT OPTIONS S1800160
REAL LAMBDA S1800170
INTEGER FILE,GOOD,TITLE S1800180
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S1800190
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S1800200
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S1800210
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S1800220
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S1800230
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S1800240
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S1800250
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S1800260
. FS(20),MDLNAM(12),DBAR(20) S1800270
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S1800280
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S1800290
. MODEL4,MODEL5,MODEL6 S1800300
INTEGER RUNNUM,RT,CL,CS S1800310
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S1800320
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S1800330
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S1800340
. ,MIXING,MAXDEP,LAYBOT(3) S1800350
. ;ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S1800360
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S1800370
. MINUS1,MINUS9,MINS1,MINS9, S1800380
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S1800390
. RT(24),TPROPC,IDXRT S1800400
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S1800410
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S1800420
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S1800430
. CLRLNE,INSLNE,DELNE S1800440
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S1800450
. INVNDR(2),ULINE(2), S1800460
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S1800470
. CLRLNE,INSLNE,DELNE, S1800480
. IESCAJ(3),NULL,IBLNK, S1800490

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C		S1800800
C***	END OF COMMON AREA	***S1800810
Cc	EQUIVALENCE (AA,VPAR(7)),(BB,VPAR(8)),(CC,VPAR(9))	S1800820
	ZSUM = 0.0	S1800830
	UBARS = 0.0	S1800840
	IF(LTYP.EQ.1) GO TO 10	S1800850
C	CONTINUOUS	S1800860
	A1 = 6.0*QC*HEAT/(SURDEN*CP*PI*GAMMAX*GAMMAY)	S1800870
	B1 = .3333333	S1800880
	GO TO 20	S1800890
C	INSTANTANEOUS	S1800900
10	A1 = 6.0*QC*AA*HEAT/(SURDEN*CP*PI*GAMMAX*GAMMAY*GAMMAZ)	S1800910
	B1 = 1.0/(4.0-BB)	S1800920
20	K = 1	S1800930
30	K = K+1	S1800940
40	CALL LEAST(ALT,PTEMP,DPDZ,K,0,0.0,0.0)	S1800950
	IF(DPDZ.LT.3.322E-4) DPDZ = 3.322E-4	S1800960
	IF(LTYP.EQ.1) GO TO 50	S1800970
	UBARS = UBARS+(ALT(K)-ALT(K-1))*(SPEED(K)+SPEED(K-1))*0.5	S1800980
	ZSUM = ZSUM+ALT(K)-ALT(K-1)	S1800990
	UBARK = UBARS/ZSUM	S1801000
C	CONTINUOUS	S1801010
	ZM = (A1/(UBARK*DPDZ))*B1	S1801020
	GO TO 60	S1801030
50	ZM = (A1/DPDZ)*B1	S1801040
C	INSTANTANEOUS	S1801050
	ZM = (A1/AA*(AA*ZM**BB+CC)/DPDZ)**0.25	S1801060
60	IF(ZM.LE.ALT(K)) GO TO 70	S1801070
	K = K+1	S1801080
	IF(K.GT.NUM) GO TO 160	S1801090
	GO TO 40	S1801100
70	IF(ALT(K)-ZM.LE.10.0) GO TO 150	S1801110
	IF(DPDZ-3.322E-4) 80,150,80	S1801120
80	CONTINUE	S1801130
	IF(LTYP.EQ.1) GO TO 90	S1801140
	UBARK = UBARS-(ALT(K)-ALT(K-1))*(SPEED(K)+SPEED(K-1))*0.5	S1801150
	ZBARK = ZSUM-(ALT(K)-ALT(K-1))	S1801160
90	ZP = ALT(K)	S1801170
100	ZP = ZP-10.0	S1801180
	IF(ZP.LT.ALT(1)) GO TO 170	S1801190
	TVP = PTEMP(K)-TPZ(ALT(K),ZP,PTEMP(K),PTEMP(K-1),ALT(K-1))	S1801200
	CALL LEAST(ALT,PTEMP,DPDZ,K-1,1,ZP,TVP)	S1801210
	IF(DPDZ.GT.3.322E-4) GO TO 120	S1801220
	DPDZ = 3.322E-4	S1801230
110	ZM = ZP	S1801240
	GO TO 150	S1801250
120	IF(LTYP.EQ.1) GO TO 130	S1801260
	UBARZ = SPEED(K)-TPZ(ALT(K),ZP,SPEED(K),SPEED(K-1),ALT(K-1))	S1801270
	UBARZ = (UBARK+(ZP-ALT(K-1))*(UBARZ+SPEED(K-1))*0.5)/(ZBARK+ZP	S1801280
	.-ALT(K-1))	S1801290
		S1801300

ZM = (A1/(UBARZ*DPDZ))*B1	S1801310
GO TO 140	S1801320
130 ZM = (A1/DPDZ)**B1	S1801330
ZM = (A1/AA*(AA*ZM**BB+CC)/DPDZ)**.25	S1801340
140 IF(ZM.GT.ZP) GO TO 110	S1801350
IF(ZM.GT.ZP-10.0) GO TO 150	S1801360
IF(ZP.GE.ALT(K-1)) GO TO 100	S1801370
ZM = ALT(K-1)	S1801380
C-----RETURN ZM AND DPDZ	S1801390
150 IFLG = 0	S1801400
GO TO 180	S1801410
C-----CANNOT CALCULATE ZM AND DPDZ	S1801420
160 IFLG = 1	S1801430
GO TO 180	S1801440
170 IFLG = 2	S1801450
180 RETURN	S1801460
END	S1801470

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SUBROUTINE DELXY
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C-----S1900000
C-----S1900010
C-----S1900020
C-----S1900030
C-----S1900040
C - THIS SUBROUTINE CALCULATES CLOUD TRAJECTORY (DX,DY) AND CLOUD -S1900050
C - RISE TIME TO EACH LEVEL (RISTIM) -S1900060
C - -S1900070
C-----S1900080
C-----S1900090
C-----S1900100
C****          B E G I N  C O M M O N  A R E A          ****
C 04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
. ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2)
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
. FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,
MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP
,MIXING,MAXDEP,LAYBOT(3)
,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
ICHR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
MINUS1,MINUS9,MINS1,MINS9,
MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
RT(24),TPROPC,IDXRT
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
INVNDR(2),ULINE(2),
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
CLRLNE,INSLNE,DELNE,
IESCAJ(3),NULL,IBLNK,
IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
C-----VEHICLE PARAMETERS
COMMON /VCLPR/ VPAR(17)

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C-----TIME PARAMETERS
COMMON /TIME/ JTIME, JDAY, JYEAR, ISTEAM, ISDAY, ISYEAR, LTIME,
LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30),
RH(30), PTEMP(30), SIGEP(30), SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29),
SIGYO(29)
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32),
SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4), QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE (IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3))
, (IPU2, IPAR(4)), (IPU3, IPAR(5))
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1)
C
C****
Cç
EQUIVALENCE (AA, VPAR(7)), (BB, VPAR(8)), (CC, VPAR(9))
TT=0.0
IP=4
XL=GAMMAZ
IF(NORMAL.EQ.1) GO TO 10
IP=3
XL=1.0
10 UF=0.0
UFS=0.0
ZF=0.0
ZFS=0.0
A1=SURDEN*CP*PI*GAMMAX*GAMMAY*XL/(3.0*QC*HEAT)
IF(NORMAL.EQ.1) A1=A1/AA
B1=G/TEMP(1)
S=1.0/SQRT(G*DPDZ/TEMP(1))
PPI=PI*5.5555555E-3
TSTR=PI*S
PPII=1.0/PPI
DXX=0.0
DYY=0.0
I=0
20 I=I+1

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S1900510
S1900520
S1900530
S1900540
S1900550
S1900560
S1900570
S1900580
S1900590
S1900600
S1900610
S1900620
S1900630
S1900640
S1900650
S1900660
S1900670
S1900680
S1900690
S1900700
S1900710
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S1900940
S1900950
S1900960
S1900970
S1900980
S1900990
S1901000
S1901010
S1901020

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IF(I.GE.NUM) GO TO 110	S1901030
CALL LEAST(ALT,PTEMP,DPDZS,I+1,0,0.0,0.0)	S1901040
IF(DPDZS.LT.3.322E-4) DPDZS=3.322E-4	S1901050
BK=A1*DPDZS	S1901060
IF(NORMAL.GT.1) GO TO 30	S1901070
BK=BK/(ALT(I+1)**BB+CC/AA)	S1901080
GO TO 40	S1901090
30 UFS=UF+(ALT(I+1)-ALT(I))*(SPEED(I+1)+SPEED(I))*(.5)	S1901100
ZFS=ZF+(ALT(I+1)-ALT(I))	S1901110
BK=BK*UFS/ZFS	S1901120
40 CONTINUE	S1901130
ZD=BK*ALT(I+1)**IP	S1901140
IF(ZD.GT.2.0) GO TO 80	S1901150
THETAK=(DIR(I+1)+DIR(I))*0.5	S1901160
IF(ABS(DIR(I+1)-DIR(I)).GT.180.0) THETAK=THETAK-180.0	S1901170
BBB=1.0-ZD	S1901180
IF(BBB.GT.1.0) BBB=1.0	S1901190
IF(BBB.LT.-1.0) BBB=-1.0	S1901200
S=1.0/SQRT(B1*DPDZS)	S1901210
TK=S*ARCOS(BBB)-TT	S1901220
TT=TK+TT	S1901230
IF(TT.LE.TSTR) GO TO 50	S1901240
TT=TT-TK	S1901250
GO TO 80	S1901260
50 UF=UFS	S1901270
ZF=ZFS	S1901280
IF(NORMAL.GT.1) GO TO 60	S1901290
RK=0.5*(SPEED(I+1)+SPEED(I))*TK	S1901300
GO TO 70	S1901310
60 RK=UF*TK/ZF	S1901320
70 BBB=THETAK*PPI	S1901330
DY(I)=DY(I-1)-RK*COS(BBB)	S1901340
DX(I)=DX(I-1)-RK*SIN(BBB)	S1901350
RISTIM(I)=TT	S1901360
ILXY=I	S1901370
GO TO 20	S1901380
80 RK=(ZM-ALT(I))/(ALT(I+1)-ALT(I))*0.5*(SPEED(I+1)-SPEED(I))	S1901390
+SPEED(I)	S1901400
IF(NORMAL.EQ.1) GO TO 90	S1901410
RK=RK*(ZM-ALT(I))+UF	S1901420
ZF=ZF+(ZM-ALT(I))	S1901430
RK=RK/ZF	S1901440
90 RK=RK*(TSTR-TT)	S1901450
BBB=(DIR(I+1)-DIR(I))	S1901460
IF(BBB.GT.180.0) BBB=BBB-360.0	S1901470
IF(BBB.LT.-180.0) BBB=BBB+360.0	S1901480
BBB=AMOD(BBB,360.0)	S1901490
THETAM=BBB/(ALT(I+1)-ALT(I))*(ZM-ALT(I))+DIR(I)	S1901500
THETAK=.5*(THETAM+DIR(I))	S1901510
IF(ABS(THETAM-DIR(I)).GT.180.0) THETAK=THETAK-180.0	S1901520
BBB=THETAK*PPI	S1901530
DX(I)=DX(I-1)-RK*SIN(BBB)	S1901540

DY(I)=DY(I-1)-RK*COS(BBB)	S1901550
RISTIM(I)=TSTR	S1901560
ILXY=I	S1901570
100 I=I+1	S1901580
IF(I.GE.NUM) GO TO 110	S1901590
RK=TSTR*.5*(SPEED(I+1)+SPEED(I))	S1901600
ZF=(DIR(I+1)+DIR(I))*0.5	S1901610
IF(ABS(DIR(I+1)-DIR(I)).GT.180) ZF=ZF-180.0	S1901620
BBB=ZF*PPI	S1901630
DX(I)=-RK*SIN(BBB)	S1901640
DY(I)=-RK*COS(BBB)	S1901650
RISTIM(I)=TSTR	S1901660
GO TO 100	S1901670
110 CONTINUE	S1901680
I=NUM-1	S1901690
DO 140 J=1,I	S1901700
IF(DX(J).EQ.0.0 .AND. DY(J).EQ.0.0) GO TO 140	S1901710
TT = 0.5*(SPEED(J+1)+SPEED(J))*(TSTR-RISTIM(J))	S1901720
BBB = 0.5*(DIR(J+1)+DIR(J))	S1901730
IF (ABS(DIR(J+1)-DIR(J)) .GT. 180.0) BBB = BBB-180.0	S1901740
BBB = (BBB+180.0)*PPI	S1901750
UF = DX(J)+TT*SIN(BBB)	S1901760
ZF = DY(J)+TT*COS(BBB)	S1901770
BBB=270.0-ATAN2(ZF,UF)*PPII	S1901780
IF(BBB.GT.360.0) BBB=BBB-360.0	S1901790
IF(BBB.GT.180.0) GO TO 120	S1901800
BBB=BBB+180.0	S1901810
GO TO 130	S1901820
120 BBB=BBB-180.0	S1901830
130 DX(J) = SQRT(UF*UF+ZF*ZF)	S1901840
DY(J)=BBB	S1901850
140 CONTINUE	S1901860
RETURN	S1901870
END	S1901880

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SUBROUTINE TURB4
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C-----S2000000
C-----S2000010
C-----S2000020
C-----S2000030
C-----S2000040
C-----S2000050
C-----S2000060
C-----S2000070
C-----S2000080
C-----S2000090
C-----S2000100
C****          B E G I N  C O M M O N  A R E A          ****
C      04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
              ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
              XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
              IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
              ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
              ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2)
              ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
              TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
              FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,
MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
              DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
              SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP
              ,MIXING,MAXDEP,LAYBOT(3)
              ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
              ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
              MINUS1,MINUS9,MINS1,MINS9,
              MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
              RT(24),TPROPC,IDXRT
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
              INVNDR(2),ULINE(2),
              TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
              CLRLNE,INSLNE,DELNE,
              IESCAJ(3),NULL,IBLNK,
              IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
C-----VEHICLE PARAMETERS
COMMON /VCLPR/ VPAR(17)

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C-----TIME PARAMETERS
COMMON /TIME/ JTIME, JDAY, JYEAR, ISTIME, ISDAY, ISYEAR, LTIME,
LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30),
RH(30), PTEMP(30), SIGEP(30), SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29),
SIGYO(29)
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32),
SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4), QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE(IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3))
, (IPU2, IPAR(4)), (IPU3, IPAR(5))
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1)
C
C**** END OF COMMON AREA ****
C
PHI1 = G*DPDZ/TEMP(1)
TAUK = PI/SQRT(PHI1)
IF(TAUK.GT.600.0 .OR. TAUK.LE.0.0) TAUK = 600.0
K = 0
IF(ISIG.EQ.1) GO TO 40
10 K = K+1
IF(K.GT.NUM) GO TO 40
IF(ALT(K).EQ.HM(1)) GO TO 20
IF(ALT(K).GT.HM(1)) GO TO 30
SIGAP(K) = .5*SIGMAR
SIGEP(K) = .5*SIGMER
GO TO 10
20 SIGAP(K)=SIGMAR*.37037037
SIGEP(K)=SIGMER*.37037037
GO TO 10
30 SIGAP(K) = 1.0
SIGEP(K) = 1.0
GO TO 10
40 RETURN
END

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	SUBROUTINE DIST4	S2100000
	, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S2100010
C	-----	S2100020
C	-	-S2100030
C	- THIS SUBROUTINE DETERMINES THE DISTRIBUTION OF MATERIAL IN EACH	-S2100040
C	- LAYER DEPENDING ON THE SHAPE OF THE SOURCE CLOUD	-S2100050
C	-	-S2100060
C	-----	S2100070
C		S2100080
C		S2100090
C	***** BEGIN COMMON AREA *****	S2100100
C	04/02/82	S2100110
C	-----MATH PARAMETERS AND CONSTANTS	S2100120
	COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S2100130
C	-----INPUT OPTIONS	S2100140
	REAL LAMBDA	S2100150
	INTEGER FILE,GOOD,TITLE	S2100160
	COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S2100170
	ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S2100180
	XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S2100190
	IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S2100200
	ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S2100210
	,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S2100220
	,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S2100230
	TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S2100240
	FS(20),MDLNAM(12),DBAR(20)	S2100250
C	-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S2100260
	LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S2100270
	MODEL4,MODEL5,MODEL6	S2100280
	INTEGER RUNNUM,RT,CL,CS	S2100290
	COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S2100300
	DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S2100310
	SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S2100320
	,MIXING,MAXDEP,LAYBOT(3)	S2100330
	,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S2100340
	ICHR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S2100350
	MINUS1,MINUS9,MINS1,MINS9,	S2100360
	MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S2100370
	RT(24),TPROPC,IDXRT	S2100380
C	-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S2100390
	INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S2100400
	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S2100410
	CLRLNE,INSLNE,DELINE	S2100420
	COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S2100430
	INVNDR(2),ULINE(2),	S2100440
	TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S2100450
	CLRLNE,INSLNE,DELINE,	S2100460
	IESCAJ(3),NULL,IBLNK,	S2100470
	IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S2100480
C	-----VEHICLE PARAMETERS	S2100490
	COMMON /VCLPR/ VPAR(17)	S2100500
C	-----TIME PARAMETERS	

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COMMON /TIME/ JTIME, JDAY, JYEAR, ISTEIME, ISDAY, ISYEAR, LTIME, S2100510
LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2) S2100520
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S2100530
COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30), S2100540
RH(30), PTEMP(30), SIGEP(30), SIGAP(30) S2100550
C-----LAYER PARAMETERS S2100560
COMMON /LAYER/ DX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29), S2100570
SIGYO(29) S2100580
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS) S2100590
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6) S2100600
C-----CALCULATED NEW LAYER PARAMETERS S2100610
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32), S2100620
SPEEDN(32) S2100630
C-----CONVERSION FACTORS S2100640
COMMON /CNVRT/ QCONV(4), QPDEPH S2100650
C S2100660
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S2100670
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S2100680
C-----READ/WRITE BUFFER S2100690
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S2100700
C*****S2100710
C S2100720
C-----EQUIVALENCE STATEMENTS S2100730
EQUIVALENCE(IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3)) S2100740
, (IPU2, IPAR(4)), (IPU3, IPAR(5)) S2100750
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1) S2100760
C S2100770
C**** END OF COMMON AREA ****S2100780
Cç S2100790
EQUIVALENCE (AA, VPAR(7)), (BB, VPAR(8)), (CC, VPAR(9)) S2100800
DOUBLE PRECISION D0, D1, D2, D3, D4, D5, D6 S2100810
DATA D1/4.9867347D-2/, D2/2.11410061D-2/, D3/3.2776263D-3/ S2100820
DATA D4/3.80036D-5/, D5/4.88906D-5/, D6/5.383D-6/ S2100830
IF(NORMAL.GT.1) GO TO 10 S2100840
QQ = QC*(AA*ZM**BB+CC) S2100850
GO TO 20 S2100860
10 QQ = QT S2100870
20 IF(ISHAPE.EQ.2) GO TO 30 S2100880
SQ2I = 1.0/(GAMMAZ*ZM*.465116279) S2100890
PHI = 0.0 S2100900
GO TO 40 S2100910
30 SQ2I = 0.75/(GAMMAZ*ZM) S2100920
PHI = 1.0/(3.0*(GAMMAZ*ZM)**2) S2100930
ZTC = ZM*(1.0+GAMMAZ) S2100940
ZBC = ZM*(1.0-GAMMAZ) S2100950
40 K = 1 S2100960
50 K = K+1 S2100970
IF(ISHAPE.EQ.2) GO TO 100 S2100980
IFLG = 0 S2100990
ZP = (ALT(K)-ZM)*SQ2I S2101000
IF (ZP) 70,60,80 S2101010
60 PZ = .5 S2101020

```

	GO TO 90	S2101030
70	ZP = -ZP	S2101040
	IFLG = 1	S2101050
80	DO = 1.0-0.5*(1.0+ZP*(D1+ZP*(D2+ZP*(D3+ZP*(D4+ZP*(D5+ZP*D6))))))**	S2101060
	DOT(-16)	S2101070
	PZ = DO	S2101080
	IF(IFLG.EQ.1) PZ = 1.0-PZ	S2101090
90	PZP = PZ-PHI	S2101100
	GO TO 110	S2101110
100	PZP = 0.0	S2101120
	ZT = ALT(K)	S2101130
	ZB = ALT(K-1)	S2101140
	IF(ZB.GT.ZTC .OR. ZT.LT.ZBC) GO TO 110	S2101150
	IF(ZT.GT.ZTC) ZT = ZTC	S2101160
	IF(ZB.LT.ZBC) ZB = ZBC	S2101170
	PZP = SQ2I*((ZT-ZB)-((ZT-ZM)**3-(ZB-ZM)**3)*PHI)	S2101180
110	Q(K-1) = PZP*QQ	S2101190
	IF(Q(K-1) .LT. 0.0) Q(K-1) = 0.0	S2101200
	IF(ISHAPE.EQ.1 .AND. Q(K-1).LT.1.0E-20) QQ = 0.0	S2101210
	IF(ISHAPE.EQ.1) PHI = PZ	S2101220
	IF(K.LT.NUM) GO TO 50	S2101230
	IF(NORMAL.GT.1) GO TO 140	S2101240
	K=2	S2101250
	ZP=ZM	S2101260
120	IF(ALT(K).GE.ZM) GO TO 130	S2101270
	K=K+1	S2101280
	IF(K.LE.NUM) GO TO 120	S2101290
	GO TO 140	S2101300
130	IF(K.GT.NUM) GO TO 140	S2101310
	Q(K-1) = QC*AA*(ALT(K)**BB-ZP**BB)+Q(K-1)	S2101320
	ZP = ALT(K)	S2101330
	K = K+1	S2101340
	GO TO 130	S2101350
140	CONTINUE	S2101360
	RETURN	S2101370
	END	S2101380

```

SUBROUTINE DIMS4
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C-----S2200000
C-----S2200010
C-----S2200020
C-----S2200030
C-----S2200040
C-----S2200050
C-----S2200060
C-----S2200070
C-----S2200080
C****          B E G I N C O M M O N   A R E A          ****S2200090
C   04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
.             ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
.             XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
.             IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
.             ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
.             ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)
.             ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
.             TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
.             FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,
.             MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
.             DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
.             SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP
.             ,MIXING,MAXDEP,LAYBOT(3)
.             ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
.             ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
.             MINUS1,MINUS9,MIN51,MIN59,
.             MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
.             RT(24),TPROPC,IDXRT
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
.             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.             CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
.             INVNDR(2),ULINE(2),
.             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.             CLRLNE,INSLNE,DELNE,
.             IESCAJ(3),NULL,IBLNK,
.             IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
C-----VEHICLE PARAMETERS
COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS

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COMMON /TIME/ JTIME, JDAY, JYEAR, ISTEIME, ISDAY, ISYEAR, LTIME, S2200510
LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2) S2200520
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S2200530
COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30), S2200540
RH(30), PTEMP(30), SIGEP(30), SIGAP(30) S2200550
C-----LAYER PARAMETERS S2200560
COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29), S2200570
SIGYO(29) S2200580
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS) S2200590
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6) S2200600
C-----CALCULATED NEW LAYER PARAMETERS S2200610
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32), S2200620
SPEEDN(32) S2200630
C-----CONVERSION FACTORS S2200640
COMMON /CNVRT/ QCONV(4), QPDEPH S2200650
C S2200660
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION***** S2200670
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S2200680
C-----READ/WRITE BUFFER S2200690
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879 S2200700
C***** S2200710
C S2200720
C-----EQUIVALENCE STATEMENTS S2200730
EQUIVALENCE(IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3)) S2200740
, (IPU2, IPAR(4)), (IPU3, IPAR(5)) S2200750
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1) S2200760
C S2200770
C**** END OF COMMON AREA **** S2200780
Cc S2200790
C S2200800
A=GAMMAX*ZM S2200810
B=GAMMAY*ZM S2200820
C=GAMMAZ*ZM S2200830
CINV=1.0/C S2200840
ZTC=ZM+C S2200850
ZBC=ZM-C S2200860
DO 50 K=2, NUM S2200870
ZB = ALT(K-1) S2200880
ZT=ALT(K) S2200890
IF(K.EQ.2) ZB=0.0 S2200900
ZP = .5*(ZT+ZB) S2200910
SXO=0.0 S2200920
SYO=0.0 S2200930
IF(ZB.GT.ZTC.OR.ZT.LT.ZBC) GO TO 20 S2200940
IF(ZT.GT.ZTC) ZT=ZTC S2200950
IF(ZB.LT.ZBC) ZB=ZBC S2200960
ZO=ABS(ZP-ZM) S2200970
ZTEST=ZO*CINV S2200980
IF(ZTEST.LT.1.0) GO TO 10 S2200990
ZP=.5*(ZT+ZB) S2201000
ZO=ABS(ZP-ZM) S2201010
10 FAC=(1-(ZO*ZO)*(CINV*CINV)) S2201020

```

FAC=FAC**.	5	S2201030
SXO = A*FAC		S2201040
SYO = B*FAC		S2201050
20 IF(ISHAPE .EQ. 2 .OR. SXO .GT. 0.0 .OR. ZP .GE. ZM) GOTO 30		S2201060
SXO = 50.0		S2201070
SYO = 50.0		S2201080
30 IF(NORMAL.GT.1) GO TO 40		S2201090
IF(ZP.LE.ZM) GO TO 40		S2201100
IF(SXO.LT.199.95) SXO=199.95		S2201110
IF(SYO.LT.199.95) SYO=199.95		S2201120
40 SIGLL(K-1) = SXO		S2201130
SIGPP(K-1) = SYO		S2201140
SIGXO(K-1)=SXO*.465116279		S2201150
SIGYO(K-1)=SYO*.465116279		S2201160
50 CONTINUE		S2201170
H = ZM		S2201180
RETURN		S2201190
END		S2201200

SUBROUTINE LEAST(ALT,PTEMP,DPDZ,K,ISW,ZP,TVP)  
. , UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC

S2300000  
S2300010  
S2300020  
S2300030  
S2300040  
S2300050  
S2300060  
S2300070  
S2300080  
S2300090  
S2300100  
S2300110  
S2300120  
S2300130  
S2300140  
S2300150  
S2300160  
S2300170  
S2300180  
S2300190  
S2300200  
S2300210  
S2300220  
S2300230  
S2300240  
S2300250  
S2300260  
S2300270  
S2300280

C

DIMENSION ALT(1),PTEMP(1)  
IF(K.LE.1) GO TO 50  
L = K  
TVB = 0.0  
ZB = 0.0  
DO 10 I = 1,K  
TVB = TVB + PTEMP(I)  
10 ZB = ZB + ALT(I)  
IF(ISW.EQ.0) GO TO 20  
TVB = TVB + TVP  
ZB = ZB + ZP  
L = L + 1  
20 TVB = TVB/FLOAT(L)  
ZB = ZB/FLOAT(L)  
S1 = 0.0  
S2 = 0.0  
DO 30 I = 1,K  
S1 = S1+(ALT(I)-ZB)\*(PTEMP(I)-TVB)  
30 S2 = S2+(ALT(I)-ZB)\*\*2  
IF(ISW.EQ.0) GO TO 40  
S1 = S1+(ZP-ZB)\*(TVP-TVB)  
S2 = S2+(ZP-ZB)\*\*2  
40 DPDZ = S1/S2  
50 CONTINUE  
RETURN  
END

```
FUNCTION TPZ(A,B,C,D,E)                                S2400000
. , UPDATE: 8213 SOURCE: 16 DEC 81 LOCATION: KSC      S2400010
C -----S2400020
TPZ = (A-B)*(C-D)/(A-E)                                S2400030
RETURN                                                  S2400040
END                                                    S2400050
```

```
FUNCTION ARCOS(X)
. , UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC
C -----
C THIS RELATION HOLDS FOR ALL PRINCIPAL VALUES OF X.
C 1.570796 = PI/2.
ARCOS = 0.0
IF (X-1.0) 10,20,10
10 ARCOS = 1.570796 - ATAN(X/SQRT(1.-X*X))
20 RETURN
END
```

```
S2500000
S2500010
S2500020
S2500030
S2500040
S2500050
S2500060
S2500070
S2500080
S2500090
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COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS
COMMON /TIME/ JTIME, JDAY, JYEAR, ISTEIME, ISDAY, ISYEAR, LTIME,
LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30),
RH(30), PTEMP(30), SIGEP(30), SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29),
SIGYO(29)
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32),
SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4), QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE(IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3))
, (IPU2, IPAR(4)), (IPU3, IPAR(5))
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1)
C
C**** END OF COMMON AREA ****
C
REAL MPWR
DIMENSION ANG(30), DIREC(3)
CF-----OUTPUT FORMATS
9001 FORMAT(1H1, 10(1H*), 3X, 48HCALCULATED INPUT METEOROLOGICAL LAYER PARS
. AMETERS, 4X, 10(1H*)//2X, 4HMET., 19X, 4HWIND, 19X, 4HWIND, /
. 2X, 5HLAYER, 7X, 4HWIND, 7X, 5HSPEED, 8X, 4HWIND, 5X, 9HDIRECTION,
. 3X, 8HSIGMA OF, 4X, 8HSIGMA OF/3X, 3HNO., 7X, 5HSPEED, 7X, 5HSHEAR, 5X,
. 9HDIRECTION, 3X, 9H SHEAR , 4X, 7HAZI ANG, 5X, 7HELE ANG/
. , 11X, 7H(M/SEC), 5X, 7H(M/SEC), 6X, 5H(DEG), 19X, 5H(DEG), 7X, 5H(DEG))
9002 FORMAT(1X, 40(2H--))
9003 FORMAT(3X, I2, 3X, 4(2X, F10.2), 2(2X, F10.4))
9004 FORMAT(/1X, 16(1H*), 4X, 38HCALCULATED TRANSITION LAYER PARAMETERS,
. 5X, 16(1H*))
9005 FORMAT(/26H TRANSITION LAYER NUMBER: , I2, /)
9006 FORMAT(40X, 4HWIND, 14X, 4HWIND, /
. 2X, 5HVALUE, 24X, 4HWIND, 4X, 5HSPEED, 5X, 4HWIND, 4X, 5H DIR., 4X
. , 5HSIGMA, 4X, 5HSIGMA, /3X, 2HAT, 6X, 6HHEIGHT, 4X, 5HTEMP., 4X, 5HSPEED, 4X
. , 5HSHEAR, 5X, 4HDIR., 4X, 5HSHEAR, 5X, 4HAZI., 5X, 4HELE. /
. , 9X, 8H(METERS), 1X, 7H(DEG K), 3X, 7H(M/SEC), 13X, 5H(DEG), 13X,
. 5H(DEG), 5X, 5H(DEG)/40(2H--))

```

9007	FORMAT(1X,7HTOP: ,3(1X,F8.2),10X,F8.2,9X,2(1X,F8.4))	S2601030
9008	FORMAT(1X,7HLAYER: ,18X,4(1X,F8.2),2(1X,F8.4))	S2601040
9009	FORMAT(1X,7HBOTTOM: ,3(1X,F8.2),10X,F8.2,9X,2(1X,F8.4)/40(2H--))	S2601050
9010	FORMAT(38H0* PROCESSING CONTINUES WITH NEXT RUN./1H1)	S2601060
C		S2601070
C	-----INITIALIZE SOME CONSTANTS AND VARIABLES	S2601080
	RAD=.01745329	S2601090
	NLAYS=NUM-1	S2601100
	ZRL=ZRK	S2601110
	II=-1	S2601120
C	-----CALCULATE NEW LAYER BOUNDRY PARAMETERS	S2601130
	DO 10 I=1,NBK	S2601140
	II=II+2	S2601150
	IJ=II+1	S2601160
	NTAL=LAYBOT(I)	S2601170
	NTAK=LAYTOP(I)+1	S2601180
	SPEEDB(II)=SPEED(NTAL)	S2601190
	SPEEDB(IJ)=SPEED(NTAK)	S2601200
C	SIGAPB(II)=SIGAP(NTAL)	S2601210
C	SIGAPB(IJ)=SIGAP(NTAK)	S2601220
C	SIGEPB(II)=SIGEP(NTAL)	S2601230
C	SIGEPB(IJ)=SIGEP(NTAK)	S2601240
	DIRB(II)=DIR(NTAL)	S2601250
	DIRB(IJ)=DIR(NTAK)	S2601260
	TEMPB(II)=PTEMP(NTAL)	S2601270
	TEMPB(IJ)=PTEMP(NTAK)	S2601280
	10 CONTINUE	S2601290
C	-----CALCULATE PARAMETERS FOR SUBLAYERS (1 TO NLAYS)	S2601300
C	TAUOK=TAUK	S2601310
C	TAUOL=TAUOK	S2601320
C	TAUL=TAUK	S2601330
C	STO1=((TAUK/TAUOK)**.2)*RAD	S2601340
C	STO2=((TAUK/600.0)**.2)*RAD	S2601350
	TAUOK=600.0	S2601360
	FAC=(TAUK/TAUOK)**.2	S2601370
	S=ALT(2)/ZRK	S2601380
	S1=1.0/ALOGT(S)	S2601390
C	-----COMPUTE SPEED,SIGMAP,SIGMEP FOR ALL SUBLAYERS	S2601400
C	*** LAYER 1 ***	S2601410
	P=RB8(SPEED(2),SPEED(1),S1)	S2601420
	SPEEDN(1)=RB11(SPEED(1),P,ALT(2),ZRK)	S2601430
	PPWR=P	S2601440
C	P=RB8(SIGAP(2),SIGAP(1),S1)	S2601450
C	SIGAPN(1)=STO1*RB11(SIGAP(1),P,ALT(2),ZRK)	S2601460
C	MPWR=P	S2601470
C	P=RB8(SIGEP(2),SIGEP(1),S1)	S2601480
C	SIGEPN(1)=RB11(SIGEP(1),P,ALT(2),ZRK)*RAD	S2601490
C	QPWR=P	S2601500
	IF(NLAYS.LT.2) GO TO 30	S2601510
C	*** LAYERS 2 TO NLAYS ***	S2601520
	DO 20 I=2,NLAYS	S2601530
	J=I+1	S2601540



SPEEDN(I)=.5*(SPEED(J)+SPEED(I))	S2601550
C SIGAPN(I)=.5*STO2*(SIGAP(J)+SIGAP(I))	S2601560
C 12 SIGEPN(I)=.5*RAD*(SIGEP(J)+SIGEP(I))	S2601570
20 CONTINUE	S2601580
C-----CALCULATE WIND DIRECTION AND WIND SHEAR FOR SUBLAYERS	S2601590
C *** LAYERS 1 TO NLAYS ***	S2601600
30 DO 90 I=1,NLAYS	S2601610
J=I+1	S2601620
IF(ISIG.EQ.1) GO TO 40	S2601630
IF(ALT(J).NE.HM(1)) GO TO 40	S2601640
SIGAPN(I)=SIGAP(I)*FAC	S2601650
SIGEPN(I)=SIGEP(I)*FAC	S2601660
GO TO 50	S2601670
40 SIGAPN(I)=.5*(SIGAP(J)+SIGAP(I))*FAC	S2601680
SIGEPN(I)=.5*(SIGEP(J)+SIGEP(I))*FAC	S2601690
50 IF(SIGAPN(I).LT.1.0) SIGAPN(I)=1.0	S2601700
IF(SIGEPN(I).LT.1.0) SIGEPN(I)=1.0	S2601710
DIRN(I)=.5*(DIR(J)+DIR(I))	S2601720
IF(ABS(DIR(J)-DIR(I)).LE.180.0) GO TO 60	S2601730
DIRN(I)=DIRN(I)-180.0	S2601740
60 DDIR(I)=DIR(J)-DIR(I)	S2601750
IF(DDIR(I).LE.180.0) GO TO 70	S2601760
DDIR(I)=360.0-DDIR(I)	S2601770
70 IF(DDIR(I).GE.-180.0) GO TO 80	S2601780
DDIR(I)=DDIR(I)+360.0	S2601790
80 DSPEED(I)=SPEED(J)-SPEED(I)	S2601800
IF(DSPEED(I).GE.0.0) GO TO 90	S2601810
IF((PTEMP(J)-PTEMP(I)).GT.0.0) GO TO 90	S2601820
DSPEED(I)=ABS(DSPEED(I))	S2601830
90 CONTINUE	S2601840
C-----CALCULATE PARAMETERS FOR NEW LAYERS (1 TO NBK)	S2601850
IF(ISIG.EQ.1) GO TO 110	S2601860
DO 100 I=1,NBK	S2601870
NLAYSI=NLAYS+I	S2601880
M1=LAYBOT(I)	S2601890
M2=LAYTOP(I)	S2601900
SIGAPN(NLAYSI)=.5*RAD*(SIGAP(M2)*FAC+SIGAP(M1)*FAC)	S2601910
SIGEPN(NLAYSI)=.5*RAD*(SIGEP(M2)*FAC+SIGEP(M1)*FAC)	S2601920
100 CONTINUE	S2601930
GO TO 130	S2601940
110 DO 130 I=1,NBK	S2601950
IF(IRUN.EQ.4) WRITE(IOU,9011) I	S2601960
9011 FORMAT(/22H DIAGNOSTICS FOR LAYER,I2,16H FOR SIGMA,SIGME)	S2601970
NLAYSI=NLAYS+I	S2601980
M1=LAYBOT(I)	S2601990
M2=LAYTOP(I)	S2602000
M21=M2+1	S2602010
DPLAY=ALT(M21)-ALT(M1)	S2602020
DPLAYI=1/DPLAY	S2602030
TMP1=0.0	S2602040
TMP2=0.0	S2602050
DO 120 J=M1,M2	S2602060

K=J+1	S2602070
ALTD=ALT(K)-ALT(J)	S2602080
TMP1=TMP1+(ALTD*(0.5*RAD*FAC*(SIGAP(K)+SIGAP(J))))	S2602090
TMP2=TMP2+(ALTD*(0.5*RAD*FAC*(SIGEP(K)+SIGEP(J))))	S2602100
IF(IRUN.EQ.4) WRITE(IOU,9012) J,K,ALT(J),ALT(K),SIGAP(J),SIGAP(K)	S2602110
.,SIGEP(J),SIGEP(K),ALTD,FAC,TMP1,TMP2	S2602120
9012 FORMAT(3H J=,I2,3H K=,I2,8H ALT(J)=,F10.3,	S2602130
.8H ALT(K)=,F10.3,10H SIGAP(J)=,F10.5,10H SIGEP(K)=,F10.5,	S2602140
.10H SIGEP(J)=,F10.5,10H SIGEP(K)=,F10.5/6H ALTD=,F10.3,5H FAC=,	S2602150
.F10.5,6H TMP1=,F10.5,6H TMP2=,F10.5)	S2602160
120 CONTINUE	S2602170
SIGAPN(NLAYS I)=TMP1*DPLAY I	S2602180
SIGEPN(NLAYS I)=TMP2*DPLAY I	S2602190
130 CONTINUE	S2602200
C-----CALCULATE WIND SPEED AND DIRECTION FOR TRANSITION LAYERS	S2602210
DO 240 I=1,NBK	S2602220
NLAYS I=NLAYS+I	S2602230
IBDX1=2*I-1	S2602240
IBDX2=2*I	S2602250
M1=LAYBOT(I)	S2602260
M2=LAYTOP(I)	S2602270
M21=M2+1	S2602280
S=0.0	S2602290
DO 140 J=M1,M2	S2602300
JJ=J+1	S2602310
140 S=S+.5*(SPEED(J)+SPEED(JJ))*(ALT(JJ)-ALT(J))	S2602320
SPEEDN(NLAYS I)=S/(ALT(M21)-ALT(M1))	S2602330
T1=DIR(M1)	S2602340
T2=0.0	S2602350
ANG(M1)=T1	S2602360
S=0.0	S2602370
DO 170 J=M1,M2	S2602380
JJ=J+1	S2602390
T2=DIR(JJ)	S2602400
IF(ABS(T2-T1).LE.180.0) GO TO 160	S2602410
IF(T2.GT.T1) GO TO 150	S2602420
T2=T2+360.0	S2602430
GO TO 160	S2602440
150 T2=T2-360.0	S2602450
160 P=.5*(T2+T1)	S2602460
T1=T2	S2602470
ANG(JJ)=T1	S2602480
170 S=S+P*(ALT(JJ)-ALT(J))	S2602490
DIRN(NLAYS I)=S/(ALT(M21)-ALT(M1))	S2602500
C-----CALCULATE WIND DIRECTION SHEAR FOR ALL LAYERS	S2602510
T1=0.0	S2602520
T2=0.0	S2602530
DO 180 J=M1,M21	S2602540
T1=T1+ALT(J)	S2602550
180 T2=T2+ANG(J)	S2602560
P=1.0/FLOAT(M21-M1+1)	S2602570
T2=T2*P	S2602580

T1=T1*P	S2602590
P=0.0	S2602600
S=0.0	S2602610
DO 190 J=M1,M21	S2602620
P=P+(ALT(J)-T1)*(ANG(J)-T2)	S2602630
TTT=(ABS(ALT(J)-T1)**2)	S2602640
S=S+TTT	S2602650
190 CONTINUE	S2602660
DDIR(NLAYS I)=(ALT(M21)-ALT(M1))*P/S	S2602670
IF(DDIR(NLAYS I).LE.180.0) GO TO 200	S2602680
DDIR(NLAYS I)=360.0-DDIR(NLAYS I)	S2602690
200 IF(DDIR(NLAYS I).GE.-180.0) GO TO 210	S2602700
DDIR(NLAYS I)=360.0+DDIR(NLAYS I)	S2602710
C-----CALCULATE CHANGE IN WIND SPEED FOR ALL NEW LAYERS	S2602720
210 T1=0.0	S2602730
T2=0.0	S2602740
DO 220 J=M1,M21	S2602750
T1=T1+SPEED(J)	S2602760
T2=T2+ALT(J)	S2602770
220 CONTINUE	S2602780
P=1.0/FLOAT(M21-M1+1)	S2602790
T1=T1*P	S2602800
T2=T2*P	S2602810
P=0.0	S2602820
S=0.0	S2602830
DO 230 J=M1,M21	S2602840
P=P+(ALT(J)-T2)*(SPEED(J)-T1)	S2602850
TTT=(ABS(ALT(J)-T2)**2)	S2602860
S=S+TTT	S2602870
230 CONTINUE	S2602880
DSPEED(NLAYS I)=(ALT(M21)-ALT(M1))*P/S	S2602890
IF(DSPEED(NLAYS I).GE.0.0) GO TO 240	S2602900
IF((TEMPB(IBDX2)-TEMPB(IBDX1)).GT.0.0) GO TO 240	S2602910
DSPEED(NLAYS I)=ABS(DSPEED(NLAYS I))	S2602920
240 CONTINUE	S2602930
250 IF(IPRINT.GT.1) GO TO 290	S2602940
C-----OUTPUT LAYER PARAMETERS	S2602950
260 WRITE(IOU,9001)	S2602960
WRITE(IOU,9002)	S2602970
DO 270 I=1,NLAYS	S2602980
DIRNP=DIRN(I)	S2602990
IF(DIRNP.LT.0.0) DIRNP=DIRNP+360.0	S2603000
IF(DIRNP.GT.360.0) DIRNP=DIRNP-360.0	S2603010
WRITE(IOU,9003) I,SPEEDN(I),DSPEED(I),DIRNP,DDIR(I),SIGAPN(I)	S2603020
,SIGEPN(I)	S2603030
270 CONTINUE	S2603040
WRITE(IOU,9004)	S2603050
DO 290 I=1,NBK	S2603060
J=2*I	S2603070
K=J-1	S2603080
L=NLAYS+I	S2603090
M=LAYTOP(I)+1	S2603100

N=LAYBOT(I)	S2603110
DIREC(1)=DIRB(J)	S2603120
DIREC(2)=DIRN(L)	S2603130
DIREC(3)=DIRB(K)	S2603140
SIGMA=SIGAPN(L)*57.2958	S2603150
SIGME=SIGEPN(L)*57.2958	S2603160
DO 280 IDX=1,3	S2603170
IF(DIREC(IDX).LT.0.0) DIREC(IDX)=DIREC(IDX)+360.0	S2603180
IF(DIREC(IDX).GT.360.0) DIREC(IDX)=DIREC(IDX)-360.0	S2603190
280 CONTINUE	S2603200
SIGMA1=SIGAP(M)*FAC	S2603210
SIGME1=SIGEP(M)*FAC	S2603220
SIGMA2=SIGAP(N)*FAC	S2603230
SIGME2=SIGEP(N)*FAC	S2603240
WRITE(IOU,9005) I	S2603250
WRITE(IOU,9006)	S2603260
WRITE(IOU,9007) ALT(M), TEMPB(J), SPEEDB(J), DIREC(1), SIGMA1, SIGME1	S2603270
WRITE(IOU,9008) SPEEDN(L), DSPEED(L), DIREC(2), DDIR(L), SIGMA, SIGME	S2603280
WRITE(IOU,9009) ALT(N), TEMPB(K), SPEEDB(K), DIREC(3), SIGMA2, SIGME2	S2603290
290 CONTINUE	S2603300
RETURN	S2603310
END	S2603320

FUNCTION RB8(A,B,C)  
 , UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC  
RB8=ALOGT(A/B)\*C  
IF(RB8+1.0) 20,10,20  
10 RB8=-.999999  
20 RB8=RB8+1.0  
RETURN  
END

S2700000  
S2700010  
S2700020  
S2700030  
S2700040  
S2700050  
S2700060  
S2700070

FUNCTION RB11(A,B,C,D)	S2800000
. , UPDATE: 8213 SOURCE: 06 FEB 81 LOCATION: KSC	S2800010
RB11=A*(C**B-D**B)/(B*(C-D)*D**(B-1.0))	S2800020
RETURN	S2800030
END	S2800040

REEDM SOURCE MODULE &RMMRM

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FTN4
PROGRAM RMMRM(5,120)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C**** DECLARATIONS.
C
Cç
C****          B E G I N   C O M M O N   A R E A          ****
C    04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
.             ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
.             XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
.             IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
.             ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
.             ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2)
.             ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
.             TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
.             FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,
.         MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
.             DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
.             SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP
.             ,MIXING,MAXDEP,LAYBOT(3)
.             ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
.             ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
.             MINUS1,MINUS9,MINS1,MINS9,
.             MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
.             RT(24),TPROPC,IDXRT
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
.         TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.         CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
.             INVNDR(2),ULINE(2),
.             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.             CLRLNE,INSLNE,DELNE,
.             IESCAJ(3),NULL,IBLNK,
.             IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
C-----VEHICLE PARAMETERS
COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)

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SUBROUTINE RMFRM(IPASS)
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C: S3000000
C: S3000010
C: S3000020
C: S3000030
C: S3000040
C: S3000050
C: S3000060
C: ORGANIZATION: H. E. CRAMER CO., INC. S3000070
C: S3000080
C: WORK FOR: DR. J. B. STEPHENS (ES84) S3000090
C: S3000100
C: PROGRAM CODE: RMETM S3000110
C: S3000120
C: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST S3000130
C: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER) S3000140
C: S3000150
C: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS S3000160
C: S3000170
C: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS S3000180
C: S3000190
C: S3000200
C: S3000210
C S3000220
C ***** S3000230
C * S3000240
C * THIS PROGRAM GENERATES A METEOROLOGICAL PROFILE OF A SOUNDING * S3000250
C * ON THE PLOTTER * S3000260
C * S3000270
C ***** S3000280
C S3000290
C S3000300
CF FORMAT STATEMENTS S3000310
CF S3000320
9001 FORMAT (I2,1XA2,A1,1XI4) S3000330
9002 FORMAT (I4) S3000340
9003 FORMAT (F6.1) S3000350
9004 FORMAT (4I4) S3000360
C S3000370
C TYPE AND DIMENSION STATEMENTS S3000380
C S3000390
INTEGER STARS,CRSPC,SETTAB,TAB,TAB2,OFF,BKARO,BLNKNG,XRITEL, S3000400
. CLRTAB,CLRDSP,CURLFT,CURSDN,DELIN,CLRLNE,CR,CURSUP,ULINE S3000410
. ,ALTSET S3000420
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S3000430
. INVNDR(2),ULINE(2), S3000440
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S3000450
. CLRLNE,INSLNE,DELIN, S3000460
. IESCAJ(3),NULL,IBLNK, S3000470
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S3000480
DIMENSION WSX(30),DTX(30),PTX(30),WDX(30),CURVEY(30),IPASS(2) S3000490
DIMENSION XAX(3),YAX(3),XLINQ(38),YLINQ(22) S3000500
DIMENSION IALTL(8),IP(5) S3000510
DIMENSION IXNUM(13),IYNUM(26)

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	DIMENSION AWDIR(30)	S3000520
	DIMENSION XL(5),YL(5),IDT(8),IPT(8),IWS(8),IWD(7)	S3000530
	DIMENSION ISURLO(41),ISURL1(53)	S3000540
	DIMENSION ISTL(12)	S3000550
	DIMENSION LABALT(6)	S3000560
	DIMENSION IPGEN(24),IHT(5)	S3000570
	DIMENSION IWDL(9),IALPHA(10),IREG(2),IBUFR(33)	S3000580
	DIMENSION IMET(2),ITOPV(2),IBOTV(2)	S3000590
	DIMENSION IN(2),XRITEL(6)	S3000600
C		S3000610
C		S3000620
C		S3000630
	EQUIVALENCE (STBALT,H),(IN,IN1),(IREG,REG,IA),(IREG(2),IB)	S3000640
	. , (XLINQ(4),XLINQ4),(XLINQ(6),XLINQ6),(XLINQ(8),XLINQ8)	S3000650
	. , (XLINQ(10),XLINQA),(XLINQ(12),XLINQC)	S3000660
	. , (XLINQ(14),XLINQE),(XLINQ(16),XLINQG)	S3000670
	. , (XLINQ(19),XLINQJ),(XLINQ(21),XLINQL)	S3000680
	. , (XLINQ(24),XLINQO),(XLINQ(27),XLINQR)	S3000690
	. , (XLINQ(29),XLINQT),(XLINQ(31),XLINQV)	S3000700
	. , (XLINQ(33),XLINQX),(XLINQ(35),XLINQY)	S3000710
	. , (XLINQ(37),XLINQZ)	S3000720
	EQUIVALENCE (YLINQ(4),YLINQ4),(YLINQ(6),YLINQ6),(YLINQ(8),YLINQ8)	S3000730
	. , (YLINQ(11),YLINQB),(YLINQ(13),YLINQD)	S3000740
	. , (YLINQ(16),YLINQG),(YLINQ(19),YLINQJ)	S3000750
	. , (YLINQ(21),YLINQL)	S3000760
C		S3000770
C		S3000780
C		S3000790
	DATA CRSPC/6440B/	S3000800
	DATA LABALT/2HAL,2HTI,2HTU,2HDE,2H (,2HM)/	S3000810
	DATA IEXP3/2H3 /	S3000820
	DATA ISTL/2HSP,2HEE,2HD(,2HM/,2HS)	S3000830
	. ,2H ,2HTE,2HMP,2H(D,2HEG,2H C,2H) /	S3000840
	DATA ISURLO/2HDA,2HTE,2H: ,8*2H ,	S3000850
	. 2H T,2HIM,2HE:,7*2H ,	S3000860
	. 2H P,2HLO,2HTT,2HED,2H A,2HT:,5*2H ,	S3000870
	. 2HFR,2HOM,2H F,2HIL,2HE:,4*2H /	S3000880
	DATA ISURL1/2HSU,2HRF,2HAC,2HE ,2HPR,2HES,2HSU,2HRE,2H: ,3*2H ,	S3000890
	. 2H M,2HB ,2*2H ,	S3000900
	. 2HDE,2HNS,2HIT,2HY:,4*2H ,2HG/,2HM ,2*2H ,	S3000910
	. 2H @,2H -,2H S,2HTA,2HB ,2HHT,2H: ,3*2H ,2H M,2*2H ,	S3000920
	. 2H *,2H* ,2H- ,2HCA,2HLC,2H H,2HT:,4*2H ,2HM /	S3000930
	DATA XLINQ/ 0.0, 0.0, 5.0	S3000940
	. , 20.0, 55.0	S3000950
	. , 181.0, 216.0	S3000960
	. , 20.0, 139.0	S3000970
	. , 244.0, 300.0	S3000980
	. , 419.0, 503.0	S3000990
	. , 601.0, 692.0	S3001000
	. , 460.0, 100.0, 100.0	S3001010
	. , 310.0, 460.0	S3001020
	. , 726.0, 726.0, 506.0	S3001030

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      ,763.0,768.0,768.0
      ,308.0,336.0
      , 95.0,102.0
      ,731.0,724.0
      ,100.0,106.0
      ,321.0,398.0
      ,468.0,538.0/
DATA YLINQ/ 5.0, 0.0, 0.0
      ,488.0,488.0
      ,473.0,473.0
      , 90.0, 90.0,378.0
      , 70.0, 70.0
      ,378.0, 90.0, 90.0
      ,512.0,512.0,507.0
      , 88.0, 92.0
      , 68.0, 72.0/
DATA IDT/2HDR,2HY ,2HTE,2HMP,2H (,2HDE,2HG ,2HC)/
DATA IPT/2HPO,2HT ,2HTE,2HMP,2H (,2HDE,2HG ,2HC)/
DATA IMINUS/1H-/
DATA IWS/2HWI,2HND,2H S,2HPE,2HED,2H (,2HM/,2HS)/
DATA IWD/2HWI,2HND,2H D,2HIR,2H (,2HDE,2HG)/
DATA IALTL/2H A,2H L,2H T,2H I,2H T,2H U,2H D,2H E/
DATA IXNUM/2H10,2H-5,2H 0,2H 5,2H10,2H15,2H20,2H25,2H30,2H35,
      2H40,2H45,2H50/
DATA IYNUM/2H ,2H 0,2H 3,2H00,2H 6,2H00,2H 9,2H00,2H12,2H00,
12H15,2H00,2H18,2H00,2H21,2H00,2H24,2H00,2H27,2H00,2H30,2H00
      ,2H33,2H00,2H36,2H00/
DATA IMET/2H(M,1H)/
DATA XRITEL/2H 0,2H 2,2H 4,2H 6,2H 8,2H10/
DATA BKARO,CR /20137B,15B/
DATA IHF/1HF/
C
C**** FIRST EXECUTABLE STATEMENT.
C
      IPU1 = IPASS(1)
      IN1 = IAND(IPASS(2),177400B) + 40B
C
      IF (IPAR(1) .EQ. 98) CALL LURQ(1,IPU1,1)
C      CALL SUBROUTINES PLTLU,SFACT, AND LLEFT TO INITIALIZE PLOTTER.
C
10 CALL PLTLU(IPU1)
      CALL SFACT(7.68,5.12)
      CALL LLEFT
20 WRITE(ICU,9005) BLNKNG,OFF,BKARO
9005 FORMAT(10X,2A2,15HFORM GENERATION,3A2)
C
C* * * * *
C
      THIS PROGRAM DRAWS THE MET PLOT FORM
C
C* * * * *
C

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S3001040
S3001050
S3001060
S3001070
S3001080
S3001090
S3001100
S3001110
S3001120
S3001130
S3001140
S3001150
S3001160
S3001170
S3001180
S3001190
S3001200
S3001210
S3001220
S3001230
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S3001460
S3001470
S3001480
S3001490
S3001500
S3001510
S3001520
S3001530
S3001540
S3001550

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C		S3001560
C	DRAW LOWER LEFT POSITION MARK	S3001570
C		S3001580
C	CALL LINQ(XLINQ,YLINQ,3,0)	S3001590
C		S3001600
C	DRAW THE DATE, TIME, LOCATION, AND FILENAME LABELS	S3001610
C		S3001620
	CALL CHARQ(20.0,490.0,0,ISURL0,74,2,1)	S3001630
	CALL LINQ(XLINQ4,YLINQ4,2,0)	S3001640
	CALL LINQ(XLINQ6,YLINQ4,2,0)	S3001650
	CALL LINQ(XLINQY,YLINQ4,2,0)	S3001660
	CALL LINQ(XLINQZ,YLINQ4,2,0)	S3001670
C		S3001680
C	DRAW THE SURFACE PRESSURE, DENSITY,	S3001690
C	STABILIZATION HEIGHT, AND CALCULATION HEIGHT LABELS	S3001700
C		S3001710
	CALL CHARQ(20.0,475.0,0,ISURL1,105,2,1)	S3001720
	CALL LINQ(XLINQ8,YLINQ6,2,0)	S3001730
	CALL LINQ(XLINQA,YLINQ6,2,0)	S3001740
	CALL CHARQ(377.0,478.0,0,IEXP3,1,2,1)	S3001750
	CALL LINQ(XLINQC,YLINQ6,2,0)	S3001760
	CALL LINQ(XLINQE,YLINQ6,2,0)	S3001770
C		S3001780
C	PRINT SURFACE AND OTHER REQUIRED HEADERS.	S3001790
C		S3001800
C		S3001810
C	DRAW ALTITUDE LABEL	S3001820
C		S3001830
C	30 CALL CHARQ(30.0,435.0,0,LABALT,12,2,1)	S3001840
		S3001850
C	DRAW DRY TEMPERATURE LABEL	S3001860
C		S3001870
C	CALL CHARQ(30.0,425.0,0,IDT,16,2,1)	S3001880
		S3001890
C	DRAW POTENTIAL TEMPERATURE LABEL	S3001900
C		S3001910
C	CALL CHARQ(30.0,415.0,0,IPT,16,2,1)	S3001920
		S3001930
C	DRAW WIND SPEED LABEL	S3001940
C		S3001950
C	CALL CHARQ(30.0,405.0,0,IWS,16,2,1)	S3001960
		S3001970
C	DRAW WIND DIRECTION LABEL	S3001980
C		S3001990
C	CALL CHARQ(30.0,395.0,0,IWD,14,2,1)	S3002000
		S3002010
C	DRAW X AND Y AXES	S3002020
C		S3002030
C	CALL LINQ(XLINQG,YLINQ8,3,0)	S3002040
		S3002050
C	DRAW X AXIS LABELS	S3002060
C		S3002070

.	CALL CHARQ(100.0,70.0,0,ISTL,24,2,1)	S3002080
C		S3002090
C	DRAW TICK MARKS ON X AXIS	S3002100
C		S3002110
	TIC = 70.0	S3002120
	COORD = 62.0	S3002130
	DO 40 I=1,13	S3002140
	TIC = TIC + 30.0	S3002150
	XL(1) = TIC	S3002160
	XL(2) = TIC	S3002170
	CALL LINQ(XL,YLINQJ,2,0)	S3002180
	XL(1) = XL(1) + 15.0	S3002190
	XL(2) = XL(1)	S3002200
	IF(I .NE. 13)CALL LINQ(XL,YLINQJ,2,0)	S3002210
	COORD = COORD + 30.0	S3002220
	IF(I .EQ. 1)CALL CHARQ(84.0,80.0,0,IMINUS,1,2,1)	S3002230
	40 CALL CHARQ(COORD,80.0,0,IXNUM(I),2,2,1)	S3002240
C		S3002250
C	DRAW WIND DIRECTION AXIS	S3002260
C		S3002270
	CALL LINQ(XLINQJ,YLINQB,2,0)	S3002280
C		S3002290
C	DRAW WIND DIRECTION AXIS LABEL	S3002300
C		S3002310
	CALL CHARQ(336.0,50.0,0,IWD,14,2,1)	S3002320
C		S3002330
C	DRAW TICK MARKS ON WIND DIRECTION AXIS	S3002340
C		S3002350
	XL(1)=295.0	S3002360
	TIC = 15.0	S3002370
	DO 50 I=1,11	S3002380
	XL(1)=XL(1)+ TIC	S3002390
	XL(2)=XL(1)	S3002400
	50 CALL LINQ(XL,YLINQL)	S3002410
C		S3002420
C	DRAW TICK MARKS ON Y AXIS [LEFT SIDE]	S3002430
C		S3002440
	TIC = 66.0	S3002450
	N = 1	S3002460
	DO 60 I=1,13	S3002470
	TIC = TIC + 24.0	S3002480
	YL(1) = TIC	S3002490
	YL(2) = TIC	S3002500
	CALL CHARQ(64.0,YL-2.5,0,IYNUM(N),4,2,1)	S3002510
	N = N + 2	S3002520
	60 CALL LINQ(XLINQT,YL,2,0)	S3002530
C		S3002540
C	DRAW Y AXIS LABEL	S3002550
C		S3002560
	COORD = 344.0	S3002570
	DO 70 I=1,8	S3002580
	COORD = COORD - 20.0	S3002590

	70 CALL CHARQ(30.0,COORD,0,IALTL(I),2,2,1)	S3002600
	CALL CHARQ(30.0,COORD-20.0,0,IMET,3,2,1)	S3002610
C		S3002620
C	DRAW RIGHT HAND X AND Y AXES	S3002630
C		S3002640
	CALL LINQ(XLINQL,YLINQD,3,0)	S3002650
	TIC=484.0	S3002660
	COORD=496.0	S3002670
	DO 80 I=0,10,2	S3002680
	TIC=TIC+22.0	S3002690
	XL(1)=TIC	S3002700
	XL(2)=TIC	S3002710
	CALL LINQ(XL,YLINQJ,2,0)	S3002720
	TIC=TIC+22.0	S3002730
	XL(1)=TIC	S3002740
	XL(2)=TIC	S3002750
	IF(I.LT.10) CALL LINQ(XL,YLINQJ,2,0)	S3002760
	CALL CODE	S3002770
	CALL CHARQ(COORD,80.0,0,XRITEL(I/2+1),2,2,1)	S3002780
	COORD=COORD+44.0	S3002790
	80 CONTINUE	S3002800
C		S3002810
C	LABEL RIGHT HAND X AXIS	S3002820
C		S3002830
	CALL CODE	S3002840
	WRITE(IALPHA,9006)	S3002850
	9006 FORMAT(30HRANGE ALONG MEAN WIND DIR (KM))	S3002860
	CALL CHARQ(513.0,70.0,0,IALPHA,30,2,1)	S3002870
C		S3002880
C	DRAW TIC MARKS ON RIGHT HAND Y AXIS	S3002890
C		S3002900
	TIC=66.0	S3002910
	N = 1	S3002920
	DO 90 I=1,13	S3002930
	TIC=TIC+24.0	S3002940
	YL(1)=TIC	S3002950
	YL(2)=TIC	S3002960
	CALL CHARQ(734.0,YL-2.5,0,IYNUM(N),4,2,1)	S3002970
	CALL LINQ(XLINQV,YL,2,0)	S3002980
	N = N + 2	S3002990
	90 CONTINUE	S3003000
C		S3003010
C	DRAW UPPER RIGHT POSITION MARK	S3003020
C		S3003030
	CALL LINQ(XLINQO,YLINQG,3,0)	S3003040
C		S3003050
C	REMOVE "FORM GENERATION"	S3003060
C		S3003070
	WRITE(ICU,9007) CR,CLRDSP,BKARO.	S3003080
	9007 FORMAT(50A2)	S3003090
C		S3003100
	CALL URITE	S3003110

C	CHECK FOR "F"	S3003120
C		S3003130
	IF(IN1.EQ.IHF) GO TO 110	S3003140
100	WRITE(ICU,9008) BLNKNG,OFF,INVNDR,INV,OFF,ULINE,OFF,BKARO	S3003150
9008	FORMAT(57H DO YOU WANT TO PLOT ANOTHER METEOROLOGICAL PROFILE FORMS	S3003160
	./5X,2A2,30HCHANGE PLOT PAPER BEFORE A YES,2A2	S3003170
	. ,14X,1H(,2A2,1HY,2A2,2HES,2A2,4H OR ,2A2,1HN,2A2,2HO),A2)	S3003180
	READ (ICU,9007) IN1	S3003190
	WRITE(ICU,9007) CURSUP,CURSUP,CR,CLRDSP,BKAKO	S3003200
	IF (IN1.EQ.IBLNK.OR.IN1.EQ.IYSJ.OR.IN1.EQ.IYESJ) GO TO 20	S3003210
	IF (IN1.EQ. INJ.OR.IN1 .EQ. INOJ) GO TO 110	S3003220
	WRITE (ICU,9009) INV,OFF,0,0	S3003230
	GO TO 100	S3003240
9009	FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S3003250
	*,I2,1H.,I1/)	S3003260
110	CONTINUE	S3003270
	RETURN	S3003280
	END	S3003290

C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S3100000
C																				S3100010
C																				S3100020
C																				S3100030
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S3100040
																				S3100050
																				S3100060
																				S3100070
																				S3100080
																				S3100090
																				S3100100
10																				S3100110
																				S3100120
																				S3100130
																				S3100140

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SUBROUTINE LINQ(X,Y,LEN,IDUM)
. , UPDATE: 8213 SOURCE: 18 JAN 79 LOCATION: KSC
DIMENSION X(1),Y(1)
CALL PLOT(.01*X(1),.01*Y(1),3)
DO 10 I=2,LEN
CALL PLOT(.01*X(I),.01*Y(I),2)
10 CONTINUE
CALL PLOT(.01*X(LEN),.01*Y(LEN),3)
RETURN
END

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REEDM SOURCE MODULE &RMMRN

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FTN4
SUBROUTINE RMETM
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200000
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200010
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200020
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200030
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200040
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200050
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200060
C:: ORGANIZATION: H. E. CRAMER CO., INC. S3200070
C:: WORK FOR: DR. J. B. STEPHENS (ES84) S3200080
C:: PROGRAM CODE: RMETM S3200090
C:: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST S3200100
C:: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER) S3200110
C:: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS S3200120
C:: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS S3200130
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200140
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200150
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200160
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200170
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200180
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200190
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200200
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3200210
C S3200220
C ***** S3200230
C * S3200240
C * THIS PROGRAM GENERATES A METEOROLOGICAL PROFILE OF A SOUNDING * S3200250
C * ON THE PLOTTER * S3200260
C * S3200270
C ***** S3200280
C S3200290
C S3200300
C**** BEGIN COMMON AREA *****S3200300
C 04/02/82 S3200310
C-----MATH PARAMETERS AND CONSTANTS S3200320
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S3200330
C-----INPUT OPTIONS S3200340
REAL LAMBDA S3200350
INTEGER FILE,GOOD,TITLE S3200360
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S3200370
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S3200380
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S3200390
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S3200400
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S3200410
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S3200420
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S3200430
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S3200440
. FS(20),MDLNAM(12),DBAR(20) S3200450
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S3200460
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S3200470
. MODEL4,MODEL5,MODEL6 S3200480
INTEGER RUNNUM,RT,CL,CS S3200490

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COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,          S3200500
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,                 S3200510
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP                          S3200520
. ,MIXING,MAXDEP,LAYBOT(3)                                     S3200530
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,                   S3200540
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),                  S3200550
. MINUS1,MINUS9,MINS1,MINS9,                                    S3200560
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,          S3200570
. RT(24),TPROPC,IDXRT                                         S3200580
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.  S3200590
  INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,                  S3200600
.   TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,       S3200610
.   CLRLNE,INSLNE,DELINE                                       S3200620
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),    S3200630
.   INVNDR(2),ULINE(2),                                        S3200640
.   TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,      S3200650
.   CLRLNE,INSLNE,DELINE,                                       S3200660
.   IESCAJ(3),NULL,IBLNK,                                       S3200670
.   IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)                 S3200680
C-----VEHICLE PARAMETERS                                     S3200690
COMMON /VCLPR/ VPAR(17)                                       S3200700
C-----TIME PARAMETERS                                     S3200710
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,     S3200720
.   LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)               S3200730
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S3200740
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S3200750
.   RH(30),PTEMP(30),SIGEP(30),SIGAP(30)                      S3200760
C-----LAYER PARAMETERS                                     S3200770
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S3200780
.   SIGYO(29)                                                   S3200790
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)          S3200800
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)                     S3200810
C-----CALCULATED NEW LAYER PARAMETERS                     S3200820
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S3200830
.   SPEEDN(32)                                                  S3200840
C-----CONVERSION FACTORS                                  S3200850
COMMON /CNVRT/ QCONV(4),QPDEPH                                 S3200860
C                                                                S3200870
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S3200880
COMMON /EXTRA/   NCOM(1),   NTOTAL(1),   PLUS(900)             S3200890
C-----READ/WRITE BUFFER                                   S3200900
C-----A R R A Y   = 2077 + 1 + 1 + 2 * 900 = 3879S3200910
C*****S3200920
C                                                                S3200930
C-----EQUIVALENCE STATEMENTS                              S3200940
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))         S3200950
.   ,(IPU2,IPAR(4)),(IPU3,IPAR(5))                             S3200960
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)                S3200970
C                                                                S3200980
C****          E N D   O F   C O M M O N   A R E A          ****S3200990
Cç                                                    S3201000
C                                                    S3201010

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	DIMENSION RANGE(30,6),BEARNG(30,6),SIGYBR(30,6),CORSG(30,6)	S3201020
	. ,RCORSG(6),BCORSG(6),XCORSG(6)	S3201030
C	-----EQUIVALENCE STATEMENTS	S3201040
	EQUIVALENCE	S3201050
	. (PLUS,RANGE),(PLUS(181),BEARNG),(PLUS(361),SIGYBR)	S3201060
	. ,(PLUS(541),XCORSG),(PLUS(547),CORSG),(PLUS(727),RCORSG)	S3201070
	. ,(PLUS(733),BCORSG)	S3201080
	EQUIVALENCE (PLUS(735),LOOP)	S3201090
C		S3201100
CF	FORMAT STATEMENTS	S3201110
CF		S3201120
	9001 FORMAT (I2,1XA2,A1,1XI4)	S3201130
	9002 FORMAT (I4)	S3201140
	9003 FORMAT (F6.1)	S3201150
	9004 FORMAT (4I4)	S3201160
C		S3201170
C	TYPE AND DIMENSION STATEMENTS	S3201180
C		S3201190
	INTEGER STARS,CRSPC,BKARO,CR,BKAKO,ZIP	S3201200
	DIMENSION WSX(30),DTX(30),PTX(30),WDX(30),CURVEY(30)	S3201210
	DIMENSION XAX(3),YAX(3),XLINQ(2)	S3201220
	DIMENSION AWDIR(30)	S3201230
	DIMENSION XL(5),YL(5)	S3201240
	DIMENSION ISURT(20)	S3201250
	DIMENSION ICRVT(4)	S3201260
	DIMENSION LALAB1(3),LALAB2(3),LALAB(16)	S3201270
	DIMENSION IHT(5)	S3201280
	DIMENSION IWDL(9),IALPHA(15)	S3201290
	DIMENSION ITOPV(2),IBOTV(2),ZIP(5)	S3201300
	DIMENSION IN(2)	S3201310
C		S3201320
C	DATA STATEMENTS	S3201330
C		S3201340
	DATA CRSPC/6440B/	S3201350
	DATA LALAB1/2HLA,2HYE,2HR1/	S3201360
	DATA LALAB2/2HLA,2HYE,2HR2/	S3201370
	DATA LALAB/16*2H /	S3201380
	DATA IWDL/270,0,90,180,270,360,90,180,270/	S3201390
	DATA STARS/2H**/	S3201400
	DATA ICRVT/2HWS,2HDT,2HPT,2HWD/	S3201410
	DATA XLINQ/100.0,106.0/	S3201420
	DATA ISURT /2HSU,2HRF,2HAC,2HE ,16*2H /	S3201430
	DATA ITOPV/2H T,2HOP/, IBOTV/2H B,2HOT/	S3201440
	DATA BKARO,CR,BKAKO,ZIP	S3201450
	. /20137B,15B,137B,5*0/	S3201460
	DATA IHAT/1H@/	S3201470
C		S3201480
C****	STATEMENT FUNCTIONS:	S3201490
C		S3201500
	PLIM(R)=AMAX1(100.0,AMIN1(460.0,6.0*R+160.0))	S3201510
C		S3201520
C****	FIRST EXECUTABLE STATEMENT.	S3201530

C		S3201540
	10 IF(GOOD.NE.0) GO TO 20	S3201550
	WRITE(ICU,9005) DELINE,CLRDSP,SETTAB,CR,BKAKO	S3201560
	9005 FORMAT(2A2,32X3A2)	S3201570
	9006 FORMAT(50A2)	S3201580
	9007 FORMAT(10X,2A2,8HPLOTTING,3A2)	S3201590
C		S3201600
C		S3201610
C	DETERMINE SOME X AND Y COORDINATES AND TOTAL NUMBER OF POINTS	S3201620
C	FOR THE CURVES	S3201630
C		S3201640
	20 IF(GOOD .GT. 0) WRITE(ICU,9006) (CURSUP,I=-1,LOOP),DELINE,	S3201650
	1 (CURSDN,I=1,LOOP)	S3201660
	IKND = IBLNK	S3201670
	IF (CRT) IKND = BKARO	S3201680
	IF(GOOD.GE.0) WRITE(ICU,9007) BLNKNG,OFF,IKND	S3201690
	CALL PLTLU(IPU1)	S3201700
	CALL SFACT(7.68,5.12)	S3201710
	CALL LLEFT	S3201720
	IF(GOOD.NE.0) GO TO 110	S3201730
	30 DO 40 I=1,NUM	S3201740
	IF(ALT(I) .GE. 3600.0)GO TO 50	S3201750
	CURVEY(I) = ALT(I) * 0.08 + 90.0	S3201760
	40 AWDIR(I) = DIR(I)	S3201770
	I = NUM + 1	S3201780
	50 ILP = I - 1	S3201790
C		S3201800
C	CALL SUBROUTINE TO ROTATE WIND DIRECTION FOR PLOTTING	S3201810
C		S3201820
	CALL WINDS(AWDIR,ILP,ISC)	S3201830
	COORD=293.0	S3201840
	DO 60 I=0,5	S3201850
	CALL CODE	S3201860
	WRITE(IALPHA,9002) IWDL(ISC+1)	S3201870
	CALL CHARQ(COORD,60.0,0,IALPHA,4,2,1)	S3201880
	60 COORD=COORD+30.0	S3201890
C		S3201900
C****	CALCULATE PLOTTER COORDINATES FOR WIND SPEED	S3201910
C****	TEMPERATURE, AND POTENTIAL TEMPERATURE.	S3201920
C		S3201930
	DO 70 I=1,ILP	S3201940
	WSX(I) = PLIM(SPEED(I))	S3201950
	DTX(I) = PLIM(TEMP(I)-273.15)	S3201960
	PTX(I) = PLIM(PTEMP(I)-273.15)	S3201970
	70 WDX(I) = ABS(AWDIR(I)) * 0.333333 + 310.0	S3201980
C		S3201990
C	WRITE THE DATE, TIME OF THE DATA, INSTALLATION, AND DATA FILENAS	S3202000
C		S3202010
	CALL CODE	S3202020
	WRITE (IALPHA,9001) ISDAY,ISMON(1),ISMON(2),ISYEAR	S3202030
	CALL CHARQ(69.,490.,0,IALPHA,11,2,1)	S3202040
	CALL CODE	S3202050

	WRITE (IALPHA,9002) ISTEIME	S3202060
	IF(IALPHA(1).LT.30000B) IALPHA(1)=IALPHA(1)+10000B	S3202070
	CALL CHARQ(230.,490.,0,IALPHA,4,2,1)	S3202080
	CALL CHARQ(258.0,490.0,0,LSDT,4,2,1)	S3202090
	IF(IPLACE .EQ. 0)GO TO 80	S3202100
	I = IPLACE - IPLACE/3	S3202110
	CALL CHARQ(412.0,490.0,0,LOCATN,4,2,1)	S3202120
	CALL CHARQ(552.0,490.0,0,FILE,6,2,1)	S3202130
C		S3202140
C	WRITE THE SURFACE PRESSURE, DENSITY, STABILIZATION HEIGHT	S3202150
C	AND CALCULATION HEIGHT.	S3202160
C		S3202170
	80 CALL CODE	S3202180
	WRITE (IALPHA,9003) PRESS(1)	S3202190
	CALL CHARQ(153.0,475.0,0,IALPHA,6,2,1)	S3202200
	CALL CODE	S3202210
	WRITE (IALPHA,9003) SURDEN	S3202220
	CALL CHARQ(314.0,475.0,0,IALPHA,6,2,1)	S3202230
	CALL CODE	S3202240
	WRITE (IALPHA,9003) H	S3202250
	CALL CHARQ(517.0,475.0,0,IALPHA,6,2,1)	S3202260
	CALL CODE	S3202270
	WRITE(IALPHA,9003) CALHT	S3202280
	IALPHA(2)=MAX0(IALPHA(2),20060B)	S3202290
	CALL CHARQ(706.0,475.0,0,IALPHA,6,2,1)	S3202300
C		S3202310
C	DRAW THE WIND SPEED LINE	S3202320
C		S3202330
	CALL PLOTQ(WSX,CURVEY,ILP,1)	S3202340
	COORD = CURVEY(ILP) + 3.0	S3202350
	CALL CHARQ(WSX(ILP),COORD,0,ICRVT(1),2,2,1)	S3202360
C		S3202370
C	DRAW THE DRY TEMPERATURE LINE	S3202380
C		S3202390
	CALL PLOTQ(DTX,CURVEY,ILP,0)	S3202400
	COORD = CURVEY(ILP) - 8.0	S3202410
	CALL CHARQ(DTX(ILP)+4.0,COORD,0,ICRVT(2),2,2,1)	S3202420
C		S3202430
C	DRAW THE POTENTIAL TEMPERATURE LINE	S3202440
C		S3202450
	CALL PLOTQ(PTX,CURVEY,ILP,1)	S3202460
	COORD = CURVEY(ILP) + 3.0	S3202470
	CALL CHARQ(PTX(ILP),COORD,0,ICRVT(3),2,2,1)	S3202480
C		S3202490
C	DRAW THE WIND DIRECTION LINE	S3202500
C		S3202510
	I1 = 1	S3202520
	DO 90 I=2,ILP	S3202530
	IF(AWDIR(I) .GE. 0.0)GO TO 90	S3202540
	NUMP = I - I1	S3202550
	CALL PLOTQ(WDX(I1),CURVEY(I1),NUMP,0)	S3202560
	I1 = I	S3202570

90	CONTINUE	S3202580
	NUMP = ILP - I1 + 1	S3202590
	CALL PLOTQ(WDX(I1),CURVEY(I1),NUMP,0)	S3202600
	COORD = CURVEY(ILP) - 8.0	S3202610
	CALL CHARQ(WDX(ILP)+4.0,COORD,0,ICRVT(4),2,2,1)	S3202620
C		S3202630
C	DRAW TICK MARKS AT THE VALID DATA POINTS ON THE Y AXIS	S3202640
C		S3202650
	DO 100 I=1,ILP	S3202660
	YL(1) = ALT(I) * 0.08 + 90.0	S3202670
	YL(2) = YL(1)	S3202680
100	CALL PLOTQ(XLINQ,YL,2,0)	S3202690
C		S3202700
C	DRAW ** AT CALCULATION HEIGHT	S3202710
C		S3202720
	COORD=CALHT*0.08+86.0	S3202730
	CALL CHARQ(115.0,COORD,0,STARS,2,2,1)	S3202740
	CALL CHARQ(705.0,COORD,0,STARS,2,2,1)	S3202750
C		S3202760
C	DRAW @ AT STABILIZATION HEIGHT	S3202770
C		S3202780
	CALL CHARQ(616.0,86.5+0.08*H,0,IHAT,1,2,1)	S3202790
C		S3202800
C	DRAW THE CLOUD	S3202810
C		S3202820
110	IF(GOOD.GT.0) CALL CLOUD	S3202830
C		S3202840
C	WRITE OUT LAYER INTERFACE DATA AND PLOT IT	S3202850
C		S3202860
	NLINE=0	S3202870
	IHT(1)=1	S3202880
	IHTX=2	S3202890
	IF(LAYBOT(1).EQ.1) GO TO 120	S3202900
	IHT(2)=LAYBOT(1)	S3202910
	LXWRD=5	S3202920
	NCHAR=40	S3202930
	NXWRD=10	S3202940
	NLINE=1	S3202950
	IHTX=3	S3202960
	ISURT(6)=IBOTV(1)	S3202970
	ISURT(7)=IBOTV(2)	S3202980
	GO TO 130	S3202990
120	NCHAR=32	S3203000
	NXWRD=6	S3203010
	LXWRD=1	S3203020
130	ISURT(NXWRD)=ITOPV(1)	S3203030
	ISURT(NXWRD+1)=ITOPV(2)	S3203040
	IHT(IHTX)=LAYTOP(1)+1	S3203050
	NLINE=NLINE+1	S3203060
	NXWRD=NXWRD+4	S3203070
	IHTX=IHTX+1	S3203080
	IF(LAYTOP(2).GT.0) GO TO 140	S3203090

LXWRD2=0	S3203100
NCHAR=NCHAR-16	S3203110
GO TO 150	S3203120
140 LXWRD2=LXWRD+8	S3203130
ISURT(NXWRD)=IBOTV(1)	S3203140
ISURT(NXWRD+1)=IBOTV(2)	S3203150
ISURT(NXWRD+4)=ITOPV(1)	S3203160
ISURT(NXWRD+5)=ITOPV(2)	S3203170
IHT(IHTX)=LAYBOT(2)	S3203180
IHT(IHTX+1)=LAYTOP(2)+1	S3203190
NLINE=NLINE+2	S3203200
150 IF(GOOD.LT.0) GO TO 180	S3203210
LALAB(LXWRD)=LALAB1(1)	S3203220
LALAB(LXWRD+1)=LALAB1(2)	S3203230
LALAB(LXWRD+2)=LALAB1(3)	S3203240
IF(LXWRD2.GT.0) GO TO 160	S3203250
LCHAR=2*(LXWRD+2)	S3203260
GO TO 170	S3203270
160 LALAB(LXWRD2)=LALAB2(1)	S3203280
LALAB(LXWRD2+1)=LALAB2(2)	S3203290
LALAB(LXWRD2+2)=LALAB2(3)	S3203300
LCHAR=2*(LXWRD2+2)	S3203310
170 CALL CHARQ(198.0+LASET,461.0,0,LALAB,LCHAR,2,1)	S3203320
CALL CHARQ(163.0,451.0,0,ISURT,NCHAR,2,1)	S3203330
180 DO 190 NL=1,NLINE+1	S3203340
XP=100.0+56.0*FLOAT(NL)	S3203350
CALL MOVEM(IHT(NL),XP,NL,NLINE)	S3203360
190 CONTINUE	S3203370
IF(GOOD.GT.0) GO TO 200	S3203380
CALL PLOT(4.50,2.56,3)	S3203390
IF(GOOD.EQ.0)	S3203400
\$ WRITE(ICU,9008) CR,CLRDSP,TAB,CLRTAB,CR,INVHF,OFF	S3203410
9008 FORMAT(5A2,12H * * * * * ,2A2,34HDO NOT CHANGE PLOTTER PEN POSITIS	S3203420
\$ON,2A2,11H * * * * *)	S3203430
RETURN	S3203440
C	S3203450
C PRINT DATE AND TIME PLOTTED .	S3203460
C	S3203470
200 CALL FTIME(IALPHA)	S3203480
CALL CODE(80)	S3203490
READ (IALPHA,9009) (IFRMT(I),I=1,7)	S3203500
9009 FORMAT (A2,1X,A2,11X,A2,2X,A2,A1,3X,2A2)	S3203510
CALL CODE	S3203520
WRITE(IALPHA,9010) (IFRMT(I),I=1,7)	S3203530
9010 FORMAT(16HPLOTTED AT: *** ,2A2,2H, ,A2,1X,4A2,4H ***)	S3203540
CALL CHARQ(499.,7.,0,IALPHA,37,2,1)	S3203550
C	S3203560
C CALL URITE TO TERMINATE GRAPHIC MODE	S3203570
C DELETE "PLOTING" MESSAGE.	S3203580
C	S3203590
CALL URITE	S3203600
WRITE(ICU,9006) CR,CLRLNE,BKAKO	S3203610

C		S3203620
C	TERMINATE RMETM	S3203630
C		S3203640
	RETURN	S3203650
C		S3203660
C	END OF RMETM	S3203670
C		S3203680
	END	S3203690



	SUBROUTINE WINDS(WD,NWD,IST)	S3300000
	. , UPDATE: 8213 SOURCE: 22 JAN 79 LOCATION: KSC	S3300010
C	-----	S3300020
C	-----	S3300030
C	-	S3300040
C	- THIS SUBROUTINE COMPUTES THE WIND DIRECTION LABELS -	S3300050
C	- FOR PLOTTING -	S3300060
C	-	S3300070
C	-----	S3300080
C	-----	S3300090
	DIMENSION DWD(30),STWD(4),WD(1)	S3300100
	DATA STWD/270.0,0.0,90.0,180.0/	S3300110
	WD1=WD(1)	S3300120
	WDX=WD1	S3300130
	WDN=WD1	S3300140
	DO 10 I=2,NWD	S3300150
	WD2=WD(I)	S3300160
C		S3300170
C	CALCULATE LAYER DIRECTIONAL SHEAR	S3300180
C		S3300190
	DWDI=WD2-WD1	S3300200
	IF(DWDI.LT.-180.0) DWDI=DWDI+360.0	S3300210
	IF(DWDI.GT. 180.0) DWDI=DWDI-360.0	S3300220
	DWD(I)=DWDI	S3300230
	WDI=WD(I-1)+DWDI	S3300240
C		S3300250
C	FIND MINIMUM WIND DIRECTION WITH RESPECT TO WD(1)	S3300260
C		S3300270
	IF(WDI.LT.WDN) WDN=WDI	S3300280
	WD(I)=WDI	S3300290
	WD1=WD2	S3300300
10	CONTINUE	S3300310
	WDNP=WDN	S3300320
	IF(WDN.LT.0) WDN=WDN+360.0	S3300330
C		S3300340
C	CALCULATE START INDEX FOR WIND DIRECTION LABEL	S3300350
C		S3300360
	IST=2+IFIX(WDN)/90	S3300370
	IF(IST.GT.4) IST=1	S3300380
C		S3300390
C	CALCULATE RELATIVE POSITION WITH RESPECT TO STWD(IST)	S3300400
C		S3300410
	WD(1)=WD(1)-WDNP+WDN-STWD(IST)	S3300420
	DO 20 I=2,NWD	S3300430
	WD(I)=WD(I-1)+DWD(I)	S3300440
	IF(WD(I).LT.0.0) WD(I)=WD(I)+360.0	S3300450
	IF(WD(I).GT.450.0) WD(I)=WD(I)-360.0	S3300460
20	CONTINUE	S3300470
	RETURN	S3300480
	END	S3300490

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C - - - - - S3400000
C - - - - - S3400010
C - - - - - S3400020
C - - - - - S3400030
C - - - - - S3400040
SUBROUTINE CLOUD
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C - - - - - S3400050
C - - - - - S3400060
C - - - - - S3400070
C ----- S3400080
C - - - - - S3400090
C - THIS SUBROUTINE DRAWS THE CLOUD FOR THE MET - S3400100
C - PROFILE, AT A SPECIFIED X AND Y POSITION. - S3400110
C - - - - - S3400120
C ----- S3400130
Cc ----- S3400140
C****          B E G I N C O M M O N A R E A          ****S3400150
C   04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
.           ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
.           XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
.           IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
.           ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
.           ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2)
.           ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
.           TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
.           FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,
.           MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
.           DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
.           SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP
.           ,MIXING,MAXDEP,LAYBOT(3)
.           ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
.           ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
.           MINUS1,MINUS9,MINS1,MINS9,
.           MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
.           RT(24),TPROPC,IDXRT
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
.           TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.           CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
.           INVNDR(2),ULINE(2),
.           TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,S3400500

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.          CLRLNE, INSLNE, DELINE,          S3400510
.          IESCAJ(3), NULL, IBLNK,         S3400520
.          IPAR(5), ICU, IYSJ, IYESJ, INJ, INOJ, NAMEP(3) S3400530
C-----VEHICLE PARAMETERS                  S3400540
COMMON /VCLPR/ VPAR(17)                   S3400550
C-----TIME PARAMETERS                    S3400560
COMMON /TIME/ JTIME, JDAY, JYEAR, ISTEIME, ISDAY, ISYEAR, LTIME, S3400570
.          LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2) S3400580
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S3400590
COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30), S3400600
.          RH(30), PTEMP(30), SIGEP(30), SIGAP(30) S3400610
C-----LAYER PARAMETERS                   S3400620
COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29), S3400630
.          SIGYO(29) S3400640
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS) S3400650
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6) S3400660
C-----CALCULATED NEW LAYER PARAMETERS S3400670
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32), S3400680
.          SPEEDN(32) S3400690
C-----CONVERSION FACTORS                 S3400700
COMMON /CNVRT/ QCONV(4), QPDEPH S3400710
C S3400720
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S3400730
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S3400740
C-----READ/WRITE BUFFER S3400750
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S3400760
C*****S3400770
C S3400780
C-----EQUIVALENCE STATEMENTS S3400790
EQUIVALENCE (IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3)) S3400800
.          , (IPU2, IPAR(4)), (IPU3, IPAR(5)) S3400810
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1) S3400820
C S3400830
C****          E N D O F C O M M O N A R E A ****S3400840
C S3400850
C S3400860
DIMENSION RANGE(30,6), BEARNG(30,6), SIGYBR(30,6), CORSG(30,6) S3400870
.          , RCORSG(6), BCORSG(6), XCORSG(6) S3400880
C-----EQUIVALENCE STATEMENTS S3400890
EQUIVALENCE S3400900
.          . (PLUS, RANGE), (PLUS(181), BEARNG), (PLUS(361), SIGYBR) S3400910
.          . , (PLUS(541), XCORSG), (PLUS(547), CORSG), (PLUS(727), RCORSG) S3400920
.          . , (PLUS(733), BCORSG) S3400930
DIMENSION X(5), Y(5) S3400940
REAL LEFT S3400950
EQUIVALENCE (X, LEFT), (Y, BOT), (X(3), RIGHT), (Y(2), TOP) S3400960
DATA D2RAD/0.01745329/ S3400970
INDIR=NLAIS+1 S3400980
IF(H.GT.ALT(LAYTOP(1))) INDIR=NLAIS+2 S3400990
BOT=90.0+0.08*ALT(1) S3401000
DO 20 I=1, NLAIS S3401010
XCENR=506.0+0.022*TAUK*SPEEDN(I) S3401020

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BOVRA=SIGPP(I)/SIGLL(I)	S3401030
THETAP=DIRN(INDIR)-DIRN(I)	S3401040
BOVRA1=1.-BOVRA*BOVRA	S3401050
STP=SIN(THETAP*D2RAD)	S3401060
THETAR=ATAN(BOVRA1*STP*COS(THETAP*D2RAD)/(1.-BOVRA1*STP*STP))	S3401070
CTMTP=COS((DIRN(I)-THETAP)*D2RAD)	S3401080
DX=SIGPP(I)*COS(THETAR)/SQRT(1.-BOVRA1*CTMTP*CTMTP)	S3401090
TOP=AMINI(90.0+0.08*ALT(I+1),378.0)	S3401100
LEFT=AMAX1(AMAX1(XCENTR-0.022*DX,506.0),726.0)	S3401110
RIGHT=AMAX1(AMAX1(XCENTR+0.022*DX,726.0),506.0)	S3401120
IF(LEFT.EQ.RIGHT) GO TO 10	S3401130
X(2)=LEFT	S3401140
Y(3)=TOP	S3401150
X(4)=RIGHT	S3401160
Y(4)=BOT	S3401170
X(5)=LEFT	S3401180
Y(5)=BOT	S3401190
CALL PLOTQ(X,Y,5,0)	S3401200
10 BOT=TOP	S3401210
20 CONTINUE	S3401220
RETURN	S3401230
END	S3401240

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C - - - - - S3500000
C - - - - - S3500010
C - - - - - S3500020
C - - - - - S3500030
C - - - - - S3500040
C - - - - - S3500050
SUBROUTINE MOVEM(JND,XPR,NL,NLINE) S3500060
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC S3500070
C ----- S3500080
C - - - - - S3500090
C - - - - - S3500100
THIS SUBROUTINE PLOTS LAYER BOUNDARIES. S3500110
C - - - - - S3500120
C ----- S3500130
Cq ***** S3500140
C****          B E G I N   C O M M O N   A R E A
C          04/02/82 S3500150
C-----MATH PARAMETERS AND CONSTANTS S3500160
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S3500170
C-----INPUT OPTIONS S3500180
REAL LAMBDA S3500190
INTEGER FILE,GOOD,TITLE S3500200
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S3500210
ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S3500220
XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S3500230
IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S3500240
ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S3500250
,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S3500260
,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S3500270
TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S3500280
FS(20),MDLNAM(12),DBAR(20) S3500290
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S3500300
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S3500310
MODEL4,MODEL5,MODEL6 S3500320
INTEGER RUNNUM,RT,CL,CS S3500330
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S3500340
DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S3500350
SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S3500360
,MIXING,MAXDEP,LAYBOT(3) S3500370
,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S3500380
ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S3500390
MINUS1,MINUS9,MINS1,MINS9, S3500400
MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S3500410
RT(24),TPROPC,IDXRT S3500420
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S3500430
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S3500440
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S3500450
CLRLNE,INSLNE,DELNE S3500460
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S3500470
INVNDR(2),ULINE(2), S3500480
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S3500490
CLRLNE,INSLNE,DELNE, S3500500

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      .          IESCAJ(3),NULL,IBLNK,
      .          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
C-----VEHICLE PARAMETERS
      COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,
      .          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
      .          RH(30),PTEMP(30),SIGEP(30),SIGAP(30)
C-----LAYER PARAMETERS
      COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
      .          SIGYO(29)
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS)
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
      .          SPEEDN(32)
C-----CONVERSION FACTORS
      COMMON /CNVRT/ QCONV(4),QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
      COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C
C-----EQUIVALENCE STATEMENTS
      EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))
      .          ,(IPU2,IPAR(4)),(IPU3,IPAR(5))
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)
C
C****          E N D O F C O M M O N A R E A          ****
Cç
C
      DIMENSION RANGE(30,6),BEARNG(30,6),SIGYBR(30,6),CORSG(30,6)
      .          ,RCORSG(6),BCORSG(6),XCORSG(6)
C-----EQUIVALENCE STATEMENTS
      EQUIVALENCE
      .          (PLUS,RANGE),(PLUS(181),BEARNG),(PLUS(361),SIGYBR)
      .          ,(PLUS(541),XCORSG),(PLUS(547),CORSG),(PLUS(727),RCORSG)
      .          ,(PLUS(733),BCORSG)
9001 FORMAT (F8.1)
      DIMENSION LAB(1),X(2),Y(2),JNDVAR(4,5),IPSURX(4)
      .          ,ISURX(99),SURX(57)
      EQUIVALENCE (JNDVR1,JNDVAR(1,2)),(JNDVR2,JNDVAR(1,3))
      .          ,(JNDVR3,JNDVAR(1,4)),(JNDVR4,JNDVAR(1,5))
      .          ,(JNDVR0,JNDVAR(1,1))
      DATA IPSURX/44,17,4,1/
      DATA SURX/130.,150.,160.,170.,180.,190.,200.,210.,220.,230.
      .          ,240.,250.,260.,270.,280.,290.,300.,310.,320.,330.
      .          ,340.,350.,360.,370.,380.,390.,400.,410.,420.,430.

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.	,440.,450.,460.,470.,480.,490.,500.,510.,520.,530.	S3501030
.	,540.,550.,560.,570.,580.,590.,600.,610.,620.,630.	S3501040
.	,640.,650.,660.,670.,680.,690.,700./	S3501050
.	DATA ISURX/1,1,55,6,1,8,10,17,19,26,28,35,37,44,46,55	S3501060
.	,12,1,4,5,8,10,13,14,17,19,22,23,26,28,31,32,35	S3501070
.	,37,40,44,45,47,48,51,55	S3501080
.	,28,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18	S3501090
.	,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36	S3501100
.	,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54	S3501110
.	,54,55,56/	S3501120
.	IF(JND.EQ.1) GO TO 30	S3501130
.	Y(1) = ALT(JND) * 0.08 + 90.0	S3501140
.	IF (ALT(JND) .GE. 3600.0) GO TO 30	S3501150
.	Y(2) = Y(1)	S3501160
.	IST=IPSURX(3+NL-NLINE)	S3501170
.	NDASH=ISURX(IST)	S3501180
.	NINC=1	S3501190
.	IF(GOOD.GT.0) GO TO 10	S3501200
.	NDASH=28	S3501210
.	IST=44	S3501220
.	NINC=7	S3501230
10	DO 20 ND=1,NDASH,NINC	S3501240
	ND2=2*ND	S3501250
	ND2M1=ND2-1	S3501260
	X(1)=SURX(ISURX(IST+ND2M1))	S3501270
	X(2)=SURX(ISURX(IST+ND2))	S3501280
	CALL PLOTQ(X,Y,2,0)	S3501290
20	CONTINUE	S3501300
30	IF((GOOD.GT.0.AND.JND.GT.1).OR.(GOOD.EQ.0.AND.JND.EQ.1)) GO TO 40	S3501310
	RETURN	S3501320
40	CALL CODE	S3501330
	WRITE (JNDVRO,9001) ALT(JND)	S3501340
	YLABEL=TEMP(JND)-273.15	S3501350
	CALL CODE	S3501360
	WRITE (JNDVR1,9001) YLABEL	S3501370
	YLABEL = PTEMP(JND) - 273.15	S3501380
	CALL CODE	S3501390
	WRITE (JNDVR2,9001) YLABEL	S3501400
	CALL CODE	S3501410
	WRITE (JNDVR3,9001) SPEED(JND)	S3501420
	CALL CODE	S3501430
	WRITE (JNDVR4,9001) DIR(JND)	S3501440
	YLABEL = 435.0	S3501450
	DO 50 I=1,5	S3501460
	CALL CHARQ(XPR, YLABEL, 0, JNDVAR(1, I), 8, 2, 1)	S3501470
50	YLABEL = YLABEL - 10.0	S3501480
	RETURN	S3501490
	END	S3501500





	SUBROUTINE PLOTQ(X,Y,LEN,JSW)	S3700000
	, UPDATE: 8213 SOURCE: 16 DEC 81 LOCATION: KSC	S3700010
	DIMENSION X(1),Y(1)	S3700020
C	PLOTS SOLID OR DASHED LINES	S3700030
C		S3700040
C		S3700050
	LSW = 3	S3700060
	DO 70 J=1,LEN	S3700070
	XP = X(J)*.01	S3700080
	YP = Y(J)*.01	S3700090
	IF (JSW .EQ. 0) GO TO 10	S3700100
	IF (LSW .EQ. 2) GO TO 20	S3700110
	DLST = 0.0	S3700120
	XLST = XP	S3700130
	YLST = YP	S3700140
	LST = 1	S3700150
	L = 2	S3700160
	10 CALL PLOT(XP,YP,LSW)	S3700170
	GO TO 70	S3700180
	20 DX = XP-XLST	S3700190
	DY = YP-YLST	S3700200
	DR = SQRT(DX*DX+DY*DY)	S3700210
	TH = ATAN2(DY,DX)	S3700220
	CSS = COS(TH)	S3700230
	SSS = SIN(TH)	S3700240
	30 DINC = .05	S3700250
	40 DINC = DINC-DLST	S3700260
	IF (DINC .LE. DR) GO TO 50	S3700270
	DINC = DR	S3700280
	DLST = DLST+DINC	S3700290
	GO TO 60	S3700300
	50 DLST = 0.0	S3700310
	60 XN = XLST+DINC*CSS	S3700320
	YN = YLST+DINC*SSS	S3700330
	LTSW = 2	S3700340
	IF (MOD(LST,2) .EQ. 0) LTSW = 3	S3700350
	CALL PLOT(XN,YN,LTSW)	S3700360
	XLST = XN	S3700370
	YLST = YN	S3700380
	DR = DR-DINC	S3700390
	IF (DLST .GT. 0.0) GO TO 70	S3700400
	LST = LST+1	S3700410
	IF (LST .GT. L) LST = 1	S3700420
	IF (DR .GT. 0.0) GO TO 30	S3700430
	70 LSW = 2	S3700440
	CALL PLOT(.01*X(LEN),.01*Y(LEN),3)	S3700450
	RETURN	S3700460
	END	S3700470

REEDM SOURCE MODULE &RDHMM

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FTN4
PROGRAM RDHMM(5)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3800000
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3800010
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3800020
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3800030
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3800040
C::: S3800050
C::: S3800060
C::: ORGANIZATION: H. E. CRAMER CO., INC. S3800070
C::: S3800080
C::: WORK FOR: DR. J. B. STEPHENS (ES84) S3800090
C::: S3800100
C::: PROGRAM CODE: RDHMM S3800110
C::: S3800120
C::: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST S3800130
C::: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER)::: S3800140
C::: S3800150
C::: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS ::: S3800160
C::: S3800170
C::: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS S3800180
C::: S3800190
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3800200
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S3800210
C ***** S3800220
C * S3800230
C * PROGRAM RDHMM - READS BOTTOM AND MIXING LAYER HEIGHT * S3800240
C * S3800250
C ***** S3800260
Cc S3800270
C**** BEGIN COMMON AREA *****S3800280
C 04/02/82 S3800290
C-----MATH PARAMETERS AND CONSTANTS S3800300
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S3800310
C-----INPUT OPTIONS S3800320
REAL LAMBDA S3800330
INTEGER FILE,GOOD,TITLE S3800340
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S3800350
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S3800360
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S3800370
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S3800380
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S3800390
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S3800400
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S3800410
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S3800420
. FS(20),MDLNAM(12),DBAR(20) S3800430
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S3800440
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S3800450
. MODEL4,MODEL5,MODEL6 S3800460
INTEGER RUNNUM,RT,CL,CS S3800470
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S3800480
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S3800490

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      SIGZ, ISNDF0, CRT, LAYTOP(3), ITDU, KEEP          S3800500
      , MIXING, MAXDEP, LAYBOT(3)                    S3800510
      , ALTSV, BATCH, CL(14), CS(10), CASSET, IAGAIN,  S3800520
      ICHAR(12), IDXCL, IDXCS, IERROR(5), IFRMT(80),  S3800530
      MINUS1, MINUS9, MINS1, MINS9,                  S3800540
      MODEL4, MODEL5, MODEL6, NNNEST, NNNTRY, LLNEST, LLNTRY, S3800550
      RT(24), TPROPC, IDXRT                          S3800560
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S3800570
      INTEGER ALTSET, OFF, BLNKNG, INV, ULINE, INVNDR, S3800580
      TAB, TAB2, SETTAB, CLRTAB, CURSUP, CURSDN, CURLFT, CLRDSP, S3800590
      CLRLNE, INSLNE, DELINE                          S3800600
      COMMON /CNTRL/ ALTSET(2), OFF(2), BLNKNG(2), INV(2), INVHF(2), S3800610
      INVNDR(2), ULINE(2),                            S3800620
      TAB, TAB2, SETTAB, CLRTAB, CURSUP, CURSDN, CURLFT, CLRDSP, S3800630
      CLRLNE, INSLNE, DELINE,                        S3800640
      IESCAJ(3), NULL, IBLNK, .                      S3800650
      IPAR(5), ICU, IYSJ, IYESJ, INJ, INOJ, NAMEP(3)  S3800660
C-----VEHICLE PARAMETERS                                S3800670
      COMMON /VCLPR/ VPAR(17)                        S3800680
C-----TIME PARAMETERS                                S3800690
      COMMON /TIME/ JTIME, JDAY, JYEAR, ISTIME, ISDAY, ISYEAR, LTIME, S3800700
      LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2) S3800710
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S3800720
      COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30), S3800730
      RH(30), PTEMP(30), SIGEP(30), SIGAP(30)        S3800740
C-----LAYER PARAMETERS                                S3800750
      COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29), S3800760
      SIGYO(29)                                       S3800770
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)      S3800780
      COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6)    S3800790
C-----CALCULATED NEW LAYER PARAMETERS                S3800800
      COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32), S3800810
      SPEEDN(32)                                     S3800820
C-----CONVERSION FACTORS                             S3800830
      COMMON /CNVRT/ QCONV(4), QPDEPH                S3800840
C                                                     S3800850
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S3800860
      COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)  S3800870
C-----READ/WRITE BUFFER                             S3800880
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S3800890
C*****S3800900
C                                                     S3800910
C-----EQUIVALENCE STATEMENTS                        S3800920
      EQUIVALENCE(IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3)) S3800930
      , (IPU2, IPAR(4)), (IPU3, IPAR(5))           S3800940
      EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1) S3800950
C                                                     S3800960
C*****          E N D   O F   C O M M O N   A R E A          *****S3800970
Cq                                                     S3800980
CF-----INPUT FORMAT STATEMENTS                     S3800990
      9001 FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS3801000
      * IF -1 TYPED AGAIN/)                          S3801010

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9002	FORMAT(A2)	S3801020
9003	FORMAT(I2)	S3801030
9004	FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REF. *,I2,1H.,I1/)	S3801040 S3801050
9005	FORMAT(50H DO YOU WISH TO PLOT THE METEOROLOGICAL PROFILE? (,2A2, *1HY,2A2,2HES,2A2,1H.,,2A2,1HN,2A2,4HO):_)	S3801060 S3801070
9006	FORMAT(3A2)	S3801080
9007	FORMAT(15H HEIGHT AT THE ,2A2,8H OF THE ,3A2,15HLAYER (METERS):,9XS *,F8.2)	S3801090 S3801100
9008	FORMAT(24H DO YOU WISH TO CHANGE (,2A2,1HN,2A2,6HEITHER,2A2,1H.,, *2A2,1HU,2A2,5HPPER,,2A2,1HL,2A2,25HOWER) TRANSITION LAYER?:_)	S3801110 S3801120
9009	FORMAT(24H DO YOU WISH TO CHANGE (,2A2,1HT,2A2,2HOP,2A2,1H.,,2A2, *1HB,2A2,33HASE) HEIGHT OF THE UPPER LAYER?:_)	S3801130 S3801140
9010	FORMAT(25H ENTER THE HEIGHT AT THE ,2A2,8H OF THE ,3A2,17H LAYER (S3801150 *METERS):_)	S3801160
9011	FORMAT(69H *** REEDM WARNING 020, INVALID LAYERING - SPACE RETURN *TO CONTINUE:_)	S3801170 S3801180
9012	FORMAT(2A2,18H ENTER SIGMA AZ, (,2A2,1HE,2A2,9HSTIMATED=,2A2, *F5.2,2A2,1H.,,2A2,1HA,2A2,9HNOTHER):_)	S3801190 S3801200
9013	FORMAT(2A2,23H ENTER SIGMA AZ (DEG):_)	S3801210
9014	FORMAT(2A2,20H SIGMA AZ (DEGREES):,45X,F5.2)	S3801220
9015	FORMAT(57H DO YOU WISH TO INPUT SIGMA A & SIGMA E FOR EACH LEVEL? *(,2A2,1HN,2A2,1HO,2A2,1H.,,2A2,1HY,2A2,5HES):_)	S3801230 S3801240
9016	FORMAT(18H ENTER SIGMA EL, (,2A2,1HE,2A2,9HSTIMATED=,2A2,F5.2 *,2A2,1H.,,2A2,1HA,2A2,9HNOTHER):_)	S3801250 S3801260
9017	FORMAT(2A2,23H ENTER SIGMA EL (DEG):_)	S3801270
9018	FORMAT(2A2,20H SIGMA EL (DEGREES):,45X,F5.2)	S3801280
9019	FORMAT(43H ENTER SIGMA A, SIGMA E (IN DEG) FOR LEVEL ,I2,2H (, *F6.3,1H.,,F6.3,3H):_)	S3801290 S3801300
9020	FORMAT(2A2,27H SIGMA A,SIGMA E FOR LEVEL ,I2,1H:,33X,2F6.2)	S3801310
9021	FORMAT(69H *** REEDM WARNING 021, TOP OF UPPER LAYER LESS THAN TOPS * OF SOUNDING,/12H CONTINUE? (,2A2,1HN,2A2,1HO,2A2,1H.,,2A2,1HY,2A2, *5HES):_)	S3801320 S3801330 S3801340
9022	FORMAT(68H *** REEDM WARNING 022, GAP BETWEEN LAYERS MAY NOT PRODUS *CE REALISTIC/44H GRAVITATIONAL SETTLING RESULTS, CONTINUE? (,2A2, *1HN,2A2,1HO,2A2,1H.,,2A2,1HY,2A2,5HES):_)	S3801350 S3801360 S3801370
CF-----	OUTPUT FORMAT STATEMENTS.	S3801380
9023	FORMAT(2A2,A1)	S3801390
C-----	TYPE AND DIMENSION STATEMENTS	S3801400
	LOGICAL IBATCH,DONE(2)	S3801410
	INTEGER UPPER(3),LOWER(3),BASE(2),TOP(2),FMTHT1(25),FMTHT2(25)	S3801420
	DIMENSION HEIGHT(2),IPFMT(2)	S3801430
C-----		S3801440
	EQUIVALENCE (PLUS(740),IBATCH), (PLUS(738),HEIGHT),	S3801450
1	(PLUS(737),IPFMT), (PLUS(736),IIUTMP),	S3801460
2	(PLUS(735),LOOP), (PLUS(734),IPLOT)	S3801470
C-----	DATA STATEMENTS	S3801480
	DATA FMTHT1 /2H(8,2H(2,2HH ,2H+),2H," ,2H C,2HAL,2HCU,2HLA,2HTI,	S3801490
1	2HON,2H H,2HEI,2HGH,2HT",2H,7,2H(2,2HH ,2H+),2H,8,	S3801500
2	2HX,,2HF8,2H.2,2H) ,2H /	S3801510
	DATA FMTHT2 /2H(7,2H(2,2HH ,2H+),2H," ,2H S,2HTA,2HBI,2HLI,2HZA,	S3801520
1	2HTI,2HON,2H H,2HEI,2HGH,2HT",2H,7,2H(2,2HH ,2H+),	S3801530

2	2H,8,2HX,,2HF8,2H.2,2H) /	S3801540
	DATA UPPER/2HUP,2HPE,1HR/	S3801550
	DATA LOWER/2HLO,2HWE,1HR/	S3801560
	DATA BASE/2HBA,2HSE/	S3801570
	DATA TOP/2HTO,2HP /	S3801580
	DATA IHF/1HF/,IHU/1HU/,IHL/1HL/,IHB/1HB/,IHT/1HT/,IHA/1HA/,	S3801590
	*IHE/1HE/	S3801600
	DATA IIHAN/2HAN/,IIHES/2HES/,IIHNE/2HNE/	S3801610
	DATA IESA/15501B/,IESD/15504B/,IESJ/15512B/	S3801620
	DATA JVERSN/8213/	S3801630
C		S3801640
C		S3801650
	IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S3801660
	IF (CRT) GO TO 10	S3801670
	IESA = NULL	S3801680
	IESD = NULL	S3801690
	IESJ = .NULL	S3801700
	10 CONTINUE	S3801710
C		S3801720
C	-----DETERMINE SEGMENT ENTRY POINT.	S3801730
	GOTO (20,130,460), NNNTRY	S3801740
	20 CONTINUE	S3801750
	IBATCH = .FALSE.	S3801760
C		S3801770
	IF(KEEP.EQ.1) GO TO 40	S3801780
C	-----BEGIN PROCESSING	S3801790
	IF(ICALC.EQ.1) CALHT=0.0	S3801800
	IF(ICALC.EQ.2) CALHT=H	S3801810
C	DEFAULT MIXING HEIGHT TO TWICE THE STABILIZATION HEIGHT.	S3801820
	HM(1) = H + H	S3801830
	ISF=1	S3801840
	INDX=IHIDX(ALT,NUM,HM(1),ISF)	S3801850
	HM(1)=ALT(INDX+1)	S3801860
	HM(2)=0.0	S3801870
	BOTLAY=0.0	S3801880
	LAYBOT(1)=1	S3801890
	LAYTOP(1)=INDX	S3801900
	LAYBOT(2)= 1	S3801910
	LAYTOP(2)= 0	S3801920
	LAYBOT(3) = 1	S3801930
	LAYTOP(3) = 0	S3801940
	IF(INDX+1 .EQ. NUM) GOTO 40	S3801950
C	-----FOR HM(1) \$ ALT(NUM) SET TOP OF SECOND	S3801960
C	BOUNDARY LAYER TO TOP OF MET SOUNDING.	S3801970
	HM(2) = ALT(NUM)	S3801980
	LAYTOP(2) = NUM - 1	S3801990
	IF(MODEL .NE. 6) GOTO 30	S3802000
	LAYBOT(2) = 1	S3802010
	GOTO 40	S3802020
	30 LAYBOT(2) = INDX + 1	S3802030
	BOTLAY = HM(1)	S3802040
	40 CONTINUE	S3802050

C-----	INITIALIZE CALCULATION & STABILIZATION RELATIONSHIPS.	S3802060
	HEIGHT(1) = CALHT	S3802070
	HEIGHT(2) = H	S3802080
	IF(H .GT. CALHT) GOTO 50	S3802090
	IPFMT(1) = 1	S3802100
	IPFMT(2) = 2	S3802110
	GOTO 60	S3802120
50	IPFMT(1) = 2	S3802130
	IPFMT(2) = 1	S3802140
60	CONTINUE	S3802150
	JER = 0	S3802160
C-----	PLOT METEOROLOGICAL PROFILE	S3802170
	IPLOT=1	S3802180
	GOOD=0	S3802190
	IF(.NOT.BATCH) GOTO 70	S3802200
	READ(IIU,9002) INPT	S3802210
	IPLOT = 2	S3802220
	IF(INPT .EQ. INJ .OR. INPT .EQ. INOJ) GOTO 130	S3802230
	IPLOT = 1	S3802240
	N = 2	S3802250
	IF(INPT .EQ. IHF) N = 1	S3802260
	GOTO 120	S3802270
70	WRITE(ICU,9005) INVNDR,INV,OFF,ULINE,OFF	S3802280
	INPT = IBLNK	S3802290
	READ(IIU,9002) INPT	S3802300
	N = 1	S3802310
	IF(INPT.EQ.INJ .OR. INPT.EQ.INOJ) GO TO 90	S3802320
	IF(INPT .EQ. MINUS9) GO TO 900	S3802330
	IF(INPT .NE. MINUS1) GO TO 80	S3802340
	JER = JER+1	S3802350
	IF (JER .GT. 1) GO TO 890	S3802360
	WRITE (ICU,9001)	S3802370
	GO TO 70	S3802380
80	IF (INPT .EQ. IBLNK.OR. INPT.EQ.IYSJ.OR. INPT.EQ.IYESJ) GO TO 100	S3802390
	WRITE (ICU,9004) INV,OFF,17,0	S3802400
	GO TO 70	S3802410
90	IPLOT = 2	S3802420
100	JER = 0	S3802430
	WRITE(ICU,9006) IESA,IESD,IESJ	S3802440
110	GO TO (120,130) IPLOT	S3802450
120	GOOD=0	S3802460
	NNNEST = 4	S3802470
	NNNTRY = N	S3802480
	LLNEST = 3	S3802490
	LLNTRY = 2	S3802500
	CALL REEDM	S3802510
C-----	DISPLAY BOUNDARY LAYERS VALUES. MUCH OF THE LOGIC DETERMINES	S3802520
C	WHEN TO DISPLAY THE CALCULATION & STABILIZATION HEIGHTS.	S3802530
C		S3802540
130	CONTINUE	S3802550
	IF(.NOT.BATCH .OR. IBATCH) GOTO 150	S3802560
	READ(IIU,9002) I	S3802570

	IF(I .EQ. IYSJ.OR. I .EQ. IYESJ) GOTO 140	S3802580
	GO TO 460	S3802590
C	GOTO (450,460), IPLOT	S3802600
140	IBATCH = .TRUE.	S3802610
	IIUTMP = IIU	S3802620
	IIU = ICU	S3802630
150	DONE(1) = .FALSE.	S3802640
	DONE(2) = .FALSE.	S3802650
	LOOP=0	S3802660
	DO 160 I = 1,2	S3802670
	I1 = IPFMT(I)	S3802680
	IF(HM(2).EQ.0.0.OR.HEIGHT(I1).LT.HM(2)) GO TO 160	S3802690
	IF(I1.EQ.1) WRITE(ICU,FMTH1) HEIGHT(1)	S3802700
	IF(I1.EQ.2) WRITE(ICU,FMTH2) HEIGHT(2)	S3802710
	LOOP=LOOP+1	S3802720
	DONE(I1) = .TRUE.	S3802730
160	CONTINUE	S3802740
	IF(HM(2).EQ.0.0) GO TO 170	S3802750
	WRITE(ICU,9007) TOP,UPPER,HM(2)	S3802760
	LOOP=LOOP+1	S3802770
170	DO 180 I = 1,2	S3802780
	I1 = IPFMT(I)	S3802790
	IF(BOTLAY.EQ.0.0.OR.HEIGHT(I1).LT.BOTLAY.OR.DONE(I1)) GO TO 180	S3802800
	IF(I1.EQ.1) WRITE(ICU,FMTH1) HEIGHT(1)	S3802810
	IF(I1.EQ.2) WRITE(ICU,FMTH2) HEIGHT(2)	S3802820
	LOOP=LOOP+1	S3802830
	DONE(I1) = .TRUE.	S3802840
180	CONTINUE	S3802850
	IF((MODEL .NE. 6 .AND. BOTLAY .EQ. 0.0) .OR.	S3802860
1	(MODEL .EQ. 6 .AND. HM(2) .EQ. 0.0)) GOTO 190	S3802870
	WRITE(ICU,9007) BASE,UPPER,BOTLAY	S3802880
	LOOP=LOOP+1	S3802890
190	DO 200 I = 1,2	S3802900
	I1 = IPFMT(I)	S3802910
	IF(HEIGHT(I1).LT.HM(1).OR.DONE(I1)) GO TO 200	S3802920
	IF(I1.EQ.1) WRITE(ICU,FMTH1) HEIGHT(1)	S3802930
	IF(I1.EQ.2) WRITE(ICU,FMTH2) HEIGHT(2)	S3802940
	LOOP=LOOP+1	S3802950
	DONE(I1) = .TRUE.	S3802960
200	CONTINUE	S3802970
	WRITE(ICU,9007) TOP,LOWER,HM(1)	S3802980
	LOOP=LOOP+1	S3802990
	DO 210 I = 1,2	S3803000
	I1 = IPFMT(I)	S3803010
	IF(DONE(I1)) GO TO 210	S3803020
	IF(I1.EQ.1) WRITE(ICU,FMTH1) HEIGHT(1)	S3803030
	IF(I1.EQ.2) WRITE(ICU,FMTH2) HEIGHT(2)	S3803040
	LOOP=LOOP+1	S3803050
	DONE(I1) = .TRUE.	S3803060
210	CONTINUE	S3803070
	WRITE(ICU,9007) BASE,LOWER,ALT(1)	S3803080
	LOOP=LOOP+1	S3803090

C		S3803100
C-----	ENTER BOUNDARY LAYERS OPTIONS.	S3803110
C		S3803120
220	WRITE(ICU,9008) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF	S3803130
	LOOP=LOOP+1	S3803140
	INPT = IBLNK	S3803150
	READ(IIU,9002) INPT	S3803160
	IF(INPT .NE. MINUS1) GOTO 230	S3803170
	INPT = -2	S3803180
	GOTO 420	S3803190
230	IF(.NOT.BATCH .AND. INPT.EQ.MINUS9) GO TO 900	S3803200
	IF (INPT.EQ.IBLNK.OR.INPT.EQ.INJ.OR.INPT.EQ.IIHNE) GO TO 460	S3803210
	IF (INPT .EQ. IHU.OR.INPT .EQ. UPPER(1)) GO TO 240	S3803220
	IF (INPT .EQ. IHL.OR.INPT .EQ. LOWER(1)) GO TO 270	S3803230
	IF (BATCH) GO TO 460	S3803240
	WRITE (ICU,9004) INV,OFF,18,0	S3803250
	LOOP = LOOP-1	S3803260
	GO TO 220	S3803270
240	I = 3	S3803280
	IF(MODEL .EQ. 6) GOTO 280	S3803290
250	WRITE(ICU,9009) INVNDR,INV,OFF,ULINE,OFF	S3803300
	LOOP=LOOP+1	S3803310
	INPT = IBLNK	S3803320
	READ(IIU,9002) INPT	S3803330
	IF(INPT .EQ. MINUS1) GOTO 410	S3803340
	IF(.NOT.BATCH .AND. INPT.EQ.MINUS9) GO TO 900	S3803350
	IF(INPT.EQ.IHB.OR.INPT .EQ.BASE(1)) GO TO 260	S3803360
	IF (INPT.EQ.IBLNK.OR.INPT.EQ.IHT.OR.INPT.EQ.TOP(1)) GO TO 280	S3803370
	WRITE (ICU,9004) INV,OFF,18,2	S3803380
	LOOP = LOOP-1	S3803390
	GO TO 250	S3803400
260	I = 2	S3803410
	GO TO 280	S3803420
270	I=1	S3803430
280	GO TO (290,330,370) I	S3803440
290	WRITE(ICU,9010) TOP,LOWER	S3803450
	LOOP=LOOP+1	S3803460
	CALL IFNBR(IFRMT,14,IER,IIU)	S3803470
	IF (BATCH .OR. IER .EQ. 0) GO TO 310	S3803480
300	WRITE (ICU,9004) INV,OFF,18,1	S3803490
	LOOP = LOOP-1	S3803500
	GO TO 280	S3803510
310	A1 = 0.0	S3803520
	CALL CODE(80)	S3803530
	READ (IFRMT,*) A1	S3803540
	IF(BATCH .AND. A1 .LT. -1.0) A1 = -1.0	S3803550
	IF (A1 .EQ. MINS1) GO TO 410	S3803560
	IF (A1 .EQ. MINS9) GO TO 900	S3803570
	IF (A1 .GE. 0.0) GO TO 320	S3803580
	GO TO 300	S3803590
320	ISF=1	S3803600
	INDX=IHIDX(ALT,NUM,A1,ISF)	S3803610



	HM(1)=ALT(INDX+1)	S3803620
	LAYTOP(1)=INDX	S3803630
	GO TO 420	S3803640
C	ENTER BOTLAY - BASE OF UPPER LAYER.	S3803650
330	WRITE(ICU,9010) BASE,UPPER	S3803660
	LOOP=LOOP+1	S3803670
	CALL IFNBR(IFRMT,14,IER,IIU)	S3803680
	IF (BATCH .OR. IER .EQ. 0) GO TO 350	S3803690
340	WRITE (ICU,9004) INV,OFF,18,3	S3803700
	LOOP = LOOP-1	S3803710
	GO TO 280	S3803720
350	A1 = 0.0	S3803730
	CALL CODE(80)	S3803740
	READ (IFRMT,*) A1	S3803750
	IF(BATCH .AND. A1 .LT. -1.0) A1 = -1.0	S3803760
	IF (A1 .EQ. MINS1) GO TO 410	S3803770
	IF (A1 .EQ. MINS9) GO TO 900	S3803780
	IF (A1 .GE. 0.0) GO TO 360	S3803790
	GO TO 340	S3803800
360	ISF=0	S3803810
	INDX=IHIDX(ALT,NUM,A1,ISF)	S3803820
	BOTLAY=ALT(INDX)	S3803830
	LAYBOT(2)=INDX	S3803840
	GO TO 420	S3803850
370	WRITE(ICU,9010) TOP,UPPER	S3803860
	LOOP=LOOP+1	S3803870
	CALL IFNBR(IFRMT,14,IER,IIU)	S3803880
	IF (BATCH .OR. IER .EQ. 0) GO TO 390	S3803890
380	WRITE (ICU,9004) INV,OFF,18,4	S3803900
	LOOP = LOOP-1	S3803910
	GO TO 280	S3803920
390	A1 = 0.0	S3803930
	CALL CODE(80)	S3803940
	READ (IFRMT,*) A1	S3803950
	IF(BATCH .AND. A1 .LT. -1.0) A1 = -1.0	S3803960
	IF (A1 .EQ. MINS1) GO TO 410	S3803970
	IF (A1 .EQ. MINS9) GO TO 900	S3803980
	IF (A1 .GE. 0.0) GO TO 400	S3803990
	GO TO 380	S3804000
400	ISF=1	S3804010
	INDX=IHIDX(ALT,NUM,A1,ISF)	S3804020
	HM(2)=ALT(INDX+1)	S3804030
	LAYTOP(2)=INDX	S3804040
	GOTO 420	S3804050
410	INPT = MINS1	S3804060
420	DO 430 I=1,LOOP	S3804070
	WRITE(ICU,9006) IESA,IESD,IESJ	S3804080
430	CONTINUE	S3804090
	IF(BATCH .AND. INPT .LT. -1) INPT = -1	S3804100
	IF(INPT+1) 40,130,440	S3804110
440	GO TO (450,130) IPLOT	S3804120
450	GOOD=-1	S3804130

NNNEST = 4	S3804140
NNNTRY = 2	S3804150
LLNEST = 3	S3804160
LLNTRY = 2	S3804170
CALL REEDM	S3804180
460 I=0	S3804190
IF(MODEL .NE. 6) GOTO 490	S3804200
IF(HM(2) .EQ. 0.0 .AND. HM(1) .GT. 0.0) I = 1	S3804210
IF(HM(2).GT.0.0 .AND. HM(2).GT.HM(1) .AND. HM(1).GT.0.0) I = 2	S3804220
IF(I) 550,550,470	S3804230
470 IF(LAYTOP(I)-(NUM-1)) 480,570,570	S3804240
480 WRITE(ICU,9021) INVNDR,INV,OFF,ULINE,OFF	S3804250
INPT = IBLNK	S3804260
READ(IIU,9002) INPT	S3804270
IF(.NOT.BATCH .AND. INPT .EQ. MINUS9) GOTO 900	S3804280
WRITE(ICU,9023) IESCAJ	S3804290
IF(INPT .EQ. IYSJ.OR. INPT .EQ.IYESJ) GOTO 570	S3804300
IF (INPT.EQ.IBLNK.OR.INPT.EQ.INJ.OR.INPT.EQ.INOJ) GO TO 420	S3804310
WRITE (ICU,9004) INV,OFF,0,0	S3804320
GO TO 480	S3804330
490 CONTINUE	S3804340
IF(HM(2) .EQ.0.0 .AND. BOTLAY .EQ.0.0 .AND. HM(1) .GT.0.0) I=1	S3804350
IF(HM(2) .GT. BOTLAY .AND. BOTLAY .EQ. HM(1) .AND. HM(1) .GT.0.0) I=2	S3804360
IF(HM(2) .GT. BOTLAY .AND. BOTLAY .GT. HM(1) .AND. HM(1) .GT.0.0) I=3	S3804370
IF(MODEL .EQ. 5) GOTO 540	S3804380
IF(I .EQ. 1 .AND. CALHT .LT. HM(1)) GO TO 560	S3804390
IF(I .EQ. 2 .AND. CALHT .LT. HM(2)) GO TO 560	S3804400
IF(I-3) 550,500,550	S3804410
500 IF(CALHT .LT. HM(2) .AND. CALHT .GE. BOTLAY) GO TO 510	S3804420
IF(CALHT .LT. HM(1)) GO TO 510	S3804430
GOTO 550	S3804440
510 DO 520 J = 1,4	S3804450
IF(IPLLNT(J)-4) 520,530,520	S3804460
520 CONTINUE	S3804470
GOTO 560	S3804480
530 WRITE(ICU,9022) INVNDR,INV,OFF,ULINE,OFF	S3804490
INPT = IBLNK	S3804500
READ(IIU,9002) INPT	S3804510
IF(.NOT.BATCH .AND. INPT .EQ. MINUS9) GOTO 900	S3804520
WRITE(ICU,9023) IESCAJ,IESCAJ	S3804530
IF(INPT .EQ. IYSJ.OR. INPT .EQ.IYESJ) GOTO 560	S3804540
IF (INPT.EQ.IBLNK.OR.INPT.EQ.INJ.OR.IBLNK.EQ.INOJ) GO TO 420	S3804550
WRITE (ICU,9004) INV,OFF,0,0	S3804560
GO TO 530	S3804570
540 IF(I .EQ. 1 .OR. I .EQ. 2) GOTO 560	S3804580
C-----INVALID LAYERING - REENTER LAYERS.	S3804590
550 WRITE (ICU,9011)	S3804600
LOOP=LOOP+1	S3804610
INPT = IBLNK	S3804620
READ(IIU,9002) INPT	S3804630
IF(.NOT.BATCH .AND. INPT .EQ. MINUS9) GOTO 890	S3804640
GO TO 420	S3804650

560	IF(.NOT.MAXDEP.OR.MODEL.NE.4.OR.LAYTOP(1)+1.EQ.NUM) GOTO 570	S3804660
C	-----SETUP "HIDDEN" BOUNDARY LAYER FOR MODEL 4	S3804670
C	GRAVITATIONAL SETTling.	S3804680
	IF(CALHT .LT. HM(1)) NBK = 2	S3804690
	IF(I.NE.1 .AND. CALHT.GE.HM(1) .AND. LAYTOP(2).NE.NUM) NBK = 3	S3804700
	LAYBOT(NBK) = LAYBOT(NBK-1)	S3804710
	LAYTOP(NBK) = NUM - 1	S3804720
	GOTO 580	S3804730
C	-----VALID LAYERING - CONTINUE	S3804740
570	CONTINUE	S3804750
	NBK=1	S3804760
	IF(I.EQ.2.OR.I.EQ.3) NBK=2	S3804770
580	CONTINUE	S3804780
	IF(IPLOT .EQ. 1) GOOD = 1	S3804790
	IF(IBATCH) IIU = IIUTMP	S3804800
	IBATCH = .FALSE.	S3804810
C		S3804820
C	-----ENTER SIGMA(A) AND SIGMA(E)	S3804830
C		S3804840
	IF(.NOT.BATCH) GOTO 590	S3804850
	READ(IIU,9002) I	S3804860
	IF(I .NE. IHA.AND.I .NE. IIHAN) GOTO 670	S3804870
	IBATCH = .TRUE.	S3804880
	IIUTMP = IIU	S3804890
	IIU = ICU	S3804900
590	WRITE(ICU,9012) IESA,IESJ,ULINE,OFF,INV,SIGMAR,OFF,ULINE,OFF	S3804910
	INPT = IBLNK	S3804920
	READ(IIU,9002) INPT	S3804930
	IF(BATCH) GOTO 600	S3804940
	IF(INPT .EQ. MINUS9) GOTO 900	S3804950
	IF(INPT .EQ. MINUS1) GOTO 410	S3804960
600	IF (INPT.EQ.IBLNK.OR.INPT.EQ.IHE.OR.INPT.EQ.IIHES) GO TO 660	S3804970
	IF (INPT.EQ.IHA.OR.INPT.EQ.IIHAN) GO TO 610	S3804980
	IF (BATCH) GO TO 660	S3804990
	WRITE (ICU,9004) INV,OFF,19,0	S3805000
	GO TO 590	S3805010
610	WRITE(ICU,9013) IESA,IESJ	S3805020
	RNPT = 0.0	S3805030
	CALL IFNBR(IFRMT,14,IER,IIU)	S3805040
	IF (BATCH .OR. IER .EQ. 0) GO TO 630	S3805050
620	WRITE (ICU,9004) INV,OFF,19,1	S3805060
	GO TO 610	S3805070
630	CALL CODE(80)	S3805080
	READ (IFRMT,*) RNPT	S3805090
	IF (BATCH) GO TO 650	S3805100
	IF (RNPT .EQ. MINS1) GO TO 640	S3805110
	IF (RNPT .EQ. MINS9) GO TO 900	S3805120
	IF (RNPT .GT. 0.0) GO TO 650	S3805130
	GO TO 620	S3805140
640	WRITE(ICU,9023) IESCAJ	S3805150
	GOTO 580	S3805160
650	IF(RNPT.GT.0.0) SIGMAR=RNPT	S3805170

660	WRITE(ICU,9014) IESA,IESJ,SIGMAR	S3805180
670	CONTINUE	S3805190
	SIGMER = SIGMAR	S3805200
	IF(IBATCH) IIU = IIUTMP	S3805210
	IBATCH = .FALSE.	S3805220
C		S3805230
	IF(.NOT.BATCH) GOTO 680	S3805240
	READ(IIU,9002) I	S3805250
	IF(I .NE. IHA.AND.I .NE. IIHAN) GOTO 880	S3805260
	IBATCH = .TRUE.	S3805270
	IIUTMP = IIU	S3805280
	IIU = ICU	S3805290
680	WRITE(ICU,9016) ULINE,OFF,INV,SIGMER,OFF,ULINE,OFF	S3805300
	INPT = IBLNK	S3805310
	READ(IIU,9002) INPT	S3805320
	IF(BATCH) GOTO 690	S3805330
	IF(INPT .EQ. MINUS9) GOTO 900	S3805340
	IF(INPT .NE. MINUS1) GOTO 690	S3805350
	WRITE(ICU,9023) IESCAJ	S3805360
	GOTO 580	S3805370
690	IF (INPT.EQ.IBLNK.OR.INPT.EQ.IHE.OR.INPT.EQ.IIHES) GO TO 750	S3805380
	IF (INPT.EQ.IHA.OR.INPT.EQ.IIHAN) GO TO 700	S3805390
	IF (BATCH) GO TO 750	S3805400
	WRITE (ICU,9004) INV,OFF,20,0	S3805410
	GO TO 680	S3805420
700	WRITE(ICU,9017) IESA,IESJ	S3805430
	RNPT = 0.0	S3805440
	CALL IFNBR(IFRMT,14,IER,IIU)	S3805450
	IF (BATCH .OR. IER .EQ. 0) GO TO 720	S3805460
710	WRITE (ICU,9004) INV,OFF,20,1	S3805470
	GO TO 700	S3805480
720	CALL CODE(80)	S3805490
	READ (IFRMT,*) RNPT	S3805500
	IF(BATCH) GOTO 740	S3805510
	IF (RNPT .EQ. MINS1) GO TO 730	S3805520
	IF (RNPT .EQ. MINS9) GO TO 900	S3805530
	IF (RNPT .GT. 0.0) GO TO 740	S3805540
	GO TO 710	S3805550
730	WRITE(ICU,9023) IESCAJ	S3805560
	GOTO 670	S3805570
740	IF(RNPT.GT.0.0) SIGMER=RNPT	S3805580
750	WRITE(ICU,9018) IESA,IESJ,SIGMER	S3805590
	IF(IBATCH) IIU = IIUTMP	S3805600
		S3805610
C		S3805620
C		S3805630
C		S3805640
	IF(IRUN .LT. 3) GOTO 880	S3805650
760	ISIG = 0	S3805660
	WRITE(ICU,9015) INVNDR,INV,OFF,ULINE,OFF	S3805670
	INPT = IBLNK	S3805680
	READ(IIU,9002) INPT	S3805690
	IF(INPT .EQ. MINUS9) GOTO 900	S3805690

IF(INPT .NE. MINUS1) GOTO 770	S3805700
WRITE(ICU,9023) IESCAJ,IESCAJ	S3805710
GOTO 670	S3805720
770 WRITE(ICU,9006) IESA,IESD,IESJ	S3805730
IF (INPT.EQ.IBLNK.OR.INPT.EQ.INJ.OR.INPT.EQ.INOJ) GO TO 880	S3805740
IF (INPT.EQ.IYSJ.OR.INPT.EQ.IYESJ) GO TO 780	S3805750
WRITE (ICU,9004) INV,OFF,20,2	S3805760
GO TO 760	S3805770
C SET USER-ENTERED SIGAP & SIGEP FLAG FOR ROUTINE TURB4 IN RCLDM.	S3805780
780 ISIG = 1	S3805790
I = 2	S3805800
790 CONTINUE	S3805810
IF (ALT(I) .EQ. HM(1)) GO TO 800	S3805820
IF (ALT(I) .GT. HM(1)) GO TO 810	S3805830
SIGAP(I) = SIGMAR	S3805840
SIGEP(I) = SIGMER	S3805850
GO TO 820	S3805860
800 SIGAP(I) = SIGMAR*.74074074	S3805870
SIGEP(I) = SIGMER*.74074074	S3805880
GO TO 820	S3805890
810 SIGAP(I) = 1.0	S3805900
SIGEP(I) = 1.0	S3805910
820 WRITE (ICU,9019) I,SIGAP(I),SIGEP(I)	S3805920
CALL IFNBR(IFRMT,20,IER,IIU)	S3805930
IF (BATCH .OR. IER .EQ. 0) GO TO 840	S3805940
830 WRITE (ICU,9004) INV,OFF,20,3	S3805950
GO TO 790	S3805960
840 RNPT = 0.0	S3805970
RNPT1 = 0.0	S3805980
CALL CODE(80)	S3805990
READ (IFRMT,*) RNPT,RNPT1	S3806000
IF (RNPT .EQ. MINS1) GO TO 850	S3806010
IF (RNPT .EQ. MINS9) GO TO 900	S3806020
IF (RNPT .GE. 0.0.AND.RNPT1 .GE. 0.0) GO TO 870	S3806030
GO TO 830	S3806040
850 WRITE(ICU,9023) IESCAJ,IESCAJ	S3806050
IF(I-2) 760,760,860	S3806060
860 I=I-1	S3806070
GO TO 790	S3806080
870 IF (RNPT .GT. 0.0) SIGAP(I) = RNPT	S3806090
IF (RNPT1.GT. 0.0) SIGEP(I) = RNPT1	S3806100
WRITE(ICU,9020) IESA,IESJ,I,SIGAP(I),SIGEP(I)	S3806110
I = I + 1	S3806120
IF(NUM-I) 880,790,790	S3806130
880 SIGEP(I)=SIGMER	S3806140
SIGAP(I)=SIGMAR	S3806150
GOTO 910	S3806160
C-----ERROR EXIT.	S3806170
890 IERROR(1) = MINS1	S3806180
GOTO 910	S3806190
900 IERROR(1) = 1	S3806200
910 NNNEST = 2	S3806210

NNTRY = 3  
CALL REEDM  
END

S3806220  
S3806230  
S3806240

INTEGER FUNCTION IHIDX(Z,N,VAR,II)	S3900000
. , UPDATE: 8213 SOURCE: 30 MAR 79 LOCATION: KSC	S3900010
C-----	S3900020
DIMENSION Z(1)	S3900030
IF(VAR.LT.Z(1)) VAR=Z(1)	S3900040
IF(VAR.GT.Z(N)) VAR=Z(N)	S3900050
DO 10 I=1,N-1	S3900060
IF(VAR.GE.Z(I).AND.VAR.LT.Z(I+1)) GO TO 20	S3900070
J=I+1	S3900080
10 CONTINUE	S3900090
I=I-1	S3900100
20 IF(II.EQ.1.AND.ABS(VAR-Z(I)).LT.ABS(Z(I+1)-VAR)) I=I-1	S3900110
IF(II.EQ.0.AND.ABS(VAR-Z(I)).GT.ABS(Z(I+1)-VAR)) I=I+1	S3900120
IHIDX=I	S3900130
RETURN	S3900140
END	S3900150

REEDM SOURCE MODULE &RCONM

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FTN4 S4000000
PROGRAM RCONM(5) S4000010
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC S4000020
C: S4000030
C: S4000040
C: S4000050
C: S4000060
C: ORGANIZATION: H. E. CRAMER CO., INC. S4000070
C: S4000080
C: WORK FOR: DR. J. B. STEPHENS (ES84) S4000090
C: S4000100
C: PROGRAM CODE: RCONM S4000110
C: S4000120
C: PROGRAM DESCRIPTION: S4000130
C: THIS PROGRAM CALCULATES THE DOSAGE, CONCENTRATION, TIME MEAN S4000140
C: CONCENTRATION, AND MAXIMUM CENTERLINE CONCENTRATION FOR THE S4000150
C: MEAN WIND DIRECTION RADIAL AT EVERY 1000 METERS DOWNWIND FROM S4000160
C: THE LAUNCH SITE. S4000170
C: S4000180
C: S4000190
C: S4000200
C S4000210
C S4000220
C S4000230
C**** BEGIN COMMON AREA ****S4000240
C 04/02/82 S4000250
C-----MATH PARAMETERS AND CONSTANTS S4000260
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S4000270
C-----INPUT OPTIONS S4000280
REAL LAMBDA S4000290
INTEGER FILE,GOOD,TITLE S4000300
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S4000310
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S4000320
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S4000330
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S4000340
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S4000350
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S4000360
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S4000370
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S4000380
. FS(20),MDLNAM(12),DBAR(20) S4000390
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S4000400
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S4000410
. MODEL4,MODEL5,MODEL6 S4000420
INTEGER RUNNUM,RT,CL,CS S4000430
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S4000440
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S4000450
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S4000460
. ,MIXING,MAXDEP,LAYBOT(3) S4000470
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S4000480
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S4000490

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      .          MINUS1,MINUS9,MINS1,MINS9,          S4000500
      .          MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S4000510
      .          RT(24),TPROPC,IDXRT                S4000520
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S4000530
      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,    S4000540
      .          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4000550
      .          CLRLNE,INSLNE,DELINE                S4000560
      COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S4000570
      .          INVNDR(2),ULINE(2),                 S4000580
      .          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4000590
      .          CLRLNE,INSLNE,DELINE,               S4000600
      .          IESCAJ(3),NULL,IBLNK,               S4000610
      .          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S4000620
C-----VEHICLE PARAMETERS                                S4000630
      COMMON /VCLPR/ VPAR(17)                        S4000640
C-----TIME PARAMETERS                                  S4000650
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S4000660
      .          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2) S4000670
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S4000680
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S4000690
      .          RH(30),PTEMP(30),SIGEP(30),SIGAP(30) S4000700
C-----LAYER PARAMETERS                                  S4000710
      COMMON /LAYER/ DX,DY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S4000720
      .          SIGYO(29)                            S4000730
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS) S4000740
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6) S4000750
C-----CALCULATED NEW LAYER PARAMETERS S4000760
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S4000770
      .          SPEEDN(32)                            S4000780
C-----CONVERSION FACTORS                                S4000790
      COMMON /CNVRT/ QCONV(4),QPDEPH                S4000800
C-----S4000810
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S4000820
      COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S4000830
C-----READ/WRITE BUFFER                                S4000840
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S4000850
C*****S4000860
C-----S4000870
C-----EQUIVALENCE STATEMENTS                            S4000880
      EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S4000890
      .          ,(IPU2,IPAR(4)),(IPU3,IPAR(5)) S4000900
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1) S4000910
C-----S4000920
C*****          E N D O F C O M M O N   A R E A          ****S4000930
C-----S4000940
C-----S4000950
C-----S4000960
      DIMENSION IPL(12)                               S4000970
      DIMENSION WTMOL(3),CDHOLD(8,3),IER(2)          S4000980
      DIMENSION RANGE(30,1),BEARNG(30,1),CDAMXS(1), S4000990
      1 VALUES(30,1),PEAKS(2,1),CLDTIM(2,2,30),CLDDTM(2,3,60) S4001000
      DIMENSION PHIS(50),UBARNK(50),SIGAPK(50),SIGEPK(50) S4001010
C-----S4001010

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	EQUIVALENCE (PLUS,RANGE), (PLUS(181), BEARNG),	S4001020
	1 (PLUS(541), CDAMXS), (PLUS(547), VALUES),	S4001030
	2 (PLUS(727), PEAKS), (ERR, IER), (CLDTIM, CLDDTM)	S4001040
C		S4001050
C	-----DATA STATEMENTS.	S4001060
C		S4001070
	DATA IPL/2H H, 2HCL, 2H , 2H C, 2HO2, 2H , 2H C, 2HO , 2H , 2HAL, 2H2O,	S4001080
	. 2H3 /	S4001090
C		S4001100
	HCL CO2 CO	S4001110
	DATA WTMOL/36.46, 44.01, 28.01/	S4001120
	DATA ISXS, NXS, INCXS /2, 30, 1/	S4001130
	DATA RAD/.01745329/	S4001140
	DATA JVERSN/8213/	S4001150
C		S4001160
CF	-----FORMAT STATEMENTS	S4001170
	9001 FORMAT (2A2, 38H *** REEDM ERROR 001, DATA INPUT ERROR, 2A2, 6H REC.	S4001180
	*, I2, 1H., I1/)	S4001190
	9002 FORMAT(1H1, 38(2H**)/1X, 8(2H**), 44X, 8(2H**)/	S4001200
	1 1X, 8(2H**), 3X, 13HREEDM UPDATE, I5, 11H LOCATION , 2A2, 8X, 8(2H**)/	S4001210
	2 1X, 8(2H**), 5X, 12A2, 6H MODEL, 9X, 8(2H**)/	S4001220
	3 1X, 8(2H**), 44X, 8(2H**)/1X, 38(2H**)/)	S4001230
	9003 FORMAT(1X, 8(2H**), 7X, 31HMAXIMUM CENTERLINE CALCULATIONS, 6X,	S4001240
	. 8(2H**)//20X, 5H FOR , 3A2, 16H AT A HEIGHT OF , F8.2, 7H METERS/	S4001250
	. 15X, 17H DOWNWIND FROM A , 14A2, 7H LAUNCH/, 4X,	S4001260
	. 41H CALCULATIONS APPLY TO THE LAYER BETWEEN , F7.2, 5H AND ,	S4001270
	. F7.2, 7H METERS//9X, 33H THE METEOROLOGICAL DATA IS FROM , I5, 2A2, I4	S4001280
	. , 1X, 2A2, I4/20X, 16H LAUNCH TIME IS, I11, 2A2, I4, 1X, 2A2, I4/	S4001290
	. 16X, 20HTIME OF EXECUTION IS, I11, 2A2, I4, 1X, 2A2, I4)	S4001300
	9004 FORMAT(//35X, 2(7X, 5HCLOUD)/5X, 5HRANGE, 7X, 7HBEARING, 6X, 5HTOTAL, 6X,	S4001310
	120HARRIVAL DEPARTURE/4X, 2(8HFROM PAD, 5X), 6HDOSAGE, 7X,	S4001320
	2 2(4HTIME, 8X))	S4001330
	9005 FORMAT(5F12.3)	S4001340
	9006 FORMAT(//60X, 5HRANGE, 5X, 7HBEARING/59X, 9(2H--)/F11.3,	S4001350
	128H IS THE MAXIMUM TOTAL DOSAGE, 17X, 2F10.1)	S4001360
	9007 FORMAT(28X, 8H(MILLI G/4X, 33H(METERS) (DEGREES) SEC/M**3),	S4001370
	1 5X, 2(5H(MIN), 7X)/3X, 29(2H--))	S4001380
	9008 FORMAT(4X, 33H(METERS) (DEGREES) (PPM SEC), 5X, 2(5H(MIN), 7X)/	S4001390
	1 3X, 29(2H--))	S4001400
	9009 FORMAT(//30X, 5HPEAK , 2(7X, 5HCLOUD)/5X, 5HRANGE, 7X, 7HBEARING, 5X,	S4001410
	132HCONCEN- ARRIVAL DEPARTURE/	S4001420
	2 4X, 32HFROM PAD FROM PAD TRATION, 7X, 2(4HTIME, 8X))	S4001430
	9010 FORMAT(4X, 31H(METERS) (DEGREES) (PPM), 2(7X, 5H(MIN))/	S4001440
	1 3X, 29(2H--))	S4001450
	9011 FORMAT(28X, 9H(MILLI G//4X, 31H(METERS) (DEGREES) M**3),	S4001460
	1 2(7X, 5H(MIN))/3X, 29(2H--))	S4001470
	9012 FORMAT(//60X, 5HRANGE, 5X, 7HBEARING/59X, 9(2H--)/F11.3,	S4001480
	134H IS THE MAXIMUM PEAK CONCENTRATION, 11X, 2F10.1)	S4001490
	9013 FORMAT(43HIDIAGNOSTICS FOR DOSAGE/CONCENTRATION MODEL/)	S4001500
	9014 FORMAT(2A2, A1)	S4001510
	9015 FORMAT(//28X, F4.1, 5H MIN. /30X, 5HMEAN , 2(7X, 5HCLOUD)/5X,	S4001520
	1 5HRANGE, 7X, 7HBEARING, 5X, 32HCONCEN- ARRIVAL DEPARTURE/	S4001530
	2 4X, 32HFROM PAD FROM PAD TRATION, 7X, 2(4HTIME, 8X))	

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9016 FORMAT(//60X,17HRANGE      BEARING/59X,9(2H--)/F11.3,          S4001540
      116H IS THE MAXIMUM ,F4.1,25H MIN. MEAN CONCENTRATION ,2F10.1) S4001550
9017 FORMAT(A2,1X,12A2,30H MODEL IS PROCESSING RANGE AT ,2A2,F7.1,2A2, S4001560
      17H METERS) S4001570
9018 FORMAT(2A2,10X,2A2,8HPRINTING,2A2) S4001580
9019 FORMAT(3A2) S4001590
C S4001600
C!!!! H.E.C COPY ONLY. S4001610
9020 FORMAT(56HDO YOU WISH MAXIMUM CENTERLINE DOSAGE & CONCENTRATION? (S4001620
      *,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S4001630
9021 FORMAT (A2) S4001640
C!!!! S4001650
C S4001660
9022 FORMAT(40H DIAGNOSTIC RUN. ENTER ISXS,NXS,INCXS:_) S4001670
9023 FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS4001680
      * IF -1 TYPED AGAIN/) S4001690
C S4001700
C S4001710
      IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH) S4001720
C-----INITIALIZE. S4001730
      TIMIN = TIMAV*0.016666667 S4001740
C S4001750
C!!!! H.E.C COPY ONLY. S4001760
      IF (BATCH) GO TO 30 S4001770
10 WRITE (ICU,9020) INVNDR,INV,OFF,ULINE,OFF S4001780
      READ (IIU,9021) IFRMT1 S4001790
      IF (IFRMT1.EQ.INJ.OR.IFRMT1.EQ.INOJ) GO TO 310 S4001800
      IF (IFRMT1.EQ.IBLNK.OR.IFRMT1.EQ.IYSJ.OR.IFRMT1.EQ.IYESJ) GO TO 20S4001810
      WRITE (ICU,9001) INV,OFF,0,0 S4001820
      GO TO 10 S4001830
20 WRITE (ICU,9019) CURSUP,CLRLNE S4001840
30 CONTINUE S4001850
C!!!! S4001860
C S4001870
      JER = 0 S4001880
C CLEAR WORK SPACE. S4001890
      DO 40 I = 1,900 S4001900
40 PLUS(I) = 0.0 S4001910
C-----COMPUTE CONVERSION FACTORS FOR ALL POLLUTANTS S4001920
C-----SEE VPARS ARRAY IN PROGRAM REEDM FOR SPECIES %. S4001930
      XXX=1000.0*22.4*1013.2*TEMP(1)/(273.16*PRESS(1)) S4001940
      DO 50 I=1,3 S4001950
50 QCONV(I)=(XXX/WTMOL(I))*VPAR(I+12) S4001960
      QCONV(4)=1000.0*VPAR(16) S4001970
      IF(IRUN .EQ. 4) WRITE(IOU,9013) S4001980
C-----INITIALIZE PARAMETERS FOR BOUNDARY LAYERS. S4001990
      ILK=1 S4002000
      IF(CALHT.GT.ALT(LAYTOP(1)+1)) ILK=2 S4002010
      JF=NLAYS+ILK S4002020
      IBOT=LAYBOT(ILK) S4002030
      ITOP=LAYTOP(ILK) S4002040
      YT = DIRN(JF)+180.0 S4002050

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	IF(YT .GT. 360.0) YT = YT - 360.0	S4002060
	ZBSL=0.0	S4002070
	IF(IBOT.GT.1) ZBSL = ALT(IBOT)	S4002080
	ZTPL = ALT(ITOP+1)	S4002090
	ZTPAL = ZTPL	S4002100
	IF(LAYTOP(ILK+1) .GT. 0) ZTPAL = ALT(LAYTOP(ILK+1)+1)	S4002110
	IF(GRVSET) CALL SHEAR(UBARNK,PHIS,SIGAPK,SIGEPK,1)	S4002120
C		S4002130
C	CHECK SEGMENT ENTRY POINT.	S4002140
C		S4002150
C		S4002160
C		S4002170
	IF(IRUN .NE. 4) GOTO 110	S4002180
60	WRITE(ICU,9022)	S4002190
	CALL IFNBR(IFRMT,20,IER,IIU)	S4002200
	IF (IER .EQ. 0) GO TO 80	S4002210
70	WRITE (ICU,9001) INV,OFF,0,0.	S4002220
	IF (BATCH) GO TO 320	S4002230
	GO TO 60	S4002240
80	CALL CODE(80)	S4002250
	READ (IFRMT,*) ISXS,NXS,INCXS	S4002260
	IF (ISXS .NE. MINS1) GO TO 90	S4002270
	JER = JER+1	S4002280
	IF (JER .GT. 1) GO TO 320	S4002290
	WRITE (ICU,9023)	S4002300
	GO TO 60	S4002310
90	IF (ISXS .EQ. MINS9) GO TO 330	S4002320
	IF (ISXS .LE.NXS.AND.INCXS.LE.NXS) GO TO 100	S4002330
	GO TO 70	S4002340
100	CONTINUE	S4002350
	WRITE(ICU,9014) IESCAJ	S4002360
110	CONTINUE	S4002370
C		S4002380
C-----	-----LOOP THROUGH EACH RANGE (I = ISXS,NXS,INCXS)	S4002390
	DO 130 I= ISXS,NXS,INCXS	S4002400
	XT=FLOAT(I-1)*1000.0	S4002410
	IF(.NOT.BATCH) WRITE(ICU,9017) CURSUP,MDLNAM,INV,XT,OFF	S4002420
	CALL BREAK(JF,XT,YT,I,.FALSE.,CDHOLD,PHIS,UBARNK,CLDTIM(1,1,I),	S4002430
	1 SIGAPK,SIGEPK)	S4002440
	DO 120 J = 1,6	S4002450
	IF(CDAMXS(J) .GT. VALUES(I,J)) GOTO 120	S4002460
	CDAMXS(J) = VALUES(I,J)	S4002470
	PEAKS(1,J) = RANGE(I,J)	S4002480
	PEAKS(2,J) = BEARNG(I,J)	S4002490
120	CONTINUE	S4002500
130	CONTINUE	S4002510
	IF(.NOT.BATCH) WRITE(ICU,9018) CURSUP,CLRDSP,BLNKNG,OFF	S4002520
C-----	-----CALCULATE THE NUMBER OF POLLUTANTS	S4002530
	NPOL=0	S4002540
	DO 140 I=1,4	S4002550
	IF(IPLLNT(I).EQ.0) GO TO 150	S4002560
140	NPOL=NPOL+1	S4002570

150	CONTINUE	S4002580
C		S4002590
C	-----WRITE OUT CON,DOS,AVCON,PASSTM,AND X,Y LOCATION	S4002600
C	-----CDAMXS(1-6) = CONC.GAS, DOS.GAS, TIME-MEAN CONC.GAS,	S4002610
C	-----CONC.AL203, DOS.AL203, TIME-MEAN CONC. AL203	S4002620
C		S4002630
	IF(NPOL.EQ.0) GO TO 310	S4002640
	DO 300 JJ=1,NPOL	S4002650
	IP = IPLLNT(JJ)	S4002660
	IDX=(JJ-1)*7	S4002670
	KDX=IP*3-3	S4002680
	DO 300 IS = 1,3	S4002690
C	PRINT HEADING.	S4002700
	WRITE(IOU,9002) IVERSN,LOCATN,MDLNAM	S4002710
	A1 = ZTPL	S4002720
	IF(IP .EQ. 4) A1 = ZTPAL	S4002730
	WRITE(IOU,9003) (IPL(KDX+J),J=1,3),CALHT,TITLE,ZBSL,A1,	S4002740
	. ISTEIME,LSDT,ISDAY,ISMON,ISYEAR,LTIME,LSDT,LDAY,LMON,LYEAR,	S4002750
	. JTIME,LSDT,JDAY,JMON,JYEAR	S4002760
	IF(IS-2) 160,170,180	S4002770
160	WRITE(IOU,9009)	S4002780
	GOTO 190	S4002790
170	WRITE(IOU,9004)	S4002800
	GOTO 190	S4002810
180	WRITE(IOU,9015) TIMIN	S4002820
190	ISS = IS	S4002830
	IF(IP .NE. 4) GOTO 220	S4002840
	ISS = IS + 3	S4002850
	CD1 = CDAMXS(ISS)	S4002860
	IPASTM = 2	S4002870
	IF(IS-2) 200,210,200	S4002880
200	WRITE(IOU,9011)	S4002890
	GOTO 250	S4002900
210	WRITE(IOU,9007)	S4002910
	GOTO 250	S4002920
220	I1 = 2	S4002930
	CD1 = CDAMXS(ISS)*QCONV(IP)	S4002940
	IPASTM = 1	S4002950
	IF(IS-2) 230,240,230	S4002960
230	WRITE(IOU,9010)	S4002970
	GOTO 250	S4002980
240	WRITE(IOU,9008)	S4002990
C	BEGIN LOOP OVER RANGES.	S4003000
250	DO 260 IXS = ISXS,NXS,INCXS	S4003010
	VALUE = VALUES(IXS,ISS)	S4003020
	IF(IP .NE. 4) VALUE = VALUE*QCONV(IP)	S4003030
	IF(VALUE .LT. .0005) GOTO 260	S4003040
	WRITE(IOU,9005) RANGE(IXS,ISS),BEARNG(IXS,ISS),VALUE,	S4003050
	1 CLDTIM(1,IPASTM,IXS),CLDTIM(2,IPASTM,IXS)	S4003060
260	CONTINUE	S4003070
C	PRINT MAXIMUM VALUE.	S4003080
	IF(IS-2) 270,280,290	S4003090

270	WRITE(IOU,9012) CD1,PEAKS(1,ISS),PEAKS(2,ISS)	S4003100
	GOTO 300	S4003110
280	WRITE(IOU,9006) CD1,PEAKS(1,ISS),PEAKS(2,ISS)	S4003120
	GOTO 300	S4003130
290	WRITE(IOU,9016) CD1,TIMIN,PEAKS(1,ISS),PEAKS(2,ISS)	S4003140
300	CONTINUE	S4003150
	IF(.NOT.BATCH) WRITE(ICU,9019) CURSUP,CURLFT,CLRDSP	S4003160
310	CONTINUE	S4003170
	QCONV(4) = 1.0	S4003180
C		S4003190
	NNNEST = 3	S4003200
	NNNTRY = 4	S4003210
	GO TO 350	S4003220
C		S4003230
C		S4003240
C		S4003250
320	IERROR(1) = MINSI	S4003260
	GO TO 340	S4003270
330	IERROR(1) = 1	S4003280
340	NNNEST = 1	S4003290
	NNNTRY = 3	S4003300
350	CONTINUE	S4003310
	CALL REEDM	S4003320
	END	S4003330

REEDM SOURCE MODULE &RCNOM

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FTN4
PROGRAM RCNOM(5)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:::::::::::S4100030
C:::::::::::S4100040
C::: ::S4100050
C::: ::S4100060
C::: ORGANIZATION: H. E. CRAMER CO., INC. ::S4100070
C::: ::S4100080
C::: WORK FOR: DR. J. B. STEPHENS (ES84) ::S4100090
C::: ::S4100100
C::: PROGRAM CODE: RCNOM ::S4100110
C::: ::S4100120
C::: PROGRAM DESCRIPTION: ::S4100130
C::: THIS PROGRAM CALCULATES THE DOSAGE, CONCENTRATION, TIME MEAN ::S4100140
C::: CONCENTRATION, AND MAXIMUM CENTERLINE CONCENTRATION FOR THE ::S4100150
C::: MEAN WIND DIRECTION RADIAL AT EVERY 1000 METERS DOWNWIND FROM ::S4100160
C::: THE LAUNCH SITE. ::S4100170
C::: ::S4100180
C:::::::::::S4100190
C:::::::::::S4100200
C S4100210
C S4100220
Cc S4100230
C**** B E G I N C O M M O N A R E A ****S4100240
C 04/02/82 S4100250
C-----MATH PARAMETERS AND CONSTANTS S4100260
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S4100270
C-----INPUT OPTIONS S4100280
REAL LAMBDA S4100290
INTEGER FILE,GOOD,TITLE S4100300
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S4100310
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S4100320
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S4100330
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S4100340
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S4100350
. ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2) S4100360
. ,IPLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S4100370
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S4100380
. FS(20),MDLNAM(12),DBAR(20) S4100390
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S4100400
LOGICAL ISNDF0,CRT,MAXDEP,BATCH,GASSET,GRVSET, S4100410
. MODEL4,MODEL5,MODEL6 S4100420
INTEGER RUNNUM,RT,CL,CS S4100430
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S4100440
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S4100450
. SIGZ,ISNDF0,CRT,LAYTOP(3),ITDU,KEEP S4100460
. ,MIXING,MAXDEP,LAYBOT(3) S4100470
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S4100480
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S4100490

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.          MINUS1,MINUS9,MINS1,MINS9,          S4100500
.          MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S4100510
.          RT(24),TPROPC,IDXRT                S4100520
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S4100530
.          INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,      S4100540
.          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4100550
.          CLRLNE,INSLNE,DELINELINE           S4100560
.          COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S4100570
.          INVNDR(2),ULINE(2),                S4100580
.          TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4100590
.          CLRLNE,INSLNE,DELINELINE           S4100600
.          IESCAJ(3),NULL,IBLNK,              S4100610
.          IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S4100620
C-----VEHICLE PARAMETERS                               S4100630
.          COMMON /VCLPR/ VPAR(17)             S4100640
C-----TIME PARAMETERS                                 S4100650
.          COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S4100660
.          LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2) S4100670
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S4100680
.          COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S4100690
.          RH(30),PTEMP(30),SIGEP(30),SIGAP(30) S4100700
C-----LAYER PARAMETERS                               S4100710
.          COMMON /LAYER/ DX,DY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S4100720
.          SIGYO(29)                           S4100730
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS) S4100740
.          COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6) S4100750
C-----CALCULATED NEW LAYER PARAMETERS               S4100760
.          COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S4100770
.          SPEEDN(32)                           S4100780
C-----CONVERSION FACTORS                             S4100790
.          COMMON /CNVRT/ QCONV(4),QPDEPH      S4100800
C                                                    S4100810
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S4100820
.          COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S4100830
C-----READ/WRITE BUFFER                             S4100840
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S4100850
C*****S4100860
C                                                    S4100870
C-----EQUIVALENCE STATEMENTS                         S4100880
.          EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S4100890
.          ,(IPU2,IPAR(4)),(IPU3,IPAR(5)) S4100900
.          EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1) S4100910
C                                                    S4100920
C****          E N D O F C O M M O N A R E A          ****S4100930
Cc                                                    S4100940
.          LOGICAL IBATCH                        S4100950
C                                                    S4100960
.          DIMENSION IPL(12)                    S4100970
.          DIMENSION WTMOL(3),DISBUF(15,1),CDHOLD(8,3),CDOUT(9), S4100980
.          1 KMAX(3),YMAX(3),IER(2)             S4100990
.          DIMENSION CDAMXS(3),                S4101000
.          1 CLDDTM(2,3,60)                     S4101010

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	DIMENSION PHIS(50),UBARNK(50),SIGAPK(50),SIGEPK(50),IDDISR(10,60)	S4101020
C		S4101030
	EQUIVALENCE (PLUS,DISBUF),	S4101040
	1 (ERR,IER)	S4101050
C		S4101060
C	-----DATA STATEMENTS.	S4101070
C		S4101080
	DATA IPL/2H H,2HCL,2H ,2H C,2HO2,2H ,2H C,2HO ,2H ,2HAL,2H2O,	S4101090
	.2H3 /	S4101100
C	HCL CO2 CO	S4101110
	DATA WTMOL/36.46,44.01,28.01/	S4101120
	DATA IBATCH /.FALSE./	S4101130
	DATA RAD/.01745329/	S4101140
	DATA JVERSN/8213/	S4101150
C		S4101160
CF	-----FORMAT STATEMENTS	S4101170
	9001 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S4101180
	*,I2,1H.,I1/)	S4101190
	9002 FORMAT(A2)	S4101200
	9003 FORMAT(1H1,38(2H**)/1X,8(2H**),44X,8(2H**)/	S4101210
	1 1X,8(2H**),3X,13HREEDM UPDATE,I5,11H LOCATION ,2A2,8X,8(2H**)/	S4101220
	2 1X,8(2H**),5X,12A2,6H MODEL,9X,8(2H**)/	S4101230
	3 1X,8(2H**),44X,8(2H**)/1X,38(2H**)/)	S4101240
	9004 FORMAT(	S4101250
	1 1X,8(2H**),7X,30HDISCRETE RECEPTOR CALCULATIONS,7X,8(2H**)//	S4101260
	2 35X,4HFOR ,3A2/15X,17H DOWNWIND FROM A ,14A2,7H LAUNCH/4X,	S4101270
	3 40HCALCULATIONS APPLY TO THE LAYER BETWEEN ,F7.2,5H AND ,	S4101280
	3 F7.2,7H METERS//5X,32HTHE METEOROLOGICAL DATA IS FROM ,I5,2A2,	S4101290
	4 I4,1X,2A2,I4/15X,16H LAUNCH TIME IS,I11,2A2,I4,1X,2A2,I4/	S4101300
	5 11X,20HTIME OF EXECUTION IS,I11,2A2,I4,1X,2A2,I4)	S4101310
	9005 FORMAT(/49X,F5.2,5H MIN./21X,15HCALCU- PEAK,14X,25H MEAN CS	S4101320
	1LOUD CLOUD/3X,74HRANGE BEARING LATION CONCEN- TOTAL	S4101330
	2 CONCEN- ARRIVAL DEPARTURE/1X,2(8HFROM PAD,2X),44HHEIGHT TRATS	S4101340
	3ION DOSAGE TRATION TIME,6X,4HTIME)	S4101350
	9006 FORMAT(75H (METERS) (DEGREES) (METERS) (PPM) (PPM/SEC) (PPM)	S4101360
	1 (MIN) (MIN),6X,10HIDENTIFIER/1X,49(2H--))	S4101370
	9007 FORMAT(29X,3(10H(MILLI G/ )/75H (METERS) (DEGREES) (METERS) METER*	S4101380
	1*3) M**3/SEC) METER**3) (MIN) (MIN),6X,10HIDENTIFIER/	S4101390
	2 1X,49(2H--))	S4101400
	9008 FORMAT(F8.1,F9.1,F10.1,F9.2,F10.2,F10.3,F9.1,F10.1,2X,10A2)	S4101410
	9009 FORMAT (1X,37(2H**)/1X,52H* PEAK CONCENTRATION * TOTAL DOS	S4101420
	*SAGE * ,F3.0,19HMIN. AVERAGE CONC.*/2H *,3(25H-10 DEG. POINT	S4101430
	*+10 DEG.* )/1X,37(2H**))	S4101440
	9010 FORMAT(/60X,16HRANGE BEARING/58X,9(2H--)/	S4101450
	1 F10.2,34H IS THE MAXIMUM PEAK CONCENTRATION,11X,2F10.1/	S4101460
	1 F10.2,28H IS THE MAXIMUM TOTAL DOSAGE,17X,2F10.1/	S4101470
	1 F10.2,15H IS THE MAXIMUM,F6.2,24H MIN. MEAN CONCENTRATION,2F10.1)	S4101480
	9011 FORMAT(43H1DIAGNOSTICS FOR DOSAGE/CONCENTRATION MODEL/)	S4101490
	9012 FORMAT(2A2,A1)	S4101500
	9013 FORMAT(3A2)	S4101510
	9014 FORMAT(46H DO YOU WISH DISCRETE RECEPTOR CALCULATIONS? (,2A2,1HY,	S4101520
	1 2A2,2HES,2A2,1H,,2A2,1HN,2A2,2HO,,2A2,3HLU#,2A2,16H OF DATA FILE)	S4101530

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2:_)
9015 FORMAT(2A2,68H ENTER DISCRETE RECEPTOR LOCATION RELATIVE TO LAUNCHS4101540
1 PAD. A 20 CHAR./52H COMMENT MAY BE ENTERED STARTING UNDER THE ASTS4101550
2ERISK.,11X,1H*/34H RANGE(M),BEARING(DEG),HEIGHT(M):_) S4101570
9016 FORMAT(22H CALCULATION HEIGHT OF,F8.2,20H METERS IS TOO HIGH., S4101580
119H PLEASE RE-ENTER:_) S4101590
9017 FORMAT(22H CALCULATION HEIGHT OF,F8.2,42H METERS IS GREATER THAN 5S4101600
1 METERS (MAXIMUM)/39H AND WILL CAUSE ERRONEOUS A1203 RESULTS/ S4101610
2 11X,26HDO YOU WISH TO CONTINUE? (,2A2,1HY,2A2,2HES,2A2, S4101620
3 1HN,2A2,1HO,2A2,3H):_) S4101630
9018 FORMAT (/26H DISCRETE RECEPTOR RANGE =,F8.1,11H, BEARING =,F6.1, S4101640
*13H, CALC. HT. =,F7.2/21H CLOUD ARRIVAL TIME =,F5.1,29H MIN., CLOUS4101650
*D DEPARTURE TIME =,F5.1,5H MIN./2H *,4X,13HCONCENTRATION,6X,1H*, S4101660
*9X,6HDOSAGE,9X,1H*,1X,21HTIME-AV CONCENTRATION) S4101670
9019 FORMAT (32X,3H** ,4A2,A1,2A2,3H **/2H *,2(F6.2,2X),F6.2,2H *,3(F7.S4101680
*2,1X),1H*,3(F7.3,1X)) S4101690
9020 FORMAT(63H A MAXIMUM OF 60 DISCRETE RECEPTOR LOCATIONS HAVE BEEN ES4101700
1NTERED./29H THIS SECTION IS TERMINATED. _) S4101710
9021 FORMAT(59H DO YOU WISH TO ENTER ANOTHER DISCRETE RECEPTOR LOCATIONS4101720
1? (,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S4101730
9022 FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS4101740
* IF -1 TYPED AGAIN/) S4101750
C S4101760
C S4101770
IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH) S4101780
C-----INITIALIZE. S4101790
TIMIN = TIMAV*0.016666667 S4101800
JER = 0 S4101810
C CLEAR WORK SPACE. S4101820
DO 10 I = 1,900 S4101830
10 PLUS(I) = 0.0 S4101840
C-----COMPUTE CONVERSION FACTORS FOR ALL POLLUTANTS S4101850
C-----SEE VPARS ARRAY IN PROGRAM REEDM FOR SPECIES %. S4101860
XXX=1000.0*22.4*1013.2*TEMP(1)/(273.16*PRESS(1)) S4101870
DO 20 I=1,3 S4101880
20 QCONV(I)=(XXX/WTMOL(I))*VPAR(I+12) S4101890
QCONV(4)=1000.0*VPAR(16) S4101900
IF(IRUN .EQ. 4) WRITE(IOU,9011) S4101910
C-----INITIALIZE PARAMETERS FOR BOUNDARY LAYERS. S4101920
ILK=1 S4101930
IF(CALHT.GT.ALT(LAYTOP(1)+1)) ILK=2 S4101940
JF=NLAYS+ILK S4101950
IBOT=LAYBOT(ILK) S4101960
ITOP=LAYTOP(ILK) S4101970
YT = DIRN(JF)+180.0 S4101980
IF(YT .GT. 360.0) YT = YT - 360.0 S4101990
ZBSL=0.0 S4102000
IF(IBOT.GT.1) ZBSL = ALT(IBOT) S4102010
ZTPL = ALT(ITOP+1) S4102020
ZTPAL = ZTPL S4102030
IF(LAYTOP(ILK+1) .GT. 0) ZTPAL = ALT(LAYTOP(ILK+1)+1) S4102040
IF(GRVSET) CALL SHEAR(UBARNK,PHIS,SIGAPK,SIGEPK,1) S4102050

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C		S4102060
C	CHECK SEGMENT ENTRY POINT.	S4102070
C		S4102080
	30 IER = 0	S4102090
	JER = 0	S4102100
	IF(.NOT.BATCH) GOTO 40	S4102110
	IDMY = IBLNK	S4102120
	READ(IIU,9002) IDMY	S4102130
	GOTO 50	S4102140
	40 WRITE(ICU,9014) INVNDR,INV,OFF,(ULINE,OFF,I=1,2)	S4102150
	CALL IFNBR(IFRMT,12,IER,IIU)	S4102160
	IDMY = IFRMT(1)	S4102170
	IF(IDMY.EQ.MINUS9) GOTO 520	S4102180
	IF (IDMY .NE. MINUS1) GO TO 50	S4102190
	JER = JER+1	S4102200
	IF (JER .GT. 1) GO TO 510	S4102210
	WRITE (ICU,9022)	S4102220
	GO TO 40	S4102230
	50 IF(IDMY.EQ.INJ.OR.IDMY.EQ.INOJ) GOTO 500	S4102240
	IF(IDMY.EQ.IBLNK.OR.IDMY.EQ.IYSJ.OR.IDMY.EQ.IYESJ) GOTO 70	S4102250
	IF(IER .EQ. 0) GO TO 60	S4102260
	WRITE (ICU,9001) INV,OFF,23,0	S4102270
	IF (BATCH) GO TO 510	S4102280
	GO TO 40	S4102290
	60 CONTINUE	S4102300
C	READ FROM LU IDMY	S4102310
	IBATCH = .TRUE.	S4102320
	IIUTMP = IIU	S4102330
	CALL CODE(2)	S4102340
	READ(IDMY,*) IIU	S4102350
	WRITE(ICU,9012) IESCAJ	S4102360
C		S4102370
C	-----BEGIN DISCRETE RECEPTOR CALCULATIONS.	S4102380
C		S4102390
	70 QCONV(4) = 1000.0*VPAR(16)	S4102400
	JER = 0	S4102410
	CLCHTS = CALHT	S4102420
	CALHT = 0.0	S4102430
	NXS = 0	S4102440
	LINEP = 100	S4102450
	LINED = 100	S4102460
	DO 80 I = 1,3	S4102470
	CDAMXS(I) = 0.0	S4102480
	YYMAX(I) = 0.0	S4102490
	80 KKMAX(I) = 1	S4102500
	90 CONTINUE	S4102510
	DO 100 I = 1,10	S4102520
	100 IFRMT(15+I) = IBLNK	S4102530
	IF(.NOT.BATCH .AND. .NOT.IBATCH) GOTO 120	S4102540
	IF(NXS .GT. 59) GOTO 400	S4102550
	ERR = EXEC(1,IIU,IFRMT,-80)	S4102560
	IF(IER(2) .LE. 0) GOTO 400	S4102570

CALL IFNBR(IFRMT,-26,IER,IIU)	S4102580
IF (IER .EQ. 0) GO TO 110	S4102590
WRITE (ICU,9001) INV,OFF,23,1	S4102600
GO TO 90	S4102610
110 CALL CODE(30)	S4102620
READ(IFRMT,*) XT,YT,CALHT	S4102630
IF(XT .LT. 0.0) GOTO 400	S4102640
GOTO 240	S4102650
120 WRITE(ICU,9015) CURSUP,CLRDSP	S4102660
130 CALL IFNBR(IFRMT,26,IER,IIU)	S4102670
IF (IER .EQ. 0) GO TO 140	S4102680
WRITE (ICU,9001) INV,OFF,23,1	S4102690
WRITE (ICU,9015) IBLNK,IBLNK	S4102700
GO TO 130	S4102710
140 CALL CODE(80)	S4102720
READ (IFRMT,*) XT,YT,CALHT	S4102730
IF (XT .EQ. MINS1) GO TO 150	S4102740
IF (XT .EQ. MINS9) GO TO 520	S4102750
GO TO 160	S4102760
150 WRITE(ICU,9012) IESCAJ,IESCAJ	S4102770
GOTO 30	S4102780
C CHECK FOR VALID CALCULATION HEIGHT.	S4102790
160 IF(ALT(LAYTOP(2)).GT.0.0 .AND. CALHT.GT.ALT(LAYTOP(2))) GOTO 170	S4102800
IF(ALT(LAYTOP(2)).EQ.0.0 .AND. CALHT.GT.ALT(LAYTOP(1))) GOTO 170	S4102810
IF(GRVSET .AND. (CALHT .GT. 5.0)) GOTO 220	S4102820
GOTO 230	S4102830
170 WRITE(ICU,9016) CALHT	S4102840
CALL IFNBR(IFRMT,14,IER,IIU)	S4102850
IF (IER .EQ. 0) GO TO 190	S4102860
180 WRITE (ICU,9001) INV,OFF,0,0	S4102870
GO TO 170	S4102880
190 CALL CODE(80)	S4102890
READ (IFRMT,*) CALHT	S4102900
IF (CALHT .EQ. MINS1) GO TO 210	S4102910
IF (CALHT .EQ. MINS9) GO TO 520	S4102920
IF (CALHT .GE. 0.0) GO TO 200	S4102930
GO TO 180	S4102940
200 WRITE(ICU,9013) CURSUP,CURLFT,CLRDSP	S4102950
GO TO 160	S4102960
210 WRITE(ICU,9012) IESCAJ	S4102970
GOTO 90	S4102980
220 WRITE(ICU,9017) CALHT,INV,OFF,INVNDR,INV,OFF	S4102990
IDMY = IBLNK	S4103000
READ(IIU,9002) IDMY	S4103010
WRITE(ICU,9013) (CURSUP,CURLFT,CLRDSP,I=1,4)	S4103020
C WRITE BLANK LINE.	S4103030
WRITE(ICU,9002) IBLNK	S4103040
IF(IDMY .EQ. MINUS9) GOTO 520	S4103050
IF(IDMY.EQ.IYSJ.OR.IDMY.EQ.IYESJ) GO TO 230	S4103060
IF(IDMY.EQ.IBLNK.OR.IDMY.EQ.INJ.OR.IDMY.EQ.INOJ) GO TO 90	S4103070
WRITE (ICU,9001) INV,OFF,0,0	S4103080
GO TO 220	S4103090

230	WRITE(ICU,9013) (CURSUP,CURLFT,CLRDSP,I=1,2)	S4103100
C	GET MAJOR BOUNDARY LAYER.	S4103110
240	JF = NLAYS + 1	S4103120
	IF(CALHT .GE. ALT(LAYTOP(1))) JF = JF + 1	S4103130
C	MAKE 3 CALCULATIONS PER DISCRETE RECEPTOR.	S4103140
	YT1 = YT - 10.0	S4103150
	IF(YT1 .LE. 0.0) YT1 = YT1 + 360.0	S4103160
	NXS = NXs + 1	S4103170
	DISBUF(1,NXS) = XT	S4103180
	DISBUF(2,NXS) = YT1	S4103190
	DISBUF(3,NXS) = CALHT	S4103200
	DO 250 J = 1,10	S4103210
250	IDDISR(J,NXS) = IFRMT(15+J)	S4103220
	DO 260 J = 1,3	S4103230
	CALL BREAK(JF,XT,YT1,NXS,.TRUE.,CDHOLD(1,J),PHIS,UBARNK,	S4103240
1	CLDDTM(1,J,NXS),SIGAPK,SIGEPK)	S4103250
	YT1 = YT1 + 10.0	S4103260
	IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4103270
260	CONTINUE	S4103280
C	SAVE RESULTS IN BUFFER.	S4103290
	L = 3	S4103300
	DO 280 J = 1,3	S4103310
	DO 270 K = 1,4	S4103320
270	DISBUF(L+K,NXS) = CDHOLD(K,J)	S4103330
280	L = L + 4	S4103340
	IF(BATCH) GOTO 320	S4103350
C	DISPLAY DISCRETE RECEPTOR RESULTS.	S4103360
	IF(LINED .LT. 22) GOTO 290	S4103370
	LINED = 5	S4103380
	WRITE(ICU,9009) TIMIN	S4103390
290	CONTINUE	S4103400
	LINED = LINED + 3	S4103410
	WRITE(ICU,9018) XT,YT,CALHT,CDHOLD(4,2),CLDDTM(1,2,NXS)	S4103420
	DO 310 JJ = 1,4	S4103430
	IP = IPLLNT(JJ)	S4103440
	IF(IP .EQ. 0) GOTO 310	S4103450
	L = 0	S4103460
	IF(IP .EQ. 4) L = 4	S4103470
	KDX = IP*3 - 3	S4103480
	K = 0	S4103490
	DO 300 I = 1,3	S4103500
	DO 300 J = 1,3	S4103510
	K = K + 1	S4103520
300	CDOUT(K) = CDHOLD(I+L,J)*QCONV(IP)	S4103530
	LINED = LINED + 2	S4103540
	WRITE(ICU,9019) INV,(IPL(KDX+J),J=1,3),OFF,CDOUT	S4103550
310	CONTINUE	S4103560
C	PRINT DISCRETE RECEPTOR RESULTS FOR AL203.	S4103570
320	CONTINUE	S4103580
	DO 360 JJ = 1,4	S4103590
	IF(IPLLNT(JJ) .NE. 4) GOTO 360	S4103600
	IF(LINEP .LT. 53) GOTO 330	S4103610

LINEP = 27	
WRITE(IOU,9003) IVERSN,LOCATN,MDLNAM	S4103620
WRITE(IOU,9004) (IPL(9+J),J=1,3),TITLE,ZBSL,ZTPAL,	S4103630
1 ISTEIME,LSDT,ISDAY,ISMON,ISYEAR,LTIME,LSDT,LDAY,LMON,LYEAR,	S4103640
2 JTIME,LSDT,JDAY,JMON,JYEAR	S4103650
WRITE(IOU,9005) TIMIN	S4103660
WRITE(IOU,9007)	S4103670
330 CONTINUE	S4103680
YTI = DISBUF(2,NXS)	S4103690
DO 360 J = 1,3	S4103700
DO 340 I = 1,3	S4103710
CDOUT(I) = CDHOLD(I+4,J)*QCONV(4)	S4103720
IF(CDOUT(I) .LT. CDAMXS(I)) GOTO 340	S4103730
CDAMXS(I) = CDOUT(I)	S4103740
YYMAX(I) = YTI	S4103750
KKMAX(I) = NXs	S4103760
340 CONTINUE	S4103770
IF(CDOUT(1).LT.0.0005 .AND. CDOUT(2).LT.0.005 .AND.	S4103780
1 CDOUT(3).LT.0.0005) GOTO 350	S4103790
LINEP = LINEP + 1	S4103800
IF (J.NE.2) WRITE(IOU,9008) XT,YTI,CALHT,(CDOUT(I),I=1,3),	S4103810
1 CDHOLD(8,J),CLDDTM(2,J,NXS),(IBLNK,I=1,10)	S4103820
IF (J.EQ.2) WRITE(IOU,9008) XT,YTI,CALHT,(CDOUT(I),I=1,3),	S4103830
1 CDHOLD(8,J),CLDDTM(2,J,NXS),(IDDISR(I,NXS),I=1,10)	S4103840
350 YTI = YTI + 10.0	S4103850
IF(YTI .GT. 360.0) YTI = YTI - 360.0	S4103860
360 CONTINUE	S4103870
IF(BATCH) GOTO 90	S4103880
IF(NXS .LT. 60) GOTO 370	S4103890
WRITE(ICU,9020)	S4103900
GOTO 400	S4103910
370 IF(IBATCH) GOTO 90	S4103920
WRITE(ICU,9021) INVNDR,INV,OFF,ULINE,OFF	S4103930
IDMY = IBLNK	S4103940
READ(IIU,9002) IDMY	S4103950
IF(IDMY .EQ. MINUS9) GOTO 520	S4103960
IF(IDMY .NE. MINUS1) GOTO 380	S4103970
WRITE(ICU,9012) IESCAJ	S4103980
GOTO 30	S4103990
380 IF(IDMY.EQ.IBLNK.OR.IDMY.EQ.IYSJ.OR.IDMY.EQ.IYESJ) GO TO 90	S4104000
IF (IDMY.EQ.INJ.OR.IDMY.EQ.INOJ) GO TO 390	S4104010
WRITE (ICU,9001) INV,OFF,23,2	S4104020
GO TO 370	S4104030
390 WRITE(ICU,9013) CURSUP,CURLFT,CLRDSP	S4104040
C WRITE BLANK LINE.	S4104050
WRITE(ICU,9002) IBLNK	S4104060
C PRINT DISCRETE RECEPTOR RESULTS (AL203 EXCEPT MAX. HAS BEEN	S4104070
C PRINTED).	S4104080
400 CONTINUE	S4104090
IF(.NOT.IBATCH) GOTO 410	S4104100
IIU = IIUTMP	S4104110
WRITE(ICU,9002) IBLNK	S4104120
	S4104130

410 DO 420 JJ = 1,4	S4104140
IF(IPLLNT(JJ) .NE. 4) GOTO 420	S4104150
WRITE(IOU,9010) (CDAMXS(I),DISBUF(1,KKMAX(I)),YYMAX(I),I=1,2),	S4104160
1 CDAMXS(3),TIMIN,DISBUF(1,KKMAX(3)),YYMAX(3)	S4104170
420 CONTINUE	S4104180
DO 490 JJ = 4,1,-1	S4104190
IP = IPLLNT(JJ)	S4104200
IF(IP .EQ. 0 .OR. IP .EQ. 4) GOTO 490	S4104210
KDX = IP*3 - 3	S4104220
DO 430 J = 1,3	S4104230
KKMAX(J) = 1	S4104240
YYMAX(J) = 0.0	S4104250
430 CDAMXS(J) = 0.0	S4104260
LINEP = 100	S4104270
DO 480 KK=1,NXS	S4104280
IF(LINEP .LT. 53) GOTO 440	S4104290
LINEP = 27	S4104300
WRITE(IOU,9003) IVERSN,LOCATN,MDLNAM	S4104310
WRITE(IOU,9004) (IPL(KDX+J),J=1,3),TITLE,ZBSL,ZTPL,	S4104320
1 ISTEIN,LSDT,ISDAY,ISMON,ISYEAR,LTIME,LSDT,LDAY,LMON,LYEAR,	S4104330
2 JTIME,LSDT,JDAY,JMON,JYEAR	S4104340
WRITE(IOU,9005) TIMIN	S4104350
WRITE(IOU,9006)	S4104360
440 CONTINUE	S4104370
XT = DISBUF(1,KK)	S4104380
YT1 = DISBUF(2,KK)	S4104390
CALHT = DISBUF(3,KK)	S4104400
L = 3	S4104410
DO 470 J = 1,3	S4104420
DO 450 I = 1,3	S4104430
CDOUT(I) = DISBUF(I+L,KK)*QCONV(IP)	S4104440
IF(CDOUT(I) .LT. CDAMXS(I)) GOTO 450	S4104450
CDAMXS(I) = CDOUT(I)	S4104460
YYMAX(I) = YT1	S4104470
KKMAX(I) = KK	S4104480
450 CONTINUE	S4104490
C DON'T PRINT IF VALUES ARE LESS THAN FORMAT ALLOWS.	S4104500
IF(CDOUT(1).LT.0.005 .AND. CDOUT(2).LT.0.005 .AND.	S4104510
1 CDOUT(3).LT.0.0005) GOTO 460	S4104520
LINEP = LINEP + 1	S4104530
IF(J.NE.2) WRITE(IOU,9008) XT,YT1,CALHT,(CDOUT(I),I=1,3),	S4104540
1 DISBUF(L+4,KK),CLDDTM(1,J,KK),(IBLNK,I=1,10)	S4104550
IF(J.EQ.2) WRITE(IOU,9008) XT,YT1,CALHT,(CDOUT(I),I=1,3),	S4104560
1 DISBUF(L+4,KK),CLDDTM(1,J,KK),(IDDISR(I,KK),I=1,10)	S4104570
460 YT1 = YT1 + 10.0	S4104580
IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4104590
470 L = L + 4	S4104600
480 CONTINUE	S4104610
WRITE(IOU,9010) (CDAMXS(I),DISBUF(1,KKMAX(I)),YYMAX(I),I=1,2),	S4104620
1 CDAMXS(3),TIMIN,DISBUF(1,KKMAX(3)),YYMAX(3)	S4104630
490 CONTINUE	S4104640
CALHT = CLCHTS	S4104650

```
500 CONTINUE
    GOTO 530
C-----ERROR EXIT.
510 IERROR(1) = MINS1
    GOTO 530
520 IERROR(1) = 1
530 NNNEST = 1
    NNTRY = 3
    CALL REEDM
    END
```

```
S4104660
S4104670
S4104680
S4104690
S4104700
S4104710
S4104720
S4104730
S4104740
S4104750
```



REEDM SOURCE MODULE &RCONN

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FTN4
SUBROUTINE BREAK(JF,XO,YO,IXS,DISCRT,BUFDIS,PHIS,UBARNK,CLDTIM,
1          SIGAPK,SIGEPK)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
-----
C
C
C THIS SUBROUTINE CALCULATES CONCENTRATION,DOSAGE,TIME MEAN CONCEN-
C TRATION AT MAXIMUM CENTERLINE OR DISCRETE RECEPTOR LOCATIONS.
C
-----
C
C
C
C*****          B E G I N C O M M O N   A R E A          *****
C 04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
. FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,
. MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP
. ,MIXING,MAXDEP,LAYBOT(3)
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
. MINUS1,MINUS9,MINI1,MINI9,
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
. RT(24),TPROPC,IDXRT
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
. CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
. INVNDR(2),ULINE(2),
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
. CLRLNE,INSLNE,DELNE,
. IESCAJ(3),NULL,IBLNK,
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)

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C-----VEHICLE PARAMETERS
COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS
COMMON /TIME/ JTIME, JDAY, JYEAR, ISTEIME, ISDAY, ISYEAR, LTIME,
LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30),
RH(30), PTEMP(30), SIGEP(30), SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29),
SIGYO(29)
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32),
SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4), QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE (IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3))
, (IPU2, IPAR(4)), (IPU3, IPAR(5))
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1)
C
C**** END OF COMMON AREA ****
C
LOGICAL DISCRT
REAL LAT
CD ARRAY = CONC.GAS, DOS.GAS, TIME-MEAN CONC.GAS,
CONC.AL2O3, DOS.AL2O3, TIME-MEAN CONC.AL2O3
DIMENSION CD(50,6), YMCDL(3), LMCDL(3), CDMAX(3), YPI(50,2), BUFDIS(1),
1 SIGYI(50,2), NSOURC(2), AVGSY(2), PASTIM(2), CLDTIM(4), CDOUT(6)
DIMENSION RANGE(30,1), BEARNG(30,1), SIGYBR(30,1),
1 VALUES(30,1), PHIS(1), UBARNK(1), SIGAPK(1), SIGEPK(1)
EQUIVALENCE (PLUS, RANGE), (PLUS(181), BEARNG),
1 (PLUS(361), SIGYBR), (PLUS(547), VALUES)
EQUIVALENCE (CDOUT(1), S2GS), (CDOUT(2), S1GS), (CDOUT(3), S3GS),
1 (CDOUT(4), S2AL), (CDOUT(5), S1AL), (CDOUT(6), S3AL)
EQUIVALENCE (NSOURC(1), NSO1), (NSOURC(2), NSO2)
DATA NCAT /6/, RAD /57.29578/, SQR2P /2.5066283/, RAD /.01745329/
*, TWOPI /6.283185/, TIMI /.016666667/
C
C*** INITIALIZE.
C
XOP = XO

```

IF (XOP .EQ. 0.0) XOP = 5.0	S4201020
LOOP = 0	S4201030
10 CONTINUE	S4201040
AVGSY(1) = 0.0	S4201050
AVGSY(2) = 0.0	S4201060
NSGYGS = 0	S4201070
NSGYAL = 0	S4201080
TIMALG = 1.E20	S4201090
TIMALA = 1.E20	S4201100
TIMDLG = 0.0	S4201110
TIMDLA = 0.0	S4201120
NSO1 = 0	S4201130
NSOGS = 0	S4201140
NSO2 = 0	S4201150
DO 30 M = 1,50	S4201160
DO 20 J = 1,NCAT	S4201170
20 CD(M,J) = 0.0	S4201180
DO 30 J = 1,2	S4201190
SIGYI(M,J) = 0.0	S4201200
30 YPI(M,J) = 0.0	S4201210
C	S4201220
C*** BEGIN LOOP OVER MAJOR BOUNDARY LAYERS.	S4201230
C	S4201240
NILK = 0	S4201250
DO 330 ILK = 1,2	S4201260
IF(ILK .EQ. 1) GOTO 40	S4201270
IF(.NOT.GRVSET) GOTO 330	S4201280
IF(LAYTOP(NLK+1) .EQ. 0) GOTO 330	S4201290
IBOT = LAYTOP(NLK) + 1	S4201300
ITOP = LAYTOP(NLK+1)	S4201310
JF = NLAYS + NLK + 1	S4201320
GOTO 50	S4201330
40 CONTINUE	S4201340
NLK = 1	S4201350
IF(CALHT .GT. ALT(LAYTOP(1))) NLK = 2	S4201360
JF = NLAYS + NLK	S4201370
IBOT = LAYBOT(NLK)	S4201380
ITOP = LAYTOP(NLK)	S4201390
ZBL = ALT(IBOT)	S4201400
IF(DISCRT .OR. LOOP.GT.0) GOTO 50	S4201410
YO = DIRN(JF) + 180.0	S4201420
IF(YO .GT. 360.0) YO = YO - 360.0	S4201430
50 CONTINUE	S4201440
NILK = NILK + 1	S4201450
SPEEDI = 1./SPEEDN(JF)	S4201460
ZTLZBL = ALT(ITOP+1) - ZBL	S4201470
IF(IRUN.EQ.4) WRITE(IOU,9001) XO,YO ,ILK,CALHT,ZBL,ZTLZBL	S4201480
9001 FORMAT(/35H DIAGNOSTICS FOR DOWNWIND LOCATION ,2F10.2/I6,3E13.6)	S4201490
C	S4201500
C*** BEGIN LOOP OVER METEOROLOGICAL LAYERS.	S4201510
C	S4201520
DO 320 M = IBOT,ITOP	S4201530

IFL = 1	S4201540
IFAL = 1	S4201550
IF (.NOT.GRVSET) IFAL = 0	S4201560
SIGXAL = 0.0	S4201570
SIAL = 0.0	S4201580
S2AL = 0.0	S4201590
S3AL = 0.0	S4201600
S1GS = 0.0	S4201610
S2GS = 0.0	S4201620
S3GS = 0.0	S4201630
IF(IRUN .EQ. 4) WRITE(IOU,9002) M	S4201640
9002 FORMAT(19H0*** FOR MET. LAYER,I3)	S4201650
C	S4201660
C** COMPUTE XBAR & YBAR OF SOURCE M WITH RESPECT TO BOUNDARY LAYER	S4201670
C** WIND DIRECTION (DIRN(JF)) FOR GAS.	S4201680
C	S4201690
A1 = DIRN(JF)*RAD	S4201700
CALL COORD(A1,M,XO,YO ,XS,YS,X,Y)	S4201710
IF(IFLG.GE.0) GO TO 60	S4201720
IFL = 0	S4201730
60 CONTINUE	S4201740
IF (.NOT.GRVSET) GO TO 90	S4201750
C	S4201760
C** ADJUST XBAR & YBAR DUE TO GRAVITATIONAL SETTLING FOR AL2O3.	S4201770
C** COMPUTE SIGMAS USING ADJUSTED XBAR.	S4201780
C** COMPUTE FRONT-END TERMS FOR AL2O3.	S4201790
C	S4201800
IF(.NOT. (DISCRT .OR. LOOP.GT.0)) GOTO 70	S4201810
A1 = DIRN(M)*RAD+PHIS(M)	S4201820
CALL COORD(A1,M,XO,YO ,XS,YS,XAL,YAL)	S4201830
IF (IFLG .GE. 0) GO TO 80	S4201840
IFAL = 0	S4201850
GO TO 80	S4201860
70 PHISM = (DIRN(M)+180.0)*RAD + PHIS(M)	S4201870
IF(PHISM .GT. TWOPI) PHISM = PHISM - TWOPI	S4201880
IF(PHISM .LE. 0.0) PHISM = PHISM + TWOPI	S4201890
THETC = DY(M)*RAD	S4201900
SR = ABS(PHISM - THETC)	S4201910
IF (SR .GT. PI) SR = TWOPI-SR	S4201920
SR = ABS(PI-SR)	S4201930
A1 = DX(M)	S4201940
SS = PI - (SR + ARSIN(A1*SIN(SR)/XOP))	S4201950
XAL = A1*A1 + XO*XO - 2.0*A1*XO*COS(SS)	S4201960
IF(XAL .LE. 0.0) IFAL = 0	S4201970
XAL = ABS(XAL)	S4201980
XAL = SQRT(XAL)	S4201990
SK = 1.0	S4202000
IF(ABS(PHISM - THETC) .GT. PI) SK = -1.0	S4202010
IF(PHISM .LT. THETC) SK = -1.0*SK	S4202020
YAL = THETC + SK*SS	S4202030
IF(YAL .LE. 0.0) YAL = YAL + TWOPI	S4202040
IF(YAL .GT. TWOPI) YAL = YAL - TWOPI	S4202050

		S4202060
	80 CONTINUE	S4202070
C	COMPUTE SIGMAS FOR AL203	S4202080
	IF (IFAL .EQ. 0) GO TO 90	S4202090
	CALL SIGMA(XAL,M,JF,1,SIGAPK(M),SIGEPK(M),PHIS(M)*RADI)	S4202100
	SIGXAL = SIGXNK	S4202110
	IF(SIGYNK .LE. 0.0) GOTO 90	S4202120
	SIGYAL = SIGYNK	S4202130
	IF(SIGZ .LE. 0.0) GOTO 90	S4202140
	SIGZAL = SIGZ	S4202150
	UBRIAL = 1./UBARNK(M)	S4202160
C	COMPUTE FRONT-END TERMS FOR AL203	S4202170
	SIAL = Q(M)*UBRIAL/(2.0*SQR2P*SIGYAL*(ALT(M+1)-ALT(M)))	S4202180
	IF(DECAY .GT. 0.0) SIAL = SIAL*EXP(-DECAY*XAL*UBRIAL)	S4202190
	IF(SIGXAL .GT. 0.0) S2AL = SIAL*UBARNK(M)/(SQR2P*SIGXAL)	S4202200
	IF(DISCRT .OR. LOOP.GT.0) ALATAL = YAL/SIGYNK	S4202210
C		S4202220
C**	COMPUTE SIGMAS AND FRONT-END TERMS FOR GASES.	S4202230
C		S4202240
	90 CONTINUE	S4202250
	IF (IFL .EQ. 0.AND.IFAL .EQ. 0) GO TO 280	S4202260
	IF(LOOP .GT. 0.OR.IFL .EQ. 0) GOTO 100	S4202270
	CALL SIGMA(X,M,JF,0,SIGAPN(M),SIGEPN(M),DDIR(M))	S4202280
	IF(SIGYNK .LE. 0.0) GOTO 100	S4202290
	UBRIGS = 1./SPEEDN(M)	S4202300
	SIGS = Q(M)/(SPEEDN(JF)*2.0*SQR2P*SIGYNK*(ALT(M+1)-ALT(M)))	S4202310
	IF(DECAY .GT. 0.0) SIGS = SIGS*EXP(-DECAY*X/SPEEDN(JF))	S4202320
	IF(SIGXNK .GT. 0.0) S2GS = SIGS*SPEEDN(JF)/(SQR2P*SIGXNK)	S4202330
	IF(DISCRT) ALATGS = Y/SIGYNK	S4202340
C		S4202350
	100 IF(Q(M) .LE. 0.0) GOTO 260	S4202360
C		S4202370
C**	BEGIN LOOP OVER GRAVITATIONAL SETTLING CATEGORIES.	S4202380
C**	CALCULATE VERTICAL TERM.	S4202390
C		S4202400
	VSXSUI = 0.0	S4202410
	VERTGS = 0.0	S4202420
	VERTAL = 0.0	S4202430
C	ABSORPTION COEFFICIENT FOR GASES IN GAMMAP(21)	S4202440
	GAMMA = 1.0 - GAMMAP(21)	S4202450
C	CHECK VERTICAL TERM VARIABLES. SKIP GAS, AL203 OR BOTH.	S4202460
	JO = 0	S4202470
	J1 = NVS	S4202480
	IF(SIGZ.LE.0.0 .OR. LOOP.GT.0.OR.IFL .EQ. 0) JO = 1	S4202490
	IF(.NOT.GRVSET.OR.SIGZAL.LE.0.0.OR.XAL.LE.0.0.OR.IFAL.EQ.0)J1=0	S4202500
	IF(JO .GT. J1) GOTO 260	S4202510
	DO 170 J = JO,J1	S4202520
	IF(J .EQ. 0) GOTO 110	S4202530
	SIGZ = SIGZAL	S4202540
	VSXSUI = VS(J)*XAL*UBRIAL	S4202550
	GAMMA = GAMMAP(J)	S4202560
	110 CONTINUE	S4202570
	120 CONTINUE	

C	1./SQRT(2) = .70710678	S4202580
	SIGZI = .70710678/SIGZ	S4202590
	A1 = (-ALT(M) + CALHT + VSXSUI)*SIGZI	S4202600
	A2 = -(ALT(M+1) - CALHT - VSXSUI)*SIGZI	S4202610
	A3 = ERFXS(A1,A2)	S4202620
	A4 = (-ZBL - ZBL + ALT(M+1) + CALHT - VSXSUI)*SIGZI	S4202630
	A5 = -(ZBL + ZBL - ALT(M) - CALHT + VSXSUI)*SIGZI	S4202640
	A6 = ERFXS(A4,A5)	S4202650
	A6 = GAMMA*A6	S4202660
	SUM = A3 + A6	S4202670
	SUML = -1.0	S4202680
	GAM1 = 1.0	S4202690
	GAM2 = GAMMA	S4202700
	GAM3 = GAM2*GAMMA	S4202710
	AI = 0.0	S4202720
C*	BEGIN SUMMATION LOOP FOR VERTICAL TERM.	S4202730
130	AI = AI + 2.0	S4202740
	A10 = (AI*ZTLZBL + ZBL + ZBL - ALT(M) - CALHT + VSXSUI)*SIGZI	S4202750
	A11 = -(-AI*ZTLZBL - ZBL - ZBL + ALT(M+1) + CALHT - VSXSUI)*SIGZI	S4202760
	IF(SUML .LT. 0.0) GOTO 140	S4202770
	IF(A10 .GT. 3.0 .AND. A11 .GT. 3.0) GOTO 150	S4202780
140	CONTINUE	S4202790
	A1 = (AI*ZTLZBL - ALT(M) + CALHT + VSXSUI)*SIGZI	S4202800
	A2 = -(-AI*ZTLZBL + ALT(M+1) - CALHT - VSXSUI)*SIGZI	S4202810
	A3 = ERFXS(A1,A2)	S4202820
	A3 = GAM2*A3	S4202830
	A4 = (AI*ZTLZBL - ZBL - ZBL + ALT(M+1) + CALHT - VSXSUI)*SIGZI	S4202840
	A5 = -(-AI*ZTLZBL + ZBL + ZBL - ALT(M) - CALHT + VSXSUI)*SIGZI	S4202850
	A6 = ERFXS(A4,A5)	S4202860
	A6 = GAM3*A6	S4202870
	A7 = (AI*ZTLZBL + ALT(M+1) - CALHT - VSXSUI)*SIGZI	S4202880
	A8 = -(-AI*ZTLZBL - ALT(M) + CALHT + VSXSUI)*SIGZI	S4202890
	A9 = ERFXS(A7,A8)	S4202900
	A9 = GAM2*A9	S4202910
	A12 = ERFXS(A10,A11)	S4202920
	A12 = GAM1*A12	S4202930
	SUM = SUM + A3 + A6 + A9 + A12	S4202940
	GAM1 = GAM2	S4202950
	GAM2 = GAM3	S4202960
	GAM3 = GAM3*GAMMA	S4202970
	SUML = SUM	S4202980
	GOTO 130	S4202990
C		S4203000
150	CONTINUE	S4203010
	IF(J .GT. 0) GOTO 160	S4203020
	VERTGS = SUM	S4203030
	GOTO 170	S4203040
160	VERTAL = VERTAL + SUM*FS(J)	S4203050
170	CONTINUE	S4203060
C		S4203070
C**	COMPUTE DOSAGE (S1AL & S1GS), CONCENTRATION (S2AL & S2GS) AND	S4203080
C**	TIME-MEAN CONC. (S3AL & S3GS).	S4203090

		S4203100
		S4203110
		S4203120
		S4203130
		S4203140
		S4203150
		S4203160
		S4203170
		S4203180
		S4203190
		S4203200
		S4203210
		S4203220
		S4203230
		S4203240
		S4203250
		S4203260
		S4203270
		S4203280
		S4203290
		S4203300
		S4203310
		S4203320
		S4203330
		S4203340
		S4203350
		S4203360
		S4203370
		S4203380
		S4203390
		S4203400
		S4203410
		S4203420
		S4203430
		S4203440
		S4203450
		S4203460
		S4203470
		S4203480
		S4203490
		S4203500
		S4203510
		S4203520
		S4203530
		S4203540
		S4203550
		S4203560
		S4203570
		S4203580
		S4203590
		S4203600
		S4203610

280	IF(IRUN .EQ. 4) WRITE(IOU,9003) JF,LOOP,DISCRT,ALT(M),ALT(M+1),	S4203620
1	Q(M),SPEEDN(M),SPEEDN(JF),UBARNK(M),	S4203630
2	SIGXAL,SIGXNK,SIGYAL,SIGYNK,SIGZAL,SIGZ,	S4203640
3	VERTAL,VERTGS,ALATAL,ALATGS,	S4203650
4	TIMAKA,TIMDKA,TIMAKG,TIMDKG,XAL,X,YAL,Y,	S4203660
5	CDOUT	S4203670
9003	FORMAT(	S4203680
1	39H JF,LOOP,DISCRT,ALT(M),ALT(M+1),Q(M) =,2I5,L5,1P3E14.5/	S4203690
2	34H SPEEDN(M),SPEEDN(JF),UBARNK(M) =,3E14.5/	S4203700
3	43H SIGXAL,SIGXNK,SIGYAL,SIGYNK,SIGZAL,SIGZ =,6E14.5/	S4203710
4	31H VERTAL,VERTGS,ALATAL,ALATGS =,4E14.5/	S4203720
5	31H TIMAKA,TIMDKA,TIMAKG,TIMDKG =,4E14.5/	S4203730
6	15H XAL,X,YAL,Y =,4E14.5/	S4203740
7	11H CONC.GAS=,E12.6,9H DOS.GAS=,E12.6,20H TIME-MEAN CONC.GAS=,	S4203750
8	E12.6/13H CONC.AL2O3=,E12.6,11H DOS.AL2O3=,E12.6,21H TIME-MEAN CONS	S4203760
9	C.AL2O3=,E12.6)	S4203770
C	LOAD GOOD RESULTS IN ARRAYS.	S4203780
	IF(ILK .GT. 1) GOTO 300	S4203790
	IF(S1GS.LE.0.0 .OR. LOOP.GT.0) GOTO 300	S4203800
	NSOGS = NSOGS+1	S4203810
	DO 290 J = 1,3	S4203820
290	CD(NSOGS,J) = CDOUT(J)	S4203830
	SIGYI(NSOGS,1) = SIGYNK	S4203840
	YPI(NSOGS,1) = Y	S4203850
300	IF(S1AL .LE. 0.0) GOTO 320	S4203860
	IF (ILK .EQ. 1) NSO1 = NSO1+1	S4203870
	NSO2 = NSO2 + 1	S4203880
	DO 310 J = 4,6	S4203890
310	CD(NSO2,J) = CDOUT(J)	S4203900
	SIGYI(NSO2,2) = SIGYAL	S4203910
	YPI(NSO2,2) = YAL	S4203920
320	CONTINUE	S4203930
C		S4203940
C*	END MET. LAYER LOOP.	S4203950
C		S4203960
	IF(ILK .GT. 1) GOTO 330	S4203970
	PASTIM(1) = AMAX1(TIMALG*TIMI,0.0)	S4203980
	PASTIM(2) = TIMDLG*TIMI	S4203990
330	CONTINUE	S4204000
C		S4204010
C**	END OF MAJOR BOUNDARY LAYERS.	S4204020
C		S4204030
	IF(NILK .NE. 1) GOTO 340	S4204040
	AVGSY(2) = AVGSY(1)	S4204050
	NSGYAL = NSGYGS	S4204060
340	IF(.NOT.DISCRT) GOTO 390	S4204070
C*	DISCRETE RECEPTOR. STORE RESULTS INTO BUFDIS ARRAY.	S4204080
C*	LOCATION 1 = CONC.GAS, 2 = DOS.GAS, 3 = TIME-MEAN CONC.GAS,	S4204090
C*	4 = CLOUD ARRIVAL TIME.GAS, 5 = CONC.AL2O3, 6 = DOS.AL2O3,	S4204100
C*	7 = TIME-MEAN CONC.AL2O3, 8 = CLOUD ARRIVAL TIME.AL2O3	S4204110
C		S4204120
	DO 350 III = 1,8	S4204130



350	BUFDIS(III) = 0.0	S4204140
	BUFDIS(4) = PASTIM(1)	S4204150
	BUFDIS(8) = AMAX1(TIMALA*TIMI,0.0)	S4204160
	CLDTIM(1) = PASTIM(2)	S4204170
	CLDTIM(2) = TIMDLA*TIMI	S4204180
	IF(NSOGS.EQ. 0) GOTO 370	S4204190
C	STORE GAS RESULTS.	S4204200
	DO 360 III = 1,NSOGS	S4204210
	DO 360 J = 1,3	S4204220
360	BUFDIS(J) = BUFDIS(J) + CD(III,J)	S4204230
370	IF(NSO2 .EQ. 0) GOTO 490	S4204240
C	STORE AL2O3 RESULTS.	S4204250
	DO 380 III = 1,NSO2	S4204260
	DO 380 J = 5,7	S4204270
380	BUFDIS(J) = BUFDIS(J) + CD(III,J-1)	S4204280
	GOTO 490	S4204290
390	CONTINUE	S4204300
	IF(LOOP .NE. 0) GOTO 410	S4204310
C*	MAXIMUM CENTERLINE. CALL CHIR TO FIND LOCATION & VALUE OF	S4204320
C*	MAXIMUM GAS RESULTS.	S4204330
	CALL CHIR(CD,YPI,SIGYI,NSOGS,CDMAX,YMCDL)	S4204340
C*	SAVE MAXIMUM VALUE & LOCATION IN ARRAYS.	S4204350
	DO 400 J = 1,3	S4204360
	IF(CDMAX(J) .LE. 0.0) GOTO 400	S4204370
	A1 = YMCDL(J)	S4204380
	RANGE(IXS,J) = SQRT(XO*XO+A1*A1)	S4204390
C	RADI CONVERTS RADIANS TO DEGREES.	S4204400
	A1 = YO + ATAN2(A1,XOP)*RADI	S4204410
	IF(A1 .GT. 360.0) A1 = A1 - 360.0	S4204420
	IF(A1 .LE. 0.0) A1 = A1 + 360.0	S4204430
	BEARNG(IXS,J) = A1	S4204440
	VALUES(IXS,J) = CDMAX(J)	S4204450
	SIGYBR(IXS,J) = AVGSY(1)/NSGYGS	S4204460
400	CONTINUE	S4204470
	CLDTIM(1) = PASTIM(1)	S4204480
	CLDTIM(2) = PASTIM(2)	S4204490
410	IF(.NOT.GRVSET) GOTO 490	S4204500
	IF(LOOP .NE. 0) GOTO 430	S4204510
C*	COMPUTE MAXIMUM VALUE OVER BOUNDARY LAYER AND "HIDDEN" BOUNDARY	S4204520
C	FOR AL2O3 VALUES.	S4204530
	CALL CROSS(YPI(1,2),NSO2)	S4204540
	DO 420 I = 1,NSO2	S4204550
420	YPI(I,2) = YPI(I,2)*XO	S4204560
	CALL CHIR(CD(1,4),YPI(1,2),SIGYI(1,2),NSO2,CDMAX,YMCDL)	S4204570
C*	LOOP-BACK LOGIC. GO BACK AND CALCULATE EXACT AL2O3 RESULTS	S4204580
C*	AT MAXIMUM LOCATION (YMCDL(1)).	S4204590
	LOOP = 1	S4204600
	YO = YMCDL(1)/XOP*RADI	S4204610
	GOTO 10	S4204620
430	J = LOOP + 3	S4204630
C*	SAVE MAXIMUM VALUE & LOCATION IN ARRAYS.	S4204640
440	A1 = 0.0	S4204650

DO 450 I = 1,NS02	S4204660
450 A1 = A1 + CD(I,J)	S4204670
IF(A1 .LE. 0.0) GOTO 460	S4204680
RANGE(IXS,J) = XO	S4204690
IF(YO .GT. 360.0) YO = YO - 360.0	S4204700
IF(YO .LE. 0.0) YO = YO + 360.0	S4204710
BEARNG(IXS,J) = YO	S4204720
VALUES(IXS,J) = A1*QCONV(4)	S4204730
SIGYBR(IXS,J) = AVGSY(2)/NSGYAL	S4204740
CLDTIM(3) = AMAX1(TIMALA*TIMI,0.0)	S4204750
CLDTIM(4) = TINDLA*TIMI	S4204760
C* CONTINUE LOOP-BACK LOGIC.	S4204770
460 IF(LOOP .NE. 1) GOTO 470	S4204780
LOOP = 2	S4204790
J = 5	S4204800
IF(ABS(YMCDL(2)-YMCDL(1)) .LT. 1.E-3) GOTO 440	S4204810
J = 6	S4204820
IF(ABS(YMCDL(3)-YMCDL(1)) .LT. 1.E-3) GOTO 440	S4204830
YO = YMCDL(2)/XOP*RADI	S4204840
GOTO 10	S4204850
470 IF(LOOP .NE. 2) GOTO 480	S4204860
LOOP = 3	S4204870
J = 6	S4204880
IF(ABS(YMCDL(3)-YMCDL(2)) .LT. 1.E-3) GOTO 440	S4204890
IF(ABS(YMCDL(3)-YMCDL(1)) .LT. 1.E-3) GOTO 480	S4204900
YO = YMCDL(3)/XOP*RADI	S4204910
GOTO 10	S4204920
480 CONTINUE	S4204930
C	S4204940
C* RETURN	S4204950
C	S4204960
490 CONTINUE	S4204970
IF(IRUN .EQ. 4) WRITE(IOU,9004) NSGYAL,NSGYGS,NSOURC,NSOGS,IXS,	S4204980
1 AVGSY,CLDTIM,(RANGE(IXS,J),J=1,6),	S4204990
2 (BEARNG(IXS,J),J=1,6),(VALUES(IXS,J),J=1,6)	S4205000
9004 FORMAT(39H NSGYAL,NSGYGS,NSOURC(1-2),NSOGS,IXS = ,6I5/	S4205010
1 26H AVGSY(1-2),CLDTIM(1-4) = ,6E12.6/12H RANGE(1-6)=,6E14.7/	S4205020
2 14H BEARNG(1-6) =,6E14.7/14H VALUES(1-6) =,6E14.7)	S4205030
RETURN	S4205040
END	S4205050

	SUBROUTINE CHIR(CD,YPI,SIGYI,NSOURC,CDMAX,YMCDL)	S4300000
	, UPDATE: 8213 SOURCE: 16 DEC 81 LOCATION: KSC	S4300010
C	-----	S4300020
C		S4300030
C	THIS SUBROUTINE CALCULATES THE MAXIMUM CENTERLINE	S4300040
C	CONCENTRATION AND DOSAGE ALONG THE YBAR AXIS.	S4300050
C	-----	S4300060
C		S4300070
C	DIMENSION CD(50,1),SIGYI(1),YPI(1),CDMAX(3),YMCDL(3),YCHI(3)	S4300080
	DATA NCAT /3/	S4300100
C		S4300110
	DO 10 I = 1,NCAT	S4300120
10	CDMAX(I) = 0.0	S4300130
	IF(NSOURC.EQ.1) GO TO 40	S4300140
	DO 30 I=1,NSOURC-1	S4300150
	DO 30 J=I+1,NSOURC	S4300160
	IF(YPI(I).GT.YPI(J)) GO TO 30	S4300170
	TMP1=YPI(I)	S4300180
	YPI(I)=YPI(J)	S4300190
	YPI(J)=TMP1	S4300200
	TMP1=SIGYI(I)	S4300210
	SIGYI(I)=SIGYI(J)	S4300220
	SIGYI(J)=TMP1	S4300230
	DO 20 K = 1,NCAT	S4300240
	TMP1 = CD(I,K)	S4300250
	CD(I,K) = CD(J,K)	S4300260
20	CD(J,K) = TMP1	S4300270
30	CONTINUE	S4300280
40	CONTINUE	S4300290
	ISTR=1	S4300300
C	-----CALCULATE THE NUMBER OF SOURCES IN A GROUP	S4300310
	50 SMIN=SIGYI(ISTR)	S4300320
	I=ISTR	S4300330
60	IF(I.GT.NSOURC) GO TO 160	S4300340
	IF(I.EQ.NSOURC) GO TO 70	S4300350
	J=I+1	S4300360
	TMP1=YPI(I)-YPI(J)	S4300370
	TMP2=1.18*(SIGYI(I)+SIGYI(J))	S4300380
	IF(TMP1.GT.TMP2) GO TO 70	S4300390
	I=I+1	S4300400
	GO TO 60	S4300410
70	CONTINUE	S4300420
	SMIN=SIGYI(ISTR)	S4300430
	IF(ISTR.EQ.NSOURC) GO TO 90	S4300440
	IF(ISTR.EQ.I) GO TO 90	S4300450
	DO 80 M=ISTR+1,I	S4300460
80	SMIN=AMIN1(SMIN,SIGYI(M))	S4300470
90	YINC=.08*SMIN	S4300480
	YY=YPI(ISTR)	S4300490
100	DO 110 J = 1,NCAT	S4300500

110 YCHI(J) = 0.0	S4300510
IF(YY.LT.YPI(I)) GO TO 150	S4300520
DO 130 M=1,NSOURC	S4300530
EX=(YY-YPI(M))/SIGYI(M)	S4300540
EX = TEXP(EX)	S4300550
IF(EX .LE. 0.0) GOTO 130	S4300560
DO 120 J = 1,NCAT	S4300570
120 YCHI(J) = YCHI(J) + CD(M,J)*EX	S4300580
130 CONTINUE	S4300590
DO 140 J = 1,NCAT	S4300600
IF(YCHI(J) .LT. CDMAX(J)) GOTO 140	S4300610
CDMAX(J) = YCHI(J)	S4300620
YMCDL(J) = YY	S4300630
140 CONTINUE	S4300640
YY=YY-YINC	S4300650
GO TO 100	S4300660
150 CONTINUE	S4300670
ISTR=I+1	S4300680
GO TO 50	S4300690
160 DO 170 J = 1,NCAT	S4300700
170 IF(CDMAX(J) .LE. 0.0) YMCDL(J) = 0.0	S4300710
RETURN	S4300720
END	S4300730

REEDM SOURCE MODULE &RPDPM

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FTN4
PROGRAM RPDPM(5)                                S4400010
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC  S4400020
C:::::::::::::::::::::::::::::::::::::::::::: S4400030
C:::::::::::::::::::::::::::::::::::::::::::: S4400040
C::: :: S4400050
C::: :: S4400060
C::: ORGANIZATION: H. E. CRAMER CO., INC.      S4400070
C::: :: S4400080
C::: WORK FOR: DR. J. B. STEPHENS (ES84)       S4400090
C::: :: S4400100
C::: PROGRAM CODE: RPDPM                      S4400110
C::: :: S4400120
C::: PROGRAM DESCRIPTION:                    S4400130
C::: THIS PROGRAM CALCULATES THE GROUND-LEVEL DEPOSITION DUE TO S4400140
C::: PRECIPITATION SCAVENGING FOR THE MEAN WIND DIRECTION RADIAL AT S4400150
C::: EVERY KILOMETER DOWNWIND FROM THE LAUNCH SITE. FOR THE HCL S4400160
C::: SPECIES, THE AMOUNT OF ACID IS ALSO COMPUTED. S4400170
C::: :: S4400180
C:::::::::::::::::::::::::::::::::::::::::::: S4400190
C:::::::::::::::::::::::::::::::::::::::::::: S4400200
C S4400210
Cç S4400220
C****          B E G I N  C O M M O N  A R E A          ****S4400230
C 04/02/82 S4400240
C-----MATH PARAMETERS AND CONSTANTS S4400250
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S4400260
C-----INPUT OPTIONS S4400270
REAL LAMBDA S4400280
INTEGER FILE,GOOD,TITLE S4400290
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S4400300
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S4400310
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S4400320
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S4400330
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S4400340
. ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2) S4400350
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S4400360
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S4400370
. FS(20),MDLNAM(12),DBAR(20) S4400380
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S4400390
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S4400400
. MODEL4,MODEL5,MODEL6 S4400410
INTEGER RUNNUM,RT,CL,CS S4400420
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S4400430
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S4400440
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S4400450
. ,MIXING,MAXDEP,LAYBOT(3) S4400460
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S4400470
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S4400480
. MINUS1,MINUS9,MINS1,MINS9, S4400490

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MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S4400500
RT(24),TPROPC,IDXRT S4400510
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S4400520
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S4400530
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4400540
CLRLNE,INSLNE,DELIN S4400550
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S4400560
INVNDR(2),ULINE(2), S4400570
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4400580
CLRLNE,INSLNE,DELIN, S4400590
IESCAJ(3),NULL,IBLNK, S4400600
IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S4400610
C-----VEHICLE PARAMETERS S4400620
COMMON /VCLPR/ VPAR(17) S4400630
C-----TIME PARAMETERS S4400640
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S4400650
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2) S4400660
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S4400670
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S4400680
RH(30),PTEMP(30),SIGEP(30),SIGAP(30) S4400690
C-----LAYER PARAMETERS S4400700
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S4400710
SIGYO(29) S4400720
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS) S4400730
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6) S4400740
C-----CALCULATED NEW LAYER PARAMETERS S4400750
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S4400760
SPEEDN(32) S4400770
C-----CONVERSION FACTORS S4400780
COMMON /CNVRT/ QCONV(4),QPDEPH S4400790
C S4400800
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S4400810
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S4400820
C-----READ/WRITE BUFFER S4400830
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S4400840
C*****S4400850
C S4400860
C-----EQUIVALENCE STATEMENTS S4400870
EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S4400880
,(IPU2,IPAR(4)),(IPU3,IPAR(5)) S4400890
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1) S4400900
C S4400910
C**** END OF COMMON AREA ****S4400920
C S4400930
LOGICAL IBATCH S4400940
C S4400950
DIMENSION IPL(12),MILK(3),IER(2) S4400960
DIMENSION DISBUF(14,1),MPTDLB(8,2),ZMET(3,2),WDHOLD(4,3),WDOU(9) S4400970
DIMENSION RANGE(30,1),BEARNG(30,1),SIGYBR(30,1),VALUES(30,1) S4400980
1 ,CDAMXS(1),PEAKS(2,1),IDDISR(10,60) S4400990
C S4401000
EQUIVALENCE (PLUS,DISBUF,RANGE),(PLUS(181),BEARNG), S4401010

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	1 (PLUS(361),SIGYBR),(PLUS(541),CDAMXS),(PLUS(547),VALUES),	S4401020
	2 (PLUS(727),PEAKS), (ERR,IER)	S4401030
C		S4401040
	DATA IPL /2H H,2HCL,2H ,2H C,2HO2,2H ,2H C,2HO ,2H ,2HAL,2H2O,	S4401050
	1 2H3 /	S4401060
	DATA NXS,WTMOL /30,36.46/	S4401070
	DATA MILK /2,3,1/	S4401080
	DATA MPTDLB /2H T,2HIM,2HE-,2H-D,2HEP,2HEN,2HDE,2HNT,	S4401090
	1 2HMA,2HXI,2HMU,2HM ,2HPO,2HSS,2HIB,2HLE/	S4401100
	DATA IBATCH /.FALSE./	S4401110
	DATA JVERSN/8213/	S4401120
C		S4401130
C		S4401140
	IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S4401150
C***	INITIALIZE.	S4401160
	JER = 0	S4401170
C		S4401180
	IF(IRUN .EQ. 4) WRITE(IOU,9014)	S4401190
C	PH CONVERSION FACTOR.	S4401200
	QPDEPH = 1.0/(RAINRT*25.4*WTMOL*DURAT)	S4401210
	IF(MAXDEP) QPDEPH = QPDEPH*DURAT	S4401220
C	CLEAR WORK SPACE.	S4401230
	DO 10 I = 1,900	S4401240
10	PLUS(I) = 0.0	S4401250
	DO 20 I = 1,4	S4401260
20	QCONV(I) = 1.0	S4401270
C	INITIALIZE BOUNDARY LAYERS PARAMETERS.	S4401280
	NLK = 1	S4401290
	IF(HM(2) .GT. 0.0) NLK = 3	S4401300
	KXS = NXS - 1	S4401310
	DO 30 I = 1,2	S4401320
	ZMET(I,1) = ALT(LAYBOT(I))	S4401330
30	ZMET(I,2) = ALT(LAYTOP(I)+1)	S4401340
	ZMET(3,1) = ALT(LAYBOT(1))	S4401350
	ZMET(3,2) = ALT(LAYTOP(2)+1)	S4401360
	MAXLAB = 1	S4401370
	IF(MAXDEP) MAXLAB = 2	S4401380
C		S4401390
C	CHECK SEGMENT ENTRY POINT.	S4401400
C		S4401410
	IF(NNNTRY .EQ. 10) GOTO 180	S4401420
C		S4401430
		S4401440
C!!!!	H.E.C COPY ONLY.	S4401450
	IF (BATCH) GO TO 60	S4401460
40	WRITE (ICU,9031) INVNDR,INV,OFF,ULINE,OFF	S4401470
	READ (IIU,9032) IFRMT1	S4401480
	IF (IFRMT1.EQ.INJ.OR.IFRMT1.EQ.INOJ) GO TO 170	S4401490
	IF (IFRMT1.EQ.IBLNK.OR.IFRMT1.EQ.IYSJ.OR.IFRMT1.EQ.IYESJ) GO TO 50	S4401500
	WRITE (ICU,9001) INV,OFF,0,0	S4401510
	GO TO 40	S4401520
50	WRITE (ICU,9018) CURSUP,CLRLNE	S4401530
60	CONTINUE	

C!!!!		
C		S4401540
C		S4401550
C		S4401560
C		S4401570
C***	BEGIN LOOP OVER RANGES.	S4401580
C		S4401590
	DO 90 IXS = 2,30	S4401600
	XT = (IXS-1)*1000.0	S4401610
	IF(.NOT.BATCH) WRITE(ICU,9016) CURSUP,MDLNAM,INV,XT,OFF	S4401620
C*	CALL SUBROUTINE WHICH COMPUTES WASHOUT DEPOSITION.	S4401630
	CALL WASHT(NLK,XT,YT,IXS,WDHOLD,.FALSE.)	S4401640
C*	FIND MAXIMUM VALUES AND LOCATIONS OVER ALL RANGES.	S4401650
	DO 80 ILK = 1,NLK	S4401660
C	PH.	S4401670
	IF(CDAMXS(ILK) .GT. VALUES(IXS,ILK)) GOTO 70	S4401680
	CDAMXS(ILK) = VALUES(IXS,ILK)	S4401690
	PEAKS(1,ILK) = RANGE(IXS,ILK)	S4401700
	PEAKS(2,ILK) = BEARNG(IXS,ILK)	S4401710
C	AL203.	S4401720
	70 I1 = ILK + 3	S4401730
	IF(CDAMXS(I1) .GT. VALUES(IXS,I1)) GOTO 80	S4401740
	CDAMXS(I1) = VALUES(IXS,I1)	S4401750
	PEAKS(1,I1) = RANGE(IXS,I1)	S4401760
	PEAKS(2,I1) = BEARNG(IXS,I1)	S4401770
	80 CONTINUE	S4401780
	90 CONTINUE	S4401790
	IF(.NOT.BATCH) WRITE(ICU,9017) CURSUP,CLRDSP,BLNKNG,OFF	S4401800
C		S4401810
C***	LOOP OVER MAJOR BOUNDARIES.	S4401820
C		S4401830
	DO 160 ILK = 1,NLK	S4401840
	NILK = ILK	S4401850
	IF(NLK .GT. 2) NILK = MILK(ILK)	S4401860
	JILK = NILK + 3	S4401870
	IF(ILK .GT. 2) GOTO 100	S4401880
	IBOT = LAYBOT(ILK)	S4401890
	ITOP = LAYTOP(ILK)	S4401900
	GOTO 110	S4401910
	100 IBOT = LAYBOT(1)	S4401920
	ITOP = LAYTOP(2)	S4401930
	110 CONTINUE	S4401940
C		S4401950
C**	LOOP OVER SPECIES.	S4401960
C		S4401970
	DO 150 J = 1,4	S4401980
	IF(IPLLNT(J) .NE. 1 .AND. IPLLNT(J) .NE. 4) GOTO 150	S4401990
	KDX = IPLLNT(J)*3 - 3	S4402000
	WRITE(IOU,9002) IVERSN,LOCATN,MDLNAM	S4402010
	WRITE(IOU,9003)	S4402020
	WRITE(IOU,9005) (IPL(KDX+K),K=1,3),TITLE,ALT(IBOT),ALT(ITOP+1),	S4402030
	1 ISTDY,LSDT,ISDAY,ISMON,ISYEAR,LTIME,LSDT,LDAY,IMON,LYEAR,	S4402040
	2 JTIME,LSDT,JDAY,JMON,JYEAR	S4402050



C	PRINT HEADING DEPENDING ON WASHOUT DEPOSITION AND SPECIES OPTION.	S4402060
	WRITE(IOU,9006) (MPTDLB(K,MAXLAB),K=1,4),(MPTDLB(K,MAXLAB),K=4,8)	S4402070
	IF(IPLLNT(J) .EQ. 1) WRITE(IOU,9009)	S4402080
	IF(IPLLNT(J) .EQ. 4) WRITE(IOU,9008)	S4402090
	WRITE(IOU,9007)	S4402100
C		S4402110
C*	BEGIN LOOP OVER RANGES.	S4402120
C		S4402130
	DO 130 IXS = 2,30	S4402140
	IF(IPLLNT(J) .EQ. 1) GOTO 120	S4402150
C	PRINT AL203.	S4402160
	A1 = VALUES(IXS,JILK)	S4402170
	IF (A1 .LE. 0.0) GO TO 130	S4402180
	WRITE(IOU,9010) RANGE(IXS,JILK),BEARNG(IXS,JILK),A1	S4402190
	GOTO 130	S4402200
C	COMPUTE & PRINT PH FOR HCL.	S4402210
120	CONTINUE	S4402220
	A1 = VALUES(IXS,NILK)	S4402230
	IF(A1 .LE. 0.0) GOTO 130	S4402240
	PDEPPH = AMIN1(1.0,AMAX1(A1,1.E-14))	S4402250
	PDEPPH = -ALOGT(PDEPPH)	S4402260
	WRITE(IOU,9010) RANGE(IXS,NILK),BEARNG(IXS,NILK),PDEPPH	S4402270
130	CONTINUE	S4402280
C		S4402290
C**	PRINT MAXIMUM VALUES FOUND OVER ALL RANGES.	S4402300
C		S4402310
	WRITE(IOU,9011)	S4402320
	IF(IPLLNT(J) .NE. 1) GOTO 140	S4402330
C	PH.	S4402340
	CDAMXS(NILK) = AMIN1(1.0,AMAX1(CDAMXS(NILK),1.E-14))	S4402350
	CDAMXS(NILK) = -ALOGT(CDAMXS(NILK))	S4402360
	WRITE(IOU,9012) CDAMXS(NILK),PEAKS(1,NILK),PEAKS(2,NILK)	S4402370
	GOTO 150	S4402380
C	AL203.	S4402390
140	WRITE(IOU,9012) CDAMXS(JILK),PEAKS(1,JILK),PEAKS(2,JILK)	S4402400
150	CONTINUE	S4402410
160	CONTINUE	S4402420
	IF(.NOT.BATCH) WRITE(ICU,9018) CURSUP,CURLFT,CLRDSP	S4402430
C		S4402440
170	CONTINUE	S4402450
C		S4402460
	NNNEST = 3	S4402470
	NNNTRY = 4	S4402480
	CALL REEDM	S4402490
C		S4402500
C		S4402510
180	IER = 0	S4402520
	IF(.NOT.BATCH) GOTO 190	S4402530
	READ(IIU,9013) IDMY	S4402540
	GOTO 200	S4402550
190	WRITE(ICU,9019) INVNDR,INV,OFF,(ULINE,OFF,I=1,2)	S4402560
	CALL IFNBR(IFRMT,12,IER,IIU)	S4402570

IDMY = IFRMT(1)	S4402580
IF(IDMY.EQ.MINUS9) GOTO 620	S4402590
IF(IDMY.NE.MINUS1) GOTO 200	S4402600
JER = JER+1	S4402610
IF (JER .GT. 1) GO TO 610	S4402620
WRITE (ICU,9030)	S4402630
GO TO 190	S4402640
200 JER = 0	S4402650
IF(IDMY .EQ. INJ .OR. IDMY .EQ. INOJ) GOTO 630	S4402660
IF(IDMY.EQ.IBLNK .OR. IDMY.EQ.IYSJ.OR. IDMY.EQ.IYESJ) GOTO 220	S4402670
IF (IER .EQ. 0) GO TO 210	S4402680
WRITE (ICU,9001) INV,OFF,23,0	S4402690
IF (BATCH) GO TO 610	S4402700
GO TO 190	S4402710
210 CONTINUE	S4402720
IBATCH = .TRUE.	S4402730
IIUTMP = IIU	S4402740
CALL CODE(2)	S4402750
READ(IDMY,*) IIU	S4402760
WRITE(ICU,9015) IESCAJ	S4402770
C	S4402780
C*** BEGIN DISCRETE RECEPTOR CALCULATIONS.	S4402790
C	S4402800
220 NXS = 0	S4402810
LINE = 100	S4402820
230 CONTINUE	S4402830
DO 240 I = 1,10	S4402840
240 IFRMT(15+I) = IBLNK	S4402850
IF(.NOT.BATCH .AND. .NOT.IBATCH) GOTO 260	S4402860
IF(NXS .GT. 59) GOTO 460	S4402870
ERR = EXEC(1,IIU,IFRMT,-80)	S4402880
IF(IER(2) .LE. 0) GOTO 460	S4402890
CALL IFNBR(IFRMT,-26,IER,IIU)	S4402900
IF (IER .EQ. 0) GO TO 250	S4402910
WRITE (ICU,9001) INV,OFF,23,1	S4402920
GO TO 230	S4402930
250 CALL CODE(30)	S4402940
READ(IFRMT,*) XT,YT	S4402950
IF(XT .LT. 0.0) GOTO 460	S4402960
GOTO 320	S4402970
260 WRITE(ICU,9020) CURSUP,CLRDSP	S4402980
270 CALL IFNBR(IFRMT,26,IER,IIU)	S4402990
IF (IER .EQ. 0) GO TO 290	S4403000
280 WRITE (ICU,9001) INV,OFF,23,1	S4403010
WRITE (ICU,9020) IBLNK,IBLNK	S4403020
GO TO 270	S4403030
290 CALL CODE(80)	S4403040
READ (IFRMT,*) XT,YT	S4403050
IF (XT .EQ. MINS1) GO TO 300	S4403060
IF (XT .EQ. MINS9) GO TO 620	S4403070
IF (XT .GE. 0.0) GO TO 310	S4403080
GO TO 280	S4403090

300	WRITE(ICU,9015) IESCAJ,IESCAJ	S4403100
	GOTO 180	S4403110
310	WRITE(ICU,9018) (CURSUP,CURLFT,CLRDSP,I=1,2)	S4403120
C		S4403130
C**	MAKE 3 CALCULATIONS PER DISCRETE RECEPTOR.	S4403140
C		S4403150
320	YT1 = YT - 10.0	S4403160
	IF(YT1 .LE. 0.0) YT1 = YT1 + 360.0	S4403170
	NXS = NXS + 1	S4403180
	DISBUF(1,NXS) = XT	S4403190
	DISBUF(2,NXS) = YT1	S4403200
	DO 330 J = 1,10	S4403210
330	IDDISR(J,NXS) = IFRMT(15+J)	S4403220
	DO 340 J = 1,3	S4403230
	CALL WASHT(NLK,XT,YT1,NXS,WDHOLD(1,J),.TRUE.)	S4403240
	YT1 = YT1 + 10.0	S4403250
	IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4403260
340	CONTINUE	S4403270
C		S4403280
C**	SAVE RESULTS IN BUFFER.	S4403290
C		S4403300
	L = 2	S4403310
	DO 360 J = 1,3	S4403320
	DO 350 K = 1,4	S4403330
350	DISBUF(L+K,NXS) = WDHOLD(K,J)	S4403340
360	L = L + 4	S4403350
	IF(BATCH) GOTO 230	S4403360
C		S4403370
C**	DISPLAY DISCRETE RECEPTOR RESULTS.	S4403380
C		S4403390
	IF(LINE .LT. 22) GOTO 370	S4403400
	LINE = 5	S4403410
	WRITE(ICU,9021) (MPTDLB(I,MAXLAB),I=1,8),(ZMET(I,1),ZMET(I,2),	S4403420
	1 I=1,NLK)	S4403430
	WRITE(ICU,9033)	S4403440
370	CONTINUE	S4403450
	LINE = LINE + 3	S4403460
	WRITE(ICU,9022) XT,YT	S4403470
	DO 420 JJ = 1,4	S4403480
	IP = IPLLNT(JJ)	S4403490
	IF(IP .NE. 1 .AND. IP .NE. 4) GOTO 420	S4403500
	KDX = IP*3 - 3	S4403510
	K = 0	S4403520
	IF(IP .EQ. 4) K = 2	S4403530
	L = 0	S4403540
	DO 380 I = 1,2	S4403550
	DO 380 J = 1,3	S4403560
	L = L + 1	S4403570
380	WDOUT(L) = WDHOLD(I+K,J)	S4403580
	DO 390 I = 1,3	S4403590
	L = L + 1	S4403600
390	WDOUT(L) = WDOUT(I) + WDOUT(I+3)	S4403610

IF(IP .NE. 1) GOTO 410	S4403620
DO 400 I = 1,3*NLK	S4403630
AI = AMIN1(1.0,AMAX1(WDOUT(I),1.E-14))	S4403640
400 WDOUT(I) = -ALOGT(AI)	S4403650
410 CONTINUE	S4403660
LINE = LINE + 2	S4403670
WRITE(ICU,9023) INV,(IPL(KDX+J),J=1,3),OFF,(WDOUT(J),J=1,3*NLK)	S4403680
420 CONTINUE	S4403690
IF(NXS .LT. 60) GOTO 430	S4403700
WRITE(ICU,9024)	S4403710
GOTO 460	S4403720
430 IF(IBATCH) GOTO 230	S4403730
WRITE(ICU,9025) INVNDR,INV,OFF,ULINE,OFF	S4403740
IDMY = IBLNK	S4403750
READ(IIU,9013) IDMY	S4403760
IF(IDMY .EQ. MINUS9) GOTO 620	S4403770
IF(IDMY .NE. MINUS1) GOTO 440	S4403780
WRITE(ICU,9015) IESCAJ	S4403790
GOTO 180	S4403800
440 IF(IDMY.EQ.IBLNK.OR.IDMY.EQ.IYSJ.OR.IDMY.EQ.IYESJ) GO TO 230	S4403810
IF (IDMY.EQ.INJ.OR.IDMY.EQ.INOJ) GO TO 450	S4403820
WRITE (ICU,9001) INV,OFF,23,2	S4403830
GO TO 430	S4403840
450 WRITE(ICU,9018) CURSUP,CURLFT,CLRDSP	S4403850
C WRITE BLANK LINE.	S4403860
WRITE(ICU,9013) IBLNK	S4403870
C	S4403880
C** PRINT DISCRETE RECEPTOR RESULT.	S4403890
C	S4403900
460 CONTINUE	S4403910
IF(.NOT.IBATCH) GOTO 470	S4403920
IIU = IIUTMP	S4403930
WRITE(ICU,9013) IBLNK	S4403940
470 DO 600 ILK = 1,NLK	S4403950
DO 590 JJ = 1,4	S4403960
IP = IPLLNT(JJ)	S4403970
IF(IP .NE. 1 .AND. IP .NE. 4) GOTO 590	S4403980
KDX = IP*3 - 3	S4403990
WDMAX = 0.0	S4404000
YTMAX = 0.0	S4404010
KKMAX = 1	S4404020
LINE = 100	S4404030
DO 570 KK = 1,NXS	S4404040
IF(LINE .LT. 53) GOTO 500	S4404050
LINE = 15	S4404060
WRITE(IOU,9002) IVERS,LOCATN,MDLNAM	S4404070
WRITE(IOU,9004)	S4404080
WRITE(IOU,9005) (IPL(KDX+J),J=1,3),TITLE,ZMET(ILK,1),ZMET(ILK,2),	S4404090
1 ISTE,LSDT,ISDAY,ISMON,ISYEAR,LTIME,LSDT,LDAY,LMON,LYEAR,	S4404100
2 JTIME,LSDT,JDAY,JMON,JYEAR	S4404110
WRITE(IOU,9026) (MPTDLB(K,MAXLAB),K=1,4),(MPTDLB(K,MAXLAB),K=4,8)	S4404120
IF(IP .NE. 1) GOTO 480	S4404130

WRITE(IOU,9027)	S4404140
K = 0	S4404150
GOTO 490	S4404160
480 WRITE(IOU,9028)	S4404170
K = 2	S4404180
490 WRITE(IOU,9007)	S4404190
500 CONTINUE	S4404200
XT = DISBUF(1, KK)	S4404210
YT1 = DISBUF(2, KK)	S4404220
L = 2	S4404230
DO 560 J = 1, 3	S4404240
IF(ILK .EQ. 3) GOTO 510	S4404250
A1 = DISBUF(L+K+ILK, KK)	S4404260
GOTO 520	S4404270
510 A1 = DISBUF(L+K+1, KK) + DISBUF(L+K+2, KK)	S4404280
520 IF(IP .NE. 1) GOTO 530	S4404290
A1 = AMIN1(1.0, AMAX1(A1, 1.E-14))	S4404300
A1 = -ALOGT(A1)	S4404310
530 IF(A1 .LT. 0.0005) GOTO 550	S4404320
IF(A1 .LT. WDMAX) GOTO 540	S4404330
WDMAX = A1	S4404340
YTMAX = YT1	S4404350
KKMAX = KK	S4404360
540 LINE = LINE + 1	S4404370
IF(J.NE.2) WRITE(IOU,9029) (IBLNK, I=1, 10), XT, YT1, A1	S4404380
IF(J.EQ.2) WRITE(IOU,9029) (IDDISR(I, KK), I=1, 10), XT, YT1, A1	S4404390
550 YT1 = YT1 + 10.0	S4404400
IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4404410
560 L = L + 4	S4404420
570 CONTINUE	S4404430
IF(IP .NE. 1) GOTO 580	S4404440
WDMAX = AMIN1(1.0, AMAX1(WDMAX, 1.E-14))	S4404450
WDMAX = -ALOGT(WDMAX)	S4404460
580 CONTINUE	S4404470
WRITE(IOU,9011)	S4404480
WRITE(IOU,9012) WDMAX, DISBUF(1, KKMAX), YTMAX	S4404490
590 CONTINUE	S4404500
600 CONTINUE	S4404510
GOTO 630	S4404520
C	S4404530
C*** ERROR EXIT.	S4404540
C	S4404550
610 IERROR(1) = MINS1	S4404560
GOTO 630	S4404570
620 IERROR(1) = 1	S4404580
C	S4404590
630 NNNEST = 1	S4404600
NNNTRY = 3	S4404610
CALL REEDM	S4404620
C	S4404630
CF** FORMAT STATEMENTS.	S4404640
CF.	S4404650

9001 FORMAT (2A2,38H \*\*\* REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC. S4404660  
 \*,I2,1H.,I1/) S4404670  
 9002 FORMAT(1H1,38(2H\*\*)/1X,8(2H\*\*),44X,8(2H\*\*)/ S4404680  
 1 1X,8(2H\*\*),3X,13HREEDM UPDATE,I5,11H LOCATION ,2A2,8X,8(2H\*\*)/ S4404690  
 2 1X,8(2H\*\*),4X,12A2,6H MODEL,10X,8(2H\*\*)/ S4404700  
 3 1X,8(2H\*\*),44X,8(2H\*\*)/1X,38(2H\*\*)/) S4404710  
 9003 FORMAT(1X,8(2H\*\*),7X,31HMAXIMUM CENTERLINE CALCULATIONS,6X,8(2H\*\*)S4404720  
 \*) S4404730  
 9004 FORMAT(1X,8(2H\*\*),7X,30HDISCRETE RECEPTOR CALCULATIONS,7X,8(2H\*\*))S4404740  
 9005 FORMAT(/27X,4HFOR ,3A2,15HAT GROUND-LEVEL/15X,16HDOWNWIND FROM A ,S4404750  
 1 14A2,7H LAUNCH/4X,40HCALCULATIONS APPLY TO THE LAYER BETWEEN , S4404760  
 2 F6.1,5H AND ,F6.1,7H METERS//9X,31HTHE METEOROLOGICAL DATA IS FROS4404770  
 3M,I5,2A2,I4,1X,2A2,I4/19X,16H LAUNCH TIME IS,I10,2A2,I4,1X,2A2,I4S4404780  
 4/15X,20HTIME OF EXECUTION IS,I10,2A2,I4,1X,2A2,I4//) S4404790  
 9006 FORMAT(46X,3A2,A1/45X,R1,4A2/46X,7HWASHOUT/ S4404800  
 1 15X,5HRANGE,9X,7HBEARING,8X,10HDEPOSITION) S4404810  
 9007 FORMAT(38(2H--)) S4404820  
 9008 FORMAT(13X,8H(METERS),7X,9H(DEGREES),7X,10H(MG./SQ.M)) S4404830  
 9009 FORMAT(13X,8H(METERS),7X,9H(DEGREES),10X,4H(PH)) S4404840  
 9010 FORMAT(F21.3,F15.3,F17.3) S4404850  
 9011 FORMAT(/53X,16HRANGE BEARING/51X,9(2H--)) S4404860  
 9012 FORMAT(F15.3,31H IS THE PEAK WASHOUT DEPOSITION,F13.3,F10.3) S4404870  
 9013 FORMAT(A2) S4404880  
 9014 FORMAT(50H1DIAGNOSTICS FOR WASHOUT DEPOSITION PROGRAM, RPDPM) S4404890  
 9015 FORMAT(2A2,A1) S4404900  
 9016 FORMAT(A2,12A2,30H MODEL IS PROCESSING RANGE AT ,2A2,F7.1,2A2, S4404910  
 17H METERS) S4404920  
 9017 FORMAT(2A2,10X,2A2,8HPRINTING,2A2) S4404930  
 9018 FORMAT(3A2) S4404940  
 9019 FORMAT(46H DO YOU WISH DISCRETE RECEPTOR CALCULATIONS? (,2A2,1HY, S4404950  
 1 2A2,2HES,2A2,1H,,2A2,1HN,2A2,2HO,,2A2,3HLU#,2A2,16H OF DATA FILE)S4404960  
 2:\_) S4404970  
 9020 F0RMA T(2A2,68H ENTER DISCRETE RECEPTOR LOCATION RELATIVE TO LAUNCHS4404980  
 1 PAD. A 20 CHAR./52H COMMENT MAY BE ENTERED STARTING UNDER THE ASTS4404990  
 2ERISK.,10X,1H\*/33H RANGE(METERS),BEARING(DEGREES):\_) S4405000  
 9021 F0RMA T (1X,37(2H\*\*)/2H \*,19X,8A2,19H WASHOUT DEPOSITION,18X,1H\*/ S4405010  
 \*7H LAYERS,F7.1,3H TO,F7.1,2H \*,F10.1,3H TO,F8.1,4H \*,F10.1,3H TOS4405020  
 \*,F8.1,3H \*) S4405030  
 9022 F0RMA T(/27H DISCRETE RECEPTOR RANGE =,F8.1,11H, BEARING =,F6.1) S4405040  
 9023 F0RMA T (32X,3H\*\* ,4A2,A1,2A2,3H \*\*/2H \*,2F7.1,F8.1,2(2H \*,F8.1,F7.S4405050  
 \*1,F8.1)) S4405060  
 9024 F0RMA T(63H A MAXIMUM OF 60 DISCRETE RECEPTOR LOCATIONS HAVE BEEN ES4405070  
 INTERED./29H THIS SECTION IS TERMINATED.) S4405080  
 9025 F0RMA T(58H DO YOU WISH TO ENTER ANOTHER DISCRETE RECEPTOR LOCATIONS4405090  
 1?(,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):\_) S4405100  
 9026 F0RMA T(56X,3A2,A1/55X,R1,4A2/56X,7HWASHOUT/ S4405110  
 1 25X,5HRANGE,9X,7HBEARING,8X,10HDEPOSITION) S4405120  
 9027 F0RMA T(6X,10HIDENTIFIER,7X,8H(METERS),7X,9H(DEGREES),10X,4H(PH)) S4405130  
 9028 F0RMA T(6X,10HIDENTIFIER,7X,8H(METERS),7X,9H(DEGREES),7X,10H(MG./SQS4405140  
 1.M)) S4405150  
 9029 F0RMA T(1X,10A2,F10.3,F15.3,F17.3) S4405160  
 9030 F0RMA T (73H \*\*\* REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS4405170

* IF -I TYPED AGAIN)	S4405180
C	S4405190
C!!!! H.E.C COPY ONLY.	S4405200
9031 FORMAT (57HDO YOU WISH MAXIMUM CENTERLINE PRECIPITATION DEPOSITIONS	S4405210
*?(,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_)	S4405220
9032 FORMAT (A2)	S4405230
C!!!!	S4405240
9033 FORMAT (1X,3(24H*-10 DEG. POINT +10 DEG.),2H */1X,37(2H**))	S4405250
C	S4405260
END	S4405270

REEDM SOURCE MODULE &RPDPN

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FTN4
SUBROUTINE WASHT(NLK,XO,YO,IXS,BUFDIS,DISCRT)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
-----S4500000
C-----S4500010
C-----S4500020
C-----S4500030
C-----S4500040
C THIS SUBROUTINE CALCULATES THE MAXIMUM PRECIPITATION DEPOSITION S4500050
C FOR A GIVEN RANGE AND MAJOR BOUNDARY. S4500060
C-----S4500070
C-----S4500080
C-----S4500090
C-----S4500100
C***** BEGIN COMMON AREA *****S4500110
C 04/02/82 S4500120
C-----MATH PARAMETERS AND CONSTANTS S4500130
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S4500140
C-----INPUT OPTIONS S4500150
REAL LAMBDA S4500160
INTEGER FILE,GOOD,TITLE S4500170
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S4500180
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S4500190
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S4500200
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S4500210
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S4500220
. ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2) S4500230
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S4500240
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S4500250
. FS(20),MDLNAM(12),DBAR(20) S4500260
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S4500270
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S4500280
. MODEL4,MODEL5,MODEL6 S4500290
INTEGER RUNNUM,RT,CL,CS S4500300
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S4500310
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S4500320
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S4500330
. ,MIXING,MAXDEP,LAYBOT(3) S4500340
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S4500350
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S4500360
. MINUS1,MINUS9,MINS1,MINS9, S4500370
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S4500380
. RT(24),TPROPC,IDXRT S4500390
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S4500400
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S4500410
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4500420
. CLRLNE,INSLNE,DELINE S4500430
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S4500440
. INVNDR(2),ULINE(2), S4500450
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4500460
. CLRLNE,INSLNE,DELINE, S4500470
. IESCAJ(3),NULL,IBLNK, S4500480
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S4500490

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C-----VEHICLE PARAMETERS                                S4500500
COMMON /VCLPR/ VPAR(17)                                S4500510
C-----TIME PARAMETERS                                  S4500520
COMMON /TIME/ JTIME, JDAY, JYEAR, ISTIME, ISDAY, ISYEAR, LTIME,
LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2)        S4500530
S4500540
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S4500550
COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30),
RH(30), PTEMP(30), SIGEP(30), SIGAP(30)                S4500560
S4500570
C-----LAYER PARAMETERS                                 S4500580
COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29),
SIGYO(29)                                                S4500590
S4500600
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)      S4500610
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6)            S4500620
C-----CALCULATED NEW LAYER PARAMETERS                 S4500630
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32),
SPEEDN(32)                                               S4500640
S4500650
C-----CONVERSION FACTORS                              S4500660
COMMON /CNVRT/ QCONV(4), QPDEPH                          S4500670
S4500680
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S4500690
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)           S4500700
C-----READ/WRITE BUFFER                               S4500710
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S4500720
C*****S4500730
C
C-----EQUIVALENCE STATEMENTS                          S4500750
EQUIVALENCE(IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3))
, (IPU2, IPAR(4)), (IPU3, IPAR(5))                      S4500770
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1)      S4500780
S4500790
C*****
C****          E N D   O F   C O M M O N   A R E A          ****S4500800
C
C
C
LOGICAL DISCRT                                         S4500820
DIMENSION CI(100), DI(100), YPI(100), SIGYI(100), BUFDIS(1), MILK(3) S4500830
DIMENSION VALUES(30,1), RANGE(30,1), BEARNG(30,1), SIGYBR(30,1) S4500840
DIMENSION INDEX(2)                                     S4500850
EQUIVALENCE (PLUS, RANGE), (PLUS(181), BEARNG),
1 (PLUS(361), SIGYBR), (PLUS(547), VALUES)            S4500870
DATA MILK /2,3,1/                                     S4500880
DATA RAD /.01745329/, RADI/57.29578/                  S4500890
C
C***** INITIALIZE.                                     S4500910
C
C
XOP = XO                                               S4500930
IF (XOP .EQ. 0.0) XOP = 5.0                            S4500940
ISTART = 1                                             S4500950
SUMSY = 0.0                                           S4500960
INDM = 1                                               S4500970
DO 10 I = 1,100                                       S4500980
DI(I) = 0.0                                           S4500990
10 CI(I) = 0.0                                        S4501000
C
C
C

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C***	BEGIN LOOP OVER MAJOR BOUNDARY LAYERS.	S4501020
C		S4501030
	DO 170 ILK = 1,NLK	S4501040
	NILK = ILK	S4501050
	IF(NLK .GT. 1) NILK = MILK(ILK)	S4501060
	IF(ILK .GT. 2) GOTO 20	S4501070
	JF = NLAYS + ILK	S4501080
	IBOT = LAYBOT(ILK)	S4501090
	ITOP = LAYTOP(ILK)	S4501100
	IF(.NOT.DISCRT) YO = DIRN(JF) + 180.0	S4501110
	AVGSY = 0.0	S4501120
	GOTO 30	S4501130
20	CONTINUE	S4501140
C	COMPUTE UPPER LIMITS OF BOUNDARY LAYERS AND DISTANCE ALONG	S4501150
C	ARC FROM CENTERLINES OF BOUNDARY LAYERS AT RANGE XO.	S4501160
	INDEX(1) = ISTART - NSOURC - 1	S4501170
	INDEX(2) = ISTART - 1	S4501180
	DARC = (DIRN(NLAYS+1) - DIRN(NLAYS+2))*RAD*XO	S4501190
	AVGSY = SUMSY/(ISTART+NSOURC-1)	S4501200
	NSOURC = ISTART - 1	S4501210
	ISTART = 1	S4501220
	GOTO 120	S4501230
30	CONTINUE	S4501240
	NSOURC = 0	S4501250
	SPEEDI = 1.0/SPEEDN(JF)	S4501260
	IF(IRUN .EQ. 4) WRITE(IOU,9003) ILK,XO,YO	S4501270
C		S4501280
C***	BEGIN LOOP OVER METEOROLOGICAL LAYERS WITHIN MAJOR BOUNDARY.	S4501290
C		S4501300
	DO 110 M = IBOT,ITOP	S4501310
	PDEPMX = 0.0	S4501320
	PDEPPH = 0.0	S4501330
	IF(Q(M) .LE. 0.0) GOTO 100	S4501340
C		S4501350
C**	CALL SUBROUTINE TO COMPUTE DOWNWIND(X) AND CROSSWIND(Y) DISTANCES.	S4501360
C		S4501370
	A1 = DIRN(JF)*RAD	S4501380
	CALL COORD(A1,M,XO,YO,XS,YS,X,Y)	S4501390
C	UPWIND?	S4501400
	IF(IFLG .LT. 0) GOTO 100	S4501410
C		S4501420
C**	CALL SUBROUTINE TO COMPUTE SIGMAS FOR THIS MET LAYER.	S4501430
C		S4501440
	CALL SIGMA(X,M,JF,0,SIGAPN(M),SIGEPN(M),DDIR(M))	S4501450
C	BAD SIGMA Y?	S4501460
	IF(SIGYNK .LE. 0.0) GOTO 100	S4501470
C		S4501480
C**	COMPUTE PRIMARY TERMS.	S4501490
C		S4501500
	A1 = (X - 2.15*SIGXNK)*SPEEDI	S4501510
	IF(TIM1 .LT. A1) GOTO 40	S4501520
	IF(IRUN .NE. 4) GOTO 40	S4501530

	WRITE(IOU,9001) XO,YO,M	S4501540
40	CONTINUE	S4501550
C	2.506628 = SQRT(2*PI)	S4501560
	A2 = LAMBDA*Q(M)/(2.506628*SPEEDN(JF)*SIGYNK)	S4501570
	IF(.NOT.DISCRT) GOTO 50	S4501580
C		S4501590
C**	ALAT IS LATERAL TERM FOR NON-CENTERLINE CALCULATIONS.	S4501600
C		S4501610
	ALAT = Y/SIGYNK	S4501620
	ALAT = -.5*ALAT*ALAT	S4501630
	IF(ALAT .LT. -60.0) GOTO 100	S4501640
	ALAT = EXP(ALAT)	S4501650
50	IF(SIGXNK .LE. 0.0) GOTO 100	S4501660
C		S4501670
C**	COMPUTE CENTERLINE PREC. DEPOSITION (PDEPMX) AND ACID (PDEPPH).	S4501680
C		S4501690
	IF(MAXDEP) GOTO 60	S4501700
C	TIME-DEPENDENT.	S4501710
	PDEPMX = -LAMBDA*(X*SPEEDI-TIM1)	S4501720
	IF(PDEPMX .LT. -60.0) GOTO 100	S4501730
	PDEPMX = EXP(PDEPMX)*A2	S4501740
	PDEPPH = PDEPMX	S4501750
	GOTO 70	S4501760
60	CONTINUE	S4501770
C	MAXIMUM POSSIBLE.	S4501780
	PDEPMX = -LAMBDA*2.15*SIGXNK*SPEEDI	S4501790
	IF(PDEPMX .LT. -60.0) GOTO 100	S4501800
	PDEPMX = EXP(PDEPMX)*A2	S4501810
C	837.2093 = 3600/4.3 = HOURS TO SECONDS/STANDARD DEV.	S4501820
	PDEPPH = PDEPMX*837.2093*SPEEDN(JF)/SIGXNK	S4501830
70	CONTINUE	S4501840
	IF(.NOT.DISCRT) GOTO 80	S4501850
	PDEPPH = PDEPPH*ALAT	S4501860
	PDEPMX = PDEPMX*ALAT	S4501870
C		S4501880
C***	SAVE NON-ZERO RESULTS.	S4501890
C		S4501900
80	IF(PDEPMX) 100,100,90	S4501910
90	CI(INDM) = PDEPMX	S4501920
	DI(INDM) = PDEPPH	S4501930
	SIGYI(INDM) = SIGYNK	S4501940
	AVGSY = AVGSY + SIGYNK	S4501950
	YPI(INDM) = Y	S4501960
	NSOURC = NSOURC + 1	S4501970
	INDM = INDM + 1	S4501980
100	CONTINUE	S4501990
	IF(IRUN .NE. 4) GOTO 110	S4502000
	WRITE(IOU,9002) ILK,M,IBOT,ITOP,JF,XO,YO,XS,YS,X,Y,SIGXNK,SIGYNK,	S4502010
1	A1,A2,PDEP,LAMBDA,SPEEDN(JF),TIM1,Q(M),PDEPMX,PDEPPH.	S4502020
110	CONTINUE	S4502030
	SUMSY = SUMSY + AVGSY	S4502040
	AVGSY = AVGSY/NSOURC	S4502050

120	IF(NSOURC .EQ. 0) GOTO 170	S4502060
	I = ISTART + NSOURC - 1	S4502070
	IF(.NOT.DISCRT) GOTO 140	S4502080
	IF(ILK .EQ. 3) GOTO 170	S4502090
C		S4502100
C***	SUM DEPOSITION OVER MET LAYERS FOR DISCRETE RECEPTOR.	S4502110
C		S4502120
	PDEPPH = 0.0	S4502130
	PDEPMX = 0.0	S4502140
	DO 130 J = ISTART,I	S4502150
	PDEPPH = DI(J) + PDEPPH	S4502160
130	PDEPMX = CI(J) + PDEPMX	S4502170
	ISTART = ISTART + NSOURC	S4502180
C		S4502190
C***	SAVE RESULTS IN COMMON BLOCK EXTRA FOR DISCRETE RECEPTOR.	S4502200
C		S4502210
C	LOCATION 1 & 2 = PH WASHOUT DEPOSITION,	S4502220
C	3 & 4 = AL2O3 WASHOUT DEPOSITION.	S4502230
	BUFDIS(ILK) = PDEPPH*QPDEPH*VPAR(13)	S4502240
	BUFDIS(ILK+2) = PDEPMX*1000.0*VPAR(16)	S4502250
	GOTO 170	S4502260
140	CONTINUE	S4502270
C		S4502280
C***	COMPUTE MAXIMUM DEPOSITION ON GROUND. CALL SUBROUTINE PDEPR.	S4502290
C		S4502300
	IF(ILK .GT. 2) GOTO 150	S4502310
	CALL PDEPR(CI,DI,YPI,SIGYI,ISTART,I,PDEPMX,PDEPPH,YMX,YMPH)	S4502320
	ILKMX = ILK	S4502330
	ILKPH = ILK	S4502340
	ISTART = ISTART + NSOURC	S4502350
	GOTO 160	S4502360
150	CALL MAX2L(CI,DI,YPI,SIGYI,DARC,INDEX,PDEPMX,PDEPPH,	S4502370
	1 YMX,YMPH,ILKMX,ILKPH)	S4502380
160	CONTINUE	S4502390
C		S4502400
C***	SAVE RESULTS IN COMMON BLOCK EXTRA FOR MAXIMUM CENTERLINE	S4502410
C***	CALCULATIONS.	S4502420
C		S4502430
	I1 = NILK + 3	S4502440
	RANGE(IXS,NILK) = SQRT(XO*XO+YMPH*YMPH)	S4502450
	RANGE(IXS,I1) = SQRT(XO*XO+YMX*YMX)	S4502460
C	RADI CONVERTS RADIANS TO DEGREES.	S4502470
	A1 = ATAN2(YMPH,XOP)*RADI	S4502480
	A2 = A1 + DIRN(NLAYS+ILKPH) + 180.0	S4502490
	IF(A2 .GT. 360.0) A2 = A2 - 360.0	S4502500
	IF(A2 .LE. 0.0) A2 = A2 + 360.0	S4502510
	BEARNG(IXS,NILK) = A2	S4502520
	IF(YMPH .NE. YMX) A1 = ATAN2(YMX,XOP)*RADI	S4502530
	A2 = A1 + DIRN(NLAYS+ILKMX) + 180.0	S4502540
	BEARNG(IXS,I1) = AMOD(A2,360.0)	S4502550
	SIGYBR(IXS,NILK) = AVGSY	S4502560
	SIGYBR(IXS,I1) = AVGSY	S4502570

VALUES(IXS,NILK) = PDEPPH*QPDEPH*VPAR(13)	S4502580
VALUES(IXS,I1) = PDEPMX*1000.0*VPAR(16)	S4502590
170 IF(IRUN .EQ. 4) WRITE(IOU,9004) ILK,ILKMX,ILKPH,ISTART,NSOURC,	S4502600
1 PDEPMX,PDEPPH,YMMX,YMPH,AVGSY	S4502610
C	S4502620
C***	S4502630
C	S4502640
RETURN	S4502650
C	S4502660
CF** FORMAT STATEMENTS.	S4502670
CF	S4502680
9001 FORMAT(62H0*** REEDM WARNING 023, PRECIPITATION DEPOSITION CALCULS	S4502690
1TED AT/8H RANGE =,F10.3,11H, AZIMUTH =,F10.3,12H, MET. LAYER,I3/	S4502700
222H MAY BE OVER ESTIMATED)	S4502710
9002 FORMAT(20H ILK,M,IBOT,ITOP,JF=,5I6/17H XO,YO,XS,YS,X,Y=,6E12.6/	S4502720
1 33H SIGXNK,SIGYNK,A1,A2,PDEP,LAMBDA=,6E12.6/	S4502730
2 29H SPEEDN,TIM1,Q,PDEPMX,PDEPPH=,5E12.6)	S4502740
9003 FORMAT(/34H DIAGNOSTICS FOR DOWNWIND LOCATION,I6,2F10.2)	S4502750
9004 FORMAT(31H ILK,ILKMX,ILKPH,ISTART,NSOURC=,5I6/	S4502760
1 31H PDEPMX,PDEPPH,YMMX,YMPH,AVGSY=,5E13.6)	S4502770
END	S4502780

SUBROUTINE PDEPR(CI,DI,YPI,SIGYI,ISTART,NSOURC,RCHI,RDHI,	S4600000
1 RYC,RYD)	S4600010
. , UPDATE: 8213 SOURCE: 03 SEP 81 LOCATION: KSC	S4600020
C-----	S4600030
C	S4600040
C    THIS SUBROUTINE CALCULATES THE MAXIMUM CENTER LINE	S4600050
C    WASHOUT DEPOSITION.	S4600060
C	S4600070
C-----	S4600080
DIMENSION CI(1),DI(1),SIGYI(1),YPI(1)	S4600090
IF(NSOURC.EQ.1) GO TO 20	S4600100
DO 10 I = ISTART,NSOURC-1	S4600110
DO 10 J=I+1,NSOURC	S4600120
IF(YPI(I).GT.YPI(J)) GO TO 10	S4600130
TMP1=YPI(I)	S4600140
YPI(I)=YPI(J)	S4600150
YPI(J)=TMP1	S4600160
TMP1=SIGYI(I)	S4600170
SIGYI(I)=SIGYI(J)	S4600180
SIGYI(J)=TMP1	S4600190
TMP1=CI(I)	S4600200
CI(I)=CI(J)	S4600210
CI(J)=TMP1	S4600220
TMP1=DI(I)	S4600230
DI(I)=DI(J)	S4600240
DI(J)=TMP1	S4600250
10 CONTINUE	S4600260
20 CONTINUE	S4600270
ISTR= ISTART	S4600280
RCHI=0.0	S4600290
RDHI=0.0	S4600300
RY=0.0	S4600310
C-----CALCULATE THE NUMBER OF SOURCES IN A GROUP	S4600320
30 SMIN=SIGYI(ISTR)	S4600330
I=ISTR	S4600340
40 IF(I.GT.NSOURC) GO TO 150	S4600350
IF(I.EQ.NSOURC) GO TO 50	S4600360
J=I+1	S4600370
TMP1=YPI(I)-YPI(J)	S4600380
TMP2=1.18*(SIGYI(I)+SIGYI(J))	S4600390
IF(TMP1.GT.TMP2) GO TO 50	S4600400
I=I+1	S4600410
GO TO 40	S4600420
50 CONTINUE	S4600430
SMIN=SIGYI(ISTR)	S4600440
IF(ISTR.EQ.NSOURC) GO TO 70	S4600450
IF(ISTR.EQ.I) GO TO 70	S4600460
DO 60 M=ISTR+1,I	S4600470
60 SMIN=AMIN1(SMIN,SIGYI(M))	S4600480
70 YINC=.08*SMIN	S4600490
YY=YPI(ISTR)	S4600500

80	YCHI=0.0	S4600510
	YDHI=0.0	S4600520
	IF(YY.LT.YPI(I)) GO TO 130	S4600530
	DO 90 M=ISTART,NSOURC	S4600540
	EX=(YY-YPI(M))/SIGYI(M)	S4600550
	EX = TEXP(EX)	S4600560
	YDHI=YDHI+DI(M)*EX	S4600570
	YCHI=YCHI+CI(M)*EX	S4600580
90	CONTINUE	S4600590
100	IF(YCHI.LT.RCHI) GO TO 110	S4600600
	RCHI=YCHI	S4600610
	RYC = YY	S4600620
110	IF(YDHI .LT. RDHI) GOTO 120	S4600630
	RDHI = YDHI	S4600640
	RYD = YY	S4600650
120	YY=YY-YINC	S4600660
	GO TO 80	S4600670
130	CONTINUE	S4600680
140	ISTR=I+1	S4600690
	GO TO 30	S4600700
150	IF(RCHI.LE.0.0) RYC = 0.0	S4600710
	IF(RDHI .LE. 0.0) RYD = 0.0	S4600720
	RETURN	S4600730
	END	S4600740

	SUBROUTINE MAX2L(CI,DI,YPI,SIGYI,DARC,INDEX,RCHI,RDHI,	S4700000
	1 YMCL,YMDL,ILKC,ILKD)	S4700010
	. , UPDATE: 8213 SOURCE: 03 SEP 81 LOCATION: KSC	S4700020
C	-----	S4700030
C		S4700040
C	THIS SUBROUTINE FINDS THE MAXIMUM DEPOSITION VALUE THAT OCCURS	S4700050
C	OVER TWO MAJOR BOUNDARY LAYERS. FOR A GIVEN DOWNWIND DISTANCE,	S4700060
C	THIS ROUTINE INCREMENTS ALONG THE YBAR AXES OF BOTH BOUNDARY	S4700070
C	CENTERLINES AND SAVES THE MAXIMUM VALUES FOUND. THIS SUBROUTINE	S4700080
C	ASSUMES THAT ALL YBAR VALUES HAVE BEEN ORDERED IN DESCENDING	S4700090
C	ORDER WITH RESPECT TO EACH BOUNDARY LAYER CENTERLINE. AT EACH	S4700100
C	INCREMENTAL POINT ON THE YBAR AXES, YBAR VALUES ARE CALCULATED	S4700110
C	FROM EACH SOURCE CLOUD ON THE YBAR AXES TO THE POINT.	S4700120
C	-----	S4700130
C		S4700140
C	DIMENSION CI(1),DI(1),SIGYI(1),YPI(1),INDEX(1)	S4700150
C		S4700160
C	DATA RAD/.01745329/	S4700170
C***	INITIALIZE.	S4700180
C		S4700190
C	DARCY = DARC	S4700200
C	RCHI = 0.0	S4700210
C	RDHI = 0.0	S4700220
C	RAD CONVERTS FROM DEGREES TO RADIANS.	S4700230
C	DTHETR = DTHET*RAD	S4700240
C		S4700250
C***	BEGIN LOOP OVER MAJOR BOUNDARY LAYERS.	S4700260
C		S4700270
C	DO 140 ILK = 1,2	S4700280
C	GET BOUNDARY INDICES.	S4700290
C	IF(ILK .EQ. 2) GOTO 10	S4700300
C	ISTILK = 1	S4700310
C	IENILK = INDEX(1)	S4700320
C	ISTOLK = IENILK + 1	S4700330
C	IENOLK = INDEX(2)	S4700340
C	GOTO 20	S4700350
10	ISTOLK = ISTILK	S4700360
C	IENOLK = IENILK	S4700370
C	ISTILK = INDEX(1) + 1	S4700380
C	IENILK = INDEX(2)	S4700390
C	DARCY = -DARCY	S4700400
C		S4700410
C**	BEGIN LOOP OVER INTERVAL WITHIN WHICH TO INCREMENT.	S4700420
C		S4700430
C	20 ISTR = ISTILK	S4700440
C	30 IF(ISTR .GT. IENILK) GOTO 140	S4700450
C		S4700460
C*	COMPUTE NUMBER OF SOURCES IN THIS INTERVAL.	S4700470
C		S4700480
C	I = ISTR	S4700490
		S4700500



40	IF(I .EQ. IENILK) GOTO 50	S4700510
	I1 = I + 1	S4700520
	A1 = YPI(I) - YPI(I1)	S4700530
	A2 = (SIGYI(I) + SIGYI(I1))*1.18	S4700540
	IF(A1 .GT. A2) GOTO 50	S4700550
	I = I + 1	S4700560
	GOTO 40	S4700570
50	IEND = I	S4700580
C		S4700590
C*	COMPUTE INCREMENTAL DISTANCE(DYILK) & INITIALIZE STARTING	S4700600
C*	POINT(YILK).	S4700610
C		S4700620
	SMIN = 1.E30	S4700630
	DO 60 I = 1, IEND	S4700640
	SMIN = AMINI(SMIN, SIGYI(I))	S4700650
60	CONTINUE	S4700660
	DYILK = .08*SMIN	S4700670
	YILK = YPI(ISTR)	S4700680
C		S4700690
C*	COMPUTE VALUES FOR THIS INCREMENTAL POINT & SAVE MAXIMUMS.	S4700700
C		S4700710
70	YCHI = 0.0	S4700720
	YDHI = 0.0	S4700730
	IF(ISTILK .GT. IENILK) GOTO 90	S4700740
C	SUM ALONG YBAR AXIS OF ILK CENTERLINE.	S4700750
	DO 80 M = ISTILK, IENILK	S4700760
	A1 = (YILK - YPI(M)) / SIGYI(M)	S4700770
	A1 = TEXP(A1)	S4700780
	YCHI = YCHI + CI(M) * A1	S4700790
	YDHI = YDHI + DI(M) * A1	S4700800
80	CONTINUE	S4700810
90	IF(ISTOLK .GT. IENOLK) GOTO 110	S4700820
C	SUM ALONG YBAR AXIS OF OTHER(OLK) CENTERLINE.	S4700830
	DO 100 M = ISTOLK, IENOLK	S4700840
	A1 = (YILK + DARCY - YPI(M)) / SIGYI(M)	S4700850
	A1 = TEXP(A1)	S4700860
	YCHI = YCHI + CI(M) * A1	S4700870
	YDHI = YDHI + DI(M) * A1	S4700880
100	CONTINUE	S4700890
C	SAVE MAXIMUMS.	S4700900
110	IF(YCHI .LT. RCHI) GOTO 120	S4700910
	RCHI = YCHI	S4700920
	YMCL = YILK	S4700930
	ILKC = ILK	S4700940
120	IF(YDHI .LT. RDHI) GOTO 130	S4700950
	RDHI = YDHI	S4700960
	YMDL = YILK	S4700970
	ILKD = ILK	S4700980
130	CONTINUE	S4700990
C		S4701000
C*	DECREMENT TO NEXT POINT.	S4701010
C		S4701020

	YILK = YILK - DYILK	S4701030
	IF(YILK .GT. YPI(IEND)) GOTO 70	S4701040
C		S4701050
C*	GO GET NEXT INTERVAL.	S4701060
	ISTR = IEND + 1	S4701070
	GOTO 30	S4701080
C		S4701090
C**	END OF MAJOR BOUNDARY LOOP. EITHER GET OTHER CENTERLINE OR DONE.	S4701100
C		S4701110
	140 CONTINUE	S4701120
	IF(RCHI .LE. 0.0) YMCL = 0.0	S4701130
	IF(RDHI .LE. 0.0) YMDL = 0.0	S4701140
C		S4701150
C		S4701160
C		S4701170
	RETURN	S4701180
	END	S4701190



```

.           ,MIXING,MAXDEP,LAYBOT(3)                                S4800500
.           ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,              S4800510
.           ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),            S4800520
.           MINUS1,MINUS9,MINS1,MINS9,                             S4800530
.           MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,     S4800540
.           RT(24),TPROPC,IDXRT                                    S4800550
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.    S4800560
  INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,                      S4800570
.           TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,   S4800580
.           CLRLNE,INSLNE,DELIN E                                  S4800590
  COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),      S4800600
.           INVNDR(2),ULINE(2),                                   S4800610
.           TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4800620
.           CLRLNE,INSLNE,DELIN E,                               S4800630
.           IESCAJ(3),NULL,IBLNK,                                S4800640
.           IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)             S4800650
C-----VEHICLE PARAMETERS                                        S4800660
  COMMON /VCLPR/ VPAR(17)                                         S4800670
C-----TIME PARAMETERS                                        S4800680
  COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,       S4800690
.           LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)          S4800700
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)  S4800710
  COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),   S4800720
.           RH(30),PTEMP(30),SIGEP(30),SIGAP(30)                 S4800730
C-----LAYER PARAMETERS                                        S4800740
  COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S4800750
.           SIGYO(29)                                             S4800760
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS)              S4800770
  COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)                       S4800780
C-----CALCULATED NEW LAYER PARAMETERS                        S4800790
  COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S4800800
.           SPEEDN(32)                                           S4800810
C-----CONVERSION FACTORS                                    S4800820
  COMMON /CNVRT/ QCONV(4),QPDEPH                                  S4800830
C                                                                S4800840
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S4800850
  COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)                    S4800860
C-----READ/WRITE BUFFER                                     S4800870
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S4800880
C*****S4800890
C-----EQUIVALENCE STATEMENTS                                S4800900
  EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3))          S4800910
.           ,(IPU2,IPAR(4)),(IPU3,IPAR(5))                      S4800920
  EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)                 S4800930
C                                                                S4800940
C*****S4800950
C          E N D O F C O M M O N A R E A                          ****S4800960
Cq
  INTEGER UNITS(3,2)                                             S4800970
C                                                                S4800980
  DIMENSION ZTOP(2),MILK(2),GDHOLD(4,3),CDAMXS(1)                S4800990
  DIMENSION RANGE(30,1),BEARNG(30,1),SIGYBR(30,1),VALUES(30,1), S4801000
                                                                S4801010

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	1 PEAKS(2,1),PHIS(50),UBARNK(50),SIGAPK(50),SIGEPK(50),IER(2)	S4801020
C	NOTE: THESE DIMENSIONS (10) LIMIT THE MAXIMUM NUMBER OF	S4801030
C	SETTLING CATS TO 10 (SEE MAXNVS IN READM). OTHERWISE,	S4801040
C	THE MAXIMUM COULD BE 20 IF MACHINE SPACE ALLOWED.	S4801050
	DIMENSION GDEPNM(10,50),GDEPP1(10),GDEPP2(10,30),DBARI3(10)	S4801060
	1 ,GDPP2(10,3,60)	S4801070
C		S4801080
	EQUIVALENCE (PLUS,RANGE),(PLUS(181),BEARNG),	S4801090
	1 (PLUS(361),SIGYBR),(PLUS(541),CDAMXS),(PLUS(547),VALUES),	S4801100
	2 (PLUS(727),PEAKS), (ERR,IER), (GDEPP2,GDPP22)	S4801110
C		S4801120
	DATA MILK /5,4/	S4801130
	DATA UNITS /2HMG,2HRA,2HM.,2H P,2HAR,2HT./	S4801140
	DATA ISXS,NXS,INCXS /2,30,1/	S4801150
	DATA JVERSN/8213/	S4801160
C		S4801170
C		S4801180
	IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S4801190
C***	INITIALIZE.	S4801200
C		S4801210
C		S4801220
C!!!!	H.E.C COPY ONLY.	S4801230
	IF (BATCH) GO TO 30	S4801240
	10 WRITE (ICU,9017) INVNDR,INV,OFF,ULINE,OFF	S4801250
	READ (IIU,9018) IFRMT1	S4801260
	IF (IFRMT1.EQ.INJ.OR.IFRMT1.EQ.INOJ) GO TO 220	S4801270
	IF (IFRMT1.EQ.IBLNK.OR.IFRMT1.EQ.IYSJ.OR.IFRMT1.EQ.IYESJ) GO TO 20S	S4801280
	WRITE (ICU,9001) INV,OFF,0,0	S4801290
	GO TO 10	S4801300
	20 WRITE (ICU,9014) CURSUP,CLRLNE	S4801310
	30 CONTINUE	S4801320
C!!!!		S4801330
C		S4801340
	JER = 0	S4801350
	DO 40 I = 1,900	S4801360
40	PLUS(I) = 0.0	S4801370
	DO 50 I = 1,4	S4801380
50	QCONV(I) = 1.0	S4801390
	IF(LAYTOP(2) .EQ. 0) GOTO 60	S4801400
	NLK = 2	S4801410
	GOTO 70	S4801420
60	NLK = 1	S4801430
70	CONTINUE	S4801440
	IBOT = LAYBOT(1)	S4801450
	ITOP = LAYTOP(1)	S4801460
	ZTOP(1) = ALT(ITOP+1)	S4801470
	NILK = 6 - NLK	S4801480
	ITOP = LAYTOP(2)	S4801490
	ZTOP(2) = ALT(ITOP+1)	S4801500
C*	PARTICLES CONVERSION. DENSITY OF AL2O3 PARTICLE USED HERE = 1E6	S4801510
C*	G/M**3 (ACTUAL DENSITY = 3.42E6 G/M**3)	S4801520
C	1.9098593E-6 = 6/(PI*1.00E6)	S4801530

	DO 80 I = 1,NVS	S4801540
	80 DBARI3(I) = 1.9098593E-6/(1.0E-6*DBAR(I))**3	S4801550
C		S4801560
	IF(IRUN .EQ. 4) WRITE(IOU,9007)	S4801570
	CALL SHEAR(UBARNK,PHIS,SIGAPK,SIGEPK,0)	S4801580
C		S4801590
C	CHECK SEGMENT ENTRY POINT.	S4801600
C		S4801610
C		S4801620
C		S4801630
C		S4801640
	IF(IRUN .NE. 4) GOTO 140	S4801650
	90 WRITE(ICU,9015)	S4801660
	CALL IFNBR(IFRMT,20,IER,IIU)	S4801670
	IF (IER .EQ. 0) GO TO 110	S4801680
	100 WRITE (ICU,9001) INV,OFF,0,0	S4801690
	IF (BATCH) GO TO 230	S4801700
	GO TO 90	S4801710
	110 CALL CODE(80)	S4801720
	READ (IFRMT,*) ISXS,NXS,INCXS	S4801730
	IF (ISXS .NE. MINS1) GO TO 120	S4801740
	JER = JER+1	S4801750
	IF (JER .GT. 1) GO TO 230	S4801760
	WRITE (ICU,9016)	S4801770
	GO TO 90	S4801780
	120 JER = 0	S4801790
	IF (ISXS .EQ. MINS9) GO TO 240	S4801800
	IF (ISXS .LE. NX.S.AND.INCXS .LE. NX.S) GO TO 130	S4801810
	GO TO 100	S4801820
	130 WRITE(ICU,9008) IESCAJ	S4801830
	140 CONTINUE	S4801840
	LINE = 100	S4801850
C		S4801860
C***	BEGIN LOOP OVER RANGES.	S4801870
C		S4801880
	DO 170 IXS = ISXS,NXS,INCXS	S4801890
	XO = (IXS-1)*1000.0	S4801900
	YO = DIRN(NLAYS+NLK)+180.0	S4801910
	IF (YO .GT. 360.0) YO = YO-360.0	S4801920
	IF(.NOT.BATCH) WRITE(ICU,9012) CURSUP,MDLNAM,INV,XO,OFF	S4801930
C		S4801940
C**	CALL GRDEP TO COMPUTE GRAVITATIONAL DEPOSITION.	S4801950
C		S4801960
	CALL GRDEP(XO,YO,IXS,.FALSE.,NLK,GD HOLD,PHIS,UBARNK,	S4801970
	1 GDEPNM,GDEPP1,GDEPP2(1,IXS),DBARI3,SIGAPK,SIGEPK)	S4801980
C		S4801990
C**	FIND MAXIMUM VALUES OVER ALL MAJOR BOUNDARY LAYERS.	S4802000
C		S4802010
	DO 150 ILK = 1,5	S4802020
	IF(CDAMXS(ILK) .GT. VALUES(IXS,ILK)) GOTO 150	S4802030
	CDAMXS(ILK) = VALUES(IXS,ILK)	S4802040
	PEAKS(1,ILK) = RANGE(IXS,ILK)	S4802050

PEAKS(2,ILK) = BEARNG(IXS,ILK)	S4802060
150 CONTINUE	S4802070
C	S4802080
C** FOR RESEARCH MODE, PRINT PARTICLE VALUES FOR ALL	S4802090
C** SETTLING CATEGORIES OF THE FIRST BOUNDARY LAYER.	S4802100
C	S4802110
IF(IRUN .LT. 3) GOTO 170	S4802120
IF(LINE .LT. 57) GOTO 160	S4802130
LINE = 24	S4802140
WRITE(IOU,9002) IVERSN,LOCATN,MDLNAM	S4802150
WRITE(IOU,9003)	S4802160
WRITE(IOU,9004) TITLE,ZTOP(1),ISTIME,LSDT,ISDAY,ISMON,ISYEAR,	S4802170
1 LTIME,LSDT,LDAY,LMON,LYEAR,JTIME,LSDT,JDAY,JMON,JYEAR	S4802180
WRITE(IOU,9009)	S4802190
160 A1 = VALUES(IXS,NLK+3)	S4802200
A2 = VALUES(IXS,NLK)	S4802210
IF(A1 .LT. 0.0005 .AND. A2 .LT. 0.05) GOTO 170	S4802220
WRITE(IOU,9010) RANGE(IXS,NLK),BEARNG(IXS,NLK),A1,A2,	S4802230
1 (N,GDEPP1(N),N=1,NVS)	S4802240
LINE = LINE + NVS/4 + 1	S4802250
170 CONTINUE	S4802260
IF(.NOT.BATCH) WRITE(ICU,9013) CURSUP,CLRDSP,BLNKNG,OFF	S4802270
C	S4802280
C*** BEGIN OUTPUT -- LOOP OVER MAJOR BOUNDARY LAYERS.	S4802290
C	S4802300
DO 210 ILK = 1,NLK	S4802310
I1 = ILK + 3	S4802320
IF(NLK .EQ. 2) I1 = MILK(ILK)	S4802330
IF(IRUN .GT. 2 .AND. ILK .EQ. 1) GOTO 210	S4802340
C	S4802350
C** BEGIN LOOP OVER RANGES.	S4802360
C	S4802370
LINE = 100	S4802380
DO 200 IXS = ISXS,NXS,INCXS	S4802390
IF(LINE .LT. 57) GOTO 180	S4802400
C* PRINT HEADING.	S4802410
LINE = 24	S4802420
WRITE(IOU,9002) IVERSN,LOCATN,MDLNAM	S4802430
WRITE(IOU,9003)	S4802440
WRITE(IOU,9004) TITLE,ZTOP(ILK),ISTIME,LSDT,ISDAY,ISMON,ISYEAR,	S4802450
1 LTIME,LSDT,LDAY,LMON,LYEAR,JTIME,LSDT,JDAY,JMON,JYEAR	S4802460
IF(IRUN .GT. 2) WRITE(IOU,9009)	S4802470
IF(IRUN .LT. 3) WRITE(IOU,9011)	S4802480
C* PRINT RESULTS.	S4802490
180 A1 = VALUES(IXS,I1)	S4802500
A2 = VALUES(IXS,I1-3)	S4802510
IF (IRUN .LT. 3.AND.A1 .LT. .0005) GO TO 200	S4802520
IF(A1 .LT. 0.0005 .AND. A2 .LT. 0.05) GOTO 200	S4802530
IF(IRUN .GT. 2) GOTO 190	S4802540
WRITE(IOU,9005) RANGE(IXS,I1),BEARNG(IXS,I1),A1,A2	S4802550
GOTO 200	S4802560
190 WRITE(IOU,9010) RANGE(IXS,I1),BEARNG(IXS,I1),A1,A2,	S4802570

1	(N,GDEPP2(N,IXS),N=1,NVS)	S4802580
	LINE = LINE + NVS/5 + 1	S4802590
200	CONTINUE	S4802600
C		S4802610
C**	PRINT MAXIMUM VALUE FOUND OVER ALL RANGES.	S4802620
C		S4802630
210	WRITE(IOU,9006) CDAMXS(I1),PEAKS(1,I1),PEAKS(2,I1)	S4802640
	IF(.NOT.BATCH) WRITE(ICU,9014) CURSUP,CURLFT,CLRDSP	S4802650
C	UNLOCK PRINTER.	S4802660
220	CONTINUE	S4802670
C		S4802680
C		S4802690
C		S4802700
	NNNEST = 3	S4802710
	NNNTRY = 4	S4802720
	GO TO 260	S4802730
C		S4802740
C***	ERROR EXIT.	S4802750
C		S4802760
230	IERROR(1) = MINS1	S4802770
	GO TO 250	S4802780
240	IERROR(1) = 1	S4802790
250	NNNEST = 1	S4802800
	NNNTRY = 3	S4802810
260	CONTINUE	S4802820
	CALL REEDM	S4802830
C		S4802840
C		S4802850
C		S4802860
CF**	FORMAT STATEMENTS.	S4802870
CF		S4802880
9001	FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S4802890
	*,I2,1H.,I1/)	S4802900
9002	FORMAT(1H1,38(2H**)/1X,8(2H**),44X,8(2H**)/	S4802910
	1 1X,8(2H**),3X,13HREEDM UPDATE,I5,11H LOCATION ,2A2,8X,8(2H**)/	S4802920
	2 1X,8(2H**),7X,12A2,6H MODEL,7X,8(2H**)/	S4802930
	3 1X,8(2H**),44X,8(2H**)/1X,38(2H**)/)	S4802940
9003	FORMAT(1X,8(2H**),7X,31HMAXIMUM CENTERLINE CALCULATIONS,6X,8(2H**)	S4802950
	*)	S4802960
9004	FORMAT(/27X,25HFOR AL2O3 AT GROUND-LEVEL/15X,16HDOWNWIND FROM A ,	S4802970
	1 14A2,7H LAUNCH/4X,56HCALCULATIONS APPLY TO THE LAYER BETWEEN THE	S4802980
	2SURFACE AND ,F7.2,7H METERS//9X,31HTHE METEOROLOGICAL DATA IS FROMS	S4802990
	3 ,I5,2A2,I4,1X,2A2,I4/19X,16H LAUNCH TIME IS,I10,2A2,I4,1X,2A2,I4S	S4803000
	4/15X,20HTIME OF EXECUTION IS,I10,2A2,I4,1X,2A2,I4//)	S4803010
9005	FORMAT(11X,2F12.3,F14.3,1PE18.5)	S4803020
9006	FORMAT(/56X,16HRANGE BEARING/53X,10(2H--)/FI5.3,	S4803030
	1 37H IS THE PEAK GRAVITATIONAL DEPOSITION,2F10.3)	S4803040
9007	FORMAT(47H1DIAGNOSTICS FOR GRAVITATIONAL DEPOSITION MODEL/)	S4803050
9008	FORMAT(2A2,A1)	S4803060
9009	FORMAT(30X,28H- GRAVITATIONAL DEPOSITION -/	S4803070
	1 7X,50HRANGE BEARING (MILLIGRAMS/ (PARTICLES/,16X,	S4803080
	2 34H- PARTICLES BY SETTLING CATEGORY -/	S4803090



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3 5X,25H(METERS) (DEGREES) ,2(11H(SQ. METER),5X), S4803100
4 3(12H CAT. DEP.,7X)/5X,57(2H--)) S4803110
9010 FORMAT(1X,2F12.3,F14.3,1PE18.5,2X,3(I6,E13.5)/(59X,3(I6,E13.5))) S4803120
9011 FORMAT(40X,28H- GRAVITATIONAL DEPOSITION -/ S4803130
1 17X,50HRANGE BEARING (MILLIGRAMS/ (PARTICLES// S4803140
2 15X,25H(METERS) (DEGREES) ,2(11H(SQ. METER),5X)/15X,27(2H--S4803150
3)) S4803160
9012 FORMAT(A2,1X,12A2,30H MODEL IS PROCESSING RANGE AT ,2A2,F7.1,2A2, S4803170
1 7H METERS) S4803180
9013 FORMAT(2A2,10X,2A2,8HPRINTING,2A2) S4803190
9014 FORMAT(3A2) S4803200
9015 FORMAT(41H DIAGNOSTIC RUN. ENTER ISXS,NXS,INCXS:_) S4803210
9016 FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS4803220
* IF -1 TYPED AGAIN) S4803230
C S4803240
C!!!! H.E.C COPY ONLY. S4803250
9017 FORMAT (57HDO YOU WISH MAXIMUM CENTERLINE GRAVITATIONAL DEPOSITIONS4803260
*?(,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_) S4803270
9018 FORMAT (A2) S4803280
C!!!! S4803290
C S4803300
END S4803310

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REEDM SOURCE MODULE &RGPDM

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FTN4
PROGRAM RGPDM(5)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:::::
C:::::
C:::::
C:::::
C:::: ORGANIZATION: H. E. CRAMER CO., INC.
C:::::
C:::: WORK FOR: DR. J. B. STEPHENS (ES84)
C:::::
C:::: PROGRAM CODE: RGPDM
C:::::
C:::: PROGRAM DESCRIPTION:
C:::: THIS PROGRAM CALCULATES GROUND-LEVEL DEPOSITION DUE TO GRAVITA-
C:::: TIONAL SETTLING FOR A SOURCE THAT EXTENDS VERTICALLY THROUGH AN-
C:::: ENTIRE BOUNDARY LAYER. THE AL2O3 SPECIES IS THE ONLY ONE TO
C:::: HAVE GRAVITATIONAL DEPOSITION. CALCULATIONS ARE MADE EVERY
C:::: KILOMETER DOWNWIND FROM THE LAUNCH SITE AND, UPON REQUEST,
C:::: CALCULATIONS MAY ALSO BE MADE AT USER-DEFINED DISCRETE
C:::: LOCATIONS. THIS PROGRAM CONTROLS THE PRINT OUTPUT AND PLOT
C:::: OPTIONS.
C:::::
C:::::
C:::::
C:::::
C
Cç
C****          B E G I N C O M M O N A R E A          ****
C      04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
.      ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
.      XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
.      IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
.      ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
.      ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2)
.      ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
.      TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
.      FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,
MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
.      DPZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
.      SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP

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.           ,MIXING,MAXDEP,LAYBOT(3)           S4900500
.           ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S4900510
.           ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S4900520
.           MINUS1,MINUS9,MINS1,MINS9,           S4900530
.           MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S4900540
.           RT(24),TPROPC,IDXRT                 S4900550
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S4900560
      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S4900570
.           TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4900580
.           CLRLNE,INSLNE,DELIN                   S4900590
      COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S4900600
.           INVNDR(2),ULINE(2),                   S4900610
.           TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S4900620
.           CLRLNE,INSLNE,DELIN                   S4900630
.           IESCAJ(3),NULL,IBLNK,                 S4900640
.           IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S4900650
C-----VEHICLE PARAMETERS S4900660
      COMMON /VCLPR/ VPAR(17) S4900670
C-----TIME PARAMETERS S4900680
      COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME, S4900690
.           LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2) S4900700
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S4900710
      COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30), S4900720
.           RH(30),PTEMP(30),SIGEP(30),SIGAP(30) S4900730
C-----LAYER PARAMETERS S4900740
      COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S4900750
.           SIGYO(29) S4900760
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS) S4900770
      COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6) S4900780
C-----CALCULATED NEW LAYER PARAMETERS S4900790
      COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S4900800
.           SPEEDN(32) S4900810
C-----CONVERSION FACTORS S4900820
      COMMON /CNVRT/ QCONV(4),QPDEPH S4900830
C S4900840
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S4900850
      COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S4900860
C-----READ/WRITE BUFFER S4900870
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S4900880
C*****S4900890
C S4900900
C-----EQUIVALENCE STATEMENTS S4900910
      EQUIVALENCE(IIU,IPAR(1)),(IOU,IPAR(2)),(IPU1,IPAR(3)) S4900920
.           ,(IPU2,IPAR(4)),(IPU3,IPAR(5)) S4900930
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1) S4900940
C S4900950
C****          E N D O F C O M M O N A R E A          ****S4900960
Cç S4900970
      INTEGER UNITS(3,2) S4900980
      LOGICAL IBATCH S4900990
C S4901000
      DIMENSION DISBUF(14,1),ZTOP(2),GDHOLD(4,3), S4901010

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	1 PHIS(50),UBARNK(50),SIGAPK(50),SIGEPK(50),IER(2)	S4901020
C	NOTE: THESE DIMENSIONS (10) LIMIT THE MAXIMUM NUMBER OF	S4901030
C	SETTLING CATS TO 10 (SEE MAXNVS IN READM). OTHERWISE,	S4901040
C	THE MAXIMUM COULD BE 20 IF MACHINE SPACE ALLOWED.	S4901050
	DIMENSION GDEPNM(10,50),GDEPP1(10),GDEPP2(10,30),DBARI3(10)	S4901060
	1 ,GDPP22(10,3,60),IDDISR(10,60)	S4901070
C		S4901080
	EQUIVALENCE (PLUS,DISBUF),	S4901090
	2 (ERR,IER), (GDEPP2,GDPP22)	S4901100
C		S4901110
	DATA UNITS /2HMG,2HRA,2HM.,2H P,2HAR,2HT./	S4901120
	DATA NXS /30/	S4901130
	DATA IBATCH /.FALSE./	S4901140
	DATA JVERSN/8213/	S4901150
C		S4901160
C		S4901170
	IF (IVERSN .NE. JVERSN) CALL LOADS(-1,0,0,0,0,BATCH)	S4901180
C***	INITIALIZE.	S4901190
C		S4901200
	JER = 0	S4901210
	DO 10 I=1,900	S4901220
10	PLUS(I) = 0.0	S4901230
	DO 20 I=1,4	S4901240
20	QCONV(I) = 1.0	S4901250
	IF(LAYTOP(2) .EQ. 0) GOTO 30	S4901260
	NLK = 2	S4901270
	GOTO 40	S4901280
30	NLK = 1	S4901290
40	CONTINUE	S4901300
	IBOT = LAYBOT(1)	S4901310
	ITOP = LAYTOP(1)	S4901320
	ZTOP(1) = ALT(ITOP+1)	S4901330
	NILK = 6 - NLK	S4901340
	ITOP = LAYTOP(2)	S4901350
	ZTOP(2) = ALT(ITOP+1)	S4901360
C*	PARTICLES CONVERSION. DENSITY OF AL2O3 PARTICLE USED HERE = 1E6	S4901370
C*	G/M**3 (ACTUAL DENSITY = 3.42E6 G/M**3)	S4901380
C	1.9098593E-6 = 6/(PI*1.00E6)	S4901390
	DO 50 I = 1,NVS	S4901400
50	DBARI3(I) = 1.9098593E-6/(1.0E-6*DBAR(I))**3	S4901410
C		S4901420
	IF(IRUN .EQ. 4) WRITE(IOU,9007)	S4901430
	CALL SHEAR(UBARNK,PHIS,SIGAPK,SIGEPK,0)	S4901440
C		S4901450
C***	CHECK FOR DISCRETE RECEPTOR CALCULATIONS.	S4901460
C		S4901470
60	IER = 0	S4901480
	IF(.NOT.BATCH) GOTO 70	S4901490
	READ(IIU,9005) IDMY	S4901500
	GOTO 80	S4901510
70	WRITE(ICU,9015) INVNDR,INV,OFF,(ULINE,OFF,I=1,2)	S4901520
	CALL IFNBR(IFRMT,14,IER,IIU)	S4901530

IDMY = IFRMT(1)	S4901540
IF(IDMY.EQ.MINUS9) GOTO 420	S4901550
IF(IDMY.NE.MINUS1) GO TO 80	S4901560
JER = JER+1	S4901570
IF (JER .GT. 1) GO TO 410	S4901580
WRITE (ICU,9022)	S4901590
GO TO 70	S4901600
80 JER = 0	S4901610
IF(IDMY .EQ. INJ .OR. IDMY .EQ. INOJ) GOTO 430	S4901620
IF(IDMY.EQ.IBLNK.OR.IDMY.EQ.IYSJ.OR.IDMY.EQ.IYESJ) GOTO 100	S4901630
IF (IER .EQ. 0) GO TO 90	S4901640
WRITE (ICU,9001) INV,OFF,23,0	S4901650
IF (BATCH) GO TO 410	S4901660
GO TO 70	S4901670
90 IBATCH = .TRUE.	S4901680
IIUTMP = IIU	S4901690
CALL CODE(2)	S4901700
READ(IDMY,*) IIU	S4901710
WRITE(ICU,9008) IESCAJ	S4901720
C	S4901730
C*** BEGIN DISCRETE RECEPTOR CALCULATIONS.	S4901740
C	S4901750
100 GDMAX = 0.0	S4901760
YTMAX = 0.0	S4901770
MIXS = 1	S4901780
NXS = 0	S4901790
LINED = 100	S4901800
LINEP = 100	S4901810
C QUERY RECEPTOR LOCATION.	S4901820
110 CONTINUE	S4901830
DO 120 J = 1,10	S4901840
120 IFRMT(15+J) = IBLNK	S4901850
IF(.NOT.BATCH .AND. .NOT.IBATCH) GOTO 140	S4901860
IF(NXS .GT. 59) GOTO 320	S4901870
ERR = EXEC(1,IIU,IFRMT,-80)	S4901880
IF(IER(2) .LE. 0) GOTO 320	S4901890
CALL IFNBR(IFRMT,-26,IER,IIU)	S4901900
IF (IER .EQ. 0) GO TO 130	S4901910
WRITE (ICU,9001) INV,OFF,23,1	S4901920
GO TO 110	S4901930
130 CALL CODE(30)	S4901940
READ(IFRMT,*) XT,YT	S4901950
IF(XT .LT. 0.0) GOTO 320	S4901960
GOTO 200	S4901970
140 WRITE(ICU,9009) CURSUP,CLRDSP	S4901980
150 CALL IFNBR(IFRMT,26,IER,IIU)	S4901990
IF (IER .EQ. 0) GO TO 170	S4902000
160 WRITE (ICU,9001) INV,OFF,23,1	S4902010
WRITE (ICU,9009) IBLNK,IBLNK	S4902020
GO TO 150	S4902030
170 CALL CODE(80)	S4902040
READ (IFRMT,*) XT,YT	S4902050

IF (XT .EQ. MINS1) GO TO 180	S4902060
IF (XT .EQ. MINS9) GO TO 420	S4902070
IF (XT .GE. 0.0) GO TO 190	S4902080
GO TO 160	S4902090
180 WRITE(ICU,9008) IESCAJ	S4902100
GOTO 60	S4902110
190 WRITE(ICU,9010) (CURSUP,CURLFT,CLRDSP,I=1,2)	S4902120
C	S4902130
C** MAKE 3 CALCULATIONS PER DISCRETE RECEPTOR ENTERED.	S4902140
C	S4902150
200 YT1 = YT - 10.0	S4902160
IF(YT1 .LE. 0.0) YT1 = YT1 + 360.0	S4902170
NXS = NXs + 1	S4902180
DISBUF(1,NXS) = XT	S4902190
DISBUF(2,NXS) = YT1	S4902200
DO 210 J = 1,10	S4902210
210 IDDISR(J,NXS) = IFRMT(15+J)	S4902220
DO 250 J = 1,3	S4902230
DO 220 I=1,4	S4902240
220 GDHOLD(I,J) = 0.0	S4902250
C* CALL GRDEP TO COMPUTE GRAVITATIONAL DEPOSITION.	S4902260
CALL GRDEP(XT,YT1,NXS, .TRUE. ,NLK,GDHOLD(1,J),PHIS,UBARNK,	S4902270
1 GDEPNM,GDEPPI,GDPP22(1,J,NXS),DBARI3,SIGAPK,SIGEPK)	S4902280
C	S4902290
C* FOR RESEARCH MODE, PRINT PARTICLE VALUES FOR ALL SETTLING	S4902300
C* CATEGORIES OF THE FIRST BOUNDARY LAYER.	S4902310
C	S4902320
IF(IRUN .LT. 3) GOTO 240	S4902330
IF(LINEP .LT. 53) GOTO 230	S4902340
LINEP = 23	S4902350
WRITE(IOU,9002) IVERS,LOCATN,MDLNAM	S4902360
WRITE(IOU,9006)	S4902370
WRITE(IOU,9003) TITLE,ZTOP(1),ISTIME,LSDT,ISDAY,ISMON,ISYEAR,	S4902380
1 LTIME,LSDT,LDAY,LMON,LYEAR,JTIME,LSDT,JDAY,JMON,JYEAR	S4902390
WRITE(IOU,9019)	S4902400
230 A1 = GDHOLD(1,J)	S4902410
A2 = GDHOLD(3,J)	S4902420
IF(A1 .LT. 0.0005 .AND. A2 .LT. 0.05) GOTO 240	S4902430
IF(J.NE.2) WRITE(IOU,9020) XT,YT1,A1,A2,(N,GDEPPI(N),N=1,NVS)	S4902440
IF(J.EQ.2) WRITE(IOU,9016) (IDDISR(N,NXS),N=1,10),XT,YT1,A1,A2,	S4902450
1 (N,GDEPPI(N),N=1,NVS)	S4902460
LINEP = LINEP + NVS/4 + 1	S4902470
IF(GDMAX .GT. A1) GOTO 240	S4902480
GDMAX = A1	S4902490
YTMAX = YT1	S4902500
MIXS = NXs	S4902510
240 YT1 = YT1 + 10.0	S4902520
IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4902530
250 CONTINUE	S4902540
C	S4902550
C** SAVE RESULTS IN BUFFER.	S4902560
C	S4902570

L = 2	S4902580
DO 270 J = 1,3	S4902590
DO 260 K = 1,4	S4902600
260 DISBUF(L+K,NXS) = GDHOLD(K,J)	S4902610
270 L = L + 4	S4902620
IF(BATCH) GOTO 110	S4902630
C	S4902640
C** DISPLAY DISCRETE RECEPTOR RESULTS.	S4902650
C	S4902660
C DISPLAY HEADING.	S4902670
IF(LINED .LT. 22) GOTO 280	S4902680
LINED = 5	S4902690
WRITE(ICU,9011) (ZTOP(I),I=1,NLK)	S4902700
WRITE(ICU,9023)	S4902710
280 CONTINUE	S4902720
LINED = LINED + 5	S4902730
C DISPLAY LOCATION AND RESULTS.	S4902740
WRITE(ICU,9012) XT,YT,((UNITS(I,K),I=1,3),((GDHOLD(J+K-1,I),	S4902750
1 I=1,3),J=K,K+1),K=1,2)	S4902760
IF(NXS .LT. 60) GOTO 290	S4902770
C MAX. NO. OF RECEPTORS HAVE BEEN ENTERED.	S4902780
WRITE(ICU,9013)	S4902790
GOTO 320	S4902800
C QUERY ANOTHER RECEPTOR.	S4902810
290 IF(IBATCH) GOTO 110	S4902820
WRITE(ICU,9014) INVNDR,INV,OFF,ULINE,OFF	S4902830
IDMY = IBLNK	S4902840
READ(IIU,9005) IDMY	S4902850
IF(IDMY .EQ. MINUS9) GOTO 420	S4902860
IF(IDMY .NE. MINUS1) GOTO 300	S4902870
WRITE(ICU,9008) IESCAJ	S4902880
GOTO 60	S4902890
300 IF(IDMY.EQ.IBLNK.OR.IDMY.EQ.IYSJ.OR.IDMY.EQ.IYESJ) GO TO 110	S4902900
IF (IDMY .EQ. INJ.OR.IDMY .EQ.INOJ) GO TO 310	S4902910
WRITE (ICU,9001) INV,OFF,23,2	S4902920
GO TO 290	S4902930
C CURSOR UP AND WRITE BLANK LINE.	S4902940
310 WRITE(ICU,9010) CURSUP,CURLFT,CLRDSP	S4902950
WRITE(ICU,9005)	S4902960
C** PRINT MAXIMUM FOR LAYER ONE, RESEARCH MODE.	S4902970
IF(IRUN .GT. 2) WRITE(IOU,9004) GDMAX,DISBUF(1,MIXS),YTMAX	S4902980
C	S4902990
C** PRINT DISCRETE RECEPTOR RESULTS.	S4903000
C	S4903010
320 CONTINUE	S4903020
IF(.NOT.IBATCH) GOTO 330	S4903030
IIU = IIUTMP	S4903040
WRITE(ICU,9005) IBLNK	S4903050
C* BEGIN LOOP OVER MAJOR BOUNDARY LAYERS.	S4903060
330 DO 400 ILK = 1,NLK	S4903070
IF(IRUN .GT. 2 .AND. ILK .EQ. 1) GOTO 400	S4903080
GDMAX = 0.0	S4903090

	YTMAX = 0.0	S4903100
	MIXS = 1	S4903110
	LINEP = 100	S4903120
C*	BEGIN LOOP OVER NUMBER OF DISCRETE RECEPTORS.	S4903130
	DO 390 IXS = 1,NXS	S4903140
	IF(LINEP .LT. 53) GOTO 340	S4903150
	LINEP = 23	S4903160
C	PRINT HEADING.	S4903170
	WRITE(IOU,9002) IVERS,LOCATN,MDLNAM	S4903180
	WRITE(IOU,9006)	S4903190
	WRITE(IOU,9003) TITLE,ZTOP(ILK),ISTIME,LSDT,ISDAY,ISMON,ISYEAR,	S4903200
	1 LTIME,LSDT,LDAY,LMON,LYEAR,JTIME,LSDT,JDAY,JMON,JYEAR	S4903210
	IF(IRUN .GT. 2) WRITE(IOU,9019)	S4903220
	IF(IRUN .LT. 3) WRITE(IOU,9021)	S4903230
340	XT = DISBUF(1,IXS)	S4903240
	YT1 = DISBUF(2,IXS)	S4903250
	L = 2	S4903260
	DO 380 J = 1,3	S4903270
C	PRINT RESULTS.	S4903280
	A1 = DISBUF(L+ILK,IXS)	S4903290
	A2 = DISBUF(L+ILK+2,IXS)	S4903300
	IF(A1 .LT. 0.0005 .AND. A2 .LT. 0.05) GOTO 370	S4903310
	IF(A1 .LT. GDMAX) GOTO 350	S4903320
	GDMAX = A1	S4903330
	YTMAX = YT1	S4903340
	MIXS = IXS	S4903350
350	IF(IRUN .GT. 2) GOTO 360	S4903360
	LINEP = LINEP + 1	S4903370
	IF(J.NE.2) WRITE(IOU,9018) XT,YT1,A1,A2	S4903380
	IF(J.EQ.2) WRITE(IOU,9017) (IDDISR(N,IXS),N=1,10),XT,YT1,A1,A2	S4903390
	GOTO 370	S4903400
360	IF(J.NE.2) WRITE(IOU,9020) XT,YT1,A1,A2,(N,GDPP22(N,J,IXS),	S4903410
	1 N=1,NVS)	S4903420
	IF(J.EQ.2) WRITE(IOU,9016) (IDDISR(N,IXS),N=1,10),XT,YT1,A1,A2,	S4903430
	1 (N,GDPP22(N,J,IXS),N=1,NVS)	S4903440
	LINEP = LINEP + NVS/4 + 1	S4903450
370	YT1 = YT1 + 10.0	S4903460
	IF(YT1 .GT. 360.0) YT1 = YT1 - 360.0	S4903470
380	L = L + 4	S4903480
390	CONTINUE	S4903490
C*	PRINT MAXIMUM RESULT FOUND OVER DISCRETE RECEPTORS.	S4903500
	WRITE(IOU,9004) GDMAX,DISBUF(1,MIXS),YTMAX	S4903510
400	CONTINUE	S4903520
	GOTO 430	S4903530
C		S4903540
C***	ERROR EXIT.	S4903550
C		S4903560
410	IERROR(1) = MINS1	S4903570
	GOTO 430	S4903580
420	IERROR(1) = 1	S4903590
C		S4903600
C***	RETURN TO MAIN PROGRAM.	S4903610



C		S4903620
	430 CONTINUE	S4903630
	NNNEST = 1	S4903640
	NNNTRY = 3	S4903650
	CALL REEDM	S4903660
C		S4903670
CF**	FORMAT STATEMENTS.	S4903680
CF		S4903690
9001	FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC. *,I2,1H.,I1/)	S4903700
9002	FORMAT(1H1,38(2H**)/1X,8(2H**),44X,8(2H**)/ 1 1X,8(2H**),3X,13HREEDM UPDATE,I5,11H LOCATION ,2A2,8X,8(2H**)/ 2 1X,8(2H**),7X,12A2,6H MODEL,7X,8(2H**)/ 3 1X,8(2H**),44X,8(2H**)/1X,38(2H**)/)	S4903710 S4903720 S4903730 S4903740 S4903750
9003	FORMAT(/27X,25HFOR AL203 AT GROUND-LEVEL/15X,16HDOWNWIND FROM A , 1 14A2,7H LAUNCH/4X,56HCALCULATIONS APPLY TO THE LAYER BETWEEN THE 2SURFACE AND ,F7.2,6H METERS//9X,31HTHE METEOROLOGICAL DATA IS FROMS 3 ,I5,2A2,I4,1X,2A2,I4/19X,16H LAUNCH TIME IS,I10,2A2,I4,1X,2A2,I4S 4/15X,20HTIME OF EXECUTION IS,I10,2A2,I4,1X,2A2,I4//)	S4903760 S4903770 S4903780 S4903790
9004	FORMAT(/56X,16HRANGE BEARING/53X,10(2H--)/F15.3, 1 37H IS THE PEAK GRAVITATIONAL DEPOSITION,2F10.3)	S4903800 S4903810 S4903820
9005	FORMAT(A2)	S4903830
9006	FORMAT(1X,8(2H**),7X,30HDISCRETE RECEPTOR CALCULATIONS,7X, 1 8(2H**))	S4903840 S4903850
9007	FORMAT(47HIDIAGNOSTICS FOR GRAVITATIONAL DEPOSITION MODEL/)	S4903860
9008	FORMAT(2A2,A1)	S4903870
9009	FORMAT(2A2,68H ENTER DISCRETE RECEPTOR LOCATION RELATIVE TO LAUNCHS 1 PAD. A 20 CHAR./52H COMMENT MAY BE ENTERED STARTING UNDER THE ASTS 2ERISK.,10X,1H*/33H RANGE(METERS),BEARING(DEGREES):_)	S4903880 S4903890 S4903900
9010	FORMAT(3A2)	S4903910
9011	FORMAT(1X,37(2H**)/23X,34HGRAVITATIONAL DEPOSITION FOR A1203/ 1 10H LAYERS = ,2(1H*,7X,11HSURFACE TO ,F7.2,7X))	S4903920 S4903930
9012	FORMAT(/11X,26HDISCRETE RECEPTOR RANGE = ,F7.1,11H, BEARING = ,F6.1S 1/1X,3A2,1X,2(3H *,3(1X,F9.3))/1X,3A2,1X,2(3H *,1P3E10.3))	S4903940 S4903950
9013	FORMAT(63H A MAXIMUM OF 60 DISCRETE RECEPTOR LOCATIONS HAVE BEEN ES INTERED./29H THIS SECTION IS TERMINATED._)	S4903960 S4903970
9014	FORMAT(58H DO YOU WISH TO ENTER ANOTHER DISCRETE RECEPTOR LOCATIONS 1?(,2A2,1HY,2A2,2HES,2A2,1H,,2A2,1HN,2A2,4HO):_)	S4903980 S4903990
9015	FORMAT(46H DO YOU WISH DISCRETE RECEPTOR CALCULATIONS? (,2A2,1HY, 1 2A2,2HES,2A2,1H,,2A2,1HN,2A2,2HO,,2A2,3HLU#,2A2,16H OF DATA FILE) 2:_)	S4904000 S4904010 S4904020
9016	FORMAT(1X,10A2,1X,2F11.3,F13.3,1PE18.5,2X,3(I5,E13.5)/ 1 (73X,3(I5,E13.5)))	S4904030 S4904040
9017	FORMAT(1X,10A2,2F12.3,F14.3,1PE18.5)	S4904050
9018	FORMAT(21X,2F12.3,F14.3,1PE18.5)	S4904060
9019	FORMAT(49X,28H- GRAVITATIONAL DEPOSITION -/ 1 28X,48HRANGE BEARING (MILLIGRAMS/ (PARTICLES/,14X, 2 34H- PARTICLES BY SETTLING CATEGORY -/6X,10HIDENTIFIER,10X, 3 34H(METERS) (DEGREES) (SQ. METER),5X,11H(SQ. METER),4X, 4 3(12HCAT. DEP.,6X)/1X,65(2H--))	S4904070 S4904080 S4904090 S4904100 S4904110
9020	FORMAT(22X,2F11.3,F13.3,1PE18.5,2X,3(I5,E13.5)/(73X,3(I5,E13.5)))	S4904120
9021	FORMAT(50X,28H- GRAVITATIONAL DEPOSITION -/	S4904130

1	27X,50HRANGE	BEARING	(MILLIGRAMS/	(PARTICLES//6X,	S4904140
2	10HIDENTIFIER,9X,25H(METERS)		(DEGREES)	,2(11H(SQ. METER),5XS4904150	
	3)/1X,38(2H--))				S4904160
9022	FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS4904170				
	* IF -1 TYPED AGAIN)				S4904180
9023	FORMAT(8X,2(33H * -10 DEG. POINT +10 DEG.)/1X,37(2H**))				S4904190
	END				S4904200

REEDM SOURCE MODULE &RGDPN

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FTN4
SUBROUTINE GRDEP(XO,YO,IXS,DISCRT,NLK,BUFDIS,PHIS,UBARNK,
1      GDEPNM,GDEPP1,GDEPP2,DBARI3,SIGAPK,SIGEPK)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
-----S5000000
C-----S5000010
C-----S5000020
C-----S5000030
C-----S5000040
C-----S5000050
C-----S5000060
C-----S5000070
C-----S5000080
C-----S5000090
C-----S5000100
C-----S5000110
C****          B E G I N   C O M M O N   A R E A          ****
C 04/02/82
C-----MATH PARAMETERS AND CONSTANTS
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC
C-----INPUT OPTIONS
REAL LAMBDA
INTEGER FILE,GOOD,TITLE
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,
.             ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,
.             XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,
.             IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,
.             ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)
.             ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2)
.             ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),
.             TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),
.             FS(20),MDLNAM(12),DBAR(20)
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,
.             MODEL4,MODEL5,MODEL6
INTEGER RUNNUM,RT,CL,CS
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,
.             DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,
.             SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP
.             ,MIXING,MAXDEP,LAYBOT(3)
.             ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,
.             ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),
.             MINUS1,MINUS9,MINS1,MINS9,
.             MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,
.             RT(24),TPROPC,IDXRT
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,
.             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.             CLRLNE,INSLNE,DELNE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
.             INVNDR(2),ULINE(2),
.             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
.             CLRLNE,INSLNE,DELNE,
.             IESCAJ(3),NULL,IBLNK,
.             IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)

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C-----VEHICLE PARAMETERS
COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS
COMMON /TIME/ JTIME, JDAY, JYEAR, ISTIME, ISDAY, ISYEAR, LTIME,
LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30),
RH(30), PTEMP(30), SIGEP(30), SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29),
SIGYO(29)
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32),
SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4), QPDEPH
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE (IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3))
, (IPU2, IPAR(4)), (IPU3, IPAR(5))
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1)
C*****
C-----E N D O F C O M M O N A R E A *****
Cq LOGICAL DISCRT, FIRST
DIMENSION CI(50), YPI(50), SIGYI(50), ALATM(50), YMCL(2), AVGSY(2)
DIMENSION RANGE(30,1), BEARNG(30,1), SIGYBR(30,1), VALUES(30,1),
1 PHIS(1), UBARNK(1), SIGAPK(1), SIGEPK(1), MILK(2), BUFDIS(1)
DIMENSION GDEPRT(20), GDEPNM(10,1), GDEPP1(1), GDEPP2(1), DBARI3(1)
C VPAR(16) = % OF AL2O3 IN VEHICLE.
EQUIVALENCE (VPAR(16), AL2O3)
EQUIVALENCE (PLUS, RANGE), (PLUS(181), BEARNG),
1 (PLUS(361), SIGYBR), (PLUS(547), VALUES)
C DATA MILK /5,4/, SQR2PI /0.3989423/
DATA RAD /.01745329/, RAD1/57.29578/, TWOPI/6.283185/
C*** INITIALIZE.
C XOP = XO
IF (XOP .EQ. 0.0) XOP = 5.0
LOOP = 0
10 CONTINUE

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DO 20 I = 1,50	S5001020
CI(I) = 0.0	S5001030
DO 20 J=1,NVS	S5001040
20 GDEPNM(J,I) = 0.0	S5001050
INDM = 1	S5001060
SUMSY = 0.0	S5001070
C	S5001080
C*** BEGIN LOOP OVER MAJOR BOUNDARY LAYERS.	S5001090
C	S5001100
DO 210 ILK = 1,NLK	S5001110
NSOURC = 0	S5001120
ILKP3 = ILK + 3	S5001130
IF(NLK .EQ. 2) ILKP3 = MILK(ILK)	S5001140
JF = NLAYS + ILK	S5001150
IBOT = LAYBOT(ILK)	S5001160
C FOR SECOND BOUNDARY LAYER ADJUST BOTTOM LAYER INDEX TO	S5001170
C TOP OF FIRST BOUNDARY LAYER.	S5001180
IF(ILK .GT. 1) IBOT = LAYTOP(1) + 1	S5001190
ITOP = LAYTOP(ILK)	S5001200
ALTTOP = ALT(ITOP+1)	S5001210
30 CONTINUE	S5001220
C	S5001230
IF(IRUN .EQ. 4) WRITE(IOU,9001) ILK,XO,YO,IBOT,ITOP,DIRN(JF),	S5001240
1 SIGEPN(JF)	S5001250
C	S5001260
C** BEGIN LOOP OVER METEOROLOGICAL LAYERS WITHIN BOUNDARY LAYER.	S5001270
C	S5001280
DO 200 M = IBOT,ITOP	S5001290
GDEP = 0.0	S5001300
DO 40 J=1,NVS	S5001310
40 GDEPRT(J) = 0.0	S5001320
IF(IRUN .EQ. 4) WRITE(IOU,9006) M	S5001330
IF(Q(M) .LE. 0.0) GOTO 190	S5001340
C	S5001350
IF (.NOT.(DISCRT .OR. LOOP .GT. 0)) GO TO 50	S5001360
C* CALL SUBROUTINE TO COMPUTE CLOUD-RECEPTOR POSITION (XS,YS)	S5001370
C* AND DOWNWIND & CROSSWIND DISTANCES (X,Y).	S5001380
C	S5001390
A1 = DIRN(M)*RAD+PHIS(M)	S5001400
CALL COORD(A1,M,XO,YO,XS,YS,X,Y)	S5001410
C UPWIND?	S5001420
IF(IFLG .LT. 0) GOTO 190	S5001430
GO TO 60	S5001440
C	S5001450
C* ADJUST DOWNWIND & CROSSWIND DISTANCES DUE TO CLOUD INCLINATION.	S5001460
C RAD CONVERTS DEGREES TO RADIANS.	S5001470
50 PHISM = (DIRN(M)+180.0)*RAD + PHIS(M)	S5001480
IF(PHISM .GT. TWOPI) PHISM = PHISM - TWOPI	S5001490
IF(PHISM .LE. 0.0) PHISM = PHISM + TWOPI	S5001500
THETC = DY(M)*RAD	S5001510
SR = ABS(PHISM - THETC)	S5001520
IF (SR .GT. PI) SR = TWOPI-SR	S5001530

	SR = ABS(PI-SR)	S5001540
	AI = DX(M)	S5001550
	SS = PI - (SR + ARSIN(AI*SIN(SR)/XOP))	S5001560
	X = AI*AI + XO*XO - 2.0*AI*XO*COS(SS)	S5001570
	IF(X .LE. 0.0) GOTO 190	S5001580
	X = SQRT(X)	S5001590
	SK = 1.0	S5001600
	IF(ABS(PHISM - THETC) .GT. PI) SK = -1.0	S5001610
	IF(PHISM .LT. THETC) SK = -1.0*SK	S5001620
	Y = THETC + SK*SS	S5001630
	IF(Y .LE. 0.0) Y = Y + TWOPI	S5001640
	IF(Y .GT. TWOPI) Y = Y - TWOPI	S5001650
60	CONTINUE	S5001660
C		S5001670
C*	CALL SUBROUTINE TO COMPUTE SIGMAS.	S5001680
C		S5001690
	CALL SIGMA(X,M,JF,1,SIGAPK(M),SIGEPK(M),PHIS(M)*RADI)	S5001700
	IF(SIGYNK .LE. 0.0) GOTO 190	S5001710
C		S5001720
C*	COMPUTE LATERAL TERM FOR DISCRETE RECEPTORS.	S5001730
C		S5001740
	IF(.NOT. (DISCRT .OR. LOOP.GT.0)) GOTO 70	S5001750
	AI = Y/SIGYNK	S5001760
	IF(ABS(AI) .GT. 10.0) GOTO 190	S5001770
	ALAT = EXP(-.5*AI*AI)	S5001780
70	CONTINUE	S5001790
C		S5001800
C*	INITIALIZE VARIABLES FOR MODEL EQUATIONS.	S5001810
C	.70710678 = 1./SQRT(2)	S5001820
C		S5001830
	UBARNL = UBARNK(M)	S5001840
	UBARI = 1./UBARNL	S5001850
	AI = BETA - 1.0	S5001860
	IF(AI) 80,90,80	S5001870
80	SSEX2 = 1./(SIGEPK(M)*X**BETA)	S5001880
	BSEX2 = BETA*SIGEPK(M)*X**AI*SQR2PI	S5001890
	GOTO 100	S5001900
90	SSEX2 = 1./(SIGEPK(M)*X)	S5001910
	BSEX2 = SIGEPK(M)*SQR2PI	S5001920
100	SSEX2 = SSEXS*.70710678	S5001930
	ALTM = ALT(M)	S5001940
	ALTM1 = ALT(M+1)	S5001950
	QAS = Q(M)/((ALTM1-ALTM)*SIGYNK)	S5001960
	VSSUM = 0.0	S5001970
C		S5001980
C*	BEGIN SUMMATION OVER SETTLING VELOCITY CATEGORIES.	S5001990
C		S5002000
	DO 140 J = 1,NVS	S5002010
	VS1 = VS(J)	S5002020
	VJXSUL = VS1*X*UBARI	S5002030
	GAMMA = GAMMAP(J)	S5002040
	GDEPRT(J) = 0.0	S5002050

C		S5002060
C*	COMPUTE FIRST TERMS FOR MK + NK (BMPBN).	S5002070
C		S5002080
	A1 = (ALTM1-VJXSUL)*SGEXS2	S5002090
	A2 = (ALTM-VJXSUL)*SGEXS2	S5002100
	A3 = ERFXS(A1,A2)	S5002110
	A4 = (ALTM1-VJXSUL)*SGEXS	S5002120
	A4 = TEXP(A4)	S5002130
	A5 = (ALTM-VJXSUL)*SGEXS	S5002140
	A5 = TEXP(A5)	S5002150
C		S5002160
	BMPBN = VS1*.5*UBARI*A3 - BSEXS2*(A4-A5)	S5002170
C		S5002180
C		S5002190
C		S5002200
	IF(IRUN.EQ.4) WRITE(IOU,9002) J,M,XS,YS,X,Y,DIRN(M),SIGYNK,ALAT,	S5002210
	1 UBARI,VJXSUL,SGEXS,BSEXS2,SGEXS2,ALTM,ALTM1,A1,A2,A3,A4,A5,BMPBN	S5002220
C		S5002230
C*	COMPUTE SUMMATION TERM FOR MK + NK (BMPBN).	S5002240
C		S5002250
	AI = 2.0	S5002260
	GAM = 1.0	S5002270
	SAALT = AI*ALTTOP	S5002280
	SUM = 0.0	S5002290
	FIRST = .TRUE.	S5002300
C		S5002310
110	CONTINUE	S5002320
	A1 = SAALT - ALTM1 + VJXSUL	S5002330
	A2 = SAALT - ALTM + VJXSUL	S5002340
	A11 = A1*SGEXS2	S5002350
	A21 = A2*SGEXS2	S5002360
	A3 = ERFXS(A11,A21)	S5002370
	A4 = A1*SGEXS	S5002380
	A4 = TEXP(A4)	S5002390
	A5 = A2*SGEXS	S5002400
	A5 = TEXP(A5)	S5002410
	A6 = SAALT + ALTM1 - VJXSUL	S5002420
	A7 = SAALT + ALTM - VJXSUL	S5002430
	A61 = A6*SGEXS2	S5002440
	A71 = A7*SGEXS2	S5002450
	A8 = ERFXS(A61,A71)	S5002460
	A9 = A6*SGEXS	S5002470
	A9 = TEXP(A9)	S5002480
	A10 = A7*SGEXS	S5002490
	A10 = TEXP(A10)	S5002500
C		S5002510
	SUM = SUM + GAM*(VS1*.5*UBARI*A3 + BSEXS2*(A4-A5)	S5002520
1	+ GAMMA*(VS1*.5*UBARI*A8 - BSEXS2*(A9-A10)))	S5002530
C		S5002540
	IF(FIRST) GOTO 120	S5002550
	IF(ABS(SUM-SUML) .LT. 1.E-6) GOTO 130	S5002560
120	SUML = SUM	S5002570

AI = AI + 2.0	S5002580
SAALT = AI*ALTTOP	S5002590
GAM = GAM*GAMMA	S5002600
FIRST = .FALSE.	S5002610
GOTO 110	S5002620
130 A1 = BMPBN + SUM	S5002630
IF(A1 .LE. 0.0) GOTO 140	S5002640
A2 = (1.0-GAMMAP(J))*FS(J)*A1	S5002650
VSSUM = VSSUM + A2	S5002660
GDEPRT(J) = A2*DBARI3(J)*QAS	S5002670
IF(IRUN .EQ. 4) WRITE(IOU,9005) J,M,SUM,VSSUM,A1,A2,DBARI3(J),	S5002680
1 GDEPRT(J)	S5002690
140 CONTINUE	S5002700
C	S5002710
C* COMPUTE FINAL TERMS FOR MK + NK AND GRAV. DEP.	S5002720
C	S5002730
GDEP = QAS*VSSUM	S5002740
IF(.NOT. (DISCRT .OR. LOOP.GT.0)) GOTO 160	S5002750
GDEP = GDEP*ALAT	S5002760
DO 150 J = 1,NVS	S5002770
150 GDEPRT(J) = GDEPRT(J)*ALAT	S5002780
160 IF(GDEP .LE. 0.0) GOTO 180	S5002790
CI(INDM) = GDEP	S5002800
DO 170 J = 1,NVS	S5002810
170 GDEPNM(J,INDM) = GDEPRT(J)	S5002820
SIGYI(INDM) = SIGYNK	S5002830
SUMSY = SUMSY + SIGYNK	S5002840
YPI(INDM) = Y	S5002850
NSOURC = NSOURC + 1	S5002860
INDM = INDM + 1	S5002870
180 CONTINUE	S5002880
C	S5002890
C	S5002900
C	S5002910
190 IF(IRUN .EQ. 4) WRITE(IOU,9003) LOOP,VSSUM,Q(M),QAS,SIGYNK,GDEP	S5002920
1 (GDEPRT(J),J=1,NVS)	S5002930
C* END OF MET. & MAJOR BOUNDARY LAYER LOOPS.	S5002940
200 CONTINUE	S5002950
IF(ILK .EQ. 1) AVGSY(1) = SUMSY/NSOURC	S5002960
210 CONTINUE	S5002970
AVGSY(2) = SUMSY/(INDM-1)	S5002980
IF(LOOP .NE. 0) GOTO 250	S5002990
C	S5003000
C** GET GRAVITATIONAL DEPOSITION OVER ALL MET. LAYERS.	S5003010
C** FOR MAX. CENTERLINE, COMPUTE MAXIMUM VALUE AND LOCATION.	S5003020
C** FOR DISCRETE, SUM GRAV. DEP. OVER ALL MET. LAYERS.	S5003030
C	S5003040
IF(INDM .LT. 2) GOTO 430	S5003050
IF(DISCRT) GOTO 340	S5003060
C	S5003070
C* CALL SUBROUTINES TO FIND MAXIMUM VALUE AND LOCATION	S5003080
C* OVER BOUNDARY LAYER.	S5003090



		S5003100
		S5003110
		S5003120
		S5003130
		S5003140
		S5003150
		S5003160
		S5003170
		S5003180
		S5003190
C		S5003200
	CALL GDEPR(CI,YPI,SIGYI,N,GDEP,YMCL(ILK))	S5003210
	IF(ILK .EQ. 2.OR.NLK.EQ.1) GOTO 240	S5003220
	ILK = 2	S5003230
	N = INDM - 1	S5003240
	GOTO 230	S5003250
C**	LOOP-BACK LOGIC. GO BACK AND CALCULATE EXACT RESULTS AT	S5003260
C**	MAXIMUM LOCATION.	S5003270
	240 LOOP = 1	S5003280
	YO = YMCL(1)/XOP*RADI	S5003290
	GOTO 10	S5003300
	250 IF(LOOP .NE. 1) GOTO 290	S5003310
C**	SUM RESULTS FOR LAYER 1.	S5003320
	IF (NLK .EQ. 1) NSOURC = 0	S5003330
	N = INDM - NSOURC - 1	S5003340
	ILKP3 = 4	S5003350
	IF(NLK .EQ. 2) ILKP3 = 5	S5003360
	GDEP = 0.0	S5003370
	DO 260 M = 1,N	S5003380
	260 GDEP = GDEP + CI(M)	S5003390
	GDEPP = 0.0	S5003400
	DO 280 J = 1,NVS	S5003410
	GDEPP1(J) = 0.0	S5003420
	DO 270 M = 1,N	S5003430
	270 GDEPP1(J) = GDEPP1(J) + GDEPNM(J,M)*SQR2PI*AL203	S5003440
	280 GDEPP = GDEPP + GDEPP1(J)	S5003450
	GOTO 330	S5003460
	290 CONTINUE	S5003470
C**	SUM RESULTS FOR LAYER 2.	S5003480
	N = INDM - 1	S5003490
	ILKP3 = 5	S5003500
	IF(NLK .EQ. 2) ILKP3 = 4	S5003510
	GDEP = 0.0	S5003520
	DO 300 M = 1,N	S5003530
	300 GDEP = GDEP + CI(M)	S5003540
	GDEPP = 0.0	S5003550
	DO 320 J = 1,NVS	S5003560
	GDEPP2(J) = 0.0	S5003570
	DO 310 M = 1,N	S5003580
	310 GDEPP2(J) = GDEPP2(J) + GDEPNM(J,M)*SQR2PI*AL203	S5003590
	320 GDEPP = GDEPP + GDEPP2(J)	S5003600
C		S5003610
C*	STORE RESULTS IN ARRAYS. FOR TWO LAYERS, SUM IS IN INDEX 4 &	

C*	LAYER 1 IS IN INDEX 5. FOR ONE LAYER, LAYER 1 IS IN INDEX 4.	S5003620
C*	SUBTRACT 3 FROM THIS INDEX FOR PARTICLE RESULTS.	S5003630
C		S5003640
	330 VALUES(IXS,ILKP3) = GDEP*1000.0*SQR2PI*AL203	S5003650
	ILKPM3 = ILKP3 - 3	S5003660
	VALUES(IXS,ILKPM3) = GDEPP	S5003670
	SIGYBR(IXS,ILKP3) = AVGSY(LOOP)	S5003680
	SIGYBR(IXS,ILKPM3) = AVGSY(LOOP)	S5003690
C	RANGE.	S5003700
	RANGE(IXS,ILKP3) = XO	S5003710
	RANGE(IXS,ILKPM3) = XO	S5003720
C	BEARING.	S5003730
	IF(YO .GT. 360.0) YO = YO - 360.0	S5003740
	IF(YO .LE. 0.0) YO = YO + 360.0	S5003750
	BEARNG(IXS,ILKP3) = YO	S5003760
	BEARNG(IXS,ILKPM3) = YO	S5003770
	IF(IRUN .EQ. 4) WRITE(IOU,9007) LOOP,ILKP3,GDEP,GDEPP,XO,YO,	S5003780
1	AVGSY(LOOP)	S5003790
	IF(LOOP .EQ. 2.OR.NLK.EQ.1) GOTO 420	S5003800
	LOOP = 2	S5003810
	IF(ABS(YMCL(2) - YMCL(1)) .LT. 1.E-3) GOTO 290	S5003820
	YO = YMCL(2)/XOP*RADI	S5003830
	GOTO 10	S5003840
C		S5003850
C*	DISCRETE RECEPTOR LOGIC.	S5003860
C*	SUM GRAV. DEP. OVER ALL MET LAYERS AND STORE RESULTS.	S5003870
C*	INDEX 1 = LAYER ONE, 2 = LAYER TWO,	S5003880
C*	INDEX 3 = PARTICLES LAYER ONE, 4 = PARTICLES LAYER TWO.	S5003890
C		S5003900
	340 N = INDM - NSOURC - 1	S5003910
	IF (NLK .EQ. 1) N = INDM-1	S5003920
	GDEP = 0.0	S5003930
	DO 350 I = 1,N	S5003940
	350 GDEP = GDEP + CI(I)	S5003950
	GDEPP = 0.0	S5003960
	DO 370 J = 1,NVS	S5003970
	GDEPP1(J) = 0.0	S5003980
	DO 360 M = 1,N	S5003990
	360 GDEPP1(J) = GDEPP1(J) + GDEPNM(J,M)*SQR2PI*AL203	S5004000
	370 GDEPP = GDEPP + GDEPP1(J)	S5004010
	BUFDIS(1) = GDEP*1000.0*SQR2PI*AL203	S5004020
	BUFDIS(3) = GDEPP	S5004030
	IF (NLK .EQ. 1) GO TO 420	S5004040
	N = INDM - 1	S5004050
	GDEP = 0.0	S5004060
	DO 380 I = 1,N	S5004070
	380 GDEP = GDEP + CI(I)	S5004080
	GDEPP = 0.0	S5004090
	390 DO 410 J = 1,NVS	S5004100
	GDEPP2(J) = 0.0	S5004110
	DO 400 M = 1,N	S5004120
	400 GDEPP2(J) = GDEPP2(J) + GDEPNM(J,M)*SQR2PI*AL203	S5004130

410	GDEPP = GDEPP + GDEPP2(J)	S5004140
	BUFDIS(2) = GDEP*1000.0*SQR2PI*AL203	S5004150
	BUFDIS(4) = GDEPP	S5004160
C		S5004170
C		S5004180
420	IF(IRUN .EQ. 4) WRITE(IOU,9004) IXS,INDM,NSOURC,AVGSY,YMCL,AL203,	S5004190
	1 GDEP,GDEPP,(VALUES(IXS,J),J=1,6),(BEARNG(IXS,J),J=1,6)	S5004200
430	CONTINUE	S5004210
C		S5004220
C***	RETURN	S5004230
C		S5004240
	RETURN	S5004250
C		S5004260
CF**	FORMAT STATEMENTS.	S5004270
CF		S5004280
9001	FORMAT(52H0 DIAGNOSTICS FOR MAJOR BOUNDARY LAYER AND LOCATION: ,I6,	S5004290
	1 2F10.3/24H IBOT,ITOP,DIRN,SIGEPN=,2I6,1P2E12.5)	S5004300
9002	FORMAT(47H FIRST TERMS FOR MK + NK FOR SETTling CATEGORY,I3,	S5004310
	1 12H, MET. LAYER,I3/33H XS,YS,X,Y,DIRN(M),SIGYNK,ALAT =,1P7E12.5/	S5004320
	2 35H UBARI,VJXSUL,SGEXS,BSEX2,SGEXS2=,5E12.5/	S5004330
	3 34H ALTM,ALTM1,A1,A2,A3,A4,A5,BMPBN=,8E12.5)	S5004340
9003	FORMAT(41H LOOP,VSSUM,Q(M),QAS,SIGYNK,GDEP/GDEPP =,I4,1P5E13.5/	S5004350
	1 (10E13.5))	S5004360
9004	FORMAT(18H RESULTS FOR RANGE,I3,15H INDM,NSOURC =,2I6/	S5004370
	1 41H AVGSY(1-2),YMCL(1-2),AL203,GDEP,GDEPP =,1P7E12.5/	S5004380
	2 15H VALUES(1-6) =,6E13.5/15H BEARNG(1-6) =,6E13.5)	S5004390
9005	FORMAT(45H FINAL SUMMATION TERMS FOR SETTling CATEGORY,I3,	S5004400
	112H, MET. LAYER,I3/32H SUM,VSSUM,A1,A2,DBARI3,GDEPP =,1P6E12.5)	S5004410
9006	FORMAT(19H0*** FOR MET. LAYER,I3)	S5004420
9007	FORMAT(50H GRDEP-STORED-LOOP,ILKP3,GDEP,GDEPP,XO,YO,AVGSY =,2I4,	S5004430
	1 1P5E13.5)	S5004440
	END	S5004450

	SUBROUTINE GDEPR(CI,YPI,SIGYI,NSOURC,RCHI,RYC)	S5100000
	. , UPDATE: 8213 SOURCE: 16 DEC 81 LOCATION: KSC	S5100010
C	-----	S5100020
C		S5100030
C	THIS SUBROUTINE CALCULATES THE MAXIMUM CENTERLINE	S5100040
C	GRAVITATIONAL DEPOSITION.	S5100050
C		S5100060
C	-----	S5100070
C		S5100080
C	DIMENSION CI(1),SIGYI(1),YPI(1)	S5100090
	ISTR= 1	S5100100
	RCHI=0.0	S5100110
	RY=0.0	S5100120
C	-----CALCULATE THE NUMBER OF SOURCES IN A GROUP	S5100130
	10 SMIN=SIGYI(ISTR)	S5100140
	I=ISTR	S5100150
	20 IF(I.GT.NSOURC) GO TO 120	S5100160
	IF(I.EQ.NSOURC) GO TO 30	S5100170
	J=I+1	S5100180
	TMP1=YPI(I)-YPI(J)	S5100190
	TMP2=1.18*(SIGYI(I)+SIGYI(J))	S5100200
	IF(TMP1.GT.TMP2) GO TO 30	S5100210
	I=I+1	S5100220
	GO TO 20	S5100230
	30 CONTINUE	S5100240
	SMIN=SIGYI(ISTR)	S5100250
	IF(ISTR.EQ.NSOURC) GO TO 50	S5100260
	IF(ISTR.EQ.I) GO TO 50	S5100270
	DO 40 M=ISTR+1,I	S5100280
	40 SMIN=AMIN1(SMIN,SIGYI(M))	S5100290
	50 YINC=.08*SMIN	S5100300
	YY=YPI(ISTR)	S5100310
	60 YCHI=0.0	S5100320
	IF(YY.LT.YPI(I)) GO TO 100	S5100330
	DO 70 M=1,NSOURC	S5100340
	EX=(YY-YPI(M))/SIGYI(M)	S5100350
	YCHI=YCHI+CI(M)*TEXP(EX)	S5100360
	70 CONTINUE	S5100370
	80 IF(YCHI.LT.RCHI) GO TO 90	S5100380
	RCHI=YCHI	S5100390
	RYC = YY	S5100400
	90 YY=YY-YINC	S5100410
	GO TO 60	S5100420
	100 CONTINUE	S5100430
	110 ISTR=I+1	S5100440
	GO TO 10	S5100450
	120 IF(RCHI.LE.0.0) RYC = 0.0	S5100460
	RETURN	S5100470
	END	S5100480
		S5100490

	SUBROUTINE REODR(CI,YBAR,SIGYI,GDEP,IFR,ITO,NVS)	S5200000
	, UPDATE: 8213 SOURCE: 16 DEC 81 LOCATION: KSC	S5200010
C	THIS ROUTINE REORDERS THE SOURCE CLOUD VALUES BASED ON DESCENDING	S5200020
C	YBAR.	S5200030
C		S5200040
	DIMENSION CI(1),YBAR(1),SIGYI(1),GDEP(10,1)	S5200050
C		S5200060
C		S5200070
	IF(ITO-IFR .LT. 1) RETURN	S5200080
	DO 20 I = IFR,ITO-1	S5200090
	DO 20 J = I+1,ITO	S5200100
	IF(YBAR(I) .GT. YBAR(J)) GOTO 20	S5200110
	A1 = YBAR(I)	S5200120
	YBAR(I) = YBAR(J)	S5200130
	YBAR(J) = A1	S5200140
	A1 = SIGYI(I)	S5200150
	SIGYI(I) = SIGYI(J)	S5200160
	SIGYI(J) = A1	S5200170
	A1 = CI(I)	S5200180
	CI(I) = CI(J)	S5200190
	CI(J) = A1	S5200200
	DO 10 N = 1,NVS	S5200210
	A1 = GDEP(N,I)	S5200220
	GDEP(N,I) = GDEP(N,J)	S5200230
10	GDEP(N,J) = A1	S5200240
20	CONTINUE	S5200250
	RETURN	S5200260
	END	S5200270

REEDM SOURCE MODULE &RSUBM

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FTN4                                                    S5300000
SUBROUTINE COORD(DIRCTN,L,XR,YR,XS,YS,X,Y)            S5300010
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC      S5300020
C-----S5300030
C                                                    S5300040
C THIS SUBROUTINE TRANSLATES AND ROTATES THE AXIS TO MAKE THE MEAN S5300050
C WIND DIRECTION THE POSITIVE X AXIS                S5300060
C                                                    S5300070
C-----S5300080
Cc                                                    S5300090
C****          B E G I N C O M M O N   A R E A          ****S5300100
C 04/02/82                                           S5300110
C-----MATH PARAMETERS AND CONSTANTS                S5300120
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC           S5300130
C-----INPUT OPTIONS                                S5300140
REAL LAMBDA                                          S5300150
INTEGER FILE,GOOD,TITLE                             S5300160
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S5300170
.             ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S5300180
.             XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,   S5300190
.             IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S5300200
.             ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S5300210
.             ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S5300220
.             ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S5300230
.             TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S5300240
.             FS(20),MDLNAM(12),DBAR(20)             S5300250
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES. S5300260
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,     S5300270
.             MODEL4,MODEL5,MODEL6                  S5300280
INTEGER RUNNUM,RT,CL,CS                             S5300290
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S5300300
.             DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S5300310
.             SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP   S5300320
.             ,MIXING,MAXDEP,LAYBOT(3)              S5300330
.             ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S5300340
.             ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S5300350
.             MINUS1,MINUS9,MINS1,MINS9,            S5300360
.             MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S5300370
.             RT(24),TPROPC,IDXRT                   S5300380
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S5300390
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,        S5300400
.             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S5300410
.             CLRLNE,INSLNE,DELINE                  S5300420
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S5300430
.             INVNDR(2),ULINE(2),                   S5300440
.             TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S5300450
.             CLRLNE,INSLNE,DELINE,                 S5300460
.             IESCAJ(3),NULL,IBLNK,                 S5300470
.             IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S5300480
C-----VEHICLE PARAMETERS                           S5300490

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COMMON /VCLPR/ VPAR(17)
C-----TIME PARAMETERS
COMMON /TIME/ JTIME, JDAY, JYEAR, ISTE, ISDAY, ISYEAR, LTIME,
LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30),
RH(30), PTEMP(30), SIGEP(30), SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29),
SIGYO(29)
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32),
SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4), QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE (IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3))
, (IPU2, IPAR(4)), (IPU3, IPAR(5))
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1)
C
C
C**** END OF COMMON AREA ****
C
C
IFLG=0
RAD = PI/180.0
B=AMOD(YR, 360.0)*RAD
XP=XR*SIN(B)
YP=XR*COS(B)
B=COS(DIRCTN)
A=SIN(DIRCTN)
C=DY(L)*RAD
XDX=DX(L)*SIN(C)
YDY=DX(L)*COS(C)
X1=XP-XDX
Y1=YP-YDY
X=-X1*A-Y1*B
Y=X1*B-Y1*A
IF(X.GT.0.0) GO TO 10
IFLG=-1
GO TO 20
10 XS=SQRT(X1*X1+Y1*Y1)
YS=0.0
IF(X1.EQ.0.0 .AND. Y1.EQ.0.0) GO TO 20

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```
YS=(0.5*PI)-ATAN2(Y1,X1)
IF(YS.GE.0.0) GO TO 20
YS=YS+2.0*PI
20 RETURN
END
```

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S5301020
S5301030
S5301040
S5301050
S5301060
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SUBROUTINE SIGMA(XP,M,JF,ISIGMA,SIGAPP,SIGEPP,DDIRP)	S5400000
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S5400010
	S5400020
Cc	****S5400030
C***** BEGIN COMMON AREA	S5400040
C 04/02/82	S5400050
C-----MATH PARAMETERS AND CONSTANTS	S5400060
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S5400070
C-----INPUT OPTIONS	S5400080
REAL LAMBDA	S5400090
INTEGER FILE,GOOD,TITLE	S5400100
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S5400110
ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S5400120
XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S5400130
IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S5400140
ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S5400150
,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S5400160
,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S5400170
TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S5400180
FS(20),MDLNAM(12),DBAR(20)	S5400190
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S5400200
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S5400210
MODEL4,MODEL5,MODEL6	S5400220
INTEGER RUNNUM,RT,CL,CS	S5400230
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S5400240
DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S5400250
SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S5400260
,MIXING,MAXDEP,LAYBOT(3)	S5400270
,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S5400280
ICHR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S5400290
MINUS1,MINUS9,MIN51,MIN59,	S5400300
MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S5400310
RT(24),TPROPC,IDXRT	S5400320
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S5400330
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S5400340
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S5400350
CLRLNE,INSLNE,DELNE	S5400360
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S5400370
INVNDR(2),ULINE(2),	S5400380
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S5400390
CLRLNE,INSLNE,DELNE,	S5400400
IESCAJ(3),NULL,IBLNK,	S5400410
IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S5400420
C-----VEHICLE PARAMETERS	S5400430
COMMON /VCLPR/ VPAR(17)	S5400440
C-----TIME PARAMETERS	S5400450
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	S5400460
LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	S5400470
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)	S5400480
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),	S5400490
RH(30),PTEMP(30),SIGEP(30),SIGAP(30)	S5400500
C-----LAYER PARAMETERS	

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COMMON /LAYER/ DX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29),  S5400510
                SIGYO(29)  S5400520
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)  S5400530
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6)  S5400540
C-----CALCULATED NEW LAYER PARAMETERS  S5400550
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32),  S5400560
                SPEEDN(32)  S5400570
C-----CONVERSION FACTORS  S5400580
COMMON /CNVRT/ QCONV(4), QPDEPH  S5400590
C  S5400600
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S5400610
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)  S5400620
C-----READ/WRITE BUFFER  S5400630
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S5400640
C*****S5400650
C  S5400660
C-----EQUIVALENCE STATEMENTS-  S5400670
EQUIVALENCE(IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3))  S5400680
                , (IPU2, IPAR(4)), (IPU3, IPAR(5))  S5400690
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1)  S5400700
DATA RAD/.01745329/  S5400710
C  S5400720
C****          E N D   O F   C O M M O N   A R E A          ****S5400730
Cç  S5400740
X = 0.0  S5400750
MMM = 1  S5400760
SIGZ=0.0  S5400770
SIGY = 0.0  S5400780
SIGX = 0.0  S5400790
A1 = 1.0  S5400800
A2 = SIGYO(M)  S5400810
A3 = SIGAPP  S5400820
B3 = SIGEPP  S5400830
A4 = ALPHA  S5400840
B4 = BETA  S5400850
A5 = DDIRP  S5400860
A6 = SIGXO(M)  S5400870
RL = 0.0  S5400880
IF(DSPEED(M).GT.0.0) RL = .28*X*DSPEED(M)/SPEEDN(M)  S5400890
N = 1  S5400900
10 IF((A4-1.0).EQ.0.0) GO TO 20  S5400910
A1 = 1.0/A4  S5400920
IF(MMM.EQ.2) GO TO 30  S5400930
IF((A2-A3*XRY).GT.0.0) GO TO 30  S5400940
20 XY = A2/A3  S5400950
GO TO 40  S5400960
30 XY = A4*XRY*(A2/(A3*XRY)**A1+XRY*(1.0-A4))  S5400970
40 IF(MMM.EQ.1) XY = XY-XLRY  S5400980
IF(XY.LT.0.0) XY = 0.0  S5400990
IF((A4-1.0).EQ.0.0) GO TO 50  S5401000
T1 = (X+XY-XRY*(1.0-A4))/(XRY*A4)  S5401010
IF(T1.LE.0.0) GO TO 70  S5401020

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T1 = A3*XRY*T1**A4	S5401030
GO TO 60	S5401040
50 T1 = A3*(X+XY)	S5401050
60 T2 = ABS(A5)*X*4.0589052E-3	S5401060
SIGY = SQRT(T1*T1+T2*T2)	S5401070
70 SIGX=SQRT(RL*RL*.05408329+A6*A6)	S5401080
IF(N.EQ.1) GO TO 90	S5401090
IF((B4-1.0).EQ.0.0) GO TO 80	S5401100
T1 = X/XRZ	S5401110
IF (T1 .LT. 0.0) GO TO 90	S5401120
SIGZ = B3*XRZ*T1**B4	S5401130
GO TO 90	S5401140
80 XZ = X	S5401150
SIGZ = B3*XZ	S5401160
90 CONTINUE	S5401170
IF(MMM.EQ.2) GO TO 110	S5401180
N = 2	S5401190
X = XP	S5401200
MMM = 2	S5401210
T1 = (DIRN(M)-DIRN(JF))*RAD	S5401220
A1 = 1.0	S5401230
T2 = SIN(T1)	S5401240
T1 = COS(T1)	S5401250
A2 = SQRT((SIGX*T2)**2+(SIGY*T1)**2)	S5401260
IF(ISIGMA .EQ. 1) GOTO 100	S5401270
A3 = SIGAPN(JF)	S5401280
B3 = SIGEPN(JF)	S5401290
A5 = DDIR(JF)	S5401300
100 A4 = ALPHA	S5401310
B4 = BETA	S5401320
A6 = SQRT((SIGX*T1)**2+(SIGY*T2)**2)	S5401330
RL = 0.0	S5401340
IF(DSPEED(JF).GT.0.0) RL = .28*X*DSPEED(JF)/SPEEDN(JF)	S5401350
GO TO 10	S5401360
110 SIGXNK = SIGX	S5401370
SIGYNK = SIGY	S5401380
RETURN	S5401390
END	S5401400

	FUNCTION ERFXS(A,B)	S5500000
	. , UPDATE: 8213 SOURCE: 02 OCT 79 LOCATION: KSC	S5500010
C	-----	S5500020
C		S5500030
C	CALCULATE ERF(A) - ERF(B).	S5500040
C		S5500050
C	-----	S5500060
C		S5500070
C	HPL = LOWER LIMIT - HPU = UPPER LIMIT.	S5500080
C		S5500090
	LOGICAL DONE	S5500100
	DATA HPL,HPU / 1.E-10,5.0 /	S5500110
	ERF(X) = 1+X*(.705230784E-1+X*(.422820123E-1+X*(.92705272E-2+	S5500120
1	X*(.1520143E-3+X*(.2765672E-3+X*.430638E-4))))	S5500130
C		S5500140
	DONE = .FALSE.	S5500150
	C = A	S5500160
10	IF(C .LT. 0.0) GOTO 20	S5500170
	I = 0	S5500180
	GOTO 30	S5500190
20	I = 1	S5500200
	C = -C	S5500210
30	IF(C .GT. HPL) GOTO 40	S5500220
	F = 1.	S5500230
	GOTO 60	S5500240
40	IF(C .LT. HPU) GOTO 50	S5500250
	F = 0.0	S5500260
	GOTO 70	S5500270
50	F = ERF(C)	S5500280
	F = (1./F)**16	S5500290
60	IF(I .EQ. 1) F = -F	S5500300
70	IF(DONE) GOTO 80	S5500310
	C = B	S5500320
	G = F	S5500330
	DONE = .TRUE.	S5500340
	GOTO 10	S5500350
80	CONTINUE	S5500360
	ERFXS = F - G	S5500370
C	ONE'S WILL NOT CANCEL IF A & B ARE OPPOSITE IN SIGN	S5500380
	IF(A .LT. 0.0 .AND. B .GE. 0.0) ERFXS = ERFXS-2	S5500390
	IF(A .GE. 0.0 .AND. B .LT. 0.0) ERFXS = ERFXS+2	S5500400
	RETURN	S5500410
	END	S5500420

```
FUNCTION TEXP(A)
. , UPDATE: 8213 SOURCE: 27 FEB 80 LOCATION: KSC
C
IF(ABS(A) .GT. 10.0) GOTO 10
TEXP = EXP(-.5*A*A)
RETURN
10 TEXP = 0.0
RETURN
END
```

```
S5600000
S5600010
S5600020
S5600030
S5600040
S5600050
S5600060
S5600070
S5600080
```

	SUBROUTINE CROSS(A,N)	S5700000
	. , UPDATE: 8213 SOURCE: 10 NOV 81 LOCATION: KSC	S5700010
C	ROUTINE TO ELIMINATE CROSSOVER PROBLEMS	S5700020
	DIMENSION A(1)	S5700030
C		S5700040
	I = 1	S5700050
10	I = I+1	S5700060
	IF (I .GT. N) GO TO 30	S5700070
	IF (ABS(A(I)-A(I-1)) .LE. 3.141593) GO TO 10	S5700080
	IF (A(I) .GT. A(I-1)) GO TO 20	S5700090
	A(I) = A(I)+6.283185	S5700100
	GO TO 10	S5700110
20	A(I) = A(I)-6.283185	S5700120
	GO TO 10	S5700130
30	CONTINUE	S5700140
	RETURN	S5700150
	END	S5700160

	FUNCTION ARSIN(X)		S5800000
C	CALCULATES THE ARCSIN OF X		S5800010
C			S5800020
	IF (X .GT. 1.0) X = 1.0		S5800030
	IF (X .LT.-1.0) X =-1.0		S5800040
	ARSIN = 1.570796		S5800050
	IF (X-1.0) 10,20,10		S5800060
10	ARSIN = ATAN2(X,SQRT(1.0-X*X))		S5800070
20	RETURN		S5800080
	END		S5800090





```

.          TAB, TAB2, SETTAB, CLRTAB, CURSUP, CURSDN, CURLFT, CLRDSP, S5900510
.          CLRLNE, INSLNE, DELINE, S5900520
.          IESCAJ(3), NULL, IBLNK, S5900530
.          IPAR(5), ICU, IYSJ, IYESJ, INJ, INOJ, NAMEP(3) S5900540
C-----VEHICLE PARAMETERS S5900550
COMMON /VCLPR/ VPAR(17) S5900560
C-----TIME PARAMETERS S5900570
COMMON /TIME/ JTIME, JDAY, JYEAR, ISTEIME, ISDAY, ISYEAR, LTIME, S5900580
.          LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2) S5900590
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S5900600
COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30), S5900610
.          RH(30), PTEMP(30), SIGEP(30), SIGAP(30) S5900620
C-----LAYER PARAMETERS S5900630
COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29), S5900640
.          SIGYO(29) S5900650
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS) S5900660
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6) S5900670
C-----CALCULATED NEW LAYER PARAMETERS S5900680
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32), S5900690
.          SPEEDN(32) S5900700
C-----CONVERSION FACTORS S5900710
COMMON /CNVRT/ QCONV(4), QPDEPH S5900720
C S5900730
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S5900740
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S5900750
C-----READ/WRITE BUFFER S5900760
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S5900770
C*****S5900780
C S5900790
C-----EQUIVALENCE STATEMENTS S5900800
EQUIVALENCE(IIU, IPAR(1)), (IOU, IPAR(2)), (IPU1, IPAR(3)) S5900810
.          , (IPU2, IPAR(4)), (IPU3, IPAR(5)) S5900820
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1) S5900830
C S5900840
C**** END OF COMMON AREA ****S5900850
Cq S5900860
C S5900870
C DIMENSION UBARNK(50), PHIS(50), SIGAPK(50), SIGEPK(50) S5900880
C S5900890
C DATA RAD/.01745329/ S5900900
C S5900910
C S5900920
C S5900930
C S5900940
C B1 = 1.0 S5900950
SUMX = 0.0 S5900960
SUMY = 0.0 S5900970
SIGAL = 0.0 S5900980
SIGEL = 0.0 S5900990
IF (IRUN .EQ. 4) WRITE (IOU, 9001) S5901000
DO 60 M=1, NLAYS S5901010
PHIS(M) = 0.0 S5901020

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DZ = ALT(M+1) - ALT(M)	S5901030
SIGAL = SIGAL + SIGAPN(M)*DZ	S5901040
SIGEL = SIGEL + SIGEPN(M)*DZ	S5901050
SIGAPK(M) = SIGAL/ALT(M+1)*RAD	S5901060
SIGEPK(M) = SIGEL/ALT(M+1)*RAD	S5901070
IF(M .LT. IBOT.AND.IFCON .NE. 0) GOTO 60	S5901080
A0 = DDIR(M)*RAD	S5901090
IF (ABS(A0)-2.0E-3) 10,20,20	S5901100
10 A0 = 2.0E-3*B1	S5901110
20 IF (A0 .LT. 0.0) B1 = 1.0	S5901120
IF (A0 .GT. 0.0) B1 = -1.0	S5901130
UBDZ = SPEEDN(M)*DZ	S5901140
BK = A0/DZ	S5901150
A4 = UBDZ/A0	S5901160
BKS = BK*ALT(M)	S5901170
BKP = BK*(0.5*DZ+ALT(M))	S5901180
X22 = SIN(BKS)	S5901190
Y22 = COS(BKS)	S5901200
X2 = (SIN(BKP)-X22)*A4	S5901210
Y2 = (COS(BKP)-Y22)*A4	S5901220
XNK = SUMX + X2	S5901230
YNK = SUMY + Y2	S5901240
BKP = BK*ALT(M+1)	S5901250
X2 = (SIN(BKP)-X22)*A4	S5901260
Y2 = (COS(BKP)-Y22)*A4	S5901270
SUMX = SUMX+X2	S5901280
SUMY = SUMY+Y2	S5901290
IF(YNK) 40,30,40	S5901300
30 UBARNK(M) = XNK/(ALT(M)+DZ*.5)	S5901310
GOTO 50	S5901320
40 PHIS(M) = ATAN2(YNK,XNK)	S5901330
UBARNK(M) = SQRT(XNK*XNK + YNK*YNK)/(ALT(M)+DZ*.5)	S5901340
50 IF (IRUN .NE. 4) GO TO 60	S5901350
PHISP = PHIS(M)/RAD	S5901360
WRITE(IOU,9002) M,A4,DZ,DDIR(M),SPEEDN(M),XNK,YNK,PHISP,	S5901370
UBARNK(M)	S5901380
60 CONTINUE	S5901390
RETURN	S5901400
9001 FORMAT (1H0,12X,1HM,7X,2HA4,10X,2HDZ,8X,4HDDIR,10X,	S5901410
*6HSPEEDN,7X,3HXNK,8X,3HYNK,9X,4HPHIS,8X,6HUBARNK)	S5901420
9002 FORMAT(12X,I3,1X,8F12.3)	S5901430
END	S5901440

REEDM SOURCE MODULE &RCIMM

FTN4	S6000000
PROGRAM RCIMM(5,119)	S6000010
., UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC	S6000020
C**** DECLARATIONS.	S6000030
C	S6000040
Cc	S6000050
C**** BEGIN COMMON AREA	****S6000060
C 04/02/82	S6000070
C-----MATH PARAMETERS AND CONSTANTS	S6000080
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC	S6000090
C-----INPUT OPTIONS	S6000100
REAL LAMBDA	S6000110
INTEGER FILE,GOOD,TITLE	S6000120
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP,	S6000130
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA,	S6000140
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT,	S6000150
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY,	S6000160
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3)	S6000170
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2)	S6000180
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10),	S6000190
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20),	S6000200
. FS(20),MDLNAM(12),DBAR(20)	S6000210
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES	S6000220
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET,	S6000230
. MODEL4,MODEL5,MODEL6	S6000240
INTEGER RUNNUM,RT,CL,CS	S6000250
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,	S6000260
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,	S6000270
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP	S6000280
. ,MIXING,MAXDEP,LAYBOT(3)	S6000290
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,	S6000300
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),	S6000310
. MINUS1,MINUS9,MINS1,MINS9,	S6000320
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,	S6000330
. RT(24),TPROP,IDXRT	S6000340
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.	S6000350
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,	S6000360
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S6000370
. CLRLNE,INSLNE,DELNE	S6000380
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),	S6000390
. INVNDR(2),ULINE(2),	S6000400
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,	S6000410
. CLRLNE,INSLNE,DELNE,	S6000420
. IESCAJ(3),NULL,IBLNK,	S6000430
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)	S6000440
C-----VEHICLE PARAMETERS	S6000450
COMMON /VCLPR/ VPAR(17)	S6000460
C-----TIME PARAMETERS	S6000470
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,	S6000480
. LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)	S6000490



80	NNNEST = 1	S6001020
	NNNTRY = 1	S6001030
90	CALL REEDM	S6001040
	STOP	S6001050
9001	FORMAT (47H MOUNT A CENTERLINE PROFILE FORM ON PLOTTER LU ,I2/	S6001060
	*28X,2A2,14HSPACE - RETURN,2A2,11H WHEN READY/	S6001070
	*28X,6HENTER ,2A2,1HF,2A2,19H TO PLOT THE FORM:_)	S6001080
9002	FORMAT (3A2)	S6001090
9003	FORMAT (73H *** REEDM WARNING 019, -1 NOT APPLICABLE, PROG. ABORTSS	S6001100
	* IF -1 TYPED AGAIN/)	S6001110
9004	FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S6001120
	*,I2,1H.,I1/)	S6001130
	END	S6001140

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SUBROUTINE RCFRM(IPASS,CRT)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
INTEGER ALTSET,OFF,BLNKNG,ULINE,TAB,TAB2,SETTAB,CLRTAB,CURSUP,
1 CURSDN,CURLFT,CLRDSP,CLRLNE,DELINE
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),
. INVNDR(2),ULINE(2),
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,
. CLRLNE,INSLNE,DELINE,
. IESCAJ(3),NULL,IBLNK,
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)
LOGICAL CRT
INTEGER SECNDS(3),EQUALS(2),BKARO,BKAKO,CR
COMPLEX XLGND(5),CH(2),TOR(2),TOL(2),BOL(2),HOC(2),SF(3)
. ,PRDT(3),LAUNCH(2),RL(2),DFN(2)
DIMENSION NUML(3),NUM(2),LGNDX(21),IBUFR(33),IPASS(2)
. ,LEGEND(98),METERS(2),IREG(2),IN(2)
EQUIVALENCE (NUML,NUMLI),(NUML(2),NUM),(LGNDX(2),XLGND)
. ,(IREG,REG,IA),(IREG(2),IB),(IN,INI),(IPAR(1),IIU)
. ,(LEGEND(2),CH),(LEGEND(11),TOR),(LEGEND(20),TOL)
. ,(LEGEND(29),BOL),(LEGEND(38),HOC),(LEGEND(60),PRDT)
. ,(LEGEND(73),LAUNCH),(LEGEND(46),LGND1),(LEGEND(59),LGND2)
. ,(LEGEND(72),LGND3),(LEGEND(82),RL),(LEGEND(91),DFN)
. ,(LEGEND(81),LGND4),(LEGEND(90),LGND5),(LEGEND(47),SF)
. ,(IPAR(2),IOU)
DATA LEGEND(1),LEGEND(10),LEGEND(19),LEGEND(28),LEGEND(37)
. ,LEGEND(46),LEGEND(59),LEGEND(72),LEGEND(81),LEGEND(90)
. ,LGNDX(1)
. /12,12,12,15,14,18,18,12,13,14,40/
DATA CH/8HCLOUD HE,8HIGHT /,TOR/8HTIME OF ,8HRISE /
. ,TOL/8HTOP OF L,8HAYER /,BOL/8HBOTTOM O,8HF LAYER /
. ,HOC/8HHEIGHT O,8HF CALC /,SF/8HSOUNDING,8H/FORECAS
. ,8HT: /,PRDT/8HTIME OF ,8HEXECUTIO,8HN: /
. ,LAUNCH/8HLAUNCH T,8HIME: /
. ,RL/8HRUN LOCA,8HTION: /,DFN/8HDATA FIL,8HENAME: /
DATA METERS/1,1HM/,SECNDS/3,2HSE,2HC /,EQUALS/1,1H=/
DATA XLGND/8H DISTANC,8HE FROM C,8HLOUD STA,8HBILIZATI
. ,8HON (KM) /,IN1/1H@/
DATA CR,BKARO,BKAKO/15B,20137B,137B/
C FIRST EXECUTABLE STATEMENT
C
C IF (CRT) GO TO 10
CR = NULL
BKARO = NULL
BKAKO = IBLNK
10 IPU2=IPASS(1)
IN1=IAND(IPASS(2),177400B)+40B
IF (IIU .EQ. 99) CALL LURQ(1,IPU2,1)
20 CALL PLTLU(IPU2)
C PLOT SIZE IN CM
C

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C		S6100510
	CALL SFACT(33.0,24.0)	S6100520
	CALL LLEFT	S6100530
	30 WRITE(ICU,9001) BLNKNG,OFF,BKARO	S6100540
	9001 FORMAT(10X,2A2,15HFORM GENERATION,3A2)	S6100550
C		S6100560
C	MARK LOWER LEFT	S6100570
C		S6100580
	CALL PLOT(0.2,0.0,2)	S6100590
	CALL PLOT(0.0,0.0,2)	S6100600
	CALL PLOT(0.0,0.2,2)	S6100610
C		S6100620
C	PLOTTER NOW SET UP:: LABEL X-AXIS	S6100630
C		S6100640
	X=2.26	S6100650
	NUMLI=2	S6100660
	DO 40 I=0,30	S6100670
	CALL CODE	S6100680
	WRITE(NUM,9002) I	S6100690
9002	FORMAT(I2)	S6100700
	CALL SYMB(X+FLOAT(I),1.8,0.2,NUML,0.0,1)	S6100710
40	CONTINUE	S6100720
C		S6100730
C	DRAW X-AXIS W/TICS	S6100740
C		S6100750
	CALL PLOT(32.5,2.2,3)	S6100760
	CALL PLOT(32.5,2.5,2)	S6100770
	DO 50 I=29,0,-1	S6100780
	FI=2.5+FLOAT(I)	S6100790
	CALL PLOT(FI,2.5,2)	S6100800
	CALL PLOT(FI,2.2,2)	S6100810
	CALL PLOT(FI,2.5,2)	S6100820
50	CONTINUE	S6100830
	CALL PLOT(FI,2.5,3)	S6100840
	CALL SYMB(13.5,1.3,0.2,LGNDX,0.0,1)	S6100850
C		S6100860
C	BEGIN LEGEND	S6100870
C		S6100880
	CALL SYMB(16.7,20.5,0.2,LGND5,0.0,1)	S6100890
	CALL SYMB(16.7,21.0,0.2,LGND4,0.0,1)	S6100900
	CALL SYMB(16.7,21.5,0.2,LGND3,0.0,1)	S6100910
	CALL SYMB(16.7,22.0,0.2,LGND2,0.0,1)	S6100920
	CALL SYMB(16.7,22.5,0.2,LGND1,0.0,1)	S6100930
C		S6100940
C	UNITS	S6100950
C		S6100960
	CALL SYMB(14.7,22.5,0.2,METERS,0.0,1)	S6100970
	CALL SYMB(14.7,22.0,0.2,SECNDS,0.0,1)	S6100980
	CALL SYMB(14.7,21.5,0.2,METERS,0.0,1)	S6100990
	CALL SYMB(14.7,21.0,0.2,METERS,0.0,1)	S6101000
	CALL SYMB(14.7,20.5,0.2,METERS,0.0,1)	S6101010
C		S6101020

C	.EQUALS	S6101030
C		S6101040
	FI=20.0	S6101050
	DO 60 I=1,5	S6101060
	FI=FI+0.5	S6101070
	CALL SYMB(11.9,FI,0.2,EQUALS,0.0,1)	S6101080
	60 CONTINUE	S6101090
C		S6101100
C	MORE LEGEND	S6101110
C		S6101120
	DO 70 I=1,37,9	S6101130
	CALL SYMB(7.7,FI,0.2,LEGEND(I),0.0,1)	S6101140
	FI=FI-0.5	S6101150
	70 CONTINUE	S6101160
C		S6101170
C	MARK UPPER RIGHT	S6101180
C		S6101190
	CALL PLOT(33.0,23.8,3)	S6101200
	CALL PLOT(33.0,24.0,2)	S6101210
	CALL PLOT(32.8,24.0,2)	S6101220
	CALL PLOT(33.0,24.0,3)	S6101230
C		S6101240
C	REMOVE "FORM GENERATION"	S6101250
C		S6101260
	CALL URITE	S6101270
	WRITE(ICU,9003) CR,CLRDSP,BKAKO	S6101280
	9003 FORMAT(50A2)	S6101290
C		S6101300
C	CHECK FOR "F"	S6101310
C		S6101320
	IF(IN1.EQ.1HF) GO TO 90	S6101330
	80 WRITE(ICU,9004) BLNKNG,OFF,INVNDR,INV,OFF,ULINE,OFF,BKARO	S6101340
	9004 FORMAT(53H DO YOU WANT TO PLOT ANOTHER CENTERLINE PROFILE FORM?	S6101350
	. /5X,2A2,30HCHANGE PLOT PAPER BEFORE A YES,2A2	S6101360
	. ,14X,1H(,2A2,1HY,2A2,2HES,2A2,4H OR ,2A2,1HN,2A2,2HO),A2)	S6101370
	IN1 = IBLNK	S6101380
	READ (ICU,9005) IN1	S6101390
	WRITE(ICU,9003) CURSUP,CURSUP,CR,CLRDSP,BKAKO	S6101400
	IF(IN1.EQ.IYSJ.OR.IN1.EQ.IBLNK.OR.IN1.EQ.IYESJ) GO TO 30	S6101410
	IF (IN1 .EQ. INJ.OR.IN1 .EQ. INOJ) GO TO 90	S6101420
	WRITE (ICU,9006) INV,OFF,0,0	S6101430
	GO TO 80	S6101440
	9005 FORMAT (A2)	S6101450
	9006 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S6101460
	*,I2,1H.,I1/)	S6101470
	90 CONTINUE	S6101480
	RETURN	S6101490
	END	S6101500



REEDM SOURCE MODULE &RCIMN

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FTN4
SUBROUTINE RISOM
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6200010
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6200020
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6200030
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6200040
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::: S6200050
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::: S6200060
C::: ORGANIZATION: H. E. CRAMER CO., INC. :::::::::::::: S6200070
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::: S6200080
C::: WORK FOR: DR. J. B. STEPHENS (ES84) :::::::::::::: S6200090
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::: S6200100
C::: PROGRAM CODE: RISOM :::::::::::::::::::::::::::: S6200110
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::: S6200120
C::: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST :: S6200130
C::: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER) :: S6200140
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::: S6200150
C::: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS :: S6200160
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::: S6200170
C::: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS :: S6200180
C::: :::::::::::::::::::::::::::::::::::::::::::::::::::: S6200190
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6200200
C:::::::::::::::::::::::::::::::::::::::::::::::::::::::::: S6200210
C S6200220
C *****S6200230
C * S6200240
C * ISOPLETH PLOTTING PROGRAM -- A PROGRAM IN THE REED SERIES *S6200250
C * OF PROGRAMS *S6200260
C * *S6200270
C *****S6200280
Cq S6200290
C**** BEGIN COMMON AREA *****S6200300
C 04/02/82 S6200310
C-----MATH PARAMETERS AND CONSTANTS S6200320
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S6200330
C-----INPUT OPTIONS S6200340
REAL LAMBDA S6200350
INTEGER FILE,GOOD,TITLE S6200360
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S6200370
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S6200380
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S6200390
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S6200400
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S6200410
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S6200420
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S6200430
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S6200440
. FS(20),MDLNAM(12),DBAR(20) S6200450
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S6200460
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S6200470
. MODEL4,MODEL5,MODEL6 S6200480
INTEGER RUNNUM,RT,CL,CS S6200490

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COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H,          S6200500
.      DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK,             S6200510
.      SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP                      S6200520
.      ,MIXING,MAXDEP,LAYBOT(3)                                S6200530
.      ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN,               S6200540
.      ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80),             S6200550
.      MINUS1,MINUS9,MINS1,MINS9,                               S6200560
.      MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY,      S6200570
.      RT(24),TPROPC,IDXRT                                      S6200580
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS.  S6200590
      INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR,              S6200600
.      TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,     S6200610
.      CLRLNE,INSLNE,DELNE                                     S6200620
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2),    S6200630
.      INVNDR(2),ULINE(2),                                    S6200640
.      TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,   S6200650
.      CLRLNE,INSLNE,DELNE,                                   S6200660
.      IESCAJ(3),NULL,IBLNK,                                  S6200670
.      IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3)              S6200680
C-----VEHICLE PARAMETERS                                     S6200690
COMMON /VCLPR/ VPAR(17)                                       S6200700
C-----TIME PARAMETERS                                       S6200710
COMMON /TIME/ JTIME,JDAY,JYEAR,ISTIME,ISDAY,ISYEAR,LTIME,     S6200720
.      LDAY,LYEAR,ISMON(2),JMON(2),LMON(2),LSDT(2)           S6200730
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S6200740
COMMON /FRCT/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),  S6200750
.      RH(30),PTEMP(30),SIGEP(30),SIGAP(30)                  S6200760
C-----LAYER PARAMETERS                                       S6200770
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29), S6200780
.      SIGYO(29)                                              S6200790
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS)             S6200800
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)                     S6200810
C-----CALCULATED NEW LAYER PARAMETERS                       S6200820
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32), S6200830
.      SPEEDN(32)                                           S6200840
C-----CONVERSION FACTORS                                     S6200850
COMMON /CNVRT/ QCONV(4),QPDEPH                                S6200860
C                                                                S6200870
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S6200880
COMMON /EXTRA/      NCOM(1),      NTOTAL(1),      PLUS(900)    S6200890
C-----READ/WRITE BUFFER                                     S6200900
C-----A R R A Y   = 2077 + 1      +      1      + 2 * 900   = 3879S6200910
C*****S6200920
C                                                                S6200930
C-----EQUIVALENCE STATEMENTS                               S6200940
      EQUIVALENCE (IPU1,IPAR(3))                               S6200950
.      , (IPU2,IPAR(4)), (IPU3,IPAR(5))                       S6200960
      EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)         S6200970
C                                                                S6200980
C****          E N D   O F   C O M M O N   A R E A          ****S6200990
Cc                                                                S6201000
C                                                                S6201010

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	INTEGER ZIP, FIRSTV	S6201020
	DIMENSION RANGE(30,6), BEARNG(30,6), SIGYBR(30,6), CORSG(30,6)	S6201030
	. ,XCORSG(6), ZIP(5), MTH(4,8), NFSLS(3,9)	S6201040
	LOGICAL TMOUT, TO, FIRSTP	S6201050
	COMPLEX RBORSG(6)	S6201060
C	-----EQUIVALENCE STATEMENTS	S6201070
	EQUIVALENCE	S6201080
	. (PLUS, RANGE), (PLUS(181), BEARNG), (PLUS(361), SIGYBR)	S6201090
	. , (PLUS(541), XCORSG), (PLUS(547), CORSG), (PLUS(727), RBORSG)	S6201100
C		S6201110
CF	OUTPUT FORMAT STATEMENTS	S6201120
CF		S6201130
	9001 FORMAT(I4, 2A2, I3, 1X, A2, A1, 1X, I4)	S6201140
	9002 FORMAT(A1, 2H -, G10.4)	S6201150
C		S6201160
C	TYPE AND DIMENSION STATEMENTS	S6201170
C		S6201180
C**	VARIABLE NAME "PLUS" WAS CHANGED NOV 9, 1979 BECAUSE OF CONFLICT	S6201190
C**	WITH THE LABELED COMMON DEVICE EMPLOYED...J.S.H.	S6201200
C		S6201210
	LOGICAL DFALTC, FLGEND, FLGDAT, FLGLTR, TTY, FLGOUT, FLGSPC(4), TWOLAY	S6201220
	. , FLGPH	S6201230
	INTEGER PEN, UNITS(7,7), PDO, DFLT, WNITS(6,7), AT(2), ADD(2), LETR2(2)	S6201240
	. , LALPHA(2), BKARO, BLANK1, BKAKO, YORNO(18), CDT(57), SMORLW(14)	S6201250
	. , CR, CRLF, CURSUP, BLANK, RS, PSORL(9,4)	S6201260
	DIMENSION PLETH(10), LPAREN(2), JSPECI(3,4), LSPECI(11,4)	S6201270
	. , IALPHA(80), KSPECI(3,4), IP(5), L1(3)	S6201280
	. , DISOF(5), LPLNTQ(1), JCDT(12,6)	S6201290
	. , KCDT(13,6), DPLETH(5), KSPL(4), KCDTN(6)	S6201300
	. , JUNITS(6,4), JLABS(6,4), JDATA(6,4), LETRO(2)	S6201310
	. , IBREAK(5), IFISOS(10), NOISOS(13), IBUF(4)	S6201320
	EQUIVALENCE (LETR2(2), LETR), (LALPHA(2), IALPHA), (LALPHA, LALPH1)	S6201330
	. , (L1(2), L3)	S6201340
	. , (IALPHA(1), IFRMT(1))	S6201350
C		S6201360
C	JUNITS(CHOICE, SPECIES)	S6201370
C		S6201380
	DATA JUNITS	S6201390
	. /1,3,1,5,0,0	S6201400
	. ,1,3,1,0,0,0	S6201410
	. ,1,3,1,0,0,0	S6201420
	. ,2,4,2,6,6,7/	S6201430
	DATA NOISOS/23, 1H-, 2HOU, 2HTS, 2HID, 1HE, 2HPL, 2HOT, 2H B, 2HOU, 2HND,	S6201440
	. 2HAR, 1HY/	S6201450
C		S6201460
C	JLABS(CHOICE, SPECIES)	S6201470
C		S6201480
	DATA JLABS	S6201490
	. /1,2,3,4,0,0	S6201500
	. ,1,2,3,0,0,0	S6201510
	. ,1,2,3,0,0,0	S6201520
	. ,1,2,3,5,6,6/	S6201530

C			S6201540
C		JDATA(CHOICE, SPECIES)	S6201550
C			S6201560
		DATA JDATA	S6201570
	.	/1,2,3,1,0,0	S6201580
	.	,1,2,3,0,0,0	S6201590
	.	,1,2,3,0,0,0	S6201600
	.	,4,5,6,4,4,1/	S6201610
C			S6201620
C		UNITS	S6201630
C			S6201640
		DATA UNITS	S6201650
	.	/3*OB, 2H p, 2Hpm, 2*OB	S6201660
	.	,3*OB, 2H m, 2Hg/, 46416B, 31417B	S6201670
	.	,OB, 2H p, 2Hpm, 2H-s, 2Hec, 2*OB	S6201680
	.	,OB, 2H m, 2Hg-, 2Hse, 2Hc/, 46416B, 31417B	S6201690
	.	,3*OB, 4OB, 2HpH, 2*OB	S6201700
	.	,2*OB, 2H m, 2Hg/, 46416B, 31017B, OB	S6201710
	.	,4OB, 2HPA, 2HRT, 2H. /, 46416B, 31017B, OB/	S6201720
		DATA WNITS	S6201730
	.	/2H P, 2HPM, 4*2H	S6201740
	.	,2H M, 2HG/, 2HM*, 2H*3, 2*2H	S6201750
	.	,2H P, 2HPM, 2H-S, 2HEC, 2*2H	S6201760
	.	,2H M, 2HG-, 2HSE, 2HC/, 2HM*, 2H*3	S6201770
	.	,2H P, 2HH ,4*2H	S6201780
	.	,2H M, 2HG/, 2HM*, 2H*2, 2*2H	S6201790
	.	,2H P, 2HAR, 2HT. , 2H/M, 2H**, 2H2 /	S6201800
		DATA MTH/2H T, 2HHI, 2HRD, 2H	S6201810
	.	,2H F, 2HOU, 2HRT, 2HH	S6201820
	.	,2H F, 2HIF, 2HTH, 2H	S6201830
	.	,2H S, 2HIX, 2HTH, 2H	S6201840
	.	,2HSE, 2HVE, 2HNT, 2HH	S6201850
	.	,2H E, 2HIG, 2HHT, 2HH	S6201860
	.	,2H N, 2HIN, 2HTH, 2H	S6201870
	.	,2H , 2HLA, 2HST, 2H /	S6201880
		DATA NFSLS/2HSE, 2HCO, 2HND,	S6201890
	*	2HTH, 2HIR, 1HD,	S6201900
	*	2HFO, 2HUR, 2HTH,	S6201910
	*	2HFI, 2HFT, 1HH,	S6201920
	*	2HSI, 2HXT, 1HH,	S6201930
	*	2HSE, 2HVE, 2HNT,	S6201940
	*	2HEI, 2HGH, 2HTH,	S6201950
	*	2HNI, 2HNT, 1HH,	S6201960
	*	2HTE, 2HNT, 1HH/	S6201970
			S6201980
		VARIABLES	S6201990
			S6202000
		DATA JCDT	S6202010
	.	/5*2H , 2H C, 2HON, 2HCE, 2HNT, 2HRA, 2HTI, 2HON	S6202020
	.	,9*2H , 2HDO, 2HSA, 2HGE	S6202030
	.	,2H T, 2HIM, 2HE , 2HME, 2HAN, 2H C, 2HON, 2HCE, 2HNT, 2HRA, 2HTI, 2HON	S6202040
	.	,8*2H , 2H A, 2HCI, 2HDI, 2HTY	S6202050

. ,3*2H	,2HWA,2HSH,2HOU,2HT ,2HDE,2HPO,2HSI,2HTI,2HON	S6202060
. ,2HGR,2HAV,2HIT,2HAT,2HIO,2HNA,2HL ,2HDE,2HPO,2HSI,2HTI,2HON/		S6202070
DATA KCDT		S6202080
. /2H C,2HON,2HCE,2HNT,2HRA,2HTI,2HON,40B,5*0B		S6202090
. ,2H D,2HOS,2HAG,2HE ,9*0B		S6202100
. ,2H T,2HIM,2HE ,2HME,2HAN,2H C,2HON,2HCE,2HNT,2HRA,2HTI,2HON,40B		S6202110
. ,2H A,2HCI,2HDI,2HTY,40B,8*0B		S6202120
. ,2H W,2HAS,2HHO,2HUT,2H D,2HEP,2HOS,2HIT,2HIO,2HN ,3*0B		S6202130
. ,2H G,2HRA,2HVI,2HTA,2HTI,2HON,2HAL,2H D,2HEP,2HOS,2HIT,2HIO		S6202140
. ,2HN /		S6202150
DATA CDT		S6202160
. /40B,15446B,62104B,103B,15446B,62100B,2HON,2HCE,2HNT,2HRA,2HTI		S6202170
. ,2HON,5*0B,15446B,62100B		S6202180
. ,40B,15446B,62104B,104B,15446B,62100B,2HOS,2HAG,105B,8*0B,15446B		S6202190
. ,62100B		S6202200
. ,40B,15446B,62104B,124B,15446B,62100B,2HIM,2HE ,2HME,2HAN,2H C		S6202210
. ,2HON,2HCE,2HNT,2HRA,2HTI,2HON,15446B,62100B/		S6202220
		S6202230
		S6202240
		S6202250
		S6202260
		S6202270
		S6202280
		S6202290
		S6202300
		S6202310
DATA JSPECI		S6202320
. /2H ,2H H,2HCI		S6202330
. ,2H ,2H C,2HO2		S6202340
. ,2H ,2H ,2HCO		S6202350
. ,2H A,2H12,2HO3/		S6202360
DATA LSPECI		S6202370
. /15446B,62104B,110B,15446B,62100B,2HCI,15446B,62100B,0B,15446B		S6202380
. ,62100B		S6202390
. ,15446B,62104B,103B,15446B,62100B,117B,15446B,62104B,62B,15446B		S6202400
. ,62100B		S6202410
. ,15446B,62104B,103B,15446B,62100B,117B,15446B,62100B,0B,15446B		S6202420
. ,62100B		S6202430
. ,15446B,62104B,101B,15446B,62100B,2H12,15446B,62100B,2HO3,15446B		S6202440
. ,62100B/		S6202450
DATA KSPECI		S6202460
. /2H H,2HCL,40B		S6202470
. ,2H C,2HO2,40B		S6202480
. ,2H C,2HO ,0B		S6202490
. ,2H A,2HL2,2HO3/		S6202500
DATA KSPL/4,4,3,6/,FLGSPC/4*.FALSE./,FLGPH/.FALSE./		S6202510
. ,KCDTN/14,7,24,8,19,25/		S6202520
DATA CR,CRLF,BLANK,BLANK1,BKARO,BKAKO,ZIP		S6202530
. /15B,6412B,20040B,40B,20137B,137B,5*0/		S6202540
DATA AT,ADD,LETR2(1),LPAREN,BKARO/1,1H@,1,1H+,1,2H( ,2H ),2H _/		S6202550
. ,LETRO/1,1HO/		S6202560
DATA DISOF/0.1,0.3,0.5,0.7,0.9/		S6202570
DATA SMORLW/2H L,2HOW,2HER		
. ,2H ,2H S,2HUM		
. ,2H L,2HAY,2HER,2H 1		
. ,2H L,2HAY,2HER,2H 2/		
DATA PSORL/16,2HLO,2HWE,2HR ,2HLA,2HYE,2HR ,2HON,2HLY		
. ,13,2HSU,2HM ,2HOF,2H L,2HAY,2HER,2HS ,2H		

C  
C  
C

.	,12,2HLA,2HYE,2HR ,2H1 ,2HON,2HLY,2H ,2H	S6202580
.	,12,2HLA,2HYE,2HR ,2H2 ,2HON,2HLY,2H ,2H /	S6202590
	DATA XSCALE,YSCALE,D2RAD/0.2631,0.3545,0.01745329/	S6202600
	DATA YORNO/15446B,62106B,131B,15446B,62102B,2HES,15446B,62100B	S6202610
.	,2H 0,2HR ,15446B,62104B,116B,15446B,62100B,117B,15446B,62100B/	S6202620
	DATA ICONMA/26000B/	S6202630
	DATA IIHL1,IH1,IIHL2,IH2,IIHLA,IIHR1,IIHR2/2HL1,1H1,2HL2,1H2,2HLA,	S6202640
.	2HR1,2HR2/	S6202650
.	,IIHSU/2HSU/,IHC,IHD,IHT,IHM,IHP,IHL,IHAT,IHV/1HC,1HD,1HT,1HM,	S6202660
.	1HP,1HL,1H@,1HV/,IHS/1HS/	S6202670
C		S6202680
C	STATEMENT FUNCTIONS	S6202690
C		S6202700
	XRF(I)=(RISTIM(I)-RISBOT)*SPEEDN(I)*COS((360.0-DIRN(I))*D2RAD)	S6202710
	YRF(I)=(RISTIM(I)-RISBOT)*SPEEDN(I)*SIN((360.0-DIRN(I))*D2RAD)	S6202720
	XRP(R,B)=R*COS((180.0-B)*D2RAD)	S6202730
	YRP(R,B)=R*SIN((180.0-B)*D2RAD)	S6202740
C		S6202750
C****	FIRST EXECUTABLE STATEMENT.	S6202760
C		S6202770
	TTY=.NOT.CRT	S6202780
	IF(CRT) GO TO 50	S6202790
	K=0	S6202800
	DO 40 I=1,6	S6202810
	IF(I.GT.4) GO TO 30	S6202820
	DO 20 J=1,4	S6202830
	LSPECI(3*I-2,J) = NULL	S6202840
	LSPECI(3*I-1,J) = NULL	S6202850
	IF(J.GT.3) GO TO 20	S6202860
	IF(I.GT.2) GO TO 10	S6202870
	CDT(3*I-1+19*(J-1)) = NULL	S6202880
	CDT(3*I+19*(J-1)) = NULL	S6202890
	GO TO 20	S6202900
10	CDT(18+19*(J-1)) = NULL	S6202910
	CDT(19+19*(J-1)) = NULL	S6202920
20	CONTINUE	S6202930
	IF(I.EQ.4) K=1	S6202940
30	YORNO(3*I+K-2) = NULL	S6202950
	YORNO(3*I+K-1) = NULL	S6202960
40	CONTINUE	S6202970
50	ASSIGN 80 TO IGO	S6202980
	FIRSTP=.FALSE.	S6202990
	FIRSTV=-1	S6203000
C		S6203010
C	SET TABS AND DEFINE ALTERNATE CHARACTER SET.	S6203020
C	TABS SET IN COLS: 7,20,30,49,64	S6203030
C		S6203040
	IF(CRT) WRITE(ICU,9003) CR,CLRDSP,(SETTAB,I=1,5),ALTSET,CR,BKAKO	S6203050
9003	FORMAT(2A2,6X,A2,13X,A2,10X,A2,19X,A2,15X,5A2)	S6203060
	IPLTHP=0	S6203070
60	IVARP = 0	S6203080
C		S6203090



140	CONTINUE	S6203620
	WRITE(ICU,9004) LPAREN(1),(IALPHA(I),I=1,19),TAB2	S6203630
	. ,(IALPHA(I),I=20,38),TAB2,(IALPHA(I),I=39,57)	S6203640
	. ,LPAREN(2),BKARO	S6203650
150	CONTINUE	S6203660
9004	FORMAT(19H PLOT ISOPLETHS OF: ,20A2/A2,2X,19A2/A2,2X,21A2)	S6203670
9005	FORMAT(19H PLOT ISOPLETHS OF: ,47A2)	S6203680
	L1=40B	S6203690
160	CALL EXEC(1,ICU+400B,L1,-1)	S6203700
C		S6203710
C		S6203720
	IF(CRT) WRITE(ICU,9009) (CURSUP,K=1,3),DELINE,CLRDSP,BKAKO	S6203730
	IF(L1.NE.IBLNK) GO TO 170	S6203740
C		S6203750
C	DEFAULT	S6203760
C		S6203770
	JDO=IPLTHP+1	S6203780
	GO TO 200	S6203790
170	IF(L1.NE.IHC) GO TO 180	S6203800
C		S6203810
C	CONCENTRATION SELECTED	S6203820
C		S6203830
	JDO=1	S6203840
	GO TO 200	S6203850
180	IF(L1.NE.IHD) GO TO 190	S6203860
C		S6203870
C	DOSAGE SELECTED	S6203880
C		S6203890
	JDO=2	S6203900
	GO TO 200	S6203910
190	IF(L1.NE.IHT) GO TO 100	S6203920
C		S6203930
C	TIME MEAN CONCENTRATION	S6203940
C		S6203950
	JDO=3	S6203960
200	IPLTHP=MOD(JDO,3)	S6203970
	FIRSTP=.FALSE.	S6203980
	JLAB=JLABS(JDO,1)	S6203990
210	WRITE(ICU,9006) (JCDT(I,JLAB),I=1,12)	S6204000
9006	FORMAT(20H PLOT ISOPLETHS OF: ,21X,12A2)	S6204010
220	IF(MODEL.GT.5) GO TO 410	S6204020
C		S6204030
C	MODELS 4 AND 5	S6204040
C		S6204050
	IF(FIRSTP.AND.IVARP.EQ.FIRSTV) GO TO 80	S6204060
C		S6204070
C	FORM PROMPT MESSAGE (ALSO COUNT NUMBER OF SPECIES PRESENT)	S6204080
C		S6204090
	NSPECI=0	S6204100
	NWDS=0	S6204110
	DO 240 J=1,4	S6204120
	IF(IPLINT(J).LE.0) GO TO 250	S6204130



C		S6204140
C	NO DEPOSITION OR WASHOUT OF CO OR CO2	S6204150
C		S6204160
	IF(MODEL.GT.4.AND.(IPLLNT(J).EQ.2.OR.IPLLNT(J).EQ.3)) GO TO 240	S6204170
	JM1=J-1	S6204180
	NWDS=NWDS+12	S6204190
	NSPECI=NSPECI+1	S6204200
	FLGSPC(IPLLNT(J))=.TRUE.	S6204210
	DO 230 I=1,11	S6204220
	IALPHA(I+12*JM1)=LSPECI(I,IPLLNT(J))	S6204230
230	CONTINUE	S6204240
	IALPHA(12*J)=ICOMMA	S6204250
240	CONTINUE	S6204260
250	NWDS=NWDS-1	S6204270
		S6204280
C		S6204290
C	DON'T DISPLAY PROMPT IF THERE ARE NO CHOICES	S6204300
C		S6204310
	IF(NSPECI.EQ.1) GO TO 280	S6204320
C		S6204330
C	INVERSE VIDEO FOR DEFAULT	S6204340
C		S6204350
	DO 260 J=2,8,3	S6204360
	IALPHA(J+12*IVARP)=IOR(IALPHA(J+12*IVARP),2B)	S6204370
260	CONTINUE	S6204380
270	WRITE(ICU,9007) CR,LPAREN(1),(IALPHA(I),I=1,NWDS),LPAREN(2),BKARO	S6204390
9007	FORMAT(A2,22H PLOT ISOPLETHS FOR: ,60A2)	S6204400
	L1 = NULL	S6204410
	L2 = NULL	S6204420
	L3 = NULL	S6204430
	CALL EXEC(1,ICU+400B,L1,3)	S6204440
	IF (L1 .EQ. MINUS1.AND.MODEL .LE. 4) GO TO 80	S6204450
9008	FORMAT(5A1)	S6204460
	L2=IAND(377B,L1)	S6204470
	L1=IAND(177400B,L1)	S6204480
		S6204490
C		S6204500
C	ERASE PROMPT	S6204510
C		S6204520
	IF(CRT) WRITE(ICU,9009) CURSUP,DELINE,BKAKO	S6204530
9009	FORMAT(50A2)	S6204540
	IF(L1.NE.20000B) GO TO 290	S6204550
		S6204560
C		S6204570
C	DEFAULT	S6204580
C		S6204590
	280 IDO=IPLLNT(IVARP+1)	S6204600
	GO TO 390	S6204610
	290 IF(L1.NE.44000B.OR..NOT.FLGSPC(1)) GO TO 300	S6204620
		S6204630
C		S6204640
C	HCL SELECTED	S6204650
C		
	IDO=1	
	GO TO 380	
300	IF(L1.NE.40400B.OR..NOT.FLGSPC(4)) GO TO 310	

C		S6204660
C	AL203 SELECTED	S6204670
C		S6204680
	IDO=4	S6204690
	GO TO 380	S6204700
	310 IF(L1.EQ.41400B.AND.(FLGSPC(2).OR.FLGSPC(3))) GO TO 330	S6204710
C		S6204720
C	BAD ENTRY PROCESSING	S6204730
C		S6204740
	320 WRITE (ICU,9010) INV,OFF,22,2	S6204750
	9010 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S6204760
	*,I2,IH.,I2//)	S6204770
	GO TO 270	S6204780
C		S6204790
C	CO2 AND CO	S6204800
C		S6204810
	330 IF(L2.NE.62B.OR..NOT.FLGSPC(2)) GO TO 350	S6204820
C		S6204830
C	CO2 SELECTED	S6204840
C		S6204850
	340 IDO=2	S6204860
	GO TO 380	S6204870
	350 IF(L2.NE.40B.OR..NOT.FLGSPC(3)) GO TO 370	S6204880
C		S6204890
C	CO SELECTED	S6204900
C		S6204910
	360 IDO=3	S6204920
	GO TO 380	S6204930
	370 IF(L2.NE.117B) GO TO 320	S6204940
	IF(L3.EQ.IBLNK.AND.FLGSPC(3)) GO TO 360	S6204950
	IF(L3.EQ.IH2.AND.FLGSPC(2)) GO TO 340	S6204960
	GO TO 320	S6204970
C		S6204980
C	PICK UP CONVERSION FACTOR AND WRITE SPECIES SELECTED	S6204990
C		S6205000
	380 FIRSTP=.FALSE.	S6205010
C		S6205020
C	SET UP NEXT DEFAULT	S6205030
C		S6205040
	390 DO 400 I=1,4	S6205050
	IF(IDO.NE.IPLLNT(I)) GO TO 400	S6205060
	IVARP=MOD(I,NSPECI)	S6205070
	IF(FIRSTP) GO TO 410	S6205080
	FIRSTP=.TRUE.	S6205090
	FIRSTV=MOD(I+NSPECI-1,NSPECI)	S6205100
	GO TO 410	S6205110
	400 CONTINUE	S6205120
	IVARP=0	S6205130
	FIRSTP=.FALSE.	S6205140
	FIRSTV=-1	S6205150
	410 LNDX=0	S6205160
	IF(MODEL.EQ.6) IDO=4	S6205170

WRITE(ICU,9007) CR,(BLANK,I=1,18),BLANK1,(JSPECI(I,IDO),I=1,3)	S6205180
IF(MODEL.LT.5) GO TO 540	S6205190
IF(MODEL.GT.5) GO TO 500	S6205200
C	S6205210
C       MODEL 5 ONLY	S6205220
C	S6205230
C       JDO=4	S6205240
C	S6205250
C	S6205260
420 WRITE(ICU,9011) INVNDR,INV,OFF,(ULINE,OFF,I=1,4)	S6205270
9011 FORMAT(20H PLOT ISOPLETHS FOR ,2A2,1HS,2A2,2HUM,2A2,14H OF LAYERS	S6205280
*OR ,2A2,1HL,2A2,5HAYER ,2A2,1H1,2A2,4H OR ,2A2,1HL,2A2,5HAYER ,2A2	S6205290
*,1H2,2A2,4H? :_)	S6205300
LDO=1	S6205310
KS = 4	S6205320
K = 4	S6205330
J = 6	S6205340
LNDX = 2	S6205350
DO 430 I=1,4	S6205360
430 IBUF(I) = IBLNK	S6205370
READ (ICU,9009) IBUF	S6205380
IF (IBUF(1) .EQ. MINUS1) GO TO 80	S6205390
IF (IBUF(1) .NE. MINUS9) GO TO 440	S6205400
IERROR(1) = 1	S6205410
NNNEST = 1	S6205420
GO TO 1280	S6205430
440 IF (IBUF(1).EQ.IBLNK.OR.IBUF(1).EQ.IHS.OR.IBUF(1).EQ.IIHSU) GO TO	S6205440
*490	S6205450
IF (IBUF(1).EQ.IIHL1.OR.IBUF(1).EQ.IH1) GO TO 460	S6205460
IF (IBUF(1).EQ.IIHL2.OR.IBUF(1).EQ.IH2) GO TO 470	S6205470
IF (IBUF(1).NE.IIHLA.OR.IBUF(2).NE.IYESJ) GO TO 450	S6205480
IF (IBUF(3).EQ.IIHR1.OR.IBUF(4).EQ.IH1) GO TO 460	S6205490
IF (IBUF(3).EQ.IIHR2.OR.IBUF(4).EQ.IH2) GO TO 470	S6205500
450 WRITE (ICU,9010) INV,OFF,22,3	S6205510
GO TO 420	S6205520
460 KS = 6	S6205530
K = 7	S6205540
J = 10	S6205550
LNDX = 0	S6205560
GO TO 490	S6205570
470 IF (LAYTOP(2) .GT. 0) GO TO 480	S6205580
IF (CRT) WRITE (ICU,9009) CURSUP,DELINE,BKAKO	S6205590
WRITE (ICU,9012)	S6205600
9012 FORMAT (29H THERE IS NOT A SECOND LAYER )	S6205610
GO TO 420	S6205620
480 KS = 8	S6205630
K = 11	S6205640
J = 14	S6205650
LNDX = 1	S6205660
490 CONTINUE	S6205670
IF(CRT) WRITE(ICU,9009) CURSUP,DELINE,BKAKO	S6205680
WRITE (ICU,9015) TAB2,(SMORLW(I),I=K,J)	S6205690

	FLGPH=.TRUE.	S6205700
	IF(IDO.EQ.4) FLGPH=.FALSE.	S6205710
	GO TO 540	S6205720
C		S6205730
C	MODEL 6 ONLY.	S6205740
C		S6205750
	500 IDO=4	S6205760
	JDO=5	S6205770
	LNDX=0	S6205780
	LDO=1	S6205790
	WRITE(ICU,9013) INVNDR,INV,OFF,ULINE,OFF,BKARO	S6205800
	9013 FORMAT(21H PLOT DEPOSITION IN (,2A2,1HM,2A2,9HILLIGRAMS,2A2,4H OR	S6205810
	.,2A2,1HP,2A2,14HARTICLES/M**3),A2)	S6205820
	K = 40B	S6205830
	CALL EXEC(1,ICU+400B,K,-1)	S6205840
	IF(CRT) WRITE(ICU,9009) CURSUP,DELINE,BKAKO	S6205850
	IF(K.EQ.IBLNK.OR.K.EQ.IHM) GO TO 520	S6205860
	IF(K.EQ.IHP) GO TO 510	S6205870
	WRITE (ICU,9010) INV,OFF,22,4	S6205880
	GO TO 500	S6205890
	510 JDO=6	S6205900
	520 WRITE(ICU,9014) INVNDR,INV,OFF,ULINE,OFF,BKARO	S6205910
	9014 FORMAT(20H PLOT ISOPLETHS FOR ,2A2,1HS,2A2,2HUM,2A2,	S6205920
	.18H OF LAYERS OR FOR ,2A2,1HL,2A2,16HOWER LAYER ONLY?,A2)	S6205930
	K=40B	S6205940
	CALL EXEC(1,ICU+400B,K,-1)	S6205950
	IF(CRT) WRITE(ICU,9009) CURSUP,DELINE,BKAKO	S6205960
	IF(K.EQ.IHL.OR. K.EQ.IHS.OR. K.EQ.IBLNK) GO TO 530	S6205970
	WRITE (ICU,9010) INV,OFF,22,5	S6205980
	GO TO 520	S6205990
	530 KS=4	S6206000
	IF(K.EQ.IHL) KS=1	S6206010
	WRITE(ICU,9015) TAB2,(SMORLW(I),I=KS,KS+2)	S6206020
	9015 FORMAT(21H ISOPLETHS DRAWN FOR:,A2,11X,4A2)	S6206030
	IF(K.NE.IHL) GO TO 540	S6206040
	LNDX=1	S6206050
C		S6206060
C	SELECT UNITS FOR DISPLAY AND DATA LOCATION	S6206070
C		S6206080
	540 JUNIT=JUNITS(JDO,IDO)	S6206090
	JLAB=JLABS(JDO,IDO)	S6206100
	LNDX=LNDX+JDATA(JDO,IDO)	S6206110
C		S6206120
C	RESET YORNO DEFAULT BACK TO Y	S6206130
C		S6206140
	550 IF(TTY) GO TO 560	S6206150
	YORNO( 2)=62106B	S6206160
	YORNO( 5)=62102B	S6206170
	YORNO(12)=62104B	S6206180
	YORNO(15)=62100B	S6206190
C		S6206200
C	COMPUTE AND DISPLAY MAXIMUM	S6206210

C	560 QF=QCONV(IDO)	S6206220
	QMAX=QF*XCORSG(LNDX)	S6206230
	CQMAX=QMAX	S6206240
	IF(FLGPH) CQMAX=XCORSG(LNDX)	S6206250
	WRITE(ICU,9016) (KCDT(I,JLAB),I=1,13), (KSPECI(I,IDO),I=1,3),QMAX	S6206260
	, (UNITS(N1,JUNIT),N1=1,7)	S6206270
	9016 FORMAT(8H MAXIMUM,13A2,2HOF,3A2,1H=,G10.4,7A2)	S6206280
C		S6206290
C	COMPUTE DEFAULT ISOPLETH VALUES	S6206300
C		S6206310
	NPLETH=0	S6206320
	DO 580 N1=1,5	S6206330
	PLETH(N1+N1-1)=0.0	S6206340
	PLETH(N1+N1)=0.0	S6206350
	DPLETH(N1)=DISOF(N1)*QMAX	S6206360
C		S6206370
C	DEFAULT ISOPLETHS OF pH.	S6206380
C		S6206390
	IF(.NOT.FLGPH) GO TO 570	S6206400
	IF(FLOAT(6-N1).LT.XCORSG(LNDX)) GO TO 580	S6206410
	DPLETH(NPLETH+1)=FLOAT(6-N1)	S6206420
	570 NPLETH=NPLETH+1	S6206430
	580 CONTINUE	S6206440
C		S6206450
C	DISPLAY DEFAULT ISOPLETHS	S6206460
C		S6206470
	590 WRITE(ICU,9017) (TAB2,INVHF,DPLETH(N1)	S6206480
	, (UNITS(N2,JUNIT),N2=1,7),OFF,N1=1,NPLETH)	S6206490
	9017 FORMAT(23H DEFAULT ISOPLETHS ARE:,3A2,G11.4,9A2/	S6206500
	,4(21X,3A2,G11.4,9A2/))	S6206510
	600 J = 0	S6206520
	610 J = J+1	S6206530
	IF (J .GT. 10) GO TO 720	S6206540
	620 IF (J .GT. 1) GO TO 640	S6206550
	630 WRITE (ICU,9018) CURSUP,CLRLNE,INV,OFF,INV,OFF	S6206560
	9018 FORMAT (2A2,7H ENTER ,2A2,5HFIRST,2A2,17H ISOPLETH VALUE (,2A2,	S6206570
	*14HSPACE - RETURN,2A2,14H FOR DEFAULTS))	S6206580
	GO TO 650	S6206590
	640 N1 = IBLNK	S6206600
	IF (J .EQ. 7) N1 = NFSLS(3,5)	S6206610
	WRITE (ICU,9019) CURSUP,CLRLNE,CURSUP,CLRLNE,INV,(NFSLS(N2,J-1),	S6206620
	*N2=1,3),N1,OFF,INV,OFF	S6206630
	9019 FORMAT (4A2,7H ENTER ,5A2,A1,2A2,17H ISOPLETH VALUE (,2A2,	S6206640
	*14HSPACE - RETURN,2A2,28HTO TERMINATE ISOPLETH INPUT))	S6206650
	650 CALL IFNBR(LALPH1,20,IER,ICU)	S6206660
	IF (IER .EQ. 0) GO TO 660	S6206670
	WRITE (ICU,9010) INV,OFF,22,6	S6206680
	GO TO 620	S6206690
	660 IF (LALPH1 .EQ. IBLNK) GO TO 700	S6206700
	IF (LALPH1 .NE. MINUS1) GO TO 670	S6206710
	IF (J .EQ. 1) GO TO 80	S6206720
		S6206730

	J = J-1	
	GO TO 620	S6206740
670	CALL CODE(80)	S6206750
	READ (LALPH1,*) PLETH(J)	S6206760
	IF (FLGPH) GO TO 680	S6206770
	IF (PLETH(J) .GT. CQMAX.OR.PLETH(J) .LE. 0.0) GO TO 690	S6206780
	GO TO 610	S6206790
680	IF (PLETH(J) .GE. CQMAX.AND.PLETH(J) .LE. 14) GO TO 610	S6206800
690	WRITE (ICU,9020) INV,OFF	S6206810
9020	FORMAT (2A2,31H ISOPLETH VALUE IS OUT OF RANGE,2A2//)	S6206820
	GO TO 620	S6206830
700	IF (J .GT. 1) GO TO 720	S6206840
C	USE DEFAULT VALUES	S6206850
	DO 710 J=1,NPLETH	S6206860
710	PLETH(J) = DPLETH(J)	S6206870
	GO TO 730	S6206880
720	NPLETH = J-1	S6206890
730	WRITE (ICU,9021) (TAB2,PLETH(N1),(UNITS(N2,JUNIT),N2=1,7),N1=1,	S6206900
	*NPLETH)	S6206910
9021	FORMAT (23H ISOPLETHS PLOTTED ARE:,A2,G11.4,7A2/4(21X,A2,G11.4,7A2S	S6206920
	*/))	S6206930
C		S6206940
C	LET'S PLOT	S6206950
C		S6206960
740	CONTINUE	S6206970
	DIRNL = AIMAG(RBORSG(LNDX))+180.0	S6206980
	CALL ORGIN(IX0,IY0,DIRNL)	S6206990
	WRITE(ICU,9022) CR,CLRDSP,BLNKNG,OFF,BKAKO	S6207000
9022	FORMAT(2A2,10X,2A2,8HPLOTTING,2A2)	S6207010
	CALL PLTLU(IPU3)	S6207020
	CALL SFACT(99.99,99.99)	S6207030
	CALL LLEFT	S6207040
	ITVXX=0	S6207050
	ITVXN=9999	S6207060
	CALL SYMB(0.01*FLOAT(IX0-45),0.01*FLOAT(IY0-80),1.6,LETRO,0.0,1)	S6207070
C		S6207080
C	DETERMINE THE INDEX OF THE LAYER THAT HAS	S6207090
C	THAT ALTITUDE JUST LOWER THAN THE EFFECTIVE CLOUD HEIGHT, H	S6207100
C		S6207110
	DO 750 I=2,NUM	S6207120
	IF(H .GT. ALT(I))GO TO 750	S6207130
	IH = I - 2	S6207140
	GO TO 760	S6207150
750	CONTINUE	S6207160
	IH = MAXO(LAYTOP(1),LAYTOP(2))	S6207170
C		S6207180
C	CALCULATE THE CLOUD MOVEMENT ALONG THE GROUND	S6207190
C	AS FAR AS THE CLOUD STABILIZATION POINT	S6207200
C		S6207210
760	X = 0.0	S6207220
	Y = 0.0	S6207230
	CALL PLOT(0.01*FLOAT(IX0),0.01*FLOAT(IY0),3)	S6207240
		S6207250

	RISBOT=0.0	S6207260
	DO 770 I=1,IH	S6207270
	X=X+XRF(I)	S6207280
	Y=Y+YRF(I)	S6207290
	RISBOT=RISTIM(I)	S6207300
	IX = INT(0.2631 * X) + IX0	S6207310
	IY = INT(0.3545 * Y) + IY0	S6207320
770	CONTINUE	S6207330
780	IHP1=IH+1	S6207340
	X=X+SPEEDN(IHP1)*(TAUK-RISTIM(IH))*COS((360.0-DIRN(IHP1))*D2RAD)	S6207350
	Y=Y+SPEEDN(IHP1)*(TAUK-RISTIM(IH))*SIN((360.0-DIRN(IHP1))*D2RAD)	S6207360
	IX=INT(XSCALE*X)+IX0	S6207370
	IY=INT(YSCALE*Y)+IY0	S6207380
	ISTABX=IX	S6207390
	ISTABY=IY	S6207400
	IF(IX.LT.75.OR.IX.GT.9925.OR.IY.LT.75.OR.IY.GT.9925) GO TO 790	S6207410
C		S6207420
C	LABEL STABILIZATION POINT WITH A "+"	S6207430
C		S6207440
	CALL SYMB(0.01*FLOAT(IX)-0.45,0.01*FLOAT(IY)-0.8,1.6,ADD,0.0,1)	S6207450
790	CONTINUE	S6207460
C		S6207470
C	PLOT LINE OF MAXIMUM VALUES	S6207480
C		S6207490
	NRNG = 1	S6207500
	PEN=1	S6207510
800	IF(RANGE(NRNG,LNDX).LE.0.0.OR.SIGYBR(NRNG,LNDX).LE.0.0) GO TO 820	S6207520
	XMAX=XRP(RANGE(NRNG,LNDX),BEARNG(NRNG,LNDX))	S6207530
	YMAX=YRP(RANGE(NRNG,LNDX),BEARNG(NRNG,LNDX))	S6207540
	IX=IFIX(XSCALE*XMAX)+IX0	S6207550
	IY=IFIX(YSCALE*YMAX)+IY0	S6207560
	IF(IX.LT.0.OR.IX.GT.9999.OR.IY.LT.0.OR.IY.GT.9999) GO TO 820	S6207570
810	CALL PLOT(0.01*FLOAT(IX),0.01*FLOAT(IY),PEN+2)	S6207580
	PEN=1-PEN	S6207590
820	NRNG=NRNG+1	S6207600
	IF(NRNG.LT.31) GO TO 800	S6207610
C		S6207620
C****	LABEL THE POINT OF MAXIMUM WITH AN "@".	S6207630
C		S6207640
830	XMAX=XRP(REAL(RBORSG(LNDX)),AIMAG(RBORSG(LNDX)))	S6207650
	YMAX=YRP(REAL(RBORSG(LNDX)),AIMAG(RBORSG(LNDX)))	S6207660
	IX=INT(XSCALE*XMAX)+IX0	S6207670
	IY=INT(YSCALE*YMAX)+IY0	S6207680
	IF(IX.GE.75.AND.IX.LE.9925.AND.IY.GE.75.AND.IY.LE.9925)	S6207690
	CALL SYMB(0.01*FLOAT(IX)-0.45,0.01*FLOAT(IY)-0.8,1.6,AT,0.0,1)	S6207700
	PDO=1	S6207710
840	LETR=IHAT	S6207720
C		S6207730
C****	FIND IF THERE ARE ANY BREAKS IN ISOPLETHS	S6207740
	DO 850 I=1,10	S6207750
	IFISOS(I) = 0	S6207760
	IF (I .GT. 5) GO TO 850	S6207770

	IBREAK(I) = 0	S6207780
850	CONTINUE	S6207790
	NBREAK = 0	S6207800
	NRNG = 0	S6207810
860	NRNG = NRNG+1	S6207820
	IF (NRNG .GT. 30) GO TO 910	S6207830
	IF (RANGE(NRNG,LNDX) .LE. 0.0) GO TO 860	S6207840
	XLST = XRP(RANGE(NRNG,LNDX),BEARNG(NRNG,LNDX))	S6207850
	YLST = YRP(RANGE(NRNG,LNDX),BEARNG(NRNG,LNDX))	S6207860
870	NRNG = 1	S6207870
880	IF (RANGE(NRNG,LNDX) .LE. 0.0) GO TO 900	S6207880
	XMAX = XRP(RANGE(NRNG,LNDX),BEARNG(NRNG,LNDX))	S6207890
	YMAX = YRP(RANGE(NRNG,LNDX),BEARNG(NRNG,LNDX))	S6207900
	XBREAK = SQRT((XMAX-XLST)**2+(YMAX-YLST)**2)	S6207910
	IF (XBREAK .LT. 2000.0) GO TO 890	S6207920
	NBREAK = NBREAK+1	S6207930
	IF (NBREAK.LE.5.AND.IBREAK(NBREAK).EQ.0) IBREAK(NBREAK)=NRNG	S6207940
890	XLST = XMAX	S6207950
	YLST = YMAX	S6207960
900	NRNG = NRNG+1	S6207970
	IF (NRNG .LT. 31) GO TO 880	S6207980
910	CONTINUE	S6207990
C		S6208000
C	PLOT THE NPLETH ISOPLETHS	S6208010
C		S6208020
	IF (NBREAK .NE. 0) WRITE (ICU,9023)	S6208030
9023	FORMAT (/60H WARNING - ISOPLETH PLOT IS BROKEN IN TWO, DUE TO WINDS	S6208040
	* SHEAR//)	S6208050
	DO 1150 N=1,NPLETH	S6208060
	NRNG=1	S6208070
	PEN=3	S6208080
	CPLETH=PLETH(N)	S6208090
C		S6208100
C	CONVERT pH TO CONCENTRATION.	S6208110
C		S6208120
	IF(FLGPH) CPLETH=10.0**(-CPLETH)	S6208130
	FLGOUT=.FALSE.	S6208140
	FLGEND=.FALSE.	S6208150
	FLGLTR=.FALSE.	S6208160
	FLGDAT=.FALSE.	S6208170
	LETR=LETR+400B	S6208180
920	IF(RANGE(IABS(NRNG),LNDX).LE.0.0.AND..NOT.FLGEND) GO TO 1140	S6208190
	IF(RANGE(IABS(NRNG),LNDX).LE.0.0.AND.FLGEND) GO TO 930	S6208200
	QFOC=QF/CPLETH	S6208210
	V=CORSG(IABS(NRNG),LNDX)	S6208220
	IF(FLGEND) GO TO 940	S6208230
	IF(NRNG.GT.0) GO TO 940	S6208240
	FLGEND=.TRUE.	S6208250
	NRNG=NRNG+1	S6208260
	IF(NRNG.GT.30) NRNG=-30	S6208270
	IF(FLGOUT) GO TO 920	S6208280
C		S6208290



C	LABEL DOWNWIND END OF CLOSED ISOPLETHS.	S6208300
C		S6208310
	ANG=(270.0-DIRNL)*D2RAD	S6208320
	FX=AMAX1(AMINI(0.01*FLOAT(IX)+1.2*COS(ANG),98.9),0.1)	S6208330
	FY=AMAX1(AMINI(0.01*FLOAT(IY)+1.2*COS(ANG),98.9),0.1)	S6208340
	CALL SYMB(FX,FY,1.0,LETR2,0.0,1)	S6208350
	CALL PLOT(0.01*FLOAT(IX),0.01*FLOAT(IY),3)	S6208360
	GO TO 920	S6208370
C		S6208380
C	LOCATION OF MAXIMUM AT DISTANCE=RANGE	S6208390
C		S6208400
	930 SIGYBR(IABS(NRNG),LNDX)=S0	S6208410
	V=0.0	S6208420
	BEARNG(IABS(NRNG),LNDX)=B0	S6208430
	RANGE(IABS(NRNG),LNDX)=R0-1000.0	S6208440
	NRNG=-1	S6208450
	GO TO 950	S6208460
	940 IF(FLGDAT) GO TO 950	S6208470
	VO=0.0	S6208480
	S0=SIGYBR(IABS(NRNG),LNDX)	S6208490
	B0=BEARNG(IABS(NRNG),LNDX)	S6208500
	R0=RANGE(IABS(NRNG),LNDX)-1000.0	S6208510
	FLGDAT=.TRUE.	S6208520
	950 DR=0.1*(RANGE(IABS(NRNG),LNDX)-R0)	S6208530
	DB=BEARNG(IABS(NRNG),LNDX)-B0	S6208540
	IF(DB.GT.180.0) DB=DB-360.0	S6208550
	IF(DB.LT.-180.0) DB=DB+360.0	S6208560
	DB=0.1*DB	S6208570
	DV=0.1*(V-VO)	S6208580
	DS=0.1*(SIGYBR(IABS(NRNG),LNDX)-S0)	S6208590
C		S6208600
C	INTERPOLATE BETWEEN RANGES	S6208610
C		S6208620
	NO PLOT = 0	S6208630
	IF (NBREAK .EQ. 0) GO TO 1000	S6208640
	IF (NRNG .GT. 0) GO TO 980	S6208650
	DO 960 I=1,NBREAK	S6208660
	IF (IABS(NRNG) .EQ. IBREAK(I)-1) GO TO 970	S6208670
	960 CONTINUE	S6208680
	GO TO 1000	S6208690
	970 NO PLOT = 1	S6208700
	GO TO 1000	S6208710
	980 DO 990 I=1,NBREAK	S6208720
	IF (NRNG .EQ. IBREAK(I)) GO TO 970	S6208730
	990 CONTINUE	S6208740
	1000 CONTINUE	S6208750
	NJPLOT = 0	S6208760
	NKPLOT = 0	S6208770
	DO 1100 IR=0,10	S6208780
	R=R0+DR*FLOAT(IR)	S6208790
	B=B0+DB*FLOAT(IR)	S6208800
	QFBOC=(VO+DV*FLOAT(IR))*QFOC	S6208810

	IF(QFBOC.LT.1.0) GO TO 1100	S6208820
	XMAX=XRP(R,B)	S6208830
	YMAX=YRP(R,B)	S6208840
C		S6208850
C	CALCULATE CROSSWIND DISTANCE TO ISOPLETH	S6208860
	NKPLOT = 0	S6208870
C		S6208880
	SIGYB=(SO+DS*FLOAT(IR))*SQRT(2.0*ALOG(QFBOC))	S6208890
	X=XMAX+XRP(SIGYB,DIRNL+FLOAT(ISIGN(90,NRNG)))	S6208900
	Y=YMAX+YRP(SIGYB,DIRNL+FLOAT(ISIGN(90,NRNG)))	S6208910
	IF (ABS(X-XMAX)-0.1) 1010,1010,1030	S6208920
1010	IF (ABS(Y-YMAX)-0.1) 1020,1020,1030	S6208930
1020	IF (NJPLOT .EQ. 0) NKPLOT = 1	S6208940
	NJPLOT = 0	S6208950
	GO TO 1040	S6208960
1030	IF (NJPLOT .EQ. 0) NKPLOT = -1	S6208970
	NJPLOT = 1	S6208980
1040	CONTINUE	S6208990
	IX=INT(XSCALE*X)+IX0	S6209000
	IY=INT(YSCALE*Y)+IY0	S6209010
	IF (IX.LT.0.OR.IX.GT.9999.OR.IY.LT.0.OR.IY.GT.9999) GO TO 1110	S6209020
C		S6209030
C	LABEL ISOPLETHS WITH LETTER: A - J	S6209040
C		S6209050
	IF(.NOT.FLGOUT) GO TO 1050	S6209060
	FLGOUT=.FALSE.	S6209070
	GO TO 1120	S6209080
1050	IF (FLGLTR) GO TO 1060	S6209090
	FLGLTR=.TRUE.	S6209100
	FX=AMAX1 (AMIN1 (0.01*(XSCALE*XMAX+FLOAT (IX0))-0.285,98.9),0.1)	S6209110
	FY=AMAX1 (AMIN1 (0.01*(YSCALE*YMAX+FLOAT (IY0))-0.5,98.9),0.1)	S6209120
	CALL SYMB (FX,FY,1.0,LETR2,0.0,1)	S6209130
	NDASH=1	S6209140
1060	IF (NOPLOT .NE. 0.OR.NKPLOT .NE. 0) PEN = 3	S6209150
1070	CALL PLOT(0.01*FLOAT (IX),0.01*FLOAT (IY),PEN)	S6209160
	IF (PEN .EQ. 2) IFISOS(N) = 1	S6209170
	IF (IY.LT.4900.OR.IY.GT.5400) GO TO 1080	S6209180
	ITVXX=MAXO (ITVXX,IX)	S6209190
	ITVXN=MINO (ITVXN,IX)	S6209200
1080	NDASH=NDASH+1	S6209210
	IF (PEN.LT.3.OR.NOPLOT .NE. 0.OR.NKPLOT .EQ. 1) GO TO 1090	S6209220
	PEN=2	S6209230
	GO TO 1070	S6209240
C		S6209250
C	IF RANGE IS LESS THAN RX0, PLOT DASHED ISOPLETHS	S6209260
C		S6209270
1090	IF (R.LT.RX0.AND.MOD (NDASH,3).EQ.0) PEN=3	S6209280
1100	CONTINUE	S6209290
	GO TO 1130	S6209300
1110	PEN=3	S6209310
	IF (FLGOUT) GO TO 1130	S6209320
C		S6209330

C	LABEL DOWNWIND ENDS OF OPEN ISOPLETHS	S6209340
C		S6209350
C	FLGLTR=.FALSE.	S6209360
	FLGOUT=.TRUE.	S6209370
1120	FX=AMAX1(AMIN1(0.01*FLOAT(IX)+0.1,98.9),0.1)	S6209380
	FY=AMAX1(AMIN1(0.01*FLOAT(IY)+0.1,98.9),0.1)	S6209390
	CALL SYMB(FX,FY,1.0,LETR2,0.0,1)	S6209400
	IF(.NOT.FLGOUT) GO TO 1060	S6209410
1130	BO=BEARNG(IABS(NRNG),LNDX)	S6209420
	RO=RANGE(IABS(NRNG),LNDX)	S6209430
	VO=V	S6209440
	S0=SIGYBR(IABS(NRNG),LNDX)	S6209450
1140	NRNG=NRNG+1	S6209460
	IF(NRNG.EQ.0) GO TO 1150	S6209470
	IF(NRNG.GT.30) NRNG=-30	S6209480
	GO TO 920	S6209490
1150	CONTINUE	S6209500
C		S6209510
C		S6209520
C		S6209530
C	ON THE PLOT, CROSS OUT EITHER THE WORD FORECAST OR SOUNDING	S6209540
C		S6209550
1160	IF(ISNDFO) GO TO 1170	S6209560
	CALL PLOT(7.07,6.04,3)	S6209570
	CALL PLOT(11.74,6.04,2)	S6209580
	GO TO 1180	S6209590
C		S6209600
1170	CALL PLOT(12.69,6.04,3)	S6209610
	CALL PLOT(17.60,6.04,2)	S6209620
C		S6209630
C	PRINT OUT FORECAST/SOUNDING TIME ON THE PLOT	S6209640
C		S6209650
1180	LALPH1=13	S6209660
	CALL TMNDT(ISTIME,ISDAY,ISMON,ISYEAR,IALPHA)	S6209670
	CALL SYMB(19.3,5.60,0.80,LALPHA,0.0,1)	S6209680
C		S6209690
C	PRINT OUT THE TIME OF EXECUTION ON THE PLOT	S6209700
C		S6209710
	CALL TMNDT(JTIME,JDAY,JMON,JYEAR,IALPHA)	S6209720
	CALL SYMB(19.30,3.40,0.80,LALPHA,0.0,1)	S6209730
C		S6209740
C	IF THE LAUNCH TIME WAS ENTERED, PRINT IT OUT ON THE PLOT	S6209750
C	ELSE PRINT OUT THE PROGRAM RUN TIME ON THE PLOT.	S6209760
C		S6209770
	CALL TMNDT(LTIME,LDAY,LMON,LYEAR,IALPHA)	S6209780
	CALL SYMB(19.30,1.20,0.80,LALPHA,0.0,1)	S6209790
C		S6209800
C	FOR MODEL 5 OR 6 PLOTS, PRINT NOTATION FOR	S6209810
C	SUM OF LAYERS OR LOWER LAYER ONLY OR LAYER 1 ONLY	S6209820
C	OR LAYER 2 ONLY.	S6209830
C		S6209840
	IF(MODEL.EQ.5.OR.MODEL.EQ.6)	S6209850

	. CALL SYMB(5.61,8.64,0.8,PSORL(1,(KS+1)/2),0.0,1)	S6209860
C		S6209870
C	ON THE PLOT, PRINT OUT THE CHARACTERS + AND @ FOR THE LEGEND	S6209880
C		S6209890
	1190 CONTINUE	S6209900
	CALL SYMB(10.41,11.24,1.6,AT,0.0,1)	S6209910
	CALL SYMB(10.41,13.52,1.6,ADD,0.0,1)	S6209920
C		S6209930
C	PRINT OUT CALCULATION HEIGHT ON PLOT	S6209940
C		S6209950
	LALPH1=30	S6209960
	CALL CODE	S6209970
	WRITE(IALPHA,9024) CALHT	S6209980
	9024 FORMAT(19HCALCULATION HEIGHT=,F7.1,4H (M))	S6209990
	CALL SYMB(4.81,18.00,0.8,LALPHA,0.0,1)	S6210000
C		S6210010
C	PRINT OUT LOCATION ON PLOT	S6210020
C		S6210030
	LALPH1=17	S6210040
	CALL CODE	S6210050
	WRITE(IALPHA,9025) LOCATN	S6210060
	9025 FORMAT(13HPLOTTED AT: ,2A2)	S6210070
	CALL SYMB(8.0,22.0,0.8,LALPHA,0.0,1)	S6210080
C		S6210090
C	PRINT OUT DATA FILENAME ON THE PLOT	S6210100
C		S6210110
	LALPH1=19	S6210120
	CALL CODE	S6210130
	WRITE(IALPHA,9026) FILE	S6210140
	9026 FORMAT(13H FROM FILE: ,3A2)	S6210150
	CALL SYMB(8.0,20.0,0.8,LALPHA,0.0,1)	S6210160
C		S6210170
C	PRINT OUT SPECIES NAME ON PLOT	S6210180
C		S6210190
	LALPH1=KSPL(IDO)	S6210200
	CALL CODE	S6210210
	WRITE(IALPHA,9009) (KSPECI(I,IDO),I=1,3)	S6210220
	CALL SYMB(7.10,23.80,0.9,LALPHA,0.0,1)	S6210230
CTV		S6210240
CTV	SPECIAL CODING FOR DISPLAY ON TV MONITOR	S6210250
CTV		S6210260
	ITVX=2770	S6210270
	ITVY=8610	S6210280
CTV		S6210290
CTV	Y-COORDINATE OF ALL LAUNCH PADS ON THE LAND MAP IS GREATER THAN	S6210300
CTV	3000	S6210310
CTV		S6210320
	IF(IY0,GT.3000) GO TO 1200	S6210330
CTV		S6210340
CTV	SEA MAP	S6210350
CTV		S6210360
	ITVY=5240	S6210370

	ITVX=ITVXX+125	S6210380
CTV		S6210390
CTV	IS THE STABILIZATION POINT SOUTH OF THE LAUNCH PAD?	S6210400
CTV		S6210410
	IF(ITVXN.LT.3400) GO TO 1200	S6210420
	ITVX=ITVXN-750	S6210430
CTV		S6210440
CTV	NOW PLOT SPECIES NAME FOR DISPLAY ON THE TV MONITOR	S6210450
CTV		S6210460
	1200 CALL SYMB(0.01*FLOAT(ITVX),0.01*FLOAT(ITVY-190),1.25,LALPHA	S6210470
	. ,0.0,1)	S6210480
CTV		S6210490
CTV		S6210500
CTV		S6210510
C		S6210520
C	PRINT TITLE	S6210530
C		S6210540
	LALPH1=35	S6210550
	CALL CODE	S6210560
	WRITE(IALPHA,9027) TITLE	S6210570
9027	FORMAT(14A2,7H LAUNCH)	S6210580
	CALL SYMB(2.01,25.6,0.73,LALPHA,0.0,1)	S6210590
C		S6210600
C	PRINT OUT CON, DOS, TIME MEAN CON, DEP, ACIDITY.	S6210610
C		S6210620
	LALPH1=KCDTN(JLAB)	S6210630
	CALL CODE	S6210640
	WRITE(IALPHA,9009) (KCDT(I,JLAB),I=1,(LALPH1+1)/2)	S6210650
	. , (WNITS(I,JUNIT),I=1,6)	S6210660
CTV		S6210670
CTV	SPECIAL LABEL FOR DISPLAY ON THE TV MONITOR	S6210680
CTV		S6210690
	IF(IY0.GT.3000.OR.ITVXN.LT.3400) GO TO 1210	S6210700
	ITVX=ITVXN-125*(LALPH1+1)	S6210710
1210	CALL SYMB(0.01*FLOAT(ITVX),0.01*FLOAT(ITVY),1.25,LALPHA,0.0,1)	S6210720
CTV		S6210730
CTV	END SPECIAL CODING FOR DISPLAY ON TV MONITOR	S6210740
CTV		S6210750
	LALPH1=LALPH1+12	S6210760
	CALL SYMB(8.55+0.375*FLOAT(36-LALPH1),99.15,0.75,LALPHA,0.0,1)	S6210770
C		S6210780
C	FOR THE LEGEND ON THE PLOT, PRINT OUT THE CON/DEP/pH VALUES	S6210790
C	FOR WHICH CONTOURS WERE DRAWN	S6210800
C		S6210810
	IXP=900	S6210820
	IYP=9752	S6210830
	LETR=IHAT	S6210840
	DO 1240 I=1,NPLETH	S6210850
	LETR=LETR+400B	S6210860
	IF(PLETH(I).LE. 0.0)GO TO 1250	S6210870
	IF(I .NE. 6) GO TO 1220	S6210880
	IXP=2280	S6210890

	IYP=9752	S6210900
1220	CONTINUE	S6210910
	CALL CODE	S6210920
	WRITE(IALPHA,9002) LETR,PLETH(I)	S6210930
	LALPHI=13	S6210940
	CALL SYMB(0.01*FLOAT(IXP),0.01*FLOAT(IYP),0.95,LALPHA,0.0,1)	S6210950
	IF (IFISOS(I) .NE. 0) GO TO 1230	S6210960
	XLST = .01*FLOAT(IXP)+0.95*FLOAT(LALPHA(1))	S6210970
	YLST = .01*FLOAT(IYP)	S6210980
	CALL SYMB(XLST,YLST,0.75,NOISOS,0.0,1)	S6210990
1230	IYP=IYP-140	S6211000
1240	CONTINUE	S6211010
C		S6211020
C	REMOVE MESSAGE: PLOTTING	S6211030
C		S6211040
1250	IF(CRT) WRITE(ICU,9009) CR,CURSUP,CLRDSP,BKAKO	S6211050
	CALL PLOT(99.99,99.99,3)	S6211060
1260	WRITE(ICU,9028) INVNDR,INV,OFF,ULINE,OFF,ULINE,OFF	S6211070
9028	FORMAT(51H DO YOU WISH TO PLOT ISOPLETHS FOR ANOTHER VARIABLE/ . 18X,13HOR SPECIES? (,2A2,1HV,2A2,7HARIABLE,2A2,1H,,2A2,1HS,2A2, *7HPECIES,,2A2,1HN,2A2,4HO):_)	S6211080
	K=40B	S6211090
	CALL EXEC(1,ICU+400B,K,-1)	S6211100
	IF(CRT) WRITE(ICU,9009) CURSUP,CURSUP,CLRDSP,BKAKO	S6211110
	ASSIGN 220 TO IGO	S6211120
	IF (K .EQ. IHS) GO TO 70	S6211130
	ASSIGN 80 TO IGO	S6211140
	IF(K.EQ.IHV.OR.K.EQ.IBLNK) GO TO 60	S6211150
	IF(K.EQ.INJ) GO TO 1270	S6211160
	WRITE (ICU,9010) INV,OFF,22,10	S6211170
	GO TO 1260	S6211180
1270	CONTINUE	S6211190
C		S6211200
C	CLEAR TABS BEFORE QUITTING AND PUT PEN IN UPPER RIGHT CORNER.	S6211210
C		S6211220
	IF(CRT) WRITE(ICU,9009) CR,(TAB,CLRTAB,I=1,5),CR,BKAKO	S6211230
	CALL PLOT(99.99,99.99,3)	S6211240
C		S6211250
C		S6211260
C		S6211270
C	RETURN	S6211280
C		S6211290
1280	CONTINUE	S6211300
	RETURN	S6211310
C		S6211320
C	END OF RISOM	S6211330
C		S6211340
C	END	S6211350
		S6211360

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SUBROUTINE ORGIN(IX0,IY0,DIRNL)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C -----S6300000
C -----S6300010
C -----S6300020
C -----S6300030
C -S6300040
C - THIS SUBROUTINE GIVES THE APPROPRIATE COORDINATES FOR PLOTTING -S6300050
C - FOR THE COMPLEX AND MAP SELECTED -S6300060
C - -S6300070
C -----S6300080
C -----S6300090
C* B E G I N C O M M O N A R E A *****S6300100
C 04/02/82 S6300110
C-----MATH PARAMETERS AND CONSTANTS S6300120
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S6300130
C-----INPUT OPTIONS S6300140
REAL LAMBDA S6300150
INTEGER FILE,GOOD,TITLE S6300160
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S6300170
ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S6300180
XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S6300190
IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S6300200
ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S6300210
,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2) S6300220
,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S6300230
TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S6300240
FS(20),MDLNAM(12),DBAR(20) S6300250
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S6300260
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S6300270
MODEL4,MODEL5,MODEL6 S6300280
INTEGER RUNNUM,RT,CL,CS S6300290
COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S6300300
DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S6300310
SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S6300320
,MIXING,MAXDEP,LAYBOT(3) S6300330
,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S6300340
ICHA(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S6300350
MINUS1,MINUS9,MINS1,MINS9, S6300360
MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S6300370
RT(24),TPROPC,IDXRT S6300380
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S6300390
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S6300400
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S6300410
CLRLNE,INSLNE,DELNE S6300420
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S6300430
INVNDR(2),ULINE(2), S6300440
TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S6300450
CLRLNE,INSLNE,DELNE, S6300460
IESCAJ(3),NULL,IBLNK, S6300470
IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S6300480
C-----VEHICLE PARAMETERS S6300490
COMMON /VCLPR/ VPAR(17) S6300500

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C-----TIME PARAMETERS
COMMON /TIME/ JTIME, JDAY, JYEAR, ISTEIME, ISDAY, ISYEAR, LTIME,
. LDAY,LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2)
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS)
COMMON /FRCST/ ALT(30),DIR(30),SPEED(30),TEMP(30),PRESS(30),
. RH(30),PTEMP(30),SIGEP(30),SIGAP(30)
C-----LAYER PARAMETERS
COMMON /LAYER/ DXX,DYY,DX(29),DY(29),Q(29),RISTIM(29),SIGXO(29),
. SIGYO(29)
C-----CALCULATED BOUNDRY DATA (FOR NEW LAYERS)
COMMON /BLAYR/ DIRB(6),SPEEDB(6),TEMPB(6)
C-----CALCULATED NEW LAYER PARAMETERS
COMMON /NLYER/ DDIR(32),DIRN(32),DSPEED(32),SIGAPN(32),SIGEPN(32),
. SPEEDN(32)
C-----CONVERSION FACTORS
COMMON /CNVRT/ QCONV(4),QPDEPH
C
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900)
C-----READ/WRITE BUFFER
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879
C*****
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE (IPU1,IPAR(3))
. , (IPU2,IPAR(4)), (IPU3,IPAR(5))
EQUIVALENCE (MAXDEP,GRVSET), (IFRMT(1),IFRMT1)
C
C**** E N D O F C O M M O N A R E A ****
C
C DIMENSION RANGE(30,6),BEARNG(30,6),SIGYBR(30,6),CORSG(30,6)
. ,RCORSG(6),BCORSG(6),XCORSG(6)
C-----EQUIVALENCE STATEMENTS
EQUIVALENCE
. (PLUS,RANGE), (PLUS(181),BEARNG), (PLUS(361),SIGYBR)
. , (PLUS(541),XCORSG), (PLUS(547),CORSG), (PLUS(727),RCORSG)
. , (PLUS(733),BCORSG)
CF OUTPUT FORMAT STATEMENTS
CF
9001 FORMAT(2A2,7H MOUNT ,6A2,19H MAP ON PLOTTER LU ,I2,10H FOR SITE ,
.A2,A1,7H, ENTER,2A2,13H SPACE-RETURN,2A2,11H WHEN READY/
.50H OR ENTER AN 'A', IF THE ALTERNATE MAP IS DESIRED?/
.66H OR AN 'S', IF YOU WISH TO SPECIFY THE LAUNCH SITE MAP LOCATIONS
.?: )
9002 FORMAT(2A2/28H ***** PLOTTING IS BASED ON ,6A2,16H MAP COORDINATES
. ,10H FOR SITE ,A2,A1,5H *****
C
C DIMENSION STATEMENT
C
C INTEGER CRSP
DIMENSION IX(12),IY(12),LORS(2),IN(2),LORSS(4),NLOC(12)

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	,DLIMIT(6)	S6301030
	EQUIVALENCE (IN,IN1)	S6301040
C		S6301050
C	DATA STATEMENTS	S6301060
C		S6301070
C		S6301080
C	TERMINAL CONTROL SEQUENCES	S6301090
C		S6301100
	DATA CRSP/6440B/	S6301110
	DATA IHA/1HA/,IHS/1HS/	S6301120
	DATA LORSS/2HLA,2HND,123B,2HEA/	S6301130
	DATA NLOC/2H39,1HA,2H39,1HB,2H39,1HC,2H40,1H ,2H41,1H ,2H17,1H /	S6301140
		S6301150
C	MAP COORDINATES OF LAUNCH SITES	S6301160
C		S6301170
C	DATA IX/4200,4095,3650,3518,3622,3490,5450,5411,4830,4825,8750, *8730/	S6301180
	DATA IY/1700,7300,1123,6702,0577,6150,2630,8243,2465,8050,2990, *8600/	S6301190
	DATA DLIMIT/200.0,200.0,200.0,180.0,185.0,180.0/	S6301200
		S6301210
		S6301220
C		S6301230
C	**** FIRST EXECUTABLE STATEMENT.	S6301240
C		S6301250
	10 LNDSEA=0	S6301260
	ISITE = 2*LSITE-1	S6301270
	LORS(1)=LORSS(1)	S6301280
	LORS(2)=LORSS(2)	S6301290
		S6301300
C	SELECTION OF MAP BASED ON LAUNCH SITE AND WIND DIRECTION	S6301310
C		S6301320
C	DIRNL=AMOD(DIRNL,360.0)	S6301330
	ICOORD = LSITE	S6301340
	IF(DIRNL.LE.DLIMIT(ICOORD)) GO TO 20	S6301350
	LNDSEA=-1	S6301360
	LORS(1)=LORSS(3)	S6301370
	LORS(2)=LORSS(4)	S6301380
	20 ICOORD=2*ICOORD+LNDSEA	S6301390
	30 WRITE(ICU,9001) CRSP,CLRDSP,INVHF,LORS,OFF,IPAR(5),NLOC(ISITE), *NLOC(ISITE+1),ULINE,OFF	S6301400
		S6301410
		S6301420
C	WAIT UNTIL CORRECT MAP IS ON PLOTTER.	S6301430
C		S6301440
C		S6301450
	IN1 = NULL	S6301460
	40 CALL EXEC(1,ICU+400B,IN,2)	S6301470
	IN1=IAND(177400B,IN1)+40B	S6301480
	IF(IN1.EQ.IBLNK) GO TO 80	S6301490
	IF(IN1.EQ.IHA) GO TO 50	S6301500
	IF (IN1.EQ.IHS) GO TO 90	S6301510
	WRITE (ICU,9003) INV,OFF,22,8	S6301520
	9003 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC. *,I2,1H.,I1/)	S6301530
	GO TO 30	S6301540

50	IF (LNDSEA .EQ. 0) GO TO 60	S6301550
	LNDSEA = 0	S6301560
	LORS(1) = LORSS(1)	S6301570
	LORS(2) = LORSS(2)	S6301580
	GO TO 70	S6301590
60	LNDSEA = -1	S6301600
	LORS(1) = LORSS(3)	S6301610
	LORS(2) = LORSS(4)	S6301620
70	ICCOORD = LSITE	S6301630
	ICCOORD = 2*ICCOORD+LNDSEA	S6301640
80	CONTINUE	S6301650
	WRITE(ICU,9002) CURSUP,DELIN,ULINE,LORS,OFF,NLOC(ISITE),NLOC(ISITS	S6301660
	*E+1)	S6301670
C		S6301680
C	SET THE COORDINATES BASED ON THE INDEX I	S6301690
C		S6301700
	IX0 = IX(ICCOORD)	S6301710
	IY0 = IY(ICCOORD)	S6301720
	GO TO 120	S6301730
90	CONTINUE	S6301740
	WRITE (ICU,9004) CURSUP,DELIN	S6301750
9004	FORMAT (2A2/68H ON A SCALE OF 0 TO 9999 UNITS IN BOTH X AND Y DIRES	S6301760
	*CTIONS, ENTER THE/66H LAUNCH LOCATION (0,0 IS THE LOWER LEFT CORNES	S6301770
	*R OF PLOT BED). X,Y?:)	S6301780
	CALL IFNBR(IFRMT,20,IER,ICU)	S6301790
	IF (IER .EQ. 0) GO TO 100	S6301800
	WRITE (ICU,9003) INV,OFF,22,9	S6301810
	GO TO 90	S6301820
100	CALL CODE(20)	S6301830
	READ (IFRMT,*) SN,WE	S6301840
	IF (SN .EQ. MINS1) GO TO 10	S6301850
	IF (SN .NE. MINS9) GO TO 110	S6301860
	IERROR(1) = 1	S6301870
	NNNEST = 1	S6301880
	CALL REEDM	S6301890
110	IX0 = SN	S6301900
	IY0 = WE	S6301910
	WRITE (ICU,9005) CURSUP,DELIN,INV,OFF	S6301920
9005	FORMAT (2A2/26H *** PLOTTING IS BASED ON ,2A2,14HUSER SPECIFIED,	S6301930
	*2A2,19H LAUNCH COORDINATES)	S6301940
120	CONTINUE	S6301950
C		S6301960
C	RETURN TO THE CALLING PROGRAM	S6301970
C		S6301980
	RETURN	S6301990
C		S6302000
C	END OF ORGIN	S6302010
C		S6302020
	END	S6302030



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SUBROUTINE RMCLM
, UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C: S6500000
C: S6500010
C: S6500020
C: S6500030
C: S6500040
C: S6500050
C: ORGANIZATION: H. E. CRAMER CO., INC. S6500060
C: S6500070
C: WORK FOR: DR. J. B. STEPHENS (ES84) S6500080
C: S6500090
C: PROGRAM CODE: RMCLM S6500100
C: S6500110
C: PROGRAM DESCRIPTION: ONE OF THE MODULES FOR ROCKET EXHAUST S6500120
C: EFFLUENT DIFFUSION ANALYSIS (MULTI-LAYER) S6500130
C: S6500140
C: INPUT: USER SPECIFIED MET SOUNDING AND USER SPECIFIED OPTIONS S6500150
C: S6500160
C: OUTPUT: PRINTED LISTING OF DATA FILE, ANALYSIS, PLOTS S6500170
C: S6500180
C: S6500190
C: S6500200
C S6500210
C ***** S6500220
C * S6500230
C * CENTERLINE PLOTTING PROGRAM -- A PROGRAM OF THE REED S6500240
C * SERIES OF PROGRAMS S6500250
C * S6500260
C ***** S6500270
C S6500280
C**** B E G I N C O M M O N A R E A ***** S6500290
C 04/02/82 S6500300
C-----MATH PARAMETERS AND CONSTANTS S6500310
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S6500320
C-----INPUT OPTIONS S6500330
REAL LAMBDA S6500340
INTEGER FILE,GOOD,TITLE S6500350
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S6500360
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S6500370
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S6500380
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S6500390
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S6500400
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S6500410
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S6500420
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S6500430
. FS(20),MDLNAM(12),DBAR(20) S6500440
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S6500450
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S6500460
. MODEL4,MODEL5,MODEL6 S6500470
INTEGER RUNNUM,RT,CL,CS S6500480
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S6500490
DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S6500500

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.          SIGZ, ISNDFO, CRT, LAYTOP(3), ITDU, KEEP          S6500510
.          , MIXING, MAXDEP, LAYBOT(3)                      S6500520
.          , ALTSV, BATCH, CL(14), CS(10), GASSET, IAGAIN,   S6500530
.          ICHAR(12), IDXCL, IDXCS, IERROR(5), IFRMT(80),   S6500540
.          MINUS1, MINUS9, MINS1, MINS9,                    S6500550
.          MODEL4, MODEL5, MODEL6, NNNEST, NNNTRY, LLNEST, LLNTRY, S6500560
.          RT(24), TPROPC, IDXRT                             S6500570
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S6500580
.          INTEGER ALTSET, OFF, BLNKNG, INV, ULINE, INVNDR,   S6500590
.          TAB, TAB2, SETTAB, CLRTAB, CURSUP, CURSDN, CURLFT, CLRDSP, S6500600
.          CLRLNE, INSLNE, DELINE                             S6500610
.          COMMON /CNTRL/ ALTSET(2), OFF(2), BLNKNG(2), INV(2), INVHF(2), S6500620
.          INVNDR(2), ULINE(2),                               S6500630
.          TAB, TAB2, SETTAB, CLRTAB, CURSUP, CURSDN, CURLFT, CLRDSP, S6500640
.          CLRLNE, INSLNE, DELINE,                           S6500650
.          IESCAJ(3), NULL, IBLNK,                           S6500660
.          IPAR(5), ICU, IYSJ, IYESJ, INJ, INOJ, NAMEP(3)    S6500670
C-----VEHICLE PARAMETERS                                   S6500680
.          COMMON /VCLPR/ VPAR(17)                            S6500690
C-----TIME PARAMETERS                                     S6500700
.          COMMON /TIME/ JTIME, JDAY, JYEAR, ISTIME, ISDAY, ISYEAR, LTIME, S6500710
.          LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2)  S6500720
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S6500730
.          COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30), S6500740
.          RH(30), PTEMP(30), SIGEP(30), SIGAP(30)           S6500750
C-----LAYER PARAMETERS                                    S6500760
.          COMMON /LAYER/ DXX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29), S6500770
.          SIGYO(29)                                          S6500780
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS)         S6500790
.          COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6)       S6500800
C-----CALCULATED NEW LAYER PARAMETERS                    S6500810
.          COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32), S6500820
.          SPEEDN(32)                                         S6500830
C-----CONVERSION FACTORS                                 S6500840
.          COMMON /CNVRT/ QCONV(4), QPDEPH                    S6500850
C                                                         S6500860
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION***** S6500870
.          COMMON /EXTRA/   NCOM(1),   NTOTAL(1),   PLUS(900) S6500880
C-----READ/WRITE BUFFER                                  S6500890
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S6500900
C*****S6500910
C                                                         S6500920
C-----EQUIVALENCE STATEMENTS                             S6500930
.          EQUIVALENCE (IPU1, IPAR(3))                        S6500940
.          , (IPU2, IPAR(4)), (IPU3, IPAR(5))                S6500950
.          EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1) S6500960
C                                                         S6500970
C*****          E N D   O F   C O M M O N   A R E A          *****S6500980
Cc                                                         S6500990
C                                                         S6501000
.          DIMENSION RANGE(30,6), BEARNG(30,6), SIGYBR(30,6), CORSG(30,6) S6501010
.          , RCORSG(6), BCORSG(6), XCORSG(6)                 S6501020

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C-----	EQUIVALENCE STATEMENTS	S6501030
	EQUIVALENCE	S6501040
	. (PLUS,RANGE),(PLUS(181),BEARNG),(PLUS(361),SIGYBR)	S6501050
	. ,(PLUS(541),XCORSG),(PLUS(547),CORSG),(PLUS(727),RCORSG)	S6501060
	. ,(PLUS(733),BCORSG)	S6501070
C		S6501080
C	TYPE AND DIMENSION STATEMENTS	S6501090
C		S6501100
	LOGICAL IGRAF,FLGSPC(4),TO	S6501110
	INTEGER CRLF,YORNO,CR,BGLINE,DFLT,YUNITS,YUNIT(3,4),PTITL(12,3)	S6501120
	. ,PDO,BKAKO,ZIP,BKARO	S6501130
	DIMENSION LLABEL(17),LPLLNT(3,4),IP(5),IN(2),LSPECI(11,4)	S6501140
	. ,LPAREN(2),IALPHA(50),YORNO(16),JSPECI(3,4),L1(3),IBUFR(71)	S6501150
	. ,IREG(2),ZIP(5)	S6501160
	EQUIVALENCE (IN,IN1),(L1(2),L3),(REG,IREG,IA),(IREG(2),IB)	S6501170
C		S6501180
C	DATA STATEMENTS	S6501190
C		S6501200
	DATA LPLLNT/OB,2HHC,2HL ,OB,2HCO,2H2 ,OB,2HCO,OB,2HAL	S6501210
	. ,2H2O,2H3 /	S6501220
	DATA LPAREN,BKARO,CRLF,CR,BKAKO,ZIP	S6501230
	. /2H( ,2H ),20137B,6412B,15B,137B,5*0/	S6501240
	DATA PTITL	S6501250
	. /2HCO,2HNC,2HEN,2HTR,2HAT,2HIO,2HN ,2HAN,2HD ,2HDO,2HSA,2HGE	S6501260
	. ,2HWA,2HSH,2HOU,2HT ,2HDE,2HPO,2HSI,2HTI,2HON,3*1H	S6501270
	. ,2HGR,2HAV,2HIT,2HAT,2HIO,2HNA,2HL ,2HDE,2HPO,2HSI,2HTI,2HON/	S6501280
	DATA JSPECI	S6501290
	. /2H ,2H H,2HCL	S6501300
	. ,2H ,2H C,2HO2	S6501310
	. ,2H ,2H ,2HCO	S6501320
	. ,2H A,2HL2,2HO3/	S6501330
	DATA YUNIT/2,4,0	S6501340
	. ,2,0,0	S6501350
	. ,2,0,0	S6501360
	. ,1,3,5/	S6501370
	DATA LSPECI	S6501380
	. /15446B,62104B,110B,15446B,62100B,2HCL,15446B,62100B,OB,15446B	S6501390
	. ,62100B	S6501400
	. ,15446B,62104B,103B,15446B,62100B,117B,15446B,62104B,62B,15446B	S6501410
	. ,62100B	S6501420
	. ,15446B,62104B,103B,15446B,62100B,117B,15446B,62100B,OB,15446B	S6501430
	. ,62100B	S6501440
	. ,15446B,62104B,101B,15446B,62100B,2HL2,15446B,62100B,2HO3,15446B	S6501450
	. ,62100B/	S6501460
	DATA YORNO	S6501470
	. /15446B,62106B,131B,15446B,62102B,2HES,15446B,62100B,2H O,2HR	S6501480
	. ,15446B,62104B,116B,15446B,62100B,117B/	S6501490
	DATA ICOMMA/26000B/	S6501500
	DATA IH2,IHM,IHP/1H2,IHM,IHP/	S6501510
C		S6501520
C	FIRST EXECUTABLE STATEMENT	S6501530
C		S6501540

C		S6501550
C	SELECT VARIABLES AND POLLUTANTS TO BE PLOTTED.	S6501560
C		S6501570
	IF(CRT) GO TO 40	S6501580
	K=0	S6501590
	DO 30 I=1,5	S6501600
	IF(I.EQ.5) GO TO 20	S6501610
	DO 10 J=1,4	S6501620
	LSPECI(3*I-1,J) = NULL	S6501630
	LSPECI(3*I-2,J) = NULL	S6501640
10	CONTINUE	S6501650
	IF(I.EQ.4) K=1	S6501660
20	YORNO(3*I+K-2) = NULL	S6501670
	YORNO(3*I+K-1) = NULL	S6501680
30	CONTINUE	S6501690
40	WRITE(ICU,9001) SETTAB,CR,BKAKO	S6501700
9001	FORMAT(59X,3A2)	S6501710
	IVARP=0	S6501720
50	NSPECI=0	S6501730
	NWDS=0	S6501740
	JM112=0	S6501750
	IF(MODEL.EQ.6) IPLLNT(1)=4	S6501760
	DO 70 J=1,4	S6501770
	IF(IPLLNT(J).LE.0) GO TO 80	S6501780
	IF(MODEL.GT.4.AND.(IPLLNT(J).EQ.2.OR.IPLLNT(J).EQ.3)) GO TO 70	S6501790
	NWDS=NWDS+12	S6501800
	NSPECI=NSPECI+1	S6501810
	FLGSPC(IPLLNT(J))=.TRUE.	S6501820
	DO 60 I=1,11	S6501830
	IALPHA(I+JM112)=LSPECI(I,IPLLNT(J))	S6501840
60	CONTINUE	S6501850
	IALPHA(NWDS)=ICOMMA	S6501860
	JM112=NWDS	S6501870
70	CONTINUE	S6501880
80	IALPHA(NWDS)=LPAREN(2)	S6501890
C		S6501900
C	NO PROMPT FOR ONLY ONE SPECIES	S6501910
C		S6501920
	IF(NSPECI.LT.2) GO TO 110	S6501930
C		S6501940
C	INVERSE VIDEO FOR DEFAULT	S6501950
C		S6501960
	DO 90 J=2,8,3	S6501970
	IALPHA(J+12*IVARP)=IOR(IALPHA(J+12*IVARP),2B)	S6501980
90	CONTINUE	S6501990
100	WRITE(ICU,9002)	S6502000
	WRITE(ICU,9005) LPAREN(1),(IALPHA(I),I=1,NWDS),BKARO	S6502010
9002	FORMAT(39H PLOT MAXIMUM CENTERLINE VALUES FOR: _)	S6502020
	L1 = NULL	S6502030
	CALL EXEC(1,ICU+400B,L1,3)	S6502040
9003	FORMAT(5A1)	S6502050
	L2=IAND(L1,377B)	S6502060

	L1=IAND(L1,177400B)	S6502070
C		S6502080
C	ERASE PROMPT	S6502090
C		S6502100
	WRITE(ICU,9005) CR,CURSUP,CLRDSP,BKAKO	S6502110
	IF(L1.NE.20000B) GO TO 120	S6502120
C		S6502130
C	DEFAULT	S6502140
C		S6502150
	110 IDO=IPLLNT(IVARP+1)	S6502160
	IF(IDO.GT.0) GO TO 210	S6502170
	IDO=IPLLNT(1)	S6502180
	IVARP=0	S6502190
	GO TO 210	S6502200
	120 IF(L1.NE.44000B.OR..NOT.FLGSPC(1)) GO TO 130	S6502210
C		S6502220
C	HCL SELECTED	S6502230
C		S6502240
	IDO=1	S6502250
	GO TO 210	S6502260
	130 IF(L1.NE.40400B.OR..NOT.FLGSPC(4)) GO TO 140	S6502270
C		S6502280
C	AL203 SELECTED	S6502290
C		S6502300
	IDO=4	S6502310
	GO TO 210	S6502320
	140 IF(L1.EQ.41400B.AND.(FLGSPC(3).OR.FLGSPC(2))) GO TO 160	S6502330
C		S6502340
C	BAD ENTRY PROCESSING	S6502350
C		S6502360
	150 WRITE (ICU,9004) INV,OFF,21,2	S6502370
	9004 FORMAT (2A2,38H *** REEDM ERROR 001, DATA INPUT ERROR,2A2,6H REC.	S6502380
	*,I2,IH.,I1/)	S6502390
	9005 FORMAT(52A2)	S6502400
	GO TO 100	S6502410
C		S6502420
C	CO2 AND CO	S6502430
C		S6502440
	160 IF(L2.NE.62B.OR..NOT.FLGSPC(2)) GO TO 180	S6502450
C		S6502460
C	CO2 SELECTED	S6502470
C		S6502480
	170 IDO=2	S6502490
	GO TO 210	S6502500
	180 IF(L2.NE.40B.OR..NOT.FLGSPC(3)) GO TO 200	S6502510
C		S6502520
C	CO SELECTED	S6502530
C		S6502540
	190 IDO=3	S6502550
	GO TO 210	S6502560
	200 IF(L2.NE.117B) GO TO 150	S6502570
	IF((L3.EQ.IBLNK.OR.L3.EQ.0B).AND.FLGSPC(3)) GO TO 190	S6502580



	IF(L3.EQ.IH2.AND.FLGSPC(2)) GO TO 170	S6502590
	GO TO 150	S6502600
C		S6502610
C	INITIALIZE THE PLOTTER	S6502620
C		S6502630
	210 CALL PLTLU(IPU2)	S6502640
	CALL SFACT(33.0,24.0)	S6502650
	CALL LLEFT	S6502660
	PDO=3	S6502670
	IF(MODEL.LT.5) GO TO 220	S6502680
	PDO=1	S6502690
	IF(LAYTOP(2).GT.0) PDO=8-MODEL	S6502700
	220 QF=QCONV(IDO)	S6502710
	YUNITS=YUNIT(MODEL-3,IDO)	S6502720
	IF(MODEL.LT.6) GO TO 240	S6502730
	WRITE(ICU,9006) INVNDR,INV,OFF,ULINE,OFF,BKARO	S6502740
	9006 FORMAT(21H PLOT DEPOSITION IN (,2A2,1HM,2A2,9HILLIGRAMS,2A2,4H OR	S6502750
	.,2A2,1HP,2A2,14HARTICLES/M**2),A2)	S6502760
	K = IHM	S6502770
	CALL EXEC(1,ICU+400B,K,-1)	S6502780
	WRITE(ICU,9005) CURSUP,DELINE,BKAKO	S6502790
	IF(K.EQ.IBLNK.OR.K.EQ.IHM) GO TO 240	S6502800
	IF(K.EQ.IHP) GO TO 230	S6502810
	WRITE (ICU,9004) INV,OFF,21,3	S6502820
	GO TO 220	S6502830
	230 CONTINUE	S6502840
	YUNITS=6	S6502850
		S6502860
C		S6502870
C	PLOT THE CENTERLINE DOSAGE AND CONCENTRATION VALUES	S6502880
C		S6502890
C		S6502900
C	DISPLAY PLOTTING	S6502910
C		S6502920
	240 WRITE(ICU,9007) BLNKNG,OFF	S6502930
	CALL LABEL(PDO,IDO,YUNITS,MODEL)	S6502940
	9007 FORMAT(10X,2A2,8HPLOTTING,3A2)	S6502950
	CALL CPLOT(PDO,IDO,YUNITS,MODEL)	S6502960
	WRITE(ICU,9005) CR,CURSUP,CLRDSP,BKAKO	S6502970
	WRITE(ICU,9008) (PTITL(I,MODEL-3),I=1,12),(JSPECI(I,IDO)	S6502980
	,I=1,3)	S6502990
	9008 FORMAT(20H MAXIMUM CENTERLINE ,12A2,16H PLOTTED FOR: ,5A2)	S6503000
	IVARP=MOD(IVARP+1,NSPECI)	S6503010
		S6503020
C		S6503030
C	PUT THE PEN IN THE UPPER RIGHT CORNER AND CLEAR THE TAB	S6503040
C		S6503050
	WRITE(ICU,9005) CR,TAB,CLRTAB,CR,BKAKO	S6503060
	250 WRITE(ICU,9009) YORNO,BKARO	S6503070
	9009 FORMAT(62H DO YOU WISH TO PLOT CENTERLINE PROFILES FOR ANOTHER SPES	S6503080
	.CIES?(,16A2,1H),A2)	S6503090
	K = IBLNK	S6503100
	CALL EXEC(1,ICU+400B,K,-1)	
	WRITE(ICU,9005) CURSUP,CURSUP,CLRDSP,BKAKO	

	IF(K.EQ.IBLNK.OR.K.EQ.IYSJ) GO TO 260	S6503110
	IF(K.EQ.INJ) GO TO 270	S6503120
	WRITE (ICU,9004) INV,OFF,21,4	S6503130
	GO TO 250	S6503140
260	NNNTRY=5	S6503150
	GO TO 280	S6503160
270	NNNTRY = 6	S6503170
280	CONTINUE	S6503180
	CALL URITE	S6503190
C		S6503200
C	RETURN	S6503210
C		S6503220
	RETURN	S6503230
C		S6503240
C	END OF RMCLM	S6503250
C		S6503260
	END	S6503270

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SUBROUTINE CPlot(PDO,IDO,YUNITS,IP)
. , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC
C
C -----S6600000
C -S6600010
C -S6600020
C -S6600030
C -S6600040
C - THIS SUBROUTINE PLOTS THE CENTERLINE CURVES -S6600050
C -S6600060
C -----S6600070
Cç S6600080
C****          B E G I N C O M M O N A R E A          ****S6600090
C 04/02/82 S6600100
C-----MATH PARAMETERS AND CONSTANTS S6600110
COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S6600120
C-----INPUT OPTIONS S6600130
REAL LAMBDA S6600140
INTEGER FILE,GOOD,TITLE S6600150
COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S6600160
. ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S6600170
. XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S6600180
. IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S6600190
. ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S6600200
. ,RAINRT,LAMBDA,TIM1,DURAT,NVS,IVERSN,LOCATN(2) S6600210
. ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S6600220
. TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S6600230
. FS(20),MDLNAM(12),DBAR(20) S6600240
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S6600250
LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S6600260
. MODEL4,MODEL5,MODEL6 S6600270
INTEGER RUNNUM,RT,CL,CS S6600280
COMMON /CTRFL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S6600290
. DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S6600300
. SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S6600310
. ,MIXING,MAXDEP,LAYBOT(3) S6600320
. ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S6600330
. ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S6600340
. MINUS1,MINUS9,MINS1,MINS9, S6600350
. MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S6600360
. RT(24),TPROPC,IDXRT S6600370
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S6600380
INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S6600390
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S6600400
. CLRLNE,INSLNE,DELIN S6600410
COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S6600420
. INVNDR(2),ULINE(2), S6600430
. TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S6600440
. CLRLNE,INSLNE,DELIN, S6600450
. IESCAJ(3),NULL,IBLNK, S6600460
. IPAR(5),ICU,IYSJ,IYESJ,INJ,INOJ,NAMEP(3) S6600470
C-----VEHICLE PARAMETERS S6600480
COMMON /VCLPR/ VPAR(17) S6600490
C-----TIME PARAMETERS S6600500

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COMMON /TIME/ JTIME, JDAY, JYEAR, ISTIME, ISDAY, ISYEAR, LTIME, S6600510
. LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2) S6600520
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S6600530
COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30), S6600540
. RH(30), PTEMP(30), SIGEP(30), SIGAP(30) S6600550
C-----LAYER PARAMETERS S6600560
COMMON /LAYER/ DX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29), S6600570
. SIGYO(29) S6600580
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS) S6600590
COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6) S6600600
C-----CALCULATED NEW LAYER PARAMETERS S6600610
COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32), S6600620
. SPEEDN(32) S6600630
C-----CONVERSION FACTORS S6600640
COMMON /CNVRT/ QCONV(4), QPDEPH S6600650
C S6600660
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S6600670
COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S6600680
C-----READ/WRITE BUFFER S6600690
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S6600700
C*****S6600710
C S6600720
C-----EQUIVALENCE STATEMENTS S6600730
EQUIVALENCE (IPU1, IPAR(3)) S6600740
. , (IPU2, IPAR(4)), (IPU3, IPAR(5)) S6600750
EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1) S6600760
C S6600770
C**** END OF COMMON AREA ****S6600780
C S6600790
C S6600800
DIMENSION RANGE(30,6), BEARNG(30,6), SIGYBR(30,6), CORSG(30,6) S6600810
. , RCORSG(6), BCORSG(6), XCORSG(6) S6600820
C-----EQUIVALENCE STATEMENTS S6600830
EQUIVALENCE S6600840
. (PLUS, RANGE), (PLUS(181), BEARNG), (PLUS(361), SIGYBR) S6600850
. , (PLUS(541), XCORSG), (PLUS(547), CORSG), (PLUS(727), RCORSG) S6600860
. , (PLUS(733), BCORSG) S6600870
C S6600880
C DIMENSION STATEMENT S6600890
C S6600900
C S6600910
C** THE VARIABLE NAME "PLUS" WAS CHANGED NOV 9, 1979 BECAUSE OF A CONFLIS6600920
C** ARISING WITH THE LABELED COMMON DEVICE...J.S.H. S6600930
C S6600940
DIMENSION YDIST(6) S6600950
INTEGER ADD(2), PEN, O(2), PDO, PDOP, YUNITS, GASORA, IALPHA(12) S6600960
. , LALPHA(2) S6600970
EQUIVALENCE (LALPHA(2), IALPHA), (LALPHA, LALPH1) S6600980
DATA FXDIST/1.0/ S6600990
. , ADD/1, 1H+/, D2RAD/0.01745329/, O/1, 1HO/ S6601000
DATA YDIST/11.04, 12.24, 14.84, 0.0, 15.44, 14.24/ S6601010
C S6601020

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C	STATEMENT FUNCTION FOR PH	S6601030
C		S6601040
	FIY(L)=16.4-2.0*AMAX1(0.0,AMIN1(7.0,-ALOGT(CORSG(NRNG,L))))	S6601050
C		S6601060
C	CALCULATE AND PLOT INTEGER SCALING FACTOR [DOSAGE OR MODELS 5	S6601070
C		S6601080
	GASORA=3*(IDO/4)	S6601090
	IF(YUNITS.EQ.6) GASORA=0	S6601100
	YDIST1=16.34	S6601110
	IF(IP.GT.4.AND.IDO.NE.1)	S6601120
	EX=ALOGT(AMAX1(XCORSG(GASORA+1),XCORSG(GASORA+3))*QCONV(IDO))	S6601130
	IF(IP.EQ.4) EX=ALOGT(XCORSG(GASORA+2)*QCONV(IDO))	S6601140
	IEXP=EX	S6601150
	IF(EX.LT.0.0) IEXP=IEXP-1	S6601160
	LALPH1=2	S6601170
	IEXP=-IEXP	S6601180
	CALL CODE	S6601190
	WRITE(IALPHA,9001) IEXP	S6601200
9001	FORMAT(I2)	S6601210
	IF(IP.LT.5)CALL SYMB(0.8,YDIST1,0.2,LALPHA,90.0,1)	S6601220
	PFAC1=20.0*QCONV(IDO)*10.0**(IEXP-1)	S6601230
	PFAC=PFAC1	S6601240
	GO TO (90,50,10),PDO	S6601250
C		S6601260
C	PLOT SYMBOLS 'O' FOR UPPER LAYER OR TIME MEAN CONCENTRATION	S6601270
C		S6601280
10	NRNG=1	S6601290
	IF(IP.GT.4) GO TO 20	S6601300
C		S6601310
C	SCALE FACTOR FOR TIME MEAN CONCENTRATION IS THE SAME	S6601320
C	AS FOR CONCENTRATION	S6601330
C		S6601340
	EX=ALOGT(XCORSG(GASORA+1)*QCONV(IDO))	S6601350
	IEXP=EX	S6601360
	IF(EX.LT.0.0) IEXP=IEXP-1	S6601370
	IEXP=-IEXP	S6601380
	PFAC=20.0*QCONV(IDO)*10.0**(IEXP-1)	S6601390
20	IF(RANGE(NRNG,PDO+GASORA).LE.0.0) GO TO 30	S6601400
	X=0.001*RANGE(NRNG,PDO+GASORA)+2.37	S6601410
	Y=PFAC*CORSG(NRNG,PDO+GASORA)+2.4	S6601420
C		S6601430
C	PH PLOTTED?	S6601440
C		S6601450
	IF(IP.EQ.5.AND.IDO.EQ.1) Y=FIY(PDO)	S6601460
	IF(X.LT.2.50.OR.X.GT.32.5.OR.Y.LT.2.5.OR.Y.GT.22.5) GO TO 30	S6601470
	CALL SYMB(X,Y,0.2,0,0.0,1)	S6601480
30	NRNG=NRNG+1	S6601490
	IF(NRNG.LT.31) GO TO 20	S6601500
C		S6601510
C	PLOT SYMBOLS '+' FOR LOWER LAYER OR DOSAGE	S6601520
C		S6601530
40	PDO=2	S6601540

	IF(IP.EQ.4) PFAC=PFAC1	S6601550
	PDOP=2	S6601560
50	NRNG=1	S6601570
60	IF(RANGE(NRNG,PDO+GASORA).LE.0.0) GO TO 70	S6601580
	X=0.001*RANGE(NRNG,PDO+GASORA)+2.37	S6601590
	Y=PFAC*CORSG(NRNG,PDO+GASORA)+2.4	S6601600
C		S6601610
C	PH PLOTTED?	S6601620
C		S6601630
	IF(IP.EQ.5.AND.IDO.EQ.1) Y=FIY(PDO)	S6601640
	IF(X.LT.2.5.OR.X.GT.32.5.OR.Y.LT.2.5.OR.Y.GT.22.5) GO TO 70	S6601650
	CALL SYMB(X,Y,0.2,ADD,0.0,1)	S6601660
70	NRNG=NRNG+1	S6601670
	IF(NRNG.LT.31) GO TO 60	S6601680
C		S6601690
C	PLOT LINE FOR COMBINED LAYERS OR CONCENTRATION	S6601700
C		S6601710
80	PDO=1	S6601720
	PDOP=1	S6601730
90	NRNG=1	S6601740
	PEN=3	S6601750
	IF(IP.GT.4) GO TO 100	S6601760
C		S6601770
C	CALCULATE SCALE FACTOR FOR CONCENTRATION	S6601780
C		S6601790
	EX=ALOGT(XCORSG(PDO+GASORA)*QCONV(IDO))	S6601800
	IEXP=EX	S6601810
	IF(EX.LT.0.0) IEXP=IEXP-1	S6601820
	IEXP=-IEXP	S6601830
	CALL CODE	S6601840
	WRITE(IALPHA,9001) IEXP	S6601850
	PFAC=20.0*QCONV(IDO)*10.0**(IEXP-1)	S6601860
100	IF(YDIST(YUNITS).GT.0.0)	S6601870
	CALL SYMB(0.8,YDIST(YUNITS),0.2,LALPHA,90.0,1)	S6601880
110	IF(RANGE(NRNG,PDO+GASORA).LE.0.0) GO TO 130	S6601890
	X=0.001*RANGE(NRNG,PDO+GASORA)+2.5	S6601900
	Y=PFAC*CORSG(NRNG,PDO+GASORA)+2.5	S6601910
C		S6601920
C	PH PLOTTED?	S6601930
C		S6601940
	IF(IP.EQ.5.AND.IDO.EQ.1) Y=FIY(PDO)+0.1	S6601950
	IF(X.LT.2.5.OR.X.GT.32.5.OR.Y.LT.2.5.OR.Y.GT.22.5) GO TO 130	S6601960
120	CALL PLOT(X,Y,PEN)	S6601970
9002	FORMAT(1X3A2,I3,6I7,2G12.4/12G11.4/12G11.4)	S6601980
	IF(PEN.LT.3) GO TO 130	S6601990
	PEN=2	S6602000
	GO TO 120	S6602010
130	NRNG=NRNG+1	S6602020
	IF(NRNG.LT.31) GO TO 110	S6602030
140	CALL PLOT(33.0,24.0,3)	S6602040
C		S6602050
C	RETURN TO RCONC	S6602060

C  
C  
C  
C

RETURN

END OF CPLOT

END

S6602070  
S6602080  
S6602090  
S6602100  
S6602110  
S6602120

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C - - - - - S6700000
C S6700010
C S6700020
C S6700030
C - - - - - S6700040
  SUBROUTINE LABEL(PDO,IDO,YUNITS,IP) S6700050
  . , UPDATE: 8213 SOURCE: 02 APR 82 LOCATION: KSC S6700060
C S6700070
C -----S6700080
C - S6700090
C - THIS SUBROUTINE LABELS THE CONCENTRATION AND DOSAGE CENTERLINE S6700100
C - PLOTS S6700110
C - S6700120
C -----S6700130
C S6700140
C****          B E G I N   C O M M O N   A R E A          ****S6700150
C 04/02/82 S6700160
C-----MATH PARAMETERS AND CONSTANTS S6700170
  COMMON /MATH/ PI,G,CP,MAXLEV,GAMMAI,GAMMAC S6700180
C-----INPUT OPTIONS S6700190
  REAL LAMBDA S6700200
  INTEGER FILE,GOOD,TITLE S6700210
  COMMON /INPUT/ IRUN,NUMRUN,MODEL,IVHICL,NORMAL,TPROP, S6700220
  . ISHAPE,GAMMAX,GAMMAY,GAMMAZ,ALPHA,BETA, S6700230
  . XRY,XRZ,XLRY,TIMAV,ISIG,ICALC,CALHT, S6700240
  . IPLACE,IPRINT,SIGMAR,SIGMER,LSITE,BOTLAY, S6700250
  . ZRK,DECAY,GOOD,NCISO,NDISO,NTISO,FILE(3) S6700260
  . ,RAINRT,LAMBDA,TIMI,DURAT,NVS,IVERSN,LOCATN(2) S6700270
  . ,IPLLNT(4),GAMMAP(30),HM(2),CISO(10),DISO(10), S6700280
  . TISO(10),TITLE(14),SIGPP(29),SIGLL(29),VS(20), S6700290
  . FS(20),MDLNAM(12),DBAR(20) S6700300
C-----COUNTERS,FLAGS,GENERAL AND INDEX VARIABLES S6700310
  LOGICAL ISNDFO,CRT,MAXDEP,BATCH,GASSET,GRVSET, S6700320
  . MODEL4,MODEL5,MODEL6 S6700330
  INTEGER RUNNUM,RT,CL,CS S6700340
  COMMON /CTRL/ IFLG,RUNNUM,NUM,NLAYS,NBK,QC,QT,HEAT,ZM,H, S6700350
  . DPDZ,TAUK,SURDEN,ZRL,IBOT,ITOP,SIGXNK,SIGYNK, S6700360
  . SIGZ,ISNDFO,CRT,LAYTOP(3),ITDU,KEEP S6700370
  . ,MIXING,MAXDEP,LAYBOT(3) S6700380
  . ,ALTSV,BATCH,CL(14),CS(10),GASSET,IAGAIN, S6700390
  . ICHAR(12),IDXCL,IDXCS,IERROR(5),IFRMT(80), S6700400
  . MINUS1,MINUS9,MINS1,MINS9, S6700410
  . MODEL4,MODEL5,MODEL6,NNNEST,NNNTRY,LLNEST,LLNTRY, S6700420
  . RT(24),TPROPC,IDXRT S6700430
C-----TERMINAL CONTROL CHARACTERS AND LOGICAL UNIT NUMBERS. S6700440
  INTEGER ALTSET,OFF,BLNKNG,INV,ULINE,INVNDR, S6700450
  . TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP, S6700460
  . CLRLNE,INSLNE,DELINE S6700470
  COMMON /CNTRL/ ALTSET(2),OFF(2),BLNKNG(2),INV(2),INVHF(2), S6700480
  . INVNDR(2),ULINE(2), S6700490
  . TAB,TAB2,SETTAB,CLRTAB,CURSUP,CURSDN,CURLFT,CLRDSP,S6700500

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      :          CLRLNE, INSLNE, DELINE,          S6700510
      :          IESCAJ(3), NULL, IBLNK,        S6700520
      :          IPAR(5), ICU, IYSJ, IYESJ, INJ, INOJ, NAMEP(3) S6700530
C-----VEHICLE PARAMETERS                      S6700540
      COMMON /VCLPR/ VPAR(17)                   S6700550
C-----TIME PARAMETERS                        S6700560
      COMMON /TIME/ JTIME, JDAY, JYEAR, ISTIME, ISDAY, ISYEAR, LTIME, S6700570
      LDAY, LYEAR, ISMON(2), JMON(2), LMON(2), LSDT(2) S6700580
C-----SOUNDING/FORCAST METEOROLOGICAL DATA (INITIAL LEVELS) S6700590
      COMMON /FRCST/ ALT(30), DIR(30), SPEED(30), TEMP(30), PRESS(30), S6700600
      RH(30), PTEMP(30), SIGEP(30), SIGAP(30) S6700610
C-----LAYER PARAMETERS                      S6700620
      COMMON /LAYER/ DX, DYY, DX(29), DY(29), Q(29), RISTIM(29), SIGXO(29), S6700630
      SIGYO(29) S6700640
C-----CALCULATED BOUNDARY DATA (FOR NEW LAYERS) S6700650
      COMMON /BLAYR/ DIRB(6), SPEEDB(6), TEMPB(6) S6700660
C-----CALCULATED NEW LAYER PARAMETERS      S6700670
      COMMON /NLYER/ DDIR(32), DIRN(32), DSPEED(32), SIGAPN(32), SIGEPN(32), S6700680
      SPEEDN(32) S6700690
C-----CONVERSION FACTORS                    S6700700
      COMMON /CNVRT/ QCONV(4), QPDEPH          S6700710
C                                               S6700720
C*****COMMON BUFFER ARRAY FOR COMMON MODIFICATION*****S6700730
      COMMON /EXTRA/ NCOM(1), NTOTAL(1), PLUS(900) S6700740
C-----READ/WRITE BUFFER                    S6700750
C-----A R R A Y = 2077 + 1 + 1 + 2 * 900 = 3879S6700760
C*****S6700770
C                                               S6700780
C-----EQUIVALENCE STATEMENTS              S6700790
      EQUIVALENCE (IPU1, IPAR(3))              S6700800
      , (IPU2, IPAR(4)), (IPU3, IPAR(5)) S6700810
      EQUIVALENCE (MAXDEP, GRVSET), (IFRMT(1), IFRMT1) S6700820
C                                               S6700830
C****          E N D O F C O M M O N A R E A ****S6700840
Cq                                               S6700850
C                                               S6700860
      DIMENSION RANGE(30,6), BEARNG(30,6), SIGYBR(30,6), CORSG(30,6) S6700870
      , RCORSG(6), BCORSG(6), XCORSG(6) S6700880
C-----EQUIVALENCE STATEMENTS              S6700890
      EQUIVALENCE                              S6700900
      . (PLUS, RANGE), (PLUS(181), BEARNG), (PLUS(361), SIGYBR) S6700910
      . , (PLUS(541), XCORSG), (PLUS(547), CORSG), (PLUS(727), RCORSG) S6700920
      . , (PLUS(733), BCORSG) S6700930
      COMPLEX CYLAB1(7), CYLAB2(7), CYLAB3(7), CYLAB4(7), CYLAB5(7) S6700940
      . , CYLAB6(7) S6700950
      INTEGER PDO, YLAB(32,6), YUNITS, PLGND(15,7), PTITL(13,3) S6700960
      DIMENSION IALPHA(18), LPLLNT(6,4), LALPHA(2) S6700970
      EQUIVALENCE (LALPHA(2), IALPHA), (LALPHA, LALPH1) S6700980
      . , (YLAB(2,1), CYLAB1), (YLAB(2,2), CYLAB2), (YLAB(2,3), CYLAB3) S6700990
      . , (YLAB(2,4), CYLAB4), (YLAB(2,5), CYLAB5), (YLAB(2,6), CYLAB6) S6701000
      DATA LPLLNT/2H F, 2HOR, 2H H, 2HCL, 2H ,8 S6701010
      , 2H F, 2HOR, 2H C, 2HO2, 2H ,8 S6701020

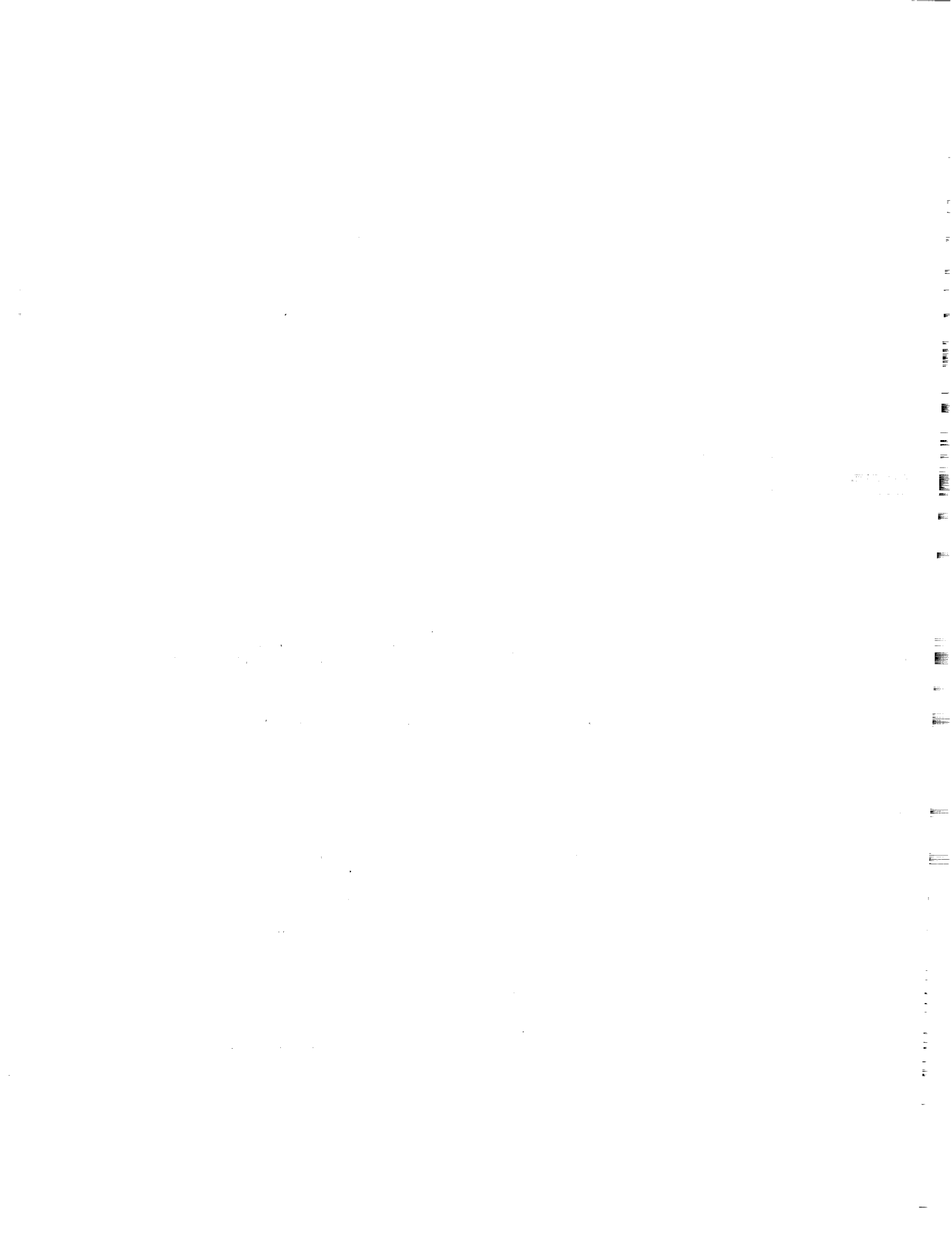
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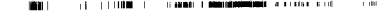
.	,2H F,2HOR,2H C,2HO ,2H ,8	S6701030
.	,2H F,2HOR,2H A,2HL2,2HO3,10/	S6701040
	DATA PLGND	S6701050
.	/22,4*2H ,2H C,2HON,2HCE,2HNT,2HRA,2HTI,2HON,3*20040B	S6701060
.	,15,4*2H+ ,2H D,2HOS,2HAG,2HE ,6*20040B	S6701070
.	,28,4*2HO ,2H ,2H ,2H M,2HIN,2H. ,2HAV,2HE ,2HCO,2HNC,20040B	S6701080
.	,19,4*2H ,2H D,2HEP,2HOS,2HIT,2HIO,2HN ,4*20040B	S6701090
.	,16,4*2H ,2H A,2HCI,2HDI,2HTY,6*20040B	S6701100
.	,20,4*2HO ,2H U,2HPP,2HER,2H L,2HAY,2HER,4*20040B	S6701110
.	,20,4*2H+ ,2H L,2HOW,2HER,2H L,2HAY,2HER,4*2H /	S6701120
	DATA PTITL	S6701130
.	/24,2HCO,2HNC,2HEN,2HTR,2HAT,2HIO,2HN ,2HAN,2HD ,2HDO,2HSA,2HGE	S6701140
.	,18,2HWA,2HSH,2HOU,2HT ,2HDE,2HPO,2HSI,2HTI,2HON,3*20040B	S6701150
.	,24,2HGR,2HAV,2HIT,2HAT,2HIO,2HNA,2HL ,2HDE,2HPO,2HSI,2HTI,2HON/	S6701160
	DATA CYLAB1 /8HCONCENTR,8HATION X ,8H10 [MG/M	S6701170
.	,8H**3] - ,8H DOSAGE ,8HX 10 [MG,8H-SEC/M**/	S6701180
	DATA CYLAB2 /8H CO,8HNCENTRAT,8HION X 10	S6701190
.	,8H [PPM] -,8H DOSAGE ,8HX 10 [PP,8HM-SEC] /	S6701200
	DATA CYLAB3 /8H ,8H WAS,8HHOUT DEP	S6701210
.	,8HOSITION ,8HX 10 [MG,8H/M**2] ,8H /	S6701220
	DATA CYLAB4 /8H ,8H ,8H WASHOUT	S6701230
.	,8H DEPOSIT,8HION [PH],8H ,8H /	S6701240
	DATA CYLAB5 /8H ,8H GRAVIT,8HATIONAL	S6701250
.	,8HDEPOSITI,8HON X 10 ,8H[MG/M**2,8H] /	S6701260
	DATA CYLAB6 /8H GRA,8HVITATION,8HAL DEPOS	S6701270
.	,8HITION X ,8H10 [PART,8HICLES/M*,8H*2] /	S6701280
	DATA YLAB(1,1),YLAB(30,1),YLAB(31,1),YLAB(32,1)	S6701290
.	,YLAB(1,2),YLAB(30,2),YLAB(31,2),YLAB(32,2)	S6701300
.	,YLAB(1,3),YLAB(30,3),YLAB(31,3),YLAB(32,3)	S6701310
.	,YLAB(1,4),YLAB(30,4),YLAB(31,4),YLAB(32,4)	S6701320
.	,YLAB(1,5),YLAB(30,5),YLAB(31,5),YLAB(32,5)	S6701330
.	,YLAB(1,6),YLAB(30,6),YLAB(31,6),YLAB(32,6)	S6701340
.	/ 58, 2H3], 41, 68	S6701350
.	, 54, 2H , 47, 68	S6701360
.	, 46, 2H , 58, 0	S6701370
.	, 40, 2H , 0, 0	S6701380
.	, 49, 2H , 64, 0	S6701390
.	, 53, 2H , 58, 0/	S6701400
C		S6701410
CF	OUTPUT FORMAT STATEMENTS	S6701420
CF		S6701430
	9001 FORMAT(I2)	S6701440
	9002 FORMAT(F5.0)	S6701450
	9003 FORMAT(F4.1)	S6701460
	9004 FORMAT(I4,2A2,I3,IX,A2,A1,IX,I4)	S6701470
	9005 FORMAT (55A2)	S6701480
	9006 FORMAT (F4.1)	S6701490
C		S6701500
C	FIRST EXECUTABLE STATEMENT	S6701510
C		S6701520
	GASORA=3*(IDO/4)	S6701530
	IPM3=IP-3	S6701540

	LALPH1=4	S6702590
	CALL CODE	S6702600
	WRITE(IALPHA,9005) LOCATN	S6702610
	CALL SYMB(20.5,21.0,0.2,LALPHA,0.0,1)	S6702620
C		S6702630
C	PRINT OUT THE DATA FILENAME ON THE PLOT	S6702640
C		S6702650
	LALPH1=6	S6702660
	CALL CODE	S6702670
	WRITE(IALPHA,9005) FILE	S6702680
	CALL SYMB(20.5,20.5,0.2,LALPHA,0.0,1)	S6702690
C		S6702700
C	CROSS OUT SOUNDING/FORECAST AS APPROPRIATE	S6702710
C		S6702720
	IF(ISNDFO)GO TO 90	S6702730
	CALL PLOT(18.6,22.6,3)	S6702740
	CALL PLOT(20.2,22.6,2)	S6702750
	GO TO 100	S6702760
	90 CALL PLOT(16.6,22.6,3)	S6702770
	CALL PLOT(18.4,22.6,2)	S6702780
	100 CONTINUE	S6702790
C		S6702800
C	PLOT LEGENDS	S6702810
C		S6702820
	CALL PLOT(25.5,22.5,3)	S6702830
	CALL PLOT(26.8,22.5,2)	S6702840
	CALL PLOT(26.8,22.5,3)	S6702850
	IF(IP.GT.4) GO TO 110	S6702860
	CALL SYMB(25.5,22.5,0.20,PLGND(1,1),0.0,1)	S6702870
	CALL SYMB(25.5,22.0,0.20,PLGND(1,2),0.0,1)	S6702880
	CALL SYMB(25.5,21.5,0.2,PLGND(1,3),0.0,1)	S6702890
	TMIN=TIMAV/60.0	S6702900
	LALPH1=4	S6702910
	CALL CODE	S6702920
	WRITE(IALPHA,9003) TMIN	S6702930
	CALL SYMB(27.2,21.5,0.2,LALPHA,0.0,1)	S6702940
	GO TO 150	S6702950
	110 IF(IDO.EQ.1) GO TO 120	S6702960
	CALL SYMB(25.5,22.5,0.20,PLGND(1,4),0.0,1)	S6702970
	GO TO 130	S6702980
	120 CALL SYMB(25.5,22.5,0.20,PLGND(1,5),0.0,1)	S6702990
	130 IF(LAYTOP(2).LE.0) GO TO 150	S6703000
	IF(IP.EQ.6) GO TO 140	S6703010
	CALL SYMB(25.5,22.0,0.20,PLGND(1,6),0.0,1)	S6703020
	140 CALL SYMB(25.5,21.5,0.20,PLGND(1,7),0.0,1)	S6703030
		S6703040
C		S6703050
C	RETURN TO RMCLM	S6703060
C		S6703070
	150 RETURN	S6703080
C		S6703090
C	END OF LABEL	S6703100
C	END	

	CALL PLOT(2.5,22.5,3)	S6702070
70	CALL SYMB(1.0,7.7,0.2,YLAB(1,YUNITS),90.0,1)	S6702080
	IZ=1	S6702090
C		S6702100
C	PRINT OUT CLOUD HEIGHT, TIME OF RISE, TOP OF LAYER	S6702110
C	BOTTOM OF LAYER, AND HEIGHT OF CALCULATION ON THE PLOT	S6702120
C		S6702130
80	IF(CALHT.GT.ALT(LAYTOP(IZ)+1)) IZ=2	S6702140
	IF(MODEL4 .AND. IDO.EQ.4 .AND. LAYTOP(IZ+1).GT.0) IZ = IZ + 1	S6702150
	LALPHI=5	S6702160
	CALL CODE	S6702170
	WRITE(IALPHA,9002) H	S6702180
	CALL SYMB(12.3,22.5,0.20,LALPHA,0.0,1)	S6702190
	CALL CODE	S6702200
	WRITE(IALPHA,9002) TAU	S6702210
	CALL SYMB(12.3,22.0,0.20,LALPHA,0.0,1)	S6702220
	CALL CODE	S6702230
	WRITE(IALPHA,9002) ALT(LAYTOP(IZ)+1)	S6702240
	CALL SYMB(12.3,21.5,0.20,LALPHA,0.0,1)	S6702250
	CALL CODE	S6702260
	WRITE(IALPHA,9002) ALT(LAYBOT(IZ))	S6702270
	IF(IALPHA(2).LT.20060B) IALPHA(2)=20060B	S6702280
	CALL SYMB(12.3,21.0,0.20,LALPHA,0.0,1)	S6702290
	CALL CODE	S6702300
	WRITE(IALPHA,9002) CALHT	S6702310
	IF(IALPHA(2).LT.20060B) IALPHA(2)=20060B	S6702320
	CALL SYMB(12.3,20.5,0.20,LALPHA,0.0,1)	S6702330
C		S6702340
C	PRINT OUT THE SOUNDING TIME ON THE PLOT	S6702350
C		S6702360
	LALPHI=20	S6702370
	CALL CODE	S6702380
	WRITE(IALPHA,9004) ISTIME,LSDT,ISDAY,ISMON,ISYEAR	S6702390
	IF(IALPHA(1).LT.30000B) IALPHA(1)=IALPHA(1)+10000B	S6702400
	CALL SYMB(20.5,22.5,0.20,LALPHA,0.0,1)	S6702410
C		S6702420
C	PRINT OUT THE PREDICTION TIME ON THE PLOT	S6702430
C		S6702440
	CALL CODE	S6702450
	WRITE(IALPHA,9004) JTIME,LSDT,JDAY,JMON,JYEAR	S6702460
	IF(IALPHA(1).LT.30000B) IALPHA(1)=IALPHA(1)+10000B	S6702470
	CALL SYMB(20.5,22.0,0.20,LALPHA,0.0,1)	S6702480
C		S6702490
C	PRINT OUT THE LAUNCH TIME ON THE PLOT	S6702500
C		S6702510
	CALL CODE	S6702520
	WRITE(IALPHA,9004) LTIME,LSDT,LDAY,LMON,LYEAR	S6702530
	IF(IALPHA(1).LT.30000B) IALPHA(1)=IALPHA(1)+10000B	S6702540
	CALL SYMB(20.5,21.5,0.20,LALPHA,0.0,1)	S6702550
C		S6702560
C	PRINT OUT THE RUN LOCATION ON THE PLOT	S6702570
C		S6702580

C		S6701550
C	GET PLOT TITLE	S6701560
C		S6701570
	LALPH1=PTITL(1,IPM3)	S6701580
	I12=LALPH1/2+1	S6701590
	LALPH1=LALPH1+LPLLNT(6,IDO)	S6701600
	I2=LALPH1/2+1	S6701610
	DO 20 I=2,I2	S6701620
	IF(I.GT.I12) GO TO 10	S6701630
	LALPHA(I)=PTITL(I,IPM3)	S6701640
	GO TO 20	S6701650
10	LALPHA(I)=LPLLNT(I-I12,IDO)	S6701660
20	CONTINUE	S6701670
	CALL SYMB(9.7,23.4,0.5,LALPHA,0.0,1)	S6701680
	FI=0.0	S6701690
	IF(IP.NE.5.OR.IDO.NE.1) GO TO 30	S6701700
		S6701710
C		S6701720
C	SET UP pH SCALE	S6701730
C		S6701740
	FI=0.0	S6701750
	FY=16.4	S6701760
	IY=15	S6701770
	DI=0.5	S6701780
	GO TO 40	S6701790
		S6701800
C		S6701810
C	SET UP LINEAR SCALE	S6701820
C		S6701830
30	FI=10.0	S6701840
	FY=22.4	S6701850
	IY=21	S6701860
	DI=-0.5	S6701870
		S6701880
C		S6701890
C	PLOT Y-UNITS	S6701900
40	DO 50 I=1,IY	S6701910
	LALPH1=4	S6701920
	CALL CODE	S6701930
	WRITE(IALPHA,9006) FI	S6701940
	CALL SYMB(1.2,FY,0.2,LALPHA,0.0,1)	S6701950
	FI=FI+DI	S6701960
	FY=FY-1.0	S6701970
50	CONTINUE	S6701980
		S6701990
C		S6702000
C	PLOT Y-AXIS	S6702010
C		S6702020
	FY=3.5	S6702030
	CALL PLOT(2.5,2.5,3)	S6702040
	DO 60 I=1,IY-1	S6702050
	CALL PLOT(2.5,FY,2)	S6702060
	CALL PLOT(2.2,FY,2)	
	CALL PLOT(2.5,FY,2)	
	FY=FY+1.0	
60	CONTINUE	





The page contains a large amount of extremely faint and illegible text, likely bleed-through from the reverse side of the paper. The text is too light to be transcribed accurately.

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18. ABSTRACT  This report contains the program listing for the REEDM Computer Program. A mathematical description of the atmospheric dispersion models, cloud-rise models, and other formulas used in the REEDM model; vehicle and source parameters, other pertinent physical properties of the rocket exhaust cloud, and meteorological layering techniques; user's instructions for the RREDM computer program; and worked example problems are contained in NASA CR-3646.					
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