NUREG-0917

Nuclear Regulatory Commission Staff Computer Programs for Use with Meteorological Data

U.S. Nuclear Regulatory Commission

Office of Nuclear Reactor Regulation

W. Snell

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ABSTRACT

The Nuclear Regulatory Commission (NRC) receives hour-by-hour meteorological data on magnetic tape in a format specified in Regulatory Guide 1.70, Revision 2, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants" (September 1975). The purpose of this report was to document the computer programs that are used by the NRC meteorology staff to examine, assess and utilize these hourly values of meteorological data. A description of each of the programs is given along with the input requirements, discussion of output, subroutine flow chart, a description of each subroutine, sample output and a program listing.

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1.0 INTRODUCTION

Regulatory Guide 1.70, Revision 2, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants" (September 1975), recommended that, if possible, hour-by-hour meteorological data should be provided to the Nuclear Regulatory Commission (NRC) on magnetic tape. The purpose for this submission was to increase the NRC meteorology staff's ability to independently evaluate the environmental and safety related consequences of routine and accidental releases at nuclear power facilities. To avoid confusion and delays by the staff in the interpretation of meterological data submitted, a letter was sent on April 22, 1977 to all power reactor licensees and applicants with applications for a license to operate or construct a power reactor. This letter contained the details of a standardized format for submittal of hourly meteorological data on magnetic tape to the NRC. Subsequent to this letter, the NRC meteorology staff developed a number of computer programs to review and utilize the meteorological data submitted in this Standard Format. These programs are routinely used by the staff to examine and assess the quality of the data submitted as well as to convert the data to formats that are compatible as input to other NRC computer programs.

Programs DATE, MISS, PRINT, QA and STABQ are used to examine the quality and validity of the applicant's hourly meteorological data. Program JFREQ is used to calculate a joint frequency distribution of wind speed, wind direction and atmospheric stability that can be used in the NRC meteorological computer programs XOQDOQ (based on R.G. 1.111) and PAVAN (based on R.G. 1.145) for routine and accidental release meteorological analyses, respectively. These analyses, in turn, are used to assure that the radiological consequences of normal operation meet the As Low As Reasonably Achievable guidelines of 10 CFR 50, Appendix I, and that the radiological consequences of accidents conform to the provisions of 10 CFR 100, 10 CFR 51, and the Statement of Interim Policy on Nuclear Power Plant Accident Considerations Under the National Environmental Policy Act of 1969@ 45 FR 40101. Program PRECP is used to assess the quality of the applicants precipitation data prior to its use in the NRC CRAC computer code, a code which is used to assess the accident risk associated with the operation of nuclear power facilities. Program TDP is used to provide meteorological information to the hydrologic engineers to aid in their ultimate heat sink analysis.

A complete description of each of these programs is provided in this NUREG. Included with each code is a description of what it does, the input requirements to run it, a description of each subroutine, sample output and a listing of each program.

These programs were developed on an IBM 370 computer system in the FORTRAN IV language and should convert easily to other systems.

2.0 BACKGROUND

The purpose of standarizing the format for meteorological data* submitted to the NRC was to minimize the staff time necessary to utilize and interpret this data. If each applicant were to submit data in their own format, an inordinate amount of time could have been spent in trying to process the data. However, because each site had a different meteorological program, the format had to be flexible enough to handle any differences from one site to another. The result was a format that could handle almost all meteorological parameters anticipated to be recorded at a nuclear power facility. The only major drawback of the format was that it used up a large amount of space due to the many empty data fields where no information was available.

The diversity of the data available from site to site also led to additional programming considerations. In writing the programs to process the data, the intent was to keep them as simple as possible so they would be easily adaptable to other computer systems. However, a minimum amount of complexity was needed to address the differences in data available at each site and handle blank data fields. It was also necessary to have a consistent interpretation of the data between each of the programs.

2.1 Blank Data Fields

According to the criteria for the Standard Format (see Appendix A), if a specific meteorological parameter is not available for the entire data set, the appropriate field for that parameter may be left blank. To avoid confusion with computer systems that interpret a blank field as a value of zero, each program checks for blank fields. If they are found they are converted to the appropriate code for missing data.

2.2 Erroneous Data

Except for the programs DATE (which only reads the dates) and PRINT (which is used to list all the data as it is), each of the codes has a built in limit beyond which the data are considered as erroneous. These limits are consistent for all the programs and are as follows.

parameter	lower limit	upper limit	units
wind direction	0.0	365.0	degrees
wind speed	0.0	99.9	meters/second
sigma theta	0.0	365.0	degrees
temperature	-99.9	99.9	degrees C
dew point	-99.9	100.0	degrees C
delta-T	-7.0	35.0	degrees C/100 meters
precipitation	0.0	254.0	mm/hour

* See Appendix A for the NRC Standard Format for Meteorological Data.

3.0 DATE

3.1 Description of Program

Date reviews a data set in the NRC Standard Format for the correct sequential ordering of the data by year, Julian day and hour.

3.2 Input Cards

Card	Column	Format	Variable	Description
1	1	I1	LL	Coding of hourly data: LL=0, coded 0000-2300 LL=1, coded 0100-2400
	2	1x		Blank
	3-74	18A4	Title	Title for output

3.3 Discussion of Output

The output consists of the date of the first data record that is read, the dates and record number of any data that is found to be out-of-sequence for any reason, and the date of the last data record that is read. When an error in the data sequence is found, the two sequential records where the error occurs will be listed.

3.4 Implementation

Input Units
- 1 - data file of hourly meteorological data in NRC Standard Format
- 5 - input card 1

Output Unit
- defaults to printer

3.5 Subroutine Flow Chart

This program contains no subroutines.

3.6 Subroutine Description

This program contains no subroutines.

3.7 Sample Output

PROGRAM: DATE VERSION: 1 DATED: MARCH 1982 RUN DATE: THURSDAY MAY 13, 1982

SITE:

TEST DATA

CONTAINS DATA FROM DECEMBER 1980 TO JANUARY 1981

BAD DATA DATES INSERTED TO CHECK PROGRAM DATE

HOURLY DATA CODED 0100 TO 2400

TITLE: SAMPLE RUN : INPUT FILE = DATA2 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

HOURLY DATA CODED: 01-24

PROGRAM: DATE VERSION: 1 DATED: MARCH 1982 RUN DATE: THURSDAY MAY 13, 1982

SAMPLE RUN : INPUT FILE = DATA2 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

DATE OF FIRST DATA RECORD READ: 80 365 12

BAD DATE SEQUENCE IN DATA:	80 365 15	RECORD	4
	0 0 0	RECORD	5
BAD DATE SEQUENCE IN DATA:	0 0 0	RECORD	5
	80 365 17	RECORD	6
BAD DATE SEQUENCE IN DATA:	80 365 20	RECORD	9
	80 345 11	RECORD	10
BAD DATE SEQUENCE IN DATA:	80 345 11	RECORD	10
	80 365 22	RECORD	11
BAD DATE SEQUENCE IN DATA:	80 366 1	RECORD	14
	82 366 2	RECORD	15
BAD DATE SEQUENCE IN DATA:	82 366 2	RECORD	15
	80 366 3	RECORD	16
BAD DATE SEQUENCE IN DATA:	80 366 11	RECORD	24
	80 366 11	RECORD	25
BAD DATE SEQUENCE IN DATA:	80 366 11	RECORD	25
	80 366 13	RECORD	26
BAD DATE SEQUENCE IN DATA:	81 1 1	RECORD	38
	81 4 2	RECORD	39
BAD DATE SEQUENCE IN DATA:	81 4 2	RECORD	39
	81 1 3	RECORD	40
BAD DATE SEQUENCE IN DATA:	81 1 19	RECORD	56
	99 999 99	RECORD	57
BAD DATE SEQUENCE IN DATA:	99 999 99	RECORD	57
	81 1 21	RECORD	58
BAD DATE SEQUENCE IN DATA:	81 2 3	RECORD	64
	81 2 8	RECORD	65
BAD DATE SEQUENCE IN DATA:	81 2 8	RECORD	65
	81 2 5	RECORD	66

PROGRAM: DATE VERSION: 1 DATED: MARCH 1982 RUN DATE: THURSDAY MAY 13, 1982

SAMPLE RUN : INPUT FILE = DATA2 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

DATE OF LAST DATA RECORD READ: 81 2 11 RECORD NO. 72

4.0 JFREQ

4.1 Description of Program

JFREQ derives a joint frequency distribution of wind speed, wind direction and atmospheric stability from meteorological data in the NRC Standard Format. Atmospheric stability can be determined using either a vertical temperature gradient (in degrees C per 100 meters) or sigma theta. The distribution is printed in both hours and percent along with various summarizations of the data. The option of having the hourly data punched on cards is also available.

4.2 Input Cards

Card	Column	Format	Variable	Description
1	1-72	18A4	A	Title to be printed on each page of the output.
2	1	I1	ILEV	Level of wind data to be used. ILEV=1, Upper (U). ILEV=2, Intermediate (I). ILEV=3, Lower (L).
	2	I1	IS	Delta T interval to be used. IS=1, U-L IS=2, U-I IS=3, I-L Sigma theta level to be used. IS=4, Upper IS=5, Intermediate IS=6, Lower
	3	I1	IP	Option to punch the hourly joint frequency distribution. IP=0, do not punch IP=1, punch
	4	I1	LSH	Coding of hourly data. LSH=0, 0000-2300 hours LSH=1, 0100-2400 hours
	5	I1	IPS	Print hourly stability class by hour of day. IPS=0, do not print IPS=1, print
	6-10	F5.2	CALM	Wind speed that defines calm winds (must be >0.0 and <0.5 m/s)
	11-17	F7.1	VB	Code for variable wind direction. VB=0.0 if there are no variable wind directions.

Card	Column	Format	Variable	Description
3	1-6	3I2	IY(1) IM(1) ID(1)	The year, month and day that calculations are to begin.
	7	1x		Blank.
	8-13	3I2	IY(2) IM(2) ID(2)	The year, month and day that calculations are to end.

4.3 Discussion of Output

The output is divided into three sections. The first section lists the stability class by hour of day. The second section gives the joint frequency distribution in hours and the third section gives the joint frequency distribution in percent. All percentages in the third section are based on the total number of hours shown at the end of the hourly summaries in the second section. The number of hours (or percent) of variable winds and calm winds in each stability category is included in the total number of hours (or percent) shown for that stability. In addition, the variable winds are summarized separately at the end of each of the joint frequency distributions. Punched output will contain the hourly data in the same order as the printout shows it, except for the first card which will contain the hours of calm, and the variable winds which will not be punched. The format is as follows:

Card 1-4: Description cards
Card 5: 7I5 (calms for stability A, B, ..., G)
Card 6-75: 16I5 (hourly data for 7 stability classes with 10 wind categories per stability class)

The appropriate titles and total number of hours are punched out to aid in identification of the card output.

4.4 Implementation

If more than one joint frequency distribution is desired from the same data file, it may be obtained by inserting as many input cards 1, 2, and 3 as desired, as long as the dates specified are chronological. That is the program that will not go back and reread records from the data file that have already been read.

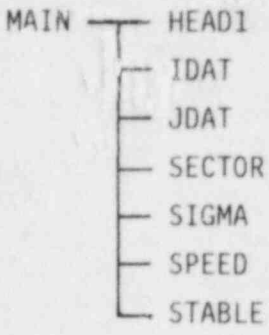
Input Units

1 - data file of hourly meteorological data
5 - input cards 1, 2, and 3

Output Unit

6 - printer

4.5 Subroutine Flow Chart



4.6 Subroutine Descriptions

Except for MAIN, all subroutines are listed alphabetically.

MAIN

The main part of the program initializes all data, reads the input cards, reads the data file, summarizes all data into the joint frequency distribution, calls all the subroutines, prints out all the results, and punches output if required.

HEAD1

This routine prints out the input parameters that were specified.

IDAT

This routine converts a given month and day to an equivalent Julian day.

JDAT

This routine converts a given Julian day to an equivalent month and day.

SECTOR

This routine distributes the wind direction data into 16 sectors centered on the principle compass points using the following equation.

SECTOR = 1+[(DIR+11.25)/22.5]

if SECTOR = 17, change to SECTOR = 1

where SECTOR = direction sector wind is blowing from
(SECTOR should be truncated to nearest whole number)
DIR = direction wind is blowing from (degrees)

Wind directions that coincide with a CALM wind speed are placed into sector 17. Wind directions that are considered variable are placed into sector 18.

SIGMA

This routine computes stability class from the horizontal deviation of wind direction (sigma theta) as follows.

Sigma theta (degrees)	Category	Stability Class
$22.5 \leq \sigma\theta$	1	A
$17.5 \leq \sigma\theta < 22.5$	2	B
$12.5 \leq \sigma\theta < 17.5$	3	C
$7.5 \leq \sigma\theta < 12.5$	4	D
$3.8 \leq \sigma\theta < 7.5$	5	E
$2.1 \leq \sigma\theta < 3.8$	6	F
$\sigma\theta < 2.1$	7	G

SPEED

This routine distributes the wind speed data into 10 different categories in meters per second as follows.

Wind speed (m/s)	Category
CALM	1
$CALM < U \leq 0.50$	2
$0.50 < U \leq 0.75$	3
$0.75 < U \leq 1.00$	4
$1.00 < U \leq 1.50$	5
$1.50 < U \leq 2.00$	6
$2.00 < U \leq 3.00$	7
$3.00 < U \leq 5.00$	8
$5.00 < U \leq 10.00$	9
$10.00 < U$	10

The variable CALM on input card 2 must be a wind speed greater than 0.0 and less than 0.5 m/s.

STABLE

This routine computes the stability class from atmospheric temperature gradient (delta-T) as follows.

Delta-T (°C/100m)	Category	Stability Class
$\Delta T \leq -1.9$	1	A
$-1.9 < \Delta T \leq -1.7$	2	B
$-1.7 < \Delta T \leq -1.5$	3	C
$-1.5 < \Delta T \leq -0.5$	4	D
$-0.5 < \Delta T \leq 1.5$	5	E
$1.5 < \Delta T \leq 4.0$	6	F
$4.0 < \Delta T$	7	G

4.7 Sample Output

PROGRAM: JFREQ VERSION: 3 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

TITLE: SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

WIND DATA FROM LEVEL: LOWER

DELTA-T INTERVAL: INTERMEDIATE MIXES LOWER

PUNCH HOURLY JFD ON CARDS: NO

HOURLY DATA CODED: 01-24

WRITE STABILITY CLASS BY HOUR OF DAY: YES

CALM WINDS CODED: 0.27 M/S

VARIABLE WIND DIRECTION CODED: 8888.8

JFD FOR DATA PERIOD: BEGINING - 80 12 30
ENDING - 81 1 3

PROGRAM: JFREQ VERSION: 3 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SITE:

TEST DATA

CONTAINS DATA FROM DECEMBER 1980 TO JANUARY 1891

HOURLY DATA CODED 0100 TO 2400

****

PROGRAM: JFREQ VERSION: 3 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

LEVEL OF WIND DATA: 10.0 METERS DELTA T LAYER: 60.0- 10.0 METERS

STABILITY CLASS BY HOUR OF DAY

			HOUR																					
YR	MN	DY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
80	12	30	-	-	-	-	-	-	-	-	-	-	-	E	E	E	D	D	D	D	C	C	C	C	C	C
80	12	31	B	B	C	A	A	D	D	D	E	E	E	E	E	E	D	D	D	D	-	C	-	-	C	F
81	1	1	B	B	C	F	G	D	D	A	-	E	E	E	E	E	D	D	-	-	C	C	C	C	C	C

PROGRAM: JFREQ VERSION: 3 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

LEVEL OF WIND DATA: 10.0 METERS DELTA T LAYER: 60.0- 10.0 METERS

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS ATMOSPHERIC STABILITY CLASS A

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
CALM-.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.5-.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.75-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0-3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.0-5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.0-10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VARIABLE																	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS ATMOSPHERIC STABILITY CLASS B

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
CALM-.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.5-.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.75-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.0-1.5	0	2	2	0	0	0	0	0	0	0	0	0	0	1	1	0	6
1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0-3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.0-5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.0-10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VARIABLE																	0
TOTAL	0	2	2	0	0	0	0	0	0	0	0	0	0	1	1	0	6

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS ATMOSPHERIC STABILITY CLASS C

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
CALM-.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.5-.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.75-1.0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3
1.0-1.5	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0-3.0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	3
3.0-5.0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5.0-10.0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
>10.0	0	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	5
VARIABLE																	0
TOTAL	0	2	2	4	6	0	0	0	1	0	0	1	0	0	0	1	17

CALM= 0.27 M/S

PROGRAM: JFREQ VERSION: 3 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

LEVEL OF WIND DATA: 10.0 METERS DELTA T LAYER: 60.0- 10.0 METERS

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS ATMOSPHERIC STABILITY CLASS D

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
CALM-.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.5-.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.75-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0-3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.0-5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.0-10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>10.0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4
VARIABLE																	0
TOTAL	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS ATMOSPHERIC STABILITY CLASS E

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
CALM-.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.5-.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.75-1.0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	3
1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0-3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.0-5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.0-10.0	1	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	6
>10.0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
VARIABLE																	2
TOTAL	1	1	0	0	5	0	0	1	2	0	0	0	0	0	0	0	12

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS ATMOSPHERIC STABILITY CLASS F

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
CALM-.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.5-.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.75-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0-3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.0-5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.0-10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VARIABLE																	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1

CALM= 0.27 M/S

PROGRAM: JFREQ VERSION: 3 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

LEVEL OF WIND DATA: 10.0 METERS DELTA T LAYER: 60.0- 10.0 METERS

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS ATMOSPHERIC STABILITY CLASS G

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
CALM-.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.5-.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.75-1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.0-1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0-3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.0-5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.0-10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VARIABLE																	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN HOURS ATMOSPHERIC STABILITY CLASS ALL

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0
CALM-.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.5-.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
.75-1.0	0	2	0	0	0	0	0	1	2	0	0	0	0	0	0	1	6
1.0-1.5	0	2	4	0	0	0	0	0	0	0	0	0	1	1	1	0	9
1.5-2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.0-3.0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	3
3.0-5.0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5.0-10.0	1	1	0	0	6	0	0	0	0	0	0	0	0	0	0	0	8
>10.0	0	0	0	0	9	0	0	0	1	0	0	0	0	0	0	0	10
VARIABLE																	2
TOTAL	1	5	4	4	15	0	0	1	3	0	0	1	1	1	1	1	40

CALM= 0.27 M/S

TOTAL VALID HOURS = 40 TOTAL POSSIBLE HOURS = 72

OVERALL STABILITY CLASS FREQUENCIES IN HOURS

STABILITY:	A	B	C	D	E	F	G	ALL
FREQUENCY:	0	6	17	4	12	1	0	40

OVERALL WIND SPEED FREQUENCIES IN HOURS

WIND SPEED (M/S):	CALM	CALM-.5	.5-.75	.75-1.0	1.0-1.5	1.5-2.0	2.0-3.0	3.0-5.0	5.0-10.0	>10.0	VARIABLE
FREQUENCY:	0	0	0	6	9	0	3	2	8	10	2
CUMULATIVE FREQ:	0	0	0	6	15	15	18	20	28	38	

PROGRAM: JFREQ VERSION: 3 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

LEVEL OF WIND DATA: 10.0 METERS DELTA T LAYER: 60.0- 10.0 METERS

DISTRIBUTION OF VARIABLE WINDS

U (M/S)	A	B	C	D	E	F	G	TOTAL
CALM	0	0	0	0	0	0	0	0
CALM-.5	0	0	0	0	0	0	0	0
.5-.75	0	0	0	0	0	0	0	0
.75-1.0	0	0	0	0	0	0	0	0
1.0-1.5	0	0	0	0	0	0	0	0
1.5-2.0	0	0	0	0	0	0	0	0
2.0-3.0	0	0	0	0	0	0	0	0
3.0-5.0	0	0	0	0	0	0	0	0
5.0-10.0	0	0	0	0	2	0	0	2
>10.0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	2	0	0	2

PROGRAM: JFREQ VERSION: 3 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

LEVEL OF WIND DATA: 10.0 METERS DELTA T LAYER: 60.0- 10.0 METERS

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN FRACTIONS ATMOSPHERIC STABILITY CLASS A

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0.0
CALM-.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.5-.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.75-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0-1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.5-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.0-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.0-5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.0-10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VARIABLE																	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN FRACTIONS ATMOSPHERIC STABILITY CLASS B

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0.0
CALM-.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.5-.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.75-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0-1.5	0.0	5.00	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.50	2.50	0.0	15.00
1.5-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.0-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.0-5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.0-10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VARIABLE																	0.0
TOTAL	0.0	5.00	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.50	2.50	0.0	15.00

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN FRACTIONS ATMOSPHERIC STABILITY CLASS C

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0.0
CALM-.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.5-.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.75-1.0	0.0	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.50	7.50
1.0-1.5	0.0	0.0	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.00
1.5-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.0-3.0	0.0	0.0	0.0	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.50	0.0	0.0	0.0	0.0	7.50
3.0-5.0	0.0	0.0	0.0	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.00
5.0-10.0	0.0	0.0	0.0	0.0	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.00
>10.0	0.0	0.0	0.0	0.0	10.00	0.0	0.0	0.0	2.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.50
VARIABLE																	0.0
TOTAL	0.0	5.00	5.00	10.00	15.00	0.0	0.0	0.0	2.50	0.0	0.0	2.50	0.0	0.0	0.0	2.50	42.50

CALM= 0.27 M/S

PROGRAM: JFREQ VERSION: 3 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

LEVEL OF WIND DATA: 10.0 METERS DELTA T LAYER: 60.0- 10.0 METERS

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN FRACTIONS ATMOSPHERIC STABILITY CLASS D

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0.0
CALM-.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.5-.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.75-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0-1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.5-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.0-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.0-5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.0-10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>10.0	0.0	0.0	0.0	0.0	10.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.00
VARIABLE																	0.0
TOTAL	0.0	0.0	0.0	0.0	10.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.00

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN FRACTIONS ATMOSPHERIC STABILITY CLASS E

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0.0
CALM-.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.5-.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.75-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.50	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.50
1.0-1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.5-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.0-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.0-5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.0-10.0	2.50	2.50	0.0	0.0	10.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.00
>10.0	0.0	0.0	0.0	0.0	2.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.50
VARIABLE																	5.00
TOTAL	2.50	2.50	0.0	0.0	12.50	0.0	0.0	2.50	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.00

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN FRACTIONS ATMOSPHERIC STABILITY CLASS F

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0.0
CALM-.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.5-.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.75-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0-1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.50	0.0	0.0	0.0	2.50
1.5-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.0-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.0-5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.0-10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VARIABLE																	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.50	0.0	0.0	0.0	2.50

CALM= 0.27 M/S

PROGRAM: JFREQ VERSION: 3 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

LEVEL OF WIND DATA: 10.0 METERS DELTA T LAYER: 60.0- 10.0 METERS

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN FRACTIONS ATMOSPHERIC STABILITY CLASS G

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0.0
CALM-.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.5-.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.75-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0-1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.5-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.0-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.0-5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.0-10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VARIABLE																	0.0
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND DIRECTION IN FRACTIONS ATMOSPHERIC STABILITY CLASS ALL

U (M/S)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM																	0.0
CALM-.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.5-.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.75-1.0	0.0	5.00	0.0	0.0	0.0	0.0	0.0	2.50	5.00	0.0	0.0	0.0	0.0	0.0	0.0	2.50	15.00
1.0-1.5	0.0	5.00	10.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.50	2.50	2.50	0.0	22.50
1.5-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.0-3.0	0.0	0.0	0.0	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.50	0.0	0.0	0.0	0.0	7.50
3.0-5.0	0.0	0.0	0.0	5.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.00
5.0-10.0	2.50	2.50	0.0	0.0	15.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.00
>10.0	0.0	0.0	0.0	0.0	22.50	0.0	0.0	0.0	2.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.00
VARIABLE																	5.00
TOTAL	2.50	12.50	10.00	10.00	37.50	0.0	0.0	2.50	7.50	0.0	0.0	2.50	2.50	2.50	2.50	2.50	100.00

CALM= 0.27 M/S

PERCENT DATA RECOVERY = 55.6

OVERALL STABILITY CLASS FREQUENCIES IN PERCENT

STABILITY:	A	B	C	D	E	F	G	ALL
FREQUENCY:	0.0	15.0	42.5	10.0	30.0	2.5	0.0	100.0

OVERALL WIND SPEED FREQUENCIES IN PERCENT

WIND SPEED (M/S):	CALM	CALM-.5	.5-.75	.75-1.0	1.0-1.5	1.5-2.0	2.0-3.0	3.0-5.0	5.0-10.0	>10.0	VARIABLE
FREQUENCY:	0.0	0.0	0.0	15.0	22.5	0.0	7.5	5.0	20.0	25.0	5.0
CUMULATIVE FREQ:	0.0	0.0	0.0	15.0	37.5	37.5	45.0	50.0	70.0	95.0	

PROGRAM: JFREQ VERSION: 3 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

LEVEL OF WIND DATA: 10.0 METERS DELTA T LAYER: 60.0- 10.0 METERS

DISTRIBUTION OF VARIABLE WINDS

U (M/S)	A	B	C	D	E	F	G	TOTAL
CALM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CALM-.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.5-.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
.75-1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0-1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.5-2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.0-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.0-5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.0-10.0	0.0	0.0	0.0	0.0	5.00	0.0	0.0	5.00
>10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.0	0.0	0.0	0.0	5.00	0.0	0.0	5.00

5.0 MISS

5.1 Description of Program

This program summarizes the periods of occurrence of missing hourly values of wind direction, wind speed, temperature, dew point, delta-T and precipitation for data in the NRC Standard Format.

5.2 Input Cards

Card	Column	Format	Variable	Description
1	1-72	18A4	TITLE	Title that will be printed at top of output.
2	1-6	3I2	JY, JM, JD	Starting year, month and day.
	7	1X		Blank.
	8-13	3I2	KY, KM, KD	Ending year, month and day.

5.3 Discussion of Output

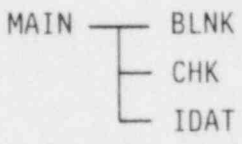
The program MISS summarizes the lengths of the missing periods, the number of occurrences of missing data, the total number of hours of missing data, the longest period of missing data, the total number of hours checked and the percent data recovery.

5.4 Implementation

Input Units
- 1 - data file of hourly metoerological data in the NRC Standard Format
- 5 - input cards 1 and 2

Output Units
- defaults to printer

5.5 Subroutine Flow Chart



5.6 Subroutine Descriptions

Except for MAIN, all subroutines are listed alphabetically.

MAIN

The main part of the program, reads in the data, makes all summaries and prints out the results.

BLNK

Checks for and converts blank data fields to 9999.9.

CHK

This routine categorizes the occurrence intervals of the missing data into periods of 1,2,3,4,5,6,7-11, 12-23, 24-47, 48-71, 72-95, 96-119 and greater then 119 hours.

IDAT

This routine converts a given month and day to an equivalent Julian day.

5.7 Sample Output

PROGRAM: MISS VERSION: 2 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 14, 1982

SITE:

TEST DATA

CONTAINS DATA FROM DECEMBER 1980 TO JANUARY 1891

HOURLY DATA CODED 0100 TO 2400

****

INPUT OPTIONS:

TITLE: SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

STARTING DATE: 80 12 30
ENDING DATE: 81 1 2

PROGRAM: MISS VERSION: 2 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 14, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

HOURLY SUMMARY OF MISSING DATA

PERIOD OF OCCURENCE (HOURS)	110.0 METERS				60.0 METERS				10.0 METERS				TEMPERATURE DIFFERENCE (DEGREES C/100METERS)			PRECIP (MM)
	WIND DIR (DEG)	WIND SPEED (M/S)	TEMP (C)	DEW POINT (C)	WIND DIR (DEG)	WIND SPEED (M/S)	TEMP (C)	DEW POINT (C)	WIND DIR (DEG)	WIND SPEED (M/S)	TEMP (C)	DEW POINT (C)	110.0-10.0	110.0-60.0	60.0-10.0	
1	1	3	3	0	2	4	0	0	1	7	0	3	9	2	2	8
2	1	0	0	0	1	0	3	0	0	3	0	0	0	2	2	0
3	1	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
7-11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24-47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48-71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72-95	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
96-119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LONGEST CASE	3	1	1	0	2	1	2	72	5	6	0	1	1	2	2	1
TOTAL HOURS MISSING	6	3	3	0	4	4	6	72	12	22	0	3	9	6	6	8
TOTAL HOURS	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72
PERCENT DATA RECOVERY	91.7	95.8	95.8	100.0	94.4	94.4	91.7	0.0	83.3	69.4	100.0	95.8	87.5	91.7	91.7	88.9

6.0 PRECP

6.1 Description of Program

This program will summarize precipitation data by occurrence, intensity, stability class and month and day.

6.2 Input Cards

Card	Column	Format	Variable	Description
1	1-72	18A4	TITLE	Title to be printed on output.
2	1	I1	IS	Delta-T interval for stability determination. IS=1: upper-lower IS=2: upper-intermediate IS=3: intermediate-lower
	2	1x		Blank
	3-8	3I2	LY1, LM1, LD1	Starting year, month and day
	9	1x		Blank
	10-15	3I2	LY2, LM2, LD2	Ending year, month and day

6.3 Discussion of Output

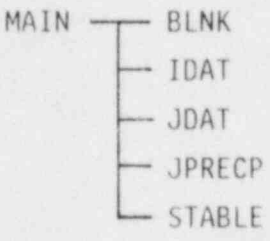
Three tables are printed out which summarize precipitation amounts by month and day, precipitation occurrences by intensity and month, and precipitation occurrences by stability and intensity. Also given is the percent data recovery for precipitation.

6.4 Implementation

Input Units
- 1 - data file of hourly meteorlogical data in the NRC Standard Format
- 5 - input cards 1 and 2

Output Units
- defaults to printer

6.5 Subroutine Flow Chart



6.6 Subroutine Descriptions

Except for MAIN, all subroutines are listed alphabetically.

MAIN

The main part of the program reads in the data, makes all summaries and prints out the results.

BLNK

Checks for and converts blank data fields to 9999.9.

IDAT

This routine converts a given month and day to an equivalenet Julian day.

JDAT

This routine converts a given Julian day to an equivalent month and day.

JPRECP

This routine categorizes hourly precipitation by intensity.

STABLE

This routine computes the stability class from atmospheric temperature gradient (delta-T) as follows.

Delta-T (°C/100m)	Category	Stability Class
$\Delta T \leq -1.9$	1	A
$-1.9 < \Delta T \leq -1.7$	2	B
$-1.7 < \Delta T \leq -1.5$	3	C
$-1.5 < \Delta T \leq -0.5$	4	D
$-0.5 < \Delta T \leq 1.5$	5	E
$1.5 < \Delta T \leq 4.0$	6	F
$4.0 < \Delta T$	7	G

6.7 Sample Output

PROGRAM: PRECP VERSION: 2 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 21, 1982

SITE:

TEST DATA

CONTAINS DATA FROM DECEMBER 1980 TO JANUARY 1891

HOURLY DATA CODED 0100 TO 2400

****

TITLE: SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

START DATE: 80 12 30
END DATE: 81 1 2

HOURS VALID PRECIPITATION: 64
TOTAL HOURS EXAMINED: 72
PERCENT DATA RECOVERY: 88.9

PROGRAM: PRECP VERSION: 2 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 21, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

PRECIPITATION SUMMARIZED BY MONTH AND DAY IN MILLIMETERS

	MONTH											
DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	46.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	162.0
TOTAL	47.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	164.8

TOTAL = 212.0 MM

PROGRAM: PRECP VERSION: 2 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 21, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

PRECIPITATION OCCURRENCES SUMMARIZED BY MONTH AND INTENSITY IN HOURS

INTENSITY (MM)	MONTH JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0.0	24	0	0	0	0	0	0	0	0	0	0	25
>0.0-.25	0	0	0	0	0	0	0	0	0	0	0	3
>.25-.50	0	0	0	0	0	0	0	0	0	0	0	2
>.50-.75	0	0	0	0	0	0	0	0	0	0	0	1
>.75-1.0	1	0	0	0	0	0	0	0	0	0	0	1
>1.0-2.0	2	0	0	0	0	0	0	0	0	0	0	0
>2.0-3.0	0	0	0	0	0	0	0	0	0	0	0	0
>3.0-4.0	0	0	0	0	0	0	0	0	0	0	0	0
>4.0-5.0	0	0	0	0	0	0	0	0	0	0	0	0
>5.0-7.5	0	0	0	0	0	0	0	0	0	0	0	0
>7.5-10.	0	0	0	0	0	0	0	0	0	0	0	0
>10.-15.	1	0	0	0	0	0	0	0	0	0	0	1
>15.-20.	0	0	0	0	0	0	0	0	0	0	0	0
>20.-25.	0	0	0	0	0	0	0	0	0	0	0	0
>25.-30.	0	0	0	0	0	0	0	0	0	0	0	0
>30.-40.	1	0	0	0	0	0	0	0	0	0	0	0
>40.	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL HRS	29	0	0	0	0	0	0	0	0	0	0	35
PERCENT	45.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.7

PROGRAM: PRECP VERSION: 2 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 21, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

DELTA-T INTERVAL: 60.0- 10.0 METERS

PRECIPITATION OCCURRENCES SUMMARIZED BY STABILITY AND INTENSITY IN HOURS

INTENSITY (MM)	STABILITY CLASS A	B	C	D	E	F	G	MISS	TOTAL	PERCENT	CUMULATIVE PERCENT
0.0	4	6	17	10	3	2	2	5	49	76.56	76.6
>0.0-.25	0	0	0	0	3	0	0	0	3	4.69	81.3
>.25-.50	0	0	0	2	0	0	0	0	2	3.13	84.4
>.50-.75	0	0	0	1	0	0	0	0	1	1.56	85.9
>.75-1.0	1	0	0	1	0	0	0	0	2	3.13	89.1
>1.0-2.0	0	0	0	0	2	0	0	0	2	3.13	92.2
>2.0-3.0	0	0	0	0	0	0	0	0	0	0.0	92.2
>3.0-4.0	0	0	0	0	0	0	0	0	0	0.0	92.2
>4.0-5.0	0	0	0	0	0	0	0	0	0	0.0	92.2
>5.0-7.5	0	0	0	0	0	0	0	0	0	0.0	92.2
>7.5-10.	0	0	0	0	0	0	0	0	0	0.0	92.2
>10.-15.	0	0	0	0	2	0	0	0	2	3.13	95.3
>15.-20.	0	0	0	0	0	0	0	0	0	0.0	95.3
>20.-25.	0	0	0	0	0	0	0	0	0	0.0	95.3
>25.-30.	0	0	0	0	0	0	0	0	0	0.0	95.3
>30.-40.	0	0	0	0	1	0	0	0	1	1.56	96.9
>40.	0	0	0	0	2	0	0	0	2	3.13	100.0
HRS WITH PRECIP	1	0	0	4	10	0	0	0	15	23.44	
PERCENT	6.67	0.0	0.0	26.67	66.67	0.0	0.0	0.0			
TOTAL HRS	5	6	17	14	13	2	2	5	64		
PERCENT	7.8	9.4	26.6	21.9	20.3	3.1	3.1	7.8			

7.0 PRINT

7.1 Description of Program

This program produces a listing of the following parameters from a data file in the NRC Standard Format: wind direction, wind speed, sigma theta, temperature, dew point, delta-T and precipitation.

7.2 Input Cards

Card	Column	Format	Variable	Description
1	1-72	18A4	TITLE	Title to be printed on each page.
2	1-6	I6	IS	Start date for printing data in order of year, month an day (3I2).
	7	IX		Blank.
	8-13	I6	IE	End date for printing data in order of year, month and day (3I2).

7.3 Discussion of Output

The data is printed with a title and header on each page. There are 53 data records per page printed across 132 columns with each record preceeded by the year, month, day and hour. The stability class (A, B,..., G) is also given for sigma theta and delta-T data.

Missing data are printed out as follows:

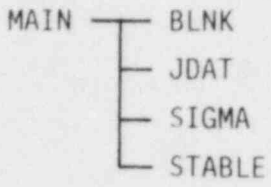
	Missing data	Blank data field
wind speed	99.9	-99.9
wind direction	999	-99
sigma theta	999.9	-99.9
temperature	999.9	-99.9
dew point	999.9	-99.9
delta-T	99.9	-99.9
precipitation	999.9	-99.9

7.4 Implementation

Input Units
- 1 - data file of hourly meteorological data in the NRC Standard Format
- 5 - input cards 1 and 2.

Output Units
- - defaults to printer

7.5 Subroutine Flow Chart



7.6 Subroutine Descriptions

Except for MAIN, all subroutines are listed alphabetically.

MAIN

The main part of the program reads in the data, calls all subroutines, and prints out the data.

BLNK

Checks for blank data fields and sets codes for missing data.

JDAT

This routine converts a given Julian day to an equivalent month and day.

SIGMA

This routine computes stability class from the horizontal deviation of wind direction (sigma theta) as follows.

Sigma theta (degrees)	Category	Stability Class
$22.5 \leq \sigma\theta$	1	A
$17.5 \leq \sigma\theta < 22.5$	2	B
$12.5 \leq \sigma\theta < 17.5$	3	C
$7.5 \leq \sigma\theta < 12.5$	4	D
$3.8 \leq \sigma\theta < 7.5$	5	E
$2.1 \leq \sigma\theta < 3.8$	6	F
$\sigma\theta < 2.1$	7	G

STABLE

This routine computes the stability class from atmospheric temperature gradient (delta-T) as follows.

Delta-T (°C/100m)	Category	Stability Class
$\Delta T \leq -1.9$	1	A
$-1.9 < \Delta T \leq -1.7$	2	B
$-1.7 < \Delta T \leq -1.5$	3	C
$-1.5 < \Delta T \leq -0.5$	4	D
$-0.5 < \Delta T \leq 1.5$	5	E
$1.5 < \Delta T \leq 4.0$	6	F
$4.0 < \Delta T$	7	G

7.7 Sample Output

PROGRAM: PRINT DATED: MARCH 1982 VERSION: 2 RUN DATE: THURSDAY MAY 13, 1982

SITE:

TEST DATA

CONTAINS DATA FROM DECEMBER 1980 TO JANUARY 1891

HOURLY DATA CODED 0100 TO 2400

****

TITLE: SAMPLE RUN - INPUT FILE = DATA1

DATES SPECIFIED TO BE PRINTED:
START DATE: 801230
END DATE: 810102

PROGRAM: PRINT DATED: MARCH 1982 VERSION: 2 RUN DATE: THURSDAY MAY 13, 1982

SAMPLE RUN - INPUT FILE = DATA1

				110.0 METERS					60.0 METERS					10.0 METERS					TEMPERATURE DIFFERENCE (DEGREES C/100METERS)			
YR	MN	DY	HR	WD (DEG)	WS (M/S)	SIGMA (DEG)	TEMP (C)	DEWPT (C)	WD (DEG)	WS (M/S)	SIGMA (DEG)	TEMP (C)	DEWPT (C)	WD (DEG)	WS (M/S)	SIGMA (DEG)	TEMP (C)	DEWPT (C)	110.0-10.0	110.0-60.0	60.0-10.0	PRECIP (MM)
80	12	30	12	180	1.0	5.5 E	20.0	15.0	175	1.0	7.5 D	21.0	999.9	170	1.0	10.0 D	25.0	15.0	2.0 F	1.0 E	1.0 E	0.1
80	12	30	13	200	5.0	1.0 G	21.0	17.0	180	2.0	5.0 E	21.0	999.9	90	10.0	15.0 C	25.0	12.0	1.0 E	0.5 E	0.3 E	0.2
80	12	30	14	220	7.0	5.0 E	20.0	18.0	20	5.0	5.0 E	21.0	999.9	90	20.0	20.0 B	26.0	10.0	0.2 E	0.1 E	0.1 E	0.1
80	12	30	15	220	10.0	1.0 G	20.0	15.0	15	10.0	1.0 G	24.0	999.9	90	20.0	25.0 A	27.5	12.0	-2.0 A	-1.0 D	-1.0 D	0.4
80	12	30	16	220	12.0	0.5 G	20.0	19.0	10	10.0	2.0 G	25.0	999.9	90	20.0	30.0 A	28.0	10.0	-2.5 A	-1.2 D	-1.2 D	0.5
80	12	30	17	300	18.0	1.0 G	20.0	21.0	5	12.0	1.9 G	26.0	999.9	90	20.0	35.0 A	30.0	12.0	-2.6 A	-1.3 D	-1.4 D	0.6
80	12	30	18	320	15.0	1.5 G	20.0	18.0	1	5.0	2.1 F	26.5	999.9	90	20.0	9.0 D	25.0	15.0	-2.7 A	-1.3 D	-1.4 D	0.9
80	12	30	19	330	16.0	1.6 G	20.0	19.0	0	0.5	2.2 F	25.5	999.9	90	20.0	5.0 E	24.0	24.0	-2.8 A	-1.4 D	-1.5 C	0.0
80	12	30	20	340	10.0	1.7 G	20.0	19.9	36	0.1	2.3 F	25.0	999.9	90	20.0	4.0 E	23.0	23.0	-2.9 A	-1.4 D	-1.5 C	0.0
80	12	30	21	350	9.0	1.8 G	20.0	20.0	0	0.2	2.4 F	23.0	999.9	80	10.0	3.0 F	22.0	21.0	-3.0 A	-1.5 C	-1.5 C	0.0
80	12	30	22	351	9.1	1.9 G	21.0	20.0	360	0.3	2.5 F	22.5	999.9	70	5.0	2.0 G	21.0	21.0	-3.1 A	-1.5 C	-1.6 C	0.0
80	12	30	23	352	9.2	1.0 G	22.0	20.0	359	0.4	2.6 F	22.0	999.9	60	2.5	1.0 G	20.0	19.0	-3.2 A	-1.6 C	-1.6 C	0.0
80	12	30	24	353	9.3	0.9 G	22.0	10.0	358	0.5	2.7 F	20.0	999.9	50	1.3	0.5 G	20.0	19.0	-3.3 A	-1.6 C	-1.6 C	0.0
80	12	31	1	354	9.4	0.8 G	21.0	10.0	357	0.6	2.8 F	20.0	999.9	40	1.2	0.3 G	20.0	19.0	-3.4 A	-1.7 B	-1.7 B	0.0
80	12	31	2	355	9.5	0.7 G	21.0	11.0	356	0.7	2.9 F	19.0	999.9	30	1.1	0.2 G	15.0	12.0	-3.5 A	-1.8 B	-1.7 B	0.0
80	12	31	3	356	9.6	0.6 G	20.0	13.0	355	0.8	3.0 F	18.0	999.9	20	1.0	0.1 G	14.0	14.0	-3.6 A	-2.0 A	-1.6 C	0.0
80	12	31	4	357	9.7	0.5 G	999.9	12.0	354	0.9	0.1 G	17.0	999.9	20	99.9	0.0 G	14.0	15.0	-3.7 A	-2.1 A	-1.9 A	0.0
80	12	31	5	358	9.8	0.4 G	20.0	11.0	353	1.0	3.1 F	16.0	999.9	21	99.9	0.5 G	13.0	999.9	99.9 -	-2.0 A	-2.5 A	0.0
80	12	31	6	359	9.9	0.9 G	19.0	11.0	352	1.1	3.2 F	15.0	999.9	999	10.0	1.1 G	19.0	18.0	-2.2 A	-1.1 D	-1.2 D	999.9
80	12	31	7	360	10.0	1.0 G	12.0	11.0	350	1.2	3.3 F	14.0	999.9	999	5.0	1.5 G	20.0	19.0	-1.0 D	-1.0 D	-1.0 D	0.0
80	12	31	8	1	11.0	1.1 G	13.0	12.0	350	1.4	3.4 F	999.9	999.9	999	99.9	999.9 -	20.0	19.5	-1.0 D	-0.5 D	-0.5 D	0.0
80	12	31	9	1	11.0	1.1 G	12.0	11.0	340	13.0	3.5 F	999.9	999.9	10	10.0	1.4 G	21.0	20.0	-0.4 E	-0.2 E	-0.2 E	0.0
80	12	31	10	2	12.0	10.0 D	14.0	11.0	300	16.5	3.6 F	20.0	999.9	90	9.0	15.0 B	22.0	22.0	-0.1 E	-0.1 E	0.0 E	999.9
80	12	31	11	30	13.0	12.5 C	14.5	14.0	180	21.0	3.7 F	20.5	999.9	90	99.9	19.5 B	21.0	20.0	0.0 E	0.1 E	0.1 E	12.0
80	12	31	12	180	1.0	5.5 E	20.0	15.0	175	1.0	7.5 D	21.0	999.9	170	1.0	10.0 D	25.0	15.0	2.0 F	1.0 E	1.0 E	50.0
80	12	31	13	200	5.0	1.0 G	21.0	17.0	180	2.0	5.0 E	21.0	999.9	20	10.0	15.0 C	25.0	12.0	1.0 E	0.5 E	0.3 E	100.0
80	12	31	14	999	7.0	999.9 -	20.0	18.0	20	40.0	5.0 E	21.0	999.9	90	99.9	20.0 B	26.0	10.0	0.2 E	0.1 E	0.1 E	0.0
80	12	31	15	999	10.0	999.9 -	20.0	15.0	70	10.0	1.0 G	24.0	999.9	90	99.9	25.0 A	27.5	12.0	-2.0 A	-1.0 D	-1.0 D	0.0
80	12	31	16	220	12.0	999.9 -	20.0	19.0	100	10.0	2.0 G	25.0	999.9	90	99.9	30.0 A	28.0	10.0	-2.5 A	-1.2 D	-1.2 D	0.0
80	12	31	17	999	18.0	999.9 -	20.0	21.0	5110.0		1.9 G	26.0	999.9	110	99.9	35.0 A	30.0	12.0	99.9 -	-1.3 D	-1.4 D	0.0
80	12	31	18	999	15.0	999.9 -	20.0	18.0	130	5.0	2.1 F	26.5	999.9	130	99.9	9.0 D	25.0	15.0	-2.7 A	99.9 -	-1.4 D	0.0
80	12	31	19	999	16.0	999.9 -	20.0	19.0	150	0.5	2.2 F	25.5	999.9	90	99.9	5.0 E	24.0	24.0	-2.8 A	-1.4 D	99.9 -	0.0
80	12	31	20	340	10.0	1.7 G	20.0	19.9	36	0.1	2.3 F	25.0	999.9	180	20.0	4.0 E	23.0	23.0	99.9 -	99.9 -	-1.5 C	0.0
80	12	31	21	350	9.0	1.8 G	20.0	20.0	0	0.2	2.4 F	23.0	999.9	200	10.0	3.0 F	22.0	21.0	-3.0 A	99.9 -	99.9 -	0.0
80	12	31	22	351	9.1	1.9 G	21.0	20.0	360	0.3	2.5 F	22.5	999.9	220	5.0	2.0 G	21.0	21.0	99.9 -	-1.5 C	99.9 -	0.0
80	12	31	23	352	9.2	1.0 G	22.0	20.0	359	0.4	2.6 F	22.0	999.9	250	2.5	1.0 G	20.0	19.0	-3.2 A	1.4 E	-1.6 C	0.0
80	12	31	24	353	9.3	0.9 G	22.0	10.0	358	0.5	2.7 F	20.0	999.9	260	1.3	0.5 G	20.0	19.0	-3.3 A	1.5 E	1.6 F	0.0
81	1	1	1	354	9.4	0.8 G	21.0	10.0	357	0.6	2.8 F	20.0	999.9	290	1.2	0.3 G	20.0	19.0	-3.4 A	-1.7 B	-1.7 B	0.0
81	1	1	2	355	9.5	0.7 G	21.0	11.0	999	99.9	999.9 -	19.0	999.9	310	1.1	0.2 G	15.0	12.0	-3.5 A	-1.8 B	-1.7 B	0.0
81	1	1	3	356	9.6	0.6 G	20.0	13.0	999	0.8	3.0 F	18.0	999.9	20	1.0	0.1 G	14.0	14.0	-3.6 A	-2.0 A	-1.6 C	0.0
81	1	1	4	357	9.7	0.5 G	999.9	12.0	354	99.9	0.1 G	17.0	999.9	20	99.9	0.0 G	14.0	15.0	5.0 G	4.1 G	3.9 F	0.0
81	1	1	5	358	9.8	0.4 G	20.0	11.0	353	1.0	3.1 F	16.0	999.9	21	99.9	0.5 G	13.0	999.9	99.9 -	4.8 G	7.5 G	0.0
81	1	1	6	359	99.9	0.9 G	19.0	11.0	352	99.9	3.2 F	15.0	999.9	999	99.9	1.1 G	19.0	18.0	-2.2 A	-1.1 D	-1.2 D	999.9
81	1	1	7	360	10.0	1.0 G	12.0	11.0	350	1.2	3.3 F	14.0	999.9	999	5.0	1.5 G	20.0	19.0	-1.0 D	-1.0 D	-1.0 D	0.0
81	1	1	8	999	11.0	1.1 G	13.0	12.0	999	1.4	3.4 F	999.9	999.9	999	99.9	999.9 -	20.0	19.5	-1.0 D	-0.5 D	-5.0 A	0.0
81	1	1	9	1	11.0	1.1 G	12.0	11.0	340	13.0	3.5 F	999.9	999.9	10	10.0	1.4 G	21.0	20.0	-0.4 E	-0.2 E	45.0 G	0.0
81	1	1	10	2	12.0	10.0 D	14.0	11.0	300	16.5	3.6 F	20.0	999.9	90	9.0	18.0 B	22.0	22.0	-0.1 E	-0.1 E	0.0 E	999.9
81	1	1	11	30	13.0	12.5 C	14.5	14.0	180	24.0	3.7 F	20.5	999.9	90	99.9	19.5 B	21.0	20.0	0.0 E	0.1 E	0.1 E	1.2
81	1	1	12	180	1.0	5.5 E	20.0	15.0	175	1.0	7.5 D	21.0	999.9	150	1.0	10.0 D	25.0	15.0	2.0 F	1.0 E	1.0 E	2.0
81	1	1	13	200	5.0	1.0 G	21.0	17.0	180	2.0	5.0 E	21.0	999.9	90	10.0	15.0 C	25.0	12.0	1.0 E	0.5 E	0.3 E	11.0
81	1	1	14	220	7.0	5.0 E	20.0	18.0	999	5.0	5.0 E	21.0	999.9	90	99.9	20.0 B	26.0	10.0	99.9 -	0.1 E	0.1 E	32.0
81	1	1	15	220	99.9	1.0 G	20.0	15.0	15	10.0	1.0 G	24.0	999.9	90	99.9	25.0 A	27.5	12.0	-2.0 A	99.9 -	-1.0 D	0.0

PROGRAM: PRINT DATED: MARCH 1982 VERSION: 2 RUN DATE: THURSDAY MAY 13, 1982

SAMPLE RUN - INPUT FILE = DATA1

				110.0 METERS					60.0 METERS					10.0 METERS					TEMPERATURE DIFFERENCE (DEGREES C/100METERS)			
YR	MN	DY	HR	WD (DEG)	WS (M/S)	SIGMA (DEG)	TEMP (C)	DEWPT (C)	WD (DEG)	WS (M/S)	SIGMA (DEG)	TEMP (C)	DEWPT (C)	WD (DEG)	WS (M/S)	SIGMA (DEG)	TEMP (C)	DEWPT (C)	110.0-10.0	110.0-60.0	60.0-10.0	PRECIP (MM)
81	1	1	16	220	12.0	0.5 G	20.0	19.0	10	10.0	2.0 G	25.0	999.9	-90	20.0	30.0 A	28.0	10.0	-2.5 A	-1.2 D	-1.2 D	0.0
81	1	1	17	300	18.0	1.0 G	20.0	21.0	5	12.0	1.9 G	26.0	999.9	30	-20.0	35.0 A	30.0	12.0	99.9 -	99.9 -	99.9 -	0.0
81	1	1	18	320	15.0	-99.9 -	20.0	18.0	1	5.0	2.1 F	26.5	999.9	90	20.0	-9.0 G	25.0	15.0	-2.7 A	99.9 -	99.9 -	-99.9
81	1	1	19	330	16.0	1.6 G	20.0	19.0	0	0.5	2.2 F	25.5	999.9	90	20.0	5.0 E	24.0	24.0	-2.8 A	-1.4 D	-1.5 C	0.0
81	1	1	20	340	10.0	1.7 G	20.0	19.9	36	0.1	2.3 F	25.0	999.9	90	20.0	4.0 E	23.0	23.0	-2.9 A	-1.4 D	-1.5 C	0.0
81	1	1	21	350	9.0	1.8 G	20.0	20.0	0	0.2	2.4 F	23.0	999.9	80	10.0	3.0 F	22.0	21.0	-3.0 A	-1.5 C	-1.5 C	0.0
81	1	1	22	351	-99.9	1.9 G	21.0	20.0	360	0.3	2.5 F	22.5	999.9	70	5.0	2.0 G	21.0	21.0	-99.9 -	-1.5 C	-1.6 C	0.0
81	1	1	23	352	9.2	1.0 G	22.0	20.0	359	0.4	2.6 F	22.0	999.9	60	2.5	1.0 G	20.0	19.0	-3.2 A	-1.6 C	-1.6 C	0.0
81	1	1	24	353	9.3	0.9 G	22.0	10.0	358	0.5	2.7 F	20.0	999.9	50	1.3	0.5 G	20.0	19.0	-3.3 A	-1.6 C	-1.6 C	0.0
81	1	2	1	354	9.4	0.8 G	21.0	10.0	357	0.6	2.8 F	20.0	999.9	40	1.2	0.3 G	20.0	19.0	-3.4 A	-1.7 B	-1.7 B	0.0
81	1	2	2	355	9.5	0.7 G	21.0	11.0	356	0.7	2.9 F	19.0	999.9	30	1.1	0.2 G	15.0	12.0	-3.5 A	-1.8 B	-1.7 B	0.0
81	1	2	3	356	9.6	0.6 G	20.0	13.0	355	0.8	3.0 F	18.0	999.9	328	1.0	0.1 G	14.0	14.0	-3.6 A	-2.0 A	-1.6 C	0.0
81	1	2	4	357	9.7	0.5 G	999.9	12.0	354	0.9	0.1 G	17.0	999.9	20	99.9	0.0 G	14.0	15.0	-3.7 A	-2.1 A	-1.9 A	-99.9
81	1	2	5	358	9.8	0.4 G	20.0	11.0	353	1.0	3.1 F	16.0	999.9	21	99.9	0.5 G	13.0	999.9	99.9 -	-2.0 A	-2.5 A	0.0
81	1	2	6	359	9.9	0.9 G	19.0	11.0	352	1.1	3.2 F	15.0	999.9	999	10.0	1.1 G	19.0	18.0	-2.2 A	-1.1 D	-1.2 D	999.9
81	1	2	7	360	10.0	1.0 G	12.0	11.0	350	1.2	3.3 F	14.0	999.9	999	5.0	1.5 G	20.0	19.0	-1.0 D	-1.0 D	-1.0 D	0.0
81	1	2	8	1	11.0	1.1 G	13.0	12.0	350	1.4	3.4 F	999.9	999.9	999	99.9	999.9 -	20.0	19.5	-1.0 D	-2.0 A	5.0 G	0.0
81	1	2	9	1	11.0	1.1 G	12.0	11.0	340	13.0	3.5 F	999.9	999.9	8888	10.0	1.4 G	21.0	20.0	-0.4 E	-0.2 E	-0.2 E	0.0
81	1	2	10	2	12.0	10.0 D	14.0	11.0	300	16.5	3.6 F	20.0	999.9	8888	9.0	18.0 B	22.0	22.0	-0.1 E	-0.1 E	0.0 E	999.9
81	1	2	11	30	13.0	12.5 C	14.5	14.0	180	21.0	3.7 F	20.5	999.9	90	99.9	19.5 B	21.0	20.0	0.0 E	0.1 E	-2.0 A	1.0

PROGRAM: PRINT DATED: MARCH 1982 VERSION: 2 RUN DATE: THURSDAY MAY 13, 1982

SITE:
TEST DATA

CONTAINS DATA FROM DECEMBER 1980 TO JANUARY 1981

BAD DATA DATES INSERTED TO CHECK PROGRAM DATE

HOURLY DATA CODED 0100 TO 2400

TITLE: SAMPLE RUN - INPUT FILE = DATA2

DATES SPECIFIED TO BE PRINTED:
START DATE: 0
END DATE: 999999

PROGRAM: PRINT DATED: MARCH 1982 VERSION: 2 RUN DATE: THURSDAY MAY 13, 1982

SAMPLE RUN - INPUT FILE = DATA2

				110.0 METERS					60.0 METERS					10.0 METERS					TEMPERATURE DIFFERENCE (DEGREES C/100METERS)			
YR	MN	DY	HR	WD (DEG)	WS (M/S)	SIGMA (DEG)	TEMP (C)	DEWPT (C)	WD (DEG)	WS (M/S)	SIGMA (DEG)	TEMP (C)	DEWPT (C)	WD (DEG)	WS (M/S)	SIGMA (DEG)	TEMP (C)	DEWPT (C)	110.0-10.0	110.0-60.0	60.0-10.0	PRECIP (MM)
80	12	30	12	180	1.0	5.5 E	20.0	15.0	175	1.0	7.5 D	21.0	999.9	170	1.0	10.0 D	25.0	15.0	2.0 F	1.0 E	1.0 E	0.1
80	12	30	13	200	5.0	1.0 G	21.0	17.0	180	2.0	5.0 E	21.0	999.9	90	10.0	15.0 C	25.0	12.0	1.0 E	0.5 E	0.3 E	0.2
80	12	30	14	220	7.0	5.0 E	20.0	18.0	20	5.0	5.0 E	21.0	999.9	90	20.0	20.0 B	26.0	10.0	0.2 E	0.1 E	0.1 E	0.1
80	12	30	15	220	10.0	1.0 G	20.0	15.0	15	10.0	1.0 G	24.0	999.9	90	20.0	25.0 A	27.5	12.0	-2.0 A	-1.0 D	-1.0 D	0.4
0	1	0	0	220	12.0	0.5 G	20.0	19.0	10	10.0	2.0 G	25.0	999.9	90	20.0	30.0 A	28.0	10.0	-2.5 A	-1.2 D	-1.2 D	0.5
80	12	30	17	300	18.0	1.0 G	20.0	21.0	5	12.0	1.9 G	26.0	999.9	90	20.0	35.0 A	30.0	12.0	-2.6 A	-1.3 D	-1.4 D	0.6
80	12	30	18	320	15.0	1.5 G	20.0	18.0	1	5.0	2.1 F	26.5	999.9	90	20.0	9.0 D	25.0	15.0	-2.7 A	-1.3 D	-1.4 D	0.9
80	12	30	19	330	16.0	1.6 G	20.0	19.0	0	0.5	2.2 F	25.5	999.9	90	20.0	5.0 E	24.0	24.0	-2.8 A	-1.4 D	-1.5 C	0.0
80	12	30	20	340	10.0	1.7 G	20.0	19.9	36	0.1	2.3 F	25.0	999.9	90	20.0	4.0 E	23.0	23.0	-2.9 A	-1.4 D	-1.5 C	0.0
80	12	10	11	350	9.0	1.8 G	20.0	20.0	0	0.2	2.4 F	23.0	999.9	80	10.0	3.0 F	22.0	21.0	-3.0 A	-1.5 C	-1.5 C	0.0
80	12	30	22	351	9.1	1.9 G	21.0	20.0	360	0.3	2.5 F	22.5	999.9	70	5.0	2.0 G	21.0	21.0	-3.1 A	-1.5 C	-1.6 C	0.0
80	12	30	23	352	9.2	1.0 G	22.0	20.0	359	0.4	2.6 F	22.0	999.9	60	2.5	1.0 G	20.0	19.0	-3.2 A	-1.6 C	-1.6 C	0.0
80	12	30	24	353	9.3	0.9 G	22.0	10.0	358	0.5	2.7 F	20.0	999.9	50	1.3	0.5 G	20.0	19.0	-3.3 A	-1.6 C	-1.6 C	0.0
80	12	31	1	354	9.4	0.8 G	21.0	10.0	357	0.6	2.8 F	20.0	999.9	40	1.2	0.3 G	20.0	19.0	-3.4 A	-1.7 B	-1.7 B	0.0
82	12	32	2	355	9.5	0.7 G	21.0	11.0	356	0.7	2.9 F	19.0	999.9	30	1.1	0.2 G	15.0	12.0	-3.5 A	-1.8 B	-1.7 B	0.0
80	12	31	3	356	9.6	0.6 G	20.0	13.0	355	0.8	3.0 F	18.0	999.9	20	1.0	0.1 G	14.0	14.0	-3.6 A	-2.0 A	-1.6 C	0.0
80	12	31	4	357	9.7	0.5 G	999.9	12.0	354	0.9	0.1 G	17.0	999.9	20	99.9	0.0 G	14.0	15.0	-3.7 A	-2.1 A	-1.9 A	0.0
80	12	31	5	358	9.8	0.4 G	20.0	11.0	353	1.0	3.1 F	16.0	999.9	21	99.9	0.5 G	13.0	999.9	99.9 -	-2.0 A	-2.5 A	0.0
80	12	31	6	359	9.9	0.9 G	19.0	11.0	352	1.1	3.2 F	15.0	999.9	999	10.0	1.1 G	19.0	18.0	-2.2 A	-1.1 D	-1.2 D	999.9
80	12	31	7	360	10.0	1.0 G	12.0	11.0	350	1.2	3.3 F	14.0	999.9	999	5.0	1.5 G	20.0	19.0	-1.0 D	-1.0 D	-1.0 D	0.0
80	12	31	8	1	11.0	1.1 G	13.0	12.0	350	1.4	3.4 F	999.9	999.9	999	99.9	999.9 -	20.0	19.5	-1.0 D	-0.5 D	-0.5 D	0.0
80	12	31	9	1	11.0	1.1 G	12.0	11.0	340	13.0	3.5 F	999.9	999.9	10	10.0	1.4 G	21.0	20.0	-0.4 E	-0.2 E	-0.2 E	0.0
80	12	31	10	2	12.0	10.0 D	14.0	11.0	300	16.5	3.6 F	20.0	999.9	90	9.0	18.0 B	22.0	22.0	-0.1 E	-0.1 E	0.0 E	999.9
80	12	31	11	30	13.0	12.5 C	14.5	14.0	180	21.0	3.7 F	20.5	999.9	90	99.9	19.5 B	21.0	20.0	0.0 E	0.1 E	0.1 E	12.0
80	12	31	11	180	1.0	5.5 E	20.0	15.0	175	1.0	7.5 D	21.0	999.9	170	1.0	10.0 D	25.0	15.0	2.0 F	1.0 E	1.0 E	50.0
80	12	31	13	200	5.0	1.0 G	21.0	17.0	180	2.0	5.0 E	21.0	999.9	20	10.0	15.0 C	25.0	12.0	1.0 E	0.5 E	0.3 E	100.0
80	12	31	14	999	7.0	999.9 -	20.0	18.0	20	40.0	5.0 E	21.0	999.9	90	99.9	20.0 B	26.0	10.0	0.2 E	0.1 E	0.1 E	0.0
80	12	31	15	999	10.0	999.9 -	20.0	15.0	70	10.0	1.0 G	24.0	999.9	90	99.9	25.0 A	27.5	12.0	-2.0 A	-1.0 D	-1.0 D	0.0
80	12	31	16	220	12.0	999.9 -	20.0	19.0	100	10.0	2.0 G	25.0	999.9	90	99.9	30.0 A	28.0	10.0	-2.5 A	-1.2 D	-1.2 D	0.0
80	12	31	17	999	18.0	999.9 -	20.0	21.0	5	110.0	1.9 G	26.0	999.9	110	99.9	35.0 A	30.0	12.0	99.9 -	-1.3 D	-1.4 D	0.0
80	12	31	18	999	15.0	999.9 -	20.0	18.0	130	5.0	2.1 F	26.5	999.9	130	99.9	9.0 D	25.0	15.0	-2.7 A	99.9 -	-1.4 D	0.0
80	12	31	19	999	16.0	999.9 -	20.0	19.0	150	0.5	2.2 F	25.5	999.9	90	99.9	5.0 E	24.0	24.0	-2.8 A	-1.4 D	99.9 -	0.0
80	12	31	20	340	10.0	1.7 G	20.0	19.9	36	0.1	2.3 F	25.0	999.9	180	20.0	4.0 E	23.0	23.0	99.9 -	99.9 -	-1.5 C	0.0
80	12	31	21	350	9.0	1.8 G	20.0	20.0	0	0.2	2.4 F	23.0	999.9	200	10.0	3.0 F	22.0	21.0	-3.0 A	99.9 -	99.9 -	0.0
80	12	31	22	351	9.1	1.9 G	21.0	20.0	360	0.3	2.5 F	22.5	999.9	220	5.0	2.0 G	21.0	21.0	99.9 -	-1.5 C	99.9 -	0.0
80	12	31	23	352	9.2	1.0 G	22.0	20.0	359	0.4	2.6 F	22.0	999.9	250	2.5	1.0 G	20.0	19.0	-3.2 A	1.4 E	-1.6 C	0.0
80	12	31	24	353	9.3	0.9 G	22.0	10.0	358	0.5	2.7 F	20.0	999.9	260	1.3	0.5 G	20.0	19.0	-3.3 A	1.5 E	1.6 F	0.0
81	1	1	1	354	9.4	0.8 G	21.0	10.0	357	0.6	2.8 F	20.0	999.9	290	1.2	0.3 G	20.0	19.0	-3.4 A	-1.7 B	-1.7 B	0.0
81	1	4	2	355	9.5	0.7 G	21.0	11.0	999	99.9	999.9 -	19.0	999.9	310	1.1	0.2 G	15.0	12.0	-3.5 A	-1.8 B	-1.7 B	0.0
81	1	1	3	356	9.6	0.6 G	20.0	13.0	999	0.8	3.0 F	18.0	999.9	20	1.0	0.1 G	14.0	14.0	-3.6 A	-2.0 A	-1.6 C	0.0
81	1	1	4	357	9.7	0.5 G	999.9	12.0	354	99.9	0.1 G	17.0	999.9	20	99.9	0.0 G	14.0	15.0	5.0 G	4.1 G	3.9 F	0.0
81	1	1	5	358	9.8	0.4 G	20.0	11.0	353	1.0	3.1 F	16.0	999.9	21	99.9	0.5 G	13.0	999.9	99.9 -	4.8 G	7.5 G	0.0
81	1	1	6	359	99.9	0.9 G	19.0	11.0	352	99.9	3.2 F	15.0	999.9	999	99.9	1.1 G	19.0	18.0	-2.2 A	-1.1 D	-1.2 D	999.9
81	1	1	7	360	10.0	1.0 G	12.0	11.0	350	1.2	3.3 F	14.0	999.9	999	5.0	1.5 G	20.0	19.0	-1.0 D	-1.0 D	-1.0 D	0.0
81	1	1	8	999	11.0	1.1 G	13.0	12.0	999	1.4	3.4 F	999.9	999.9	999	99.9	999.9 -	20.0	19.5	-1.0 D	-0.5 D	-5.0 A	0.0
81	1	1	9	1	11.0	1.1 G	12.0	11.0	340	13.0	3.5 F	999.9	999.9	10	10.0	1.4 G	21.0	20.0	-0.4 E	-0.2 E	45.0 G	0.0
81	1	1	10	2	12.0	10.0 D	14.0	11.0	300	16.5	3.6 F	20.0	999.9	90	9.0	18.0 B	22.0	22.0	-0.1 E	-0.1 E	0.0 E	999.9
81	1	1	11	30	13.0	12.5 C	14.5	14.0	180	24.0	3.7 F	20.5	999.9	90	99.9	19.5 B	21.0	20.0	0.0 E	0.1 E	0.1 E	1.2
81	1	1	12	180	1.0	5.5 E	20.0	15.0	175	1.0	7.5 D	21.0	999.9	150	1.0	10.0 D	25.0	15.0	2.0 F	1.0 E	1.0 E	2.0
81	1	1	13	200	5.0	1.0 G	21.0	17.0	180	2.0	5.0 E	21.0	999.9	90	10.0	15.0 C	25.0	12.0	1.0 E	0.5 E	0.3 E	11.0
81	1	1	14	220	7.0	5.0 E	20.0	18.0	999	5.0	5.0 E	21.0	999.9	90	99.9	20.0 B	26.0	10.0	99.9 -	0.1 E	0.1 E	32.0
81	1	1	15	220	99.9	1.0 G	20.0	15.0	15	10.0	1.0 G	24.0	999.9	90	99.9	25.0 A	27.5	12.0	-2.0 A	99.9 -	-1.0 D	0.0

PROGRAM: PRINT DATED: MARCH 1982 VERSION: 2 RUN DATE: THURSDAY MAY 13, 1982

SAMPLE RUN - INPUT FILE = DATA2

				110.0 METERS					60.0 METERS					10.0 METERS					TEMPERATURE DIFFERENCE (DEGREES C/100METERS)			
YR	MN	DY	HR	WD (DEG)	WS (M/S)	SIGMA (DEG)	TEMP (C)	DEWPT (C)	WD (DEG)	WS (M/S)	SIGMA (DEG)	TEMP (C)	DEWPT (C)	WD (DEG)	WS (M/S)	SIGMA (DEG)	TEMP (C)	DEWPT (C)	110.0-10.0	110.0-60.0	60.0-10.0	PRECIP (MM)
81	1	1	16	220	12.0	0.5 G	20.0	19.0	10	10.0	2.0 G	25.0	999.9	-90	20.0	30.0 A	28.0	10.0	-2.5 A	-1.2 D	-1.2 D	0.0
81	1	1	17	300	15.0	1.0 G	20.0	21.0	5	12.0	1.9 G	26.0	999.9	90	-20.0	35.0 A	30.0	12.0	99.9 -	99.9 -	99.9 -	0.0
81	1	1	18	320	15.0	-99.9 -	20.0	18.0	1	5.0	2.1 F	26.5	999.9	90	20.0	-9.0 C	25.0	15.0	-2.7 A	99.9 -	99.9 -	-99.9
81	1	1	19	330	16.0	1.6 G	20.0	19.0	0	0.5	2.2 F	25.5	999.9	90	20.0	5.0 E	24.0	24.0	-2.8 A	-1.4 D	-1.5 C	0.0
99	12665	99	340	10.0	1.7 G	20.0	19.9	36	0.1	2.3 F	25.0	999.9	90	20.0	4.0 E	23.0	23.0	-2.9 A	-1.4 D	-1.5 C	0.0	
81	1	1	21	350	9.0	1.8 G	20.0	20.0	0	0.2	2.4 F	23.0	999.9	80	10.0	3.0 F	22.0	21.0	-3.0 A	-1.5 C	-1.5 C	0.0
81	1	1	22	351	-99.9	1.9 G	21.0	20.0	360	0.3	2.5 F	22.5	999.9	70	5.0	2.0 G	21.0	21.0	-99.9 -	-1.5 C	-1.6 C	0.0
81	1	1	23	352	9.2	1.0 G	22.0	20.0	359	0.4	2.6 F	22.0	999.9	60	2.5	1.0 G	20.0	19.0	-3.2 A	-1.6 C	-1.6 C	0.0
81	1	1	24	353	9.3	0.9 G	22.0	10.0	358	0.5	2.7 F	20.0	999.9	50	1.3	0.5 G	20.0	19.0	-3.3 A	-1.6 C	-1.6 C	0.0
81	1	2	1	354	9.4	0.8 G	21.0	10.0	357	0.6	2.8 F	20.0	999.9	40	1.2	0.3 G	20.0	19.0	-3.4 A	-1.7 B	-1.7 B	0.0
81	1	2	2	355	9.5	0.7 G	21.0	11.0	356	0.7	2.9 F	19.0	999.9	30	1.1	0.2 G	15.0	12.0	-3.5 A	-1.8 B	-1.7 B	0.0
81	1	2	3	356	9.6	0.6 G	20.0	13.0	355	0.8	3.0 F	18.0	999.9	328	1.0	0.1 G	14.0	14.0	-3.6 A	-2.0 A	-1.6 C	0.0
81	1	2	8	357	9.7	0.5 G	999.9	12.0	354	0.9	0.1 G	17.0	999.9	20	99.9	0.0 G	14.0	15.0	-3.7 A	-2.1 A	-1.9 A	-99.9
81	1	2	5	358	9.8	0.4 G	20.0	11.0	353	1.0	3.1 F	16.0	999.9	21	99.9	0.5 G	13.0	999.9	99.9 -	-2.0 A	-2.5 A	0.0
81	1	2	6	359	9.9	0.9 G	19.0	11.0	352	1.1	3.2 F	15.0	999.9	999	10.0	1.1 G	19.0	18.0	-2.2 A	-1.1 D	-1.2 D	999.9
81	1	2	7	360	10.0	1.0 G	12.0	11.0	350	1.2	3.3 F	14.0	999.9	999	5.0	1.5 G	20.0	19.0	-1.0 D	-1.0 D	-1.0 D	0.0
81	1	2	8	1	11.0	1.1 G	13.0	12.0	350	1.4	3.4 F	999.9	999.9	999	99.9	999.9 -	20.0	19.5	-1.0 D	-2.0 A	5.0 G	0.0
81	1	2	9	1	11.0	1.1 G	12.0	11.0	340	13.0	3.5 F	999.9	999.9	8888	10.0	1.4 G	21.0	20.0	-0.4 E	-0.2 E	-0.2 E	0.0
81	1	2	10	2	12.0	10.0 D	14.0	11.0	300	16.5	3.6 F	20.0	999.9	8888	9.0	16.0 B	22.0	22.0	-0.1 E	-0.1 E	0.0 E	999.9
81	1	2	11	30	13.0	12.5 C	14.5	14.0	130	21.0	3.7 F	20.5	999.9	90	99.9	19.5 B	21.0	20.0	0.0 E	0.1 E	-2.0 A	1.0

8.0 QA

8.1 Description of Program

This is a quality assurance program for checking hourly meteorological data in the NRC Standard Format. Meteorological variables that can be checked are; wind speed, wind direction, temperature, dew point, temperature gradient and precipitation. Data are read and checked one hour at a time with the date, time and a description of the problem printed out if any questionable occurrences are found.

8.2 Input Cards

Card	Column	Format	Variable	Descriptions
1	1	I1	LEV	Specifies the level(s) of data to be checked. LEV=1: upper LEV=2: upper and lower LEV=3: upper, intermediate and lower LEV=4: lower
	2	I1	IS	Specifies which delta-T intervals are to be checked. IS=0: NONE IS=1: U-L IS=2: U-I IS=3: I-L IS=4: U-L and U-I IS=5: U-L and I-L IS=6: U-I and I-L IS=7: U-L, U-I and I-L where U=upper I=intermediate and L=lower
	3	I1	IW	Check wind speed and direction IW=1: check IW=0: do not check
	4	I1	IT	Check temperature IT=1: check IT=0: do not check
	5	I1	ID	Check dew point ID=1: check ID=0: do not check IF ID=1, IT must equal 1

Card	Column	Format	Variable	Description
1	6	I1	IP	Check precipitation IP=1: check IP=0: do not check
	7	1X		Blank
	8-13	3I2	LY1, LM1, LD1	Year, month and day checking is to begin
	14	1X		Blank
	15-20	3I2	LY2, LM2, LD2	Year, month and day checking is to end
2	1-72	18A4	TITLE(18)	Title to be printed on each page of the output

8.3 Discussion of Output

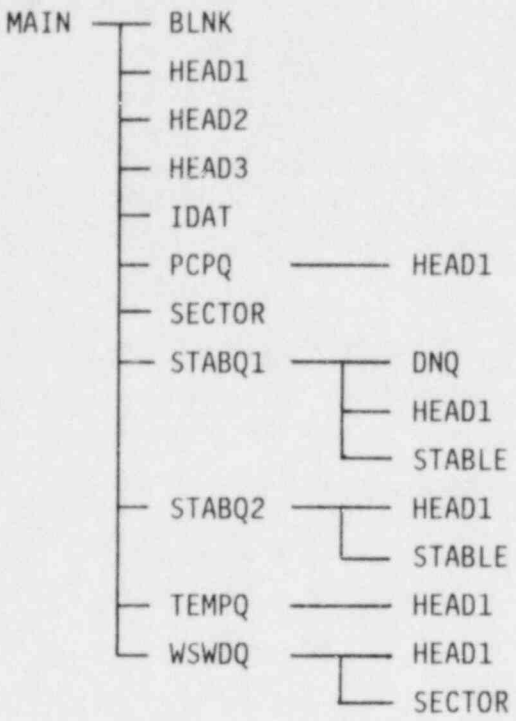
Whenever the program flags a potential error in the data, a description of the problem along with the data and time of occurrence is printed out. For errors that have persisted for an extended period of time, the last hour of that time period will be the time printed. The occurrence of valid data will cause any checking of an error over an extended time period to end. At the end of the printed output, the summaries from checking the wind speed and direction data will be printed. Also printed will be the maximum and minimum values for all levels of wind speed and direction, temeprature, dew point, delta-T and precipitation, and the number of hours they were based on. When all checking of data and printing has been completed, a statement indicating successful completion will be printed.

8.4 Implementation

Input Units
- 1 - data file of hourly meteorological data
- 5 - input cards 1 and 2

Output Units
- defaults to printer

8.5 Subroutine Flow Chart



8.6 Subroutine Descriptions

Except for MAIN, all subroutines are listed alphabetically.

MAIN

The main program initializes all data, reads the input cards, prints out the input information, reads and writes the title from the data file, reads the data from the data file and calls the appropriate subroutines for checking the data.

BLNK

Checks for and converts blank data fields to 9999.9.

DNQ

This routine checks for F or G stability during the day and A, B, or C stability at night for IS=1. Day is defined as:

December	24 -	March	22 (Winter);	hours 8-17
March	23 -	June	21 (Spring);	hours 7-18
June	22 -	September	20 (Summer);	hours 6-19
September	21 -	December	23 (Fall);	hours 7-18

All other hours are defined as night.

HEAD1

This routine prints a header, page number and title at the top of each page of the output.

HEAD2

This routine prints out the input parameters that were specified.

HEAD3

This routine prints out the summarizations of the wind speed and wind direction data compiled in subroutine WSWDQ. HEAD3 is called only after the last data record has been checked.

IDAT

This routine converts a specified month and day to an equivalent Julian day.

PCPQ

This routine checks precipitation data as follows for IP=1.

- Checks for precipitation occurring greater than 8 consecutive hours.
- Checks for 1 hour of precipitation greater than or equal to 25mm (1 inch).

SECTOR

This routine distributes the wind direction data into 16 sectors centered on the principle compass points using the following equation.

SECTOR = 1+[(DIR+11.25)/22.5]

if SECTOR = 17, change to SECTOR = 1

where SECTOR = direction sector wind is blowing from
(SECTOR should be truncated to nearest whole number)
DIR = direction wind is blowing from (degrees)

Variable wind directions are treated as missing data.

STABLE

This routine computes the stability class from atmospheric temperature gradient (delta-T) as follows.

Delta-T (°C/100m)	Category	Stability Class
$\Delta T \leq -1.9$	1	A
$-1.9 < \Delta T \leq -1.7$	2	B
$-1.7 < \Delta T \leq -1.5$	3	C
$-1.5 < \Delta T \leq -0.5$	4	D
$-0.5 < \Delta T \leq 1.5$	5	E
$1.5 < \Delta T \leq 4.0$	6	F
$4.0 < \Delta T$	7	G

STABQ1

This routine makes the following three checks on the stability measurements for IS=1.

- Checks for the wind speed at any of the levels specified to be greater than 7.5 m/sec during unstable (A,B,C) or stable (F,G) conditions.

- Checks for delta-T less than -3.4°C/100 meters (autoconvective lapse rate).

- Checks for unstable (A,B,C) or stable (F,G) conditions during precipitation.

STABQ2

This routine makes the following stability checks for IS=1.

- Checks for a greater than 3 stability class jump for two consecutive hours.

- Checks for the same stability class for 12 or more consecutive hours.

- Checks for a greater than 2 stability class difference between two temperature gradient intervals for the same hour.

TEMPQ

This routine checks both temperature and dew point at all specified levels for IT=1. The checks that are made are as follows.

- The same temperature for 8 or more consecutive hours.

- Dew point greater than temperature if ID=1.

- Temperature minus dew point greater than 5°C during precipitation if ID=1.

- Temperature equal to dew point for 8 or more consecutive hours if ID=1.

WSWDQ

This subroutine makes the following checks on wind direction and wind speed for IW=1.

For each level:

- Checks for wind speed greater than 25 m/sec.

- Checks for wind direction from the same sector for more than 8 consecutive hours.

If more then one level is to checked:

- Totals up the cases where the wind direction is the same at any two levels.

- Totals up the cases where the wind speed is the same at any two levels.

- Totals up the cases where the wind speed is greater than 2.5, 5.0 and 7.5 m/sec at either of two levels while the wind direction between the two levels is greater than 22.5 degrees.

- Checks for the wind speed at the lower of any two levels to be greater than the wind speed at the upper of any two levels.

8.7 Sample Output

PROGRAM: QA VERSION: 2 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 14, 1982 PAGE: 1

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

CHECK FOLLOWING LEVEL(S) OF DATA:
LOWER
INTERMEDIATE
UPPER

CHECK FOLLOWING DELTA-T INTERVALS:
INTERMEDIATE MINUS LOWER
UPPER MINUS INTERMEDIATE
UPPER MINUS LOWER

CHECK WIND SPEED AND DIRECTION: YES

CHECK TEMPERATURE: YES

CHECK DEW POINT: YES

CHECK PRECIPITATION: YES

CHECK DATA: BEGINING - 80 12 30
ENDING - 81 1 2

SITE:

TEST DATA

52 ----------

CONTAINS DATA FROM DECEMBER 1980 TO JANUARY 1891

HOURLY DATA CODED 0100 TO 2400

****

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

```
 YR  DAY  HOUR
 80  365  1200   HEIGHT=  10.0M   TEMPERATURE GREATER THEN DEW POINT BY  10.0 DEGREES C DURING PRECIPITATION OF   0.1 MM
 80  365  1200   PRECIPITATION OCCURED DURING STABILITY CLASS   F  BETWEEN 110.0M AND  10.0M
 80  365  1200   STABILITY CLASS   F  DURING DAY BETWEEN 110.0M AND  10.0M
 80  365  1300   HEIGHT=  10.0M   TEMPERATURE GREATER THEN DEW POINT BY  13.0 DEGREES C DURING PRECIPITATION OF   0.2 MM
 80  365  1400   HEIGHT=  10.0M   TEMPERATURE GREATER THEN DEW POINT BY  16.0 DEGREES C DURING PRECIPITATION OF   0.1 MM
 80  365  1500   HEIGHT=  10.0M   TEMPERATURE GREATER THEN DEW POINT BY  15.5 DEGREES C DURING PRECIPITATION OF   0.4 MM
 80  365  1500   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  1500   PRECIPITATION OCCURED DURING STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  1500   STABILITY CLASS JUMPED FROM   E  TO   A OVER ONE HOUR PERIOD BETWEEN 110.0M AND  10.0M
 80  365  1500   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80  365  1500   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80  365  1600   HEIGHT=  10.0M   TEMPERATURE GREATER THEN DEW POINT BY  18.0 DEGREES C DURING PRECIPITATION OF   0.5 MM
 80  365  1600   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  1600   PRECIPITATION OCCURED DURING STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  1600   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80  365  1600   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80  365  1700   HEIGHT=  10.0M   TEMPERATURE GREATER THEN DEW POINT BY  18.0 DEGREES C DURING PRECIPITATION OF   0.6 MM
 80  365  1700   HEIGHT= 110.0M    DEW POINT (  21.0 ) IS GREATER THEN TEMPERATURE (  20.0 )
 80  365  1700   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  1700   PRECIPITATION OCCURED DURING STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  1700   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80  365  1700   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80  365  1800   HEIGHT=  10.0M   TEMPERATURE GREATER THEN DEW POINT BY  10.0 DEGREES C DURING PRECIPITATION OF   0.9 MM
 80  365  1800   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  1800   PRECIPITATION OCCURED DURING STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  1800   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80  365  1800   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80  365  1800   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80  365  1900   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  1900   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80  365  1900   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN  60.0M AND  10.0M
 80  365  1900   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80  365  1900   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80  365  2000   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  2000   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80  365  2000   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN  60.0M AND  10.0M
 80  365  2000   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80  365  2000   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80  365  2100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  2100   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80  365  2100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN 110.0M AND  60.0M
 80  365  2100   STABILITY CLASS   C  DURING NIGHT BETWEEN 110.0M AND  60.0M
 80  365  2100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN  60.0M AND  10.0M
 80  365  2100   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80  365  2100   HEIGHT=  10.0M     WIND FROM SECTOR   E FOR PREVIOUS   9 HOUR PERIOD
 80  365  2100   HEIGHT= 110.0M   TEMPERATURE=  20.0DEGREES C FOR PREVIOUS    8 HOUR PERIOD
 80  365  2200   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  2200   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80  365  2200   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN 110.0M AND  60.0M
 80  365  2200   STABILITY CLASS   C  DURING NIGHT BETWEEN 110.0M AND  60.0M
 80  365  2200   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80  365  2300   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  2300   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80  365  2300   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN 110.0M AND  60.0M
```

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

```
 YR  DAY  HOUR
 80  365  2300   STABILITY CLASS   C  DURING NIGHT BETWEEN 110.0M AND  60.0M
 80  365  2300   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80  365  2400   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  365  2400   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80  365  2400   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN 110.0M AND  60.0M
 80  365  2400   STABILITY CLASS   C  DURING NIGHT BETWEEN 110.0M AND  60.0M
 80  365  2400   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80  366   100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  366   100   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80  366   100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   B  BETWEEN 110.0M AND  60.0M
 80  366   100   STABILITY CLASS   B  DURING NIGHT BETWEEN 110.0M AND  60.0M
 80  366   100   STABILITY CLASS   B  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80  366   200   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  366   200   LAPSE RATE OF   -3.5 DEGREES C/100METERS EXCEEDS THE AUTOCONVECTIVE LAPSE RATE
 80  366   200   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80  366   200   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   B  BETWEEN 110.0M AND  60.0M
 80  366   200   STABILITY CLASS   B  DURING NIGHT BETWEEN 110.0M AND  60.0M
 80  366   200   STABILITY CLASS   B  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80  366   300   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  366   300   LAPSE RATE OF   -3.6 DEGREES C/100METERS EXCEEDS THE AUTOCONVECTIVE LAPSE RATE
 80  366   300   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80  366   300   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  60.0M
 80  366   300   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  60.0M
 80  366   300   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80  366   400   HEIGHT=  10.0M    DEW POINT (  15.0 ) IS GREATER THEN TEMPERATURE (  14.0 )
 80  366   400   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  366   400   LAPSE RATE OF   -3.7 DEGREES C/100METERS EXCEEDS THE AUTOCONVECTIVE LAPSE RATE
 80  366   400   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80  366   400   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  60.0M
 80  366   400   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  60.0M
 80  366   400   STABILITY CLASS   A  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80  366   500   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  60.0M
 80  366   500   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  60.0M
 80  366   500   STABILITY CLASS   A  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80  366   600   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  366   600   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80  366   600   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80  366   600   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80  366   800   HEIGHT=  60.0M    WIND FROM SECTOR   N FOR PREVIOUS  12 HOUR PERIOD
 80  366  1000   HEIGHT= 110.0M    WIND FROM SECTOR   N FOR PREVIOUS  14 HOUR PERIOD
 80  366  1200   HEIGHT=  10.0M   TEMPERATURE GREATER THEN DEW POINT BY  10.0 DEGREES C DURING PRECIPITATION OF  50.0 MM
 80  366  1200   PRECIPITATION OF   50.0MM FELL IN THE GIVEN 1 HOUR PERIOD
 80  366  1200   PRECIPITATION OCCURED DURING STABILITY CLASS   F  BETWEEN 110.0M AND  10.0M
 80  366  1200   STABILITY CLASS   F  DURING DAY BETWEEN 110.0M AND  10.0M
 80  366  1300   HEIGHT=  10.0M   TEMPERATURE GREATER THEN DEW POINT BY  13.0 DEGREES C DURING PRECIPITATION OF 100.0 MM
 80  366  1300   PRECIPITATION OF  100.0MM FELL IN THE GIVEN 1 HOUR PERIOD
 80  366  1400   HEIGHT=  60.0M    WIND SPEED OF  40.0M/SEC OCCURRED
 80  366  1500   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  366  1500   STABILITY CLASS JUMPED FROM   E  TO   A OVER ONE HOUR PERIOD BETWEEN 110.0M AND  10.0M
 80  366  1500   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80  366  1500   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80  366  1600   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80  366  1600   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80  366  1600   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
```

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

```
 YR DAY HOUR
 80 366 1700   HEIGHT= 110.0M    DEW POINT (  21.0 ) IS GREATER THEN TEMPERATURE (  20.0 )
 80 366 1700   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80 366 1700   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80 366 1800   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80 366 1800   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80 366 1800   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80 366 1800   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80 366 1900   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80 366 1900   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80 366 1900   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80 366 1900   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80 366 2000   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN  60.0M AND  10.0M
 80 366 2000   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80 366 2000   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80 366 2000   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80 366 2100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80 366 2100   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80 366 2100   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80 366 2100   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80 366 2100   HEIGHT= 110.0M   TEMPERATURE=  20.0DEGREES C FOR PREVIOUS    8 HOUR PERIOD
 80 366 2200   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN 110.0M AND  60.0M
 80 366 2200   STABILITY CLASS   C  DURING NIGHT BETWEEN 110.0M AND  60.0M
 80 366 2200   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80 366 2200   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 80 366 2300   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80 366 2300   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80 366 2300   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 80 366 2300   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 80 366 2300   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   E
 80 366 2400   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 80 366 2400   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 80 366 2400   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   F
 80 366 2400   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   E
 81   1  100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 81   1  100   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 81   1  100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   B  BETWEEN 110.0M AND  60.0M
 81   1  100   STABILITY CLASS   B  DURING NIGHT BETWEEN 110.0M AND  60.0M
 81   1  100   STABILITY CLASS   B  DURING NIGHT BETWEEN  60.0M AND  10.0M
 81   1  100   STABILITY CLASS JUMPED FROM   F  TO   B OVER ONE HOUR PERIOD BETWEEN  60.0M AND  10.0M
 81   1  200   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 81   1  200   LAPSE RATE OF   -3.5 DEGREES C/100METERS EXCEEDS THE AUTOCONVECTIVE LAPSE RATE
 81   1  200   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 81   1  200   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   B  BETWEEN 110.0M AND  60.0M
 81   1  200   STABILITY CLASS   B  DURING NIGHT BETWEEN 110.0M AND  60.0M
 81   1  200   STABILITY CLASS   B  DURING NIGHT BETWEEN  60.0M AND  10.0M
 81   1  300   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 81   1  300   LAPSE RATE OF   -3.6 DEGREES C/100METERS EXCEEDS THE AUTOCONVECTIVE LAPSE RATE
 81   1  300   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 81   1  300   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  60.0M
 81   1  300   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  60.0M
 81   1  300   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 81   1  400   HEIGHT=  10.0M    DEW POINT (  15.0 ) IS GREATER THEN TEMPERATURE (  14.0 )
 81   1  400   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   G  BETWEEN 110.0M AND  10.0M
 81   1  400   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   G  BETWEEN 110.0M AND  60.0M
```

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

```
 YR  DAY  HOUR
 81    1   400   STABILITY CLASS JUMPED FROM   A  TO   G OVER ONE HOUR PERIOD BETWEEN 110.0M AND  10.0M
 81    1   400   STABILITY CLASS JUMPED FROM   A  TO   G OVER ONE HOUR PERIOD BETWEEN 110.0M AND  60.0M
 81    1   500   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   G  BETWEEN 110.0M AND  60.0M
 81    1   600   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 81    1   600   STABILITY FOR 110.0M MINUS  10.0M IS   G WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 81    1   600   STABILITY FOR 110.0M MINUS  10.0M IS   G WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 81    1   700   HEIGHT= 110.0M     WIND FROM SECTOR   N FOR PREVIOUS  11 HOUR PERIOD
 81    1   800   LAPSE RATE OF   -5.0 DEGREES C/100METERS EXCEEDS THE AUTOCONVECTIVE LAPSE RATE
 81    1   800   STABILITY FOR 110.0M MINUS  10.0M IS   D WHILE STABILITY FOR  60.0M MINUS  10.0M IS   A
 81    1   800   STABILITY FOR 110.0M MINUS  60.0M IS   D WHILE STABILITY FOR  60.0M MINUS  10.0M IS   A
 81    1   900   STABILITY FOR 110.0M MINUS  10.0M IS   E WHILE STABILITY FOR  60.0M MINUS  10.0M IS   A
 81    1   900   STABILITY FOR 110.0M MINUS  60.0M IS   E WHILE STABILITY FOR  60.0M MINUS  10.0M IS   A
 81    1  1000   STABILITY FOR 110.0M MINUS  10.0M IS   E WHILE STABILITY FOR  60.0M MINUS  10.0M IS   A
 81    1  1000   STABILITY FOR 110.0M MINUS  60.0M IS   E WHILE STABILITY FOR  60.0M MINUS  10.0M IS   A
 81    1  1200   HEIGHT=  10.0M   TEMPERATURE GREATER THEN DEW POINT BY  10.0 DEGREES C DURING PRECIPITATION OF   2.0 MM
 81    1  1200   PRECIPITATION OCCURED DURING STABILITY CLASS   F  BETWEEN 110.0M AND  10.0M
 81    1  1200   STABILITY CLASS   F  DURING DAY BETWEEN 110.0M AND  10.0M
 81    1  1300   HEIGHT=  10.0M   TEMPERATURE GREATER THEN DEW POINT BY  13.0 DEGREES C DURING PRECIPITATION OF  11.0 MM
 81    1  1400   HEIGHT=  10.0M   TEMPERATURE GREATER THEN DEW POINT BY  16.0 DEGREES C DURING PRECIPITATION OF  32.0 MM
 81    1  1400   PRECIPITATION OF   32.0MM FELL IN THE GIVEN 1 HOUR PERIOD
 81    1  1600   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 81    1  1600   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 81    1  1600   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   E
 81    1  1700   HEIGHT= 110.0M    DEW POINT (  21.0 ) IS GREATER THEN TEMPERATURE (  20.0 )
 81    1  1700   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 81    1  1700   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   E
 81    1  1800   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 81    1  1800   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 81    1  1800   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 81    1  1800   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   E
 81    1  1900   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 81    1  1900   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 81    1  1900   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN  60.0M AND  10.0M
 81    1  1900   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 81    1  1900   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
 81    1  1900   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   E
 81    1  2000   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 81    1  2000   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 81    1  2000   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN  60.0M AND  10.0M
 81    1  2000   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 81    1  2000   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
 81    1  2100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 81    1  2100   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 81    1  2100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN 110.0M AND  60.0M
 81    1  2100   STABILITY CLASS   C  DURING NIGHT BETWEEN 110.0M AND  60.0M
 81    1  2100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN  60.0M AND  10.0M
 81    1  2100   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 81    1  2100   HEIGHT= 110.0M   TEMPERATURE=  20.0DEGREES C FOR PREVIOUS    8 HOUR PERIOD
 81    1  2200   STABILITY CLASS   C  DURING NIGHT BETWEEN 110.0M AND  60.0M
 81    1  2200   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
 81    1  2300   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
 81    1  2300   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
 81    1  2300   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN 110.0M AND  60.0M
 81    1  2300   STABILITY CLASS   C  DURING NIGHT BETWEEN 110.0M AND  60.0M
```

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

```
YR DAY HOUR
81   1 2300   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
81   1 2400   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
81   1 2400   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
81   1 2400   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   C  BETWEEN 110.0M AND  60.0M
81   1 2400   STABILITY CLASS   C  DURING NIGHT BETWEEN 110.0M AND  60.0M
81   1 2400   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
81   2  100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
81   2  100   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
81   2  100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   B  BETWEEN 110.0M AND  60.0M
81   2  100   STABILITY CLASS   B  DURING NIGHT BETWEEN 110.0M AND  60.0M
81   2  100   STABILITY CLASS   B  DURING NIGHT BETWEEN  60.0M AND  10.0M
81   2  200   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
81   2  200   LAPSE RATE OF   -3.5 DEGREES C/100METERS EXCEEDS THE AUTOCONVECTIVE LAPSE RATE
81   2  200   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
81   2  200   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   B  BETWEEN 110.0M AND  60.0M
81   2  200   STABILITY CLASS   B  DURING NIGHT BETWEEN 110.0M AND  60.0M
81   2  200   STABILITY CLASS   B  DURING NIGHT BETWEEN  60.0M AND  10.0M
81   2  300   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
81   2  300   LAPSE RATE OF   -3.6 DEGREES C/100METERS EXCEEDS THE AUTOCONVECTIVE LAPSE RATE
81   2  300   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
81   2  300   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  60.0M
81   2  300   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  60.0M
81   2  300   STABILITY CLASS   C  DURING NIGHT BETWEEN  60.0M AND  10.0M
81   2  400   HEIGHT=  60.0M    DEW POINT (  15.0 ) IS GREATER THEN TEMPERATURE (  14.0 )
81   2  400   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
81   2  400   LAPSE RATE OF   -3.7 DEGREES C/100METERS EXCEEDS THE AUTOCONVECTIVE LAPSE RATE
81   2  400   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
81   2  400   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  60.0M
81   2  400   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  60.0M
81   2  400   STABILITY CLASS   A  DURING NIGHT BETWEEN  60.0M AND  10.0M
81   2  500   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  60.0M
81   2  500   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  60.0M
81   2  500   STABILITY CLASS   A  DURING NIGHT BETWEEN  60.0M AND  10.0M
81   2  600   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  10.0M
81   2  600   STABILITY CLASS   A  DURING NIGHT BETWEEN 110.0M AND  10.0M
81   2  600   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   D
81   2  600   STABILITY FOR 110.0M MINUS  10.0M IS   A WHILE STABILITY FOR 110.0M MINUS  60.0M IS   D
81   2  800   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN 110.0M AND  60.0M
81   2  800   STABILITY CLASS   G  DURING DAY BETWEEN  60.0M AND  10.0M
81   2  800   STABILITY FOR 110.0M MINUS  10.0M IS   D WHILE STABILITY FOR  60.0M MINUS  10.0M IS   G
81   2  800   STABILITY FOR 110.0M MINUS  60.0M IS   A WHILE STABILITY FOR  60.0M MINUS  10.0M IS   G
81   2  800   STABILITY FOR 110.0M MINUS  10.0M IS   D WHILE STABILITY FOR 110.0M MINUS  60.0M IS   A
81   2  800   HEIGHT=  60.0M     WIND FROM SECTOR   N FOR PREVIOUS  12 HOUR PERIOD
81   2  900   STABILITY CLASS JUMPED FROM   A  TO   E OVER ONE HOUR PERIOD BETWEEN 110.0M AND  60.0M
81   2 1000   HEIGHT= 110.0M     WIND FROM SECTOR   N FOR PREVIOUS  14 HOUR PERIOD
81   2 1100   WIND SPEED GREATER THEN 7.5M/SEC FOR STABILITY CLASS   A  BETWEEN  60.0M AND  10.0M
81   2 1100   PRECIPITATION OCCURED DURING STABILITY CLASS   A  BETWEEN  60.0M AND  10.0M
81   2 1100   STABILITY CLASS JUMPED FROM   E  TO   A OVER ONE HOUR PERIOD BETWEEN  60.0M AND  10.0M
81   2 1100   STABILITY FOR 110.0M MINUS  10.0M IS   E WHILE STABILITY FOR  60.0M MINUS  10.0M IS   A
81   2 1100   STABILITY FOR 110.0M MINUS  60.0M IS   E WHILE STABILITY FOR  60.0M MINUS  10.0M IS   A
```

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

NUMBER OF OCCURRANCES OF WS AT 110.0M LOWER THEN THE WS AT 60.0M EQUALS 10

NUMBER OF OCCURRANCES OF WS AT 60.0M LOWER THEN THE WS AT 10.0M EQUALS 40

NUMBER OF OCCURRANCES OF WS AT 110.0M LOWER THEN THE WS AT 10.0M EQUALS 20

NUMBER OF OCCURRANCES OF WD AT 110.0M EQUAL TO WD AT 60.0M EQUALS 0

NUMBER OF OCCURRANCES OF WD AT 60.0M EQUAL TO WD AT 10.0M EQUALS 1

NUMBER OF OCCURRANCES OF WD AT 110.0M EQUAL TO WD AT 10.0M EQUALS 0

NUMBER OF OCCURRANCES OF WS AT 110.0M EQUAL TO WS AT 60.0M EQUALS 5

NUMBER OF OCCURRANCES OF WS AT 60.0M EQUAL TO WS AT 10.0M EQUALS 3

NUMBER OF OCCURRANCES OF WS AT 110.0M EQUAL TO WS AT 10.0M EQUALS 3

WD DIFFERENCE BETWEEN 110.0M AND 60.0M IS GREATER THEN OR EQUAL TO 22.5 DEGREES AND
WS AT EITHER LEVEL IS GREATER THEN OR EQUAL TO 2.5M/SEC OCCURRANCES= 29
WS AT EITHER LEVEL IS GREATER THEN OR EQUAL TO 5.0M/SEC OCCURRANCES= 29
WS AT EITHER LEVEL IS GREATER THEN OR EQUAL TO 7.5M/SEC OCCURRANCES= 28

WD DIFFERENCE BETWEEN 60.0M AND 10.0M IS GREATER THEN OR EQUAL TO 22.5 DEGREES AND
WS AT EITHER LEVEL IS GREATER THEN OR EQUAL TO 2.5M/SEC OCCURRANCES= 33
WS AT EITHER LEVEL IS GREATER THEN OR EQUAL TO 5.0M/SEC OCCURRANCES= 30
WS AT EITHER LEVEL IS GREATER THEN OR EQUAL TO 7.5M/SEC OCCURRANCES= 27

WD DIFFERENCE BETWEEN 110.0M AND 10.0M IS GREATER THEN OR EQUAL TO 22.5 DEGREES AND
WS AT EITHER LEVEL IS GREATER THEN OR EQUAL TO 2.5M/SEC OCCURRANCES= 49
WS AT EITHER LEVEL IS GREATER THEN OR EQUAL TO 5.0M/SEC OCCURRANCES= 49
WS AT EITHER LEVEL IS GREATER THEN OR EQUAL TO 7.5M/SEC OCCURRANCES= 47

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

SUMMARY OF MAXIMUM AND MINIMUN VALUES

	110.0 M			60.0 M			10.0 M		
	HRS	MIN	MAX	HRS	MIN	MAX	HRS	MIN	MAX
WIND DIRECTION (DEG)	66	1.0	360.0	68	0.0	360.0	60	10.0	328.0
WIND SPEED (M/S)	69	1.0	18.0	68	0.1	40.0	50	1.0	20.0
TEMPERATURE (DEG C)	69	12.0	22.0	66	14.0	26.5	72	13.0	30.0
MOISTURE (DEG C OR %)	72	10.0	21.0	0	999.9	-99.9	69	10.0	24.0

	110.0 - 10.0 M			110.0 - 60.0 M			60.0 - 10.0 M		
DELTA T (DEG C/100M)	63	-3.7	5.0	66	-2.1	4.8	66	-5.0	7.5

	GROUND LEVEL		
PRECIPITATION (MM)	64	0.0	100.0

9.0 STABQ

9.1 Description of Program

STABQ reads hourly values of temperature gradient (delta-T) or sigma theta from a data set in the NRC Standard Format and summarizes the data according to stability class and continuous periods of occurrence.

5.2 Input Cards

Card	Column	Format	Variable	Description
1	1-72	10A4	TITLE	Title that will be printed at top of each page of output.
2	1	I1	IS	Stability criteria: IS=1, Delta-T IS=2, Sigma Theta
	2-8	1x,3I2	JY, JM, JD	Starting year, month and day
	9-15	1x, 3I2	KY, KM, KD	Ending year, month and day

9.3 Discussion of Output

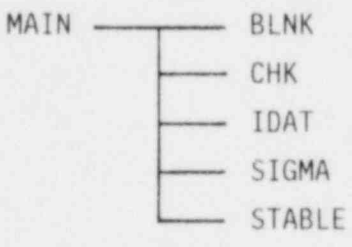
Three tables are printed; one for each of the possible stability levels available from the three measurement levels. Stability data is summarized by periods of occurrence with the longest single period of occurrence also given. If a missing data value is encoutnered, the period of occurrence will end.

9.4 Implementation

Input Units
- 1 - data file of hourly meteorological data in the NRC Standard Format
- 5 - input cards 1 and 2

Output Unit
- defaults to printer

9.5 Subroutine Flow Chart



9.6 Subroutine Descriptions

Except for MAIN all subroutines are listed alphabetically.

MAIN

The main part of the program reads in the data, makes all summaries and prints out the results.

BLNK

Checks for and converts blank data fields to 9999.9.

CHK

This routine categorizes the occurrence intervals of the stabilities into periods of 1,2,3,4,5,6,7-11, 12-23, 24-47, 48-71, 72-95, 96-119 and greater than 119 hours.

IDAT

This routine converts a specified month and day to an equivalent Julian day.

SIGMA

This routine computes stability class from the horizontal deviation of wind direction (sigma theta) as follows.

Sigma theta (degrees)	Category	Stability Class
$22.5 \leq \sigma\theta$	1	A
$17.5 \leq \sigma\theta < 22.5$	2	B
$12.5 \leq \sigma\theta < 17.5$	3	C
$7.5 \leq \sigma\theta < 12.5$	4	D
$3.8 \leq \sigma\theta < 7.5$	5	E
$2.1 \leq \sigma\theta < 3.8$	6	F
$\sigma\theta < 2.1$	7	G

STABLE

This routine computes the stability class from atmospheric temperature gradient (delta-T) as follows.

Delta-T (°C/100m)	Category	Stability Class
$\Delta T \leq -1.9$	1	A
$-1.9 < \Delta T \leq -1.7$	2	B
$-1.7 < \Delta T \leq -1.5$	3	C
$-1.5 < \Delta T \leq -0.5$	4	D
$-0.5 < \Delta T \leq 1.5$	5	E
$1.5 < \Delta T \leq 4.0$	6	F
$4.0 < \Delta T$	7	G

9.7 Sample Output

PROGRAM: STABQ VERSION: 2 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

TEST DATA

CONTAINS DATA FROM DECEMBER 1980 TO JANUARY 1891

HOURLY DATA CODED 0100 TO 2400

****

INPUT OPTIONS:

TITLE: SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

COMPUTE STABILITY BASED ON: DELTA-T

START DATE: 80 12 30
END DATE: 81 1 2

PROGRAM: STABQ VERSION: 2 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

STABILITY BASED ON DELTA-T BETWEEN 110.0- 10.0 METERS

NUMBER OF OCCURENCES

PERIOD OF OCCURENCE (HOURS)	STABILITY A	B	C	D	E	F	G
1	4	0	0	0	1	3	1
2	3	0	0	3	2	0	0
3	0	0	0	0	3	0	0
4	1	0	0	0	0	0	0
5	1	0	0	0	0	0	0
6	1	0	0	0	0	0	0
7-11	0	0	0	0	0	0	0
12-23	1	0	0	0	0	0	0
24-47	0	0	0	0	0	0	0
48-71	0	0	0	0	0	0	0
72-95	0	0	0	0	0	0	0
96-119	0	0	0	0	0	0	0
>120	0	0	0	0	0	0	0
LONGEST CASE	14	0	0	2	3	1	1

PROGRAM: STABQ VERSION: 2 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

STABILITY BASED ON DELTA-T BETWEEN 110.0- 60.0 METERS

NUMBER OF OCCURENCES

PERIOD OF OCCURENCE (HOURS)	STABILITY A	B	C	D	E	F	G
1	2	0	1	2	0	0	0
2	0	3	0	2	1	0	1
3	2	0	0	3	2	0	0
4	0	0	2	0	0	0	0
5	0	0	0	0	0	0	0
6	0	0	0	1	2	0	0
7-11	0	0	0	0	0	0	0
12-23	0	0	0	0	0	0	0
24-47	0	0	0	0	0	0	0
48-71	0	0	0	0	0	0	0
72-95	0	0	0	0	0	0	0
96-119	0	0	0	0	0	0	0
>120	0	0	0	0	0	0	0
LONGEST CASE	3	2	4	6	6	0	2

PROGRAM: STABQ VERSION: 2 DATED: FEBRUARY 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

STABILITY BASED ON DELTA-T BETWEEN 60.0- 10.0 METERS

NUMBER OF OCCURENCES

PERIOD OF OCCURENCE (HOURS)	STABILITY A	B	C	D	E	F	G
1	2	0	5	0	0	2	2
2	2	3	0	3	1	0	0
3	0	0	0	1	1	0	0
4	0	0	0	2	0	0	0
5	0	0	0	0	1	0	0
6	0	0	2	0	1	0	0
7-11	0	0	0	0	0	0	0
12-23	0	0	0	0	0	0	0
24-47	0	0	0	0	0	0	0
48-71	0	0	0	0	0	0	0
72-95	0	0	0	0	0	0	0
96-119	0	0	0	0	0	0	0
>120	0	0	0	0	0	0	0
LONGEST CASE	2	2	6	4	6	1	1

10.0 TDP

10.1 Description of Program

This program determines the average, minimum and maximum values of temperature, dew point, wind speed and wet bulb from hourly data in the NRC Standard Format. The average value for wind speed is the root-mean-square wind speed and wet bulb is calculated from temperature, dew point and barometric pressure.

10.2 Input Cards

Card	Column	Format	Variable	Description
1	1-72	18A4	TITLE	Title to be printed at the top of each page of the output.
2	1-10	F10.0	PBAR	Barometric pressure (inches of Mercury)
3	1-6	3I2	LY1, LM1, LD1	Start date (year, month and day)
	7	1x		Blank
	8-13	3I2	LY2, LM2, LD2	End date (year, month and day)

10.3 Discussion of Output

Printed output from TDP contains both monthly and annual summaries for all three possible levels in the NRC Standard Format. If a level has no available data, then the output will indicate all missing data. Also printed out are the number of valid data values that were used to determine each of the results.

Wet bulb temperature is calculated from temperature, dew point and the barometric pressure inputted on Card 2. If dew point is greater than temperature for a given hour, the dew point value is assumed to be invalid and not used.

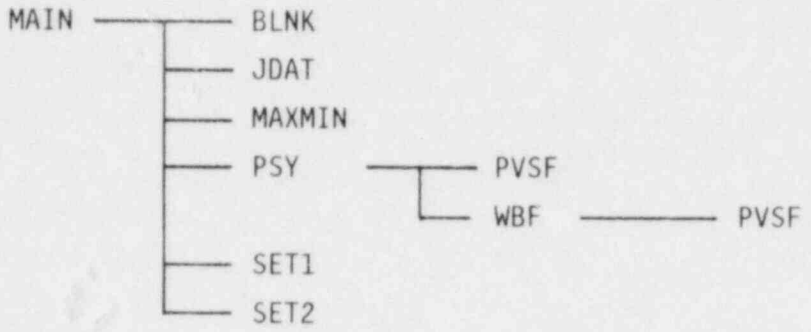
Dew point is read from the field labeled "moisture" in the NRC Standard Format. In the event that dew point is not located there, the format of the read statement will have to be modified so that dew point will be read. Similarly if wet bulb were already available, the program would have to be modified not calculate it, but use it directly.

10.4 Implementation

Input Units
- 1 - data file of hourly meterological data in the NRC Standard Format
- 5 - input cards 1, 2, and 3

Output Units
- defaults to printer

10.5 Subroutine Flow Chart



10.6 Subroutine Descriptions

Except for MAIN all subroutines are listed alphabetically.

MAIN

The main part of the program reads in all data, makes all summarizations and prints out the results.

BLNK

Checks for blank data fields and converts them to 9999.9.

JDAT

This routine converts a given Julian day to an equivalent month and day.

MAXMIN

This routine determines the maximum and minimum values on a monthly basis for each of the variables.

PSY

This routine calculates the wet bulb temperature (degrees F), humidity ratio (lb of water vapor/lb of dry air), enthalpy (BTU's/lb of dry air), volume (cubic feet/lb of dry air), vapor pressure (inches of Mercury) and relative humidity (fraction, not percent) from temperature (degrees F), dew point (Degrees F), and barometric pressure (inches of Mercury).

The source of this subroutine is: NUREG-0693, Analysis of Ultimate Heat Sink Cooling Ponds, by R. Codell and W. K. Nuttle, USNRC, November 1980, p. 104.

PVSF

This function calculates the vapor pressure of water (inches of Mercury) as a function of temperature (degrees F). The source of this function is: NUREG-0693, Analysis of Ultimate Heat Sink Cooling Ponds, by R. Codell and W. K. Nuttle, USNRC, November 1980, pp. 104-105.

SET1, SET2

These routines are used to initialize data.

WBF

This function approximates the wet bulb temperature (degrees F) from enthalpy (BTU's/lb of dry air) and barometric pressure (inches of Mercury). The source of this routine is: NUREG-0693, Analysis of Ultimate Heat Sink Cooling Ponds, by R. Codell and W. K. Nuttle, USNRC, November 1980, p. 105.

10.7 Sample Output

PROGRAM: TDP VERSION: 3 DATED: MARCH 1982 RUN DATE: FRIDAY MAY 7, 1982

SITE:

TEST DATA

CONTAINS DATA FROM DECEMBER 1980 TO JANUARY 1891

HOURLY DATA CODED 0100 TO 2400

****

TITLE: SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

INPUT DATA:

BAROMETRIC PRESSURE: 29.0

START DATE: 80 12 30
END DATE: 81 1 2

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*** WIND SPEED IS ROOT-MEAN-SQUARE WIND SPEED
*** WET BULB IS CALCULATED FROM TEMPERATURE, DEW POINT AND PRESSURE

PROGRAM: TDP VERSION: 3 DATED: MARCH 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

YEAR	MONTH			110.0 METERS AVG	110.0 METERS MIN	110.0 METERS MAX	110.0 METERS HRS	60.0 METERS AVG	60.0 METERS MIN	60.0 METERS MAX	60.0 METERS HRS	10.0 METERS AVG	10.0 METERS MIN	10.0 METERS MAX	10.0 METERS HRS
1980	DECEMBER	WIND SPEED	(M/S)	10.8	1.0	18.0	37	9.3	0.1	40.0	36	12.1	1.0	20.0	27
		TEMPERATURE	(C)	19.4	12.0	22.0	36	21.8	14.0	26.5	35	22.5	13.0	30.0	37
		DEW POINT	(C)	16.0	10.0	21.0	37	999.9	99.9	-99.9	0	16.8	10.0	24.0	36
		WET BULB	(C)	17.4	11.7	20.9	34	999.9	99.9	-99.9	0	19.3	13.4	24.3	35
1980	ANNUAL	WIND SPEED	(M/S)	10.8	1.0	18.0	37	9.3	0.1	40.0	36	12.1	1.0	20.0	27
		TEMPERATURE	(C)	19.4	12.0	22.0	36	21.8	14.0	26.5	35	22.5	13.0	30.0	37
		DEW POINT	(C)	16.0	10.0	21.0	37	999.9	99.9	-99.9	0	16.8	10.0	24.0	36
		WET BULB	(C)	17.4	11.7	20.9	34	999.9	99.9	-99.9	0	19.3	13.4	24.3	35

*** WIND SPEED IS ROOT-MEAN-SQUARE WIND SPEED
*** WET BULB IS CALCULATED FROM TEMPERATURE, DEW POINT AND PRESSURE

PROGRAM: TDP VERSION: 3 DATED: MARCH 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

YEAR	MONTH			110.0 METERS				60.0 METERS				10.0 METERS			
				AVG	MIN	MAX	HRS	AVG	MIN	MAX	HRS	AVG	MIN	MAX	HRS
1981	JANUARY	WIND SPEED	(M/S)	10.8	1.0	18.0	32	8.5	0.1	24.0	32	10.1	1.0	20.0	23
		TEMPERATURE	(C)	18.2	12.0	22.0	33	20.0	14.0	26.5	31	20.4	13.0	30.0	35
		DEW POINT	(C)	13.9	10.0	21.0	35	999.9	99.9	-99.9	0	17.3	10.0	24.0	33
		WET BULB	(C)	15.7	11.7	20.9	32	999.9	99.9	-99.9	0	19.1	13.4	24.3	31
1981	ANNUAL	WIND SPEED	(M/S)	10.8	1.0	18.0	32	8.5	0.1	24.0	32	10.1	1.0	20.0	23
		TEMPERATURE	(C)	18.2	12.0	22.0	33	20.0	14.0	26.5	31	20.4	13.0	30.0	35
		DEW POINT	(C)	13.9	10.0	21.0	35	999.9	99.9	-99.9	0	17.3	10.0	24.0	33
		WET BULB	(C)	15.7	11.7	20.9	32	999.9	99.9	-99.9	0	19.1	13.4	24.3	31

*** WIND SPEED IS ROOT-MEAN-SQUARE WIND SPEED
*** WET BULB IS CALCULATED FROM TEMPERATURE, DEW POINT AND PRESSURE

PROGRAM: TDP VERSION: 3 DATED: MARCH 1982 RUN DATE: FRIDAY MAY 7, 1982

SAMPLE RUN : INPUT FILE = DATA1 (SEE SAMPLE OUTPUT FOR PROGRAM PRINT)

DECEMBER 30, 1980 TO JANUARY 2, 1981		110.0 METERS				60.0 METERS				10.0 METERS			
		AVG	MIN	MAX	HRS	AVG	MIN	MAX	HRS	AVG	MIN	MAX	HRS
WIND SPEED	(M/S)	10.8	1.0	18.0	69	8.9	0.1	40.0	68	11.3	1.0	20.0	50
TEMPERATURE	(C)	18.8	12.0	22.0	69	21.0	14.0	26.5	66	21.5	13.0	30.0	72
DEW POINT	(C)	15.0	10.0	21.0	72	999.9	99.9	-99.9	0	17.0	10.0	24.0	69
WET BULB	(C)	16.6	11.7	20.9	66	999.9	99.9	-99.9	0	19.2	13.4	24.3	66

*** WIND SPEED IS ROOT-MEAN-SQUARE WIND SPEED
*** WET BULB IS CALCULATED FROM TEMPERATURE, DEW POINT AND PRESSURE

APPENDIX A

NRC STANDARD FORMAT FOR METEOROLOGICAL DATA

Use: 9 track tape (7 will be acceptable)
Stnadard Label, which would include
Record Length = 160 characters
Block Size = 3200 characters (fixed block size)
Density = 1600 BPI preferred (6250 or 800 PBI will be accepted)

Do not use: Magnetic tapes with unformatted or spanned records.

At the beginning of each tape, use the first five records (which is the equivalent of ten cards) to give a tape description. Include plant name and location (latitude, longitude), dates of data, information explaining data contained in the "other" fields if they are used, height of measurements, and any additional information pertinent to identification of the tape. Make sure all five records are included, even if some are blank. Format for the first five records will be 160A1. Meteorological data format is (I6, I2, I3, I4, 25F5.1, F5.2, 3F5.1). Decimal points should not be included when copying data onto the tape.

All data should be given to a tenth of a unit except solar radiation, which should be given to a hundredth of a unit. This does not necessarily indicate the accuracy of the data (e.g., wind direction is usually given to the nearest degree, but record it with a zero in the tenth's place; therefore, 275 degrees would be 275.0 degrees and placed on the tape as 2750). All nines in any field should indicate a lost record (99999). All sevens in a wind direction field should indicate calm (77777). If only two levels of data are monitored, use the upper and lower level fields. If only one level of data is monitored, use the upper level field.

TABLE A-1

MAGNETIC TAPE METEORLOGICAL DATA

LOCATION:
DATE OF DATA RECORD:

		ACCURACY
I6	Identifier (can be anything)	
I2	Year	
I3	Julian Day	
I4	Hour (on 24-hr clock)	
		ACCURACY
F5.1	Upper Measurements: Level = _____ meters	
F5.1	Wind Direction (degrees)	_____
F5.1	Wind Speed (m/s)	_____
F5.1	Sigma Theta (degrees)	_____
F5.1	Ambient Temperature (°C)	_____
F5.1	Moisture: _____	_____
F5.1	Other: _____	_____
F5.1	Intermediate Measurements: Level = _____ meters	
F5.1	Wind Direction (degrees)	_____
F5.1	Wind Speed (m/s)	_____
F5.1	Sigma Theta (degrees)	_____
F5.1	Ambient Temperature (°C)	_____
F5.1	Moisture: _____	_____
F5.1	Other: _____	_____
F5.1	Lower Measurements: Level = _____ meters	
F5.1	Wind Direction (degrees)	_____
F5.1	Wind Speed (m/s)	_____
F5.1	Sigma Theta (degrees)	_____
F5.1	Ambient Temperature (°C)	_____
F5.1	Moisture: _____	_____
F5.1	Other: _____	_____
F5.1	Temp Diff (Upper-Lower) (°C/100 meters)	_____
F5.1	Temp Diff (Upper-Intermediate) (°C/100 meters)	_____
F5.1	Temp Diff (Intermediate-Lower) (°C/100 meters)	_____
F5.1	Precipitation (mm)	_____
F5.2	Solar Radiation ($cal/cm^2/min$)	_____
F5.1	Visibility (km)	_____
F5.1	Other: _____	_____
F5.1	Other: _____	_____

APPENDIX B

PROGRAM LISTING OF DATE

```
C
C ***************************************************************
C *                                                             *
C *                          DATE                               *
C *                                                             *
C *          THIS PROGRAM CHECKS FOR THE SEQUENTIAL             *
C *          STORAGE OF DATA IN THE NRC STANDARD FORMAT         *
C *          BY YEAR, JULIAN DAY AND HOUR.                      *
C *                                                             *
C * PROGRAMMER: WILLIAM SNELL                                   *
C * DATE: MARCH 1982                                            *
C * VERSION: 1                                                  *
C *                                                             *
C ***************************************************************
C
      DIMENSION TODAY(8),A(200),TITLE(18),LH(4),LP(2)
      DATA LH/0,1,23,24/,LP/366,365/
C
C  READ AND WRITE OUT HEADING OF DATA FILE
C
      CALL RHB240 (TODAY)
      PRINT 200, TODAY
  200 FORMAT('1','PROGRAM: DATE',10X,'VERSION: 1',10X,
     1 'DATED: MARCH 1982',15X,'RUN DATE: ',8A4)
      READ(1,10) A
   10 FORMAT(4(40A4/),40A4)
      PRINT 11, A
   11 FORMAT('-','SITE:'/'0',10(' ',20A4/))
C
C  READ INPUT CARD
C
C  LL=0     HOURLY DATA CODED 0000-2300
C  LL=1     HOURLY DATA CODED 0100-2400
C  TITLE    IS A TITLE TO BE PRINTED ON EACH PAGE
C
      READ(5,12) LL,TITLE
   12 FORMAT(I1,1X,18A4)
      L1=LH(LL+1)
      L2=LH(LL+3)
      L=L2+1
      PRINT 203, TITLE,L1,L2
  203 FORMAT(///'0','TITLE: ',18A4/'0','HOURLY DATA CODED:
     1 '0',I1,'-',I2)
C
C  INITIALIZE
C
      IR=-1
      ITOT=1
      IT=0
      PRINT 200, TODAY
      PRINT 201, TITLE
  201 FORMAT('0',18A4)
C
C  READ DATA AND CHECK SEQUENCE
C
   20 READ(1,102,END=999) IY,JD,IH
  102 FORMAT(6X,I2,I3,I2)
      IF(IT.EQ.0) PRINT 206, IY,JD,IH
  206 FORMAT('0','DATE OF FIRST DATA RECORD READ: ',I3,I4,I3///)
      IR=IR+1
```

```
      GO TO 30
C
   25 READ(1,102,END=999) IY,JD,IH
      IR=IR+1
      K2=IY*100000+JD*100+IH
      IF(K1.EQ.K2) GO TO 30
      IR2=IR+1
      PRINT 208, IY1,JD1,IH1,IR,IY,JD,IH,IR2
  208 FORMAT('0','BAD DATE SEQUENCE IN DATA: ',I3,I4,I3,8X,
     1 'RECORD ',I6/' ',27X,I3,I4,I3,8X,'RECORD ',I6)
C
      ITOT=ITOT+1
      IT=IT+1
      IF(ITOT.LT.15) GO TO 30
      PRINT 200, TODAY
      PRINT 201, TITLE
      ITOT=0
   30 IY1=IY
      JD1=JD
      IH1=IH
      IH=IH+1
      IF(IH.EQ.L) GO TO 35
      K1=IY*100000+JD*100+IH
      GO TO 25
C
   35 JD=JD+1
      Y=IY*0.25
      KY=Y
      IS=(Y-KY)+1.75
      LDY=LP(IS)
      IF(JD.LE.LDY) GO TO 40
      JD=1
      IY=IY+1
C
   40 K1=IY*100000+JD*100+L1
      GO TO 25
C
  999 CONTINUE
      IR2=IR+1
      IF(IT.EQ.0) PRINT 209
  209 FORMAT('0','NO ERRORS FOUND IN DATE SEQUENCE OF DATA')
      PRINT 210, IY1,JD1,IH1,IR2
  210 FORMAT(///'0','DATE OF LAST DATA RECORD READ: ',
     1 I3,I4,I3,8X,'RECORD NO.',I6)
C
      STOP
      END
```

APPENDIX C

PROGRAM LISTING OF JFREQ

```
1.      //WSZJFREQ JOB (WDC1,720,1),W.SNELL
2.      /*CNTL WSZ,EXC
3.      /*ACCESS WDC1WSZ
4.      //STEP2 EXEC FORGCOMP
5.      //COMP.SYSIN DD *
6.      C
7.      C  ***************************************************************
8.      C  *                                                             *
9.      C  *                          JFREQ                              *
10.     C  *                                                             *
11.     C  *    THIS PROGRAM CALCULATES JOINT FREQUENCY DISTRIBUTIONS    *
12.     C  *        OF WIND SPEED AND DIRECTION BY STABILITY CLASS       *
13.     C  *           AND PRINTS STABILITY CLASS BY HOUR OF DAY         *
14.     C  *                                                             *
15.     C  * PROGRAMMER: AUDREY SMITH                                    *
16.     C  * DATE: JUNE 1977          VERSION: 1                         *
17.     C  *                                                             *
18.     C  * MODIFIED: WILLIAM SNELL                                     *
19.     C  * DATE: NOVEMBER 1978      VERSION: 2                         *
20.     C  * DATE: FEBRUARY 1982      VERSION: 3                         *
21.     C  *                                                             *
22.     C  ***************************************************************
23.     C
24.     C
25.           REAL*8 U
26.           COMMON/DATA1/ILEV,IS,IP,LSH,IPS,CALM,VB,IY(2),IM(2),
27.          1  ID(2),A(18)
28.           COMMON/DATA2/C(12),WWD(3),WWS(3),STAB(3),SST(3)
29.           DIMENSION TODAY(9),JD(2),TITLE(200),CS(8),IHS(24),
30.          1          IDATA(10,18,8), DATA(10,18,8),VAR(10),IVAR(10),
31.          2          ISUMD(18,8), ISUMS(10,8), ISUM(8),
32.          3          SUMD(18,8), SUMS(10,8), SUM(8),
33.          4          IWSC(10), SWSC(10), IWS(10), SWS(10),
34.          5          SC(8), U(11), WIND1(3), WIND2(3), H(3)
35.     C.....
36.     C.....INITIALIZE
37.     C.....
38.           K=1
39.           DATA CS/'A','B','C','D','E','F','G','-'/
40.           DATA SC/'A   ','B   ','C   ','D   ','E   ','F   ','G   ','ALL '/
41.           DATA U/'  CALM  ',' CALM-.5',' .5-.75 ',' .75-1.0',
42.          1       ' 1.0-1.5',' 1.5-2.0',' 2.0-3.0',' 3.0-5.0',
43.          2       '5.0-10.0',' >10.0 ','VARIABLE'/
44.           DATA IHS/24*8/
45.           DATA IWSC,SWSC,H/10*0,10*0.,3*0./
46.           DATA ISUMD,SUMD/144*0,144*0./
47.           DATA IDATA/1440*0/
48.           DATA IVAR,IWS,ISUM,ISUMS/108*0/
49.           DATA VAR,SWS,SUM,SUMS/108*0./
50.     C
51.           CALL RHB240 (TODAY)
52.     C
53.     10000 CONTINUE
54.           NUM=0
55.           LCNT=0
56.     C
57.     C
58.     C.....
59.     C.....READ DATA FROM CARDS
60.     C.....
```

```
C
C----------A IS THE TITLE CARD
C----------ILEV INDICATES LEVEL OF WIND DATA TO BE USED
C                    ILEV=1 FOR UPPER LEVEL
C                    ILEV=2 FOR INTERMEDIATE LEVEL
C                    ILEV=3 FOR LOWER LEVEL
C----------IS INDICATES THE LEVEL USED TO MEASURE STABILITY
C                    IS=1 FOR DELTA T:  UPPER - LOWER
C                    IS=2 FOR DELTA T:  UPPER - INTERMEDIATE
C                    IS=3 FOR DELTA T:  INTERMEDIATE - LOWER
C                    IS=4 FOR SIGMA THETA:  UPPER
C                    IS=5 FOR SIGMA THETA:  INTERMEDIATE
C                    IS=6 FOR SIGMA THETA:  LOWER
C----------IP=1 PUNCH JFD IN HOURS
C          IP=0 DO NOT PUNCH JFD
C----------LSH=0 FOR HOURS CODED 00-23
C          LSH=1 FOR HOURS CODED 01-24
C----------IPS=0 DO NOT PRINT STABILITY BY HOUR OF DAY
C          IPS=1 PRINT STABILITY BY HOUR OF DAY
C----------CALM IS STARTING SPEED OF ANNEMOMETER (M/S)
C----------VB = CODE FOR VARIABLE WIND. IF NO WINDS CODED
C---------      VARIABLE, VB=0
C----------IY(1),IM(1),ID(1) = STARTING YEAR, MONTH AND DAY
C----------IY(2),IM(2),ID(2) ENDING YEAR, MONTH AND DAY
C
      READ (5,200,END=1111) A
  200 FORMAT (18A4)
      READ(5,50) ILEV,IS,IP,LSH,IPS,CALM,VB,
     *  IY(1),IM(1),ID(1),IY(2),IM(2),ID(2)
   50 FORMAT(5I1,F5.2,F7.1/3I2,1X,3I2)
      WRITE(6,38) TODAY
      CALL READ1
      CALL IDAT(II,IM,IY,JD)
      ISET=IY(1)*1000+JD(1)
      IEND=IY(2)*1000+JD(2)
      LHC=0
C
C.....
C.....READ METEOROLOGICAL DATA
C.....PRINT STABILITY BY HOUR OF DAY
C.....
C
      IF (A.EQ.2) GO TO 1000
      READ (1,444) TITLE
  444 FORMAT (4(40A4/),40A4)
      WRITE(6,38) TODAY
      WRITE (6,445) TITLE
  445 FORMAT ('0','SITE:'/' ',20A4/9(' ',20A4/))
C
      LHD=1
      GO TO 11
   60 CONTINUE
      GO TO (151,152,153,154,154,154),IS
  151 DT1=H(1)
      DT2=H(3)
      GO TO 154
  152 DT1=H(1)
      DT2=H(2)
      GO TO 154
  153 DT1=H(2)
```

```
      DT2=H(3)
  154 CONTINUE
      LHD=0
      IF(IPS.EQ.0) GO TO 61
      WRITE(6,38) TODAY
      IF(IS.LE.3) WRITE (6,20) A,H(ILEV),DT1,DT2
      IF(IS.GE.4) WRITE (6,32) A,H(ILEV),H(IS-3)
      IF(LSH.EQ.0) WRITE(6,36)
      IF(LSH.EQ.1) WRITE(6,39)
      GO TO 61
 1000 CONTINUE
      IF(IPS.EQ.0) GO TO 11
      IF(IHR.LT.24) GO TO 11
      CALL JDAT(IYR,JDAY,IMON,IDAY)
      WRITE(6,37) IYR,IMON,IDAY,(CS(IHS(I)),I=1,24)
      LHC=LHC+1
      IF(LHC.LT.50) GO TO 11
      WRITE(6,38) TODAY
      IF(IS.LE.3) WRITE (6,20) A,H(ILEV),DT1,DT2
      IF(IS.GE.4) WRITE (6,32) A,H(ILEV),H(IS-3)
      IF(LSH.EQ.0) WRITE(6,36)
      IF(LSH.EQ.1) WRITE(6,39)
      LHC=0
C
   11 READ(1,111,END=999) IYR,JDAY,IHR,
     1 ((H(I),WWD(I),WWS(I),SST(I)),I=1,3),
     2 (STAB(N),N=1,3),(C(I),I=1,12)
  111 FORMAT (6X,I2,I3,I2,2X,3(4F5.1,15X),3F5.1,
     * T16,3(5X,3(1X,A4),15X),3(1X,A4))
      IDATE=IYR*1000+JDAY
      IF(IDATE.LT.ISRT) GO TO 11
      IF(IDATE.GT.IEND) GO TO 999
      CALL BLNK
      IF(LHD.EQ.1) GO TO 60
   61 IF(LSH.EQ.0) IHR=IHR+1
      IHS(IHR)=8
      LCNT=LCNT+1
      WD=WWD(ILEV)
      WS=WWS(ILEV)
      IF(IS.GE.4) GO TO 22
      IF(STAB(IS).LT.-7.0 .OR. STAB(IS).GT.35.0) GO TO 1000
      CALL STABLE(STAB(IS),K)
      GO TO 33
   22 ST=SST(IS-3)
      IF(ST.LT.0.0 .OR. ST.GT.360.0) GO TO 1000
      CALL SIGMA(ST,K)
   33 IHS(IHR)=K
C
      IF(WD.EQ.7777.7 .OR. WS.EQ.0.0) GO TO 42
      IF(WS.LT.0.0 .OR. WS.GE.99.9) GO TO 1000
      CALL SPEED(WS,CALM,I)
      IF(WD.EQ.VB) GO TO 41
      IF(WD.LT.0.0 .OR. WD.GT.365.0) GO TO 1000
   41 CONTINUE
      CALL SECTOR(WD,WS,CALM,VB,J)
      GO TO 43
   42 I=1
      J=17
   43 CONTINUE
C.....
```

```
C.....CALCULATE IDATA, NUM, AND DATA
C.....
C
C---------IDATA AND DATA ARE THE FREQUENCIES FOR SPECIFIC WIND
C              SPEEDS WIND DIRECTIONS, AND STABILITY CLASSES IN
C              HOURS AND FRACTIONS, RESPECTIVELY
C---------NUM AND UM ARE THE NUMBER OF HOURS OF DATA
C
      IDATA(I,J,K)=IDATA(I,J,K)+1
      IDATA(I,J,8)=IDATA(I,J,8)+1
      NUM=NUM+1
      GO TO 1000
  999 CONTINUE
      IF (NUM.EQ.0) GO TO 10000
      UM=100.0/NUM
C
      DO 105 I=1,10
      DO 105 J=1,18
      DO 105 K=1,8
  105 DATA(I,J,K)=IDATA(I,J,K)*UM
C
C.....
C.....CALCULATE SUMS OF FREQUENCIES IN HOURS AND FRACTIONS
C.....
C
C---------ISUMD, SUMD = SUMS OF FREQUENCIES FOR EACH DIRECTION IN A
C              STABILITY CLASS IN HOURS AND FRACTIONS, RESPECTIVELY
C---------ISUMS, SUMS = SUMS OF FREQUENCIES FOR EACH WIND SPEED IN A
C              STABILITY CLASS IN HOURS AND FRACTIONS, RESPECTIVELY
C---------ISUM, SUM = TOTALS OF ALL FREQUENCIES IN A STABILITY CLASS
C              IN HOURS AND FRACTIONS, RESPECTIVELY
C---------I,J,K AND L,M,N CORRESPOND TO WIND SPEED, WIND DIRECTION,
C              AND STABILITY
C
      DO 110 M=1,16
      DO 110 N=1,8
      DO 110 I=2,10
      ISUMD(M,N)=ISUMD(M,N)+IDATA(I,M,N)
  110 SUMD(M,N)=SUMD(M,N)+DATA(I,M,N)
C
      DO 115 L=2,10
      DO 115 N=1,8
      DO 115 J=1,16
      ISUMS(L,N)=ISUMS(L,N)+IDATA(L,J,N)
  115 SUMS(L,N)=SUMS(L,N)+DATA(L,J,N)
C
      DO 120 N=1,8
      ISUMS(1,N)=IDATA(1,17,N)
  120 SUMS(1,N)=DATA(1,17,N)
C
      DO 125 L=1,10
      DO 125 N=1,8
      ISUMD(18,N)=ISUMD(18,N)+IDATA(L,18,N)
      SUMD(18,N)=SUMD(18,N)+DATA(L,18,N)
      ISUM(N)=ISUM(N)+ISUMS(L,N)
  125 SUM(N)=SUM(N)+SUMS(L,N)
C
      DO 126 N=1,8
      SUM(N)=SUM(N)+SUMD(18,N)
  126 ISUM(N)=ISUM(N)+ISUMD(18,N)
```

```
241.      C
242.      C.....
243.      C.....CALCULATE OVERALL FREQUENCIES
244.      C.....
245.      C
246.            DO 145 L=1,10
247.            DO 145 N=1,7
248.            IVAR(L)=IVAR(L)+IDATA(L,18,N)
249.            VAR(L)=VAR(L)+DATA(L,18,N)
250.            IWS(L)=IWS(L)+ISUMS(L,N)
251.        145 SWS(L)=SWS(L)+SUMS(L,N)
252.      C
253.            IWD=0
254.            SWD=0.
255.            DO 149 N=1,7
256.            IWD=IWD+ISUMD(18,N)
257.        149 SWD=SWD+SUMD(18,N)
258.      C
259.            IWSC(1)=IWS(1)
260.            SWSC(1)=SWS(1)
261.            DO 146 N=2,10
262.            IWSC(N)=IWSC(N-1)+IWS(N)
263.        146 SWSC(N)=SWSC(N-1)+SWS(N)
264.      C
265.      C.....
266.      C.....PRINT    JOINT FREQUENCY TABLES AND OVERALL FREQUENCIES
267.      C.....
268.      C
269.      C
270.            PCDR=NUM*100.0/LCNT
271.      C
272.            DO 134 K=1,8
273.            GO TO (147,142,142,147,142,142,147,142),K
274.        147 WRITE(6,38) TODAY
275.            IF(IS.LE.3) WRITE(6,20) A,H(ILEV),DT1,DT2
276.            IF(IS.GE.4) WRITE(6,32) A,H(ILEV),H(IS-3)
277.        142 WRITE (6,3) SC(K)
278.            WRITE (6,4)
279.            WRITE (6,7) U(1),ISUMS(1,K)
280.            DO 133 I=2,10
281.            WRITE (6,5) U(I),(IDATA(I,J,K),J=1,16),ISUMS(I,K)
282.        133 CONTINUE
283.            WRITE (6,7) U(11),ISUMD(18,K)
284.            WRITE (6,13)
285.            WRITE (6,6) (ISUMD(J,K),J=1,16),ISUM(K)
286.            IF(K.EQ.3 .OR. K.EQ.6 .OR. K.EQ.8) WRITE (6,8) CALM
287.        134 CONTINUE
288.            WRITE (6,1) NUM,LCNT
289.            WRITE (6,14) (SC(I),I=1,8),(ISUM(M),M=1,8)
290.            WRITE (6,15) (U(I),I=1,11),(IWS(L),L=1,10),IWD,
291.           1 (IWSC(N),N=1,10)
292.            WRITE(6,38) TODAY
293.            IF(IS.LE.3) WRITE (6,20) A,H(ILEV),DT1,DT2
294.            IF(IS.GE.4) WRITE (6,32) A,H(ILEV),H(IS-3)
295.            WRITE (6,27)
296.            DO 137 I=1,10
297.        137 WRITE (6,28) U(I),(IDATA(I,18,K),K=1,7),IVAR(I)
298.            WRITE (6,30) (ISUMD(18,N),N=1,7),IWD
299.      C
300.      C
```

```
      DO 136 K=1,8
      GO TO (148,144,144,148,144,144,148,144),K
  148 WRITE(6,38) TODAY
      IF(IS.LE.3) WRITE(6,20) A,H(ILEV),DT1,DT2
      IF(IS.GE.4) WRITE(6,32) A,H(ILEV),H(IS-3)
  144 WRITE (6,2) SC(K)
      WRITE (6,4)
      WRITE (6,12) U(1),SUMS(1,K)
      DO 135 I=2,10
      WRITE (6,9) U(I),(DATA(I,J,K),J=1,16),SUMS(I,K)
  135 CONTINUE
      WRITE (6,12) U(11),SUMD(18,K)
      WRITE (6,13)
      WRITE (6,10) (SUMD(J,K),J=1,16),SUM(K)
      IF(K.EQ.3 .OR. K.EQ.6 .OR. K.EQ.8) WRITE (6,8) CALM
  136 CONTINUE
      WRITE(6,35) PCDR
      WRITE (6,16) (SC(I),I=1,8),(SUM(M),M=1,8)
      WRITE (6,17) (U(I),I=1,11),(SWS(L),L=1,10),SWD,
     1 (SWSC(N),N=1,10)
      WRITE(6,38) TODAY
      IF(IS.LE.3) WRITE (6,20) A,H(ILEV),DT1,DT2
      IF(IS.GE.4) WRITE (6,32) A,H(ILEV),H(IS-3)
      WRITE (6,27)
      DO 138 I=1,10
  138 WRITE (6,29) U(I),(DATA(I,18,K),K=1,7),VAR(I)
      WRITE (6,31) (SUMD(18,N),N=1,7),SWD
C
C
      X=2
      IF (IP.NE.1) GO TO 10000
C
C.....
C.....PUNCH JOINT FREQUENCY DATA IN NUMBERS OF HOURS
C.....
      PUNCH 21, A
      IF(IS.LE.3) PUNCH 24, H(ILEV),DT1,DT2
      IF(IS.GE.4) PUNCH 34, H(ILEV),H(IS-3)
      PUNCH 23, NUM
      PUNCH 8, CALM
      PUNCH 18, (ISUMS(1,K),K=1,7)
      DO 161 K=1,7
      DO 160 I=2,10
      PUNCH 19, (IDATA(I,J,K),J=1,16)
  160 CONTINUE
  161 CONTINUE
  888 CONTINUE
C
C.....
C.....FORMAT STATEMENTS
C.....
    1 FORMAT ('0','TOTAL VALID HOURS = ',I6,15X,'TOTAL POSSIBLE',
     1 ' HOURS = ',I6)
    2 FORMAT (' '//' ','JOINT FREQUENCY DISTRIBUTION OF WIND ',
     1 'SPEED AND DIRECTION IN FRACTIONS',10X,
     2 'ATMOSPHERIC STABILITY CLASS ',A4)
    3 FORMAT (' '//' ','JOINT FREQUENCY DISTRIBUTION OF WIND ',
     1 'SPEED AND DIRECTION IN HOURS',10X,
     2 'ATMOSPHERIC STABILITY CLASS ',A4)
    4 FORMAT ('0',1X,'U (M/S)',8X,'N',4X,'NNE',5X,'NE',4X,'ENE',
```

```
     1 6X,'E',4X,'ESE',5X,'SE',4X,'SSE',6X,'S',4X,'SSW',5X,'SW',4X,
     2 'WSW',6X,'W',4X,'WNW',5X,'NW',4X,'NNW',2X,'TOTAL'/'+',
     3 1X,'_______')
    5 FORMAT (' ',A8,2X,17I7)
    6 FORMAT (' ','TOTAL',5X,17I7)
    7 FORMAT (' ',A8,114X,I7)
    8 FORMAT('0','CALM=',F5.2,' M/S')
    9 FORMAT (' ',A8,2X,17F7.2)
   10 FORMAT (' ','TOTAL',5X,17F7.2)
   12 FORMAT (' ',A8,114X,F7.2)
   13 FORMAT ('+','________',2X,17(1X,'_____'))
   14 FORMAT ('0'/'0','OVERALL STABILITY CLASS FREQUENCIES IN ',
     1 'HOURS'/'0','STABILITY:',4X,7(4X,A4),5X,A4/' ',
     2 'FREQUENCY:',2X,7I8,I10)
   15 FORMAT (' '//' ','OVERALL WIND SPEED FREQUENCIES IN HOURS'/
     1'0','WIND SPEED (M/S):',A8,2X,A8,2(1X,A8),
     2 4(2X,A8),3X,A8,1X,A8,3X,A8/' ','FREQUENCY:',3X,2(2X,I8),
     3 2(1X,I8),4(2X,I8),3X,I8,1X,I8,3X,I8/' ',
     4 'CUMULATIVE FREQ:',I7,2X,I8,
     5 2(1X,I8),4(2X,I8),3X,I8,1X,I8,3X,I8)
   16 FORMAT ('0'/'0','OVERALL STABILITY CLASS FREQUENCIES IN ',
     1 'PERCENT'/'0','STABILITY:',4X,7(4X,A4),5X,A4/' ',
     2 'FREQUENCY:',2X,7F8.1,F10.1)
   17 FORMAT (' '//' ','OVERALL WIND SPEED FREQUENCIES IN PERCENT',
     1 /'0','WIND SPEED (M/S):',A8,2X,A8,2(1X,A8),
     2 4(2X,A8),3X,A8,1X,A8,3X,A8/' ','FREQUENCY:',3X,2(2X,F8.1),
     3 2(1X,F8.1),4(2X,F8.1),3X,F8.1,1X,F8.1,3X,F8.1/' ',
     4 'CUMULATIVE FREQ:',F7.1,2X,F8.1,
     5 2(1X,F8.1),4(2X,F8.1),3X,F8.1,1X,F8.1,3X,F8.1)
   18 FORMAT (7I5)
   19 FORMAT (16I5)
   20 FORMAT ('0',18A4/'0','LEVEL OF WIND DATA: ',F6.1,' METERS',
     1 13X,'DELTA T LAYER: ',F7.1,'-',F5.1,' METERS')
   21 FORMAT(20A4)
   23 FORMAT('TOTAL NUMBER OF HOURS =',I7)
   24 FORMAT('0','LEVEL OF WIND DATA: ',F6.1,'METERS',5X,
     1'DELTA T LAYER: ',F6.1,'-',F5.1,' METERS')
   27 FORMAT('0'//'0','DISTRIBUTION OF VARIABLE WINDS'/'0',
     1 1X,'U (M/S)',
     2 5X,'A',7X,'B',7X,'C',7X,'D',7X,'E',7X,'F',7X,'G',
     3 5X,'TOTAL'/'+',1X,'_______',5X,'_',6(7X,'_'),5X,'_____')
   28 FORMAT(' ',A8,8(1X,I7))
   29 FORMAT(' ',A8,8(1X,F7.2))
   30 FORMAT('+','________',8(3X,'_____')/' ','  TOTAL ',8(1X,I7)
     1 )
   31 FORMAT('+','________',8(3X,'_____')/' ','  TOTAL ',8(1X,F7.2)
     1 )
   32 FORMAT ('0',18A4/'0','LEVEL OF WIND DATA: ',F6.1,' METERS',
     1 13X,'SIGMA THETA LEVEL: ',F6.1,' METERS')
   34 FORMAT('0','LEVEL OF WIND DATA: ',F6.1,'METERS',5X,
     1'SIGMA THETA LEVEL: ',F6.1,' METERS')
   35 FORMAT('0','PERCENT DATA RECOVERY = ',F5.1)
   36 FORMAT('0','STABILITY CLASS BY HOUR OF DAY'/' ',
     1 46X,'HOUR'/' ','YR MN DY    0  1  2  3  4  5  6  7  8  ',
     2 '9 10 11 12 13 14 15 16 17 18 19 20 21 22 23'/' ')
   37 FORMAT(I3,2I3,2X,24(2X,A1))
   38 FORMAT('1','PROGRAM: JFREQ',10X,'VERSION: 3',10X,
     1 'DATED: FEBRUARY 1982',20X,'RUN DATE: ',8A4)
   39 FORMAT('0','STABILITY CLASS BY HOUR OF DAY'/' ',
     1 46X,'HOUR'/' ','YR MN DY    1  2  3  4  5  6  7  8  ',
```

```
421.           2 '9 10 11 12 13 14 15 16' 17 18 19 20 21 22 23 24'/' ')
422.      C
423.            GO TO 10000
424.       1111 STOP
425.            END
426.            SUBROUTINE BLNK
427.      C
428.      C.....CHECK FOR BLANK DATA FIELDS
429.      C
430.            COMMON/DATA2/C(12),WWD(3),WWS(3),STAB(3),SST(3)
431.            DATA BK/'    '/,Z/9999.9/
432.            M=9
433.            N=-2
434.            DO 10 I=1,3
435.            N=N+3
436.            IF(C(N).EQ.BK) WWD(I)=Z
437.            IF(C(N+1).EQ.BK) WWS(I)=Z
438.            IF(C(N+2).EQ.BK) SST(I)=Z
439.         10 IF(C(M+I).EQ.BK) STAB(I)=Z
440.            RETURN
441.            END
442.            SUBROUTINE HEAD1
443.      C
444.      C--------PRINT INPUT INFORMATION
445.      C
446.            REAL*8 S,T
447.            COMMON/DATA1/ILEV,IS,IP,LSH,IPS,CALM,VB,IY(2),IM(2),
448.           1  ID(2),A(18)
449.            DIMENSION S(6),R(2),T(2)
450.      C
451.            DATA S/'   UPPER',' INTER',' LOWER','       ',
452.           1 'MEDIATE ','       '/
453.            DATA R/'NO  ','YES '/,T/' 00-23  ',' 01-24  '/
454.      C
455.            WRITE(6,101) A
456.          101 FORMAT(//'0','TITLE: ',18A4)
457.            WRITE(6,100) S(ILEV),S(ILEV+3)
458.          100 FORMAT(//'0','WIND DATA FROM LEVEL:',2A8)
459.      C
460.            GO TO (20,25,30,35,35,35),IS
461.           20 WRITE(6,105) S(4),S(1),S(3),S(6)
462.          105 FORMAT('0','DELTA-T INTERVAL:',2A8,' MINUS',2A8)
463.            GO TO 50
464.           25 WRITE(6,105) S(4),S(1),S(2),S(5)
465.            GO TO 50
466.           30 WRITE(6,105) S(2),S(5),S(3),S(6)
467.            GO TO 50
468.           35 WRITE(6,110) S(IS-3),S(IS)
469.          110 FORMAT('0','SIGMA THETA LEVEL:',2A8)
470.      C
471.           50 L=IP+1
472.            WRITE(6,115) R(L)
473.          115 FORMAT('0','PUNCH HOURLY JFD ON CARDS: ',A4)
474.            L=LSH+1
475.            WRITE(6,120) T(L)
476.          120 FORMAT('0','HOURLY DATA CODED: ',A8)
477.            L=IPS+1
478.            WRITE(6,125) R(L)
479.          125 FORMAT('0','WRITE STABILITY CLASS BY HOUR OF DAY: ',A4)
480.            WRITE(6,130) CALM
```

```
  130 FORMAT('0','CALM WINDS CODED: ',F6.2,' M/S')
C
      IF(VB.EQ.0.) WRITE(6,135)
      IF(VB.NE.0.) WRITE(6,136) VB
  135 FORMAT('0','NO WINDS CODED AS A VARIABLE DIRECTION')
  136 FORMAT('0','VARIABLE WIND DIRECTION CODED: ',F7.1)
C
      WRITE(6,150) ((IY(I),IM(I),ID(I)),I=1,2)
  150 FORMAT('0','JPD FOR DATA PERIOD:  BEGINING - ',3I3/' ',
     *       '                          ENDING   - ',3I3)
C
      RETURN
      END
      SUBROUTINE IDAT (ID,IM,IY,JD)
C--------THIS SUBROUTINE CHANGES MONTH AND DAY TO JULIAN DAY
      DIMENSION ID(2),IM(2),IY(2),JD(2),YR(2),IYR(2),MON(12)
      DATA MON/0,31,59,90,120,151,181,212,243,273,304,334/
      DO 20 N=1,2
      IMM=IM(N)
      JD(N)=MON(IMM)
      JD(N)=JD(N)+ID(N)
      YR(N)=IY(N)*0.25
      IYR(N)=YR(N)
      S=YR(N)-IYR(N)
      IF (S.EQ.0.0.AND.JD(N).GT.59) JD(N)=JD(N)+1
   20 CONTINUE
      RETURN
      END
      SUBROUTINE JDAT(IY,JD,IM,ID)
C
C   THIS SUBROUTINE CONVERTS JULIAN DAY TO MONTH AND DAY
C
      DIMENSION MM(12,2)
      DATA MM/0,31,59,90,120,151,181,212,243,273,304,334,
     *        0,31,60,91,121,152,182,213,244,274,305,335/
C
      YR=IY*0.25
      IYR=YR
      S=YR-IYR
      L=1
      IF(S.EQ.0.) L=2
C
      DO 10 I=2,12
      IF(JD.LE.MM(I,L)) GO TO 15
   10 CONTINUE
      I=13
   15 ID=JD-MM(I-1,L)
      IM=I-1
      RETURN
      END
      SUBROUTINE SECTOR(DIR,SP,CALM,VB,JJ)
C--------THIS SUBROUTINE CALCULATES THE SECTOR THE WIND
C--------IS BLOWING FROM.  (COMMON METEOROLOGICAL NOTATION)
C--------THIS SUBROUTINE COURTESY OF JIM SHIELDS
      JJ=17
      IF(SP.LE.CALM) RETURN
      JJ=18
      IF(DIR.EQ.VB) RETURN
      JJ = 1 + ((DIR + 11.25)/22.5)
      IF(JJ.EQ.17) JJ=1
```

```
      RETURN
      END
      SUBROUTINE SIGMA(STAB,KK)
C---------THIS SUBROUTINE CALCULATES STABILITY FROM SIGMA THETA
      DIMENSION S(6)
      DATA S/22.5,17.5,12.5,7.5,3.8,2.1/
      DO 100 KK=1,6
  100 IF(STAB.GE.S(KK)) RETURN
      KK=7
      RETURN
      END
      SUBROUTINE SPEED(SP,CALM,II)
      DIMENSION S(9)
      DATA S/0.,.5,.75,1.,1.5,2.,3.,5.,10./
      S(1)=CALM
      DO 10 II=1,9
   10 IF(SP.LE.S(II)) RETURN
      II=10
      RETURN
      END
      SUBROUTINE STABLE(STAB,KK)
      DIMENSION S(5)
C---------THIS SUBROUTINE CALCULATES STABILITY CLASS
C---------KK=1,2,3...CORRESPONDS TO STABILITY CLASSES A,B,C...
      DATA S/-1.9,-1.7,-1.5,-0.5,1.5,4.0/
      DO 100 KK = 1,6
  100 IF(STAB.LE.S(KK)) RETURN
      KK = 7
      RETURN
      END
//STEP3 EXEC EDSIN,NAME='*DC1*SZ.TEST.DATA1',
//  DISK=FILE33,LRECL=160,BLKSIZE=3200
//STEP4 EXEC FORGLAGO
//GO.FT01F001 DD DSN=&INPUT,DISP=(OLD,KEEP)
//GO.FT05F001  DD  *
TEST RUN #1
33011 0.25 8888.8
809101 811231
/*
```

APPENDIX D

PROGRAM LISTING OF MISS

```
C
C  ***************************************************************
C  *                                                             *
C  *                          MISS                               *
C  *                                                             *
C  *     THIS PROGRAM CALCULATES PERIODS OF OCCURENCE OF         *
C  *                      MISSING DATA                           *
C  *                                                             *
C  * PROGRAMMER: WILLIAM SNELL                                   *
C  * DATE: JUNE 1978                                            *
C  * VERSION: 1                                                 *
C  *                                                             *
C  * MODIFIED: W. SNELL                                         *
C  * DATE: FEBRUARY 1982                                        *
C  * VERSION: 2                                                 *
C  *                                                             *
C  ***************************************************************
C
      REAL*8 HR
      COMMON/DATA1/D1(16),C(16)
      DIMENSION TODAY(8),A(200),H(3),D2(16),IC(16),BDN(16),BDX(16),
     1 ICHK(13,16),ITOT(16),TITLE(18),HR(13),ICT(16),ICTT(16),P(16)
      DATA HR/'     1  ','     2  ','     3  ','     4  ',
     1        '     5  ','     6  ','  7-11  ','  12-23 ',
     2        '  24-47 ','  48-71 ','  72-95 ','  96-119',
     3        '   >120'/
      DATA BDN/0.,0.,-99.9,-99.9,0.,0.,-99.9,-99.9,0.,0.,-99.9,
     1 -99.9,-1.,-1.,-1.,0./
      DATA BDX/365.,99.9,99.9,100.,365.,99.9,99.9,100.,365.,99.9,
     1 99.9,100.,35.,35.,35.,254./
      DATA IC,ICT,ITOT/48*0/,ICTT/16*0/,ICHK/208*0/,D2/16*0./
C
      CALL RHB240 (TODAY)
C
C     READ AND WRITE OUT HEADING OF DATA FILE
C
      PRINT 200, TODAY
      READ(1,10) A
   10 FORMAT(4(40A4/),40A4)
      PRINT 11, A
   11 FORMAT('-','SITE:'/'0',10(' ',20A4/))
C
C     READ INPUT CARDS
C
      READ(5,12) TITLE,JY,JM,JD,KY,KM,KD
   12 FORMAT(18A4/3I2,1X,3I2)
      CALL IDAT(JD,JM,JY,JJD)
      CALL IDAT(KD,KM,KY,JKD)
      ISTRT=JY*1000+JJD
      IEND=KY*1000+JKD
      PRINT 203, TITLE,JY,JM,JD,KY,KM,KD
C
C     READ DATA AND CATEGORIZE BY MISSING PERIOD
C
   75 READ(1,102,END=999) IY,ID,H(1),(D1(I),I=1,4),H(2),
     * (D1(I),I=5,8),H(3),(D1(I),I=9,16),(C(I),I=1,16)
  102 FORMAT(6X,I2,I3,4X,3(3F5.1,5X,2F5.1,5X),4F5.1,
     1 T16,3(6X,A4,1X,A4,6X,A4,1X,A4,5X),4(1X,A4))
      IDATE=IY*1000+ID
      IF(IDATE.LT.ISTRT) GO TO 75
```

```
      IF(IDATE.GT.IEND)  GO TO 999
      CALL BLNK
C
C     SUMMARIZE DATA
C
      DO 15 N=1,9,4
   15 IF(D1(N).EQ.7777.7) D1(N)=0.0
C
      DO 50 N=1,16
      ICTT(N)=ICTT(N)+1
      IF(D1(N).LT.BDN(N) .OR. D1(N).GT.BDX(N)) GO TO 25
      IF(D2(N).LT.BDN(N) .OR. D2(N).GT.BDX(N)) GO TO 30
      GO TO 50
   25 IC(N)=IC(N)+1
      GO TO 50
   30 CALL CHK(IC(N),M)
      IF(IC(N).GT.ITOT(N)) ITOT(N)=IC(N)
      ICHK(M,N)=ICHK(M,N)+1
      ICT(N)=ICT(N)+IC(N)
      IC(N)=0
   50 CONTINUE
C
      DO 60 N=1,16
   60 D2(N)=D1(N)
C
      GO TO 75
C
  999 CONTINUE
C
      DO 65 N=1,16
      IF(D1(N).GE.BDN(N) .AND. D1(N).LE.BDX(N)) GO TO 65
      CALL CHK(IC(N),M)
      IF(IC(N).GT.ITOT(N)) ITOT(N)=IC(N)
      ICHK(M,N)=ICHK(M,N)+1
      ICT(N)=ICT(N)+IC(N)
   65 CONTINUE
C
      DO 66 N=1,16
   66 P(N)=(ICTT(N)-ICT(N))*100./ICTT(N)
C
C     PRINT OUT RESULTS
C
      PRINT 200, TODAY
      PRINT 201, TITLE
      PRINT 207, (H(N),N=1,3),H(1),H(1),H(2),H(3),H(2),H(3)
      DO 150 M=1,13
  150 PRINT 202, HR(M),(ICHK(M,N),N=1,16)
      PRINT 204, (ITOT(N),N=1,16)
      PRINT 205, (ICT(N),N=1,16)
      PRINT 206, (ICTT(N),N=1,16)
      PRINT 208, (P(N),N=1,16)
C
C     FORMAT STATEMENTS
C
  200 FORMAT('1','PROGRAM: MISS',10X,'VERSION: 2',10X,
     1 'DATED: FEBRUARY 1982',20X,'RUN DATE: ',8A4)
  201 FORMAT('0',18A4/'0','HOURLY SUMMARY OF MISSING DATA')
  202 FORMAT('0',A8,4X,12I7,1X,3I7,1X,I7)
  203 FORMAT(/////'0','INPUT OPTIONS:'/'0','TITLE:  ',
     1 18A4/'0','STARTING DATE:',3I3/' ',
```

```
     2 'ENDING DATE:  ',3I3)
 204 FORMAT('0','LONGEST CASE',12I7,1X,3I7,1X,I7)
 205 FORMAT('0','TOTAL HOURS'/' ',' MISSING',3X,12I7,1X,3I7,1X,I7)
 206 FORMAT('0','TOTAL HOURS',1X,12I7,1X,3I7,1X,I7)
 207 FORMAT('0',6X,3(15X,F6.1,' METERS'),9X,'TEMPERATURE',
     1 ' DIFFERENCE'/' ',13X,3(2X,26('-')),2X,22('-')/' ',
     2 ' PERIOD OF',
     3 2X,3(2(3X,'WIND'),11X,'DEW'),3X,'(DEGREES C/100METERS)'/' ',
     4 ' OCCURENCE',
     5 3X,3(3X,'DIR',3X,'SPEED',2X,'TEMP',3X,'POINT'),1X,
     6 3(F6.1,'-'),3X,'PRECIP'/' ',' (HOURS) ',
     7 3(2X,'(DEG)',2X,'(M/S)',3X,'(C)',4X,'(C)',1X),
     8 2X,3(F6.1,1X),3X,'(MM)'/' ',' -------    ',
     9 12(2X,'-----'),1X,3(2X,'-----'),3X,'-----')
 208 FORMAT('0','PERCENT DATA'/' ',' RECOVERY  ',
     1 12F7.1,1X,3F7.1,1X,F7.1)
      STOP
      END
      SUBROUTINE BLNK
C
C.....CHECK FOR BLANK DATA FIELDS AND REPLACE AS MISSING
C
      COMMON/DATA1/D1(16),C(16)
      DATA BK/'    '/
C
      DO 10 I=1,16
   10 IF(C(I).EQ.BK) D1(I)=9999.9
      RETURN
      END
      SUBROUTINE CHK(IC,M)
C
C.....CATEGORIZIES OCCURENCE INTERVALS
C
      DIMENSION N(12)
      DATA N/1,2,3,4,5,6,11,23,47,71,95,119/
      DO 10 M=1,12
   10 IF(IC.LE.N(M)) RETURN
      M=13
      RETURN
      END
      SUBROUTINE IDAT (ID,IM,IY,JD)
C
C.....THIS SUBROUTINE CHANGES MONTH AND DAY TO JULIAN DAY
C
      DIMENSION MON(12)
      DATA MON/0,31,59,90,120,151,181,212,243,273,304,334/
      JD=MON(IM)
      JD=JD+ID
      YR=IY*0.25
      IYR=YR
      S=YR-IYR
      IF (S.EQ.0.0.AND.JD.GT.59) JD=JD+1
      RETURN
      END
```

APPENDIX E

PROGRAM LISTING OF PRECP

```
C
C  ***************************************************************
C  *                                                             *
C  *                          PRECP                              *
C  *                                                             *
C  *        THIS PROGRAM CATEGORIZES PRECIPITATION DATA BY       *
C  *          INTENSITY, STABILITY CLASS, MONTH AND DAY          *
C  *                                                             *
C  * PROGRAMMER: JAMES HAWXHURST                                 *
C  * VERSION: 1                                                  *
C  * DATED: APRIL 1981                                           *
C  *                                                             *
C  * REVISED: WILLIAM SNELL                                      *
C  * VERSION: 2                                                  *
C  * DATED: FEBRUARY 1982                                        *
C  *                                                             *
C  ***************************************************************
C
      REAL*8 PPT(17)
      COMMON/DATA1/D(4),C(4)
      DIMENSION TODAY(8),A(200),TITLE(18),S(8),JPC(8,17),JPM(12),
     1 IPM(12,17),MONTH(12),PM(12),IPS(8),IPC(17),PRCT(17),CUM(17),
     2 PR(12),PC(8),PP(12,31),H(3),JPS(8),PJ(8)
C
C  INITIALIZE VARIABLES
C
      DATA S /'  A ','  B ','  C ','  D ','  E ','  F ',
     1 '  G ','MISS'/
      DATA PPT /'     0.0',
     1 '>0.0-.25','>.25-.50','>.50-.75','>.75-1.0',
     2 '>1.0-2.0','>2.0-3.0','>3.0-4.0','>4.0-5.0',
     3 '>5.0-7.5','>7.5-10.','>10.-15.','>15.-20.',
     4 '>20.-25.','>25.-30.','>30.-40.','>40.    '/
      DATA PP/372*0./,PR,PC,PJ,PT,PM,PRCT,CUM/75*0./
      DATA IICT,ICT/2*0/,JPM,IPS,JPS,IPM,IPC,JPC/385*0/
      DATA MONTH/'JAN','FEB','MAR','APR','MAY','JUN','JUL','AUG',
     1 'SEP','OCT','NOV','DEC'/
C
      CALL RHB240 (TODAY)
C
      PRINT 205, TODAY
  205 FORMAT('1','PROGRAM: PRECP',10X,'VERSION: 2',10X,
     * 'DATED: FEBRUARY 1982',20X,'RUN DATE: ',8A4)
C
C  READ AND WRITE TITLE FROM DATA FILE
C
      READ(1,11) A
      PRINT 12, A
   11 FORMAT(4(40A4/),40A4)
   12 FORMAT ('0','SITE:'/' ',20A4/9(' ',20A4/)////)
C
C   READ INPUT CARDS
C
C   TITLE = TITLE TO BE PRINTED ON EACH PAGE
C   IS = INTERVAL FOR DETERMINATION OF STABILITY
C        BASED ON DELTA-T
C        IS=1 : UPPER - LOWER
C        IS=2 : UPPER - INTERMEDIATE
C        IS=3 : INTERMEDIATE - LOWER
C   LY1,LM1,LD1 = STARTING YEAR, MONTH AND DAY
```

```
C    LY2,LM2,LD2 = ENDING YEAR, MONTH AND DAY
C
      READ(5,13) TITLE,IS,LY1,LM1,LD1,LY2,LM2,LD2
   13 FORMAT(18A4/I1,1X,3I2,1X,3I2)
      PRINT 14, TITLE,LY1,LM1,LD1,LY2,LM2,LD2
   14 FORMAT('0','TITLE: ',18A4/'0','START DATE: ',
     * 3I3/' ','END   DATE: ',3I3////)
      CALL IDAT(LD1,LM1,LY1,JD1)
      CALL IDAT(LD2,LM2,LY2,JD2)
      ISTRT=LY1*1000+JD1
      IEND=LY2*1000+JD2
C
C    READ DATA FROM TAPE - NBC FORMAT
C
   35 READ(1,100,END=999) IY,ID,(H(I),I=1,3),
     1 (D(N),N=1,4),(C(N),N=1,4)
  100 FORMAT(6X,I2,I3,4X,3(F5.1,30X),4F5.1,T121,4(1X,A4))
      IDATE=IY*1000+ID
      IF(IDATE.LT.ISTRT) GO TO 35
      IF(IDATE.GT.IEND) GO TO 999
      CALL BLNK
      IICT=IICT+1
      IF(D(4).LT.0. .OR. D(4).GT.254.) GO TO 35
C
      ICT=ICT+1
      IF(D(4).GT.0.) JCT=JCT+1
      CALL JPRECP(D(4),II)
      CALL JDAT(IY,ID,MM,MD)
      CALL STABLE(D(IS),IC)
C
      PP(MM,MD)=PP(MM,MD)+D(4)
      JPC(IC,II)=JPC(IC,II)+1
      IPM(MM,II)=IPM(MM,II)+1
      PM(MM)=PM(MM)+D(4)
      IPS(IC)=IPS(IC)+1
      IF(D(4).GT.0.) JPS(IC)=JPS(IC)+1
      JPM(MM)=JPM(MM)+1
      IPC(II)=IPC(II)+1
      PT=PT+D(4)
C
      GO TO 35
C
  999 CONTINUE
C
      DO 40 I=1,8
      PJ(I)=JPS(I)*100./JCT
   40 PC(I)=IPS(I)*100./ICT
C
      DO 45 I=1,12
   45 PR(I)=JPM(I)*100./ICT
C
      DO 50 I=1,17
      PRCT(I)=IPC(I)*100./ICT
      DO 50 J=1,I
   50 CUM(I)=CUM(I)+PRCT(J)
C
C
      P=ICT*100./IICT
      PJJ=JCT*100./ICT
      PRINT 275, ICT,IICT,P
```

```
  275 FORMAT(//////'0','HOURS VALID PRECIPITATION:',I6/' ',
     1                 'TOTAL HOURS EXAMINED:     ',I5/' ',
     2                 'PERCENT DATA RECOVERY:    ',F6.1)
      L1=1
      L2=3
      IF(IS.EQ.3) L1=2
      IF(IS.EQ.2) L2=2
C
      PRINT 205, TODAY
      PRINT 250, TITLE
      PRINT 201
      PRINT 210, (MONTH(I),I=1,12)
      DO 300 N=1,31
  300 PRINT 215, N,(PP(I,N),I=1,12)
      PRINT 220, (PM(I),I=1,12),PT
C
      PRINT 205, TODAY
      PRINT 250, TITLE
      PRINT 202
      PRINT 211, (MONTH(I),I=1,12)
      DO 301 N=1,17
  301 PRINT 216, PPT(N),(IPM(I,N),I=1,12)
      PRINT 221, (JPM(I),I=1,12),(PP(I),I=1,12)
C
      PRINT 205, TODAY
      PRINT 250, TITLE
      PRINT 200, H(L1),H(L2)
      PRINT 203
      PRINT 212, (S(I),I=1,8)
      DO 302 N=1,17
  302 PRINT 217, PPT(N),(JPC(I,N),I=1,8),IPC(N),PRCT(N),CUM(N)
      PRINT 222, (JPS(I),I=1,8),JCT,PJJ,(PJ(I),I=1,8)
      PRINT 223, (IPS(I),I=1,8),ICT,(PC(I),I=1,8)
C
  200 FORMAT('0','DELTA-T INTERVAL: ',F6.1,
     * '-',F6.1,' METERS')
  201 FORMAT(/'0',T29,'PRECIPITATION SUMMARIZED BY MONTH AND DAY',
     1 ' IN MILLIMETERS')
  202 FORMAT(/'0',T28,'PRECIPITATION OCCURRENCES SUMMARIZED BY',
     1 ' MONTH AND INTENSITY IN HOURS')
  203 FORMAT(/'0',T20,'PRECIPITATION OCCURRENCES SUMMARIZED BY',
     1 ' STABILITY AND INTENSITY IN HOURS')
  210 FORMAT('0',T55,'MONTH'/' ',' DAY',12(5X,A3)/)
  211 FORMAT('0',T59,'MONTH'/' ','INTENSITY',12(5X,A3)/' ',' (MM)'/)
  212 FORMAT('0',T38,'STABILITY CLASS',T109,'CUMULATIVE'/' ',
     1 'INTENSITY',8(5X,A4),5X,'TOTAL',2(5X,'PERCENT')/' ',' (MM)'/)
  215 FORMAT(' ',I4,1X,12F8.1)
  216 FORMAT(' ',1X,A8,12I8)
  217 FORMAT(' ',1X,A8,9I9,4X,F8.2,4X,F8.1)
  220 FORMAT('0','TOTAL',12F8.1,5X,'TOTAL=',F8.1,' MM')
  221 FORMAT('0','TOTAL HRS',12I8,/'0',' PERCENT ',12F8.1)
  222 FORMAT(/'0','HRS WITH '/' ',' PRECIP  ',9I9,4X,F8.2/'0',
     * ' PERCENT ',8F9.2)
  223 FORMAT(//'0','TOTAL HRS',9I9/'0',' PERCENT ',8F9.1)
  250 FORMAT('0',18A4)
C
      STOP
      END
      SUBROUTINE BLNK
C
```

```
      C   CHECK POR BLANK DATA FIELDS AND CONVERT TO MISSING
      C
            COMMON/DATA1/D(4),C(4)
            DATA BLK/'    '/
      C
            DO 10 N=1,4
         10 IF(C(N).EQ.BLK) D(N)=9999.9
            RETURN
            END
            SUBROUTINE IDAT(ID,IM,IY,JD)
      C
      C.....THIS SUBROUTINE CHANGES MONTH AND DAY TO JULIAN DAY
      C
            DIMENSION MON(12)
            DATA MON/0,31,59,90,120,151,181,212,243,273,304,334/
            JD=MON(IM)
            JD=JD+ID
            YR=IY*0.25
            IYR=YR
            S=YR-IYR
            IF (S.EQ.0. .AND. JD.GT.59) JD=JD+1
            RETURN
            END
            SUBROUTINE JDAT(IY,JD,IM,ID)
      C
      C   THIS SUBROUTINE CONVERTS JULIAN DAY TO MONTH AND DAY
      C
            DIMENSION MM(12,2)
            DATA MM/0,31,59,90,120,151,181,212,243,273,304,334,
           *        0,31,60,91,121,152,182,213,244,274,305,335/
      C
            YR=IY*0.25
            IYR=YR
            S=YR-IYR
            L=1
            IF(S.EQ.0.) L=2
      C
            DO 10 I=2,12
            IF(JD.LE.MM(I,L)) GO TO 15
         10 CONTINUE
            I=13
         15 ID=JD-MM(I-1,L)
            IM=I-1
            RETURN
            END
            SUBROUTINE JPPECP(P,I)
      C
      C ****   THIS SUBROUTINE CATEGORIZES PRECIPITATION
      C
            DIMENSION AMT(16)
            DATA AMT/0.,.25,.5,.75,1.,2.,3.,4.,5.,7.5,10.,15.,
           * 20.,25.,30.,40./
            DO 10 I=1,16
         10 IF(P.LE.AMT(I)) RETURN
            I=17
            RETURN
            END
            SUBROUTINE STABLE(S,K)
      C
      C  *** CALCULATE STABILITY CLASS A - G BASED ON DELT-T
```

```
241.      C
242.            DIMENSION CL(6)
243.            DATA CL/-1.9,-1.7,-1.5,-0.5,1.5,4.0/
244.            K=8
245.            IF(S.LT.-7. .OR. S.GT.35.) RETURN
246.            DO 10 K=1,6
247.         10 IF(S.LE.CL(K)) RETURN
248.            K=7
249.            RETURN
250.            END
```

APPENDIX F

PROGRAM LISTING OF PRINT

```
C
C  ****************************************************************
C  *                                                              *
C  *                          PRINT                               *
C  *                                                              *
C  *       THIS PROGRAM PRINTS HOURLY DATA FROM A DATA            *
C  *       SET IN THE NRC FORMAT, DATA PRINTED IS WIND            *
C  *       SPEED, WIND DIRECTION, SIGMA THETA, TEMPERATURE,       *
C  *       DEW POINT, DELTA-T AND PRECIPITATION.                  *
C  *                                                              *
C  * PROGRAMMER: WILLIAM SNELL                                    *
C  * DATE: JUNE 1978                                              *
C  * VERSION: 1                                                   *
C  *                                                              *
C  * MODIFIED: W. SNELL                                           *
C  * DATE: MARCH 1982                                             *
C  * VERSION: 2                                                   *
C  *                                                              *
C  ****************************************************************
C
      DIMENSION TODAY(8),B(8),A(200),TITLE(18)
      COMMON IW(3),CW(3),D(16),C(16)
      DATA B/'A','B','C','D','E','F','G','-'/
      DATA ICK/52/
C
      CALL RHB240 (TODAY)
      PRINT 11, TODAY
   11 FORMAT('1','PROGRAM: PRINT',10X,'DATED: MARCH 1982',
     * 10X,'VERSION: 2',15X,'RUN DATE: ',8A4)
C
      READ(1,12) A
      PRINT 13, A
   12 FORMAT(4(40A4/),40A4)
   13 FORMAT(///'0','SITE: '/' ',10(' ',20A4/))
C
      READ(5,14) TITLE,IS,IE
   14 FORMAT(18A4/I6,1X,I6)
      PRINT 16, TITLE,IS,IE
   16 FORMAT(///'0','TITLE: ',18A4///'0',
     1 'DATES SPECIFIED TO BE PRINTED:'/' ',
     2 5X,'START DATE: ',I6/' ',5X,'END   DATE: ',I6)
C
      GO TO 25
   15 ICK=0
      PRINT 11, TODAY
      PRINT 200, TITLE,H1,H2,H3,H1,H1,H2,H3,H2,H3
      GO TO 50
C
C
   25 READ(1,100,END=998) IY,JD,IH,H1,IW(1),(D(N),N=1,4),H2,IW(2),
     1 (D(N),N=5,8),H3,IW(3),(D(N),N=9,16),CW(1),(C(N),N=1,4),
     2 CW(2),(C(N),N=5,8),CW(3),(C(N),N=9,16)
      CALL JDAT(IY,JD,IM,ID)
      IDATE=IY*10000+IM*100+ID
      IF(IDATE.LT.IS) GO TO 25
      IF(IDATE.GT.IE) GO TO 998
C
   50 ICK=ICK+1
      IF(ICK.EQ.53) GO TO 15
      IH=IH/100
```

```
      CALL BLNK
      CALL SIGMA(D(2),J4)
      CALL SIGMA(D(6),J5)
      CALL SIGMA(D(10),J6)
      CALL STABLE(D(13),J1)
      CALL STABLE(D(14),J2)
      CALL STABLE(D(15),J3)
C
      PRINT 201, IY,IM,ID,TH,IW(1),D(1 ),(2),B(J4),D(3),D(4),IW(2),
     1 D(5),D(6),B(J5),D(7),D(8),IW(3),(9),D(10),B(J6),D(11),D(12),
     1 D(13),B(J1),D(14),B(J2),D(15),B(J3),D(16)
      GO TO 25
C
  100 FORMAT(6X,T2,I3,I4,3(F5.1,I5,4F5.1,5(),4F5.1,T16,
     1 3(5X,5(1X,A4),5X),4(1X,A4))
  200 FORMAT('0',18A4/'0',T104,'TEMPERATURE DIFFERENCE',/' ',3X,
     1 3(16X,F6.1,' METERS'),T105,'(DEGREES C/100METERS)'/'+',
     2 13X,3(28('_'),2X),T104,23('_')/' ',
     3 12X,3('  WD   WS   SIGMA  TEMP DEWPT '),
     4 3(F6.1,'- '),'PRECIP'/' ','YR MN DY HR',
     5 3(' (DEG)(M/S)  (DEG)   (C)  (C) '),1X
     6 3(F7.1,1X),' (MM)'/'+',4('__ '),
     7 3(' --- ----  ------ ----- ----- '),3('------- '),'------')
  201 FORMAT(' ',I2,3I3,3(1X,I4,F5.1,F6.1,1X,A1,2F6.1),
     1 3(F6.1,1X,A1),F7.1)
C
  998 STOP
      END
      SUBROUTINE BLNK
C
C...CHECK FOR BLANK DATA FIELDS AND CONVERT TO -99.9 OR -99
C...CHANGE CODES FOR MISSING TO 99.9, 999.9 OR 999
C
      COMMON IW(3),CW(3),D(16),C(19)
      DATA BK/'    '/
      DO 20 I=1,16
      GO TO (7,5,5,5,7,5,5,5,7,5,5,5,7,7,7,5),I
    5 IF(D(I).EQ.9999.9) D(I)=999.9
      GO TO 10
    7 IF(D(I).EQ.9999.9) D(I)=99.9
   10 IF(C(I).EQ.BK) D(I)=-99.9
   20 CONTINUE
      DO 15 I=1,3
      IW(I)=IW(I)*.1
      IF(IW(I).EQ.9999) IW(I)=999
   15 IF(CW(I).EQ.BK) IW(I)=-99
      RETURN
      END
      SUBROUTINE JDAT(IY,JD,IM,ID)
C
C   THIS SUBROUTINE CONVERTS JULIAN DAY TO MONTH AND DAY
C
      DIMENSION MM(12,2)
      DATA MM/0,31,59,90,120,151,181,212,243,273,304,334,
     *        0,31,60,91,121,152,182,213,244,274,305,335/
C
      YR=IY*0.25
      IYR=YR
      S=YR-IYR
      L=1
```

```
      IF(S.EQ.0.) L=2
C
      DO 10 I=2,12
      IF(JD.LE.MM(I,L)) GO TO 15
   10 CONTINUE
      I=13
   15 ID=JD-MM(I-1,L)
      IM=I-1
      RETURN
      END
      SUBROUTINE SIGMA(SIG,K)
C
C...THIS ROUTINE CALCULATES STABILITY FROM SIGMA THETA
C
      DIMENSION S(6)
      DATA S/22.5,17.5,12.5,7.5,3.8,2.1/
      K=8
      IF(SIG.EQ.-99.9 .OR. SIG.EQ.999.9) RETURN
      DO 10 K=1,6
   10 IF(SIG.GE.S(K)) RETURN
      K=7
      RETURN
      END
      SUBROUTINE STABLE(DT,IS)
C
C...CALCULATE STABILITY CLASS BASED ON DEGREES C PER 100METERS
C
      DIMENSION S(6)
      DATA S/-1.9,-1.7,-1.5,-0.5,1.5,4.0/
      IS=8
      IF(DT.EQ.99.9 .OR. DT.EQ.-99.9) RETURN
      DO 10 IS=1,6
      IF(DT.LE.S(IS)) RETURN
   10 CONTINUE
      IS=7
      RETURN
      END
```

APPENDIX G

PROGRAM LISTING OF QA

```
C
C ***************************************************************
C *                                                             *
C *                            QA                               *
C *                                                             *
C *   THIS IS A QUALITY ASSURANCE PROGRAM FOR METEOROLOGICAL    *
C *   DATA ON MAGNETIC TAPE IN THE NRC FORMAT. PROGRAM QA       *
C *   CAN HANDLE DATA FROM ALL THREE LEVELS SIMULTANEOUSLY.     *
C *   THE VARIABLES CHECKED ARE WIND SPEED, WIND DIRECTION,     *
C *   DELTA T, TEMPERATURE, DEW POINT AND PRECIPITATION.        *
C *                                                             *
C * PROGRAMMER: WILLIAM SNELL                                   *
C * DATE: APRIL 1978                                            *
C * VERSION: 1                                                  *
C *                                                             *
C * MODIFIED: W. SNELL                                          *
C * DATE: FEBRUARY 1982                                         *
C * VERSION: 2                                                  *
C *                                                             *
C ***************************************************************
C
      COMMON/DATA1/LEV,IS,EL1,EL2,EL3,ICHK,NS(18),IP,ID
      COMMON/DATA2/IY1,IY2,ID1,ID2,IH1,IH2
      COMMON/DATA3/WS1(3),WS2(3),WD1(3),WD2(3),T1(3),T2(3),
     * DT1(3),DT2(3),P1,P2,D1(3)
      COMMON/DATA4/KX(3),JJ(3),KP,KT(6),JA,JB,JC
      COMMON/DATA5/IPAGE,INC,TITLE
      COMMON/DATA6/C(16)
      COMMON/DATA7/LY1,LM1,LD1,LY2,LM2,LD2
      COMMON/DATA8/TODAY(8)
C
      DIMENSION AB(200),TITLE(18)
      DIMENSION WDMN(3),WDMX(3),WSMN(3),WSMX(3),TMN(3),TMX(3),
     1 DMN(3),DMX(3),DTMN(3),DTMX(3),NWD(3),NWS(3),NT(3),ND(3),
     2 NDT(3)
C
C     INITIALIZE
C
      DATA WDMN,WSMN,TMN,DMN,DTMN,PMN/16*999.9/
      DATA WDMX,WSMX,TMX,DMX,DTMX,PMX/16*-99.9/
      DATA NWD,NWS,NT,ND,NDT,NP/16*0/
C
      CALL PHR240 (TODAY)
C
      DO 12 I=1,3
      KX(I)=1
      KT(I)=1
   12 KT(I+3)=0
      DO 13 I=1,18
   13 NS(I)=0
      KP=1
      JA=1
      JB=1
      JC=1
      INC=59
      ICHK=0
      IPAGE=1
C
C     READ INPUT CARD
C
```

```
C     LEV...LEVEL OF MEASUREMENTS DESIRED:
C               UPPER (U) ONLY , LEV=1
C               UPPER (U) + LOWER (L) , LEV=2
C               UPPER (U), INTERMEDIATE (I) + LOWER (L) , LEV=3
C               LOWER (L), ONLY , LEV=4
C     IS....DELTA T FOR LEVELS DESIRED:  U-L,IS=1 : U-I,IS=2 :
C                                        I-L,IS=3 : U-L,U-I,IS=4 :
C                                        U-L,I-L,IS=5 : U-I,I-L,IS=6 :
C                                        I-L,U-I,U-L,IS=7
C        IF NO STABILITY MEASUREMENTS ARE DESIRED, IS=0
C     IW....TO CHECK WIND SPEED + DIRECTION, IW=1   (IF NOT, IW=0)
C     IT....TO CHECK TEMPERATURE, IT=1   (IF NOT, IT=0)
C     ID....TO CHECK DEW POINT WITH TEMPERATURE, ID=1   (IF NOT, ID=0)
C     IP....TO CHECK PRECIPITATION, IP=1   (IF NOT, IP=0)
C
C     LY1.... YEAR CHECKING IS TO BEGIN
C     LM1.... MONTH CHECKING IS TO BEGIN
C     LD1.... DAY CHECKING IS TO BEGIN
C     LY2.... YEAR CHECKING IS TO END
C     LM2.... MONTH CHECKING IS TO END
C     LD2.... DAY CHECKING IS TO END
C
      READ(5,15) LEV,IS,IW,IT,ID,IP,LY1,LM1,LD1,LY2,LM2,LD2,TITLE
   15 FORMAT(6I1,2(1X,3I2)/18A4)
      CALL HEAD1(INC,TITLE,IPAGE)
      CALL HEAD2(LEV,IS,IW,IT,ID,IP)
      INC=58
      IF(ID.EQ.1) IT=1
C
      CALL IDAT(LD1,LM1,LY1,LD3)
      CALL IDAT(LD2,LM2,LY2,LD4)
      ISTRT=LY1*1000+LD3
      ISTOP=LY2*1000+LD4
C
C     READ AND WRITE TITLE FROM DATA FILE
C
      READ(1,35) AB
      PRINT 36, AB
   35 FORMAT(4(40A4/),40A4)
   36 FORMAT('0',20A4/9(' ',20A4/))
      CALL HEAD1(INC,TITLE,IPAGE)
C
C     READ DATA FROM DATA FILE AND MAKE APPROPRIATE CHECKS
C
  101 CONTINUE
      READ(1,41,END=103) IY1,ID1,IH1,EL1,WD1(1),WS1(1),T1(1),D1(1),
     1EL2,WD1(2),WS1(2),T1(2),D1(2),EL3,WD1(3),WS1(3),T1(3),D1(3),
     2 (DT1(I),I=1,3),P1,(C(I),I=1,16)
   41 FORMAT(6X,I2,I3,I4,3(3F5.1,5X,2F5.1,5X),4F5.1,
     * T16,3(6X,A4,1X,A4,6X,A4,1X,A4,5X),4(1X,A4))
      IDATE=IY1*1000+ID1
      IF(IDATE.LT.ISTRT) GO TO 101
      IF(IDATE.GT.ISTOP) GO TO 103
C
      CALL BLNK
C
C.....DETERMINE MAXIMUM AND MINIMUM OF EACH VALUE
C
      DO 48 N=1,3
      IF(WD1(N).GT.365. .OR. WD1(N).LT.0.) GO TO 43
```

```
121.            IF(WD1(N).LT.WDMN(N)) WDMN(N)=WD1(N)
122.            IF(WD1(N).GT.WDMX(N)) WDMX(N)=WD1(N)
123.            NWD(N)=NWD(N)+1
124.         43 IF(WS1(N).GT.99.9 .OR. WS1(N).LT.0.) GO TO 44
125.            IF(WS1(N).LT.WSMN(N)) WSMN(N)=WS1(N)
126.            IF(WS1(N).GT.WSMX(N)) WSMX(N)=WS1(N)
127.            NWS(N)=NWS(N)+1
128.         44 IF(T1(N).GT.99.9 .OR. T1(N).LT.-99.9) GO TO 45
129.            IF(T1(N).LT.TMN(N)) TMN(N)=T1(N)
130.            IF(T1(N).GT.TMX(N)) TMX(N)=T1(N)
131.            NT(N)=NT(N)+1
132.         45 IF(D1(N).GT.100. .OR. D1(N).LT.-99.9) GO TO 46
133.            IF(D1(N).LT.DMN(N)) DMN(N)=D1(N)
134.            IF(D1(N).GT.DMX(N)) DMX(N)=D1(N)
135.            ND(N)=ND(N)+1
136.         46 IF(DT1(N).GT.35.0 .OR. DT1(N).LT.-7.0) GO TO 48
137.            IF(DT1(N).LT.DTMN(N)) DTMN(N)=DT1(N)
138.            IF(DT1(N).GT.DTMX(N)) DTMX(N)=DT1(N)
139.            NDT(N)=NDT(N)+1
140.         48 CONTINUE
141.            IF(P1.GT.254. .OR. P1.LT.0.) GO TO 49
142.            IF(P1.LT.PMN) PMN=P1
143.            IF(P1.GT.PMX) PMX=P1
144.            NP=NP+1
145.         49 CONTINUE
146.      C
147.            IF(IW.EQ.1) CALL WSWDQ
148.            IF(IT.EQ.1) CALL TEMPQ
149.            IF(IP.EQ.1) CALL PCPQ
150.            IF(IS.NE.0) CALL STABQ1
151.            IF(IS.NE.0) CALL STABQ2
152.      C
153.      C     REINITIALIZE VARIABLES
154.      C
155.            ICHK=1
156.            IY2=IY1
157.            ID2=ID1
158.            IH2=IH1
159.            DO 50 N=1,3
160.            WS2(N)=WS1(N)
161.            WD2(N)=WD1(N)
162.            DT2(N)=DT1(N)
163.            T2(N)=T1(N)
164.            CALL SECTOR(WD2(N),JJ(N))
165.         50 CONTINUE
166.            P2=P1
167.            GO TO 101
168.      C
169.      C     CHECK LAST DATA RECORD AND PRINT RESULTS
170.      C
171.        103 ICHK=3
172.            IF(IS.NE.0) CALL STABQ2
173.            IF(IT.EQ.1) CALL TEMPQ
174.            IF(IP.EQ.1) CALL PCPQ
175.            IF(IW.EQ.1) CALL WSWDQ
176.            IF(IW.NE.1) GO TO 75
177.            INC=59
178.            CALL HEAD1(INC,TITLE,IPAGE)
179.            CALL HEAD3
180.         75 INC=59
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      CALL HEAD1(INC,TITLE,IPAGE)
C
      PRINT 80, EL1,EL2,EL3,((NWD(I),WDMN(I),WDMX(I)),I=1,3),
     1 ((NWS(I),WSMN(I),WSMX(I)),I=1,3),
     2 ((NT(I),TMN(I),TMX(I)),I=1,3),
     3 ((ND(I),DMN(I),DMX(I)),I=1,3)
   80 FORMAT('0',T35,'SUMMARY OF MAXIMUM AND MINIMUN VALUES'//'0',
     1 14X,3(17X,F5.1,' M')/' ',T26,3(19('-'),5X)/'0',
     2 T26,3(' HRS    MIN    MAX ',5X)/' ',
     3 T26,3('-----  -----  -----',5X)/'0',
     4 'WIND DIRECTION (DEG)',T26,3(I5,2F7.1,5X)/'0',
     5 'WIND SPEED (M/S)    ',T26,3(I5,2F7.1,5X)/'0',
     6 'TEMPERATURE (DEG C) ',T26,3(I5,2F7.1,5X)/'0',
     7 'MOISTURE (DEG C OR %)',T26,3(I5,2F7.1,5X))
      PRINT 81, EL1,EL3,EL1,EL2,EL2,EL3,
     * ((NDT(I),DTMN(I),DTMX(I)),I=1,3)
   81 FORMAT(///'0',T26,3(2X,F5.1,' - ',F5.1,' M',7X)/' ',
     1 T26,3(19('-'),5X)/'0',
     2 'DELTA T (DEG C/100M) ',T26,3(I5,2F7.1,5X))
      IF(IP.EQ.1) PRINT 82, NP,PMN,PMX
   82 FORMAT(///'0',T78,'GROUND LEVEL'/' ',T74,19('-')/'0',
     1 'PRECIPITATION (MM)',T74,I5,2F7.1)
C
      PRINT 90
   90 FORMAT('1','*****  LAST DATA RECORD HAS BEEN READ  *****'/'0'
     1'***** EXECUTION SUCCESFULLY TERMINATED *****')
   98 STOP
      END
      SUBROUTINE BLNK
C
C.....CHECK FOR BLANK DATA FIELDS AND REPLACE AS MISSING
C
      COMMON/DATA3/WS1(3),WS2(3),WD1(3),WD2(3),T1(3),T2(3),
     * DT1(3),DT2(3),P1,P2,D1(3)
      COMMON/DATA6/C(16)
      DATA BK/'    '/,S/9999.9/
C
      N=-3
      M=12
      DO 10 I=1,3
      N=N+4
      IF(C(N).EQ.BK) WD1(I)=S
      IF(C(N+1).EQ.BK) WS1(I)=S
      IF(C(N+2).EQ.BK) T1(I)=S
      IF(C(N+3).EQ.BK) D1(I)=S
      IF(C(M+I).EQ.BK) DT1(I)=S
   10 CONTINUE
      IF(C(16).EQ.BK) P1=S
      RETURN
      END
      SUBROUTINE DNQ(IY,ID,IH,K,E1,E2)
C
C.....SUBROUTINE DNQ CHECKS FOR STABLE CONDITIONS DURING THE DAY AN
C     UNSTABLE CONDITIONS AT NIGHT
C
      COMMON/DATA5/IPAGE,INC,TITLE
      DIMENSION NN(7),KK(3)
      DATA NN/'   A','   B','   C','   D','   E','   F','   G'/
C
      IF(ID.LE.81) GO TO 20
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241.            IF(ID.LE.172) GO TO 19
242.            IF(ID.LE.263) GO TO 18
243.            IF(ID.LE.357) GO TO 19
244.            GO TO 20
245.      C
246.         19 IF(IH.GE.700 .AND. IH.LE.1800) GO TO 23
247.            GO TO 22
248.         18 IF(IH.GE.600 .AND. IH.LE.1900) GO TO 23
249.            GO TO 22
250.         20 IF(IH.GE.800 .AND. IH.LE.1700) GO TO 23
251.         22 IF(K.GT.3) GO TO 75
252.            PRINT 100,IY,ID,IH,NN(K),E1,E2
253.            INC=INC+1
254.            CALL HEAD1(INC,TITLE,IPAGE)
255.            GO TO 75
256.         23 IF(K.LT.6) GO TO 75
257.            PRINT 101,IY,ID,IH,NN(K),E1,E2
258.            INC=INC+1
259.            CALL HEAD1(INC,TITLE,IPAGE)
260.        100 FORMAT(' ',I3,I4,I5,3X,'STABILITY CLASS',
261.           1A4,'  DURING NIGHT BETWEEN',F6.1,'M AND',F6.1,'M')
262.        101 FORMAT(' ',I3,I4,I5,3X,'STABILITY CLASS',
263.           1A4,'  DURING DAY BETWEEN',F6.1,'M AND',F6.1,'M')
264.         75 RETURN
265.            END
266.            SUBROUTINE HEAD1(INC,TITLE,IPAGE)
267.      C
268.      C.....PRINT HEADER ON EACH PAGE
269.      C
270.            COMMON/DATA8/TODAY(8)
271.            DIMENSION TITLE(18)
272.      C
273.            IF(INC.LT.54) RETURN
274.            PRINT 100, TODAY,IPAGE,TITLE
275.            IF(INC.NE.59) PRINT 101
276.        100 FORMAT('1','PROGRAM: QA',9X,'VERSION: 2',9X,'DATED:',
277.           * ' FEBRUARY 1982',9X,'RUN DATE: ',8A4,9X,'PAGE:',I4/'0',18A4)
278.        101 FORMAT('0',' YR DAY HOUR'/'+',' -- --- ----')
279.            INC=0
280.            IPAGE=IPAGE+1
281.            RETURN
282.            END
283.            SUBROUTINE HEAD2(LEV,IS,IW,IT,ID,IP)
284.      C
285.      C.....PRINT INPUT INFORMATION
286.      C
287.            REAL*8 S
288.            COMMON/DATA7/LY1,LM1,LD1,IY2,LM2,LD2
289.            DIMENSION S(4),R(2)
290.      C
291.            DATA S/'   UPPER',',   INTER','MEDIATE ',',   LOWER'/
292.            DATA R/'NO  ','YES '/
293.      C
294.            PRINT 100
295.        100 FORMAT('0','CHECK FOLLOWING LEVEL(S) OF DATA: ')
296.            GO TO (24,20,20,20),LEV
297.         20 PRINT 101, S(4)
298.        101 FORMAT(' ',10X,2A8)
299.            GO TO (24,24,22,26),LEV
300.         22 PRINT 101, S(2),S(3)
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      24 PRINT 101, S(1)
      26 CONTINUE
C
      PRINT 105
  105 FORMAT('0','CHECK FOLLOWING DELTA-T INTERVALS:')
      IF(IS.EQ.0) GO TO 35
      GO TO (34,32,30,32,30,30,30),IS
   30 PRINT 106, S(2),S(3),S(4)
  106 FORMAT(' ',5X,2A8,' MINUS',2A8)
  107 FORMAT(' ',5X,A8,8X,' MINUS',2A8)
      GO TO (34,32,38,32,34,32,32),IS
   32 PRINT 107, S(1),S(2),S(3)
      GO TO (34,38,38,34,34,38,34),IS
   34 PRINT 107, S(1),S(4)
      GO TO 38
   35 PRINT 109
  109 FORMAT(' ',22X,'NONE')
   38 CONTINUE
C
      L=IW+1
      PRINT 110, R(L)
  110 FORMAT('0','CHECK WIND SPEED AND DIRECTION: ',A4)
      L=IT+1
      PRINT 115, R(L)
  115 FORMAT('0','CHECK TEMPERATURE: ',A4)
      L=ID+1
      PRINT 120, R(L)
  120 FORMAT('0','CHECK DEW POINT: ',A4)
      L=IP+1
      PRINT 125, R(L)
  125 FORMAT('0','CHECK PRECIPITATION: ',A4)
C
      PRINT 130, LY1,LM1,LD1,LY2,LM2,LD2
  130 FORMAT('0','CHECK DATA:  BEGINING - ',3I3/'
     *           '                ENDING    - ',3I3)
C
      PRINT 150
  150 FORMAT('0','SITE:')
C
      RETURN
      END
      SUBROUTINE HEAD3
C
C.....SUBROUTININE HEAD3 PRINTS OUT WIND SPEED AND DIRECTION DATA
C
      COMMON/DATA1/LEV,IS,EL1,EL2,EL3,ICHK,NS(18),IP,ID
      DIMENSION NNN(16)
      DATA NNN/'   N',' NNE',' NE',' ENE','   E',' ESE',' SE',' SSE',
     1'   S',' SSW',' SW',' WSW','   W',' WNW',' NW',' NNW'/
C
      GO TO (25,20,15,25),LEV
   15 PRINT 100, EL1,EL2,NS(17)
      PRINT 100, EL2,EL3,NS(18)
      PRINT 100, EL1,EL3,NS(16)
      PRINT 101, EL1,EL2,NS(9)
      PRINT 101, EL2,EL3,NS(14)
      PRINT 101, EL1,EL3,NS(4)
      PRINT 102, EL1,EL2,NS(10)
      PRINT 102, EL2,EL3,NS(15)
      PRINT 102, EL1,EL3,NS(5)
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      PRINT 103, EL1,EL2,NS(6),NS(7),NS(8)
      PRINT 103, EL2,EL3,NS(11),NS(12),NS(13)
      PRINT 103, EL1,EL3,NS(1),NS(2),NS(3)
      GO TO 25
   20 CONTINUE
      PRINT 100, EL1,EL3,NS(16)
      PRINT 101, EL1,EL3,NS(4)
      PRINT 102, EL1,EL3,NS(5)
      PRINT 103, EL1,EL3,NS(1),NS(2),NS(3)
   25 CONTINUE
  100 FORMAT('0','NUMBER OF OCCURRANCES OF WS AT',F6.1,
     1'M LOWER THEN THE WS AT',F6.1,'M EQUALS',I7)
  101 FORMAT('0','NUMBER OF OCCURRANCES OF WD AT',F6.1,
     1'M EQUAL TO WD AT',F6.1,'M EQUALS',I7)
  102 FORMAT('0','NUMBER OF OCCURRANCES OF WS AT',F6.1,
     1'M EQUAL TO WS AT',F6.1,'M EQUALS',I7)
  103 FORMAT('0','WD DIFFERENCE BETWEEN',F6.1,'M AND',F6.1,
     1'M IS GREATER THEN OR EQUAL TO 22.5 DEGREES AND'/' ',10X,
     2'WS AT EITHER LEVEL IS GREATER THEN OR EQUAL TO 2.5M/SEC',
     36X,'OCCURRANCES=',I5/' ',10X,'WS AT EITHER LEVEL IS GREATER',
     4' THEN OR EQUAL TO 5.0M/SEC',5X,' OCCURRANCES=',I5/' ',10X,
     5'WS AT EITHER LEVEL IS GREATER THEN OR EQUAL TO 7.5M/SEC',5X,
     6' OCCURRANCES=',I5)
      RETURN
      END
      SUBROUTINE IDAY (ID,IM,IY,JD)
C
C.....THIS SUBROUTINE CHANGES MONTH AND DAY TO JULIAN DAY
C
      DIMENSION MON(12)
      DATA MON/0,31,59,90,120,151,181,212,243,273,304,334/
      JD=MON(IM)
      JD=JD+ID
      YR=IY*0.25
      IYR=YR
      S=YR-IYR
      IF (S.EQ.0.0.AND.JD.GT.59) JD=JD+1
      RETURN
      END
       SUBROUTINE PCPQ
C
      COMMON/DATA1/LEV,IS,EL1,EL2,EL3,ICHK,NS(18),IP,ID
      COMMON/DATA2/IY1,IY2,ID1,ID2,IH1,IH2
      COMMON/DATA3/WS1(3),WS2(3),WD1(3),WD2(3),T1(3),T2(3),
     * DT1(3),DT2(3),P1,P2,D1(3)
      COMMON/DATA4/KX(3),JJ(3),KP,KT(6),JA,JB,JC
      COMMON/DATA5/IPAGE,INC,TITLE
C
C.....SUBROUTINE PCPQ CHECKS FOR PRECIP OCCURING GREATER THAN
C     8 CONSECUTIVE HOURS AND FOR 1 HOUR PRECIPITATION
C     GREATER THAN OR = 25MM (1INCH)
C
      IF(ICHK.EQ.3) GO TO 60
      IF(P1.GT.254. .OR. P1.LT.0.) GO TO 60
      IF(P1.LT.25.0) GO TO 55
      PRINT 100, IY1,ID1,IH1,P1
      INC=INC+1
      CALL HEAD1(INC,TITLE,IPAGE)
   55 IF(ICHK.EQ.0) GO TO 99
      IF(P2.GT.254. .OR. P2.LT.0.) GO TO 60
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421.            IF(P1.GT.0.0 .AND. P2.GT.0.0) GO TO 75
422.         60 IF(KP.LT.9) GO TO 70
423.            PRINT 101,IY2,ID2,IH2,KP
424.            INC=INC+1
425.            CALL HEAD1(INC,TITLE,IPAGE)
426.         70 CONTINUE
427.            KP=1
428.            GO TO 99
429.         75 KP=KP+1
430.         99 CONTINUE
431.        100 FORMAT(' ',I3,I4,I5,3X,'PRECIPITATION',
432.           1 ' OF',F7.1,'MM FELL IN THE GIVEN 1 HOUR PERIOD')
433.        101 FORMAT(' ',I3,I4,I5,3X,'PRECIPITATION ',
434.           1'FELL FOR THE PREVIOUS',I3,' HOURS CONSECUTIVELY')
435.            RETURN
436.            END
437.            SUBROUTINE SECTOR(X,J)
438.      C
439.      C.....COMPUTE THE WIND DIRECTION SECTOR
440.      C
441.            J = 1 + (( X + 11.25 ) / 22.5 )
442.            IF(J.EQ.17) J=1
443.            IF(X.GT.365. .OR. X.LT.0.) J=-1
444.      C
445.            RETURN
446.            END
447.            SUBROUTINE STABLE(DELTAT,K)
448.      C
449.      C.........STABILITIES: K=1,2,3,..., STABLITY=A,B,C,...
450.      C
451.            DIMENSION S(6)
452.            DATA S/-1.9,-1.7,-1.5,-0.5,1.5,4.0/
453.      C
454.            DO 100 K=1,6
455.          100 IF(DELTAT.LE.S(K)) RETURN
456.            K=7
457.            RETURN
458.            END
459.            SUBROUTINE STABQ1
460.      C
461.            COMMON/DATA1/LEV,IS,EL1,EL2,EL3,ICHK,NS(18),IP,ID
462.            COMMON/DATA2/IY1,IY2,ID1,ID2,IH1,IH2
463.            COMMON/DATA3/WS1(3),WS2(3),WD1(3),WD2(3),T1(3),T2(3),
464.           * DT1(3),DT2(3),P1,P2,D1(3)
465.            COMMON/DATA5/IPAGE,INC,TITLE
466.      C
467.      C.....SUBROUTINE STABQ1 CHECKS FOR STABLE OR UNSTABLE CONDITIONS
468.      C      WITH WS GREATER THAN 7.5M/SEC
469.      C    ..CHECKS FOR DELTA T LESS THAN -3.4 DEGREES C PER 100METERS
470.      C      (AUTOCONVECTIVE LAPSE RATE)
471.      C    ..CHECKS FOR STABLE OR UNSTABLE CONDITIONS DURING PRECIPITATION
472.      C
473.            DIMENSION NN(7)
474.            DATA NN/'   A',   B',   C',   D',   E',   F',   G'/
475.      C
476.            GO TO (13,20,20,13,13,20,13),IS
477.         13 IF(DT1(1).GT.35. .OR. DT1(2).LT.-7.) GO TO 20
478.            CALL STABLE(DT1(1),K)
479.            IF(K.EQ.4 .OR. K.EQ.5) GO TO 18
480.            IF(WS1(1).GT.99.9 .OR. WS1(1).LT.0.) GO TO 15
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481.            IF(WS1(1).GT.7.5) GO TO 16
482.         15 IF(WS1(3).GT.99.9 .OR. WS1(3).LT.0.) GO TO 17
483.            IF(WS1(3).GT.7.5) GO TO 16
484.            GO TO 17
485.         16 PRINT 100, IY1,ID1,IH1,NN(K),EL1,EL3
486.            INC=INC+1
487.            CALL HEAD1(INC,TITLE,IPAGE)
488.         17 IF(P1.LE.0. .OR. P1.GT.254.) GO TO 19
489.            IF(IP.NE.1) GO TO 19
490.            PRINT 101, IY1,ID1,IH1,NN(K),EL1,EL3
491.            INC=INC+1
492.            CALL HEAD1(INC,TITLE,IPAGE)
493.         19 IF(DT1(1).GE.-3.4) GO TO 18
494.            PRINT 102,IY1,ID1,IH1,DT1(1)
495.            INC=INC+1
496.            CALL HEAD1(INC,TITLE,IPAGE)
497.         18 CONTINUE
498.            CALL DNQ(IY1,ID1,IH1,K,EL1,EL3)
499.      C
500.         20 GO TO (30,23,30,23,30,23,23),IS
501.         23 IF(DT1(2).GT.35. .OR. DT1(2).LT.-7.) GO TO 30
502.            CALL STABLE(DT1(2),L)
503.            IF(L.EQ.4 .OR. L.EQ.5) GO TO 28
504.            IF(WS1(1).GT.99.9 .OR. WS1(1).LT.0.) GO TO 25
505.            IF(WS1(1).GT.7.5) GO TO 26
506.         25 IF(WS1(2).GT.99.9 .OR. WS1(2).LT.0.) GO TO 27
507.            IF(WS1(2).GT.7.5) GO TO 26
508.            GO TO 27
509.         26 PRINT 100, IY1,ID1,IH1,NN(L),EL1,EL2
510.            INC=INC+1
511.            CALL HEAD1(INC,TITLE,IPAGE)
512.         27 IF(P1.LE.0. .OR. P1.GT.254.) GO TO 29
513.            IF(IP.NE.1) GO TO 29
514.            PRINT 101, IY1,ID1,IH1,NN(L),EL1,EL2
515.            INC=INC+1
516.            CALL HEAD1(INC,TITLE,IPAGE)
517.         29 IF(DT1(2).GE.-3.4) GO TO 28
518.            PRINT 102, IY1,ID1,IH1,DT1(2)
519.            INC=INC+1
520.            CALL HEAD1(INC,TITLE,IPAGE)
521.         28 CONTINUE
522.            CALL DNQ(IY1,ID1,IH1,L,EL1,EL2)
523.      C
524.         30 GO TO (40,40,33,40,33,33,33),IS
525.         33 IF(DT1(3).GT.35. .OR. DT1(3).LT.-7.) GO TO 40
526.            CALL STABLE(DT1(3),M)
527.            IF(M.EQ.4 .OR. M.EQ.5) GO TO 38
528.            IF(WS1(2).GT.99.9 .OR. WS1(2).LT.0.) GO TO 35
529.            IF(WS1(2).GT.7.5) GO TO 36
530.         35 IF(WS1(3).GT.99.9 .OR. WS1(3).LT.0.) GO TO 37
531.            IF(WS1(3).GT.7.5) GO TO 36
532.            GO TO 37
533.         36 PRINT 100, IY1,ID1,IH1,NN(M),EL2,EL3
534.            INC=INC+1
535.            CALL HEAD1(INC,TITLE,IPAGE)
536.         37 IF(P1.LE.0. .OR. P1.GT.254.) GO TO 39
537.            IF(IP.NE.1) GO TO 39
538.            PRINT 101, IY1,ID1,IH1,NN(M),EL2,EL3
539.            INC=INC+1
540.            CALL HEAD1(INC,TITLE,IPAGE)
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      39 IF(DT1(3).GE.-3.4) GO TO 38
         PRINT 102, IY1,ID1,IH1,DT1(3)
         INC=INC+1
         CALL HEAD1(INC,TITLE,IPAGE)
      38 CONTINUE
         CALL DNQ(IY1,ID1,IH1,M,EL2,EL3)
      40 CONTINUE
C
     100 FORMAT(' ',I3,I4,I5,3X,'WIND SPEED ',
        1'GREATER THEN 7.5M/SEC FOR STABILITY CLASS',A4,
        2'  BETWEEN',F6.1,'M AND',F6.1,'M')
     101 FORMAT(' ',I3,I4,I5,3X,
        1'PRECIPITATION OCCURED DURING STABILITY CLASS',A4,
        2'  BETWEEN',F6.1,'M AND',F6.1,'M')
     102 FORMAT(' ',I3,I4,I5,3X,'LAPSE RATE OF ',
        1F6.1,' DEGREES C/100METERS EXCEEDS THE AUTOCONVECTIVE LAPSE RATE')
         RETURN
         END
         SUBROUTINE STABQ2
C
         COMMON/DATA1/LEV,IS,EL1,EL2,EL3,ICHK,NS(18),IP,ID
         COMMON/DATA2/IY1,IY2,ID1,ID2,IH1,IH2
         COMMON/DATA3/WS1(3),WS2(3),WD1(3),WD2(3),T1(3),T2(3),
        * DT1(3),DT2(3),P1,P2,D1(3)
         COMMON/DATA4/KX(3),JJ(3),KP,KT(6),JA,JB,JC
         COMMON/DATA5/IPAGE,INC,TITLE
C
C.....SUBROUTINE STABQ2 CHECKS FOR A GREATER THEN 3 STABILITY
C     CLASS JUMP FROM ONE HOUR TO THE NEXT
C   ..CHECKS FOR SAME STABILITY CLASS GREATER THAN 12 CONSECUTIVE HOURS
C
         DIMENSION NN(7)
         DATA M1,M2,M3/0,0,0/
         DATA NN/'   A',',   B',',   C',',   D',',   E',',   F',',   G'/
         IF(ICHK.EQ.0) GO TO 52
C
         GO TO (15,19,19,15,15,19,15),IS
      15 IF(ICHK.EQ.3) GO TO 20
         IF(DT1(1).GT.35. .OR. DT2(1).GT.35.) GO TO 16
         IF(DT1(1).LT.-7. .OR. DT2(1).LT.-7.) GO TO 16
         CALL STABLE(DT1(1),KA)
         CALL STABLE(DT2(1),KB)
         M1=1
         KC=IABS(KA-KB)
         IF(KC.LE.3) GO TO 14
         PRINT 100, IY1,ID1,IH1,NN(KB),NN(KA),EL1,EL3
         INC=INC+1
         CALL HEAD1(INC,TITLE,IPAGE)
      14 IF(KA.EQ.KB) GO TO 17
      20 IF(JA.GT.12) GO TO 18
      16 JA=1
         GO TO 19
      17 JA=JA+1
         GO TO 19
      18 PRINT 101, IY1,ID1,IH1,NN(KB),JA,EL1,EL3
         INC=INC+1
         CALL HEAD1(INC,TITLE,IPAGE)
         JA=1
C
      19 IF(IS.EQ.2 .OR. IS.EQ.4 .OR. IS.EQ.6 .OR. IS.EQ.7) GO TO 25
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601.            GO TO 29
602.         25 IF(ICHK.EQ.3) GO TO 24
603.            IF(DT1(2).GT.35. .OR. DT2(2).GT.35.) GO TO 26
604.            IF(DT1(2).LT.-7. .OR. DT2(2).LT.-7.) GO TO 26
605.            CALL STABLE(DT1(2),KD)
606.            CALL STABLE(DT2(2),KE)
607.            M2=1
608.            KF=IABS(KD-KE)
609.            IF(KF.LE.3) GO TO 23
610.            PRINT 100, IY1,ID1,IH1,NN(KE),NN(KD),EL1,EL2
611.            INC=INC+1
612.            CALL HEAD1(INC,TITLE,IPAGE)
613.         23 IF(KD.EQ.KE) GO TO 27
614.         24 IF(JB.GT.12) GO TO 28
615.         26 JB=1
616.            GO TO 29
617.         27 JB=JB+1
618.            GO TO 29
619.         28 PRINT 101, IY1,ID1,IH1,NN(KE),JB,EL1,EL2
620.            INC=INC+1
621.            CALL HEAD1(INC,TITLE,IPAGE)
622.            JB=1
623.      C
624.         29 GO TO (39,39,35,39,35,35,35),IS
625.         35 IF(ICHK.EQ.3) GO TO 34
626.            IF(DT1(3).GT.35. .OR. DT2(3).GT.35.) GO TO 36
627.            IF(DT1(3).LT.-7. .OR. DT2(3).LT.-7.) GO TO 36
628.            CALL STABLE(DT1(3),KG)
629.            CALL STABLE(DT2(3),KH)
630.            M3=1
631.            KI=IABS(KG-KH)
632.            IF(KI.LE.3) GO TO 33
633.            PRINT 100, IY1,ID1,IH1,NN(KH),NN(KG),EL2,EL3
634.            INC=INC+1
635.            CALL HEAD1(INC,TITLE,IPAGE)
636.         33 IF(KG.EQ.KH) GO TO 37
637.         34 IF(JC.GT.12) GO TO 38
638.         36 JC=1
639.            GO TO 39
640.         37 JC=JC+1
641.            GO TO 39
642.         38 PRINT 101, IY1,ID1,IH1,NN(KH),JC,EL2,EL3
643.            INC=INC+1
644.            CALL HEAD1(INC,TITLE,IPAGE)
645.            JC=1
646.         39 CONTINUE
647.            IF(ICHK.EQ.3) GO TO 52
648.      C
649.      C      CHECK FOR GREATER THAN 2 STABILITY CLASS DIFFERENCE BETWEEN
650.      C      TWO DIFFERENT STABILITY INTERVALS
651.      C
652.            IF(IS.NE.5 .AND. IS.NE.7) GO TO 50
653.            IF(M1.EQ.0 .OR. M3.EQ.0) GO TO 50
654.            JZ=IABS(KA-KG)
655.            IF(JZ.LT.3) GO TO 50
656.            PRINT 102, IY1,ID1,IH1,EL1,EL2,NN(KA),EL2,EL3,NN(KG)
657.            INC=INC+1
658.            CALL HEAD1(INC,TITLE,IPAGE)
659.         50 IF(IS.NE.6 .AND. IS.NE.7) GO TO 51
660.            IF(M2.EQ.0 .OR. M3.EQ.0) GO TO 51
```

```
661.            JZ=IABS(KD-KG)
662.            IF(JZ.LT.3) GO TO 51
663.            PRINT 102, IY1,ID1,IH1,EL1,EL2,NN(KD),EL2,EL3,NN(KG)
664.            INC=INC+1
665.            CALL HEAD1(INC,TITLE,IPAGE)
666.         51 IF(IS.NE.4 .AND. IS.NE.7) GO TO 52
667.            IF(M1.EQ.0 .OR. M2.EQ.0) GO TO 52
668.            JZ=IABS(KA-KD)
669.            IF(JZ.LT.3) GO TO 52
670.            PRINT 102, IY1,ID1,IH1,EL1,EL3,NN(KA),EL1,EL2,NN(KD)
671.            INC=INC+1
672.            CALL HEAD1(INC,TITLE,IPAGE)
673.      C
674.        100 FORMAT(' ',I3,I4,I5,3X,'STABILITY CLASS',
675.           1' JUMPED FROM',A4,'  TO',A4,' OVER ONE HOUR PERIOD',
676.           2 ' BETWEEN',F6.1,'M AND',F6.1,'M')
677.        101 FORMAT(' ',I3,I4,I5,3X,'STABILITY CLASS',
678.           1 A4,' LASTED FOR PREVIOUS',I4,' HOUR PERIOD',
679.           2 ' BETWEEN',F6.1,'M AND',F6.1,'M')
680.        102 FORMAT(' ',I3,I4,I5,3X,'STABILITY FOR',
681.           1F6.1,'M MINUS',F6.1,'M IS',A4,' WHILE STABILITY FOR',F6.1,
682.           2'M MINUS',F6.1,'M IS',A4)
683.         52 RETURN
684.            END
685.            SUBROUTINE TEMPQ
686.      C
687.            COMMON/DATA1/LEV,IS,EL1,EL2,EL3,ICHK,NS(18),IP,ID
688.            COMMON/DATA2/IY1,IY2,ID1,ID2,IH1,IH2
689.            COMMON/DATA3/WS1(3),WS2(3),WD1(3),WD2(3),T1(3),T2(3),
690.           * DT1(3),DT2(3),P1,P2,D1(3)
691.            COMMON/DATA4/KX(3),JJ(3),KP,KT(6),JA,JB,JC
692.            COMMON/DATA5/IPAGE,INC,TITLE
693.      C
694.      C.....SUBROUTINE TEMPQ CHECKS FOR :
695.      C         DEW POINT (DP) GREATER THAN TEMPERATURE (T)
696.      C         T MINUS DP GREATER THAN OR EQUAL TO 5 DEG C DURING PRECIP
697.      C         T EQUAL TO DP FOR 8 OR MORE CONSECUTIVE HOURS
698.      C         SAME TEMPERATURE FOR 8 OR MORE CONSECUTIVE HOURS
699.      C
700.            IF(ICHK.EQ.0) GO TO 182
701.            GO TO (75,50,25,50),LEV
702.         25 IF(ICHK.EQ.3 .AND. KT(2).GE.8) GO TO 28
703.            IF(T1(2).GT.99.9 .OR. T1(2).LT.-99.9) GO TO 26
704.            IF(T2(2).LE.99.9 .AND. T2(2).GE.-99.9) GO TO 27
705.         26 IF(KT(2).GE.8) GO TO 28
706.            GO TO 29
707.         27 IF(T1(2).EQ.T2(2)) GO TO 30
708.            IF(KT(2).LT.8) GO TO 29
709.         28 PRINT 100, IY2,ID2,IH2,EL2,T2(2),KT(2)
710.            INC=INC+1
711.            CALL HEAD1(INC,TITLE,IPAGE)
712.        100 FORMAT(' ',I3,I4,I5,3X,'HEIGHT=',F6.1,
713.           1'M',3X,'TEMPERATURE=',F6.1,'DEGREES C FOR PREVIOUS',I5,
714.           2' HOUR PERIOD')
715.         29 KT(2)=1
716.            GO TO 50
717.         30 KT(2)=KT(2)+1
718.         50 CONTINUE
719.            IF(ICHK.EQ.3 .AND. KT(3).GE.8) GO TO 58
720.            IF(T1(3).GT.99.9 .OR. T1(3).LT.-99.9) GO TO 56
```

```
721.            IF(T2(3).LE.99.9 .AND. T2(3).GE.-99.9) GO TO 57
722.         56 IF(KT(3).GE.8) GO TO 58
723.            GO TO 59
724.         57 IF(T1(3).EQ.T2(3)) GO TO 60
725.            IF(KT(3).LT.8) GO TO 59
726.         58 PRINT 100, IY2,ID2,IH2,EL3,T2(3),KT(3)
727.            INC=INC+1
728.            CALL HEAD1(INC,TITLE,IPAGE)
729.         59 KT(3)=1
730.            GO TO 74
731.         60 KT(3)=KT(3)+1
732.         74 IF(LEV.EQ.4) GO TO 82
733.         75 CONTINUE
734.            IF(ICHK.EQ.3 .AND. KT(1).GE.8) GO TO 78
735.            IF(T1(1).GT.99.9 .OR. T1(1).LT.-99.9) GO TO 76
736.            IF(T2(1).LE.99.9 .AND. T2(1).GE.-99.9) GO TO 77
737.         76 IF(KT(1).GE.8) GO TO 78
738.            GO TO 79
739.         77 IF(T1(1).EQ.T2(1)) GO TO 81
740.            IF(KT(1).LT.8) GO TO 79
741.         78 PRINT 100, IY2,ID2,IH2,EL1,T2(1),KT(1)
742.            INC=INC+1
743.            CALL HEAD1(INC,TITLE,IPAGE)
744.         79 KT(1)=1
745.            GO TO 82
746.         81 KT(1)=KT(1)+1
747.         82 CONTINUE
748.      C
749.            IF(ID.NE.1) GO TO 500
750.      C
751.            GO TO (175,150,125,150),LEV
752.        125 IF(ICHK.EQ.3 .AND. KT(4).GE.8) GO TO 128
753.            IF(T1(2).GT.99.9 .OR. T1(2).LT.-99.9) GO TO 126
754.            IF(D1(2).LE.99.9 .AND. D1(2).GE.-99.9) GO TO 127
755.        126 IF(KT(4).GE.8) GO TO 128
756.            GO TO 129
757.        127 IF(T1(2).EQ.D1(2)) GO TO 130
758.            IF(KT(4).LT.8) GO TO 129
759.        128 PRINT 101, IY1,ID1,IH1,EL2,T1(2),KT(4)
760.            INC=INC+1
761.            CALL HEAD1(INC,TITLE,IPAGE)
762.        129 KT(4)=0
763.            GO TO 150
764.        130 KT(4)=KT(4)+1
765.        150 CONTINUE
766.            IF(ICHK.EQ.3 .AND. KT(5).GE.8) GO TO 158
767.            IF(T1(3).GT.99.9 .OR. T1(3).LT.-99.9) GO TO 156
768.            IF(D1(3).LE.99.9 .AND. D1(3).GE.-99.9) GO TO 157
769.        156 IF(KT(5).GE.8) GO TO 158
770.            GO TO 159
771.        157 IF(T1(3).EQ.D1(3)) GO TO 160
772.            IF(KT(5).LT.8) GO TO 159
773.        158 PRINT 101, IY1,ID1,IH1,EL3,T1(3),KT(5)
774.            INC=INC+1
775.            CALL HEAD1(INC,TITLE,IPAGE)
776.        159 KT(5)=0
777.            GO TO 174
778.        160 KT(5)=KT(5)+1
779.        174 IF(LEV.EQ.4) GO TO 182
780.        175 CONTINUE
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781.            IF(ICHK.EQ.3 .AND. KT(6).GE.8) GO TO 178
782.            IF(T1(1).GT.99.9 .OR. T1(1).LT.-99.9) GO TO 176
783.            IF(D1(1).LE.99.9 .AND. D1(1).GE.-99.9) GO TO 177
784.        176 IF(KT(6).GE.8) GO TO 178
785.            GO TO 179
786.        177 IF(T1(1).EQ.D1(1)) GO TO 181
787.            IF(KT(6).LT.8) GO TO 179
788.        178 PRINT 101, IY1,ID1,IH1,EL1,T1(1),KT(6)
789.            INC=INC+1
790.            CALL HEAD1(INC,TITLE,IPAGE)
791.        179 KT(6)=0
792.            GO TO 182
793.        181 KT(6)=KT(6)+1
794.        182 CONTINUE
795.        101 FORMAT(' ',I3,I4,I5,3X,'HEIGHT=',
796.           1F6.1,'M',3X,'TEMPERATURE EQUALS DEW POINT =',F6.1,
797.           2' DEGREES C FOR LAST ',I5,' HOURS')
798.        C
799.            IF(ICHK.EQ.3) GO TO 500
800.            GO TO (250,200,190,200),LEV
801.        190 IF(T1(2).GT.99.9 .OR. D1(2).GT.99.9) GO TO 200
802.            IF(T1(2).LT.-99.9 .OR. D1(2).LT.-99.9) GO TO 200
803.            IF(D1(2).LE.T1(2)) GO TO 195
804.            PRINT 102,IY1,ID1,IH1,EL2,D1(2),T1(2)
805.            INC=INC+1
806.            CALL HEAD1(INC,TITLE,IPAGE)
807.        195 IF(IP.EQ.0) GO TO 200
808.            IF(P1.LE.0. .OR. P1.GT.254.) GO TO 200
809.            DD=T1(2)-D1(2)
810.            IF(DD.LE.5.0) GO TO 200
811.            PRINT 103, IY1,ID1,IH1,EL2,DD,P1
812.            INC=INC+1
813.            CALL HEAD1(INC,TITLE,IPAGE)
814.        200 IF(T1(3).GT.99.9 .OR. D1(3).GT.99.9) GO TO 225
815.            IF(T1(3).LT.-99.9 .OR. D1(3).LT.-99.9) GO TO 225
816.            IF(D1(3).LE.T1(3)) GO TO 215
817.            PRINT 102,IY1,ID1,IH1,EL3,D1(3),T1(3)
818.            INC=INC+1
819.            CALL HEAD1(INC,TITLE,IPAGE)
820.        215 IF(IP.EQ.0) GO TO 225
821.            IF(P1.LE.0. .OR. P1.GT.254.) GO TO 225
822.            DD=T1(3)-D1(3)
823.            IF(DD.LE.5.0) GO TO 225
824.            PRINT 103, IY1,ID1,IH1,EL3,DD,P1
825.            INC=INC+1
826.            CALL HEAD1(INC,TITLE,IPAGE)
827.        225 IF(LEV.EQ.4) GO TO 500
828.        250 IF(T1(1).GT.99.9 .OR. D1(1).GT.99.9) GO TO 500
829.            IF(T1(1).LT.-99.9 .OR. D1(1).LT.-99.9) GO TO 500
830.            IF(D1(1).LE.T1(1)) GO TO 275
831.            PRINT 102, IY1,ID1,IH1,EL1,D1(1),T1(1)
832.            INC=INC+1
833.            CALL HEAD1(INC,TITLE,IPAGE)
834.        275 IF(IP.EQ.0) GO TO 500
835.            IF(P1.LE.0. .OR. P1.GT.254.) GO TO 500
836.            DD=T1(1)-D1(1)
837.            IF(DD.LE.5.0) GO TO 500
838.            PRINT 103, IY1,ID1,IH1,EL1,DD,P1
839.            INC=INC+1
840.            CALL HEAD1(INC,TITLE,IPAGE)
```

```
  102 FORMAT(' ',I3,I4,I5,3X,'HEIGHT=',F6.1,
     1'M',3X,' DEW POINT (',F6.1,' ) IS GREATER THEN TEMPERATURE (',
     2F6.1,' ) ')
  103 FORMAT(' ',I3,I4,I5,3X,'HEIGHT=',F6.1,
     1'M',3X,'TEMPERATURE GREATER THEN DEW POINT BY',F6.1,
     2' DEGREES C DURING PRECIPITATION OF',F6.1,' MM')
  500 CONTINUE
      RETURN
      END
      SUBROUTINE WSWDQ
C
C.....THIS SUBROUTINE CHECKS THE WIND SPEED AND WIND DIRECTION DATA
C
      COMMON/DATA1/LEV,IS,EL1,EL2,EL3,ICHK,NS(18),IP,ID
      COMMON/DATA2/IY1,IY2,ID1,ID2,IH1,IH2
      COMMON/DATA3/WS1(3),WS2(3),WD1(3),WD2(3),T1(3),T2(3),
     * DT1(3),DT2(3),P1,P2,D1(3)
      COMMON/DATA4/KX(3),JJ(3),KP,KT(6),JA,JB,JC
      COMMON/DATA5/IPAGE,INC,TITLE
C
      DIMENSION JK(3),NNN(16),G(3)
      DATA G/2.5,5.0,7.5/
C
      DATA NNN/'   N',' NNE','  NE',' ENE','   E',' ESE','  SE',' SSE',
     1'   S',' SSW','  SW',' WSW','   W',' WNW','  NW',' NNW'/
C
      IF(ICHK.EQ.3) GO TO 75
C
C     CHECK FOR WIND SPEED GREATER THEN 25M/SEC
C
      IF(LEV.NE.3) GO TO 50
      IF(WS1(2).GT.99.9) GO TO 50
      IF(WS1(2).LT.25.0) GO TO 50
      PRINT 100, IY1,ID1,IH1,EL2,WS1(2)
      INC=INC+1
      CALL HEAD1(INC,TITLE,IPAGE)
   50 IF(LEV.EQ.1) GO TO 51
      IF(WS1(3).GT.99.9) GO TO 51
      IF(WS1(3).LT.25.0) GO TO 53
      PRINT 100, IY1,ID1,IH1,EL3,WS1(3)
      INC=INC+1
      CALL HEAD1(INC,TITLE,IPAGE)
   53 IF(LEV.EQ.4) GO TO 52
   51 IF(WS1(1).GT.99.9) GO TO 52
      IF(WS1(1).LT.25.0) GO TO 52
      PRINT 100,IY1,ID1,IH1,EL1,WS1(1)
      INC=INC+1
      CALL HEAD1(INC,TITLE,IPAGE)
   52 CONTINUE
  100 FORMAT(' ',I3,I4,I5,3X,'HEIGHT=',F6.1,'M'
     1,5X,'WIND SPEED OF',F6.1,'M/SEC OCCURRED')
C
C     CHECK FOR WS GREATER THEN 2.5,5.0,7.5 M/SEC
C          WHILE WD'-WD'' GREATER THEN 22.5 DEGREES
C     CHECK FOR WD SAME AT TWO LEVELS
C     CHECK FOR WS SAME AT TWO LEVELS
C     CHECK FOR WS LOWER LEVEL GREATER THAN WS UPPER LEVEL
C
      GO TO (75,55,55,75),LEV
   55 IF(WD1(1).GT.365.0 .OR. WD1(3).GT.365.0) GO TO 62
```

```
      IF(WD1(1).LT.0. .OR. WD1(3).LT.0.) GO TO 62
      X=ABS(WD1(1)-WD1(3))
      IF(X.LT.22.5) GO TO 61
      IF(WS1(1).GE.2.5 .AND. WS1(1).LT.99.9 .OR. WS1(3).GE.2.5 .AND.
     1 WS1(3).LT.99.9) NS(1)=NS(1)+1
      IF(WS1(1).GE.5.0 .AND. WS1(1).LT.99.9 .OR. WS1(3).GE.5.0 .AND.
     1 WS1(3).LT.99.9) NS(2)=NS(2)+1
      IF(WS1(1).GE.7.5 .AND. WS1(1).LT.99.9 .OR. WS1(3).GE.7.5 .AND.
     1 WS1(3).LT.99.9) NS(3)=NS(3)+1
   61 IF(X.EQ.0.0) NS(4)=NS(4)+1
   62 IF(WS1(1).GT.99.9 .OR. WS1(3).GT.99.9) GO TO 60
      Y=WS1(1)-WS1(3)
      IF(Y.EQ.0.0) NS(5)=NS(5)+1
      IF(WS1(3).GT.WS1(1)) NS(16)=NS(16)+1
   60 CONTINUE
      IF(WD1(1).GT.365.0 .OR. WD1(2).GT.365.0) GO TO 85
      IF(WD1(1).LT.0. .OR. WD1(2).LT.0.) GO TO 85
      X=ABS(WD1(1)-WD1(2))
      IF(X.LT.22.5) GO TO 83
      IF(WS1(1).GE.2.5 .AND. WS1(1).LT.99.9 .OR. WS1(2).GE.2.5 .AND.
     1 WS1(2).LT.99.9) NS(6)=NS(6)+1
      IF(WS1(1).GE.5.0 .AND. WS1(1).LT.99.9 .OR. WS1(2).GE.5.0 .AND.
     1 WS1(2).LT.99.9) NS(7)=NS(7)+1
      IF(WS1(1).GE.7.5 .AND. WS1(1).LT.99.9 .OR. WS1(2).GE.7.5 .AND.
     1 WS1(2).LT.99.9) NS(8)=NS(8)+1
   83 IF(X.EQ.0) NS(9)=NS(9)+1
   85 IF(WS1(1).GT.99.9 .OR. WS1(2).GT.99.9) GO TO 80
      Y=WS1(1)-WS1(2)
      IF(Y.EQ.0.0) NS(10)=NS(10)+1
      IF(WS1(2).GT.WS1(1)) NS(17)=NS(17)+1
   80 CONTINUE
      IF(WD1(2).GT.365.0 .OR. WD1(3).GT.365.0) GO TO 95
      IF(WD1(2).LT.0. .OR. WD1(3).LT.0.) GO TO 95
      X=ABS(WD1(2)-WD1(3))
      IF(X.LT.22.5) GO TO 93
      IF(WS1(2).GE.2.5 .AND. WS1(2).LT.99.9 .OR. WS1(3).GE.2.5 .AND.
     1 WS1(3).LT.99.9) NS(11)=NS(11)+1
      IF(WS1(2).GE.5.0 .AND. WS1(2).LT.99.9 .OR. WS1(3).GE.5.0 .AND.
     1 WS1(3).LT.99.9) NS(12)=NS(12)+1
      IF(WS1(2).GE.7.5 .AND. WS1(2).LT.99.9 .OR. WS1(3).GE.7.5 .AND.
     1 WS1(3).LT.99.9) NS(13)=NS(13)+1
   93 IF(X.EQ.0.0) NS(14)=NS(14)+1
   95 IF(WS1(2).GT.99.9 .OR. WS1(3).GT.99.9) GO TO 75
      Y=WS1(2)-WS1(3)
      IF(Y.EQ.0.0) NS(15)=NS(15)+1
      IF(WS1(3).GT.WS1(2)) NS(18)=NS(18)+1
   75 CONTINUE
      IF(ICHK.EQ.0) GO TO 300
C
C     CHECK FOR WIND DIRECTION FROM SAME SECTOR FOR MORE THEN 8 HOURS
C
  106 FORMAT(' ',I3,I4,I5,3X,'HEIGHT=',F6.1,'M'
     1,5X,'WIND FROM SECTOR',A4,' FOR PREVIOUS',I4,' HOUR PERIOD')
      IF(LEV.EQ.1) GO TO 200
      GO TO (166,190,166,190),LEV
  166 IF(ICHK.EQ.3 .AND. KX(2).GT.8) GO TO 167
      CALL SECTOR(WD1(2),JK(2))
      IF(JK(2).EQ.-1 .OR. JJ(2).EQ.-1) GO TO 167
      IF(JJ(2).EQ.JK(2)) GO TO 165
  167 IF(KX(2).LT.8) GO TO 170
```

```
961.            N=JJ(2)
962.            PRINT 106,IY2,ID2,IH2,EL2,NNN(N),KX(2)
963.            INC=INC+1
964.            CALL HEAD1(INC,TITLE,IPAGE)
965.        170 KX(2)=1
966.            GO TO 180
967.        165 KX(2)=KX(2)+1
968.        180 JJ(2)=JK(2)
969.            IF(ICHK.EQ.3 .AND. KX(3).GT.8) GO TO 187
970.        190 CALL SECTOR(WD1(3),JK(3))
971.            IF(JK(3).EQ.-1 .OR. JJ(3).EQ.-1) GO TO 187
972.            IF(JJ(3).EQ.JK(3)) GO TO 195
973.        187 IF(KX(3).LT.8) GO TO 188
974.            N=JJ(3)
975.            PRINT 106, IY2,ID2,IH2,EL3,NNN(N),KX(3)
976.            INC=INC+1
977.            CALL HEAD1(INC,TITLE,IPAGE)
978.        188 KX(3)=1
979.            GO TO 191
980.        195 KX(3)=KX(3)+1
981.        191 JJ(3)=JK(3)
982.            IF(LEV.EQ.4) GO TO 300
983.            IF(ICHK.EQ.3 .AND. KX(1).GT.8) GO TO 210
984.        200 CALL SECTOR(WD1(1),JK(1))
985.            IF(JK(1).EQ.-1 .OR. JJ(1).EQ.-1) GO TO 210
986.            IF(JJ(1).EQ.JK(1)) GO TO 215
987.        210 IF(KX(1).LT.8) GO TO 218
988.            N=JJ(1)
989.            PRINT 106, IY2,ID2,IH2,EL1,NNN(N),KX(1)
990.            INC=INC+1
991.            CALL HEAD1(INC,TITLE,IPAGE)
992.        218 KX(1)=1
993.            GO TO 216
994.        215 KX(1)=KX(1)+1
995.        216 JJ(1)=JK(1)
996.        300 CONTINUE
997.            RETURN
998.            END
```

APPENDIX H

PROGRAM LISTING OF STABQ

```
C
C  ***************************************************************
C  *                                                             *
C  *                          STABQ                              *
C  *                                                             *
C  *      THIS PROGRAM CALCULATES PERIODS OF OCCURENCE OF        *
C  *      STABILITY CLASS BASED ON DELTA-T OR SIGMA THETA        *
C  *      FROM A DATA FILE IN THE NRC STANDARD FORMAT            *
C  *                                                             *
C  * PROGRAMMER: WILLIAM SNELL                                   *
C  * DATE: APRIL 1978                                            *
C  * VERSION: 1                                                  *
C  *                                                             *
C  * MODIFIED: W. SNELL                                          *
C  * DATE: FEBRUARY 1982                                         *
C  * VERSION: 2                                                  *
C  *                                                             *
C  ***************************************************************
C
      REAL*8 HR,TL
      COMMON/DATA1/SG(3),DT(3),C(6)
      DIMENSION TODAY(8),A(200),HR(13),IS1(3),IS2(3),IC(3),B(6),
     1 ICHK(7,13,3),ITOT(7,3),TITLE(18),H(3),NN(7)
      DATA HR/'     1  ','     2  ','     3  ','     4  ',
     1        '     5  ','     6  ','  7-11  ',' 12-23  ',
     2        '  24-47  ','  48-71  ','  72-95  ',' 96-119',
     3        '    >120'/
      DATA NN/'A','B','C','D','E','F','G'/
      DATA IC/3*1/,ITOT,ICHK,IS2/21*0,273*0,3*9/
      DATA B/'DELT','A-T ','    ','SIGM','A TH','ETA '/
C
      CALL RHR240 (TODAY)
      PRINT 200, TODAY
C
C     READ AND WRITE OUT HEADING OF DATA FILE
C
      READ(1,10) A
   10 FORMAT(4(40A4/),40A4)
      PRINT 11, A
   11 FORMAT('-',10(' ',20A4/))
C
C     READ INPUT DATA
C
C.... TITLE = TITLE PRINTED ON EACH PAGE
C.... IS = 1, STABILITY BASED ON DELTA-T
C.... IS = 2, STABILITY BASED ON SIGMA THETA
C.... JY,JM,JD = START YEAR, MONTH AND DAY
C.... KY,KM,KD = END   YEAR, MONTH AND DAY
C
      READ(5,12) TITLE,IS,JY,JM,JD,KY,KM,KD
   12 FORMAT(18A4/I1,2(1X,3I2))
      CALL IDAT(JD,JM,JY,JJD)
      CALL IDAT(KD,KM,KY,JKD)
      ISTRT=JY*1000+JJD
      IEND=KY*1000+JKD
      N1=1
      IF(IS.EQ.2) N1=4
      N2=IS*3
      PRINT 206, TITLE,(H(N),N=N1,N2),JY,JM,JD,KY,KM,KD
C
```

```
C      READ STABILITY AND CATEGORIZE INTO A STABILITY CLASS
C
   75 READ(1,101,END=999) IY,ID,((H(I),SG(I)),I=1,3),(DT(I),I=1,3),
     * (C(I),I=1,6)
  101 FORMAT(6X,I2,I3,4X,3(F5.1,10X,F5.1,15X),3F5.1,
     * T16,3(16X,A4,15X),3(1X,A4))
      IDATE=IY*1000+ID
      IF(IDATE.LT.ISTRT) GO TO 75
      IF(IDATE.GT.IEND)  GO TO 999
      CALL BLNK
C
      DO 15 N=1,3
      IF(IS.EQ.1) CALL STABLE(DT(N),J)
      IF(IS.EQ.2) CALL SIGMA(SG(N),J)
   15 IS1(N)=J
C
C     SUMMARIZE DATA
C
      DO 50 N=1,3
      IF(IS1(N).EQ.9) GO TO 50
      IF(IS2(N).EQ.9) GO TO 50
      IF(IS1(N).EQ.IS2(N)) GO TO 40
   30 L=IS2(N)
      IF(L.EQ.9) GO TO 50
      CALL CHK(IC(N),M)
      IF(IC(N).GT.ITOT(L,N)) ITOT(L,N)=IC(N)
      ICHK(L,M,N)=ICHK(L,M,N)+1
      IC(N)=1
      GO TO 50
   40 IC(N)=IC(N)+1
   50 CONTINUE
C
      DO 60 N=1,3
   60 IS2(N)=IS1(N)
C
      GO TO 75
C
  999 CONTINUE
C
      DO 65 N=1,3
      L=IS2(N)
      IF(L.EQ.9) GO TO 65
      CALL CHK(IC(N),M)
      IF(IC(N).GT.ITOT(L,N)) ITOT(L,N)=IC(N)
      ICHK(L,M,N)=ICHK(L,M,N)+1
   65 CONTINUE
C
C     PRINT OUT RESULTS
C
      DO 151 N=1,3
      PRINT 200, TODAY
      PRINT 207, TITLE
      IF(IS.EQ.2) GO TO 140
      IF(N.EQ.1) PRINT 203, H(1),H(3)
      IF(N.EQ.2) PRINT 203, H(1),H(2)
      IF(N.EQ.3) PRINT 203, H(2),H(3)
      GO TO 145
  140 PRINT 205, H(N)
  145 PRINT 201, (NN(I),I=1,7)
      DO 150 M=1,13
```

```
      150 PRINT 202, HR(M),(ICHK(L,M,N),L=1,7)
          PRINT 204, (ITOT(L,N),L=1,7)
      151 CONTINUE
C
C     FORMAT STATEMENTS
C
      200 FORMAT('1','PROGRAM: STABQ',10X,'VERSION: 2',10X,
     1 'DATED: FEBRUARY 1982',15X,'RUN DATE: ',8A4)
      201 FORMAT('0',32X,'NUMBER OF OCCURENCES'/' ',' PERIOD OF'/' ',
     1' OCCURENCE',28X,'STABILITY'/' ',' (HOURS)',
     23X,7(7X,A1)/' ',' ----------',3X,7(5X,'---'))
      202 FORMAT('0',A8,6X,7(I6,2X))
      203 FORMAT('0','STABILITY BASED ON DELTA-T BETWEEN ',
     1 F5.1,'-',F5.1,' METERS')
      204 FORMAT('0','LONGEST CASE',7(2X,I6))
      205 FORMAT('0','STABILITY BASED ON SIGMA THETA AT',F6.1,' METERS')
      206 FORMAT(/////'0','INPUT OPTIONS:'/'0','TITLE: ',
     1 18A4/'0','COMPUTE STABILITY BASED ON: ',3A4/'0',
     2 'START DATE:',3I3/' ','END   DATE:',3I3)
      207 FORMAT('-',18A4)
          STOP
          END
          SUBROUTINE BLNK
C
C.....CHECK FOR BLANK DATA FIELDS
C
          COMMON/DATA1/SG(3),DT(3),C(6)
          DATA BK/'    '/,Z/9999.9/
          DO 10 I=1,3
          IF(C(I).EQ.BK) SG(I)=Z
       10 IF(C(I+3).EQ.BK) DT(I)=Z
          RETURN
          END
          SUBROUTINE CHK(IC,M)
C
C.....CATEGORIZIES OCCURENCE INTERVALS
C
          DIMENSION N(12)
          DATA N/1,2,3,4,5,6,11,23,47,71,95,119/
          DO 10 M=1,12
       10 IF(IC.LE.N(M)) RETURN
          M=13
          RETURN
          END
          SUBROUTINE IDAT (ID,IM,IY,JD)
C--------THIS SUBROUTINE CHANGES MONTH AND DAY TO JULIAN DAY
          DIMENSION ID(2),IM(2),IY(2),JD(2),YR(2),IYR(2),MON(12)
          DATA MON/0,31,59,90,120,151,181,212,243,273,304,334/
          DO 20 N=1,2
          IMM=IM(N)
          JD(N)=MON(IMM)
          JD(N)=JD(N)+ID(N)
          YR(N)=IY(N)*0.25
          IYR(N)=YR(N)
          S=YR(N)-IYR(N)
          IF (S.EQ.0.0.AND.JD(N).GT.59) JD(N)=JD(N)+1
       20 CONTINUE
          RETURN
          END
          SUBROUTINE SIGMA(ST,KK)
```

```
C--------THIS SUBROUTINE CALCULATES STABILITY FROM SIGMA THETA
      DIMENSION S(6)
      DATA S/22.5,17.5,12.5,7.5,3.8,2.1/
      KK=9
      IF(ST.LT.0. .OR. ST.GT.365.) RETURN
      DO 100 KK=1,6
  100 IF(ST.GE.S(KK)) RETURN
      KK=7
      RETURN
      END
      SUBROUTINE STABLE(ST,KK)
      DIMENSION S(6)
C--------THIS SUBROUTINE CALCULATES STABILITY CLASS
C--------KK=1,2,3...CORRESPONDS TO STABILITY CLASSES A,B,C...
      DATA S/-1.9,-1.7,-1.5,-0.5,1.5,4.0/
      KK=9
      IF(ST.LT.-7.0 .OR. ST .GT.55.0) RETURN
      DO 100 KK = 1,6
  100 IF(ST.LE.S(KK)) RETURN
      KK = 7
      RETURN
      END
```

APPENDIX I

PROGRAM LISTING OF TDP

```
C
C ******************************************************************************
C *                                                                            *
C *                                  TDP                                       *
C *                                                                            *
C *          THIS PROGRAM CALCULATES MONTHLY ANNUAL AVERAGES                   *
C *            OF TEMPERATURE, DEW POINT, WIND SPEED (RMS)                     *
C *                    AND WET BULB (CALCULATED)                               *
C *                                                                            *
C * PROGRAMMER:  WILLIAM SNELL                                                 *
C * DATE:  APRIL  1978                                                         *
C * VERSION:  1                                                                *
C *                                                                            *
C * REVISED: R. CODELL  (TO INCLUDE WET BULB AND RMS WIND SPEED)               *
C * DATE: OCTOBER 1981                                                         *
C * VERSION: 2                                                                 *
C *                                                                            *
C * REVISED: W. SNELL                                                          *
C * DATE: MARCH 1982                                                           *
C * VERSION: 3                                                                 *
C *                                                                            *
C ******************************************************************************
C
      REAL*8 YY
C
      COMMON/DATA1/ T(3),D(3),W(3),TX(3),DX(3),TN(3),DN(3),C(9)
      COMMON/DATA2/ TT(3),TWETB(3),TW(3),ITW(3),IWETB(3),ITT(3),
     * DD(3),IDD(3),WX(3),HX(3),WN(3),HN(3),WBULB(3)
      COMMON/DATA3/ TTX(3),TDX(3),TTN(3),TDN(3),
     * TWX(3),TBX(3),TWN(3),TBN(3)
C
      DIMENSION TODAY(8),A(200),YY(13),H(3),TTW(3),HAN(3),WAN(3),
     1  TAVG(3),KT(3),KD(3),TTOT(3),DTOT(3),TAN(3),DAVG(3),
     2  DAN(3),TITLE(18),BAVG(3),KW(3),WTOT(3),KB(3),BTOT(3),
     3  PT(3),PW(3),PD(3),PB(3),IPT(3),IPD(3),IPW(3),IPB(3),
     4  TAP(3),WAP(3),DAP(3),BAP(3),
     5  PTX(3),PDX(3),PBX(3),
     6  WAVG(3),PWX(3),PWN(3),PDN(3),PTN(3),PBN(3)
C
      DATA YY/'JANUARY ','FEBURARY','MARCH   ','APRIL   ',
     1  'MAY     ','JUNE    ','JULY    ','AUGUST  ',
     2  'SEPTMBER','OCTOBER ','NOVEMBER','DECEMBER','ANNUAL  '/
C
      DATA TTW,WAVG,BAVG/9*0./
      DATA IPW,IPT,IPD,IPB/12*0/,PW,PT,PD,PB/12*0./
      DATA PTX,PBX,PWX,PDX/12*-99.9/,PTN,PDN,PBN,PWN/12*99.9/
C
      CALL RMB240 (TODAY)
      PRINT 25, TODAY
   25 FORM T('1','PROGRAM: TDP',10X,'VERSION: 3',10X,'DATED:',
     * ' MARCH 1982',15X,'RUN DATE: ',8A4)
C
      READ(1,10) A
   10 FORMAT(4(40A4/),40A4)
      PRINT 11, A
   11 FORMAT('0','SITE: '/'0',10(' ',20A4/))
C
      READ(5,12) TITLE
   12 FORMAT(18A4)
      PRINT 18, TITLE
```

```
      18 FORMAT(////'0','TITLE: ',18A4)
         READ(5,13) PBAR,LY1,LM1,LD1,LY2,LM2,LD2
      13 FORMAT(F10.0/3I2,1X,3I2)
         PRINT 14, PBAR,LY1,LM1,LD1,LY2,LM2,LD2
      14 FORMAT(////'0','INPUT DATA:'/'0','BAROMETRIC PRESSURE: ',
     * F7.1/'0','START DATE:',3I3/' ','END   DATE:',3I3)
         ISTRT=LY1*10000+LM1*100+LD1
         IEND= LY2*10000+LM2*100+LD2
C
         ICHK=9
         IANN=0
         KCK=0
         KCT=13
         KK=0
C
         CALL SET1
         CALL SET2
         GO TO 75
      17 JY=IY
         JM=IM
         KCK=1
         GO TO 23
C
C        READ IN  DATA AND COMPUTE MONTH AND DAY
C
      75 READ(1,100,END=998) IY,JD,KH,((H(I),W(I),T(I),D(I)),I=1,3),
     * (C(I),I=1,9)
     100 FORMAT(6X,I2,I3,I4,3(F5.1,5X,F5.1,5X,2F5.1,5X),
     * T16,3(11X,A4,6X,A4,1X,A4,5X))
C
         CALL JDAT(IY,JD,IM,ID)
         IDATE=IY*10000+IM*100+ID
         IF(IDATE.LT.ISTRT) GO TO 75
         IF(IDATE.GT.IEND) GO TO 998
         CALL BLNK
         IF(KCK.EQ.0) GO TO 17
         IF(IM.NE.JM) GO TO 50
C
C        TOTAL UP MONTHLY VALUES
C
      23 CONTINUE
         DO 30 N=1,3
C  RMS WINDSPEED
         IF(W(N).LT.0. .OR. W(N).GT.99.9) GO TO 26
         TW(N)=TW(N)+W(N)**2
         ITW(N)=ITW(N)+1
      26 CONTINUE
         WBULB(N)=99.9
C  TEMPERATURE
         IF(T(N).LT.-99.9 .OR. T(N).GT.99.9) GO TO 28
         TT(N)=TT(N)+T(N)
         ITT(N)=ITT(N)+1
C  CALCULATE   WET BULB TEMP
         IF(D(N).LT.-99.9 .OR. D(N).GT.99.9) GO TO 30
         IF(D(N).GT.T(N)) GO TO 28
         TFA=T(N)*1.8+32.0
         DFA=D(N)*1.8+32.0
         CALL PSY(TFA,DFA,PBAR,WFA,PVAP,HUMRAT,ENTHAL,VOLUME,
     1  VAPR,RELHUM)
         WBULB(N)=(WFA-32.0)/1.8
```

```
      TWETB(N)=TWETB(N)+WBULB(N)
      IWETB(N)=IWETB(N)+1
      GO TO 29
C  DEW POINT
   28 IF(D(N).LT.-99.9 .OR. D(N).GT.99.9) GO TO 30
   29 DD(N)=DD(N)+D(N)
      IDD(N)=IDD(N)+1
   30 CONTINUE
C
      CALL MAXMIN
C
      GO TO 75
C
C     COMPUTE MONTHLY AVERAGES AND PRINT
C
   50 CONTINUE
      DO 55 N=1,3
      WAVG(N)=999.9
      BAVG(N)=999.9
      TAVG(N)=999.9
      DAVG(N)=999.9
      IF(ITW(N).GT.0) WAVG(N)=SQRT(TW(N)/ITW(N))
      IF(IWETB(N).GT.0) BAVG(N)=TWETB(N)/IWETB(N)
      IF(ITT(N).GT.0) TAVG(N)=TT(N)/ITT(N)
      IF(IDD(N).GT.0) DAVG(N)=DD(N)/IDD(N)
      KW(N)=KW(N)+ITW(N)
      WTOT(N)=WTOT(N)+TW(N)
      KB(N)=KB(N)+IWETB(N)
      BTOT(N)=BTOT(N)+TWETB(N)
      KT(N)=KT(N)+ITT(N)
      TTOT(N)=TTOT(N)+TT(N)
      KD(N)=KD(N)+IDD(N)
   55 DTOT(N)=DTOT(N)+DD(N)
C
      DO 60 N=1,3
      IF(TX(N).GT.TTX(N)) TTX(N)=TX(N)
      IF(DX(N).GT.TDX(N)) TDX(N)=DX(N)
      IF(WX(N).GT.TWX(N)) TWX(N)=WX(N)
      IF(BX(N).GT.TBX(N)) TBX(N)=BX(N)
      IF(TN(N).LT.TTN(N)) TTN(N)=TN(N)
      IF(DN(N).LT.TDN(N)) TDN(N)=DN(N)
      IF(WN(N).LT.TWN(N)) TWN(N)=WN(N)
      IF(BN(N).LT.TBN(N)) TBN(N)=BN(N)
   60 CONTINUE
C
      IF(ICHK.NE.9) GO TO 65
      PRINT 204
      PRINT 25, TODAY
      PRINT 201, TITLE,(H(I),I=1,3)
      ICHK=0
   65 CONTINUE
C
      PRINT 202, JY,YY(JM),
     1 ((WAVG(N),WN(N),WX(N),ITW(N)),N=1,3),
     2 ((TAVG(N),TN(N),TX(N),ITT(N)),N=1,3),
     3 ((DAVG(N),DN(N),DX(N),IDD(N)),N=1,3),
     4 ((BAVG(N),BN(N),BX(N),IWETB(N)),N=1,3)
  201 FORMAT('0',18A4/'0',T40,3(6X,F5.1,' METERS',10X)/' ',
     1 T35,3(5X,23('='))/' ','YEAR  MONTH  ',T35,
     2 3(5X,'  AVG   MIN   MAX   HRS')/' ',
```

```
      3 '***** ********',T36,3(4X,4('***** '))
  202 FORMAT('0','1H',I2,1X,A8,
     1 T17,'WIND SPEED  (M/S)',T35,3(5X,3(F5.1,1X),I5),/' ',
     2 T17,'TEMPERATURE  (C)',T35,3(5X,3(F5.1,1X),I5),/' ',
     3 T17,'DEW POINT    (C)',T35,3(5X,3(F5.1,1X),I5),/' ',
     4 T17,'WET BULB     (C)',T35,3(5X,3(F5.1,1X),I5))
  204 FORMAT(///'0','*** WIND SPEED IS ROOT-MEAN-SQUARE ',
     * 'WIND SPEED'/' ','*** WET BULB IS CALCULATED FROM ',
     * 'TEMPERATURE, DEW POINT AND PRESSURE')
C
      JM=IM
      ICHK=ICHK+1
      IF(JY.NE.IY) GO TO 70
      IF(KK.EQ.1) GO TO 70
      GO TO 80
C
C     COMPUTE ANNUAL AVERAGE AND PRINT
C
   70 CONTINUE
      IF(ICHK.NE.9) GO TO 71
      PRINT 204
      PRINT 25, TODAY
      PRINT 201, TITLE,(H(I),I=1,3)
      ICHK=0
   71 CONTINUE
      DO 73 N=1,3
      WAN(N)=999.9
      IF(KW(N).GT.0) WAN(N)=SQRT(WTOT(N)/KW(N))
      BAN(N)=999.9
      IF(KB(N).GT.0) BAN(N)=BTOT(N)/KB(N)
      TAN(N)=999.9
      IF(KT(N).GT.0) TAN(N)=TTOT(N)/KT(N)
      DAN(N)=999.9
      IF(KD(N).GT.0) DAN(N)=DTOT(N)/KD(N)
      IPW(N)=IPW(N)+KW(N)
      IPT(N)=IPT(N)+KT(N)
      IPD(N)=IPD(N)+KD(N)
      IPB(N)=IPB(N)+KB(N)
      PW(N)=PW(N)+WTOT(N)
      PT(N)=PT(N)+TTOT(N)
      PD(N)=PD(N)+DTOT(N)
      PB(N)=PB(N)+BTOT(N)
   73 CONTINUE
C
      PRINT 203
      PRINT 202, JY,YY(13),
     1 ((WAN(N),TWN(N),TWX(N),KW(N)),N=1,3),
     2 ((TAN(N),TTN(N),TTX(N),KT(N)),N=1,3),
     3 ((DAN(N),TDN(N),TDX(N),KD(N)),N=1,3),
     4 ((BAN(N),TBN(N),TBX(N),KB(N)),N=1,3)
      PRINT 203
  203 FORMAT('0')
C
      DO 76 N=1,3
      IF(TTX(N).GT.PTX(N)) PTX(N)=TTX(N)
      IF(TDX(N).GT.PDX(N)) PDX(N)=TDX(N)
      IF(TWX(N).GT.PWX(N)) PWX(N)=TWX(N)
      IF(TBX(N).GT.PBX(N)) PBX(N)=TBX(N)
      IF(TTN(N).LT.PTN(N)) PTN(N)=TTN(N)
      IF(TDN(N).LT.PDN(N)) PDN(N)=TDN(N)
```

```
241.            IF(TWN(N).LT.PWN(N)) PWN(N)=TWN(N)
242.            IF(TBN(N).LT.PBN(N)) PBN(N)=TBN(N)
243.         76 CONTINUE
244.            CALL SETP
245.            DO 77 N=1,3
246.            WAN(N)=0.
247.            BAN(N)=0.
248.            TAN(N)=0.
249.         77 DAN(N)=0.
250.            ICHK=9
251.            JY=IY
252.            IF(KK.EQ.1) GO TO 999
253.            IANN=1
254.      C
255.        80  CONTINUE
256.      C
257.            CALL SET1
258.            IF(IANN.EQ.0) GO TO 79
259.            IANN=0
260.            DO 78 N=1,3
261.            KT(N)=0
262.            KD(N)=0
263.            KW(N)=0
264.            KB(N)=0
265.            WTOT(N)=0.
266.            BTOT(N)=0.
267.            TTOT(N)=0.
268.         78 DTOT(N)=0.
269.         79 CONTINUE
270.      C
271.            GO TO 23
272.      C
273.       998  KK=1
274.            GO TO 50
275.        999 PRINT 204
276.            PRINT 25, TODAY
277.            DO 90 N=1,3
278.            WAP(N)=999.9
279.            IF(IPW(N).GT.0) WAP(N)=SQRT(PW(N)/IPW(N))
280.            BAP(N)=999.9
281.            IF(IPB(N).GT.0) BAP(N)=PB(N)/IPB(N)
282.            TAP(N)=999.9
283.            IF(IPT(N).GT.0) TAP(N)=PT(N)/IPT(N)
284.            DAP(N)=999.9
285.            IF(IPD(N).GT.0) DAP(N)=PD(N)/IPD(N)
286.         90 CONTINUE
287.            PRINT 205, TITLE,(H(I),I=1,3),YY(LM1),LD1,LY1,YY(LM2),LD2,LY2,
288.           1 ((WAP(N),PWN(N),PWX(N),IPW(N)),N=1,3),
289.           2 ((TAP(N),PTN(N),PTX(N),IPT(N)),N=1,3),
290.           3 ((DAP(N),PDN(N),PDX(N),IPD(N)),N=1,3),
291.           4 ((BAP(N),PBN(N),PBX(N),IPB(N)),N=1,3)
292.        205 FORMAT('0',18A4/'0',T40,3(6X,F5.1,' METERS',10X)/' ',
293.           1 A8,I3,', 19',I2,T35,3(5X,23('='))/' ',T12,'TO',
294.           2 T35,3(5X,'  AVG   MIN   MAX   HRS')/' ',A8,I3,', 19',I2,
295.           3 T36,3(4X,4('===== ')),/'0',
296.           4 T17,'WIND SPEED  (M/S)',T35,3(5X,3(F5.1,1X),I5),/' ',
297.           5 T17,'TEMPERATURE  (C)',T35,3(5X,3(F5.1,1X),I5),/' ',
298.           6 T17,'DEW POINT    (C)',T35,3(5X,3(F5.1,1X),I5),/' ',
299.           7 T17,'WET BULB     (C)',T35,3(5X,3(F5.1,1X),I5))
300.            PRINT 204
```

```
      STOP
      END
      SUBROUTINE BLNK
C...CONVERT BLANK DATA FIELDS TO 9999.9
      COMMON/DATA1/ T(3),D(3),W(3),TX(3),DX(3),TN(3),DN(3),C(9)
      DATA BK/'    '/,Z/9999.9/
C
      N=3
      DO 10 I=1,3
      N=N+3
      IF(C(N+1).EQ.BK) W(I)=Z
      IF(C(N+2).EQ.BK) T(I)=Z
      IF(C(N+3).EQ.BK) D(I)=Z
   10 CONTINUE
      RETURN
      END
      SUBROUTINE JDAT(IY,JD,IM,ID)
C
C    THIS SUBROUTINE CONVERTS JULIAN DAY TO MONTH AND DAY
C
      DIMENSION MM(12,2)
      DATA MM/0,31,59,90,120,151,181,212,243,273,304,334,
     *        0,31,60,91,121,152,182,213,244,274,305,335/
C
      YR=IY+0.25
      IYR=YR
      A=YR-IYR
      L=1
      IF(A.EQ.0.) L=2
C
      DO 10 I=2,12
      IF(JD.LE.MM(I,L)) GO TO 15
   10 CONTINUE
      I=13
   15 ID=JD-MM(I-1,L)
      IM=I-1
      RETURN
      END
      SUBROUTINE MAXMIN
C
C.....THIS SUBROUTINE CHECKS FOR MAXIMUM & MINIMUM VALUES
C
      COMMON/DATA1/ T(3),D(3),W(3),TX(3),DX(3),TN(3),DN(3),C(9)
      COMMON/DATA2/ TT(3),TWETB(3),TW(3),ITW(3),IWETB(3),ITT(3),
     * DD(3),IDD(3),WX(3),BX(3),WN(3),BN(3),WBULB(3)
C
      DO 50 N=1,3
      IF(D(N).LT.-99.9 .OR. D(N).GT.99.9)  GO TO 25
      IF(D(N) .GT. DX(N))  DX(N)=D(N)
      IF(D(N) .LT. DN(N))  DN(N)=D(N)
   25 CONTINUE
      IF(T(N).LT.-99.9 .OR. T(N).GT.99.9) GO TO 35
      IF(T(N) .GT. TX(N)) TX(N)=T(N)
      IF(T(N) .LT. TN(N)) TN(N)=T(N)
   35 CONTINUE
      IF(W(N).LT.0. .OR. W(N).GT.99.9) GO TO 45
      IF(W(N).GT.WX(N)) WX(N)=W(N)
      IF(W(N).LT.WN(N)) WN(N)=W(N)
   45 CONTINUE
      IF(WBULB(N).EQ.99.9) GO TO 50
```

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361.            IF(WBULB(N).GT.BX(N)) BX(N)=WBULB(N)
362.            IF(WBULB(N).LT.BN(N)) BN(N)=WBULB(N)
363.         50 CONTINUE
364.            RETURN
365.            END
366.            SUBROUTINE PSY(DH,DP,PB,WB,PV,W,H,V,RH)
367.      C     THIS ROUTINE CALCULATES WET BULB TEMPERATURE (WB), HUMIDITY
368.      C        RATIO (W), ENTHALPY (H), VOLUME (V), VAPOR PRESSURE (PV),
369.      C        AND RELATIVE HUMIDITY (RH), WHEN DRY BULB TEMPERATURE (DB),
370.      C        DEW POINT TEMPERATURE (DP), AND BAROMETRIC PRESSURE (PB),
371.      C        ARE GIVEN
372.      C      UNITS: DB, WB, DP = DEGREES F
373.      C             PV, PB = INCHES MERCURY
374.      C             W = LB OF WATER VAPOR PER LB OF DRY AIR
375.      C             H = BTU'S PER LB OF DRY AIR
376.      C             V = CUBIC FEET PER LB OF DRY AIR
377.      C             RH = FRACTION (NOT PERCENT)
378.      C
379.            IF (DP.GT.DB) DP=DB
380.            PV=PVSF(DP)
381.            PVS=PVSF(DB)
382.            RH=PV/PVS
383.            W=0.622*PV/(PB-PV)
384.            V=0.754*(DB+459.7)*(1.0+7000.0*W/4360.0)/PB
385.            H=0.24*DB+(1061.0+0.444*DB)*W
386.            IF (H.GT.0.0) GO TO 100
387.            WB=DP
388.            RETURN
389.         100 WB=WBF(H,PB)
390.            RETURN
391.            END
392.            FUNCTION PVSF(X)
393.      C     CALCULATE VAPOR PRESSURE OF WATER (INCHES OF MERCURY) AS A
394.      C     FUNCTION OF TEMPERATURE (DEGREES F)
395.            DIMENSION A(6),B(4),P(4)
396.            DATA A/-7.90298,5.02808,-1.3816E-7,11.344,8.1328E-3,-3.49149/
397.            DATA B/-9.09718,-3.56654,0.876793,0.0060273/
398.            T=(X+459.688)/1.8
399.            IF (T.LT.273.16) GO TO 100
400.            Z=373.16/T
401.            P(1)=A(1)*(Z-1.0)
402.            P(2)=A(2)*ALOG10(Z)
403.            Z1=A(4)*(1.0-1.0/Z)
404.            P(3)=A(3)*(10.0**Z1-1.0)
405.            Z1=A(6)*(Z-1.0)
406.            P(4)=A(5)*(10.0**Z1-1.0)
407.            GO TO 105
408.         100 Z=273.16/T
409.            P(1)=B(1)*(Z-1.0)
410.            P(2)=B(2)*ALOG10(Z)
411.            P(3)=B(3)*(1.0-1.0/Z)
412.            P(4)=ALOG10(B(4))
413.         105 SUM=0.0
414.            DO 110 I=1,4
415.         110 SUM=SUM+P(I)
416.            PVSF=29.921*10.0**SUM
417.            RETURN
418.            END
419.            SUBROUTINE SET1
420.      C...INITIALIZE DATA
```

```
421.            COMMON/DATA1/ T(3),D(3),W(3),TX(3),DX(3),TN(3),DN(3),C(9)
422.            COMMON/DATA2/ TT(3),TWETB(3),TW(3),ITW(3),IWETB(3),ITT(3),
423.           * DD(3),IDD(3),WX(3),BX(3),WN(3),BN(3),WBULB(3)
424.      C
425.            DO 10 I=1,3
426.            DD(I)=0.
427.            TT(I)=0.
428.            TWETB(I)=0.
429.            TW(I)=0.
430.            IDD(I)=0
431.            ITW(I)=0
432.            IWETB(I)=0
433.            ITT(I)=0
434.            WX(I)=-99.9
435.            BX(I)=-99.9
436.            WN(I)=99.9
437.            BN(I)=99.9
438.            DX(I)=-99.9
439.            TX(I)=-99.9
440.            TN(I)=99.9
441.         10 DN(I)=99.9
442.      C
443.            RETURN
444.            END
445.            SUBROUTINE SET2
446.      C...INITIALIZE DATA
447.            COMMON/DATA3/ TTX(3),TDX(3),TTN(3),TDN(3),
448.           * TWX(3),TBX(3),TWN(3),TBN(3)
449.      C
450.            DO 10 I=1,3
451.            TTX(I)=-99.9
452.            TDX(I)=-99.9
453.            TWX(I)=-99.9
454.            TBX(I)=-99.9
455.            TWN(I)=99.9
456.            TBN(I)=99.9
457.            TTN(I)=99.9
458.         10 TDN(I)=99.9
459.      C
460.            RETURN
461.            END
462.            FUNCTION WBF(H,PB)
463.      C     THIS ROUTINE APPROXIMATES THE WET BULB TEMPERATURE FROM
464.      C        ENTHALPY H, AND BAROMETRIC PRESSURE PB
465.            WB(A,B,C,D,Y)=A+(B+(C+D*Y)*Y)*Y
466.            W(PV,PB)=0.622*PV/(PB-PV)
467.            X(WB12,W12)=0.24*WB12+(1061.0+0.444*WB12)*W12
468.            IF (H.LE.0.0) GO TO 105
469.            Y=ALOG(H)
470.            IF (H.GT.11.758) GO TO 100
471.            WBF=WB(0.6041,3.4841,1.3601,0.97307,Y)
472.            RETURN
473.        100 WBF=WB(30.9185,-39.682,20.5841,-1.758,Y)
474.            RETURN
475.        105 WB1=150.0
476.            PV1=PVSF(WB1)
477.            W1=W(PV1,PB)
478.            X1=X(WB1,W1)
479.            Y1=H-X1
480.        110 WB2=WB1-1.0
```

```
      PV2=PVSF(WB2)
      W2=W(PV2,PB)
      X2=X(WB2,W2)
      Y2=H*X2
      IF (Y1*Y2) 130,120,115
  115 WB1=WB2
      Y1=Y2
      GO TO 110
  120 IF (Y1.NE.0.0) GO TO 125
      WBF=WB1
      RETURN
  125 WBF=WB2
      RETURN
  130 Z=ABS(Y1/Y2)
      WBF=(WB2+Z*WB1)/(1.0+Z)
      RETURN
      END
```

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The Nuclear Regulatory Commission (NRC) receives hour-by-hour meteorological data on magnetic tape in a format specified in Regulatory Guide 1.70, Rev. 2, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants" (September 1975). The purpose of this report was to document the computer programs that are used by the NRC meteorology staff to examine, assess and utilize these hourly values of meteorological data. A description of each of the programs is given along with the input requirements, discussion of output, subroutine flow chart, a description of each subroutine, sample output and a program listing.

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