

ASCENSION ISLAND, SOUTH ATLANTIC

RANGE REFERENCE ATMOSPHERE
0-66 KM ALTITUDE

JANUARY 1984

METEOROLOGY GROUP
RANGE COMMANDERS COUNCIL

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KWAJALEIN MISSILE RANGE
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FOREWORD

Atmospheric parameters are essential to the research and development of missiles and aerospace vehicles. In the early 1960's, the need was recognized for realistic atmospheric models derived in a consistent manner for each of the several major test ranges. An atmospheric model derived from statistical data for a particular geographical location is referred to as a reference atmosphere.

The first Range Reference Atmosphere (RRA) was issued in 1963 by the Inter-Range Instrumentation Group (IRIG) for Cape Kennedy, Florida, and was followed by additional publications for several ranges up to 1974. Since that time, improved upper air data bases have become available from which to develop the RRA. These resulted from the extended period of records and from improvement in the upper air measuring program by rocketsondes for altitudes above the rawinsonde ceiling of 30 km. Revised and improved RRAs are justified for the following reasons:

- 1) Needs for more definitive statistical atmospheric models have arisen because of changes and advances in aerospace technology. The Space Transportation System (Space Shuttle) is one example.
- 2) Most ranges now have an extended and improved upper air data base from which to develop a more definitive RRA.
- 3) There are requirements for RRAs for new ranges and range sites.
- 4) There have been scientific advances in understanding the upper atmospheric structure and physical relationships.
- 5) Advances in statistical modeling techniques have been made because of the general availability of high-speed electronic computers. These have led to the adoption of advanced concepts in atmospheric modeling.

For these reasons, the Range Reference Atmosphere Committee (RRAC) was tasked by the Range Commanders Council Meteorology Group (RCC MG) to establish new and improved RRAs. The purpose, scope, and objectives of this task are outlined in the following paragraphs.

Purpose: This committee, Task MG-1, establishes RRAs for the several ranges as provided by the RCC. An RRA is a model of the Earth's atmosphere over a geographical location of interest, for use by DOD and other U.S. Government range users. The RRA is used to provide planning data for evaluating environmental constraints for the particular configurations of environment-sensitive systems and components being developed or undergoing tests.

Scope: Using the best available upper atmosphere data base to include rawinsonde, rocketsonde and possibly other high-altitude data sources for the range location, the task is to establish a model of certain statistics for wind and thermodynamic quantities derived in a uniform manner and published in a standardized format.

Objectives: The wind statistics shall be, insofar as practical, modeled to be consistent with rigorous mathematical probability properties of the multivariate normal probability theory. The thermodynamic quantities statistics shall be, insofar as practical, modeled to be consistent with the hydrostatic equation, the equation of state, and the probability principles that are related through these physical equations. The document shall serve as an authoritative source of information and as an atmospheric model for a particular range. The first in the series of revised RRAs to be published is for Kwajalein Missile Range (KMR) (publication date December 1982). The altitude range required for KMR is 0 to 70 km. The order of priority for the subsequent publications is:

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8. ESMC/Ascension Island	0 - 70 km (Terminates at 66 km because of insufficient data)
9. NASA/Wallops Flight Center, VA	0 - 70 km
10. Taquac (Guam)	0 - 30 km
11. PMTC/Barking Sands, HI	0 - 70 km

In keeping with the RCC's objective of standardization, the modeling techniques, basic text, and tabulation format are to be the same for all RRAs. These new and revised RRAs present not only the mean values of the thermodynamic quantities (pressure, temperature, virtual temperature, and density), but also include statistical measures for the dispersion (i.e., standard deviations and skewness coefficients). New quantities presented are water vapor pressure and dewpoint temperature. The statistical modeling for the wind is entirely new. The new approach uses the properties of the bivariate normal probability distribution function.

- a. Use rocketsonde data from PMTC/Point Mugu for altitudes above 30 km.
 b. Consider augmenting data base from Ely or Salt Lake City.

All final computations were performed by the United States Air Force Environmental Technical Applications Center (USAFETAC) in response to a task from Eastern Space and Missile Center (ESMC).

The text was prepared jointly by USAFETAC and the NASA/George C. Marshall Space Flight Center's Space Sciences Laboratory, Atmospheric Sciences Division. The editing and preparation of the draft manuscript were performed by the NASA/MSFC organization.

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The RRAC consists of representatives from the U.S. Air Force, U.S. Army, National Aeronautics and Space Administration, U.S. Navy, and National Oceanic and Atmospheric Administration. The committee members for the RRA for the first publication are:

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F. G. Finger, NOAA/NWS
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B. R. Hixon, PMTC
J. M. Hobbie, KMR
E. J. Keppel, AD
S. F. Kubinski, WSMR
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RANGE REFERENCE ATMOSPHERE
0-66 KM ALTITUDE

January 1984

Prepared by

Range Reference Atmosphere Committee
Meteorology Group
Range Commanders Council

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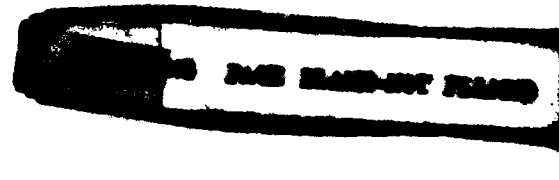
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LIST OF ORGANIZATION ACRONYMS

AD	Armament Division
AFFTC	Air Force Flight Test Center
AFSC	Air Force Systems Command
AFSC/AFGL	AFSC/Air Force Geophysics Laboratory
AFSC/SD	AFSC/Space Division
AFSCF	Air Force Satellite Control Facility
AFTFWC	Air Force Tactical Fighter Weapons Center
AWS	Air Weather Service
BMD	Ballistic Missile Division
DOD	Department of Defense
DOE	Department of Energy
DOE/NTS	DOE/Nevada Test Site
DPG	Dugway Proving Ground
ESMC	Eastern Space and Missile Center
ETR	Eastern Test Range
KMR	Kwajalein Missile Range
NASA	National Aeronautics and Space Administration
NASA/MSFC	NASA/Marshall Space Flight Center
NASA/WFC	NASA/Wallops Flight Center
NOAA	National Oceanic and Atmospheric Administration
NWC	Naval Weapons Center
PMTC	Pacific Missile Test Center
USA/DTC	U.S. Army/Deseret Test Center
USAECOM	U.S. Army Electronics Command
USAFETAC	United States Air Force Environmental Technical Applications Center

UTTR	Utah Test and Training Range
WSMC	Western Space and Missile Center
WSMR	White Sands Missile Range
WTR	Western Test Range
YPG	Yuma Proving Ground
6585TG	6585th Test Group
TSCF	Targeting Systems Characterization Facility

FOREWORD

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CHAPTER I. INTRODUCTION

A. Definition and Purpose of the Range Reference Atmosphere

A.1 Definition

A reference atmosphere is a statistical model of the Earth's atmosphere derived from upper air measurements over a particular geographical location. Hence, these Range Reference Atmospheres (RRAs) are atmospheric models developed by the Range Reference Atmosphere Committee (RRAC) in response to a task by the Range Commanders Council Meteorology Group (RCC MG) and published by the RCC Secretariat. The RCC MG, formerly called the Inter-Range Instrumentation Group/Meteorology Working Group (IRIG/MWG), published a series of RRAs during the period 1963 through 1974.

A.2 Purpose

A series of revised and expanded RRAs are to be published for locations of interest to the RCC. These publications are to serve as authoritative reference sources on certain upper air statistics and as atmospheric models for particular range sites. The technical usefulness of these documents for the ranges, range users, U.S. aerospace industries, and the scientific community is recognized because of the standardization of the development techniques and the presentation of the tabulations.

B. Scope of the Range Reference Atmosphere and Arrangement of Tables

B.1 Scope

The RRA contains tabulations for monthly and annual means, standard deviations, and skewness coefficients for windspeed, pressure, temperature, density, water vapor pressure, virtual temperature, and dewpoint temperature; the means and standard deviations for the zonal (U) and meridional (V) wind components; and the linear (product moment) correlation coefficient between the wind components. These statistical parameters are tabulated at the station elevation, at 1-km intervals from sea level to 30 km, and at 2-km intervals from 30 to 90 km. The wind statistics are given at approximately 10 m above the station elevations and at altitudes with respect to mean sea level thereafter. For those range sites without rocketsonde measurements, the RRAs terminate at 30 km altitude, or they are extended, if required, when rocketsonde data from a nearby launch site are available. There are four sets of tables for each of the 12 monthly reference periods and the annual reference period.

B.2 Arrangement of Tables

The statistical parameters for the RRA models are presented in four tables, as outlined in the following paragraphs.

Table I contains all the wind statistical parameters. This table gives the monthly and annual means and standard deviations of the U and V wind components and the linear (product moment) correlation coefficient between these

two components; the mean, standard deviation and skewness coefficient of the windspeed, and the number of wind observations (sample size).

Table II contains the monthly and annual means, standard deviations, and skewness values of pressure, temperature, and density, and the number of observations used for each of these thermodynamic quantities.

Table III contains the monthly and annual means, standard deviations and skewness values of the water vapor pressure, virtual temperature and dewpoint, and the number of observations for each of these moisture-related quantities. The statistical parameters for water vapor pressure and dewpoint terminate at 15 km altitude. Above 15 km the statistical parameters for virtual temperature are considered to be the same as those for temperature.

Table IV contains the monthly and annual mean atmospheric models for the thermodynamic variables: pressure, virtual temperature, and density. This table is derived from the monthly and annual mean virtual temperature versus altitude (geometric) using the hydrostatic equation and the equation of state. Also presented is the geopotential height corresponding to the tabulated geometric altitudes.

The physical unit for all wind parameters is meters per second. The physical unit for pressure is millibars; for temperature and virtual temperature, degrees Kelvin; for density, grams per cubic meter; and for water vapor pressure, millibars. In all cases the skewness coefficient and the correlation coefficient between wind components are unitless. All reference to altitude is geometric altitude and is expressed in kilometers. All reference to height is geopotential height and has the unit geopotential meters or kilometers. All geometric altitudes and geopotential heights are with respect to mean sea level.

C. Data Quality Control Procedures

A small portion (less than 10 percent) of the soundings in the data base used to calculate the RRA tables contained erroneous data values. The soundings which contained these erroneous values were eliminated from the data base using the following procedures:

- 1) Soundings containing gaps in their height data greater than 200 mb were rejected. This step was taken because some soundings only contained height values at their "mandatory" pressure levels, which were occasionally missing, resulting in soundings with no height information at all.

- 2) An initial set of RRA statistics was computed using all the remaining soundings. This initial set of statistics was used to determine data limits for the temperature, pressure, U and V components of the wind, and the dewpoint (for the 0- to 30-km portion of the RRA) or the density (for the 30- to 90-km portion of the RRA). The lower (upper) data limits were set at the mean value for a specific parameter, minus (plus) six standard deviations of that quantity. One pair of data limits was computed for each of these parameters: month of the year and data level.

3) This initial set of data limits was then used to screen the data base. All the soundings that contained values outside these data limits were rejected. A new RRA was then computed using the screened data base. This second RRA was used to generate a second set of data limits.

4) The second set of data limits was then used to screen the data base further. A new RRA was again generated. The skewness values in this RRA were then evaluated, according to empirical criteria specified in section II.A.3 of this document for the winds, and according to criteria in section III.A.3 for the thermodynamic quantities. If these criteria were satisfied, the new RRA was then used to generate a final set of data limits, which were used to control the quality of the data base for the final version of the RRA.

5) Occasionally, the third RRA that was generated did not satisfy all of the skewness criteria. This indicated that some incorrect values were still present in the data base. To complete quality control, steps 3 and 4 were repeated for additional iterations (usually one or two) until the resulting RRA satisfied the skewness criteria. At that point, a final set of data limits was generated. This final set of data limits was then used to control the quality of the data base and generate the final RRA.

D. Organization of the Chapters

Because there are plans to publish a series of RRAs, comments on the special organization of the document are in order. The RRA document is arranged in four chapters. Chapter I is the introduction. Chapter II, Wind Statistics and Models, contains the techniques used to arrive at the wind statistical parameters, table I, and the probability functions that are to be used as wind models to derive several wind statistics. Chapter III, Statistics of Thermodynamic Quantities and Models, contains the techniques used to arrive at the thermodynamic and moisture-related statistical parameters given in tables II and III and the atmospheric thermodynamic model presented in table IV. This chapter also contains sets of equations to calculate several atmospheric properties. Chapter IV contains the general conclusions and recommendations. These four chapters are reprinted without change for each documented RRA to assure consistency and for expediency in preparing the documentation. To account for variations particular to a specific RRA, two appendixes have been included. Appendix A, Examples of Wind Statistics, is designed to give a few illustrative examples of wind statistics for the specific RRA and cursory observations, comparisons, or comments on wind statistics. Appendix B, Range Specific Information, is designed to present specific information particular to the range, such as geographical location, data base, etc., and any cursory observations or comments on the thermodynamic quantities.

Read these appendixes! They are located as the last two units in the document because they may vary in length depending on the circumstances. Appendixes A and B and tables I, II, III, and IV are the only differences among the RRA documents published in this new RRA series.

CHAPTER II. WIND STATISTICS AND MODELS

A. General Considerations

A.1. Objectives

An objective of the RRA is to furnish minimum tabulation for the wind statistics. To meet this objective, the bivariate normal probability distribution was adopted as a statistical model for the wind treated as a vector quantity at the RRA data levels. Only five statistical parameters are required to completely describe this probability function. In Cartesian coordinates these parameters are the means and standard deviations of the two orthogonal components and the correlation coefficient between the two components. These five statistical parameters for the U and V (meteorological coordinates) components are given in table I. The statistical properties of the bivariate normal probability distribution are used to derive many wind statistics that are of interest to the ranges and range users. This procedure produces consistent wind statistics that are connected through rigorous mathematical probability functions. By using these functions, extensive tabulations of wind statistics are avoided.

The statistical properties of the bivariate normal probability distribution presented for the vector wind statistical model are:

- 1) The wind components are univariate normally distributed.
- 2) The conditional distribution of one component given a value of the other component is univariate normally distributed.
- 3) The windspeed is of the form of a generalized Rayleigh distribution.
- 4) The frequency distribution of wind direction can be derived.
- 5) The conditional distribution of windspeed given a value of wind direction (wind rose) can be derived.
- 6) The five tabulated wind statistical parameters with respect to the meteorological U and V coordinate system can be derived for any arbitrary rotation of the orthogonal axes.

The probability distribution functions and sets of equations to derive wind statistics for the previously stated properties of the vector wind model are presented in this chapter. Symbols used are summarized in table A. Illustrative examples are presented in appendix A. No attempt is made to give the derivation of the probability functions. The reader is referred to Smith (1976) for some derivations and several applications of the probability distribution properties for wind statistics.

A.2. Data Quality Control

The U and V components of the wind were used to generate data limits set at plus and minus six standard deviations from the mean for each of the

TABLE A. LIST OF SYMBOLS USED IN CHAPTER II

N	- The number of wind measurements in table I
r	- A general variable for the bivariate normal probability distribution in polar coordinates
R	- A generalized Rayleigh variable used for derived windspeed probability distribution
R (U, V)	- The linear (product moment) correlation coefficient between the zonal and meridional wind components in table I
SK (W)	- Skewness parameter for windspeed in table I
S (U)	- The standard deviation of the zonal wind component in table I
S (V)	- The standard deviation of the meridional wind component in table I
S (W)	- The standard deviation of windspeed in table I
t	- A standardized normal variate used in text table B
U	- The zonal wind component
UBAR	- The mean value of the zonal wind component in table I
V	- The meridional wind component
VBAR	- The mean value of the meridional wind component in table I
W	- Windspeed or modulus of wind vector, a scalar quantity
WBAR	- The mean value of windspeed in table I
X	- A general component variable or coordinate axis
Y	- A general component variable or coordinate axis
$\bar{X}$	- A general component mean value in the [x,y] coordinate system
$\bar{Y}$	- A general component mean value in the [x,y] coordinate system
α (alpha)	- Rotation angle for the [x,y] coordinate system

TABLE A. (concluded)

θ (theta) - Wind direction in the polar coordinate system

$\lambda_{()}$ (Lambda) - A parameter in the bivariate normal probability distribution in text table C

ξ (Xi) - The mean value in the standardized normal probability distribution used in text table B

π (Pi) - Constant = 3.14159 ...

ρ (Rho) - The general linear correlation coefficient between the two component variables in the [x,y] coordinate system

σ_x, σ_y - The general standard deviations of the x and y component variables in the [x,y] coordinate system.

quantities. These data limits were used to screen the wind data base, as described in section I.C. The data base was considered to be free from errors under the following conditions:

- 1) The skewness of the windspeed was below 4.0 at data levels where the mean windspeed was less than 15 m/s, and
- 2) The skewness of the windspeed was below 2.5 at data levels where the mean windspeed was greater than 15 m/s.

A.3 Limitations

For the wind statistics, the correlation coefficients for like wind components and unlike wind components between altitude levels were not computed. Therefore, wind statistics with respect to altitude (profile) cannot be derived from the RRA statistics. For wind profile modeling techniques the user is referred to Smith (1976). However, the wind statistics at discrete altitudes are valid; all of the probability distribution functions given in chapter II can be derived from the five wind component statistical parameters contained in table I, and the derived distributions can be considered as wind models at discrete altitudes.

By convention, in the statistical literature Greek letters are used for population or theoretically known parameters, and sample estimates are denoted by English alphabetical letters or with a "hat" (^) over the Greek letters. In chapter II Greek letters are used for the variances and the linear correlation coefficient, and the means are denoted by $\bar{X}$ and $\bar{Y}$ when dealing with the bivariate normal distribution. It will always be understood that table I contains sample estimates of the statistical parameters and they are with respect to the meteorological U and V coordinate system.

B. Coordinate System and Computation of Statistical Parameters

B.1. Coordinate System

Wind measurements are recorded in terms of magnitude and direction. The wind direction is measured in degrees clockwise from true north and is the direction from which the wind is blowing. The wind magnitude (the modulus of the vector) is the scalar quantity and is referred to as windspeed or scalar wind. A statistical description that accounts for the wind as a vector quantity is appropriate and requires a coordinate system.

For the RRA the standard meteorological coordinate system has been chosen for the wind statistics, all tables of statistical parameters, and related discussions because the coordinate system used in aerospace and related applied fields has not always been consistent.

Using figure 1, the polar and Cartesian forms for the meteorological coordinate system are defined:

W = windspeed, scalar wind, or magnitude of the wind vector in meters per second.

θ = wind direction. θ is measured in degrees clockwise from true north and is the direction from which the wind is blowing.

U = zonal wind component, positive west to east, in meters per second.

V = meridional wind component, positive south to north, in meters per second.

The components θ and W define the polar form, and the U - V components define the Cartesian forms:

$$U = -W \sin \theta \quad , \quad 0 \leq \theta \leq 360^\circ \quad (1)$$

$$V = -W \cos \theta \quad . \quad (2)$$

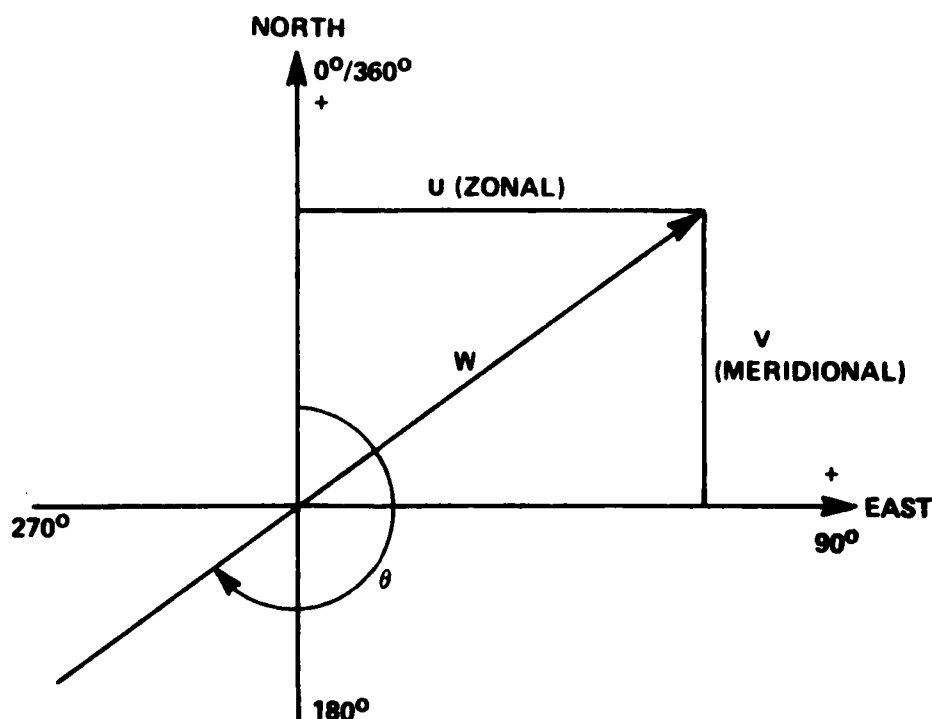


Figure 1. The meteorological coordinate system.

It is helpful to note the difference between the mathematical convention for a vector direction and the meteorological convention for wind direction:

$$\theta_{\text{met}} = 270 - \theta_{\text{math}} \quad (3)$$

when $0 \leq \theta_{\text{math}} \leq 270^\circ$

$$\theta_{\text{met}} = 360 + (270 - \theta_{\text{math}})$$

when $270 \leq \theta_{\text{math}} \leq 360^\circ$

B.2 Computation of Statistical Parameters

The wind statistical parameters in table I for the means and standard deviations of the U and V wind components and windspeed and the skewness parameter of windspeed were computed using the sums technique presented in chapter III.C.3. In addition, the linear (product moment) correlation coefficient between the U and V wind components, $r(u,v)$ in table I, was computed. This correlation coefficient is defined as

$$r(u,v) = \frac{\sum_{i=1}^n (U_i - \bar{U})(V_i - \bar{V})}{N s(u) \cdot s(v)} \quad (4)$$

These statistical parameters are with respect to the Standard Meteorological Coordinate System.

C. Statistical Wind Models

C.1. Wind Component Statistics

The univariate normal (Gaussian) probability distribution function is used to obtain wind component statistics. In generalized notations, this probability density function (pdf) is

$$f(t) = \frac{e^{-\frac{t^2}{2}}}{\sqrt{2\pi}} \quad (5)$$

where $t = X - \xi / \sigma_x$ is the standardized variate, with ξ defining the mean and σ_x the standard deviation. The probability distribution function (PDF) is

$$F(X) = \int_{-\infty}^X f(t) dt \quad (6)$$

Because this integral cannot be obtained in closed form, it is widely tabulated for zero mean and unit standard deviation. For a convenient reference for the RRA, selected values of $F(X)$ are given in table B. To emphasize the connotation of probability, $F(X)$ is shown in table B as $P\{X\}$.

The t values in table B are used as multiplier factors to the standard deviation to express the probability that a normally distributed variable, X , is less than or equal to a given value as

$$P\{X \leq \text{mean} + t \sigma_X\} = \text{probability, } p \quad (7)$$

For example, when $t = 1.6449$, the probability that X is less than or equal to the mean plus 1.6449 standard deviations is 0.95. That value of X that is less than or equal to the mean plus 1.6449 standard deviations is called the 95th percentile value of X . Also given in table B are the numerical values to express the probability that X falls in the interval X_1 and X_2 ; i.e.,

$$P\{X_1 \leq X \leq X_2\} = \text{Interpercentile Range} \quad (8)$$

where

$$X_1 = \bar{X} - t \sigma_X$$

$$X_2 = \bar{X} + t \sigma_X$$

For $t = 1.9602$ the probability that X lies in the interval X_1 and X_2 is 0.95. The values of X_1 and X_2 in this example comprise the 95th interpercentile range.

For a normally distributed variable, the mode (most frequent value) and the median (50th percentile value) are the same as the mean value. The means and standard deviations of the U and V wind components from table 1 are used in equations (7) and (8) to compute the percentile values and interpercentile ranges of the U and V wind components. When equation (7) is illustrated on a normal probability graph, a straight line is formed.

C.2. The Vector Wind Model

Because wind is a vector quantity having direction and magnitude that can be expressed as two components in an orthogonal coordinate system, a probability model that describes the joint relationship is the bivariate normal probability distribution. In general component notation, the bivariate normal probability density function (BNpdf) is

TABLE B. VALUES OF t FOR STANDARDIZED NORMAL
(UNIVARIATE) DISTRIBUTION FOR PERCENTILES
AND INTERPERCENTILE RANGES

t	$P(X)$	X	$P\{X_1 \leq X \leq X_2\} (\%)$
-3.0000	0.00135	$\xi - 3.0000 \sigma$	
-2.5758	0.00500	$\xi - 2.5758 \sigma$	
-2.3263	0.01000	$\xi - 2.3263 \sigma$	
-2.2365	0.01266	$\xi - 2.2365 \sigma$	
-2.0000	0.02275	$\xi - 2.0000 \sigma$	
-1.9602	0.02500	$\xi - 1.9602 \sigma$	
-1.6449	0.05000	$\xi - 1.6449 \sigma$	
-1.2816	0.10000	$\xi - 1.2816 \sigma$	
-1.0000	0.15866	$\xi - 1.0000 \sigma$	
-0.8416	0.20000	$\xi - 0.8416 \sigma$	
-0.6745	0.25000	$\xi - 0.6745 \sigma$	
-0.2533	0.40000	$\xi - 0.2533 \sigma$	
0.0000	0.50000	ξ	
0.2533	0.60000	$\xi + 0.2533 \sigma$	
0.6745	0.75000	$\xi + 0.6745 \sigma$	
0.8416	0.80000	$\xi + 0.8614 \sigma$	
1.0000	0.84134	$\xi + 1.0000 \sigma$	
1.2816	0.90000	$\xi + 1.2816 \sigma$	
1.6449	0.95000	$\xi + 1.6449 \sigma$	
1.9602	0.97502	$\xi + 1.9602 \sigma$	
2.0000	0.97725	$\xi + 2.0000 \sigma$	
2.2365	0.98734	$\xi + 2.2365 \sigma$	
2.3263	0.99000	$\xi + 2.3263 \sigma$	
2.5758	0.99500	$\xi + 2.5758 \sigma$	
3.0000	0.99865	$\xi + 3.0000 \sigma$	

where $X_1 = \xi - t\sigma$
and $X_2 = \xi + t\sigma$

$$f(X,Y) = \frac{1}{2\pi\sigma_x\sigma_y\sqrt{1-\rho^2}} \left[\exp \frac{-1}{2(1-\rho^2)} \left\{ \frac{(X-\bar{X})^2}{\sigma_x^2} - \frac{2\rho(X-\bar{X})(Y-\bar{Y})}{\sigma_x\sigma_y} + \frac{(Y-\bar{Y})^2}{\sigma_y^2} \right\} \right] \quad -\infty \leq X \leq \infty \text{ and } -\infty \leq Y \leq \infty \quad (9)$$

where the five parameters are $\bar{x}, \bar{y}$, the component means; σ_x, σ_y , the component standard deviations; and ρ , the correlation coefficient between the two component variables, X and Y .

For many applications the interest is in determining the probability that a point $\{X,Y\}$ will fall within a contour of equal probability density. The exponential terms of equation (9), when set equal to a constant, λ^2 , give a family of ellipses depending on the value of the constant. The ellipses have a common center at the point $\{\bar{X}, \bar{Y}\}$. Integration of equation (9) over the region bounded by the contours of equal probability density gives

$$P(\lambda) = 1 - e^{-\frac{\lambda^2}{2(1-\rho^2)}} \quad (10)$$

Solving for λ^2 and replacing $P(\lambda)$ by p gives

$$\lambda^2 = -2(1-\rho^2) \ln(1-p) \quad (11)$$

Now define

$$\lambda_e = \sqrt{2} \sqrt{-\ln(1-p)} \quad (12)$$

For ready reference and comparisons, λ_e is shown in table C for selected values of p .

TABLE C. VALUES OF λ FOR BIVARIATE NORMAL
DISTRIBUTION ELLIPSES AND CIRCLES

P(%)	λ_c (ellipse)	λ_c (circle)	P(%)	λ_c (ellipse)	λ_c (circle)
0.000	0.0000	0.0000	65.000	1.4490	1.0246
5.000	0.3203	0.2265	68.268	1.5151	1.0713
10.000	0.4590	0.3246	70.000	1.5518	1.0973
15.000	0.5701	0.4031	75.000	1.6651	1.1774
20.000	0.6680	0.4723	80.000	1.7941	1.2686
25.000	0.7585	0.5363	85.000	1.9479	1.3774
30.000	0.8446	0.5972	86.466	2.0000	1.4142
35.000	0.9282	0.6563	90.000	2.1460	1.5175
39.347	1.0000	0.7071	95.000	2.4477	1.7308
40.000	1.0108	0.7147	95.450	2.4860	1.7579
45.000	1.0935	0.7732	98.000	2.7971	1.9778
50.000	1.1774	0.8325	98.168	2.8284	2.0000
54.406	1.2533	0.8862	98.889	3.0000	2.1213
55.000	1.2637	0.8936	99.000	3.0348	2.1460
60.000	1.3537	0.9572	99.730	3.4393	2.4320
63.212	1.4142	1.0000	99.9877	4.2426	3.0000
$\lambda_c = \sqrt{2} \sqrt{-\ln(1-P)}$ $\lambda_c = \sqrt{-\ln(1-P)}$					

The probability ellipse that contains p-percent of the wind vectors expressed in the most general form is the conic defined by

$$AX^2 + BXY + CY^2 + DX + EY + F = 0 \quad , \quad (13)$$

where

$$A = \sigma_y^2$$

$$B = -2\rho\sigma_x\sigma_y$$

$$C = \sigma_x^2$$

$$D = 2\sigma_x\sigma_y \rho \bar{Y} - 2\sigma_y^2 \bar{X} = - (B\bar{Y} + 2A\bar{X})$$

$$E = 2\sigma_x\sigma_y \rho \bar{X} - 2\sigma_x^2 \bar{Y} = - (B\bar{X} + 2C\bar{Y})$$

$$F = A\bar{X}^2 + C\bar{Y}^2 + B\bar{X}\bar{Y} - AC (1 - \rho^2) \lambda_e^2 \quad ,$$

and

$$\lambda_e = \sqrt{2} \sqrt{-\ln (1 - p)} \quad .$$

For graphical presentations, the range of the variable is important in order to arrange the scale. The largest and smallest values of X and Y for a given probability ellipse, p, are given by

$$X_{L,S} = \bar{X} \pm \sigma_x \lambda_e \quad (14)$$

$$Y_{L,S} = \bar{Y} \pm \sigma_y \lambda_e \quad , \quad (15)$$

where, as before, $\lambda_e = \sqrt{2} \sqrt{-\ln(1-p)}$.

Although there are several approaches to graphing the probability ellipses, the following procedure is advantageous for electronic computer plotting. In establishing the computer plotting program, the sample estimates for $\bar{X}, \bar{Y}, \sigma_x, \sigma_y$, and ρ are constants in equation (13). The user makes the choice of probability ellipses desired. Thus, p in equation (12) is programmed as a parameter. The largest and smallest values for X and Y are computed by equations (14) and (15) for the largest probability ellipse selected. This sets the graphical scale. Values of X within the range of " X smallest" to " X largest" are obtained by incrementing X between these limits. Using the quadratic equation, a solution for Y of equation (13) is made and plotted for each value of X . The centroid $(\bar{X}, \bar{Y})$ for the family of probability ellipses is plotted as a point. Labeling and other identification complete the plotting program.

For a given probability, equation (13) defines an ellipse that contains p -percent of the points X, Y . Since the entire area under the bivariate normal density function [equation (9)] is unity, upon integration for a given probability ellipse, that given ellipse contains p -percent of the total area. In the wind statistics, p -percent of the wind vectors fall within the specified probability ellipse. From this point of view, a specified probability ellipse gives the joint probability that p -percent of the $U-V$ components lie within the given ellipse.

When $\sigma_x^2 = \sigma_y^2 = \sigma^2$ and $\rho = 0$ in the bivariate normal distribution, the probability ellipses of equation (13) reduce to circles whose centers are at the means $\bar{X}, \bar{Y}$. The radii of the probability circles are $\sigma_{V1} \lambda_c$, where

$$\sigma_{V1} = \sqrt{2\sigma^2} \quad (16)$$

and

$$\lambda_c = \sqrt{-\ln(1-p)} \quad (17)$$

Values for λ_c for selected probabilities, p , are given in table C.

Because this function is simple, it can easily be graphed manually. However, the generalized plotting technique for electronic computer plotters, as represented by equation (13), can be advantageously used.

C.3. Derived Distributions for Wind Statistics

In this subsection the probability distribution functions and sets of equations are presented to derive certain probability distribution functions for wind statistics. These derived probability distributions are:

- 1) The conditional distribution of wind components
- 2) The generalized Rayleigh distribution for windspeed
- 3) The distribution for wind direction
- 4) The conditional distribution of windspeed given a wind direction (wind rose).

The required five statistical parameters for these derived distributions for wind statistics are given in table I.

C.3.1 The Conditional Distribution of Wind Components

Given that two random variables X and Y are bivariate normally distributed, the conditional distribution $f(Y|X)$ is read as $f(Y)$ given X , and likewise $f(X|Y)$ is read as $f(X)$ given Y . The conditional probability distribution function $F(Y|X)$ has the mean $E(Y|X)$ and variance $\sigma^2_{(Y|X)}$, where

$$E(Y|X^*) = \bar{Y} + \rho \left(\frac{\sigma_Y}{\sigma_X} \right) (X^* - \bar{X}) \quad (18)$$

and

$$\sigma^2_{(Y|X^*)} = \sigma_Y^2 (1 - \rho^2) \quad (19)$$

The conditional standard deviation is

$$\sigma_{(Y|X^*)} = \sigma_Y \sqrt{1 - \rho^2} \quad (20)$$

By interchanging the variables and parameters, the conditional distribution function for $F(X|Y^*)$ has the conditional mean

$$E(X|Y^*) = \bar{X} + \rho \left(\frac{\sigma_X}{\sigma_Y} \right) (Y^* - \bar{Y}) \quad , \quad (21)$$

conditional variance

$$\sigma^2_{(X|Y^*)} = \sigma_X^2 (1 - \rho^2) \quad , \quad (22)$$

and conditional standard deviation

$$\sigma_{(X|Y^*)} = \sigma_X \sqrt{1 - \rho^2} \quad . \quad (23)$$

The preceding conditional probability distribution functions are univariate normal distributions for a (fixed) given value for one of the bivariate normal variables. Thus, the t-values given in table B are applicable for conditional probability statements. For example,

$$F(Y|X^*) = E(Y|X^*) + t\sigma_{(Y|X^*)} \quad . \quad (24)$$

For $t = 1.6449$ there is a 95 percent chance that Y is less than or equal to $\bar{Y} + 1.6449 \sigma_{(Y|X^*)}$ given that $X = X^*$. In symbols this statement reads

$$P \left\{ Y \leq E(Y|X^*) + 1.6449 \sigma_{(Y|X^*)} \mid X = X^* \right\} = 0.9500 \quad . \quad (25)$$

Interval probability statements can also be made; namely,

$$P \left\{ Y_1 = E(Y|X^*) - t\sigma_{(Y|X^*)} \leq Y \leq Y_2 = E(Y|X^*) + t\sigma_{(Y|X^*)} \mid X = X^* \right\}$$

where X^* can take on any fixed value of X , but a convenient arrangement is to let $X^* = \bar{X} \pm t\sigma_X$.

The close connection of the regression function of Y on X to the conditional mean for the bivariate normal distribution is noted; namely,

$$Y = \bar{Y} + \rho \left(\frac{\sigma_Y}{\sigma_X} \right) (X - \bar{X}) \quad (26)$$

Similarly, the regression function of X on Y is

$$X = \bar{X} + \rho \left(\frac{\sigma_X}{\sigma_Y} \right) (Y - \bar{Y}) \quad (27)$$

These are linear functions and express the same results as would be obtained from a least-squares regression line.

C.3.2. The Generalized Rayleigh Distribution for Windspeed

If two random variables, X and Y, are bivariate normally distributed, then the probability distribution for the modulus, R, can be derived in terms of the five parameters that define the bivariate normal distribution.

$$R = \sqrt{X^2 + Y^2} \quad (28)$$

The distribution of R so derived is called a generalized Rayleigh distribution because there are no restrictions on the parameters. For applications to the RRA, the variable R is recognized as windspeed or the modulus of the wind vector.

The probability density function for R is expressed as

$$f(R) = a_0 \text{Re}^{-a_1 R^2} \left[I_0(a_2 R^2) I_0(a_3 R) + 2 \sum_{k=1}^{\infty} I_k(a_2 R^2) I_{2k}(a_3 R) \cos 2k\psi \right] R \geq 0 \quad (29)$$

The functions $I_0(\cdot)$, $I_k(\cdot)$, and $I_{2k}(\cdot)$ are the modified Bessel functions of the first kind for zero order, kth order, and 2kth order. The coefficients are

$$a_0 = \exp \left[-\frac{1}{2} \left\{ \frac{\bar{X}^2}{\sigma_a^2} + \frac{\bar{Y}^2}{\sigma_b^2} \right\} \right] / \sigma_a \sigma_b ,$$

where σ_a^2 and σ_b^2 are the rotated variances to produce zero correlation between X and Y. σ_a and σ_b are the positive and negative roots¹ of the expression

$$\sigma_{(+,-)}^2 = \frac{1}{2} \left\{ \sigma_x^2 + \sigma_y^2 \pm \left[(\sigma_x^2 + \sigma_y^2)^2 - 4\sigma_x^2 \sigma_y^2 (1 - \rho^2) \right]^{1/2} \right\} ,$$

$$a_1 = (\sigma_x^2 + \sigma_y^2) / 4(1 - \rho^2) \sigma_x^2 \sigma_y^2 ,$$

$$a_2 = \frac{\left[(\sigma_x^2 - \sigma_y^2)^2 + 4\rho^2 \sigma_x^2 \sigma_y^2 \right]^{1/2}}{4(1 - \rho^2) \sigma_x^2 \sigma_y^2} ,$$

$$a_3 = \left[\left(\frac{\bar{X}}{\sigma_a} \right)^2 + \left(\frac{\bar{Y}}{\sigma_b} \right)^2 \right]^{1/2} ,$$

1. This computational form is obtained from the determinant

$$\begin{vmatrix} \sigma_x^2 - K & \sigma_x \sigma_y \rho \\ \sigma_x \sigma_y \rho & \sigma_y^2 - K \end{vmatrix} ,$$

where K is $\sigma_{(+,-)}^2$, and σ_a and σ_b are analogous to the standard deviation of the major and minor axes of the bivariate normal probability ellipse.

and

$$\tan \psi = \frac{\bar{Y}}{\bar{X}} \frac{\sigma_a^2}{\sigma_b^2} .$$

Since this density function cannot be integrated in closed form from zero to R, numerical integration is used to obtain practical results for the probability distribution function; i.e.,

$$F(R) = \int_0^{R*} f(R) dR . \quad (30)$$

A number of special cases can be obtained from the general Rayleigh distribution [equation (29)], the simplest of which is to let $\sigma_x \equiv \sigma_y = \sigma$ and $\bar{X} = \bar{Y} = 0$ with independent variables X and Y. This gives

$$f(R) = \frac{R}{\sigma^2} e^{-R^2/2\sigma^2} , \quad (31)$$

which is recognized as the classical Rayleigh probability density function. The density function, equation (31), can be integrated in closed form over any range of the variable R. Hence, the probability distribution function, F(R), for equation (31) is

$$F(R) = 1 - \exp \left\{ \frac{-R^2}{2\sigma^2} \right\} . \quad (32)$$

C.3.3. The Derived Distribution of Wind Direction

Considering the wind as a vector quantity and bivariate normally distributed, the wind direction can be derived. This is done by first writing the bivariate normal probability density function in polar coordinates whose variables are

$$g(r, \theta) = r d_1 e^{-\frac{1}{2} (a^2 r^2 - 2br + c^2)} \quad (33)$$

(see footnote 2)

where

$$a^2 = \frac{1}{(1 - \rho^2)} \left[\frac{\sin^2 \theta}{\sigma_x^2} - \frac{2\rho \cos \theta \sin \theta}{\sigma_x \sigma_y} + \frac{\cos^2 \theta}{\sigma_y^2} \right]$$

$$b = \frac{-1}{(1 - \rho^2)} \left[\frac{\bar{x} \sin \theta}{\sigma_x^2} - \frac{\rho(\bar{x} \cos \theta + \bar{y} \sin \theta)}{\sigma_x \sigma_y} + \frac{\bar{y} \cos \theta}{\sigma_y^2} \right]$$

$$c^2 = \frac{1}{(1 - \rho^2)} \left[\frac{\bar{x}^2}{\sigma_x^2} - \frac{2\rho \bar{x} \bar{y}}{\sigma_x \sigma_y} + \frac{\bar{y}^2}{\sigma_y^2} \right]$$

$$d_1 = \frac{1}{2\rho \sigma_x \sigma_y \sqrt{1 - \rho^2}}$$

$r = \sqrt{x^2 + y^2}$ is the modulus of the vector or speed, and θ is the direction of the vector. After integrating $g(r, \theta)$ over $r = 0$ to ∞ , the probability density function of θ is

$$g(\theta) = \frac{d_1}{a^2} e^{-\frac{1}{2} c^2} \left[1 + \sqrt{2\pi} \left(\frac{b}{a} \right) e^{\frac{1}{2} \left(\frac{b}{a} \right)^2} \Phi \left(\frac{b}{a} \right) \right] \quad (34)$$

2. This expression, equation (33), in Smith 1976) is given with respect to the mathematical convention for a vector direction.

where a^2 , b , c^2 , and d_1 are as previously defined in equation (33) and

$$\phi\left(\frac{b}{a}\right) = \phi(x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^x e^{-\frac{1}{2}t^2} dt$$

is taken from tables of normal distribution functions or made available through a computer subroutine.

If desired, equation (34) can be integrated numerically over a chosen range of θ to obtain the probability that the vector direction will lie within the chosen range; i.e.,

$$F(\theta) = \int_{\theta_2}^{\theta_1} g(\theta) d\theta \quad (35)$$

One application may be to obtain the probability that the wind will flow from a given quadrant or sector as, for example, onshore.

C.3.4. The Derived Conditional Distribution of Windspeed Given the Wind Direction (Wind Rose)

Continuing with the considerations in section C.3.3. of this chapter, the conditional probability density function (pdf) for windspeed, r , given a specified value for the wind direction, θ , can be expressed as

$$f(r|\theta) = \frac{a^2 r e^{-\frac{1}{2}(a^2 r^2 - br)}}{1 + \sqrt{2\pi} \left(\frac{b}{a}\right) e^{\frac{1}{2}\left(\frac{b}{a}\right)^2} \phi\left\{\frac{b}{a}\right\}} \quad (36)$$

where the coefficients, a and b and the function $\phi\left\{\frac{b}{a}\right\}$ are as previously defined in equation (33) and in equation (34).

From equation (36) the mode (most frequent value) of the conditional windspeed given a specified value of the wind direction is the positive solution of the quadratic equation,

$$a^2 r^2 - br - 1 = 0 \quad (37)$$

which is

$$(\ddot{r} | \theta) = \frac{1}{2a} \left[\left(\frac{b}{a} \right) + \sqrt{4 + \left(\frac{b}{a} \right)^2} \right] \quad (38)$$

The locus of the conditional modal values of windspeed when plotted in polar form versus the given wind directions forms an ellipse.

The noncentral moment for equation (36) is expressed as

$$\mu'_n = \int_0^{\infty} r^n f(r|\theta) dr \quad (39)$$

Now the first noncentral moment is identical to the first central moment or the expected value, $E(r|\theta)$. The integration of equation (39) for the first moment is sufficiently simple to yield practical computations and can be expressed as

$$E(r|\theta) = \frac{\left(\frac{b}{a} \right) + \left[1 + \left(\frac{b}{a} \right)^2 \right] \sqrt{2\pi} e^{\frac{1}{2} \left(\frac{b}{a} \right)^2} \phi \left\{ \frac{b}{a} \right\}}{a \left[1 + \left(\frac{b}{a} \right) \sqrt{2\pi} e^{\frac{1}{2} \left(\frac{b}{a} \right)^2} \phi \left\{ \frac{b}{a} \right\} \right]} \quad (40)$$

Hence, equation (40) gives the conditional mean value of the windspeed given a specified value for the wind direction.

The integration of equation (36) for the limits $r = 0$ to $r = r^*$ gives the probability that the conditional windspeed is $\leq r^*$ given a value for the wind direction, θ . This conditional probability distribution (PDF) can be written as

$$\Pr \left\{ r \leq r^* \mid \theta = \theta_0 \right\} = 1 - \left[\frac{e^{-\frac{1}{2} r_s^2 + \sqrt{2\pi} \left(\frac{b}{a} \right) \left\{ 1 - \phi(r_s) \right\}}}{e^{-\frac{1}{2} \left(\frac{b}{a} \right)^2 + \sqrt{2\pi} \left(\frac{b}{a} \right) \phi \left\{ \frac{b}{a} \right\}}} \right] \quad (41)$$

$$\text{where } r_s = \left[a r^* - \left(\frac{b}{a} \right) \right]$$

By definition, equation (41) is an expression for a "wind rose." Empirical wind rose statistics are often tabulated or graphically illustrated giving the frequency that the windspeed is not exceeded for those windspeed values that lie within assigned class intervals of the wind direction. After evaluation of equation (41) for various values of windspeed, r^* , and the given wind directions, θ , interpolations can be performed to obtain various percentile values of the conditional windspeed.

For the special case when b in equation (33) equals zero (i.e., for $\bar{x} = \bar{y} = 0$), the conditional modal values of windspeeds [equation (38)], the conditional mean values of windspeeds [equation (40)], and the fixed conditional percentile values of windspeeds [interpolated from evaluations of equation (41)], when plotted in polar form versus the given wind directions, produce a family of ellipses.

For the special case when $\bar{x} = \bar{y} = 0$, equation (36) reduces to the following simple case:

$$\Pr \left\{ r \leq r^* \mid \theta = \theta_0 \right\} = 1 - e^{-\frac{a^2 r^{*2}}{2}} \quad (42)$$

There is a special significance of equation (42) when related to the bivariate normal probability distribution. If r^* and θ are measured from the centroid of the probability ellipse, then the probability that $r \leq r^*$ is the same as the given probability ellipse. Further, solving equation (42) for r^* , gives

$$r^* = \frac{1}{a} \sqrt{-2 \ln (1 - P)} \quad (43)$$

If a probability ellipse P is chosen, equation (42) gives the distance of r along any θ from the centroid of the ellipse to the intercept of the specified probability ellipse. If there is an interest in conditional probability of winds for a given θ relative to the monthly means, equation (43) is applicable. If it is desired to find the magnitude of the wind along any θ relative to the monthly mean to the intercept of a given probability ellipse, equation (43) is applicable.

D. Statistical Parameters With Respect To Any Orthogonal Axes

The five wind statistical parameters presented in table I are given with respect to the standard meteorological coordinate system; i.e., these parameters are for the U and V components. For many aerospace vehicles and range applications, there is a need for wind statistics with respect to orthogonal axes other than west to east and south to north. For example, it may be required to present wind statistics with respect to a flight azimuth of an

aerospace vehicle whose flight azimuth is α degrees from true north measured in a clockwise direction. The following sets of equations are presented to compute the five parameters for the new coordinate axes rotated α degrees clockwise from true north.

a. Rotation of the means through α degrees:

$$\bar{X}_{\alpha} = \bar{X} \cos (90 - \alpha) + \bar{Y} \sin (90 - \alpha) \quad (44)$$

$$\bar{Y}_{\alpha} = \bar{Y} \cos (90 - \alpha) - \bar{X} \sin (90 - \alpha) \quad (45)$$

b. Rotation of the variances through α degrees:

$$\begin{aligned} \sigma_{x_{\alpha}}^2 &= \sigma_x^2 \cos^2 (90 - \alpha) + \sigma_y^2 \sin^2 (90 - \alpha) \\ &+ 2\rho\sigma_x\sigma_y \cos (90 - \alpha) \sin (90 - \alpha) \end{aligned} \quad (46)$$

$$\begin{aligned} \sigma_{y_{\alpha}}^2 &= \sigma_y^2 \cos^2 (90 - \alpha) + \sigma_x^2 \sin^2 (90 - \alpha) \\ &- 2\rho\sigma_x\sigma_y \cos (90 - \alpha) \sin (90 - \alpha) \end{aligned} \quad (47)$$

c. Rotation of the linear correlation coefficient through α degrees:

$$\rho_{\alpha} = \frac{\text{cov} (X,Y)_{\alpha}}{\sigma_{x_{\alpha}} \sigma_{y_{\alpha}}} \quad (48)$$

where $\text{cov} (X,Y)_{\alpha}$ is the rotated covariance,

$$\begin{aligned} \text{cov} (X,Y)_{\alpha} &= \text{cov} (X,Y) [\cos^2 (90 - \alpha) - \sin^2 (90 - \alpha)] \\ &+ \cos (90 - \alpha) \sin (90 - \alpha) (\sigma_y^2 - \sigma_x^2) \end{aligned}$$

and

$$\text{cov}(X,Y) = \rho \sigma_x \sigma_y$$

By using these rotational equations, the bivariate normal distribution with respect to any desired rotated coordinates can be obtained from sample estimates that have been computed with respect to a specific axis. The marginal distributions after rotation are also normally (univariate) distributed. Using the rotational equations greatly reduces computational efforts for applications requiring statistics with respect to several coordinate axes.

Appendix A presents some illustrative examples for the wind statistics of the specific RRA.

CHAPTER III. STATISTICS OF THERMODYNAMICS QUANTITIES AND MODELS

A. General Considerations

A.1. Objectives

The objective inherent in developing the thermodynamic section of the RRA was to describe the thermodynamic characteristics of the atmosphere using a minimum of data tabulations. A set of parameters was selected which, together, thermodynamically describe the climatological state of the atmosphere. These parameters are the pressure, temperature, density, dewpoint, virtual temperature, and water vapor pressure. Used together, these parameters permit the calculation of a large number of derived quantities. (Symbols used in the calculations in this chapter are summarized in table D.) Some of these quantities, such as the speed of sound, are dealt with in section III.E.

The probability distribution of each of the six thermodynamic RRA parameters is described by its mean value, its standard deviation, and its skewness. Several of these parameters (temperature, pressure, dewpoint and density) have probability distributions that are close to a univariate normal distribution; the others do not. The skewness parameter gives an estimate of the asymmetrical departures of a probability distribution.

Hydrostatically modeled mean values of pressure and density were calculated (table IV), so that users may determine the departure of the actual climatological values of these parameters from hydrostatic conditions. This was done by hydrostatically integrating the pressure from the lowest RRA data level to the termination altitude of the particular RRA.

A.2. Data Quality Control

Data limits derived from the following parameters were used to screen the thermodynamic portion of the RRA data base: temperature, pressure, dewpoint (for the 0- to 30-km portion only), and density (for the 30- to 70-km portion only). These limits were set to plus and minus six standard deviations from the mean values of each of these quantities. These limits were used to screen the thermodynamic portion of the RRA data base, according to the procedures described in section I.C. The data base used to generate the thermodynamic portion of the RRA (tables I, II, and IV) was considered to be free from errors under the following conditions:

- a) The skewness values of the pressure and temperature were between -2.5 and 2.5 at all data levels.
- b) The skewness values of the density were between -3.5 and 3.5 at data levels between 0 and 30 km.
- c) The skewness values of the density were between -3.0 and 3.0 at data levels between 30 and 70 km.
- d) The skewness values of the dewpoint were between -2.5 and 2.5 at all data levels with more than 10 data values.

TABLE D. LIST OF SYMBOLS USED IN CHAPTER III

C_s	- Speed of sound
C_d	- Collision diameter
E	- Vapor pressure
g_ϕ	- Gravity at latitude ϕ
H	- Geopotential height
H_m	- Geopotential height at a mandatory radiosonde data level
H_s	- Geopotential height at a significant radiosonde data level
K_t	- Coefficient of thermal conductivity
L	- Mean free path length
M	- Mean molecular weight of air at sea level
$M3Q$	- Annual or monthly third moment of quantity Q
n	- Refractive modulus
N	- Refractive index
NA	- Avogadro's constant
N_Q	- Number of values of quantity Q
P	- Pressure
P_m	- Pressure at a mandatory radiosonde data level
P_s	- Pressure at a significant radiosonde data level
P_h	- Hydrostatically integrated mean monthly or annual pressure
Q	- Any tabulated RRA quantity
R^*	- Universal gas constant
R'	- Specific gas constant of dry air
r', r^*	- Parameters used in converting z to h and vice versa

TABLE D. (concluded)

S	- Sutherland's constant, used in the calculation of dynamic viscosity
T	- Temperature
T_d	- Dew point
T_v	- Virtual temperature
T_{vm}	- Virtual temperature at a mandatory radiosonde data level
T_{vs}	- Virtual temperature at a significant radiosonde data level
V	- Mean air particle speed
V_c	- Mean collision frequency
w	- Parameter used in the hydrostatic interpolation of pressure and density
Z	- Geometric altitude
λ	- Wavelength
α_Q	- Skewness of quantity Q
β	- Constant used in the equation for viscosity
γ	- Ratio of specific heat at constant pressure to specific heat at constant volume
η	- Kinematic coefficient of viscosity
μ	- Dynamic coefficient of viscosity
ρ	- Density
ρ_h	- Mean monthly or annual density derived from pressure height
σ	- Standard deviation of the quantity Q

A.3. Limitation of Thermodynamic Statistics

The correlation coefficients between the thermodynamic quantities and the moisture-related quantities were not calculated at discrete altitudes, nor were any of the correlations between altitudes. Therefore, valid statistical dispersion models that require the relationship between two or more of these quantities at the same altitude or between altitudes cannot be derived. Approximations for the correlation coefficients between pressure, virtual temperature, and density at discrete altitudes may be obtained from the coefficients of variation as developed by Buell (1970). The coefficient of variation is the standard deviation divided by the mean. The mean values and the standard deviations are taken from table II. A model for the profile of monthly and annual mean pressure, virtual temperature, and density that is in excellent agreement with the respective statistical mean values is given by table IV. This agreement results because the physical relationships, given by the hydrostatic equation and the equation of state, were used to derive table IV. When only the monthly or annual mean values for pressure, virtual temperature, and density are required, it is recommended that table IV be used.

B. Establishing Data Samples at the Required Altitude Levels

This section describes the computational procedures used to establish data samples of the thermodynamic RRA parameters at the RRA data levels. References are cited only when an equation given is one of many available in the literature or when an equation is stated in an unusual form.

B.1. Conversion of Data Recorded in Geopotential Heights to Geometric Altitude

The upper air rocketsonde observations used to obtain the table values above 30 km were recorded in terms of geometric altitude and can be interpolated directly to the altitude intervals shown in the tables. However, the radiosonde observations used to obtain the tabular values below 30 km were recorded in terms of geopotential heights. The change of coordinates from geopotential heights to geometric altitudes (h to z) is accomplished by calculating a table of geopotential heights that correspond exactly to the geometric altitudes at which the atmospheric parameters are tabulated. The radiosonde observations are then interpolated to these geopotential heights. The relationship used to calculate geometric altitude from geopotential height is

$$H = (r'z)/(r^*z) \quad , \quad (49)$$

where

$$r' = gr^*/9.80665$$

and

$$r^* = -2g_\phi / (\partial g_\phi / \partial z_0) \quad .$$

g_ϕ is the sea-level gravity at the latitude ϕ corresponding to the proper location. This value is given by (List, 1968)

$$g_\phi = 9.780356 (1 + 5.2885 \times 10^{-3} \sin^2 \phi - 5.9 \times 10^{-6} \sin^2 (2\phi)). \quad (50)$$

$\frac{\partial g_\phi}{\partial z_0}$ is the rate of change of gravity at the sea level. This quantity is given

by the equation

$$\frac{\partial g_\phi}{\partial z_0} = -3.085462 \times 10^{-6} + 2.27 \times 10^{-9} \cos (2\phi) - 2 \times 10^{-12} \cos (4\phi). \quad (51)$$

The units used for gravity are meters per square second, while the units for

$\frac{\partial g_\phi}{\partial z_0}$ are per square second.

The resulting table of values of H obtained by using even increments of 2 in equation (49) is shown in table IV of the RRA. The values of H above 30 km are not used in the interpolation of original data, but are included for the convenience of the user.

B.2. Calculations on the Original Rawinsonde Data Records

It was necessary to interpolate the information from the original rawinsonde data records to the geometric altitudes specified as the RRA data levels. The parameters for which this interpolation was required were the temperature, dewpoint, and pressure. The other parameters were calculated from the interpolated values at each RRA data level. These "derived" parameters were the water vapor pressure, density, and virtual temperature.

B.2.1. Calculation of the Geopotential Height at Significant Levels

Two somewhat different interpolation procedures were used to obtain data from radiosonde and rocketsonde observations at the levels shown in the tables. The procedure used to interpolate radiosonde observations began with the calculation of virtual temperature at each data level in a sounding. The virtual temperature was computed by

$$T_v = T / (1 - 0.379 (e/p)) \quad , \quad (52)$$

where T_v and T are in degrees Kelvin and e and p are in millibars.

The radiosonde soundings contain a mix of data taken at "mandatory" and "significant" levels. Pressure, temperature, and dewpoint information was given in these soundings at both types of levels. However, geopotential height information was only given at the mandatory levels. The heights at the significant levels were "filled in" (calculated) hydrostatically using pressure and temperature data from these levels. This procedure permitted the use of most of the significant level data in the calculation of the RRA tables. The equation used for this process was

$$H_s = H_m + 29.2712617 \frac{(T_{vs} - T_{vm})}{2} \ln(P_s/P_m) , \quad (53)$$

where the subscripts s and m denote quantities at significant and mandatory levels. This equation was not used if the difference between two adjacent mandatory levels was greater than 200 mb. All soundings with such data gaps were rejected for use in compiling the RRA.

B.2.2. Temperature

Radiosonde temperatures were interpolated logarithmically with respect to pressure using the equation

$$T = T_U + (T_L - T_U) \frac{\ln p - \ln p_L}{\ln p_U - \ln p_L} , \quad (54)$$

where the subscripts U and L indicate values at the nearest data levels in the actual sounding above and below the interpolated level.

B.2.3. Pressure

The pressure values in each radiosonde sounding were interpolated to the RRA data levels using the equation

$$p = p_L \exp \left(\frac{H_L - H_U}{29.2712617 (0.5) (T_{vU} + T_{vL})} \right) \quad (55)$$

where the subscript L indicates virtual temperature, geopotential height, and pressure values at the data level below and closest to the level at which data were required.

B.2.4. Dewpoint Temperature

Dewpoint values were interpolated logarithmically with respect to pressure using the equation

$$T_d = T_{dU} + (T_{dL} - T_{dU}) \left(\frac{\ln p - \ln p_L}{\ln p_U - \ln p_L} \right) . \quad (56)$$

The subscripts U and L indicate data at the nearest upper and lower data levels in a sounding.

B.2.5. Derived Water Vapor Pressure

The water vapor pressure was calculated from the interpolated dewpoint values at the RRA data levels using Tetten's approximation:

$$e = 6.11 \text{ mb} \times 10^{7.5(T_d - 273.15)/(T_d - 35.86)} \quad (57)$$

B.2.6. Derived Density

The density values derived from radiosonde observations were calculated at the RRA data levels using the equation

$$\rho = 348.36787 \text{ p}/T_v \quad (58)$$

B.2.7. Derived Virtual Temperature

The virtual temperature values were calculated at the RRA data levels for each sounding using the equation

$$T_v = T/(1 - 0.379(e/p)) \quad (59)$$

where T_v and T are in degrees Kelvin, and p and e are the pressure and vapor pressure, respectively, in millibars.

B.3. Calculations on the Original Rocketsonde Data Records

The rocketsonde data records used to calculate the RRA table values above 30 km were given in terms of geometric altitude. For this reason, slightly different calculations were required to convert the recorded data values to values at the RRA data levels. The pressure, temperature, and density were all interpolated to the RRA data levels; moisture-related parameters (virtual temperature, water vapor pressure, and dewpoint) were not calculated, since atmospheric moisture at altitudes above 30 km was considered to be negligible.

No interpolation was done across gaps in the pressure or temperature data within a sounding larger than 7,000 m. Data values at the RRA levels within such a gap were set to missing.

B.3.1. Temperature

Rocketsonde temperatures were interpolated linearly with respect to geometric altitude using the equation

$$T = T_U + (T_L - T_U) \frac{Z - Z_L}{Z_U - Z_L} , \quad (60)$$

where the subscripts U and L indicate values at the nearest data level in the actual sounding above and below the interpolated level.

B.3.2. Pressure

The pressure values in each rocketsonde sounding were interpolated to the RRA data levels using the equation

$$P = P_L \exp \left(- \frac{g_\phi}{R^*} \frac{M(Z - Z_L)}{\bar{T}_v} \cdot W^2 \right) , \quad (61)$$

where $\bar{T}_v = \frac{T_{vU} + T_{vL}}{2}$ and $W = \frac{r^*}{\left(r^* + Z + \frac{Z - Z_L}{2} \right)}$.

B.3.3. Density

Rocketsonde density values were interpolated using the equation

$$\rho = \rho_L \exp \left(- \frac{g_\phi M}{R^*} \frac{(Z - Z_L)}{\bar{T}_v} \cdot W^2 \right) , \quad (62)$$

where W is specified in section III.B.3.2.

C. Computation of Statistical Parameters for Tables II and III

A three-step procedure was used for computing the monthly and annual means, standard deviations, and skewness values from the data values at the RRA data levels. Initially, certain statistical sums were calculated and stored as the soundings in the data base were processed. These sums were then used to calculate the monthly statistics given in the RRA tables. The annual statistics were then calculated from these stored sums and the monthly statistics.

C.1. Stored Statistical Sums

The sums calculated were

$$\sum Q, \sum Q^2, \text{ and } \sum Q^3 ,$$

where Q is any one of the quantities given in the thermodynamic part of the RRA.

C.2. Calculation of the Monthly Statistics

C.2.1. Monthly Means

The mean monthly values of the thermodynamic RRA quantities were calculated using the equation

$$\bar{Q} = \sum Q / N_Q ,$$

where N_Q is the number of observed values of the quantity Q for a given month.

C.2.2. Monthly Standard Deviations

The monthly standard deviations of the thermodynamic RRA quantities were calculated using the equation

$$\sigma_Q = \sqrt{\frac{(N_Q \sum Q^2) - (\sum Q)^2}{N_Q \cdot (N_Q - 1)}} . \quad (63)$$

C.2.3. Monthly Skewness Values

The monthly skewness values of the windspeed and of the thermodynamic RRA quantities were calculated using the equation

$$\alpha_Q = \frac{M_{3Q}}{\sigma_Q^3} ,$$

where M_{3Q} is the third moment of the quantity Q , σ_Q is its standard deviation, and

$$M_{3Q} = \left[\frac{\sum Q^3}{N_Q} - \frac{3 \sum Q \sum Q^2}{N_Q^2} - \frac{2 \sum Q^3}{N_Q^3} \right] \cdot \frac{N_Q^2}{(N_Q - 1)(N_Q - 2)} . \quad (64)$$

C.3. Calculation of the Annual Statistics

Equations (63) and (64), used to calculate the monthly values of the standard deviations and skewness values, involve taking the differences between two pairs of large sums containing Q^2 and Q^3 , where Q is any thermodynamic RRA quantity. Using these equations to compute the annual statistics would have resulted in a substantial loss of precision, as these sums become larger by several orders of magnitude in such a case. This problem was avoided by calculating the annual means, standard deviations, and skewness values from the monthly statistics.

C.3.1 Annual Mean Values

The annual mean values of the thermodynamic RRA quantities were calculated using the equation

$$Q_{ANN} = Q_A / N_Q$$

where Q_A is the total of all observed values of Q and N_Q is the total number of observations of Q .

C.3.2. Annual Standard Deviations

The annual standard deviations of the thermodynamic RRA quantities were calculated using the equation

$$\sigma_{Q_{ANN}} = \sqrt{\frac{1}{N_Q} \sum_{i=1}^{12} (N_{Qi} \sigma_{Qi}^2) + \frac{1}{N_Q} \sum_{i=1}^{12} (N_{Qi} \bar{Q}_i^2) - Q_{ANN}^2} \quad (65)$$

where N_{Qi} = the number of data values for Q in month i ($i = 1$ to 12), Q_i = the monthly mean of Q , and σ_{Qi} = the standard deviation of quantity Q in month i .

C.3.3. Annual Skewness Values

The annual skewness values of the thermodynamic RRA quantities were calculated using the equation

$$\begin{aligned}
M3Q_{ANN} = & \frac{1}{N} \sum_{i=1}^{12} (N_{Qi} M_{3Qi}) + \frac{3}{NQ_{ANN}} \sum_{i=1}^{12} (N_{Qi} \bar{Q}_i Q_i^2) \\
& + \frac{1}{NQ_{ANN}} \sum_{i=1}^{12} (N_{Qi} Q_i^3) - \frac{3\bar{Q}_{ANN}}{NQ_{ANN}} \sum_{i=1}^{12} (N_{Qi} Q_i^2) \\
& - \frac{3\bar{Q}_{ANN}}{NQ_{ANN}} \sum_{i=1}^{12} (N_{Qi} Q_i^2) + 2\bar{Q}_{ANN}^3, \quad (66)
\end{aligned}$$

where M_{3Qi} = the third moment about the mean of quantity Q in month i and $M3Q_{ANN}$ = the annual third moment about the mean of the quantity Q .

D. Derived Monthly Mean and Annual Mean Model Atmospheres

A set of modeled monthly mean and annual mean hydrostatic values of pressure and density was calculated from the lowest RRA data level (0 km, mean sea level) upwards to 30 km, and from 30 km upwards to 70 km. The integration from 0 to 30 km was computed independently of the integration from 30 to 70 km because of the difference in data sources. The two different values for 30 km are provided for comparison. When 30-km data are required, the values given in the 0- to 30-km table should be used. These hydrostatically modeled mean values, which are given in table IV, are useful as a check on the validity of the pressure and density values given in table II. In most cases, the values in tables II and IV for any given data level are within 1 percent of each other. The hydrostatic pressure values in table IV were calculated using the equation

$$p_1 = p_0 \exp \left(- \frac{0.034162 (H_1 - H_0)}{0.5 (T_{v1} + T_{v0})} \right), \quad (67)$$

where $H_1 - H_0$ is in meters and a "0" subscript refers to values at the RRA data level immediately below the level being checked. p_0 at the lowest data level is set equal to the RRA mean pressure; p_1 , calculated for the next highest data level, is taken as p_0 for the level above that. This process is repeated for all the other RRA data levels. The hydrostatic density corresponding to the hydrostatic pressures is calculated from these pressures and the RRA virtual temperature values using the formula

$$\rho_H = 348.36786 P_H / T_v, \quad (68)$$

where ρ_H and P_H are the hydrostatic density and pressure shown in table IV of the RRA.

E. Thermodynamic Quantities Derivable from the Basic Tables

Several other quantities can be calculated from the statistics listed in tables I and II. Primary physical constants used in these calculations are listed in table E. The equations given in this section can be used to calculate the approximate mean values of these quantities at each RRA data level. It is not possible to infer or derive any information concerning the standard deviation or skewness values of these quantities from the data in tables II and III of the RRA.

E.1. Mean Air Particle Speed

The mean air particle speed, V , is the arithmetic average of the speeds of all air particles in the volume element being considered. For a valid average to occur, there must be a sufficient number of particles involved to represent mean conditions. The equation for V for dry air is

$$V = \sqrt{\frac{8}{\pi} \cdot \frac{R \cdot T}{M}} \quad (69)$$

A computational form for dry air, using tabulated values, is

$$V = \sqrt{7.3094 \times 10^2 \times T} \text{ (meters per second)} \quad (70)$$

where T is the temperature in degrees Kelvin from table II. Equation (69), when corrected for moist air, becomes

$$V = \sqrt{\frac{8}{\pi} \cdot R' \cdot T_v} \quad (71)$$

The computational form for moist air is

$$V = \sqrt{7.3094 \cdot 10^2 \cdot T_v} \text{ (meters per second)} \quad (72)$$

where T_v is the virtual temperature in degrees Kelvin from table III.

TABLE E. LIST OF PRIMARY PHYSICAL CONSTANTS

P_o	= standard atmospheric pressure at sea level = 1.013250×10^5 Newton/m ² = 2116.22 lb/ft ²
ρ_o	= standard atmospheric density at sea level = 1.2250 kg/m ³ = 0.076474 lb/ft ³
T_o	= standard temperature at sea level = 288.15 K = 15.0°C = 59.0°F
g_o	= standard gravity at sea level at latitude 45°32'33" = 9.80665 m/s ²
S	= Sutherland's constant used in calculation of dynamic viscosity = 110.4 K
T_i	= ice-point temperature at P_o = 273.15 K
μ	= constant used in calculation of dynamic viscosity = 1.458×10^{-6} kg/s m K ^{1/2} = 7.3025×10^{-7} lb/s ft R ^{1/2}
γ	= ratio of specific heat of air at constant pressure to specific heat of air at constant volume = 1.4
C_D	= mean effective collision diameter of air molecules = 3.65×10^{-10} m = 1.1975×10^{-9} ft
N_a	= Avogadro's constant = 6.022169×10^{26} /kg mol = 2.73179×10^{26} /lb mol
R^*	= gas constant = 8.31432 J/mol K
R'	= gas constant for dry air = 2.8704×10^2 J/kg K
M	= molecular weight of dry air = 28.966 g/mol

E.2. Mean Free Path

The mean free path, L , is the mean value of the distance traveled by each neutral air particle in a selected air parcel, between successive collisions with other particles in that parcel. A meaningful average requires that the selected parcel be large enough to contain a substantial number of particles. The equation for L is given by

$$L = \left(\frac{\sqrt{2}}{2\pi} \right) \left(\frac{R^*T}{N_a C_d^2 P} \right) \quad , \quad (73)$$

where C_d is the effective collision diameter of the mean air molecules. The 1976 standard atmosphere value of 3.65×10^{-10} is valid for the range of altitudes in the RRA.

A computational form for moist air, using tabulated values, is

$$L = 2.335 \times 10^{-7} \frac{T}{P} \text{ (meters)} \quad , \quad (74)$$

where T is the temperature in degrees Kelvin from table II and P is the pressure in millibars from table II.

A form of (73) to correct L for moist air is

$$L = \left(\frac{\sqrt{2}}{2\pi} \right) \frac{R^*MT_v}{N_a C_d^2} \quad . \quad (75)$$

The computational form for moist air is

$$L = 2.3325 \times 10^{-7} \frac{T_v}{P} \text{ (meters)} \quad , \quad (76)$$

where T_v is the virtual temperature in degrees Kelvin from table III and P is the pressure in millibars from table II.

E.3. Mean Collision Frequency

The mean collision frequency, V_c , is considered to be the average speed of air particles contained in an air parcel, divided by the mean free path of the particles inside that parcel. Computationally this is equivalent to

$$V_c = \frac{V}{L} \text{ (sec}^{-1}\text{)} \quad (77)$$

To determine V_c for dry air, use V and L from equations (70) and (74). To determine V_c for moist air, use V and L from equations (72) and (76).

E.4. Speed of Sound

The expression for the speed of sound, C_s , in meters per second in dry air, is

$$C_s = \sqrt{\frac{R \cdot T}{M}} \quad (78)$$

To compute C_s for dry air from tabulated values, use

$$C_s = \sqrt{4.0185 \cdot 10^2 \cdot T} \text{ (meters per second)} \quad (79)$$

where T is the temperature in degrees Kelvin from table II. One form for the speed of sound in moist air is

$$C_s = \sqrt{R \cdot T_v} \quad (80)$$

where T_v is the virtual temperature from table III. A computational form for moist air is

$$C_s = \sqrt{4.0185 \times 10^2 T_v} \text{ (meters per second)} \quad (81)$$

E.5. Dynamic Coefficient of Viscosity

The coefficient of dynamic viscosity, μ , is defined as a coefficient of internal friction developed where gas regions move adjacent to each other at different velocities. The following expression is taken from the U.S. Standard Atmosphere (1976):

$$\mu = \frac{B \cdot T^{3/2}}{T + S} \quad (82)$$

The computational form is

$$\mu = \frac{(1.458 \cdot 10^{-6}) T^{3/2}}{T + 110.4} \quad \left(\begin{array}{l} \text{kilograms per second} \\ \text{per meter} \end{array} \right), \quad (83)$$

where T is the temperature in degrees Kelvin from table II.

E.6. Kinematic Coefficient of Viscosity

The kinematic coefficient of viscosity, designated as η , is defined to be the ratio of the dynamic coefficient of viscosity of a gas to its density, or

$$\eta = \mu / \rho \quad (84)$$

The computational form is

$$\eta = 1.0 \cdot 10^3 \mu / \rho \quad \left(\begin{array}{l} \text{square meters} \\ \text{per second} \end{array} \right), \quad (85)$$

where μ is the dynamic coefficient of viscosity from equation (83) and ρ is the density in grams per cubic meter from table II.

E.7. Coefficient of Thermal Conductivity

The empirical expression used for the coefficient of thermal conductivity, designated as K_t , is given in the 1976 Standard Atmosphere as

$$K_t = \frac{2.65019 \times 10^{-3} \cdot T^{3/2}}{T + 245.4 \times 10^{-(12/T)}} \quad \left(\begin{array}{l} \text{watts per meter} \\ \text{per degree Kelvin} \end{array} \right), \quad (86)$$

where T is in degrees Kelvin.

E.8. Refractive Modulus and Refractive Index

The refractive modulus or refractivity (Selby and McClatchey, 1975; Smith and Weintraub, 1953) is defined as N, where

$$N = (n - 1) \cdot 10^6 \quad (87)$$

and n is the refractive index.

For microwave frequencies below approximately 30 GHz (equivalent to wavelengths above 1 cm), N , the refractive modulus, is given by the empirical equation

$$N = 77.6 \frac{P}{T_d} + 3.73 \times 10^5 \frac{e}{T^2} \quad (\text{dimensionless}), \quad (88)$$

where E and P are in millibars and T and T_d are in degrees Kelvin.

The following expression is valid for the visible and infrared wavelengths shorter than approximately 30 μm (0.03 mm).

$$N = 77.6 \frac{P}{T} + 0.584 \frac{P}{T\lambda} \quad (\text{dimensionless}), \quad (89)$$

where λ is the wavelength in microns and T is in degrees Kelvin.

The expression for N for the wavelength from 0.03 mm to 1 cm is an extremely complex function of wavelength.

CHAPTER IV. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This document satisfies the technical objectives established for the RRAC by the RCC MG. Upper air statistics and models for wind and thermodynamic quantities for the specific site have been derived in a consistent and uniform manner, which will be used in publications for all other assigned site locations. These RRAs represent an improvement over the previously published RRAs because of the availability of more extensive upper air data bases and the adaptation of more advanced statistical techniques. A statistical measure of central tendency (mean values) and a measure of dispersion (standard deviation with respect to the mean values) for monthly and annual reference periods have been tabulated for all variables in a consistent manner from data bases that have been edited and quality-controlled in the same manner. Further, a statistical measure for symmetry (skewness coefficient that involves the third statistical moment) has been tabulated for all variables except the U and V wind components. Even with these improvements, the user of these RRAs must recognize certain limitations of the statistical tabulations:

- 1) The wind profile structure with respect to altitude cannot be modeled from the RRA statistics because the interlevel and crosslevel correlations were not computed.

- 2) The profile structure with respect to altitude for any of the thermodynamic variables or any quantities derivable from these variables cannot be modeled because the prerequisite correlations were not computed. However, the profiles of monthly and annual means for pressure, virtual temperature, and density are in agreement (table IV) with the hydrostatic equation and the equation of state.

The preceding limitations are cited to prevent a misuse of the RRAs. More extensive statistical tabulations were beyond the scope of this committee's task. As greater insight is gained through usage of these RRAs, many adaptations of the statistical tabulations for specific engineering and scientific applications are envisioned.

Recommendations

It is recommended that the wind and thermodynamic statistical tabulations and attendant models contained in the RRAs be used as a standard reference source, as may be appropriate, by the ranges and range users. It is further recommended that the respective Range Staff Meteorologist or responsible agency staff member be consulted for the applicability of the RRAs for specific engineering applications.

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CONVERSION UNITS

Physical Constants and Conversion Factors

Numerical values in this document are given in the International System of Units (SI, *Système International d'Unités*). The values in parentheses are equivalent U.S. Customary Units, which are English units adapted for use by the United States of America. The SI and U.S. Customary Units provided in table F are those normally used for measuring and reporting atmospheric data.

By definition, the following fundamental conversion factors are exact:

<u>Type</u>	<u>U.S. Customary Units</u>	<u>Metric</u>
Length	1 U.S. yard (yd)	0.9144 meter (m)
Mass	1 avoirdupois pound (lb)	453.59237 gram (g)
Time	1 second (s)	1 second (s)
Temperature	1 degree Rankine (°R)	5/9 degree Kelvin (K)

To aid in the conversion of units, conversion factors based on the above fundamental conversion factors are given in table F.

TABLE F. FACTORS FOR CONVERSION UNITS

Type of Data	M. I. F. R. I. C.		U. S. C. U. S. T. O. M. A. R. Y.				C. O. N. V. E. R. S. I. O. N.	
	Unit	Abbreviation	Unit	Abbreviation	Multiply	By	To Get	
TEMPERATURE	Ambient Temperature							
	degree Celsius	°C	degree Fahrenheit	°F	°F - 32	0.5556	°C	
	degree Kelvin	K	degree Rankine	°R	°C	1.8°	°F + 459.67	
					°R - 459.67	1.00°	°F	
					K	1.00°	°C + 273.15	
Temperature Change	degree Celsius	°C	degree Fahrenheit	°F	K - 273.15	1.00°	°C	
	degree Kelvin	K	degree Rankine	°R	°C or K	1.8°	temp. change °F or °R	
					°F or °R	0.5556	temp. change °C or K	
DENSITY	Water Vapor							
	Vapor Concentration	gram per cubic meter	gram per cubic foot	gr ft ⁻³	gr m ⁻³	0.43700	gr ft ⁻³	
	(Absolute Humidity)	gram per cubic centimeter			gr ft ⁻³	2.2883	gr m ⁻³	
	and Ambient Density				gr m ⁻³	10 ⁻⁶	gr cm ⁻³	
					gr cm ⁻³	4.370 x 10 ³	gr ft ⁻³	
WIND	meter per second	m s ⁻¹	mile per hour	mph	gr ft ⁻³	2.288 x 10 ⁻⁶	gr cm ⁻³	
			knots	knots	m s ⁻¹	2.2369	mph	
			feet per second	ft s ⁻¹	mph	0.44704°	m s ⁻¹	
					m s ⁻¹	1.9438	knots	
					knots	0.51444	m s ⁻¹	
DISTANCE	meter	m	feet	ft	mph	0.868976	knots	
	micron	μ	inch	in.	knots	1.15078	mph	
	Angstrom unit	Å			m s ⁻¹	3.2808	ft s ⁻¹	
					ft s ⁻¹	0.3048°	m s ⁻¹	

* Defined exact conversion factor

TABLE F. (continued)

Type of Data	METRIC		U. S. CUSTOMARY			CONVERSION	
	Unit	Abbreviation	Unit	Abbreviation	Multiply	By	To Get
DISTANCE (Continued)					μ	10^{-6}	m
					μ	3.937×10^{-5}	in.
					$\text{\AA}$	10^{-10}	m
					$\text{\AA}$	3.937×10^{-9}	in.
MASS Weight	gram	g	gram	gr	lb	0.45359237*	kg
	kilogram	kg	pound	lb	lb	453.59237*	g
					kg	2.20462	lb
					F	15.4324	gr
					gr	0.06480	g
PRESSURE Atmospheric	newton per square meter	newton m^{-2}	pound force per square inch	lb in^{-2}	mb	10^{-3}	bar
	millimeter of Mercury	mmHg	inch of Mercury	in Hg	bar	10^{-3}	mb
	bar	bar			newton m^{-2}	10^{-2}	mb
	millibar	mb			newton m^{-2}	1.4504×10^{-4}	lb in^{-2}
	dyne per square centimeter (microbar)	dyne cm^{-2}			lb in^{-2}	6.8948×10^{-3}	newton m^{-2}
	kilogram force per square meter	kg m^{-2}			mb	1.4504×10^{-2}	lb in^{-2}
					lb in^{-2}	68.948	mb
					mb	10^{-3}	dyne cm^{-2}
					dyne cm^{-2}	10^{-3}	mb
					lb in^{-2}	6.8948×10^4	dyne cm^{-2}
					dyne cm^{-2}	1.4504×10^{-5}	lb in^{-2}
					mb	10.1972	kg m^{-2}
					kg m^{-2}	0.0980665	mb
					lb in^{-2}	703.0696	kg m^{-2}
					kg m^{-2}	0.0014223	lb in^{-2}
					mb	2.9530×10^{-2}	in. Hg (32°F)
					mb	0.75006	mmHg (0°C)
					in. Hg (32°F)	25.40*	mmHg (0°C)
					mmHg (0°C)	1.33322	mb
					in. Hg (32°F)	33.8639	mb
		pascal	Pa			Pa	1.00*

* Defined exact conversion factor

TABLE I-1. WIND STATISTICAL PARAMETERS

JANUARY

STATION = 619020									
ASCENSION (WIDE AWAKE)									
Z	MEAN U	S.D. U	R(U,V)	MEAN V	S.D. V	MEAN WS	S.D. WS	SKEW WS	NOBS
KM	M/S	M/S		M/S	M/S	M/S	M/S		
.020	-6.30	1.80	.0000	3.97	1.03	7.67	1.64	.15	508.
1.000	-3.59	2.09	-.3459	1.55	2.08	4.69	2.50	.40	503.
2.000	-3.17	3.72	-.2001	.12	2.68	4.03	2.00	.93	509.
3.000	-4.31	3.51	-.1906	-.08	2.38	5.05	2.93	.49	505.
4.000	-4.63	3.39	-.1450	-.05	2.89	6.07	2.97	.49	510.
5.000	-5.14	3.65	-.1209	-.70	3.05	6.34	3.05	.31	503.
6.000	-5.80	3.27	-.0833	-.64	3.31	7.10	3.21	.16	509.
7.000	-5.62	4.75	-.0441	-.05	3.53	7.54	3.31	.11	503.
8.000	-4.06	6.52	.0000	-1.11	3.80	7.78	3.75	.71	509.
9.000	-1.81	2.03	.0173	-1.57	4.31	6.23	4.09	1.00	510.
10.000	.40	9.02	.0155	-2.28	4.90	6.66	5.70	1.26	503.
11.000	2.54	9.99	.0606	-2.94	5.42	9.95	6.71	1.27	507.
12.000	5.08	10.01	.0535	-3.70	5.33	11.05	7.65	1.14	507.
13.000	7.60	12.07	.0270	-3.72	5.65	13.11	8.95	1.07	507.
14.000	9.69	13.39	.0445	-2.52	5.78	14.29	9.64	.33	507.
15.000	6.49	12.17	.1773	-1.51	5.53	12.40	8.31	1.00	505.
16.000	1.18	8.33	.0032	-1.41	4.43	9.74	5.12	.99	506.
17.000	-3.57	5.77	-.1301	-1.21	3.70	6.97	3.55	.47	503.
18.000	-6.15	4.34	-.0473	-.44	3.31	7.54	4.03	.60	459.
19.000	-3.33	5.04	.0010	-.32	2.63	7.04	4.00	.74	454.
20.000	-7.03	8.19	-.1074	.02	2.48	9.30	6.97	.60	493.
21.000	-10.45	10.77	-.1477	.75	2.71	11.90	9.56	.59	483.
22.000	-13.81	12.03	-.1080	1.61	3.23	15.07	11.01	.47	481.
23.000	-15.00	10.05	-.0090	1.30	2.70	16.30	10.48	.35	473.
24.000	-17.21	10.00	.0001	.02	3.22	17.05	10.03	.30	460.
25.000	-17.04	10.09	.0001	-.09	3.13	18.05	9.70	.41	454.
26.000	-18.35	10.03	-.0074	-1.01	2.80	18.87	10.11	.44	441.
27.000	-19.97	12.16	-.0313	-1.75	3.03	20.31	11.42	.31	414.
28.000	-21.27	13.10	-.0515	-1.30	3.21	21.97	12.38	.20	402.
29.000	-23.52	13.89	.0192	-1.06	3.11	24.13	13.21	-.04	326.
30.000	-25.08	13.84	.1181	-.84	3.27	25.62	13.76	-.16	303.
32.000	-22.15	13.14	.0806	-.37	3.86	20.77	12.64	.01	81.
34.000	-26.55	12.93	-.2145	.09	3.06	26.65	12.74	-.02	81.
36.000	-30.24	11.10	-.1430	1.50	4.40	30.63	11.03	.12	81.
38.000	-34.53	10.44	.0349	1.07	4.59	34.63	10.43	.20	51.
40.000	-42.88	9.83	.0401	.68	4.93	42.15	9.90	.58	81.
42.000	-52.23	8.55	.0455	-1.18	5.83	52.60	6.48	.01	81.
44.000	-61.49	9.05	-.0411	-3.23	7.60	62.05	8.95	-.18	81.
46.000	-67.94	13.29	-.0465	-5.30	8.15	68.63	13.31	-.18	80.
48.000	-71.46	17.99	-.0510	-6.27	7.28	72.14	17.62	-.32	79.
50.000	-63.61	22.97	-.0070	-6.68	9.11	64.73	22.01	-.33	77.
52.000	-45.86	24.16	.0218	-7.25	10.12	40.23	22.55	.12	76.
54.000	-20.20	20.95	-.0300	-4.33	14.06	33.02	17.32	.77	74.
56.000	-14.85	17.15	.1379	-1.13	15.17	24.41	12.04	.75	70.
58.000	-1.54	16.54	-.1300	1.43	15.57	20.14	10.40	.38	59.
60.000	4.24	17.46	-.2739	3.03	14.29	20.46	10.49	1.00	50.
62.000	6.44	17.37	-.0195	2.29	17.37	22.49	11.56	1.22	43.
64.000	11.77	16.85	-.0045	4.73	18.56	25.41	11.16	.28	27.
66.000	20.23	19.51	-.0590	9.01	22.72	29.43	19.84	.47	7.

TABLE I-2. WIND STATISTICAL PARAMETERS

FEBRUARY

STATION - 619020		ASCENSION (WIDE AWAKE)								SKCH WS	NOBS
Z	MEAN U	S.D. U	R(U,V)	MEAN V	S.D. V	MEAN WS	S.D. WS				
M/S	M/S	M/S		M/S	M/S	M/S	M/S				
0.000	-6.37	1.60	.0559	3.78	1.75	7.62	1.81	-.13		461.	
1.000	-4.33	2.59	-.3709	2.53	2.16	5.49	2.54	.23		461.	
2.000	-2.73	3.31	-.2459	.26	2.81	4.61	2.26	.60		459.	
3.000	-3.55	3.51	-.2328	-.92	2.67	5.26	2.52	.30		459.	
4.000	-3.48	3.57	-.1671	-1.15	3.03	5.43	2.42	.33		459.	
5.000	-4.29	3.58	-.1251	-.60	2.86	5.70	2.69	.27		459.	
6.000	-5.42	3.82	-.1763	-.38	3.20	6.77	2.93	.37		459.	
7.000	-5.93	4.52	-.1227	-.69	3.53	7.63	3.10	.22		459.	
8.000	-5.27	5.47	-.1003	-1.32	3.70	7.88	3.32	.36		459.	
9.000	-4.05	5.49	-.2150	-1.89	4.20	8.01	3.94	.59		459.	
10.000	-2.47	7.31	-.1470	-2.52	4.87	8.39	4.37	.62		459.	
11.000	-.68	8.67	-.0500	-3.36	5.61	9.55	5.18	1.19		459.	
12.000	1.39	9.50	-.0129	-3.42	5.53	9.94	5.95	1.08		454.	
13.000	3.00	10.57	-.0112	-3.29	5.78	10.71	7.08	1.33		454.	
14.000	2.90	11.18	-.0534	-2.01	5.88	11.01	7.39	1.31		456.	
15.000	.31	10.03	-.1378	-2.30	5.13	9.75	6.10	1.39		455.	
16.000	-2.50	7.30	-.1001	-1.75	4.13	7.76	4.40	.87		457.	
17.000	-4.70	5.23	-.1521	-.74	3.53	7.11	3.52	.57		456.	
18.000	-6.17	5.11	-.0297	.02	3.31	7.52	4.13	.61		456.	
19.000	-6.84	5.05	-.0257	-.17	2.61	8.05	4.04	.67		444.	
20.000	-8.57	8.09	-.1676	.09	2.78	9.02	7.08	.64		433.	
21.000	-10.73	10.62	-.1504	.21	3.07	12.10	9.59	.61		475.	
22.000	-13.55	11.06	.0152	1.49	3.21	14.63	10.00	.55		424.	
23.000	-15.23	10.16	.2205	1.33	2.77	15.79	9.86	.53		411.	
24.000	-16.64	9.92	.1202	1.08	3.47	17.42	9.59	.52		401.	
25.000	-17.00	10.18	-.0331	-.44	3.18	18.28	9.83	.77		393.	
26.000	-19.04	11.28	-.0537	-1.23	2.94	19.49	10.03	.59		373.	
27.000	-20.22	12.71	-.0679	-1.04	3.07	20.90	12.09	.29		352.	
28.000	-22.02	13.74	-.0088	-1.89	3.01	22.70	13.08	.13		332.	
29.000	-23.66	14.44	-.0312	-1.79	3.33	24.54	13.76	-.02		299.	
30.000	-25.72	14.37	-.0318	-1.72	3.06	26.20	13.92	-.09		241.	
32.000	-22.08	13.70	.2329	-1.20	3.76	22.67	13.29	.16		73.	
34.000	-20.69	13.29	-.0989	-.63	3.93	27.03	13.20	.14		73.	
35.000	-31.33	12.49	-.2311	-.33	3.93	31.64	12.30	.37		73.	
36.000	-35.25	11.57	-.0309	-.16	4.86	33.50	11.48	.46		73.	
40.000	-40.42	10.19	-.1525	.78	4.86	40.74	10.10	.73		73.	
42.000	-45.43	14.21	.1820	.79	6.00	46.03	13.52	.32		73.	
44.000	-45.89	19.69	.2407	-1.66	8.01	47.04	18.60	-.21		73.	
46.000	-40.10	23.53	.2119	-2.93	8.87	41.82	22.33	.05		76.	
48.000	-30.13	24.64	.1805	-4.09	6.89	33.45	21.83	.81		77.	
50.000	-17.04	22.44	.1000	-6.78	8.21	24.44	18.10	1.34		77.	
52.000	-4.87	17.92	-.0712	-7.22	8.79	19.45	11.37	1.46		77.	
54.000	3.71	15.22	.0031	-6.07	10.01	18.17	8.94	.55		72.	
56.000	8.93	15.67	.0235	-3.64	10.44	19.35	10.43	1.04		62.	
58.000	11.89	11.72	.3424	-1.13	10.19	17.90	7.78	.22		53.	
60.000	15.81	12.35	.1816	-1.30	11.99	21.63	8.71	-.07		51.	
62.000	15.64	16.38	-.3610	1.09	12.55	23.25	11.09	.67		36.	
64.000	15.91	16.44	-.4237	.22	13.99	24.24	10.73	.61		21.	
66.000	12.53	20.57	.7527	-2.39	14.23	23.13	14.15	.42		8.	

TABLE I-3. WIND STATISTICAL PARAMETERS

MARCH

STATION = 619020		ASCENSION (WIDE AWAKE)							
Z	MEAN U	S.D. U	R(U,V)	MEAN V	S.D. V	MEAN WS	S.D. WS	SKEW WS	NOBS
KM	M/S	M/S		M/S	M/S	M/S	M/S		
.020	-6.47	1.98	-.0870	3.75	1.78	7.74	1.76	-.14	506.
1.000	-4.76	2.55	-.3311	2.69	2.13	5.84	2.62	.23	507.
2.000	-2.66	3.79	-.3078	.44	2.57	4.63	2.50	.66	506.
3.000	-2.61	3.85	-.1949	-.79	2.77	4.67	2.50	.58	505.
4.000	-3.05	3.43	-.0725	-.75	2.66	4.30	2.43	.53	505.
5.000	-4.17	3.25	-.1070	-.64	2.67	6.61	2.49	.30	506.
6.000	-6.20	3.81	-.2044	-.31	3.10	6.43	2.03	.25	507.
7.000	-5.55	3.87	-.2370	-.41	3.31	6.97	3.10	.33	507.
8.000	-4.58	4.68	-.1631	-.68	3.81	6.82	3.36	.31	506.
9.000	-2.97	5.61	-.0825	-.90	4.41	6.93	3.54	.78	505.
10.000	-1.02	6.54	-.0407	-1.33	4.91	7.33	3.97	.92	505.
11.000	.80	7.53	.0209	-1.99	5.59	8.36	4.74	1.16	505.
12.000	2.22	8.13	.0362	-3.01	5.50	9.07	5.29	1.14	505.
13.000	3.35	9.35	.0674	-3.55	5.70	10.36	6.03	.97	506.
14.000	4.26	10.55	.0303	-3.10	5.51	11.24	6.56	.56	506.
15.000	3.09	9.50	-.0031	-1.95	5.04	9.99	6.06	.96	505.
16.000	-.29	7.25	-.0573	-1.32	4.18	7.37	4.17	1.15	500.
17.000	-3.72	4.79	-.0021	-.66	3.32	6.12	3.27	.72	492.
18.000	-5.51	5.59	.0530	.17	3.01	7.34	4.09	.52	491.
19.000	-5.65	6.64	-.0155	.38	2.69	7.70	5.18	.82	430.
20.000	-7.17	8.54	-.0030	.81	2.66	9.26	6.91	.62	483.
21.000	-9.45	9.83	-.0445	1.20	2.79	11.03	8.57	.52	474.
22.000	-12.00	10.51	.0205	1.63	3.02	13.31	9.46	.67	471.
23.000	-13.54	9.27	.1379	1.73	2.55	14.25	8.69	.58	467.
24.000	-14.67	9.54	.0757	1.51	3.25	15.47	8.94	.64	457.
25.000	-16.13	10.43	-.0225	.09	3.09	16.69	9.99	.85	454.
26.000	-17.42	11.81	-.0576	-1.01	2.83	18.01	11.30	.50	436.
27.000	-18.93	13.13	-.0335	-1.78	2.79	19.77	12.24	.20	389.
28.000	-20.68	13.85	-.0575	-2.37	2.90	21.69	12.76	.01	377.
29.000	-22.87	14.46	.0316	-7.39	2.83	23.60	13.39	-.14	260.
30.000	-24.03	14.16	-.0730	-2.10	2.69	24.77	13.26	-.29	268.
32.000	-19.57	15.65	.0606	-.76	3.27	21.14	13.84	-.03	99.
34.000	-23.02	14.32	-.0152	1.04	3.82	23.60	13.91	-.02	99.
35.000	-27.68	13.01	-.1595	1.34	4.28	28.15	12.76	-.11	99.
38.000	-29.76	11.34	.0653	.97	4.58	30.20	11.07	-.13	99.
40.000	-27.05	12.83	.0837	-.83	5.07	27.79	12.25	.22	99.
42.000	-19.41	19.31	.3700	.85	6.45	23.31	15.72	.49	68.
44.000	-8.25	20.83	.3028	1.06	7.81	19.60	13.30	.89	101.
46.000	-.10	17.78	.0375	-.20	7.01	16.21	10.00	.69	101.
48.000	4.37	16.20	.0833	-1.56	7.63	16.17	9.27	.80	100.
50.000	11.87	13.92	.0347	-4.11	7.16	18.25	8.08	.19	100.
52.000	17.12	12.95	.2441	-3.80	8.66	21.23	9.62	-.06	99.
54.000	21.08	11.48	.0792	-3.61	8.53	23.59	10.21	-.32	96.
56.000	23.79	11.56	.0417	-3.08	8.42	25.78	10.69	.02	91.
58.000	24.29	13.64	.1266	-.33	9.26	26.41	12.78	.30	79.
60.000	25.73	16.95	.1673	.03	10.92	29.47	14.05	.51	66.
62.000	23.89	20.27	.0510	.77	14.30	30.84	15.10	.44	50.
64.000	23.00	19.58	-.3154	-.02	10.19	28.19	15.63	.59	27.
65.000	30.99	24.18	.2276	-.92	15.87	37.11	19.18	.28	9.

TABLE I-4. WIND STATISTICAL PARAMETERS

APRIL

STATION - 619020		ASCENSION (WIDE AWAKE)								NOBS
Z	MEAN U	S.D. U	R(U,V)	MEAN V	S.D. V	MEAN WS	S.D. WS	SKEW WS		
KM	M/S	M/S		M/S	M/S	M/S	M/S			
.020	-6.84	1.93	.1010	3.80	1.72	8.04	1.77	-.36	485.	
1.000	-5.37	2.07	-.3240	2.93	2.19	6.40	2.91	.01	481.	
2.000	-3.04	4.32	-.1472	.29	2.43	5.12	2.82	.74	484.	
3.000	-2.30	4.15	-.2105	-.71	2.57	4.75	2.65	.58	484.	
4.000	-2.26	3.63	-.1810	-.05	2.57	4.42	2.44	.60	465.	
5.000	-2.89	3.54	-.1772	-.51	2.69	4.73	2.48	.53	483.	
6.000	-3.47	3.60	-.1012	-.20	3.05	5.37	2.75	.70	486.	
7.000	-3.53	4.42	-.0013	.10	3.34	5.79	3.11	.73	465.	
8.000	-2.70	5.26	-.1147	.49	3.78	6.12	3.46	1.02	487.	
9.000	-.65	5.94	-.1465	.33	4.27	6.33	3.78	.55	485.	
10.000	1.14	6.57	-.0617	-.54	5.09	7.15	4.41	1.23	483.	
11.000	2.51	7.21	.0348	-2.49	6.02	8.72	4.95	1.29	482.	
12.000	3.56	7.76	.0315	-3.20	6.09	9.57	5.40	1.31	481.	
13.000	4.40	8.72	.0171	-3.46	6.04	10.36	6.03	1.06	480.	
14.000	4.73	9.48	-.0361	-2.62	5.40	10.38	6.43	1.13	480.	
15.000	3.59	9.23	.0003	-1.93	4.54	9.36	5.90	1.33	473.	
16.000	.35	7.57	.0603	-1.33	3.77	7.17	4.67	1.40	470.	
17.000	-3.09	6.15	-.0077	-.61	3.32	6.61	3.90	1.05	471.	
18.000	-4.03	6.31	-.0409	.06	3.25	6.82	4.47	1.56	472.	
19.000	-3.44	7.16	-.0582	.43	2.62	6.83	4.84	1.20	463.	
20.000	-4.72	8.53	-.0947	.74	2.53	7.95	6.21	1.05	463.	
21.000	-6.66	9.25	-.0701	.97	2.80	9.25	7.16	.69	457.	
22.000	-8.20	9.26	-.0130	1.02	3.04	10.34	7.51	1.04	451.	
23.000	-10.01	6.90	.0321	1.05	2.33	11.19	7.76	.91	433.	
24.000	-11.96	10.58	.0102	.07	2.85	13.38	9.07	.72	435.	
25.000	-14.07	11.96	.0154	.71	3.00	15.54	10.44	.43	431.	
26.000	-15.79	13.09	-.0033	.06	2.75	17.31	11.33	.25	415.	
27.000	-16.84	14.24	-.0122	-.81	2.89	18.65	11.83	.07	367.	
28.000	-17.83	14.65	.0121	-1.74	2.99	20.26	11.64	-.03	355.	
29.000	-18.04	15.75	.0554	-2.30	3.26	21.03	12.11	-.04	260.	
30.000	-17.50	15.95	-.0423	-2.24	2.78	21.01	12.03	-.10	261.	
32.000	-10.79	17.53	.1697	-.40	3.42	17.40	11.44	.21	50.	
34.000	-11.64	16.71	.1740	1.49	3.08	17.23	11.55	.42	91.	
35.000	-12.42	14.65	.0794	1.00	3.68	15.90	11.53	.57	91.	
38.000	-0.44	14.13	.1905	1.17	4.14	14.59	9.64	1.01	92.	
40.000	-.45	14.65	.1576	1.22	8.02	13.66	8.02	.41	92.	
42.000	9.39	14.17	.2151	3.47	5.01	16.12	8.04	.30	92.	
44.000	18.01	10.55	.1072	2.91	5.34	20.00	8.48	.00	93.	
46.000	21.93	9.25	-.1023	1.25	5.08	22.72	8.79	.05	93.	
48.000	24.10	10.21	-.0155	-1.12	5.23	23.10	9.20	.10	53.	
50.000	25.05	11.31	.0748	-2.37	5.60	27.05	9.93	-.23	03.	
52.000	28.63	11.73	-.0071	-2.51	6.07	23.75	10.72	-.34	50.	
54.000	32.62	12.01	.0206	-1.43	6.63	33.59	11.21	-.26	90.	
56.000	35.45	11.16	.0425	.19	8.36	37.54	10.60	-.25	83.	
58.000	40.57	11.87	-.3247	1.38	9.08	41.73	11.36	-.31	73.	
60.000	40.09	13.32	-.3075	3.61	8.85	41.51	12.31	-.19	59.	
62.000	43.40	17.64	-.2203	4.33	11.35	45.85	15.51	-.52	46.	
64.000	35.77	19.75	-.1522	8.67	11.54	41.36	15.15	.21	28.	
66.000	29.88	25.34	-.0652	3.31	11.75	25.62	17.65	.72	13.	

TABLE I-5. WIND STATISTICAL PARAMETERS

MAY

STATION = 619320		ASCENSION (WIDE AWAKE)								NOBS
Z	MEAN U	S.D. U	R(U,V)	MEAN V	S.D. V	MEAN WS	S.D. WS	SKEW WS		
KM	M/S	M/S		M/S	M/S	M/S	M/S			
.020	-7.28	1.90	.0403	3.67	1.69	6.36	1.75	-.33	509.	
1.000	-5.42	2.61	-.3183	2.52	2.10	5.33	2.82	.03	509.	
2.000	-1.96	3.87	-.0000	.05	2.54	4.43	2.38	.77	510.	
3.000	-.56	3.81	-.1053	-.87	2.83	4.29	2.28	.65	510.	
4.000	-.86	3.72	-.1246	-.59	2.91	4.18	2.43	1.15	510.	
5.000	-1.69	4.04	-.2302	-.24	2.94	4.56	2.65	1.00	510.	
6.000	-2.43	4.92	-.2905	-.16	3.23	5.50	3.19	.74	510.	
7.000	-2.43	5.52	-.1506	.14	3.60	6.05	3.57	.79	509.	
8.000	-1.04	6.11	-.1427	.40	4.46	6.64	3.78	.93	504.	
9.000	1.20	6.71	-.1630	-.09	5.08	7.36	4.27	1.00	503.	
10.000	3.08	6.91	-.1031	-1.80	5.47	6.16	4.67	1.01	504.	
11.000	4.42	7.27	-.0246	-4.02	6.03	9.64	5.65	.79	504.	
12.000	5.50	7.88	.0013	-4.80	5.58	10.54	5.34	.72	505.	
13.000	6.43	8.30	.1328	-5.03	5.60	11.67	6.26	.61	504.	
14.000	7.53	9.40	.1089	-4.56	5.46	12.34	6.68	.60	503.	
15.000	7.52	9.12	.0819	-3.75	5.05	11.74	6.43	.58	504.	
16.000	4.10	7.35	.0347	-2.37	4.19	8.45	4.75	.70	503.	
17.000	-.03	5.60	-.0247	-.91	3.65	6.03	3.43	.64	466.	
18.000	-1.45	6.52	-.0700	.01	3.29	6.44	3.73	.60	460.	
19.000	.25	6.70	-.0400	.39	2.70	6.41	3.55	.54	491.	
20.000	-.25	7.51	-.0244	.70	2.73	6.75	4.32	.92	485.	
21.000	-2.60	8.32	.0976	.50	2.87	7.37	5.49	1.20	477.	
22.000	-5.60	9.31	.0373	.23	2.81	8.36	6.18	.93	475.	
23.000	-8.17	10.79	-.0323	.03	2.36	11.44	7.60	.55	466.	
24.000	-10.41	12.93	-.0000	-.14	2.82	14.31	8.97	.17	463.	
25.000	-12.00	14.62	-.1500	-.12	3.02	16.93	9.25	-.03	460.	
26.000	-13.12	15.64	-.0503	-.18	2.95	16.52	9.00	-.14	441.	
27.000	-13.68	16.47	.0217	-.52	3.22	19.55	9.28	-.16	399.	
28.000	-13.57	17.18	-.0044	-1.23	2.97	20.04	9.35	-.16	391.	
29.000	-14.46	17.72	-.0105	-1.53	3.28	21.12	9.45	-.35	319.	
30.000	-13.65	18.09	-.0539	-1.10	2.95	20.78	9.55	-.28	304.	
32.000	-3.43	18.53	-.0751	.40	3.42	17.64	3.28	-.13	73.	
34.000	-3.68	15.99	.2706	1.62	4.43	15.01	7.94	.27	73.	
36.000	-1.62	13.41	-.0572	2.04	4.20	12.53	6.71	.61	73.	
38.000	4.51	13.45	-.1225	2.44	4.20	13.00	7.33	.32	73.	
40.000	11.16	12.64	-.1403	3.15	4.03	15.81	7.69	.28	73.	
42.000	16.30	10.75	-.1765	2.67	4.29	17.95	9.17	.33	73.	
44.000	17.84	9.84	-.2551	2.39	5.19	19.28	8.67	.32	76.	
46.000	17.74	11.20	-.1604	2.07	5.97	19.59	9.77	.21	75.	
48.000	15.78	12.97	-.0931	-.57	7.35	19.20	10.07	.14	75.	
50.000	16.49	13.00	-.1429	-2.22	7.01	20.14	9.37	.15	74.	
52.000	18.89	14.30	-.0557	-2.56	7.46	22.62	10.47	.26	74.	
54.000	21.63	15.83	.0300	-1.01	6.30	24.63	12.14	-.08	71.	
56.000	25.25	17.80	-.0977	2.28	8.44	28.43	13.79	.04	67.	
58.000	26.57	20.63	-.0342	5.57	7.65	31.59	14.80	.04	59.	
60.000	26.33	26.55	.3207	5.40	8.95	34.59	17.34	-.20	37.	
62.000	32.53	31.14	.3252	5.81	9.98	42.36	18.25	-.81	22.	
64.000	28.57	36.70	.6788	5.77	18.74	46.23	17.40	.19	13.	
66.000	20.91	35.06	.6596	4.99	15.06	35.25	21.95	-.03	8.	

TABLE 1-6. WIND STATISTICAL PARAMETERS

JUNE

STATION = 810020		ASCENSION (WIDE AWAKE)							
Z	MEAN U	S.D. U	R(U,V)	MEAN V	S.D. V	MEAN WS	S.D. WS	SKEW WS	NCOS
KM	M/S	M/S		M/S	M/S	M/S	M/S		
.000	-7.21	1.56	.1400	3.51	1.80	8.28	1.78	.02	474.
1.000	-5.39	2.60	-.3114	2.85	2.19	6.45	2.06	.12	474.
2.000	-1.68	3.58	-.0047	.47	2.70	4.24	2.38	.73	475.
3.000	-.14	3.65	-.1641	-.70	3.25	4.33	2.28	.53	475.
4.000	-.52	4.14	-.1825	-.66	3.03	4.59	2.48	.62	475.
5.000	-1.89	4.78	-.1370	-.26	2.97	5.18	2.85	.82	475.
6.000	-2.93	5.91	-.0457	.19	3.52	6.48	3.73	.68	475.
7.000	-2.89	6.68	-.0337	.66	4.43	7.51	4.07	.83	475.
8.000	-1.50	6.95	-.1713	.48	5.02	7.51	4.22	.82	474.
9.000	.22	7.13	-.1525	-1.00	5.58	8.00	4.75	.78	474.
10.000	1.35	7.25	-.0493	-2.09	6.01	8.87	4.55	.58	472.
11.000	1.99	8.07	.1218	-5.24	6.51	10.61	5.12	.46	471.
12.000	3.57	9.17	.2534	-5.06	6.59	11.85	5.64	.57	471.
13.000	5.23	9.81	.1667	-5.21	6.22	12.38	5.93	.55	470.
14.000	6.57	9.10	.0083	-3.86	5.72	11.70	6.05	.47	470.
15.000	5.67	7.86	-.0537	-2.35	5.41	9.87	5.58	.61	465.
16.000	2.10	6.45	.0177	-1.31	4.34	7.07	4.05	.89	463.
17.000	-.63	5.76	.0332	-.65	3.41	5.68	3.33	.78	455.
18.000	-.32	6.17	-.0177	-.32	3.28	6.05	3.50	.93	454.
19.000	1.45	6.38	-.1531	-.15	2.85	6.24	3.54	.63	451.
20.000	1.18	7.24	-.1512	-.08	2.80	6.83	3.66	.67	449.
21.000	-.80	9.10	-.0613	.05	2.78	8.09	5.05	.78	432.
22.000	-4.34	11.79	.0420	.22	2.64	11.24	6.27	.42	430.
23.000	-7.30	13.32	-.0203	.10	2.56	13.43	7.54	.12	425.
24.000	-9.76	14.94	-.0543	-.33	3.14	16.12	8.26	-.07	422.
25.000	-10.87	15.55	-.1650	-.68	2.84	17.50	7.83	-.13	415.
26.000	-11.50	16.15	-.1675	-.62	2.84	18.56	8.03	-.16	394.
27.000	-11.77	16.99	-.1231	-.97	3.26	18.06	8.05	-.22	353.
28.000	-11.49	17.55	-.0659	-.94	2.78	19.05	8.22	-.24	345.
29.000	-12.23	17.87	-.0049	-.89	3.05	19.72	9.46	-.23	280.
30.000	-11.08	17.01	.0219	-.45	2.72	18.21	9.35	-.10	262.
32.000	-3.93	15.56	-.0433	.35	3.64	13.08	9.06	.96	61.
34.000	-1.80	14.43	-.1373	-.32	3.57	12.67	7.82	.56	61.
36.000	.25	17.02	.4073	.06	4.31	15.03	7.73	.44	61.
38.000	4.84	15.36	.3526	1.61	3.97	15.52	8.05	.33	61.
40.000	6.90	13.81	.0463	1.77	4.63	14.33	7.29	.38	61.
42.000	7.45	13.28	-.1927	2.00	5.06	14.41	7.36	.61	61.
44.000	5.32	14.62	-.1394	3.55	5.30	14.84	7.73	.64	61.
46.000	1.73	15.45	.0063	3.28	6.08	14.84	8.12	.34	61.
48.000	-1.31	17.53	.1402	.37	7.41	16.25	9.79	.58	61.
50.000	-1.48	20.34	.1990	-3.08	6.35	17.92	11.80	.68	60.
52.000	1.40	23.97	.3374	-2.75	7.72	21.51	13.17	.78	59.
54.000	7.52	23.27	.0221	-.59	8.37	22.64	12.17	.65	53.
56.000	12.29	21.09	.1326	1.47	9.41	23.17	13.47	.66	59.
58.000	18.31	19.57	-.1025	2.33	7.76	24.17	13.94	.43	47.
60.000	24.26	20.77	-.2193	3.60	10.20	30.30	14.51	-.05	33.
62.000	26.53	23.31	.0760	2.09	12.13	32.27	17.46	.21	23.
64.000	30.64	18.00	-.0463	1.66	13.69	35.57	12.76	-.03	14.
66.000	33.47	18.72	-.2482	-2.04	9.89	35.67	16.51	-.02	6.

TABLE E-7. WIND STATISTICAL PARAMETERS

JULY

STATION - 619020		ASCENSION (WIDE AWAKE)				S.D. V	MEAN WS	S.D. WS	SKEW WS	NOBS
Z	MEAN U	S.D. U	R(U,V)	MEAN V	M/S					
M/H	M/S	M/S		M/S	M/S		M/S	M/S		
.020	-7.38	1.91	-.0589	3.47	1.88	8.43	1.73	-.09	462.	
1.000	-5.02	2.69	-.1870	3.18	2.32	7.06	2.60	.10	467.	
2.000	-1.79	3.95	-.0053	.46	3.08	4.63	2.55	.74	467.	
3.000	.30	4.36	-.0074	-1.21	3.48	5.09	2.60	.46	467.	
4.000	-2.84	4.40	-.1827	-.00	3.00	4.72	2.64	.81	467.	
5.000	-2.39	4.62	-.1076	-.37	3.14	5.25	3.05	.85	467.	
6.000	-3.50	5.40	-.1823	-.18	3.64	6.37	3.76	1.01	463.	
7.000	-3.18	6.04	-.0050	.19	4.02	6.83	3.83	.75	467.	
8.000	-1.83	6.67	-.1312	.32	4.56	7.32	3.90	.79	463.	
9.000	-.36	7.40	-.0771	-.68	5.66	8.31	4.31	.78	465.	
10.000	.88	8.24	.0009	-2.72	6.45	9.71	4.82	.48	465.	
11.000	2.27	9.91	.2033	-3.89	7.21	11.66	5.80	.41	462.	
12.000	4.46	11.30	.2176	-4.05	6.71	12.82	6.65	.49	463.	
13.000	7.04	11.38	.1933	-3.32	6.59	13.91	7.32	.61	469.	
14.000	8.71	11.09	.0440	-1.71	5.96	13.30	7.76	.52	456.	
15.000	6.15	8.62	-.0350	-.80	4.84	9.99	6.02	.79	455.	
16.000	1.43	6.44	-.1025	-.83	3.85	6.67	3.82	.98	454.	
17.000	-.86	5.37	-.0953	-.33	3.30	5.46	3.27	.83	445.	
18.000	.42	5.51	-.0171	.52	3.34	5.54	3.35	.97	446.	
19.000	1.65	5.68	.0023	.66	2.84	5.69	3.32	.85	445.	
20.000	.92	7.60	.0325	.68	2.67	7.05	4.02	1.12	434.	
21.000	-1.84	11.11	.0749	.46	3.14	10.34	5.44	.71	426.	
22.000	-5.56	13.68	.1187	-.11	2.95	13.42	6.01	.25	423.	
23.000	-7.61	14.13	.0220	-.24	2.74	14.37	7.64	.09	412.	
24.000	-9.17	14.75	-.0721	-.22	3.35	15.73	8.08	.04	409.	
25.000	-10.57	14.80	-.1762	-.12	3.04	16.39	9.44	.11	395.	
26.000	-11.53	14.90	-.1713	-.28	2.82	16.75	9.05	-.01	381.	
27.000	-12.02	15.27	-.1129	-.64	3.23	17.11	9.77	-.04	356.	
28.000	-12.35	15.09	-.0023	-.60	2.83	16.79	10.31	.06	346.	
29.000	-13.47	15.18	.0753	-.28	3.21	17.81	10.21	-.03	278.	
30.000	-12.28	13.53	.1309	.14	2.82	15.22	9.67	.09	260.	
32.000	-5.50	12.27	.1561	.65	3.56	10.77	8.81	1.10	87.	
34.000	-5.38	10.72	.1160	.35	3.29	10.43	8.72	.92	87.	
36.000	-7.63	12.91	.0409	.04	4.01	13.38	7.79	.59	87.	
38.000	-9.69	15.42	.1294	.93	4.18	15.52	10.37	.80	87.	
40.000	-11.05	15.61	.0270	2.11	5.25	16.86	10.58	.67	87.	
42.000	-13.45	15.23	.0152	3.32	5.96	18.38	11.00	.32	87.	
44.000	-16.78	15.94	-.0554	4.05	6.56	20.64	12.05	.26	89.	
46.000	-21.20	16.50	-.0469	4.60	6.73	24.53	14.00	.27	89.	
48.000	-24.18	16.76	.0393	1.28	7.91	27.08	13.53	.30	88.	
50.000	-23.37	17.29	.2692	-1.79	8.19	26.57	14.41	.53	87.	
52.000	-17.39	15.98	.1089	-3.35	7.71	21.30	13.15	.73	85.	
54.000	-7.96	15.50	.0499	-2.37	8.81	17.52	8.57	.90	84.	
56.000	.98	14.91	-.1023	-2.67	9.44	16.17	7.39	.31	80.	
58.000	9.61	14.04	-.2011	-2.72	11.48	18.32	9.47	.56	69.	
60.000	13.88	16.38	.1206	1.88	10.72	21.00	11.52	.51	44.	
62.000	18.28	17.22	.4094	7.51	9.70	24.03	14.05	.28	35.	
64.000	22.28	17.71	-.3052	5.83	9.69	27.43	13.16	.53	23.	
66.000	22.19	23.68	.0392	10.49	12.69	33.00	13.65	-.12	11.	

TABLE 1-8. WIND STATISTICAL PARAMETERS

AUGUST

STATION # 815020		ASCENSION (WIDE AWAKE)								
Z	MEAN U	S.D. U	R(U,V)	MEAN V	S.D. V	MEAN WS	S.D. WS	SKEW WS	NOBS	
KM	M/S	M/S		M/S	M/S	M/S	M/S			
.020	-7.34	1.77	.0039	3.45	1.59	8.29	1.67	-.15	483.	
1.000	-6.59	2.51	-.2012	3.60	2.14	7.00	2.51	-.30	481.	
2.000	-3.77	4.16	-.16.2	.79	2.60	5.52	2.69	.56	480.	
3.000	-1.94	4.54	-.0337	-1.00	3.16	5.31	2.59	.54	479.	
4.000	-1.04	4.14	-.1735	-.87	3.29	5.04	2.61	.83	479.	
5.000	-2.70	4.50	-.1274	-.18	3.22	5.47	2.69	.63	479.	
6.000	-3.28	5.13	-.0258	.09	3.71	6.32	3.27	.50	480.	
7.000	-2.24	5.79	-.0700	.51	4.09	6.63	3.46	.66	480.	
8.000	-.00	6.48	-.0213	.56	4.78	7.19	3.79	.63	478.	
9.000	.15	7.39	-.0732	-.77	5.67	8.24	4.41	.76	478.	
10.000	.05	8.39	.1315	-2.72	6.60	9.73	5.24	.64	477.	
11.000	2.18	10.19	.3114	-4.30	8.07	12.27	6.43	.46	476.	
12.000	5.25	10.67	.3773	-3.53	8.05	12.95	7.12	.60	476.	
13.000	8.41	10.41	.2270	-2.14	7.23	13.45	7.39	.43	475.	
14.000	9.62	8.62	.0772	-.77	6.23	12.62	6.91	.37	475.	
15.000	6.51	5.03	-.0771	-.83	5.31	9.54	5.21	.53	474.	
16.000	2.00	5.53	-.2703	-1.04	4.02	6.28	3.52	.73	473.	
17.000	-.45	4.79	-.2774	-.30	3.06	5.06	2.63	.70	470.	
18.000	.38	5.28	-.0091	.35	3.10	5.30	3.10	1.03	469.	
19.000	1.60	6.59	-.0740	.51	2.77	6.20	3.92	1.20	469.	
20.000	.40	8.79	-.0446	.61	2.67	8.03	4.50	.98	467.	
21.000	-2.51	11.90	-.0134	.54	2.98	11.26	5.43	.23	463.	
22.000	-5.53	13.98	.0674	.25	2.84	13.55	7.03	.20	459.	
23.000	-7.99	14.72	.1033	.23	2.63	14.02	8.21	.20	448.	
24.000	-9.41	14.06	.0627	.20	3.30	15.03	8.92	.15	443.	
25.000	-11.16	14.99	-.0346	.05	2.95	16.38	9.29	.05	433.	
26.000	-11.53	15.29	-.0924	-.56	2.94	17.06	9.71	.03	419.	
27.000	-11.82	16.13	-.0003	-1.02	3.08	17.38	10.38	.13	381.	
28.000	-12.13	16.19	-.0053	-.60	2.81	17.22	10.93	.09	374.	
29.000	-13.17	15.68	-.0037	-.46	3.06	17.74	10.65	-.03	304.	
30.000	-12.43	14.04	-.0091	-.03	2.73	16.11	9.95	.09	289.	
32.000	-5.40	12.05	.1020	.41	3.60	11.43	6.23	.00	89.	
34.000	-7.18	11.41	-.0149	.06	3.91	12.01	7.18	.71	89.	
36.000	-9.10	13.22	-.0150	-.70	4.55	14.02	8.54	.61	60.	
38.000	-12.77	18.04	-.0390	.72	8.54	17.57	11.80	.47	89.	
40.000	-16.14	15.92	.0008	2.73	6.00	19.02	12.77	.41	88.	
42.000	-15.90	13.12	.0172	4.28	6.18	19.29	10.41	.36	88.	
44.000	-16.05	11.75	-.0633	4.21	8.08	19.32	10.09	.33	88.	
46.000	-15.98	11.65	-.1944	2.21	7.07	18.97	10.09	.34	88.	
48.000	-12.14	12.18	-.0073	-.15	6.93	18.07	9.19	.68	89.	
50.000	-6.04	12.36	.0343	-2.03	7.10	13.03	8.47	.73	87.	
52.000	-1.25	13.83	-.0093	-2.44	7.60	13.47	8.63	.93	66.	
54.000	2.37	13.11	-.0750	-2.20	7.94	13.30	8.15	.63	84.	
56.000	8.15	13.73	-.1565	-1.17	8.32	15.71	8.74	.56	79.	
58.000	14.05	13.60	-.1306	2.92	8.77	19.57	9.06	.45	68.	
60.000	18.01	14.42	.0331	6.42	12.44	24.30	11.55	.22	53.	
62.000	22.68	16.56	-.0057	11.07	15.91	30.91	14.10	.07	33.	
64.000	27.30	17.33	-.1571	9.10	16.74	35.00	13.60	-.17	20.	
66.000	23.49	18.57	-.3741	22.13	11.88	36.70	12.11	.03	10.	

TABLE I-9. WIND STATISTICAL PARAMETERS

SEPTEMBER

STATION = 819020		ASCENSION (WIDE AWAKE)								
Z	MEAN U	S.D. U	R(U,V)	MEAN V	S.D. V	MEAN WS	S.D. WS	SKEW WS	NOBS	
KM	M/S	M/S		M/S	M/S	M/S	M/S			
.020	-6.95	1.85	.1129	3.54	1.60	8.01	1.69	-.40	445.	
1.000	-6.05	2.55	-.2530	3.51	2.15	8.01	2.47	-.25	444.	
2.000	-6.51	4.28	-.1773	1.09	2.92	7.59	3.58	.41	444.	
3.000	-5.89	5.04	-.2247	-.79	2.81	7.46	3.59	.45	443.	
4.000	-4.24	4.93	-.0723	-1.14	2.86	6.23	3.60	.66	443.	
5.000	-3.27	4.46	-.2616	-.43	2.94	5.36	3.27	.93	443.	
6.000	-3.43	5.16	-.2097	.13	3.18	5.92	3.67	1.15	443.	
7.000	-3.03	5.97	-.0365	.33	3.73	6.57	3.94	.91	443.	
8.000	-1.47	6.55	-.0333	-.21	4.31	7.04	3.75	.64	443.	
9.000	.14	7.42	-.0058	-1.60	5.30	8.25	4.19	.60	443.	
10.000	1.85	8.60	.1373	-3.09	6.39	10.17	4.92	.80	442.	
11.000	4.09	9.65	.2015	-4.01	6.55	12.01	5.82	.49	441.	
12.000	7.81	10.46	.1591	-3.05	6.50	13.17	6.94	.56	441.	
13.000	10.55	10.43	.0404	-2.05	6.11	14.45	7.83	.31	441.	
14.000	12.11	9.30	-.0597	-1.15	5.59	14.43	7.57	.16	442.	
15.000	9.30	7.33	-.0305	-1.09	4.97	11.35	6.10	.41	442.	
16.000	3.47	5.35	-.1222	-1.40	3.85	6.67	3.59	.63	440.	
17.000	-.38	4.74	-.1735	-.04	2.91	4.96	2.67	.65	475.	
18.000	-.22	5.52	-.0550	.23	3.10	5.44	3.24	1.22	434.	
19.000	.28	6.67	-.0422	.31	2.69	6.16	3.00	1.00	431.	
20.000	-.86	9.09	-.1063	.45	2.86	8.52	4.37	.09	426.	
21.000	-2.65	12.10	-.0749	.32	2.97	11.40	5.78	.35	418.	
22.000	-5.44	14.30	-.0039	.53	2.95	13.68	7.61	.43	416.	
23.000	-7.36	15.14	-.0003	.65	2.83	14.56	8.91	.30	400.	
24.000	-9.57	15.77	-.0223	.54	3.71	16.06	9.81	.35	326.	
25.000	-11.10	14.84	-.0045	.00	3.22	15.97	9.92	.16	389.	
26.000	-12.00	14.40	-.1945	-.52	2.82	15.68	10.34	.15	301.	
27.000	-12.61	14.80	-.2130	-.86	3.37	16.49	10.87	.18	332.	
28.000	-12.91	14.51	-.2222	-.93	2.69	15.65	11.57	.25	320.	
29.000	-14.20	14.30	-.1871	-.80	3.14	17.10	11.13	.15	243.	
30.000	-13.87	13.54	.0000	-.65	2.63	16.25	10.90	.22	220.	
32.000	-6.48	12.51	.0757	-.61	3.53	12.43	7.42	.52	88.	
34.000	-6.00	14.33	-.0226	.40	3.30	13.99	7.42	.33	88.	
36.000	-6.97	15.65	.0956	.29	3.95	14.99	9.11	.47	88.	
38.000	-8.78	16.64	-.1077	.63	4.13	15.58	11.27	.43	68.	
40.000	-10.90	17.12	-.0094	1.23	5.75	17.17	12.23	.65	83.	
42.000	-10.28	16.39	.0479	1.12	5.15	16.78	10.90	1.17	89.	
44.000	-7.09	14.82	-.0387	2.83	5.02	14.44	9.63	1.48	91.	
46.000	-1.57	14.88	-.1470	3.06	6.28	14.11	8.45	.96	92.	
48.000	3.21	13.61	-.0243	.51	6.53	13.32	7.69	.84	91.	
50.000	6.45	13.67	-.1207	-3.31	7.29	14.65	8.73	.95	91.	
52.000	8.00	15.75	.0450	-5.40	6.65	17.39	8.93	.52	90.	
54.000	9.71	15.68	.1153	-5.12	6.24	17.75	9.38	.50	87.	
56.000	12.97	13.27	.0190	-1.81	8.07	17.78	9.59	.48	89.	
58.000	16.18	14.18	.0479	3.26	8.02	20.29	11.16	.59	80.	
60.000	20.26	15.00	-.1762	7.14	8.44	24.55	12.14	.91	66.	
62.000	25.69	17.52	.0154	7.84	10.00	30.00	14.98	.42	49.	
64.000	34.12	19.46	.3769	8.64	11.65	38.58	15.98	.33	26.	
66.000	48.06	16.73	.0504	6.32	11.69	43.60	16.48	-.25	10.	

TABLE I-10. WIND STATISTICAL PARAMETERS

OCTOBER

STATION - 619020		ASCENSION (WIDE AWAKE)								NOBS
Z	MEAN U	S.D. U	R(U,V)	MEAN V	S.D. V	MEAN WS	S.D. WS	SKEW WS		
KM	M/S	M/S		M/S	M/S	M/S	M/S			
.020	-7.15	1.61	.0975	3.20	1.60	8.00	1.55	-.10	461.	
1.000	-6.97	2.37	-.2032	2.78	2.13	7.79	2.47	-.14	461.	
2.000	-7.30	4.40	-.0783	.63	2.79	8.16	3.76	.39	460.	
3.000	-7.14	4.91	-.2005	-.41	2.61	8.21	3.62	.20	460.	
4.000	-5.67	4.96	-.0486	-1.10	2.55	7.05	3.84	.48	459.	
5.000	-4.18	4.28	-.0748	-.83	2.84	5.87	3.18	.82	460.	
6.000	-3.61	4.82	-.2983	-.61	3.35	6.09	3.27	1.03	461.	
7.000	-2.56	5.18	-.2724	-.19	4.03	6.22	3.32	.91	461.	
8.000	-.37	5.95	-.2059	.09	4.97	6.71	3.88	1.26	458.	
9.000	2.60	6.84	-.2418	-.32	6.08	8.24	4.75	.97	453.	
10.000	5.47	7.48	-.1627	-1.23	7.12	10.36	5.55	.59	450.	
11.000	8.21	8.35	-.0516	-2.55	8.19	13.04	6.37	.37	450.	
12.000	11.21	8.82	-.0533	-2.94	7.66	14.53	6.91	.17	458.	
13.000	13.56	8.68	-.1335	-2.63	7.31	16.35	7.47	.18	463.	
14.000	14.28	8.57	-.2546	-1.93	6.46	18.24	7.66	.21	462.	
15.000	11.54	7.81	-.1945	-1.49	5.28	13.37	6.74	.43	461.	
16.000	5.47	6.04	-.0355	-1.33	4.08	7.96	4.63	.85	460.	
17.000	.32	4.29	-.1114	-.85	3.16	5.21	2.91	.67	459.	
18.000	-.82	5.59	.0973	.33	3.02	5.40	3.45	1.30	447.	
19.000	-.80	6.31	.1287	.39	2.67	5.83	3.71	1.30	447.	
20.000	-1.99	8.78	.0005	.35	2.70	8.30	4.38	.40	443.	
21.000	-4.40	12.29	-.1073	.22	2.76	11.49	6.75	.48	439.	
22.000	-6.65	14.48	-.1034	.23	3.15	13.85	8.46	.30	427.	
23.000	-8.67	14.85	-.0620	.49	2.71	14.32	9.89	.33	412.	
24.000	-11.13	15.27	-.0025	.63	3.43	15.91	10.76	.28	406.	
25.000	-13.12	14.33	.0504	.71	2.87	16.48	10.70	.10	393.	
26.000	-14.09	13.72	.1250	.22	2.51	16.49	11.00	.10	376.	
27.000	-14.78	13.63	.0242	-.58	3.18	17.01	11.20	.03	344.	
28.000	-14.01	12.94	-.1023	-.66	2.67	16.00	10.85	.24	335.	
29.000	-13.92	13.21	-.2039	-2.01	3.13	16.59	10.34	.27	262.	
30.000	-12.69	13.34	-.1739	-2.03	2.81	15.72	10.17	.37	246.	
32.000	-7.59	14.50	.0334	-1.00	3.86	14.40	8.63	.27	83.	
34.000	-9.22	15.71	-.0539	-.03	3.44	16.07	9.13	.14	83.	
36.000	-8.74	17.79	-.0252	.80	3.69	17.36	10.15	.30	83.	
38.000	-7.62	17.41	-.0275	.20	4.12	16.34	10.43	.56	83.	
40.000	-3.25	14.35	.1445	.26	4.63	12.89	9.41	1.03	83.	
42.000	.45	11.29	.0144	1.62	5.14	10.00	6.28	.63	64.	
44.000	4.25	11.50	-.2857	2.13	6.32	12.01	7.04	.75	87.	
46.000	8.35	10.56	-.4203	-.97	7.18	12.69	8.01	1.08	85.	
48.000	11.38	10.91	-.5467	-2.31	6.45	14.62	8.99	.85	85.	
50.000	12.57	11.70	-.1209	-3.29	6.40	16.39	8.78	.39	85.	
52.000	14.13	13.29	.2135	-2.03	7.12	18.92	8.42	.41	83.	
54.000	17.89	11.54	.1052	-2.73	7.27	20.98	8.50	.10	81.	
56.000	19.76	8.28	.1603	-1.52	6.54	21.29	8.23	.29	72.	
58.000	20.07	9.23	-.0059	-1.78	7.31	21.35	8.13	.00	60.	
60.000	23.05	11.90	.1331	.62	7.81	25.13	10.02	-.03	46.	
62.000	24.69	11.31	.0262	3.79	8.53	26.66	10.56	.00	38.	
64.000	26.68	9.70	.0375	3.77	7.61	28.19	9.54	-.11	27.	
66.000	23.33	16.57	-.0991	6.67	13.28	29.44	12.44	.18	16.	

TABLE I-11. WIND STATISTICAL PARAMETERS

NOVEMBER

STATION = 619020		ASCENSION (WIDE AWAKE)									
Z	MEAN U	S.D. U	R(U,V)	MEAN V	S.D. V	MEAN WS	S.D. WS	SKEW WS	NOBS		
KM	M/S	M/S		M/S	M/S	M/S	M/S				
.020	-6.92	1.63	.0916	3.26	1.50	7.81	1.55	-.18	463.		
1.000	-5.90	2.34	-.3269	2.35	2.33	6.63	2.36	-.18	462.		
2.000	-6.15	3.67	-.2579	-.19	2.74	7.02	3.09	.62	462.		
3.000	-5.89	4.20	-.2109	-.97	2.85	7.14	3.22	.31	462.		
4.000	-4.77	4.15	-.0739	-.80	2.87	6.22	3.18	.44	461.		
5.000	-4.07	3.98	-.1014	-.61	3.44	6.00	2.92	.45	461.		
6.000	-3.54	4.51	-.2053	-.64	3.69	6.11	3.09	.59	459.		
7.000	-2.31	5.42	-.1002	-.65	4.04	6.33	3.37	.64	459.		
8.000	-.02	6.25	-.2225	-.32	4.93	7.00	3.79	.82	458.		
9.000	3.03	7.33	-.1621	-.57	5.93	8.59	4.93	.72	457.		
10.000	6.24	8.30	-.1448	-1.75	6.83	11.04	6.01	.59	456.		
11.000	9.25	9.26	-.1233	-3.59	7.97	14.07	7.07	.34	452.		
12.000	11.94	9.47	-.1226	-4.55	8.07	15.69	7.83	.31	450.		
13.000	13.97	9.60	-.2172	-4.72	7.63	17.23	8.41	.23	450.		
14.000	14.55	9.47	-.2355	-4.07	6.75	17.09	8.45	.32	448.		
15.000	12.13	8.83	-.3200	-2.75	5.94	14.36	7.55	.57	448.		
16.000	6.17	7.35	-.0532	-2.20	4.91	9.65	5.27	1.01	446.		
17.000	.43	5.94	-.0039	-1.63	3.94	6.41	3.53	.81	439.		
18.000	-2.27	5.40	-.0941	-.69	3.09	5.83	3.22	.62	436.		
19.000	-1.96	6.18	.0110	-.16	2.71	6.08	3.53	.58	432.		
20.000	-3.42	9.14	-.0163	.26	2.65	8.65	5.24	.73	425.		
21.000	-6.45	11.82	-.0555	.57	3.08	11.44	7.75	.48	415.		
22.000	-9.47	13.08	-.0043	.60	2.91	13.34	9.58	.39	413.		
23.000	-12.04	13.20	.0137	.83	2.57	14.52	10.75	.32	407.		
24.000	-14.05	13.96	-.0403	.68	3.28	16.71	11.15	.24	403.		
25.000	-15.12	13.27	.0378	.31	3.07	17.13	10.90	.27	395.		
26.000	-15.03	12.87	.0736	-.37	2.53	16.76	10.90	.15	378.		
27.000	-14.35	13.51	.0013	-1.21	2.76	16.96	10.47	.11	336.		
28.000	-13.22	14.03	-.0141	-2.01	2.84	16.89	9.90	.27	320.		
29.000	-12.27	14.69	-.0044	-1.00	3.37	16.92	9.63	.30	250.		
30.000	-11.43	14.93	.0153	-1.56	3.01	16.55	9.34	.40	243.		
32.000	-9.44	16.02	.1102	.45	3.90	17.34	8.12	.15	77.		
34.000	-8.98	17.99	.1681	-.07	3.87	17.67	10.22	.23	76.		
36.000	-7.06	18.24	-.0343	-.03	3.30	16.68	10.59	.35	78.		
38.000	-3.59	14.90	.1506	.71	4.35	13.65	8.10	.83	78.		
40.000	.85	12.34	.3062	.48	4.49	10.73	7.66	1.83	78.		
42.000	1.14	12.45	.0627	.78	4.67	11.20	7.19	1.09	79.		
44.000	-.09	12.97	-.0635	-.45	5.91	12.04	7.53	.85	81.		
46.000	-2.30	13.93	-.0669	-1.47	4.83	12.80	7.67	1.00	82.		
48.000	-4.35	16.92	-.0537	-3.75	6.16	16.45	9.01	.70	83.		
50.000	-6.36	17.62	.1335	-4.32	7.11	17.58	10.52	.52	83.		
52.000	-7.22	18.50	.1163	-5.53	6.63	18.45	11.21	.72	82.		
54.000	-7.21	19.29	.0932	-6.61	6.70	18.95	12.25	.93	77.		
56.000	-6.39	19.92	.1618	-6.55	6.00	18.76	12.58	1.43	74.		
58.000	-4.18	19.62	.0858	-6.39	8.06	18.54	12.95	1.38	61.		
60.000	-3.09	21.08	-.3271	-5.23	8.31	19.03	13.38	2.14	35.		
62.000	1.53	25.73	.1046	-4.29	11.94	23.14	16.17	1.43	28.		
64.000	9.08	16.07	-.0429	-4.28	11.87	20.21	8.63	.19	19.		
66.000	11.68	13.69	.0923	3.32	13.75	20.33	9.29	.10	12.		

TABLE I-12. WIND STATISTICAL PARAMETERS

DECEMBER

STATION = 619020		ASCENSION (WIDE AWAKE)								NOBS
Z	MEAN U	S.D. U	R(U,V)	MEAN V	S.D. V	MEAN WS	S.D. WS	SKEW WS		
KM	M/S	M/S		M/S	M/S	M/S	M/S			
.020	-6.64	1.81	.0740	3.63	1.50	7.73	1.53	-.26	453.	
1.000	-4.66	2.46	-.4217	1.93	2.29	5.55	2.43	.07	455.	
2.000	-4.87	3.43	-.3237	.17	2.91	5.94	2.93	.41	454.	
3.000	-5.72	3.78	-.3175	-.57	2.95	6.82	3.07	.30	454.	
4.000	-5.72	3.79	-.1042	-.77	3.10	6.85	3.20	.70	453.	
5.000	-5.45	3.70	-.1302	-.47	3.35	6.73	3.10	.65	453.	
6.000	-5.62	4.05	-.1417	-.68	3.25	7.02	3.12	.34	452.	
7.000	-4.52	4.70	-.0233	-1.28	3.46	6.96	3.39	.29	452.	
8.000	-2.97	5.93	-.0424	-1.59	4.12	7.03	3.71	.39	451.	
9.000	-.10	7.10	-.0762	-1.97	5.00	7.83	4.22	.60	450.	
10.000	2.71	7.98	-.0675	-2.66	5.78	9.30	5.00	.80	449.	
11.000	5.31	8.96	.0176	-3.64	6.33	11.19	6.17	.69	449.	
12.000	7.95	9.31	-.0103	-5.13	6.53	12.92	7.20	.49	449.	
13.000	10.39	10.07	-.0509	-5.40	6.73	14.83	7.99	.42	449.	
14.000	11.20	10.81	-.1704	-4.30	8.45	15.26	8.31	.34	448.	
15.000	8.29	10.20	-.0413	-3.19	5.95	12.93	7.13	.63	446.	
16.000	2.38	7.72	-.0763	-2.75	4.99	8.75	4.58	.72	445.	
17.000	-2.83	5.28	-.1716	-2.13	3.91	6.65	3.38	.55	430.	
18.000	-4.61	4.70	-.0476	-.69	3.11	6.43	3.49	.82	440.	
19.000	-4.06	6.15	-.0155	-.18	2.49	6.60	4.11	.74	439.	
20.000	-5.74	8.88	-.1084	.10	2.57	8.85	6.32	.64	434.	
21.000	-8.61	11.35	-.1627	.48	2.87	11.64	8.70	.46	425.	
22.000	-12.12	12.76	-.1325	1.10	3.10	14.39	10.67	.34	423.	
23.000	-14.92	12.62	-.0243	1.07	2.76	16.24	11.27	.27	410.	
24.000	-17.28	12.52	-.0235	.65	3.41	18.44	11.29	.13	416.	
25.000	-17.65	11.23	.0848	-.73	3.18	18.57	10.51	.27	408.	
26.000	-17.45	10.50	.0716	-1.45	2.57	17.95	10.05	.22	393.	
27.000	-17.07	11.37	.0453	-1.86	2.69	17.92	10.50	.24	363.	
28.000	-16.61	12.71	.0520	-1.62	2.64	18.02	11.03	.28	358.	
29.000	-17.09	14.21	.0434	-1.21	3.00	18.96	12.03	.23	277.	
30.000	-17.08	14.62	.0535	-.97	2.70	18.68	12.57	.29	208.	
32.000	-18.12	14.80	.0272	-.48	3.70	20.25	12.24	-.07	59.	
34.000	-19.16	14.37	.0333	.57	2.99	19.78	12.38	.19	59.	
36.000	-17.60	13.05	-.0822	.44	3.63	18.81	11.78	.25	59.	
38.000	-15.54	11.85	.1542	.16	4.19	16.64	11.03	.55	59.	
40.000	-16.74	12.67	.0379	.81	4.47	17.98	11.71	.38	59.	
42.000	-22.25	14.58	.1227	1.79	4.90	23.19	14.02	.70	59.	
44.000	-29.78	15.04	.1941	-.11	4.83	30.25	14.85	.58	59.	
46.000	-33.25	16.12	-.1025	-2.41	5.34	30.03	15.80	.29	59.	
48.000	-44.45	17.54	-.0569	-3.81	6.30	45.19	17.16	.74	59.	
50.000	-47.26	20.08	.0531	-5.48	6.47	40.66	18.44	.51	53.	
52.000	-43.48	20.67	.2186	-6.85	6.77	50.03	18.07	.34	53.	
54.000	-42.17	22.99	-.0213	-7.72	5.81	45.08	19.02	-.26	59.	
56.000	-32.90	25.55	.0322	-7.32	8.12	38.69	19.20	-.15	59.	
58.000	-20.45	25.45	-.0494	-7.12	8.04	26.94	18.34	.55	48.	
60.000	-12.93	24.17	-.0466	-4.83	10.15	22.97	18.46	1.39	33.	
62.000	-9.58	24.65	.1527	-4.44	12.48	23.65	17.47	1.14	23.	
64.000	-1.26	12.54	.3351	-6.45	9.47	15.26	7.15	.96	16.	
66.000	-8.23	15.04	.4519	.07	6.86	15.66	7.73	-.03	7.	

TABLE I-13. WIND STATISTICAL PARAMETERS

ANNUAL

STATION = 619020		ASCENSION (WIDE AWAKE)								
Z	MEAN U	S.D. U	RID. V	MEAN V	S.D. V	MEAN WS	S.D. WS	SKEN WS	NOBS	
KM	M/S	M/S		M/S	M/S	M/S	M/S			
.020	-6.90	1.86	.0699	3.53	1.71	8.00	1.71	-.14	5716.	
1.000	-5.45	2.77	-.3353	2.71	2.26	6.49	2.78	.03	5714.	
2.000	-3.75	4.30	-.2035	.38	2.78	5.54	3.11	.85	5710.	
3.000	-3.25	4.79	-.1774	-.75	2.65	5.75	3.12	.71	5707.	
4.000	-3.10	4.47	-.0115	-.64	2.80	5.44	3.03	.63	5706.	
5.000	-3.51	4.22	-.1301	-.49	3.03	5.55	2.95	.69	5707.	
6.000	-4.02	4.77	-.1567	-.29	3.33	6.29	3.33	.70	5710.	
7.000	-3.70	5.45	-.0603	-.18	3.81	6.75	3.52	.83	5707.	
8.000	-2.25	6.30	-.0621	-.23	4.43	7.09	3.76	.75	5693.	
9.000	-.26	7.24	-.0970	-.93	5.19	7.84	4.34	.87	5697.	
10.000	1.68	8.09	-.0215	-2.13	5.95	9.06	5.12	.88	5690.	
11.000	3.53	9.23	.0676	-3.51	6.75	10.07	6.11	.78	5665.	
12.000	5.76	9.97	.0701	-3.93	6.61	12.01	6.90	.75	5650.	
13.000	7.79	10.70	.0375	-3.72	6.49	13.19	7.59	.72	5650.	
14.000	8.71	10.81	-.0273	-2.81	6.05	13.28	7.81	.71	5653.	
15.000	6.65	9.69	-.0300	-2.00	5.30	11.21	6.69	.63	5644.	
16.000	2.13	7.40	-.0618	-1.53	4.27	7.72	4.53	1.03	5627.	
17.000	-1.65	5.69	-.0846	-.90	3.48	6.05	3.38	.81	5542.	
18.000	-2.60	6.11	-.0600	-.04	3.21	6.33	3.78	.97	5534.	
19.000	-2.03	7.09	.0051	.18	2.75	6.64	4.23	1.04	5502.	
20.000	-3.21	9.05	-.0503	.40	2.66	8.29	5.97	.52	5438.	
21.000	-5.65	11.27	-.0932	.59	2.91	10.59	7.45	.75	5314.	
22.000	-8.55	12.76	-.0517	.77	3.06	12.93	8.80	.65	5203.	
23.000	-10.73	12.65	-.0275	.73	2.69	14.24	9.26	.42	5150.	
24.000	-12.64	13.47	-.0274	.51	3.31	16.06	9.72	.35	5120.	
25.000	-13.99	13.43	-.0314	-.10	3.10	17.01	9.62	.30	5022.	
26.000	-14.02	13.73	-.0301	-.66	2.84	17.66	10.25	.22	4810.	
27.000	-15.37	14.60	-.0220	-1.16	3.09	18.49	10.90	.16	4373.	
28.000	-15.76	15.17	-.0000	-1.41	2.90	18.96	11.40	.18	4201.	
29.000	-16.67	15.80	.0000	-1.37	3.21	20.03	11.73	.14	3346.	
30.000	-18.58	15.79	.0312	-1.12	2.96	19.62	11.91	.22	3164.	
32.000	-11.22	10.29	.1003	-.23	3.65	16.69	11.27	.53	902.	
34.000	-12.45	16.09	.0102	.40	3.76	17.69	11.67	.63	902.	
36.000	-13.60	17.78	-.0245	.64	4.10	19.26	12.17	.65	902.	
38.000	-13.05	18.12	.0034	.78	4.47	20.09	13.04	.62	903.	
40.000	-12.03	21.25	.1081	1.24	5.18	21.01	14.37	.75	903.	
42.000	-12.05	24.20	.1020	1.87	5.64	22.33	16.37	1.00	904.	
44.000	-10.98	23.96	.2155	1.56	6.85	23.81	18.17	1.19	980.	
46.000	-10.37	23.02	.1915	.33	7.27	24.65	19.65	1.37	902.	
48.000	-9.24	30.39	.1403	-1.79	7.21	25.47	20.40	1.59	979.	
50.000	-5.89	23.77	.1484	-3.71	7.39	24.93	19.21	1.61	972.	
52.000	-1.36	28.01	.1033	-4.24	7.87	24.37	16.52	1.40	953.	
54.000	4.18	25.72	.1337	-3.60	8.51	23.70	14.27	.99	935.	
56.000	9.25	23.06	.1571	-2.07	9.34	23.53	13.57	.78	884.	
58.000	14.12	21.67	.1219	-.05	10.10	24.18	13.77	.70	753.	
60.000	17.91	21.49	.0903	2.09	11.02	26.25	14.37	.65	574.	
62.000	20.68	23.27	.1274	3.56	13.06	29.84	16.33	.49	428.	
64.000	22.50	20.91	.1516	3.55	13.53	30.39	15.31	.62	261.	
66.000	22.90	23.63	.1235	5.39	14.37	32.13	17.45	.48	117.	

TABLE II-1. THERMODYNAMIC STATISTICAL PARAMETERS

JANUARY

STATION - 610023 Z KM	ACCESSION (NINE ANXES)				S.D. T DEG K	SKEW T	MEAN D G/M3	S.D. D G/M3	SKEW D	NOBS P	NOBS T	NOBS D
	MEAN P MB	SKEW P	MEAN T DEG K	S.D. P MB								
0.000 1006.5000	1.2453	.03	292.75	1.27	-1.22	1101.0000	8.0200	.19	.460.	460.	460.	460.
0.000 1007.0000	1.2437	.03	293.25	1.25	-1.24	1159.0000	6.0620	.19	493.	493.	493.	493.
1.000 1007.5000	1.2435	.14	291.05	1.22	-.39	1074.0000	4.9730	-.28	493.	493.	493.	493.
2.000 1008.0000	1.2525	-.04	292.00	1.72	-.61	955.4000	5.6740	.53	493.	493.	493.	493.
3.000 1008.5000	1.2500	.11	293.99	1.19	-.51	873.9000	3.6070	-.32	493.	493.	493.	493.
4.000 1009.0000	1.2423	.04	277.45	1.20	-.10	753.7000	3.5270	-.02	492.	492.	492.	492.
5.000 1009.5000	1.1943	.03	273.00	1.34	-.55	714.8000	3.5320	.29	492.	492.	492.	492.
6.000 1010.0000	1.1174	.14	265.31	1.33	-.24	671.2000	3.3150	.02	492.	492.	492.	492.
7.000 1010.5000	1.1132	.12	260.04	1.33	-.70	593.3000	2.9310	.37	492.	492.	492.	492.
8.000 1011.0000	1.1107	.07	253.03	1.28	-.59	521.4000	2.9620	-.16	493.	493.	493.	493.
9.000 1011.5000	1.1026	-.03	245.47	1.33	-.34	465.1000	2.9230	-.69	493.	493.	493.	493.
10.000 1012.0000	1.1335	-.03	237.56	1.38	-.01	420.9000	2.6310	-.80	492.	492.	492.	492.
11.000 1012.5000	1.1191	-.03	229.65	1.43	.04	377.2000	1.7430	.26	492.	492.	492.	492.
12.000 1013.0000	1.0721	.01	221.55	1.29	.03	335.5000	1.5550	.02	492.	492.	492.	492.
13.000 1013.5000	1.0318	.14	214.50	1.33	.44	297.1000	1.7710	-1.19	492.	492.	492.	492.
14.000 1014.0000	.9775	.33	203.05	1.50	.50	261.1000	2.0300	-1.17	492.	492.	492.	492.
15.000 1014.5000	.8403	.43	203.15	1.89	.42	227.7000	2.1320	-.68	491.	491.	491.	491.
16.000 1015.0000	.7785	.39	197.71	2.02	.40	193.5000	2.0900	-.03	490.	490.	490.	490.
17.000 1015.5000	.6934	.30	185.43	2.05	-.03	167.3000	2.0550	.24	485.	485.	485.	485.
18.000 1016.0000	.6040	.29	183.52	2.60	.42	129.5000	2.0910	-.19	485.	485.	485.	485.
19.000 1016.5000	.5340	.29	200.99	2.67	.28	115.3000	1.6350	.04	483.	483.	483.	483.
20.000 1017.0000	.4627	.34	205.63	2.59	.09	95.4500	1.1750	.31	479.	479.	479.	479.
21.000 1017.5000	.4522	.40	213.47	2.43	.23	79.6100	.8401	.39	472.	472.	472.	472.
22.000 1018.0000	.4222	.44	216.39	2.28	.27	66.9700	.6930	.09	470.	470.	470.	470.
23.000 1018.5000	.3826	.49	214.49	2.07	.32	56.5300	.5930	.11	464.	464.	464.	464.
24.000 1019.0000	.3522	.40	215.40	2.35	.18	47.5000	.6294	.03	458.	458.	458.	458.
25.000 1019.5000	.3187	.37	210.51	2.53	.21	40.3500	.5993	.12	454.	454.	454.	454.
26.000 1020.0000	.2634	.22	221.66	2.61	.06	34.4100	.5331	.34	440.	440.	440.	440.
27.000 1020.5000	.2434	.03	223.04	2.62	-.02	29.2200	.4593	.27	414.	414.	414.	414.
28.000 1021.0000	.2231	-.02	223.07	2.55	-.10	24.8000	.4008	.18	410.	410.	410.	410.
29.000 1021.5000	.1933	-.10	222.44	2.63	-.18	21.2400	.3541	.28	347.	347.	347.	347.
30.000 1022.0000	.1733	-.10	220.49	2.58	-.35	18.1700	.2924	.17	339.	339.	339.	339.
31.000 1022.5000	.1323	-.23	233.67	3.23	.14	13.2500	.2104	.04	75.	75.	75.	75.
32.000 1023.0000	.1125	-.02	233.54	3.65	.04	9.9000	.1551	-.15	75.	75.	75.	75.
33.000 1023.5000	.0959	.13	241.15	4.20	.24	7.3400	.1281	-.36	75.	75.	75.	75.
34.000 1024.0000	.0851	.10	245.53	5.03	.18	5.4490	.1010	-.02	73.	73.	73.	73.
35.000 1024.5000	.0755	.07	252.14	5.25	-.27	4.0550	.0569	-.24	73.	73.	73.	73.
36.000 1025.0000	.0637	-.05	250.65	5.28	-.03	3.0780	.0704	.15	73.	73.	73.	73.
37.000 1025.5000	.0562	-.23	253.53	4.68	-.01	2.3040	.0595	.40	72.	72.	72.	72.
38.000 1026.0000	.0476	-.34	257.15	4.65	-.51	1.7770	.0493	.15	68.	68.	68.	68.
39.000 1026.5000	.0405	-.33	253.59	5.62	-.13	1.3760	.0447	-.08	66.	66.	66.	66.
40.000 1027.0000	.0379	-.31	253.29	6.17	.42	1.0590	.0373	-.19	66.	66.	66.	66.
41.000 1027.5000	.0374	-.14	270.03	6.17	.56	.8313	.0334	-.52	67.	67.	67.	67.
42.000 1028.0000	.0225	-.20	263.21	6.04	.13	.6510	.0271	-.27	64.	64.	64.	64.
43.000 1028.5000	.0189	-.19	267.66	6.57	.10	.5100	.0222	-.39	61.	61.	61.	61.
44.000 1029.0000	.0160	.07	267.31	7.15	.25	.4213	.0181	-.47	56.	56.	56.	56.
45.000 1029.5000	.0119	.22	259.26	8.30	.34	.3159	.0135	-.16	49.	49.	49.	49.
46.000 1030.0000	.0037	.40	254.50	8.63	.63	.2453	.0101	-.07	37.	37.	37.	37.
47.000 1030.5000	.0031	.50	250.30	9.42	1.22	.1913	.0067	-.15	29.	29.	29.	29.
48.000 1031.0000	.0015	.60	233.71	10.10	1.65	.1523	.0033	-.87	10.	10.	10.	10.

TABLE II-2. THERMODYNAMIC STATISTICAL PARAMETERS

FEBRUARY

STATION - 619020		ASCENSION (HIDE AWAY)										S.D. D				NOBS T			
Z	MEAN P	S.D. P	SKEN P	MEAN T	S.D. T	SKEN T	MEAN D	S.D. D	SKEN D	NOBS P	NOBS T	NOBS D	NOBS T	NOBS D	NOBS P	NOBS T	NOBS D	NOBS T	NOBS D
KN	PS	PS	PS	DEG K	DEG K	DEG K	G/M3	G/M3	G/M3	G/M3	G/M3	G/M3	G/M3	G/M3	G/M3	G/M3	G/M3	G/M3	G/M3
1.000	1006.3030	1.7199	.17	333.20	1.16	-.26	1157.0030	5.9330	.30	424.	424.	424.	424.	424.	424.	424.	424.	424.	424.
.820	1004.0030	1.7084	.17	333.19	1.15	-.24	1154.0030	5.9310	.29	446.	446.	446.	446.	446.	446.	446.	446.	446.	446.
1.000	903.6300	1.4936	.18	231.85	1.13	-.20	1071.0030	4.7020	-.27	450.	450.	450.	450.	450.	450.	450.	450.	450.	450.
2.000	804.0600	1.3612	.28	130.10	1.50	-.49	655.4030	5.0730	.32	449.	449.	449.	449.	449.	449.	449.	449.	449.	449.
3.000	714.2700	1.3030	.43	233.29	1.27	-.07	875.0030	3.9163	.04	449.	449.	449.	449.	449.	449.	449.	449.	449.	449.
4.000	632.7500	1.2679	.43	277.53	1.35	-.13	732.5030	3.7010	.02	449.	449.	449.	449.	449.	449.	449.	449.	449.	449.
5.000	573.2100	1.2535	.53	272.40	1.37	-.24	714.2030	3.1030	-.02	449.	449.	449.	449.	449.	449.	449.	449.	449.	449.
6.000	423.2500	1.2031	.52	202.30	1.44	-.15	642.5030	2.2410	.03	448.	448.	448.	448.	448.	448.	448.	448.	448.	448.
7.000	433.3500	1.2537	.45	233.30	1.37	-.04	579.0700	2.8030	.02	448.	448.	448.	448.	448.	448.	448.	448.	448.	448.
8.000	379.6300	1.3122	.33	233.23	1.31	.07	520.0700	2.4403	-.03	448.	448.	448.	448.	448.	448.	448.	448.	448.	448.
9.000	331.3500	1.3042	.35	243.13	1.33	-.17	468.4000	2.3550	-.18	448.	448.	448.	448.	448.	448.	448.	448.	448.	448.
10.000	230.0000	1.3110	.33	233.15	1.34	-.41	420.8030	2.1630	-.31	449.	449.	449.	449.	449.	449.	449.	449.	449.	449.
11.000	245.2500	1.2524	.22	233.18	1.42	-.25	377.2000	1.5630	.27	449.	449.	449.	449.	449.	449.	449.	449.	449.	449.
12.000	214.3030	1.2523	.28	232.33	1.44	-.30	335.0300	1.5150	.02	449.	449.	449.	449.	449.	449.	449.	449.	449.	449.
13.000	183.6000	1.2091	.24	214.67	1.50	.73	237.7000	1.6530	-.75	449.	449.	449.	449.	449.	449.	449.	449.	449.	449.
14.000	155.3500	1.1375	.30	207.65	1.58	.22	200.0030	1.5030	-.25	449.	449.	449.	449.	449.	449.	449.	449.	449.	449.
15.000	132.4500	1.0597	.51	231.93	1.84	.33	205.3030	1.5230	-.52	448.	448.	448.	448.	448.	448.	448.	448.	448.	448.
16.000	111.7800	.9761	.55	197.95	1.65	.11	197.1000	1.5220	-.23	448.	448.	448.	448.	448.	448.	448.	448.	448.	448.
17.000	94.0910	.8716	.57	153.35	1.54	.56	157.8500	2.1230	-.09	445.	445.	445.	445.	445.	445.	445.	445.	445.	445.
18.000	79.1030	.7425	.54	159.50	2.73	.32	140.3030	2.4090	.21	442.	442.	442.	442.	442.	442.	442.	442.	442.	442.
19.000	65.7050	.6259	.50	200.78	2.73	.31	115.8030	1.8420	.42	441.	441.	441.	441.	441.	441.	441.	441.	441.	441.
20.000	56.4690	.5552	.37	225.14	2.25	.25	95.9000	1.3475	.44	438.	438.	438.	438.	438.	438.	438.	438.	438.	438.
21.000	47.6420	.5224	.33	219.07	2.76	.61	79.6700	1.0100	.40	421.	421.	421.	421.	421.	421.	421.	421.	421.	421.
22.000	40.6220	.4928	.37	212.14	2.49	.12	67.0700	.7847	.29	419.	419.	419.	419.	419.	419.	419.	419.	419.	419.
23.000	34.6450	.4103	.38	214.52	2.34	.43	56.5030	.5651	-.17	411.	411.	411.	411.	411.	411.	411.	411.	411.	411.
24.000	29.7770	.3234	.31	219.23	2.91	.33	40.5500	.0523	.50	397.	397.	397.	397.	397.	397.	397.	397.	397.	397.
25.000	25.4950	.3230	.01	221.51	2.78	.21	34.3500	.5491	.21	385.	385.	385.	385.	385.	385.	385.	385.	385.	385.
26.000	21.8040	.2830	.10	223.23	2.65	.24	13.4200	.1812	.29	65.	65.	65.	65.	65.	65.	65.	65.	65.	65.
27.000	18.7550	.2541	.10	224.13	2.72	.24	9.5400	.1400	-.35	66.	66.	66.	66.	66.	66.	66.	66.	66.	66.
28.000	16.1750	.2541	.19	220.07	4.10	-.24	7.3630	.1618	-.30	66.	66.	66.	66.	66.	66.	66.	66.	66.	66.
29.000	13.5330	.2541	.01	227.29	5.28	-.22	5.4420	.1189	-.17	66.	66.	66.	66.	66.	66.	66.	66.	66.	66.
30.000	12.0520	.1521	.13	220.30	2.71	.05	24.6300	.4334	.05	339.	339.	339.	339.	339.	339.	339.	339.	339.	339.
31.000	9.0410	.1506	.12	221.11	3.65	.09	18.1700	.3034	.21	275.	275.	275.	275.	275.	275.	275.	275.	275.	275.
32.000	5.7550	.1534	.10	223.23	3.77	.73	13.4200	.1812	.29	65.	65.	65.	65.	65.	65.	65.	65.	65.	65.
33.000	5.1313	.1126	.24	212.57	4.10	-.24	7.3630	.1618	-.30	66.	66.	66.	66.	66.	66.	66.	66.	66.	66.
34.000	3.9056	.0942	.19	220.07	4.57	-.22	5.4420	.1189	-.17	66.	66.	66.	66.	66.	66.	66.	66.	66.	66.
35.000	2.9257	.0803	.01	227.29	5.28	-.22	4.0560	.0935	.40	66.	66.	66.	66.	66.	66.	66.	66.	66.	66.
36.000	2.3156	.0699	.13	220.11	6.17	-.25	3.0330	.0714	-.09	66.	66.	66.	66.	66.	66.	66.	66.	66.	66.
37.000	1.6520	.0615	-.14	270.13	3.57	-.19	2.3320	.0535	.04	66.	66.	66.	66.	66.	66.	66.	66.	66.	66.
38.000	1.4075	.0315	-.14	272.49	5.63	.09	1.7390	.0574	-.02	68.	68.	68.	68.	68.	68.	68.	68.	68.	68.
39.000	1.1021	.0441	.07	272.51	4.75	.19	1.4050	.0557	-.03	69.	69.	69.	69.	69.	69.	69.	69.	69.	69.
40.000	.8523	.0316	.11	271.21	4.75	.93	1.1040	.0490	.06	68.	68.	68.	68.	68.	68.	68.	68.	68.	68.
41.000	.6707	.0206	.15	220.29	5.67	-.23	.8701	.0401	.32	68.	68.	68.	68.	68.	68.	68.	68.	68.	68.
42.000	.5224	.0212	.06	223.23	6.35	.09	.6322	.0285	.52	69.	69.	69.	69.	69.	69.	69.	69.	69.	69.
43.000	.4064	.0175	.01	224.24	7.25	-.64	.5353	.0227	1.10	66.	66.	66.	66.	66.	66.	66.	66.	66.	66.
44.000	.3147	.0145	.03	221.23	6.33	-.25	.4135	.0160	-.03	63.	63.	63.	63.	63.	63.	63.	63.	63.	63.
45.000	.2418	.0121	.13	227.50	10.10	-.11	.3275	.0129	-.01	55.	55.	55.	55.	55.	55.	55.	55.	55.	55.
46.000	.1825	.0111	.13	225.14	11.10	-.07	.2549	.0089	.01	46.	46.	46.	46.	46.	46.	46.	46.	46.	46.
47.000	.1414	.0093	.16	250.41	11.26	.26	.1537	.0070	-.09	28.	28.	28.	28.	28.	28.	28.	28.	28.	28.
48.000	.1044	.0078	1.22	222.21	12.16	1.13	.1510	.0039	-.41	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.

TABLE II-3. THERMODYNAMIC STATISTICAL PARAMETERS

MARCH

STATION = 816020		ASLENSION (INDC AMPL)		S.D. T		SKEW T		S.D. D		SKEW D		NOBS P		NOBS T		NOBS D	
Z	MEAN P	S.D. P	SKEW P	DEG K	DEG K	DEG K	DEG K	G/M3	G/M3	G/M3	G/M3						
KH	MB	PS															
.000	1006.0000	1.4761	.23	300.98	1.08	1.08	1.08	1153.0000	5.0460	.20	.20	466.	466.	466.	466.	466.	466.
.020	1003.7000	1.4762	.24	300.65	1.08	1.08	1.08	1151.0000	4.9770	.21	.21	480.	480.	480.	480.	480.	480.
1.000	903.5900	1.3531	.16	232.51	.93	.93	.93	1069.0000	4.0050	.16	.16	480.	480.	480.	480.	480.	480.
2.000	804.1500	1.2235	.23	235.75	1.32	1.32	1.32	960.2000	4.6570	.63	.63	480.	480.	480.	480.	480.	480.
3.000	714.3200	1.2331	.23	235.67	1.15	1.15	1.15	974.5000	3.4930	.21	.21	480.	480.	480.	480.	480.	480.
4.000	632.6900	1.2037	.13	277.65	1.13	1.13	1.13	791.0000	3.3100	.03	.03	480.	480.	480.	480.	480.	480.
5.000	558.4100	1.1232	.26	272.65	1.22	1.22	1.22	713.6000	3.3450	.00	.00	480.	480.	480.	480.	480.	480.
6.000	493.2800	1.0919	.28	257.84	1.15	1.15	1.15	642.5000	2.9120	.03	.03	480.	480.	480.	480.	480.	480.
7.000	433.6000	1.0558	.37	250.84	1.09	1.09	1.09	578.5000	2.4750	.16	.16	480.	480.	480.	480.	480.	480.
8.000	379.6300	1.0474	.53	254.10	1.14	1.14	1.14	520.2000	2.3390	.05	.05	480.	480.	480.	480.	480.	480.
9.000	331.7400	1.0375	.51	245.83	1.21	1.21	1.21	467.6000	2.3520	.30	.30	480.	480.	480.	480.	480.	480.
10.000	293.4500	1.0316	.40	245.92	1.25	1.25	1.25	423.0000	2.1400	.48	.48	479.	479.	479.	479.	479.	479.
11.000	249.7300	1.0472	.30	230.24	1.27	1.27	1.27	376.6000	1.5510	.26	.26	479.	479.	479.	479.	479.	479.
12.000	214.6000	1.0335	.39	232.78	1.23	1.23	1.23	335.9000	1.3530	.40	.40	479.	479.	479.	479.	479.	479.
13.000	194.0700	.9919	.37	214.91	1.26	1.26	1.26	293.4000	1.3500	.35	.35	479.	479.	479.	479.	479.	479.
14.000	153.7600	.9436	.44	207.60	1.40	1.40	1.40	263.1000	1.5220	.72	.72	479.	479.	479.	479.	479.	479.
15.000	132.7600	.8761	.45	201.49	1.58	1.58	1.58	229.5000	1.7300	.65	.65	478.	478.	478.	478.	478.	478.
16.000	111.5600	.8025	.47	197.00	1.59	1.59	1.59	198.0000	1.7450	.12	.12	478.	478.	478.	478.	478.	478.
17.000	94.1000	.7657	.49	194.85	1.67	1.67	1.67	163.4000	1.9720	.06	.06	473.	473.	473.	473.	473.	473.
18.000	79.1700	.5904	.53	195.57	2.84	2.84	2.84	140.5000	2.3210	.13	.13	474.	474.	474.	474.	474.	474.
19.000	66.7710	.4817	.57	201.32	2.56	2.56	2.56	115.5000	1.6410	.11	.11	473.	473.	473.	473.	473.	473.
20.000	56.5510	.4463	.42	205.60	2.46	2.46	2.46	95.7400	1.1340	.32	.32	470.	470.	470.	470.	470.	470.
21.000	48.0420	.4120	.23	203.60	2.23	2.23	2.23	79.6500	.8411	.30	.30	450.	450.	450.	450.	450.	450.
22.000	40.9320	.3839	.22	213.11	2.14	2.14	2.14	66.5200	.7754	.09	.09	450.	450.	450.	450.	450.	450.
23.000	34.9750	.3366	.21	215.72	1.88	1.88	1.88	56.4000	.6309	.13	.13	445.	445.	445.	445.	445.	445.
24.000	29.8110	.3043	.14	218.19	2.32	2.32	2.32	47.7600	.6317	.17	.17	447.	447.	447.	447.	447.	447.
25.000	25.6330	.2687	.06	220.39	2.55	2.55	2.55	40.5300	.5755	.05	.05	443.	443.	443.	443.	443.	443.
26.000	22.0170	.2332	.01	222.31	2.50	2.50	2.50	34.4300	.4653	.27	.27	429.	429.	429.	429.	429.	429.
27.000	18.5290	.2046	.02	232.22	2.47	2.47	2.47	29.6300	.4143	.40	.40	396.	396.	396.	396.	396.	396.
28.000	16.3040	.1823	.05	237.75	2.46	2.46	2.46	24.5400	.3553	.20	.20	386.	386.	386.	386.	386.	386.
29.000	14.0760	.1620	.09	232.10	2.59	2.59	2.59	21.3100	.3057	.15	.15	307.	307.	307.	307.	307.	307.
30.000	12.1670	.1459	.10	232.10	2.44	2.44	2.44	18.2600	.2449	.13	.13	300.	300.	300.	300.	300.	300.
32.000	9.0755	.1458	.46	235.59	3.78	3.78	3.78	13.4100	.2643	.28	.28	90.	90.	90.	90.	90.	90.
34.000	6.6342	.1275	.48	239.61	4.24	4.24	4.24	9.9280	.1853	.18	.18	90.	90.	90.	90.	90.	90.
36.000	5.1731	.1139	.37	244.60	4.61	4.61	4.61	7.3560	.1184	.42	.42	90.	90.	90.	90.	90.	90.
38.000	3.9453	.0926	.30	251.60	5.53	5.53	5.53	5.4500	.1006	.61	.61	90.	90.	90.	90.	90.	90.
40.000	3.0341	.0674	.24	259.73	6.12	6.12	6.12	4.0530	.0844	.03	.03	89.	89.	89.	89.	89.	89.
42.000	2.5515	.0775	.23	256.33	5.02	5.02	5.02	3.0769	.0769	.12	.12	88.	88.	88.	88.	88.	88.
44.000	1.8322	.0620	.43	270.61	5.42	5.42	5.42	2.3300	.0755	.53	.53	80.	80.	80.	80.	80.	80.
46.000	1.4305	.0530	.55	272.11	4.81	4.81	4.81	1.8300	.0525	.10	.10	87.	87.	87.	87.	87.	87.
48.000	1.1185	.0428	.61	271.27	4.78	4.78	4.78	1.4320	.0530	.25	.25	85.	85.	85.	85.	85.	85.
50.000	.8716	.0243	.63	259.31	5.35	5.35	5.35	1.1250	.0440	.21	.21	85.	85.	85.	85.	85.	85.
52.000	.6790	.0277	.62	265.52	5.68	5.68	5.68	.8657	.0341	.27	.27	85.	85.	85.	85.	85.	85.
54.000	.5273	.0225	.57	264.20	6.52	6.52	6.52	.6941	.0286	.33	.33	86.	86.	86.	86.	86.	86.
56.000	.4003	.0184	.42	251.43	7.01	7.01	7.01	.5440	.0219	.41	.41	83.	83.	83.	83.	83.	83.
58.000	.3150	.0155	.62	257.57	7.08	7.08	7.08	.4255	.0163	.31	.31	79.	79.	79.	79.	79.	79.
60.000	.2417	.0131	.63	254.07	7.23	7.23	7.23	.3314	.0137	.26	.26	74.	74.	74.	74.	74.	74.
62.000	.1879	.0091	.27	249.57	6.71	6.71	6.71	.2534	.0099	.26	.26	54.	54.	54.	54.	54.	54.
64.000	.1360	.0032	.63	242.40	7.25	7.25	7.25	.1972	.0081	.28	.28	34.	34.	34.	34.	34.	34.
66.000	.1041	.0067	1.64	237.63	8.58	8.58	8.58	.1521	.0047	.78	.78	13.	13.	13.	13.	13.	13.

TABLE II-5. THERMODYNAMIC STATISTICAL PARAMETERS

MAY

STATION = 619020			ASCENSION (LIDE ANGLE)			S.D. T			SKEW T			S.D. D			SKEW D			NOBS P			NOBS T			NOBS D		
Z	MEAN P	MB	S.D. P	SKEW P	MEAN T	DEG K	S.D. K	DEG K	MEAN T	G/M3	G/M3	S.D. D	G/M3	G/M3	SKEW D	G/M3	G/M3	NOBS P	NOBS T	NOBS D	NOBS P	NOBS T	NOBS D	NOBS P	NOBS T	NOBS D
.000	1007.4000		1.4250	.18	377.52	1.05			-28	1157.0000		.14						412.			412.			412.		
.020	1005.2000		1.3339	.12	303.43	1.58			-17	1153.0000		.03						459.			459.			459.		
1.030	504.5500		1.2448	.27	291.75	1.01			.03	1073.0000		.03						488.			488.			488.		
2.000	644.7300		1.1648	.24	533.03	1.75			-27	913.0000		.30						488.			488.			488.		
3.000	714.6300		1.1933	.32	234.03	1.36			-58	874.1000		.44						488.			488.			488.		
4.000	533.3100		1.1210	.25	272.59	1.17			-20	750.1000		.06						488.			488.			488.		
5.000	523.3000		1.0333	.15	272.59	1.18			-13	713.0000		.08						488.			488.			488.		
6.000	493.7400		1.0342	.10	267.10	1.24			-08	612.4000		.45						488.			488.			488.		
7.000	434.0300		1.0542	.24	261.06	1.17			-06	577.9000		.60						488.			488.			488.		
8.000	380.4400		1.0349	.16	234.53	1.16			-03	519.3000		.85						456.			456.			456.		
9.000	332.2400		1.0872	.18	247.45	1.24			-14	456.0000		.86						486.			486.			486.		
10.000	293.0000		1.1152	.17	239.51	1.21			-02	419.3000		.80						485.			485.			485.		
11.000	250.3000		1.0858	.14	231.37	1.18			-07	376.0000		.09						485.			485.			485.		
12.000	215.3500		1.0934	.19	225.25	1.21			.09	335.0000		.07						485.			485.			485.		
13.000	184.6100		1.0103	.22	215.29	1.26			.07	255.7000		.50						484.			484.			484.		
14.000	157.2500		.9392	.27	267.76	1.20			.34	253.7000		.55						483.			483.			483.		
15.000	133.2000		.9073	.24	201.51	1.51			.27	259.3000		.82						482.			482.			482.		
16.000	112.3300		.8639	.29	195.96	1.54			-06	199.7000		.03						482.			482.			482.		
17.000	94.5550		.7755	.33	195.28	1.81			.28	160.7000		.00						475.			475.			475.		
18.000	79.5040		.6763	.25	158.01	2.60			-01	139.0000		.16						474.			474.			474.		
19.000	67.1680		.6105	.80	202.79	2.31			-05	115.4000		.52						469.			469.			469.		

TABLE II-6. THERMODYNAMIC STATISTICAL PARAMETERS

JUNE

STATION = 615020		ASCENDING (WILE ANAKE)							
Z	MEAN P	S.D. P	SKWH P	MEAN T	S.D. T	SKWH T	MEAN D	S.D. D	SKWH D
MM	MM	MM		°C K	°C K		°C	°K	
.000	1009.1000	1.6373	.01	259.50	1.11	-.51	1164.0000	5.2530	.50
.020	1009.6000	1.6033	.01	260.44	1.09	-.49	1164.0000	5.1320	.19
1.000	905.0100	1.4534	.23	259.65	1.05	.12	1079.0000	4.4400	.04
2.000	805.2500	1.4449	-.13	259.45	2.03	.05	975.5000	7.0320	-.03
3.000	714.5500	1.3693	-.23	253.75	1.42	-.39	875.7000	4.7760	.25
4.000	633.3400	1.3375	-.03	277.02	1.30	.17	792.3500	4.2700	-.05
5.000	559.7300	1.2518	.04	272.20	1.26	-.22	715.1000	3.0740	.20
6.000	493.4100	1.2593	.20	269.62	1.41	-.25	643.6000	3.5320	.41
7.000	433.6400	1.2590	.49	269.05	1.47	.05	570.7000	3.2370	.63
8.000	379.5000	1.2765	.53	269.50	1.32	.37	500.3000	3.1350	-.47
9.000	331.6800	1.2646	.75	246.50	1.40	.43	457.5000	3.2290	1.00
10.000	288.3400	1.2679	.81	245.38	1.42	.39	400.6000	2.9140	1.33
11.000	245.5200	1.2403	.72	230.24	1.49	.34	377.5000	1.7050	-.31
12.000	214.5500	1.2318	.77	222.25	1.40	.35	336.5000	1.5510	-.17
13.000	183.8100	1.1753	.72	214.55	1.30	.72	298.4000	1.5550	-.37
14.000	155.5200	1.1072	.81	207.53	1.48	.72	253.6000	1.0700	-.22
15.000	132.6000	1.0141	.84	202.03	1.51	.34	200.5000	1.9770	.01
16.000	111.5200	.9162	1.00	193.41	1.75	.27	150.5000	2.1130	.69
17.000	94.3120	.8115	1.09	197.45	2.05	-.05	160.4000	2.2370	.21
18.000	79.4040	.6355	1.08	200.35	2.67	-.03	133.3000	2.2320	.48
19.000	67.2670	.5837	.84	203.01	2.41	.04	114.3000	1.7310	.98
20.000	57.1340	.4756	.75	203.41	2.21	.03	95.0000	1.3420	.428
21.000	48.6520	.3523	.57	212.74	2.26	-.04	79.7000	1.1500	.73
22.000	41.5330	.3332	.54	215.62	1.36	-.15	67.1400	.9212	.60
23.000	35.5310	.2536	.23	213.64	1.99	-.04	55.6200	.6714	.65
24.000	30.4510	.2074	.19	230.65	2.27	.30	40.1000	.5313	.25
25.000	25.1020	.2548	.01	223.09	2.21	.29	40.5500	.4740	.49
26.000	22.5000	.2112	-.13	225.17	2.09	.03	34.9100	.3757	.63
27.000	19.3730	.1833	-.28	227.09	2.19	.31	29.7200	.3335	.360
28.000	16.7050	.1702	-.34	227.55	1.58	.34	25.4600	.2735	.14
29.000	14.4250	.1537	-.10	229.56	2.18	.35	21.0500	.2354	.16
30.000	12.4680	.1373	.04	233.00	2.11	-.16	18.7200	.2354	-.04
32.000	9.3457	.1207	.53	237.14	3.60	-.13	13.7400	.2332	.16
34.000	7.5543	.1033	.73	232.14	4.50	-.13	10.1500	.1753	-.10
36.000	5.5343	.0732	.55	235.53	4.31	-.11	7.5500	.1513	-.05
38.000	4.0831	.0359	.45	251.35	3.91	-.28	5.5520	.1012	.12
40.000	3.1341	.0734	.22	255.09	3.68	-.73	4.2510	.0339	.52
42.000	2.4155	.0603	.23	253.14	3.52	-.41	3.2360	.0774	.11
44.000	1.8392	.0400	.13	254.05	3.58	-.68	2.4640	.0453	.41
46.000	1.4519	.0497	-.02	258.33	3.80	-.04	1.8970	.0456	.32
48.000	1.1234	.0341	-.07	257.73	5.31	.53	1.4650	.0332	.10
50.000	.8734	.0253	-.20	257.02	4.23	.35	1.1420	.0177	.27
52.000	.6345	.0241	.01	255.01	5.15	-.30	.8750	.0170	.49
54.000	.5313	.0200	.11	253.04	4.53	-.73	.7035	.0335	.15
56.000	.4111	.0163	.25	253.59	5.49	-.47	.5517	.0202	.53
58.000	.3153	.0143	.41	244.62	6.71	-.32	.4518	.0130	.48
60.000	.2421	.0122	.30	249.39	7.51	-.21	.3385	.0130	.43
62.000	.1831	.0103	.34	241.20	7.74	.05	.2244	.0123	.26
64.000	.1334	.0076	.45	237.16	5.21	-.43	.2014	.0123	.15
66.000	.1034	.0051	.05	229.41	5.42	-.47	.1591	.0700	.8

TABLE II-7. THERMODYNAMIC STATISTICAL PARAMETERS

JULY

STATION = 819020		ASCENSION (HIDE ANAKE)		S.D. T		SKEW T		S.D. D		SKEW D		NOBS P		NOBS T		NOBS D	
Z	MEAN P	S.D. P	SKEW P	DEG K	DEG K	DEG K	DEG K	G/M3	G/M3	G/M3	G/M3						
MB	MB	MB															
.000	1010.4000	1.3598	.33	253.62	.97	-.39	1170.0000	4.6030	.48	396.	396.					396.	
.020	1008.1000	1.3313	.26	239.55	.96	-.44	1167.0000	4.4690	.52	451.	451.					451.	
1.000	906.5100	1.3393	.33	139.72	1.03	.04	1034.0000	4.2190	.07	461.	461.					461.	
2.000	825.0200	1.2789	.05	255.83	2.45	.13	978.3000	7.9990	-.05	461.	461.					461.	
3.000	715.0200	1.2901	-.12	222.87	1.44	-.52	678.6000	4.9140	.05	461.	461.					461.	
4.000	633.2400	1.2648	-.20	277.36	1.36	-.35	793.5000	4.4010	-.03	461.	461.					461.	
5.000	559.5100	1.2094	-.33	272.05	1.32	-.37	715.2000	3.7510	.06	461.	461.					461.	
6.000	493.1800	1.2214	-.29	253.91	1.25	.16	643.9000	3.3700	-.35	460.	460.					460.	
7.000	433.3500	1.1658	-.20	253.91	1.25	.21	579.8000	3.2700	-.34	460.	460.					460.	
8.000	379.5500	1.1638	-.04	252.25	1.29	.01	521.9000	3.2020	-.56	459.	459.					459.	
9.000	331.1200	1.1447	-.04	245.23	1.37	.05	469.6000	2.9370	-.86	458.	458.					458.	
10.000	277.5300	1.1575	-.02	237.14	1.36	-.16	421.2000	2.6700	-1.04	455.	455.					455.	
11.000	243.7400	1.1420	-.12	229.12	1.41	.04	378.2000	1.7020	.19	454.	454.					454.	
12.000	213.7600	1.1049	-.11	221.22	1.27	.03	336.9000	1.4360	.13	453.	453.					453.	
13.000	193.0200	1.0537	-.11	213.99	1.39	.17	237.9000	1.5810	-.19	450.	450.					450.	
14.000	155.8100	.9901	-.05	207.64	1.41	-.07	251.4000	1.7500	-.15	450.	450.					450.	
15.000	132.0300	.9072	.03	202.62	1.50	.19	227.0000	1.8090	-.02	449.	449.					449.	
16.000	111.5300	.8055	.14	193.39	1.48	.04	194.5000	1.7670	.08	447.	447.					447.	
17.000	94.0770	.7066	.22	179.35	1.88	-.02	164.4000	2.0750	.21	441.	441.					441.	
18.000	79.4700	.6153	.40	202.39	2.37	-.07	135.5000	1.9790	.13	441.	441.					441.	
19.000	67.3750	.5256	.65	207.03	2.39	.08	113.4000	1.6200	.24	440.	440.					440.	
20.000	57.3100	.4739	.77	210.93	2.23	.08	94.5700	1.3470	.34	430.	430.					430.	
21.000	48.6580	.3751	.67	214.01	2.19	.19	79.5300	1.0010	.36	416.	416.					416.	
22.000	41.7600	.3374	.74	216.20	2.31	.46	67.3000	.8500	-.01	411.	411.					411.	
23.000	35.7470	.2939	.62	218.23	2.24	.59	57.0700	.6466	-.06	405.	405.					405.	
24.000	30.6230	.2692	.48	220.02	2.40	.43	48.4900	.5667	.24	406.	406.					406.	
25.000	26.2890	.2234	.13	222.19	2.33	.32	41.2200	.4727	.38	391.	391.					391.	
26.000	22.5540	.2057	.04	224.29	2.29	.30	35.1000	.4010	.67	381.	381.					381.	
27.000	19.4450	.1659	-.04	223.19	2.28	.26	29.5300	.3267	.19	357.	357.					357.	
28.000	16.7550	.1291	.07	227.49	2.11	.09	25.6300	.2537	.02	350.	350.					350.	
29.000	14.4470	.1495	.23	236.59	2.16	-.22	22.0200	.2403	.08	291.	291.					291.	
30.000	12.4760	.1359	.22	230.33	2.34	.24	18.8700	.2293	.27	285.	285.					285.	
32.000	9.2933	.1394	-.21	234.96	4.88	.00	13.7800	.2425	.27	73.	73.					73.	
34.000	6.9325	.1325	-.12	239.34	5.35	-.14	10.1800	.1717	.73	76.	76.					76.	
36.000	5.2826	.1203	-.21	243.36	4.24	.18	7.5630	.1139	-.01	72.	72.					72.	
38.000	4.0211	.1051	-.16	248.82	4.30	.18	5.6220	.1107	.03	72.	72.					72.	
40.000	3.0774	.0901	-.15	254.39	4.51	.20	4.2130	.0924	-.03	72.	72.					72.	
42.000	2.3580	.0768	-.03	253.93	4.51	.20	3.1850	.0924	-.20	72.	72.					72.	
44.000	1.6307	.0631	-.01	263.37	4.83	-.50	2.4210	.0810	.00	72.	72.					72.	
46.000	1.4216	.0569	.04	267.39	5.41	-.05	1.6510	.0632	.16	73.	73.					73.	
48.000	1.1081	.0417	.03	265.44	5.95	.06	1.4340	.0521	.24	71.	71.					71.	
50.000	.8634	.0339	.41	268.42	5.97	.42	1.1180	.0425	.50	71.	71.					71.	
52.000	.6718	.0293	.49	257.69	5.11	.00	.8729	.0350	-.07	71.	71.					71.	
54.000	.5223	.0239	.54	261.98	5.26	-.08	.6837	.0297	-.70	70.	70.					70.	
56.000	.4051	.0191	.61	261.34	5.33	-.24	.5400	.0241	.55	70.	70.					70.	
58.000	.3128	.0150	.65	253.24	6.01	.10	.4702	.0192	.53	68.	68.					68.	
60.000	.2399	.0140	.63	251.07	6.23	.18	.3313	.0174	.47	68.	68.					68.	
62.000	.1815	.0123	.95	243.71	7.73	-.27	.2434	.0154	.47	38.	38.					38.	
64.000	.1353	.0108	1.01	235.32	9.70	.00	.2003	.0141	.65	25.	25.					25.	
66.000	.1037	.0114	1.20	230.10	14.74	-.14	.1572	.0157	.61	10.	10.					10.	

AUGUST

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TABLE II-9. THERMODYNAMIC STATISTICAL PARAMETERS

SEPTEMBER

STATION = 619020		ASCENSION (WIDE AREA)		S.D. T		SKEW T		MEAN D		S.D. D		SKEW D		NOBS P		NOBS T		NOBS D	
Z	MEAN P	S.D. P	SKEW P	MEAN T	DEG K	SKEW T	DEG K	MEAN D	G/M3	S.D. D	G/M3	SKEW D	G/M3	NOBS P	NOBS T	NOBS D	NOBS P	NOBS T	NOBS D
1.000	1010.3000	1.3225	-0.03	297.05	1.17	-0.32	1174.0000	5.2930	.18	365.	365.	.18	365.	365.	365.	365.	365.	365.	365.
2.000	1007.9000	1.3714	-0.04	297.57	1.16	-0.32	1171.0000	5.3230	.15	410.	410.	.15	410.	410.	410.	410.	410.	410.	410.
3.000	905.0100	1.2593	-0.03	293.74	.85	-0.23	1097.0000	3.5630	-.13	410.	410.	-.13	410.	410.	410.	410.	410.	410.	410.
4.000	805.2200	1.1663	-0.18	283.09	2.24	-0.94	970.5000	7.6030	.92	410.	410.	.92	410.	410.	410.	410.	410.	410.	410.
5.000	719.0000	1.1855	-0.25	283.19	1.40	-0.60	877.6000	4.3310	-.06	410.	410.	-.06	410.	410.	410.	410.	410.	410.	410.
6.000	633.2500	1.1063	-0.19	270.60	1.23	-0.21	755.7000	3.9330	-.09	410.	410.	-.09	410.	410.	410.	410.	410.	410.	410.
7.000	550.4200	1.1112	-0.13	271.31	1.27	-0.01	716.0000	3.6120	-.05	410.	410.	-.05	410.	410.	410.	410.	410.	410.	410.
8.000	483.1100	1.0235	-0.12	253.13	1.29	.03	613.5000	3.2730	-.22	410.	410.	-.22	410.	410.	410.	410.	410.	410.	410.
9.000	433.3300	1.0753	.02	253.23	1.27	.03	579.2000	2.6230	-.58	410.	410.	-.58	410.	410.	410.	410.	410.	410.	410.
10.000	379.5200	1.0235	.21	253.23	1.16	.30	521.4000	2.6570	-.62	409.	409.	-.62	409.	409.	409.	409.	409.	409.	409.
11.000	331.2000	1.0234	.32	243.52	1.23	.40	469.2000	2.7030	-.78	409.	409.	-.78	409.	409.	409.	409.	409.	409.	409.
12.000	287.7400	1.1039	.43	237.43	1.24	.37	421.6000	2.4740	-.82	409.	409.	-.82	409.	409.	409.	409.	409.	409.	409.
13.000	248.8800	1.1060	.55	229.51	1.24	.17	377.6000	1.6600	-.14	409.	409.	-.14	409.	409.	409.	409.	409.	409.	409.
14.000	213.9100	1.0232	.55	221.63	1.31	.04	336.2000	1.4640	-.46	410.	410.	-.46	410.	410.	410.	410.	410.	410.	410.
15.000	183.1900	1.0425	.59	214.22	1.37	.70	297.9000	1.4170	-.15	409.	409.	-.15	409.	409.	409.	409.	409.	409.	409.
16.000	155.9600	1.5527	.76	207.81	1.47	.63	261.5000	1.6940	-.41	409.	409.	-.41	409.	409.	409.	409.	409.	409.	409.
17.000	132.1900	.9238	.84	202.60	1.23	.32	227.1000	1.6260	-.17	409.	409.	-.17	409.	409.	409.	409.	409.	409.	409.
18.000	111.6500	.8189	.77	193.47	1.23	-.22	195.0000	1.7530	.31	410.	410.	.31	410.	410.	410.	410.	410.	410.	410.
19.000	94.2050	.6888	.83	193.02	1.67	-.23	164.5000	2.0370	.58	405.	405.	.58	405.	405.	405.	405.	405.	405.	405.
20.000	79.5160	.5943	.91	202.65	2.44	.35	136.7000	2.0290	.06	402.	402.	.06	402.	402.	402.	402.	402.	402.	402.
21.000	67.4130	.4915	.95	205.97	2.27	-.11	113.5000	1.5920	.50	403.	403.	.50	403.	403.	403.	403.	403.	403.	403.
22.000	57.3230	.4138	.78	219.77	2.45	.29	94.7700	1.2350	.40	400.	400.	.40	400.	400.	400.	400.	400.	400.	400.
23.000	43.8760	.2538	.70	213.78	2.73	.61	79.6000	1.0200	.25	395.	395.	.25	395.	395.	395.	395.	395.	395.	395.
24.000	41.7620	.3449	.70	216.02	2.52	.56	67.3600	.7283	.22	383.	383.	.22	383.	383.	383.	383.	383.	383.	383.
25.000	35.7430	.3227	.74	210.00	2.20	.44	57.1200	.5304	.39	372.	372.	.39	372.	372.	372.	372.	372.	372.	372.
26.000	30.6150	.3046	.74	219.36	2.18	.15	48.4900	.5005	.29	372.	372.	.29	372.	372.	372.	372.	372.	372.	372.
27.000	26.2730	.2039	.74	211.88	2.35	.04	41.2500	.4735	.16	368.	368.	.16	368.	368.	368.	368.	368.	368.	368.
28.000	19.4170	.2080	.64	235.51	2.09	-.01	30.0000	.3560	.29	317.	317.	.29	317.	317.	317.	317.	317.	317.	317.
29.000	16.7240	.2033	.62	233.03	1.99	-.05	25.6000	.3263	.31	314.	314.	.31	314.	314.	314.	314.	314.	314.	314.
30.000	12.4520	.1735	.65	233.26	2.22	.11	22.0000	.3030	.39	295.	295.	.39	295.	295.	295.	295.	295.	295.	295.
31.000	9.2755	.1546	.53	230.33	2.06	-.24	18.8300	.2556	.47	251.	251.	.47	251.	251.	251.	251.	251.	251.	251.
32.000	8.2755	.1944	-.29	236.24	5.12	.59	13.6700	.2357	-.07	74.	74.	-.07	74.	74.	74.	74.	74.	74.	74.
33.000	6.5039	.1831	-.31	241.53	4.34	-.39	10.0900	.2146	.03	73.	73.	.03	73.	73.	73.	73.	73.	73.	73.
34.000	5.3112	.1442	-.26	247.11	5.00	.15	7.4300	.1537	-.13	73.	73.	-.13	73.	73.	73.	73.	73.	73.	73.
35.000	4.0598	.1249	-.28	253.53	4.83	-.31	5.5710	.1139	.07	73.	73.	.07	73.	73.	73.	73.	73.	73.	73.
36.000	3.1260	.1050	-.32	253.83	3.98	.07	4.2020	.1150	-.07	73.	73.	-.07	73.	73.	73.	73.	73.	73.	73.
37.000	2.4119	.0855	-.28	262.52	4.14	.09	3.2000	.1027	-.38	73.	73.	-.38	73.	73.	73.	73.	73.	73.	73.
38.000	1.8719	.0696	-.25	267.48	5.22	.54	2.4300	.0907	-.18	73.	73.	-.18	73.	73.	73.	73.	73.	73.	73.
39.000	1.4533	.0573	-.16	270.27	5.50	.07	1.6780	.0656	-.31	73.	73.	-.31	73.	73.	73.	73.	73.	73.	73.
40.000	1.1387	.0471	-.02	271.93	5.12	.08	1.4500	.0493	-.40	72.	72.	-.40	72.	72.	72.	72.	72.	72.	72.
41.000	.8333	.0335	-.11	271.13	4.71	.20	1.1430	.0465	-.40	72.	72.	-.40	72.	72.	72.	72.	72.	72.	72.
42.000	.6235	.0283	-.23	263.41	4.55	-.63	.6382	.0325	-.19	71.	71.	-.19	71.	71.	71.	71.	71.	71.	71.
43.000	.5369	.0223	-.17	265.16	4.76	-.26	.7082	.0295	-.25	69.	69.	-.25	69.	69.	69.	69.	69.	69.	69.
44.000	.4176	.0186	-.04	260.08	5.49	.26	.5593	.0306	-.42	69.	69.	-.42	69.	69.	69.	69.	69.	69.	69.
45.000	.3239	.0153	.10	255.54	6.41	-.04	.4378	.0190	-.14	69.	69.	-.14	69.	69.	69.	69.	69.	69.	69.
46.000	.2474	.0125	.07	252.19	6.82	-.15	.3419	.0151	-.40	66.	66.	-.40	66.	66.	66.	66.	66.	66.	66.
47.000	.1878	.0101	.17	247.03	7.14	-.29	.2649	.0125	-.60	57.	57.	-.60	57.	57.	57.	57.	57.	57.	57.
48.000	.1412	.0072	-.01	243.40	8.16	-.28	.2035	.0104	1.14	31.	31.	1.14	31.	31.	31.	31.	31.	31.	31.
49.000	.1049	.0055	-.07	235.65	8.85	-.155	.1554	.0167	1.09	11.	11.	1.09	11.	11.	11.	11.	11.	11.	11.

TABLE II-10. THERMODYNAMIC STATISTICAL PARAMETERS

OCTOBER

STATION - 615020		ASCENSION CHISE ARKIE:			S.D. T		SKEW T		MEAN D		S.D. D		SKEW D		NOBS P		NOBS T		NOBS D	
Z	MEAN P	S.D. P	SKEW P	MEAN T	CEC K	DEG K	SKEW K	G/M ³	G/M ³	G/M ³	G/M ³	G/M ³	G/M ³	G/M ³	G/M ³	G/M ³	G/M ³	G/M ³	G/M ³	G/M ³
1.000	1009.1000	1.5166	.03	237.71	1.16	1.16	-.15	1172.0000	5.4130	.22	388.	388.	.22	388.	388.	388.	388.	388.	388.	388.
.620	1006.6000	1.5137	-.02	237.57	1.15	1.15	-.19	1105.0000	5.3570	.25	427.	427.	.25	427.	427.	427.	427.	427.	427.	427.
1.000	505.0000	1.5011	.15	238.87	1.23	1.23	.34	1005.0000	5.8730	-.18	433.	433.	-.18	433.	433.	433.	433.	433.	433.	433.
2.000	804.6700	1.2103	.11	239.05	1.06	1.06	-.04	975.9000	6.4300	.71	433.	433.	.71	433.	433.	433.	433.	433.	433.	433.
3.000	714.7600	1.1931	-.02	238.63	1.10	1.10	-.42	875.9000	3.5720	.10	433.	433.	.10	433.	433.	433.	433.	433.	433.	433.
4.000	633.1100	1.1043	.01	277.19	1.14	1.14	.06	754.9000	3.5940	-.09	433.	433.	-.09	433.	433.	433.	433.	433.	433.	433.
5.000	553.3700	1.0575	-.03	271.04	1.32	1.32	-.04	715.0000	3.0030	-.14	433.	433.	-.14	433.	433.	433.	433.	433.	433.	433.
6.000	493.0000	1.0502	-.07	255.55	1.30	1.30	-.10	674.7000	3.3700	.02	433.	433.	.02	433.	433.	433.	433.	433.	433.	433.
7.000	473.3500	1.0576	-.04	253.23	1.28	1.28	-.17	653.0000	2.7700	.07	433.	433.	.07	433.	433.	433.	433.	433.	433.	433.
8.000	373.0000	1.0373	.00	253.46	1.24	1.24	-.21	621.0000	2.0700	.07	433.	433.	.07	433.	433.	433.	433.	433.	433.	433.
9.000	331.2000	1.0444	.03	245.62	1.23	1.23	-.14	423.6000	2.4050	-.39	432.	432.	-.39	432.	432.	432.	432.	432.	432.	432.
10.000	237.8500	1.0537	.01	237.53	1.23	1.23	.12	377.7000	2.0500	-.71	432.	432.	-.71	432.	432.	432.	432.	432.	432.	432.
11.000	243.0300	1.0336	.00	220.91	1.23	1.23	.43	377.7000	1.5210	-.48	432.	432.	-.48	432.	432.	432.	432.	432.	432.	432.
12.000	214.0700	1.0540	.10	221.97	1.14	1.14	.41	355.0000	1.3200	-.65	431.	431.	-.65	431.	431.	431.	431.	431.	431.	431.
13.000	183.3000	.9753	.08	214.31	1.13	1.13	.32	289.1000	1.3610	-.10	430.	430.	-.10	430.	430.	430.	430.	430.	430.	430.
14.000	156.1100	.9057	.15	207.48	1.27	1.27	.23	232.1000	1.5210	-.45	430.	430.	-.45	430.	430.	430.	430.	430.	430.	430.
15.000	132.2400	.8302	.21	201.94	1.34	1.34	.26	203.1000	1.6930	-.07	429.	429.	-.07	429.	429.	429.	429.	429.	429.	429.
16.000	111.6100	.7655	.27	153.45	1.39	1.39	-.07	195.0000	1.7450	.32	429.	429.	.32	429.	429.	429.	429.	429.	429.	429.
17.000	94.0210	.6341	.31	157.65	1.05	1.05	-.29	163.0000	2.0790	.55	427.	427.	.55	427.	427.	427.	427.	427.	427.	427.
18.000	79.2830	.5360	.32	200.60	2.53	2.53	-.11	137.7000	2.1230	.31	427.	427.	.31	427.	427.	427.	427.	427.	427.	427.
19.000	67.1080	.4530	.45	205.30	2.50	2.50	-.26	115.9000	1.5310	.25	425.	425.	.25	425.	425.	425.	425.	425.	425.	425.
20.000	57.0050	.4035	.26	203.31	2.62	2.62	.34	94.8000	1.1650	.13	421.	421.	.13	421.	421.	421.	421.	421.	421.	421.
21.000	48.5450	.3973	.14	212.35	2.50	2.50	.43	79.6000	.9335	.10	406.	406.	.10	406.	406.	406.	406.	406.	406.	406.
22.000	41.4350	.3785	.15	214.83	2.69	2.69	.38	67.2000	.7186	.01	404.	404.	.01	404.	404.	404.	404.	404.	404.	404.
23.000	35.4400	.3599	.20	217.07	2.47	2.47	.17	56.6000	.5238	.32	396.	396.	.32	396.	396.	396.	396.	396.	396.	396.
24.000	30.3590	.3442	.24	219.45	2.65	2.65	.21	48.1600	.4997	.00	395.	395.	.00	395.	395.	395.	395.	395.	395.	395.
25.000	26.0210	.3140	.18	221.50	2.46	2.46	-.27	40.9300	.4227	.25	385.	385.	.25	385.	385.	385.	385.	385.	385.	385.
26.000	22.3500	.2830	.19	223.60	2.32	2.32	-.15	34.8200	.4037	.24	369.	369.	.24	369.	369.	369.	369.	369.	369.	369.
27.000	19.2180	.2528	.20	225.63	2.26	2.26	.03	29.6700	.3378	.07	330.	330.	.07	330.	330.	330.	330.	330.	330.	330.
28.000	18.2510	.2271	.15	227.62	2.26	2.26	.03	25.3300	.3057	-.05	326.	326.	-.05	326.	326.	326.	326.	326.	326.	326.
29.000	14.2760	.1915	.11	220.53	2.45	2.45	.12	21.6000	.3411	.01	274.	274.	.01	274.	274.	274.	274.	274.	274.	274.
30.000	12.3430	.1691	.12	222.12	2.32	2.32	.05	18.5300	.2942	.08	208.	208.	.08	208.	208.	208.	208.	208.	208.	208.
31.000	9.2531	.1427	-.03	220.66	3.69	3.69	-.32	13.5100	.1603	-.04	73.	73.	-.04	73.	73.	73.	73.	73.	73.	73.
32.000	6.8020	.1225	-.13	200.48	2.84	2.84	-.15	10.6000	.1309	.35	73.	73.	.35	73.	73.	73.	73.	73.	73.	73.
33.000	5.3563	.1033	-.30	200.45	4.14	4.14	-.19	7.9400	.1473	-.42	73.	73.	-.42	73.	73.	73.	73.	73.	73.	73.
34.000	4.0737	.0833	-.16	203.77	4.27	4.27	-.04	5.2910	.1577	.13	73.	73.	.13	73.	73.	73.	73.	73.	73.	73.
35.000	3.1267	.0823	-.25	202.28	4.14	4.14	-.61	4.2010	.0226	.00	73.	73.	.00	73.	73.	73.	73.	73.	73.	73.
36.000	2.4190	.0664	-.31	204.53	4.02	4.02	-.30	3.4320	.0763	.04	74.	74.	.04	74.	74.	74.	74.	74.	74.	74.
37.000	1.8811	.0475	-.40	229.10	3.47	3.47	-.69	2.4320	.0602	.02	74.	74.	.02	74.	74.	74.	74.	74.	74.	74.
38.000	1.4033	.0475	-.40	229.10	3.47	3.47	-.69	1.8760	.0539	-.23	73.	73.	-.23	73.	73.	73.	73.	73.	73.	73.
39.000	1.1478	.0375	-.44	272.91	3.91	3.91	.62	1.4350	.0441	-.68	73.	73.	-.68	73.	73.	73.	73.	73.	73.	73.
40.000	.8009	.0315	-.33	271.72	3.69	3.69	.15	1.1600	.0317	-.53	72.	72.	-.53	72.	72.	72.	72.	72.	72.	72.
41.000	.7000	.0261	-.27	255.00	3.41	3.41	-.60	.9000	.0217	-.50	72.	72.	-.50	72.	72.	72.	72.	72.	72.	72.
42.000	.5943	.0204	-.13	225.02	4.39	4.39	-.12	.7143	.0233	-.24	71.	71.	-.24	71.	71.	71.	71.	71.	71.	71.
43.000	.4215	.0166	-.07	201.72	5.03	5.03	-.28	.5612	.0176	-.83	70.	70.	-.83	70.	70.	70.	70.	70.	70.	70.
44.000	.3242	.0132	-.03	209.15	6.01	6.01	-.26	.4551	.0143	-.47	64.	64.	-.47	64.	64.	64.	64.	64.	64.	64.
45.000	.2437	.0110	-.32	203.70	6.92	6.92	-.45	.3417	.0121	-.22	58.	58.	-.22	58.	58.	58.	58.	58.	58.	58.
46.000	.1690	.0093	-.05	246.90	7.19	7.19	.33	.2633	.0101	-.26	45.	45.	-.26	45.	45.	45.	45.	45.	45.	45.
47.000	.1427	.0077	-.01	220.52	9.13	9.13	-.43	.2073	.0093	-.02	25.	25.	-.02	25.	25.	25.	25.	25.	25.	25.
48.000	.1078	.0074	-.25	232.02	9.64	9.64	-.75	.1612	.0077	.52	13.	13.	.52	13.	13.	13.	13.	13.	13.	13.

TABLE II-1.1. THERMODYNAMIC STATISTICAL PARAMETERS

NOVEMBER

STATION = 6180±0		ASCENSION (WIDE AREA)				S.D. T		SKEW T		S.D. D		SKEW D		NOBS P		NOBS T		NOBS D	
Z	MEAN P	S.D. P	MEAN T	SKEW P	DEG K	DEG K	DEG K	DEG K	DEG K	G/M3	G/M3	G/M3	G/M3						
KM	MB	MB	DEG K	DEG K	DEG K	DEG K	DEG K	DEG K	DEG K	G/M3	G/M3	G/M3	G/M3						
0.000	1008.0000	1.6294	298.18	.05	1.11	.07	1168.0000	5.5583	.02	405.	405.	.02	405.	405.	405.	405.	405.	405.	405.
.020	1005.5000	1.6288	298.13	.08	1.19	-.05	1165.0000	5.9410	.10	429.	429.	.10	429.	429.	429.	429.	429.	429.	429.
1.000	894.2500	1.3315	293.36	.14	1.10	.78	1002.0000	4.5010	-.46	430.	430.	-.46	430.	430.	430.	430.	430.	430.	430.
2.000	874.0000	1.2854	293.54	.14	1.80	-.09	857.6000	6.1830	.74	430.	430.	.74	430.	430.	430.	430.	430.	430.	430.
3.000	714.0500	1.2514	293.30	.14	1.25	-.23	875.0000	3.8530	.05	430.	430.	.05	430.	430.	430.	430.	430.	430.	430.
4.000	632.5000	1.1856	277.68	.01	1.27	-.01	762.2000	3.6530	-.21	430.	430.	-.21	430.	430.	430.	430.	430.	430.	430.
5.000	558.9300	1.1276	272.30	-.06	1.32	-.20	714.1000	3.6330	.01	430.	430.	.01	430.	430.	430.	430.	430.	430.	430.
6.000	492.7800	1.1486	265.43	.01	1.40	-.16	643.5000	3.4200	-.03	430.	430.	-.03	430.	430.	430.	430.	430.	430.	430.
7.000	433.1100	1.1560	260.00	-.01	1.41	-.01	579.4000	3.1010	-.21	430.	430.	-.21	430.	430.	430.	430.	430.	430.	430.
8.000	379.2600	1.1795	253.19	-.03	1.29	-.01	521.2000	2.6790	-.26	430.	430.	-.26	430.	430.	430.	430.	430.	430.	430.
9.000	330.9300	1.1738	245.70	-.08	1.37	-.25	469.6000	2.6200	-.45	428.	428.	-.45	428.	428.	428.	428.	428.	428.	428.
10.000	287.5500	1.2233	237.67	-.12	1.40	-.33	420.0000	2.4670	-.73	426.	426.	-.73	426.	426.	426.	426.	426.	426.	426.
11.000	243.7500	1.2259	229.68	-.17	1.39	-.23	377.3000	1.9100	.02	426.	426.	.02	426.	426.	426.	426.	426.	426.	426.
12.000	213.8200	1.1920	221.82	-.11	1.25	-.02	335.8000	1.6100	.08	425.	425.	.08	425.	425.	425.	425.	425.	425.	425.
13.000	183.1300	1.1300	214.36	-.08	1.27	-.23	297.6000	1.4470	-.24	424.	424.	-.24	424.	424.	424.	424.	424.	424.	424.
14.000	155.9400	1.0536	207.71	.00	1.27	.10	261.5000	1.3130	-.12	424.	424.	-.12	424.	424.	424.	424.	424.	424.	424.
15.000	132.0900	.9431	201.53	.09	1.46	-.25	227.9000	1.8000	-.57	423.	423.	-.57	423.	423.	423.	423.	423.	423.	423.
16.000	111.4700	.8514	197.63	.19	1.53	-.05	195.2000	2.0040	-.15	421.	421.	-.15	421.	421.	421.	421.	421.	421.	421.
17.000	93.8750	.7249	193.58	.30	1.74	-.14	163.4000	2.0250	.13	415.	415.	.13	415.	415.	415.	415.	415.	415.	415.
18.000	79.0300	.6129	187.63	.39	2.45	-.15	130.4000	2.0070	.33	412.	412.	.33	412.	412.	412.	412.	412.	412.	412.
19.000	66.7000	.5104	203.52	.20	2.48	.16	114.3000	1.9100	.24	409.	409.	.24	409.	409.	409.	409.	409.	409.	409.
20.000	56.0200	.4572	207.60	.15	2.42	.40	93.0000	1.6710	.27	408.	408.	.27	408.	408.	408.	408.	408.	408.	408.
21.000	40.1000	.4133	211.10	.09	2.50	.07	73.5100	.9130	-.01	393.	393.	-.01	393.	393.	393.	393.	393.	393.	393.
22.000	41.0960	.3956	213.87	.10	2.35	.59	66.9100	.7437	.28	392.	392.	.28	392.	392.	392.	392.	392.	392.	392.
23.000	35.1300	.3821	216.41	.18	2.14	.48	58.5600	.5373	.23	387.	387.	.23	387.	387.	387.	387.	387.	387.	387.
24.000	30.0270	.3632	218.70	.23	2.15	-.03	47.6200	.5422	.04	386.	386.	.04	386.	386.	386.	386.	386.	386.	386.
25.000	25.7740	.2633	221.05	.25	2.07	-.04	40.6200	.5187	.14	382.	382.	.14	382.	382.	382.	382.	382.	382.	382.
26.000	22.1260	.2542	223.64	.25	2.07	.05	34.4800	.4624	.17	367.	367.	.17	367.	367.	367.	367.	367.	367.	367.
27.000	19.0400	.2164	223.35	.21	2.37	.33	29.3100	.4293	.13	334.	334.	.13	334.	334.	334.	334.	334.	334.	334.
28.000	16.4140	.1631	229.07	.11	2.50	.30	24.9700	.3742	.07	324.	324.	.07	324.	324.	324.	324.	324.	324.	324.
29.000	14.1790	.1673	231.37	.21	2.52	-.03	21.3500	.2535	.23	266.	266.	.23	266.	266.	266.	266.	266.	266.	266.
30.000	12.2660	.1462	233.49	.17	2.42	.15	18.3070	.2335	.29	263.	263.	.29	263.	263.	263.	263.	263.	263.	263.
32.000	9.2042	.1374	238.01	-.16	3.80	-.08	13.5000	.2045	.23	57.	57.	.23	57.	57.	57.	57.	57.	57.	57.
34.000	6.9466	.1139	242.39	.01	5.07	-.27	9.9560	.1930	-.77	57.	57.	-.77	57.	57.	57.	57.	57.	57.	57.
35.000	5.2639	.1031	247.16	-.15	5.06	-.12	7.4340	.1482	.13	57.	57.	.13	57.	57.	57.	57.	57.	57.	57.
38.000	4.0255	.0827	253.45	-.14	5.01	-.65	5.5380	.1116	.09	57.	57.	.09	57.	57.	57.	57.	57.	57.	57.
40.000	3.0374	.0737	260.23	-.26	5.90	-.22	4.1520	.0707	.08	57.	57.	.08	57.	57.	57.	57.	57.	57.	57.
42.000	2.3926	.0643	265.03	-.50	5.26	-.42	3.1730	.0672	.24	57.	57.	.24	57.	57.	57.	57.	57.	57.	57.
44.000	1.8628	.0548	271.43	-.75	4.56	-.71	2.4130	.0509	.13	57.	57.	.13	57.	57.	57.	57.	57.	57.	57.
46.000	1.4530	.0455	271.25	-.02	4.53	.05	1.8720	.0337	-.03	57.	57.	-.03	57.	57.	57.	57.	57.	57.	57.
48.000	1.1354	.0373	271.48	-.03	4.82	.39	1.4620	.0410	-.23	57.	57.	-.23	57.	57.	57.	57.	57.	57.	57.
50.000	.8854	.0311	269.78	-.01	5.48	.42	1.1470	.0357	-.84	57.	57.	-.84	57.	57.	57.	57.	57.	57.	57.
52.000	.6916	.0278	267.60	-.55	5.73	-.09	.9020	.0307	-.12	56.	56.	-.12	56.	56.	56.	56.	56.	56.	56.
54.000	.5387	.0247	264.90	-.22	6.21	-.24	.7053	.0253	.38	59.	59.	.38	59.	59.	59.	59.	59.	59.	59.
56.000	.4123	.0206	261.04	-.25	6.35	-.28	.5578	.0215	.26	56.	56.	.26	56.	56.	56.	56.	56.	56.	56.
58.000	.2700	.0175	257.27	-.13	7.41	-.13	.4031	.0177	.35	53.	53.	.35	53.	53.	53.	53.	53.	53.	53.
60.000	.2403	.0130	259.41	-.23	8.31	-.24	.2417	.0167	.31	46.	46.	.31	46.	46.	46.	46.	46.	46.	46.
62.000	.1853	.0056	246.82	-.40	8.80	.53	.2631	.0154	.43	31.	31.	.43	31.	31.	31.	31.	31.	31.	31.
64.000	.1430	.0028	232.13	-.23	9.51	1.05	.2031	.0147	-.11	20.	20.	-.11	20.	20.	20.	20.	20.	20.	20.
66.000	.1093	.0004	227.45	-.75	9.02	-.75	.1005	.0159	-.27	9.	9.	-.27	9.	9.	9.	9.	9.	9.	9.

TABLE II-12. THERMODYNAMIC STATISTICAL PARAMETERS

DECEMBER

STATION = 619020		ASCENSION (HIDE AWAKE)				S.D. T		SKEW T		MEAN D		S.D. D		SKEW D		NOBS P		NOBS T		NOBS D	
Z	MI	MEAN P	MB	MB	DEG K	DEG K	DEG K	DEG K	DEG K	G/M3	G/M3	G/M3	G/M3	G/M3	G/M3						
.000	1007.3000	1.6470	1.6470	1.6470	298.66	1.20	-.04	298.66	1.20	.01	1165.0000	5.8310	.11	428.	428.	428.	428.	428.	428.	428.	428.
.020	1005.0000	1.6220	1.6220	1.6220	293.60	1.19	-.06	293.60	1.19	-.02	1163.0000	5.8280	.14	453.	453.	453.	453.	453.	453.	453.	453.
1.000	903.9400	1.4240	1.4240	1.4240	250.09	1.25	-.08	250.09	1.25	-.67	1079.0000	5.1940	-.47	453.	453.	453.	453.	453.	453.	453.	453.
2.000	803.8900	1.3345	1.3345	1.3345	233.89	1.83	-.05	233.89	1.83	-.99	866.3000	6.0040	.79	453.	453.	453.	453.	453.	453.	453.	453.
3.000	714.1200	1.3160	1.3160	1.3160	223.49	1.33	-.14	223.49	1.33	-.54	875.4000	4.2190	.25	453.	453.	453.	453.	453.	453.	453.	453.
4.000	632.5800	1.2835	1.2835	1.2835	277.33	1.36	-.17	277.33	1.36	-.03	793.1000	3.2230	-.07	453.	453.	453.	453.	453.	453.	453.	453.
5.000	558.5300	1.2032	1.2032	1.2032	272.10	1.42	-.10	272.10	1.42	-.16	714.7200	4.1600	.07	453.	453.	453.	453.	453.	453.	453.	453.
6.000	482.7500	1.1845	1.1845	1.1845	265.57	1.48	-.06	265.57	1.48	.11	643.6000	3.5670	-.12	453.	453.	453.	453.	453.	453.	453.	453.
7.000	433.0300	1.1851	1.1851	1.1851	260.20	1.32	.01	260.20	1.32	.04	579.1000	2.6900	-.24	452.	452.	452.	452.	452.	452.	452.	452.
8.000	378.3200	1.2183	1.2183	1.2183	253.21	1.26	.14	253.21	1.26	-.15	521.3000	2.5610	-.38	450.	450.	450.	450.	450.	450.	450.	450.
9.000	330.9800	1.1971	1.1971	1.1971	245.55	1.33	-.03	245.55	1.33	-.33	468.9000	2.6100	-.81	448.	448.	448.	448.	448.	448.	448.	448.
10.000	287.5800	1.2136	1.2136	1.2136	237.51	1.34	-.09	237.51	1.34	-.35	421.5000	2.5590	-.1.03	448.	448.	448.	448.	448.	448.	448.	448.
11.000	248.7500	1.1948	1.1948	1.1948	233.50	1.35	-.15	233.50	1.35	-.27	377.0000	1.6750	.24	448.	448.	448.	448.	448.	448.	448.	448.
12.000	213.6100	1.1374	1.1374	1.1374	221.63	1.35	-.03	221.63	1.35	-.12	333.0000	1.5350	.49	447.	447.	447.	447.	447.	447.	447.	447.
13.000	183.1000	1.1071	1.1071	1.1071	214.55	1.39	-.07	214.55	1.39	-.11	297.0000	1.5930	-.19	447.	447.	447.	447.	447.	447.	447.	447.
14.000	155.5200	1.0221	1.0221	1.0221	207.73	1.53	.01	207.73	1.53	.39	231.3000	1.6370	-.52	447.	447.	447.	447.	447.	447.	447.	447.
15.000	132.0800	.9638	.9638	.9638	201.57	1.53	.15	201.57	1.53	.53	227.0000	2.0280	-.64	446.	446.	446.	446.	446.	446.	446.	446.
16.000	111.4400	.8707	.8707	.8707	197.55	1.60	.30	197.55	1.60	.35	155.9000	2.0920	-.22	446.	446.	446.	446.	446.	446.	446.	446.
17.000	93.7940	.7436	.7436	.7436	193.37	1.59	.39	193.37	1.59	.04	167.0000	2.2160	.24	439.	439.	439.	439.	439.	439.	439.	439.
18.000	78.8760	.6432	.6432	.6432	193.19	2.67	.29	193.19	2.67	.25	139.4000	2.2150	.11	440.	440.	440.	440.	440.	440.	440.	440.
19.000	68.5380	.5555	.5555	.5555	201.52	2.76	-.09	201.52	2.76	-.09	114.6000	1.6920	.38	439.	439.	439.	439.	439.	439.	439.	439.
20.000	55.4000	.5045	.5045	.5045	235.47	2.55	-.23	235.47	2.55	-.06	95.1000	1.2030	.35	436.	436.	436.	436.	436.	436.	436.	436.
21.000	47.9410	.4531	.4531	.4531	210.31	2.42	.16	210.31	2.42	.46	73.4000	.8404	.25	427.	427.	427.	427.	427.	427.	427.	427.
22.000	40.0630	.4288	.4288	.4288	213.43	2.25	.14	213.43	2.25	.40	66.7000	.7712	.40	424.	424.	424.	424.	424.	424.	424.	424.
23.000	34.9140	.3817	.3817	.3817	215.78	2.05	.15	215.78	2.05	.55	56.3700	.5958	.24	420.	420.	420.	420.	420.	420.	420.	420.
24.000	29.8250	.3477	.3477	.3477	217.68	2.12	.16	217.68	2.12	.11	47.7500	.5704	.12	418.	418.	418.	418.	418.	418.	418.	418.
25.000	25.5320	.3151	.3151	.3151	220.23	2.25	.17	220.23	2.25	.14	40.4900	.5322	.05	416.	416.	416.	416.	416.	416.	416.	416.
26.000	21.8750	.2785	.2785	.2785	223.06	2.22	.04	223.06	2.22	.31	34.3200	.5215	-.03	407.	407.	407.	407.	407.	407.	407.	407.
27.000	18.8530	.2593	.2593	.2593	225.60	2.51	.06	225.60	2.51	.26	29.1600	.4823	-.02	374.	374.	374.	374.	374.	374.	374.	374.
28.000	15.2200	.2423	.2423	.2423	225.65	2.64	.07	225.65	2.64	.44	24.2100	.4145	.14	367.	367.	367.	367.	367.	367.	367.	367.
29.000	14.8510	.1801	.1801	.1801	220.00	2.71	-.02	220.00	2.71	.39	21.2100	.3409	.25	293.	293.	293.	293.	293.	293.	293.	293.
30.000	12.1500	.1585	.1585	.1585	225.61	2.35	-.07	225.61	2.35	.33	18.2100	.2637	.35	285.	285.	285.	285.	285.	285.	285.	285.
32.000	9.0781	.1805	.1805	.1805	235.49	3.89	-.34	235.49	3.89	.23	13.4400	.2150	-.36	53.	53.	53.	53.	53.	53.	53.	53.
34.000	6.8348	.1572	.1572	.1572	240.23	4.42	-.20	240.23	4.42	-.02	9.9150	.1627	-.02	53.	53.	53.	53.	53.	53.	53.	53.
36.000	5.1724	.1334	.1334	.1334	246.70	4.31	-.25	246.70	4.31	.23	7.3330	.1447	.15	53.	53.	53.	53.	53.	53.	53.	53.
38.000	3.9397	.1132	.1132	.1132	246.31	5.99	-.32	246.31	5.99	.08	5.3090	.1177	.38	53.	53.	53.	53.	53.	53.	53.	53.
40.000	3.0162	.1044	.1044	.1044	253.53	8.00	-.25	253.53	8.00	.02	4.0350	.0900	-.30	53.	53.	53.	53.	53.	53.	53.	53.
42.000	2.7233	.0903	.0903	.0903	253.47	5.37	-.35	253.47	5.37	-.53	3.0910	.0937	.26	53.	53.	53.	53.	53.	53.	53.	53.
44.000	1.6234	.0750	.0750	.0750	253.50	4.47	-.45	253.50	4.47	-.55	2.3310	.0930	.20	52.	52.	52.	52.	52.	52.	52.	52.
46.000	1.4683	.0623	.0623	.0623	259.12	4.54	-.45	259.12	4.54	-.20	1.8230	.0850	.03	53.	53.	53.	53.	53.	53.	53.	53.
48.000	1.0978	.0522	.0522	.0522	270.01	4.53	-.54	270.01	4.53	.12	1.4170	.0576	-.04	53.	53.	53.	53.	53.	53.	53.	53.
50.000	.8551	.0427	.0427	.0427	272.24	5.36	-.53	272.24	5.36	-.05	1.1070	.0500	-.08	52.	52.	52.	52.	52.	52.	52.	52.
52.000	.6809	.0352	.0352	.0352	257.08	8.15	-.74	257.08	8.15	.04	.8639	.0438	.10	51.	51.	51.	51.	51.	51.	51.	51.
54.000	.5132	.0273	.0273	.0273	253.37	6.39	-.71	253.37	6.39	.16	.6790	.0356	-.41	50.	50.	50.	50.	50.	50.	50.	50.
56.000	.4025	.0218	.0218	.0218	253.74	7.44	-.74	253.74	7.44	.31	.5318	.0235	-.70	50.	50.	50.	50.	50.	50.	50.	50.
58.000	.3117	.0175	.0175	.0175	250.72	7.63	-.72	250.72	7.63	.42	.450	.0242	-.50	49.	49.	49.	49.	49.	49.	49.	49.
60.000	.2404	.0125	.0125	.0125	257.03	8.91	-.52	257.03	8.91	.48	.3297	.0130	-.21	39.	39.	39.	39.	39.	39.	39.	39.
62.000	.1641	.0094	.0094	.0094	253.62	13.01	-.73	253.62	13.01	.35	.2230	.0140	.19	23.	23.	23.	23.	23.	23.	23.	23.
64.000	.1425	.0061	.0061	.0061	250.93	13.35	-.77	250.93	13.35	.19	.1972	.0112	.48	14.	14.	14.	14.	14.	14.	14.	14.
66.000	.1074	.0045	.0045	.0045	240.38	18.01	-.98	240.38	18.01	.53	.1577	.0093	.19	9.	9.	9.	9.	9.	9.	9.	9.

TABLE II-13. THERMODYNAMIC STATISTICAL PARAMETERS

ANNUAL

STATION - 619020 Z KM	MEAN P PB	ACCELERATION (GAL) (4-1950)			S.D. T DEG K	SKEW T	MEAN D G/H3	S.D. D G/H3	SKEW D	NOBS P	NOBS T	NOBS D
		S.D. P PB	SKEW P	MEAN T DEG K								
.000	1059.0000	2.2681	.13	229.25	1.66	-.05	1154.0000	9.1040	-.01	4924.	4924.	4924.
.020	1055.7000	2.2373	.10	229.15	1.64	-.07	1161.0000	9.9480	-.02	5393.	5393.	5393.
.100	934.7500	1.7454	.18	229.55	1.71	-.18	1078.0000	7.7750	-.13	5481.	5481.	5481.
2.000	834.5000	1.4943	.10	229.10	2.24	-.73	873.0000	7.8510	.82	5480.	5480.	5480.
3.000	714.5000	1.2950	.05	229.55	1.55	-.43	873.0000	4.4820	.65	5480.	5480.	5480.
4.000	632.9500	1.2435	.01	227.63	1.55	-.12	702.0000	4.1510	.01	5479.	5479.	5479.
5.000	553.3800	1.1935	.02	229.23	1.34	-.24	714.0000	3.6530	.07	5479.	5479.	5479.
6.000	493.1500	1.1287	.04	223.67	1.36	-.13	643.0000	3.4030	-.03	5478.	5478.	5478.
7.000	433.4100	1.1752	.11	230.42	1.35	-.11	578.0000	2.9330	-.16	5476.	5476.	5476.
8.000	379.7100	1.2077	.13	223.63	1.36	-.05	570.0000	2.8780	-.36	5468.	5468.	5468.
9.000	331.4000	1.2191	.14	225.13	1.51	-.03	403.0000	2.9380	-.66	5457.	5457.	5457.
10.000	283.0000	1.2735	.14	223.11	1.54	.02	403.0000	2.8730	-.05	5449.	5449.	5449.
11.000	243.6400	1.2779	.11	222.02	1.55	.02	377.0000	1.7510	-.16	5443.	5443.	5443.
12.000	214.5000	1.2571	.17	222.42	1.45	.10	275.0000	1.4540	.13	5440.	5440.	5440.
13.000	183.5000	1.2035	.18	214.61	1.40	.28	283.0000	1.5500	-.55	5432.	5432.	5432.
14.000	153.3300	1.1195	.23	227.75	1.45	.23	222.0000	1.8740	-.53	5430.	5430.	5430.
15.000	132.4400	1.0071	.35	222.02	1.05	.29	223.0000	2.1720	-.23	5417.	5417.	5417.
16.000	111.7700	.8029	.42	192.01	1.34	.02	153.0000	2.2270	.01	5413.	5413.	5413.
17.000	94.1400	.7833	.49	195.53	2.59	.16	153.0000	2.0000	.05	5355.	5355.	5355.
18.000	79.2710	.6770	.44	172.10	3.64	.11	133.0000	2.6120	.14	5344.	5344.	5344.
19.000	67.0370	.6338	.57	223.07	3.52	.00	114.0000	1.6220	.29	5327.	5327.	5327.
20.000	55.5100	.6012	.18	227.97	3.22	.04	55.0000	1.2000	.23	5281.	5281.	5281.
21.000	48.3710	.5716	.05	211.24	3.00	.24	75.0000	.5781	.30	5123.	5123.	5123.
22.000	41.2530	.5450	.03	214.40	2.70	.18	67.0000	.9171	.24	5059.	5059.	5059.
23.000	35.2240	.4983	-.01	216.75	2.50	.12	56.7100	.6541	.18	5021.	5021.	5021.
24.000	30.1990	.4652	-.04	218.90	2.75	.04	48.0000	.6329	.05	4997.	4997.	4997.
25.000	25.6720	.4165	-.11	221.33	2.82	-.11	40.7500	.5156	.04	4929.	4929.	4929.
26.000	22.2000	.3735	-.19	223.53	2.67	-.14	34.5700	.5522	.01	4764.	4764.	4764.
27.000	19.1370	.3371	-.22	223.07	2.63	-.04	23.0000	.5150	-.05	4393.	4393.	4393.
28.000	14.8200	.2847	-.20	222.75	2.59	.02	21.0000	.4422	.00	3545.	3545.	3545.
29.000	12.5320	.2239	-.34	221.68	2.62	-.18	18.0000	.3734	.28	3467.	3467.	3467.
30.000	9.1820	.1500	-.12	225.13	4.29	-.04	13.0000	.2507	.03	875.	875.	875.
34.000	6.0240	.1042	-.12	240.49	4.53	.01	10.0000	.1532	.03	874.	874.	874.
36.000	5.7434	.1431	-.14	225.42	5.01	-.02	7.4420	.1553	-.12	823.	823.	823.
38.000	3.9236	.1221	-.16	231.28	5.30	-.23	5.5420	.1270	-.03	821.	821.	821.
40.000	3.0523	.1043	-.20	227.03	5.57	-.18	4.1510	.1143	.02	820.	820.	820.
42.000	2.3713	.0871	-.05	225.03	5.53	-.12	3.1570	.1031	.00	837.	837.	837.
44.000	1.6719	.0715	-.23	227.57	5.16	-.03	2.1500	.0630	-.02	830.	830.	830.
46.000	1.4249	.0534	-.39	223.01	4.93	-.01	1.3310	.0530	-.12	815.	815.	815.
48.000	1.1194	.0477	-.40	220.45	5.01	-.02	1.4410	.0633	-.31	810.	810.	810.
50.000	.8725	.0255	-.35	223.66	5.16	-.01	1.1250	.0639	-.36	803.	803.	803.
52.000	.6507	.0203	-.35	227.49	5.76	-.01	.7550	.0411	-.40	798.	798.	798.
54.000	.5233	.0248	-.25	224.23	5.06	.07	.6259	.0225	-.40	790.	790.	790.
56.000	.4102	.0159	-.19	221.05	6.57	.12	.5433	.0230	-.40	771.	771.	771.
58.000	.3165	.0170	-.31	222.75	7.55	.21	.4000	.0177	-.04	732.	732.	732.
60.000	.2422	.0127	.14	223.57	6.24	.16	.3245	.0151	-.04	701.	701.	701.
62.000	.1653	.0102	.03	220.12	9.32	.34	.2500	.0131	.09	482.	482.	482.
64.000	.1323	.0073	.01	242.43	10.19	.25	.2000	.0111	.52	275.	275.	275.
66.000	.1024	.0055	.37	234.53	10.37	-.70	.1505	.0104	.03	115.	115.	115.

TABLE III-1. MOISTURE RELATED STATISTICAL PARAMETERS

JANUARY

STATION # 619020		ASCENSION (WIDE AWAKE)			TV		DEWPT T		S.D. DPT		NOBS T+P		NOBS TV	
Z	VAPOR P	S.D. VP	SKEW VP	TV	S.D.	SKEW TV	MEAN	S.D. DPT	SKEW DPT					
KM	MB	MB		DEG K	DEG K		DEG K	DEG K						
.000	23.401	2.217	-.09	302.02	1.40	-.13	203.10	1.55	-.34	460.	460.			
.020	23.228	2.187	-.10	301.92	1.37	-.14	202.53	1.54	-.37	493.	493.			
1.000	15.791	1.970	-.02	293.00	1.31	.31	206.85	1.96	-.43	490.	493.			
2.000	7.190	2.004	.23	280.05	1.70	-.58	274.27	6.24	-.55	460.	493.			
3.000	4.450	1.713	.21	264.03	1.25	-.52	267.92	5.61	-.57	443.	493.			
4.000	2.708	1.170	.28	277.98	1.27	.07	261.29	6.02	-.53	363.	492.			
5.000	1.212	.650	1.02	272.42	1.45	-.27	251.41	6.05	.10	330.	492.			
6.000	.574	.320	1.43	258.03	1.43	-.07	243.26	5.50	.30	303.	492.			
7.000	.313	.170	1.23	250.39	1.47	-.55	237.07	5.23	.18	295.	492.			
8.000	.169	.104	1.47	253.29	1.48	-.22	230.87	5.54	.13	298.	493.			
9.000	.090	.055	1.10	245.62	1.61	.36	224.97	5.68	-.17	320.	493.			
10.000	.043	.024	1.03	257.01	1.63	.62	212.91	5.09	-.45	261.	493.			
11.000	.020	.009	1.25	255.05	1.44	.10	213.35	3.35	.02	220.	492.			
12.000	.009	.004	1.20	271.95	1.29	.00	207.13	2.93	.12	210.	492.			
13.000	.003	.001	.03	214.53	1.33	.44	200.69	3.01	-.56	123.	492.			
14.000	.001	.001	.90	203.03	1.58	.50	194.76	3.13	-.35	84.	492.			
15.000	.001	.000	.96	202.16	1.89	.42	191.03	1.72	.38	14.	491.			
16.000	99.999	99.999	999.99	197.71	2.02	.40	959.99	99.99	999.99	0.	490.			
17.000	99.999	99.999	999.99	195.43	2.05	-.03	959.99	99.99	999.99	0.	495.			
18.000	99.999	99.999	999.99	193.62	2.00	.42	959.99	99.99	999.99	0.	495.			
19.000	99.999	99.999	999.99	200.53	2.67	.29	959.99	99.99	999.99	0.	493.			
20.000	99.999	99.999	999.99	255.09	2.59	.09	959.99	99.99	999.99	0.	473.			
21.000	99.999	99.999	999.99	269.47	2.43	.26	959.99	99.99	999.99	0.	472.			
22.000	99.999	99.999	999.99	212.70	2.28	.27	959.99	99.99	999.99	0.	470.			
23.000	99.999	99.999	999.99	214.49	2.07	.32	959.99	99.99	999.99	0.	464.			
24.000	99.999	99.999	999.99	216.40	2.35	.18	959.99	99.99	999.99	0.	458.			
25.000	99.999	99.999	999.99	218.51	2.53	.21	959.99	99.99	999.99	0.	454.			
26.000	99.999	99.999	999.99	221.05	2.61	.06	959.99	99.99	999.99	0.	440.			
27.000	99.999	99.999	999.99	223.04	2.62	-.02	959.99	99.99	999.99	0.	414.			
28.000	99.999	99.999	999.99	226.07	2.55	-.10	959.99	99.99	999.99	0.	410.			
29.000	99.999	99.999	999.99	223.44	2.63	-.10	959.99	99.99	999.99	0.	347.			
30.000	99.999	99.999	999.99	220.43	2.58	-.35	959.99	99.99	999.99	0.	339.			

TABLE III-2. MOISTURE RELATED STATISTICAL PARAMETERS

FEBRUARY

STATION = 610020		ASCENSION (WIDE AREA)		TV		TV		DEWPT T		S.D. DPT		SKEW DPT		NOBS T+P		NOBS TV	
Z	VAPOR P	S.D. VP	SKEW VP	TV	S.D.	SKEW TV	DEWPT T	S.D. DPT	SKEW DPT	NOBS T+P	NOBS TV						
MM	MM	MM		MEAN	DEG K		MEAN	DEG K									
.000	24.535	2.264	-.25	303.10	1.30	-.26	293.87	1.53	-.55	424.	424.						
.020	24.395	2.227	-.21	302.98	1.28	-.24	293.78	1.51	-.52	446.	446.						
1.000	16.030	2.250	-.19	293.85	1.21	.13	287.03	2.28	-1.01	446.	450.						
2.000	7.372	2.879	.49	293.17	1.50	-.27	274.77	5.74	-.29	427.	449.						
3.000	4.278	1.654	.15	284.09	1.34	.07	267.35	5.09	-.63	428.	449.						
4.000	2.420	1.201	.40	278.05	1.37	.21	259.94	6.55	-.32	374.	449.						
5.000	1.130	.626	1.43	272.78	1.43	-.05	250.68	5.81	.33	316.	449.						
6.000	.641	.301	2.53	267.22	1.50	-.14	244.41	5.55	.37	293.	448.						
7.000	.355	.192	1.57	260.81	1.47	-.11	233.42	5.13	.17	291.	448.						
8.000	.187	.100	1.04	253.92	1.44	.00	232.08	5.14	-.06	295.	448.						
9.000	.098	.053	.74	246.42	1.50	-.07	226.01	5.30	-.42	314.	448.						
10.000	.048	.024	.68	238.45	1.55	-.11	220.10	4.77	-.74	254.	449.						
11.000	.023	.009	.69	230.18	1.42	-.25	214.46	3.23	-.29	212.	449.						
12.000	.009	.003	.67	222.33	1.44	.30	207.81	2.82	-.36	214.	449.						
13.000	.003	.001	.72	214.07	1.50	.73	200.43	3.22	-.43	129.	449.						
14.000	.001	.001	.79	207.06	1.63	.52	194.41	3.03	-.40	85.	449.						
15.000	.001	.000	-.57	201.93	1.84	.33	189.56	2.86	-.85	10.	448.						
16.000	99.999	99.999	999.99	197.55	1.85	.11	999.99	99.99	999.99	0.	448.						
17.000	99.999	99.999	999.99	195.33	1.94	.58	999.99	99.99	999.99	0.	445.						
18.000	99.999	99.999	999.99	175.50	2.73	.32	999.99	99.99	999.99	0.	442.						
19.000	99.999	99.999	999.99	130.78	2.79	.31	999.99	99.99	999.99	0.	441.						
20.000	99.999	99.999	999.99	99.14	2.70	.25	999.99	99.99	999.99	0.	440.						
21.000	99.999	99.999	999.99	97.07	2.70	.81	999.99	99.99	999.99	0.	441.						
22.000	99.999	99.999	999.99	212.14	2.49	.12	999.99	99.99	999.99	0.	449.						
23.000	99.999	99.999	999.99	214.52	2.34	.25	999.99	99.99	999.99	0.	441.						
24.000	99.999	99.999	999.99	216.80	2.68	.43	999.99	99.99	999.99	0.	443.						
25.000	99.999	99.999	999.99	218.63	2.91	.33	999.99	99.99	999.99	0.	397.						
26.000	99.999	99.999	999.99	211.51	2.76	.21	999.99	99.99	999.99	0.	395.						
27.000	99.999	99.999	999.99	204.13	2.72	.16	999.99	99.99	999.99	0.	398.						
28.000	99.999	99.999	999.99	203.61	2.71	.05	999.99	99.99	999.99	0.	399.						
29.000	99.999	99.999	999.99	225.30	2.71	.30	999.99	99.99	999.99	0.	200.						
30.000	99.999	99.999	999.99	231.11	2.66	.09	999.99	99.99	999.99	0.	205.						

TABLE III-3. MOISTURE RELATED STATISTICAL PARAMETERS

MARCH

STATION # 619020		ASCENSION (WIDE AREA)			TV		DEWPT T		S.D. DPT		NOBS T+P	NOBS TV
Z	VAPOR P	S.D. VP	SKEW VP	TV	S.D.	SKEW TV	MEAN	S.D.	SKEW DPT			
KM	MB	MB		MEAN	DEG K		DEG K	DEG K				
.000	25.709	2.299	.48	303.52	1.18	-.23	294.64	1.46	-.13	466.	468.	
.020	25.533	2.267	.47	303.70	1.17	-.25	294.53	1.45	-.14	480.	480.	
1.000	16.650	2.300	-.12	294.08	1.01	-.15	287.09	2.20	-.57	479.	483.	
2.000	8.354	3.029	.15	293.54	1.44	-.61	276.60	5.81	-.79	466.	460.	
3.000	4.894	1.817	.31	284.44	1.18	-.19	269.22	5.53	-.71	448.	460.	
4.000	2.739	1.234	.67	278.52	1.17	.06	261.31	6.27	-.35	377.	460.	
5.000	1.460	.827	1.40	273.09	1.30	.02	253.47	6.32	.12	341.	480.	
6.000	.753	.452	1.33	267.45	1.23	.06	245.85	6.39	.32	303.	480.	
7.000	.413	.275	2.05	261.19	1.19	.24	230.67	5.95	.35	301.	480.	
8.000	.225	.148	2.17	254.45	1.29	.10	233.47	5.95	.10	289.	480.	
9.000	.115	.074	2.02	247.13	1.41	.11	227.18	5.09	-.29	309.	480.	
10.000	.058	.024	2.23	239.26	1.44	.17	221.42	5.03	-.40	251.	479.	
11.000	.026	.013	2.16	233.05	1.32	.20	215.30	3.70	-.05	225.	479.	
12.000	.010	.005	2.08	222.76	1.23	-.10	208.60	3.16	.06	229.	479.	
13.000	.004	.002	1.91	214.51	1.26	.27	201.29	3.31	.07	113.	479.	
14.000	.001	.001	1.23	207.60	1.40	.18	194.73	3.21	-.18	90.	479.	
15.000	99.999	99.999	99.999	201.49	1.58	.13	99.99	99.99	999.99	3.	478.	
16.000	99.999	99.999	99.999	197.00	1.58	.14	99.99	99.99	999.99	0.	479.	
17.000	99.999	99.999	99.999	184.00	1.67	-.17	99.99	99.99	999.99	0.	473.	
18.000	99.999	99.999	99.999	165.57	2.84	.38	99.99	99.99	999.99	0.	474.	
19.000	99.999	99.999	99.999	201.22	2.66	.08	999.99	99.99	999.99	0.	473.	
20.000	99.999	99.999	99.999	205.80	2.46	.15	999.99	99.99	999.99	0.	470.	
21.000	99.999	99.999	99.999	203.60	2.23	.18	999.99	99.99	999.99	0.	480.	
22.000	99.999	99.999	99.999	213.11	2.14	.21	999.99	99.99	999.99	0.	450.	
23.000	99.999	99.999	99.999	215.72	1.96	.33	999.99	99.99	999.99	0.	445.	
24.000	99.999	99.999	99.999	218.10	2.32	.25	999.99	99.99	999.99	0.	447.	
25.000	99.999	99.999	99.999	200.00	2.56	.11	999.99	99.99	999.99	0.	443.	
26.000	99.999	99.999	99.999	222.81	2.50	.04	999.99	99.99	999.99	0.	429.	
27.000	99.999	99.999	99.999	225.22	2.47	-.22	999.99	99.99	999.99	0.	396.	
28.000	99.999	99.999	99.999	227.75	2.45	-.22	999.99	99.99	999.99	0.	385.	
29.000	99.999	99.999	99.999	230.10	2.59	-.33	999.99	99.99	999.99	0.	307.	
30.000	99.999	99.999	99.999	232.10	2.44	-.36	999.99	99.99	999.99	0.	300.	

TABLE III-4. MOISTURE RELATED STATISTICAL PARAMETERS

APRIL

STATION # 619020		ASCENSION (WIDE AWAKE)		TV		DEWPT T		S.D. DPT		NOBS T+P		NOBS TV	
Z	VAPOR P	S.D. VP	SKW VP	TV	S.D.	MEAN	S.D.	SKW DPT	NOBS T+P	NOBS TV			
KM	MB	MB		DEG K	DEG K	DEG K	DEG K						
0.000	25.020	2.504	-1.12	303.58	1.31	294.58	1.67	-1.51	422.	422.			
1.000	25.613	2.540	-1.09	303.97	1.30	294.55	1.65	-1.48	448.	448.			
2.000	16.734	2.200	-1.20	294.57	1.12	297.72	2.31	-1.78	459.	459.			
3.000	8.593	3.143	-1.11	291.03	1.43	275.55	5.83	-1.69	433.	433.			
4.000	4.722	1.900	1.34	284.87	1.22	268.62	5.81	-1.55	390.	409.			
5.000	2.513	1.205	1.60	279.05	1.20	260.03	6.69	-1.23	335.	409.			
6.000	1.444	1.901	1.31	273.53	1.24	253.07	6.78	1.33	297.	409.			
7.000	1.757	1.500	1.79	267.75	1.35	245.55	6.44	1.32	272.	409.			
8.000	1.424	1.207	1.66	261.10	1.35	239.22	6.07	1.40	265.	409.			
9.000	1.215	1.143	1.38	254.10	1.39	232.92	5.93	1.34	267.	409.			
10.000	1.116	1.077	1.70	247.03	1.60	227.41	5.32	-1.12	273.	409.			
11.000	1.020	1.033	1.53	240.07	1.70	221.53	5.04	-1.05	250.	409.			
12.000	1.006	1.012	1.34	231.55	1.35	215.46	3.57	-1.25	189.	409.			
13.000	1.010	1.004	1.91	223.35	1.14	208.77	2.74	-1.10	213.	409.			
14.000	1.004	1.002	1.20	215.34	1.17	201.09	3.17	-1.28	118.	409.			
15.000	1.001	1.001	1.04	207.71	1.31	194.32	2.85	-1.34	69.	409.			
16.000	99.999	99.999	999.99	201.09	1.44	187.99	99.99	999.99	5.	453.			
17.000	99.999	99.999	999.99	193.23	1.51	180.03	99.99	999.99	0.	453.			
18.000	99.999	99.999	999.99	184.15	1.70	171.99	99.99	999.99	0.	449.			
19.000	99.999	99.999	999.99	175.54	2.72	163.99	99.99	999.99	0.	448.			
20.000	99.999	99.999	999.99	167.77	2.74	155.04	99.99	999.99	0.	445.			
21.000	99.999	99.999	999.99	159.49	2.23	146.03	99.99	999.99	0.	443.			
22.000	99.999	99.999	999.99	150.63	2.24	137.99	99.99	999.99	0.	432.			
23.000	99.999	99.999	999.99	141.20	2.29	129.99	99.99	999.99	0.	432.			
24.000	99.999	99.999	999.99	131.30	2.09	120.03	99.99	999.99	0.	424.			
25.000	99.999	99.999	999.99	121.25	2.41	110.03	99.99	999.99	0.	419.			
26.000	99.999	99.999	999.99	111.50	2.52	100.03	99.99	999.99	0.	412.			
27.000	99.999	99.999	999.99	101.69	2.42	90.99	99.99	999.99	0.	404.			
28.000	99.999	99.999	999.99	91.96	2.47	81.99	99.99	999.99	0.	373.			
29.000	99.999	99.999	999.99	82.25	2.25	72.99	99.99	999.99	0.	351.			
30.000	99.999	99.999	999.99	72.55	2.19	62.99	99.99	999.99	0.	275.			
				233.47	2.04	52.99	99.99	999.99	0.	263.			

TABLE III-5. MOISTURE RELATED STATISTICAL PARAMETERS

MAY

STATION - 610020		ASCENSION (WIDE AWAKE)		TV		TV		DEWPT T		S.D. DPT		NOBS T+P		NOBS TV	
Z	VAPOR P	S.D. VP	SKEW VP	TV	S.D.	SKEW TV	DEWPT T	S.D. DPT	SKEW DPT	NOBS T+P	NOBS TV				
KM	MEAN MB	MB		MEAN DEO K	DEO K		MEAN DEO K	DEO K							
.000	24.216	2.299	-.09	303.28	1.04	-.20	293.65	1.56	-.39	412.	412.				
.020	23.919	2.323	-.05	303.16	1.06	-.12	293.45	1.60	-.37	469.	469.				
1.000	15.555	2.274	-.05	293.67	1.11	-.05	265.58	2.32	-.62	465.	469.				
2.000	7.831	3.345	.25	283.17	1.71	-.31	274.89	0.82	-.45	431.	408.				
3.000	3.774	1.648	.20	274.84	1.51	-.08	265.31	0.52	-.12	355.	428.				
4.000	1.370	1.032	1.22	279.24	1.40	.04	257.04	6.38	.20	303.	498.				
5.000	1.101	.733	2.30	273.55	1.47	.18	250.03	6.23	.67	270.	479.				
6.000	.029	.420	2.02	267.76	1.53	.26	243.93	6.02	.65	257.	453.				
7.000	.340	.204	2.33	261.06	1.52	.44	237.85	5.24	.42	257.	498.				
8.000	.199	.121	1.82	255.20	1.67	.48	232.53	5.26	.30	272.	486.				
9.000	.109	.063	1.09	245.03	1.69	.60	226.91	5.43	-.20	295.	485.				
10.000	.075	.027	1.17	240.14	1.93	.77	221.34	4.41	-.56	253.	485.				
11.000	.026	.011	1.75	231.43	1.35	.91	215.60	3.27	-.05	214.	483.				
12.000	.010	.004	1.52	223.26	1.21	.09	208.55	2.64	-.03	233.	485.				
13.000	.004	.002	1.15	215.29	1.25	.07	201.53	3.10	-.09	135.	484.				
14.000	.001	.001	.55	207.75	1.28	.34	194.58	2.78	-.52	80.	483.				
15.000	99.999	99.999	999.93	201.51	1.51	.27	999.99	99.99	999.99	2.	482.				
16.000	99.999	99.999	999.99	195.63	1.64	-.06	999.99	99.99	999.99	0.	482.				
17.000	99.999	99.999	999.99	195.23	1.81	.28	999.99	99.99	999.99	0.	475.				
18.000	99.999	99.999	999.99	190.01	2.60	-.01	999.99	99.99	999.99	0.	475.				
19.000	99.999	99.999	999.99	207.79	2.31	-.05	999.99	99.99	999.99	0.	474.				
20.000	99.999	99.999	999.99	207.50	2.20	.10	999.99	99.99	999.99	0.	469.				
21.000	99.999	99.999	999.99	211.59	2.17	.06	999.99	99.99	999.99	0.	450.				
22.000	99.999	99.999	999.99	215.07	2.05	-.06	999.99	99.99	999.99	0.	455.				
23.000	99.999	99.999	999.99	217.99	1.84	-.01	999.99	99.99	999.99	0.	449.				
24.000	99.999	99.999	999.99	220.57	2.19	.16	999.99	99.99	999.99	0.	448.				
25.000	99.999	99.999	999.99	223.29	2.11	.10	999.99	99.99	999.99	0.	448.				
26.000	99.999	99.999	999.99	225.60	2.10	.00	999.99	99.99	999.99	0.	431.				
27.000	99.999	99.999	999.99	227.59	2.15	.33	999.99	99.99	999.99	0.	401.				
28.000	99.999	99.999	999.99	229.42	1.89	.31	999.99	99.99	999.99	0.	395.				
29.000	99.999	99.999	999.99	231.08	1.79	.27	999.99	99.99	999.99	0.	335.				
30.000	99.999	99.999	999.99	232.53	1.65	-.24	999.99	99.99	999.99	0.	332.				

TABLE III-6. MOISTURE RELATED STATISTICAL PARAMETERS

JUNE

STATION # 016020		ASCENSION (WIDE AWAKE)		TV		DESKPT T		S.D. DPT		SKEW DPT		NOBS T+P		NOBS TV	
Z	V-M P	S.D. VP	SKEW VP	MEAN	S.D.	MEAN	DEG K	DEG K	DEG K						
KM	MB	MB	DEG K	DEG K	DEG K	DEG K	DEG K	DEG K	DEG K						
0.000	22.328	2.511	.09	302.03	1.23	-1.37	292.32	1.83	-1.30	368.	368.				
1.000	22.018	2.465	.11	301.94	1.27	-1.35	292.10	1.81	-1.26	426.	426.				
2.000	19.023	2.065	.10	292.45	1.14	.09	292.72	2.21	-1.40	446.	447.				
3.000	7.564	3.164	.13	297.53	2.06	.02	274.04	6.71	-1.64	369.	447.				
4.000	2.861	1.479	1.91	274.42	1.53	-1.10	281.69	5.95	.27	344.	447.				
5.000	1.549	.700	2.00	278.47	1.51	.32	294.50	5.34	.23	318.	447.				
6.000	.918	.522	2.23	272.70	1.51	.01	240.44	5.32	.02	301.	447.				
7.000	.493	.250	1.73	257.00	1.61	-1.09	241.98	4.90	.47	283.	447.				
8.000	.312	.162	1.33	251.04	1.72	.14	237.18	4.92	.20	273.	447.				
9.000	.179	.094	1.10	254.33	1.73	.46	231.73	4.50	-1.06	308.	447.				
10.000	.092	.051	.83	245.65	1.91	.85	226.24	4.35	-1.40	329.	444.				
11.000	.031	.020	2.45	279.50	1.96	1.06	220.05	4.55	-1.45	279.	444.				
12.000	.024	.010	1.71	230.25	1.50	.30	214.97	3.16	-1.34	234.	444.				
13.000	.010	.005	.75	222.25	1.40	.35	208.29	2.61	-1.40	235.	443.				
14.000	.004	.002	.64	214.55	1.39	.72	201.70	2.37	-1.50	170.	442.				
15.000	.001	.001	.73	207.63	1.48	.72	192.33	2.62	-1.46	83.	442.				
16.000	.001	.000	-1.05	202.03	1.61	.34	191.18	1.49	-1.38	6.	439.				
17.000	99.999	99.999	999.99	198.41	1.75	.27	999.99	99.99	999.99	0.	439.				
18.000	99.999	99.999	999.99	197.45	2.05	-1.06	999.99	99.99	999.99	0.	439.				
19.000	99.999	99.999	999.99	200.35	2.67	-1.03	999.99	99.99	999.99	0.	431.				
20.000	99.999	99.999	999.99	205.01	2.41	.04	999.99	99.99	999.99	0.	428.				
21.000	99.999	99.999	999.99	202.41	2.21	.03	999.99	99.99	999.99	0.	416.				
22.000	99.999	99.999	999.99	212.74	2.25	-1.04	999.99	99.99	999.99	0.	412.				
23.000	99.999	99.999	999.99	215.02	1.93	-1.15	999.99	99.99	999.99	0.	407.				
24.000	99.999	99.999	999.99	210.04	1.98	-1.04	999.99	99.99	999.99	0.	405.				
25.000	99.999	99.999	999.99	220.63	2.27	.30	999.99	99.99	999.99	0.	402.				
26.000	99.999	99.999	999.99	223.09	2.21	.29	999.99	99.99	999.99	0.	363.				
27.000	99.999	99.999	999.99	225.17	2.09	.09	999.99	99.99	999.99	0.	360.				
28.000	99.999	99.999	999.99	227.08	2.19	.31	999.99	99.99	999.99	0.	349.				
29.000	99.999	99.999	999.99	220.03	1.98	.34	999.99	99.99	999.99	0.	284.				
30.000	99.999	99.999	999.99	232.00	2.11	-1.16	999.99	99.99	999.99	0.	287.				

TABLE III-7. MOISTURE RELATED STATISTICAL PARAMETERS

JULY

STATION = 819023		ASCENSION (WIDE AWAKE)		TV		TV		DEWPT T		S.D. DPT		NOBS T+P		NOBS TV	
Z	VAPOR P	S.D. VP	SKEM VP	TV	S.D.	SKEM TV	DEWPT T	S.D. DPT	SKEM DPT	NOBS T+P	NOBS TV				
MEAN				MEAN		MEAN		MEAN							
K4	MB	MB		DEG K	DEG K		DEG K	DEG K							
.000	20.036	2.138	-.03	300.56	1.05	-.36	291.21	1.63	-.42	396.	396.				
.020	20.034	2.092	-.01	300.63	1.02	-.41	291.08	1.63	-.39	451.	451.				
1.000	13.655	1.945	.24	291.41	1.11	-.01	284.84	2.14	-.13	459.	461.				
2.000	8.569	2.919	.17	295.98	2.35	.13	273.79	6.47	-.51	406.	461.				
3.000	2.902	1.304	.81	283.51	1.59	-.18	251.70	5.91	-.05	354.	461.				
4.000	1.424	.683	1.23	277.89	1.56	-.06	253.61	5.30	.29	322.	461.				
5.000	.840	.444	1.76	272.53	1.48	-.28	247.56	5.18	.53	309.	461.				
6.000	.506	.292	2.25	270.23	1.46	.24	242.00	5.24	.46	302.	461.				
7.000	.339	.173	1.72	268.40	1.53	.33	230.91	5.31	.15	304.	460.				
8.000	.175	.082	1.00	263.34	1.69	.50	231.39	5.34	-.29	322.	459.				
9.000	.033	.049	.61	245.66	1.76	.72	225.58	5.32	-.59	347.	458.				
10.000	.048	.021	.64	237.93	1.73	.48	220.23	4.35	-1.08	292.	455.				
11.000	.022	.008	1.00	229.12	1.41	.04	214.17	3.12	-.42	239.	454.				
12.000	.009	.003	.50	221.32	1.27	.03	207.67	2.50	-.56	239.	453.				
13.000	.004	.001	.61	213.09	1.38	.17	201.55	2.34	-.27	125.	450.				
14.000	.001	.001	1.24	207.64	1.41	-.07	195.93	2.25	.10	69.	450.				
15.000	.001	.000	-.40	202.52	1.50	.19	190.05	2.22	-.59	6.	449.				
16.000	99.999	99.999	999.99	197.33	1.46	.04	909.99	99.99	999.99	0.	447.				
17.000	99.999	99.999	999.99	193.36	1.88	-.02	909.99	99.99	999.99	0.	441.				
18.000	99.999	99.999	999.99	202.89	2.37	-.07	999.99	99.99	999.99	0.	441.				
19.000	99.999	99.999	999.99	207.03	2.39	.08	999.99	99.99	999.99	0.	440.				
20.000	99.999	99.999	999.99	210.93	2.23	.08	999.99	99.99	999.99	0.	430.				
21.000	99.999	99.999	999.99	214.01	2.19	.19	999.99	99.99	999.99	0.	416.				
22.000	99.999	99.999	999.99	216.20	2.31	.48	999.99	99.99	999.99	0.	411.				
23.000	99.999	99.999	999.99	218.23	2.24	.59	999.99	99.99	999.99	0.	405.				
24.000	99.999	99.999	999.99	220.02	2.40	.43	999.99	99.99	999.99	0.	406.				
25.000	99.999	99.999	999.99	222.19	2.33	.32	999.99	99.99	999.99	0.	331.				
26.000	99.999	99.999	999.99	224.29	2.29	.30	999.99	99.99	999.99	0.	381.				
27.000	99.999	99.999	999.99	226.19	2.28	.26	999.99	99.99	999.99	0.	357.				
28.000	99.999	99.999	999.99	227.49	2.11	.09	999.99	99.99	999.99	0.	350.				
29.000	99.999	99.999	999.99	230.59	2.16	-.22	999.99	99.99	999.99	0.	291.				
30.000	99.999	99.999	999.99	230.33	2.34	-.70	999.99	99.99	999.99	0.	285.				

TABLE III-8. MOISTURE RELATED STATISTICAL PARAMETERS

AUGUST

STATION - 619020		ASCENSION (WIDE AWAKE)				TV		DEWPT T		S.D. DPT		NOBS T+P		NOBS TV	
Z	VAPOR P	S.D. VP	SKEW VP	TV	TV	S.D.	SKEW TV	MEAN	MEAN	S.D. DPT	SKEW DPT				
MM	MB	MS		DEG K	DEG K			DEG K	DEG K						
.000	20.010	2.233	-.15	300.15	1.21	-.70		290.57	1.84		-.54	390.		390.	
.020	19.843	2.219	-.22	300.07	1.16	-.73		290.44	1.62		-.60	461.		461.	
1.000	13.740	1.823	.08	290.62	1.03	.11		284.71	2.18		-.27	475.		477.	
2.000	5.928	2.623	.61	287.63	2.71	-.28		271.29	6.90		-.27	406.		477.	
3.000	2.905	1.341	1.39	283.70	1.63	-.16		262.23	5.75		-.08	390.		477.	
4.000	1.545	.748	.63	277.68	1.52	-.19		254.45	5.69		.03	338.		477.	
5.000	.838	.413	1.55	272.43	1.48	-.15		247.65	4.92		.45	319.		477.	
6.000	.520	.269	1.16	265.82	1.48	.18		242.37	5.16		.29	322.		477.	
7.000	.316	.173	1.51	260.84	1.47	.23		237.18	5.21		.17	328.		477.	
8.000	.180	.076	.73	253.06	1.56	.54		231.63	5.40		-.34	335.		476.	
9.000	.055	.046	.43	245.20	1.73	.57		225.93	3.70		-.68	353.		474.	
10.000	.049	.023	.70	237.69	1.60	.70		220.44	4.30		-.02	290.		473.	
11.000	.021	.009	.62	229.33	1.44	1.04		214.03	3.04		-.32	258.		471.	
12.000	.009	.003	.44	221.67	1.36	.61		207.44	2.71		-.49	257.		471.	
13.000	.003	.001	.20	214.32	1.54	.39		200.82	3.01		-.52	140.		471.	
14.000	.001	.001	.44	207.69	1.61	.23		194.80	2.51		-.29	52.		470.	
15.000	99.999	99.999	999.99	202.82	1.51	.64		999.99	99.99	999.99		2.		470.	
16.000	99.999	99.999	999.99	193.72	1.51	.23		999.99	99.99	999.99		0.		470.	
17.000	99.999	99.999	999.99	193.03	1.79	.29		999.99	99.99	999.99		0.		467.	
18.000	99.999	99.999	999.99	203.14	2.32	.07		999.99	99.99	999.99		0.		466.	
19.000	99.999	99.999	999.99	207.41	2.41	-.32		999.99	99.99	999.99		0.		464.	
20.000	99.999	99.999	999.99	211.18	2.24	-.10		999.99	99.99	999.99		0.		461.	
21.000	99.999	99.999	999.99	214.23	2.33	.63		999.99	99.99	999.99		0.		449.	
22.000	99.999	99.999	999.99	216.19	2.74	.60		999.99	99.99	999.99		0.		445.	
23.000	99.999	99.999	999.99	217.84	2.33	.40		999.99	99.99	999.99		0.		441.	
24.000	99.999	99.999	999.99	219.37	2.39	.26		999.99	99.99	999.99		0.		440.	
25.000	99.999	99.999	999.99	221.46	2.30	.15		999.99	99.99	999.99		0.		431.	
26.000	99.999	99.999	999.99	223.42	2.11	.35		999.99	99.99	999.99		0.		416.	
27.000	99.999	99.999	999.99	225.07	2.14	.25		999.99	99.99	999.99		0.		389.	
28.000	99.999	99.999	999.99	226.30	2.11	-.03		999.99	99.99	999.99		0.		360.	
29.000	99.999	99.999	999.99	227.04	2.22	.15		999.99	99.99	999.99		0.		328.	
30.000	99.999	99.999	999.99	228.59	2.24	-.22		999.99	99.99	999.99		0.		314.	

TABLE III-9. MOISTURE RELATED STATISTICAL PARAMETERS

SEPTEMBER

STATION - 619320		ASCENSION (WIDE AWAKE)										
Z	VAPOR P	S.D. VP	SKEW VP	TV	S.D.	SKEW TV	DEPT T	S.D. OPT	SKEW OPT	NOBS T+P	NOBS TV	
KM	MEAN MB	MB		MEAN DEG K	S.D. DEG K		MEAN DEG K	DEG K				
.000	19.890	2.052	-.21	299.69	1.23	-.14	290.49	1.67	-.44	365.	365.	
.020	19.754	2.026	-.21	299.79	1.23	-.14	290.38	1.65	-.43	410.	410.	
1.000	13.925	1.714	.12	290.43	.92	.19	294.94	1.88	-.22	409.	410.	
2.000	5.371	2.436	.63	289.94	2.23	-.87	270.11	6.41	-.23	365.	410.	
3.000	3.481	1.354	.47	283.80	1.49	.02	264.72	5.42	-.47	357.	410.	
4.000	1.876	.859	.50	277.25	1.34	.01	255.75	5.09	-.30	302.	410.	
5.000	.873	.425	1.05	272.19	1.38	.21	248.05	5.11	.33	257.	410.	
6.000	.525	.280	1.25	266.83	1.42	.34	242.43	5.21	.39	251.	410.	
7.000	.314	.172	1.08	260.65	1.43	.41	237.10	5.24	.24	265.	410.	
8.000	.180	.037	.82	253.60	1.41	.63	231.64	5.29	-.05	273.	409.	
9.000	.094	.050	.59	245.90	1.60	.66	225.59	5.44	-.54	284.	409.	
10.000	.045	.022	.23	237.79	1.65	.68	219.61	4.73	-.86	254.	409.	
11.000	.020	.007	.34	229.01	1.35	.24	213.62	2.92	-.42	237.	409.	
12.000	.008	.003	.30	221.63	1.31	.04	207.27	2.03	-.41	240.	410.	
13.000	.003	.001	.57	214.22	1.37	.70	199.93	3.15	-.31	117.	409.	
14.000	.001	.000	.39	207.61	1.47	.63	194.40	2.64	-.35	55.	409.	
15.000	99.999	99.999	999.99	202.80	1.29	.32	999.99	99.99	999.99	1.	409.	
16.000	99.999	99.999	999.99	199.47	1.23	-.22	999.99	99.99	999.99	0.	410.	
17.000	99.999	99.999	999.99	199.02	1.67	-.23	999.99	99.99	999.99	0.	405.	
18.000	99.999	99.999	999.99	202.65	2.44	.35	999.99	99.99	999.99	0.	402.	
19.000	99.999	99.999	999.99	206.97	2.27	-.11	999.99	99.99	999.99	0.	403.	
20.000	99.999	99.999	999.99	210.77	2.45	.29	999.99	99.99	999.99	0.	400.	
21.000	99.999	99.999	999.99	213.73	2.73	.61	999.99	99.99	999.99	0.	365.	
22.000	99.999	99.999	999.99	216.02	2.52	.56	999.99	99.99	999.99	0.	383.	
23.000	99.999	99.999	999.99	218.00	2.20	.44	999.99	99.99	999.99	0.	372.	
24.000	99.999	99.999	999.99	219.96	2.18	.15	999.99	99.99	999.99	0.	372.	
25.000	99.999	99.999	999.99	221.88	2.35	.04	999.99	99.99	999.99	0.	368.	
26.000	99.999	99.999	999.99	223.85	2.15	-.09	999.99	99.99	999.99	0.	350.	
27.000	99.999	99.999	999.99	225.51	2.09	-.01	999.99	99.99	999.99	0.	317.	
28.000	99.999	99.999	999.99	226.03	1.99	-.05	999.99	99.99	999.99	0.	314.	
29.000	99.999	99.999	999.99	228.20	2.22	.11	999.99	99.99	999.99	0.	255.	
30.000	99.999	99.999	999.99	230.33	2.06	-.24	999.99	99.99	999.99	0.	251.	

TABLE III-10. MOISTURE RELATED STATISTICAL PARAMETERS

OCTOBER

STATION - 615020		ASCENSION (WIDE AWAKE)			TV		DEWPT T		S.D. OPT		NOBS T+P	NOBS TV
Z	VAPOR P	S.D. VP	SKEN VP	TV	S.D.	SKEN TV	MEAN	S.D. OPT	SKEN OPT			
KM	MB	MB		DEC K	DEC K		DEC K	DEC K				
.000	20.221	2.008	.01	203.99	1.22	.01	290.76	1.06	-.26	388.	388.	
.020	20.097	2.061	.00	209.94	1.20	-.03	290.66	1.04	-.27	427.	427.	
1.000	14.532	1.584	-.14	200.64	.95	.30	265.60	1.80	-.43	432.	433.	
2.000	5.631	2.195	.30	203.93	1.93	-.80	271.72	5.47	-.42	394.	433.	
3.000	3.944	1.571	.08	204.29	1.20	-.16	266.21	5.87	-.61	398.	433.	
4.000	2.139	1.025	.43	277.00	1.19	.35	250.20	6.27	-.24	334.	433.	
5.000	.949	.483	1.01	272.20	1.44	.30	245.83	5.54	.15	292.	433.	
6.000	.535	.273	1.06	200.59	1.49	.18	242.67	5.23	.20	274.	433.	
7.000	.323	.173	1.07	200.57	1.39	.19	237.42	5.16	.25	283.	433.	
8.000	.190	.100	1.52	203.78	1.42	.07	232.13	5.24	.10	287.	433.	
9.000	.080	.049	.58	240.23	1.44	.22	225.15	4.97	-.48	296.	432.	
10.000	.048	.022	.34	233.00	1.45	.41	220.22	4.59	-.96	256.	432.	
11.000	.022	.009	.54	220.91	1.26	.43	214.25	3.22	-.46	225.	432.	
12.000	.009	.003	.33	221.97	1.14	.41	207.78	2.84	-.54	225.	431.	
13.000	.003	.001	.53	214.31	1.13	.32	200.49	3.19	-.44	120.	430.	
14.000	.001	.001	1.08	207.48	1.23	.23	194.18	3.22	-.23	64.	430.	
15.000	.001	.000	.10	201.94	1.34	.35	190.18	3.45	-.43	7.	429.	
16.000	99.920	99.929	99.92	190.45	1.39	-.07	99.99	99.99	99.99	0.	429.	
17.000	99.909	99.933	99.90	107.56	1.86	-.48	99.99	99.99	99.99	0.	427.	
18.000	99.909	99.919	99.90	200.60	2.63	-.11	99.99	99.99	99.99	0.	427.	
19.000	99.907	99.923	99.90	206.30	2.50	-.26	99.99	99.99	99.99	0.	420.	
20.000	99.907	99.923	99.90	210.31	2.52	.34	99.99	99.99	99.99	0.	421.	
21.000	99.909	99.920	99.90	210.36	2.00	.43	99.99	99.99	99.99	0.	406.	
22.000	99.909	99.929	99.90	214.23	2.09	.38	99.99	99.99	99.99	0.	404.	
23.000	99.909	99.920	99.90	217.07	2.47	.17	99.99	99.99	99.99	0.	395.	
24.000	99.909	99.920	99.90	219.43	2.63	.21	99.99	99.99	99.99	0.	395.	
25.000	99.909	99.920	99.90	221.50	2.46	-.27	99.99	99.99	99.99	0.	369.	
26.000	99.909	99.920	99.90	223.60	2.32	-.15	99.99	99.99	99.99	0.	369.	
27.000	99.909	99.920	99.90	225.60	2.26	.09	99.99	99.99	99.99	0.	330.	
28.000	99.909	99.920	99.90	227.62	2.28	.03	99.99	99.99	99.99	0.	326.	
29.000	99.909	99.920	99.90	229.60	2.43	.12	99.99	99.99	99.99	0.	274.	
30.000	99.909	99.920	99.90	232.12	2.32	.05	99.99	99.99	99.99	0.	268.	

TABLE III-11. MOISTURE RELATED STATISTICAL PARAMETERS

NOVEMBER

STATION = 615020		ASCENSION (WIDE AWAKE)											
Z	VAPOR P	S.D. VP	SKW VP	TV	TV	SKW TV	DEPRT T	S.D. OPT	SKW OPT	NOBS T+P	NOBS TV		
	MEAN			MEAN	S.D.		MEAN						
KM	PS	MB		DEG K	DEG K		DEG K	DEG K					
.000	21.037	2.091	-.30	290.55	1.21	.11	291.33	1.62	-.61	405.	405.		
.020	20.504	2.122	-.35	290.49	1.20	-.05	291.28	1.65	-.66	429.	429.		
1.000	15.008	1.783	-.01	291.19	1.10	.02	296.09	1.84	-.27	429.	430.		
2.000	6.518	2.477	.19	293.49	1.62	-.79	273.04	5.85	-.65	406.	430.		
3.000	4.044	1.630	.18	283.93	1.29	-.18	266.49	6.02	-.63	381.	430.		
4.000	2.005	1.026	.65	278.15	1.34	.20	257.37	6.26	-.03	325.	430.		
5.000	1.012	.544	1.81	272.69	1.43	.03	249.53	5.54	.31	302.	430.		
6.000	.581	.259	1.12	266.78	1.55	.10	243.52	5.27	.20	294.	430.		
7.000	.333	.176	1.02	260.35	1.60	.23	237.73	5.21	.12	293.	430.		
8.000	.191	.105	.07	253.02	1.51	.22	232.18	5.33	-.09	308.	430.		
9.000	.105	.056	.64	246.02	1.05	.16	225.63	5.34	-.54	315.	428.		
10.000	.052	.026	.73	239.00	1.73	.21	220.80	4.83	-.87	274.	426.		
11.000	.022	.009	.45	229.68	1.40	-.18	214.20	3.55	-.63	256.	425.		
12.000	.009	.004	.76	221.62	1.25	-.02	207.71	3.16	-.49	256.	425.		
13.000	.003	.001	.23	214.35	1.27	.23	200.55	3.37	-.60	139.	424.		
14.000	.001	.001	.21	207.71	1.27	.10	194.65	3.18	-.59	99.	424.		
15.000	.001	.000	-.24	201.53	1.46	.25	187.78	2.33	-.60	0.	423.		
16.000	99.999	99.999	999.99	197.88	1.56	-.05	999.99	99.99	999.99	0.	421.		
17.000	99.999	99.999	999.99	193.53	1.74	-.14	999.99	99.99	999.99	0.	415.		
18.000	99.999	99.999	999.99	188.33	2.45	.15	999.99	99.99	999.99	0.	412.		
19.000	99.999	99.999	999.99	203.52	2.49	.16	999.99	99.99	999.99	0.	409.		
20.000	99.999	99.999	999.99	207.60	2.42	.40	999.99	99.99	999.99	0.	406.		
21.000	99.999	99.999	999.99	211.16	2.50	.87	999.99	99.99	999.99	0.	393.		
22.000	99.999	99.999	999.99	213.97	2.35	.59	999.99	99.99	999.99	0.	392.		
23.000	99.999	99.999	999.99	215.41	1.92	.48	999.99	99.99	999.99	0.	387.		
24.000	99.999	99.999	999.99	218.70	2.14	-.03	999.99	99.99	999.99	0.	386.		
25.000	99.999	99.999	999.99	221.03	2.15	-.04	999.99	99.99	999.99	0.	382.		
26.000	99.999	99.999	999.99	223.04	2.07	.05	999.99	99.99	999.99	0.	367.		
27.000	99.999	99.999	999.99	226.53	2.37	.33	999.99	99.99	999.99	0.	334.		
28.000	99.999	99.999	999.99	229.07	2.50	.30	999.99	99.99	999.99	0.	324.		
29.000	99.999	99.999	999.99	231.37	2.52	-.03	999.99	99.99	999.99	0.	266.		
30.000	99.999	99.999	999.99	233.49	2.42	.15	999.99	99.99	999.99	0.	263.		

TABLE III-12. MOISTURE RELATED STATISTICAL PARAMETERS

DECEMBER

STATION = 619020		ASCENSION (WICE ARRIE)		TV		DEWPT T		S.D. DPT		NOBS T+P		NOBS TV	
Z	VAPOR P MEAN	S.D. VP	SKEM VP	TV MEAN	S.D.	MEAN	S.D.	SKEM TV	DEWPT T MEAN	S.D. DPT	SKEM DPT	NOBS T+P	NOBS TV
KM	MB	MB		DEG K	DEG K	DEG K	DEG K						
1.000	21.076	2.210	-1.19	201.11	1.29	201.60	1.66	.04	201.60	1.66	-1.43	428.	428.
1.000	21.077	2.175	-1.16	201.04	1.25	201.79	1.64	.01	201.79	1.64	-1.43	453.	453.
1.000	19.079	1.000	-1.07	201.00	1.34	200.34	1.95	.49	200.34	1.95	-1.48	450.	453.
2.000	6.744	2.000	.31	273.00	1.02	273.03	5.16	-1.91	273.03	5.16	-1.47	428.	453.
3.000	4.431	1.000	.24	201.21	1.41	207.04	5.30	-1.39	207.04	5.30	-1.01	431.	453.
4.000	2.000	1.101	.44	277.05	1.20	260.72	6.01	.03	260.72	6.01	-1.25	374.	453.
5.000	1.014	1.000	1.64	272.49	1.55	251.59	0.13	.10	251.59	0.13	-1.13	341.	453.
6.000	.000	.315	1.00	200.00	1.09	243.04	5.33	.18	243.04	5.33	-1.17	319.	453.
7.000	.237	.178	.73	200.00	1.43	257.91	5.16	.23	257.91	5.16	-1.00	318.	452.
8.000	.105	.159	.64	200.00	1.40	272.40	5.17	.25	272.40	5.17	-1.04	332.	450.
9.000	.101	.101	.40	200.01	1.03	200.43	5.17	.46	200.43	5.17	-1.00	330.	449.
10.000	.000	.000	.00	200.00	1.70	200.51	4.00	.67	200.51	4.00	-1.01	201.	448.
11.000	.000	.000	.67	200.00	1.36	214.09	3.03	-1.25	214.09	3.03	-1.49	250.	448.
12.000	.000	.004	.69	201.00	1.36	207.79	2.97	-1.12	207.79	2.97	-1.49	250.	447.
13.000	.004	.002	.71	214.35	1.39	201.36	3.03	-1.11	201.36	3.03	-1.48	147.	447.
14.000	.000	.001	.61	207.73	1.50	153.59	2.77	.33	153.59	2.77	-1.64	S+.	447.
15.000	.001	.000	.00	201.07	1.69	191.53	1.49	.53	191.53	1.49	-1.10	8.	446.
16.000	99.000	99.000	99.00	197.00	1.80	000.00	00.00	.30	000.00	00.00	99.00	0.	446.
17.000	99.000	99.000	99.00	197.00	1.69	000.00	00.00	.04	000.00	00.00	99.00	0.	420.
18.000	99.000	99.000	99.00	197.19	2.67	000.00	00.00	.75	000.00	00.00	99.00	0.	440.
19.000	99.000	99.000	99.00	201.09	2.78	000.00	00.00	-1.09	000.00	00.00	99.00	0.	439.
20.000	99.000	99.000	99.00	200.47	2.56	000.00	00.00	-1.06	000.00	00.00	99.00	0.	436.
21.000	99.000	99.000	99.00	210.31	2.42	000.00	00.00	.46	000.00	00.00	99.00	0.	427.
22.000	99.000	99.000	99.00	213.43	2.26	000.00	00.00	.40	000.00	00.00	99.00	0.	424.
23.000	99.000	99.000	99.00	215.70	2.05	000.00	00.00	.55	000.00	00.00	99.00	0.	420.
24.000	99.000	99.000	99.00	217.65	2.12	000.00	00.00	.11	000.00	00.00	99.00	0.	418.
25.000	99.000	99.000	99.00	210.20	2.06	000.00	00.00	.14	000.00	00.00	99.00	0.	416.
26.000	99.000	99.000	99.00	223.00	2.22	000.00	00.00	.31	000.00	00.00	99.00	0.	407.
27.000	99.000	99.000	99.00	219.00	2.51	000.00	00.00	.25	000.00	00.00	99.00	0.	374.
28.000	99.000	99.000	99.00	219.00	2.64	000.00	00.00	.44	000.00	00.00	99.00	0.	307.
29.000	99.000	99.000	99.00	230.00	2.71	000.00	00.00	.39	000.00	00.00	99.00	0.	293.
30.000	99.000	99.000	99.00	232.61	2.30	000.00	00.00	.33	000.00	00.00	99.00	0.	293.

TABLE III-13. MOISTURE RELATED STATISTICAL PARAMETERS

ANNUAL

STATION - 015000		ASBESTOS (WIDE AREA)				TV		DOWNT		S.D. DPT		SKEW DPT		NOBS T+P		NOBS TV	
Z	VAR OF P	S.D. VP	SKEW VP	TV	TV	S.D.	SKEW TV	DOWN T	DOWN T	S.D.	SKEW	NOBS	T+P	NOBS	TV	NOBS	TV
KM	MM	MM		MM	MM	MM		MM	MM	MM							
000	20.000	3.000	15	201.00	1.91	.03	201.00	2.00	-1.20	4924.	4924.						
001	20.000	3.000	17	201.00	1.60	.03	201.00	2.01	-1.19	5003.	5003.						
002	20.000	3.000	19	201.00	1.60	.10	201.00	2.33	-1.31	5403.	5403.						
003	20.000	3.000	21	201.00	2.22	-.76	201.00	6.40	-1.46	5011.	5400.						
004	20.000	3.000	23	201.00	1.46	-.24	201.00	6.31	-1.37	4725.	5400.						
005	20.000	3.000	25	201.00	1.47	.07	201.00	6.64	-1.05	4091.	5400.						
006	20.000	3.000	27	201.00	1.50	.00	201.00	6.11	.43	3500.	5400.						
007	20.000	3.000	29	201.00	1.52	.08	201.00	5.69	.44	3473.	5400.						
008	20.000	3.000	31	201.00	1.54	.10	201.00	5.30	.27	3400.	5400.						
009	20.000	3.000	33	201.00	1.56	.10	201.00	5.41	.00	3400.	5400.						
010	20.000	3.000	35	201.00	1.58	.10	201.00	5.42	-1.23	3400.	5400.						
011	20.000	3.000	37	201.00	1.59	.10	201.00	5.42	-1.23	3400.	5400.						
012	20.000	3.000	39	201.00	1.60	.10	201.00	5.42	-1.23	3400.	5400.						
013	20.000	3.000	41	201.00	1.61	.10	201.00	5.42	-1.23	3400.	5400.						
014	20.000	3.000	43	201.00	1.62	.10	201.00	5.42	-1.23	3400.	5400.						
015	20.000	3.000	45	201.00	1.63	.10	201.00	5.42	-1.23	3400.	5400.						
016	20.000	3.000	47	201.00	1.64	.10	201.00	5.42	-1.23	3400.	5400.						
017	20.000	3.000	49	201.00	1.65	.10	201.00	5.42	-1.23	3400.	5400.						
018	20.000	3.000	51	201.00	1.66	.10	201.00	5.42	-1.23	3400.	5400.						
019	20.000	3.000	53	201.00	1.67	.10	201.00	5.42	-1.23	3400.	5400.						
020	20.000	3.000	55	201.00	1.68	.10	201.00	5.42	-1.23	3400.	5400.						
021	20.000	3.000	57	201.00	1.69	.10	201.00	5.42	-1.23	3400.	5400.						
022	20.000	3.000	59	201.00	1.70	.10	201.00	5.42	-1.23	3400.	5400.						
023	20.000	3.000	61	201.00	1.71	.10	201.00	5.42	-1.23	3400.	5400.						
024	20.000	3.000	63	201.00	1.72	.10	201.00	5.42	-1.23	3400.	5400.						
025	20.000	3.000	65	201.00	1.73	.10	201.00	5.42	-1.23	3400.	5400.						
026	20.000	3.000	67	201.00	1.74	.10	201.00	5.42	-1.23	3400.	5400.						
027	20.000	3.000	69	201.00	1.75	.10	201.00	5.42	-1.23	3400.	5400.						
028	20.000	3.000	71	201.00	1.76	.10	201.00	5.42	-1.23	3400.	5400.						
029	20.000	3.000	73	201.00	1.77	.10	201.00	5.42	-1.23	3400.	5400.						
030	20.000	3.000	75	201.00	1.78	.10	201.00	5.42	-1.23	3400.	5400.						
031	20.000	3.000	77	201.00	1.79	.10	201.00	5.42	-1.23	3400.	5400.						
032	20.000	3.000	79	201.00	1.80	.10	201.00	5.42	-1.23	3400.	5400.						
033	20.000	3.000	81	201.00	1.81	.10	201.00	5.42	-1.23	3400.	5400.						
034	20.000	3.000	83	201.00	1.82	.10	201.00	5.42	-1.23	3400.	5400.						
035	20.000	3.000	85	201.00	1.83	.10	201.00	5.42	-1.23	3400.	5400.						
036	20.000	3.000	87	201.00	1.84	.10	201.00	5.42	-1.23	3400.	5400.						
037	20.000	3.000	89	201.00	1.85	.10	201.00	5.42	-1.23	3400.	5400.						
038	20.000	3.000	91	201.00	1.86	.10	201.00	5.42	-1.23	3400.	5400.						
039	20.000	3.000	93	201.00	1.87	.10	201.00	5.42	-1.23	3400.	5400.						
040	20.000	3.000	95	201.00	1.88	.10	201.00	5.42	-1.23	3400.	5400.						
041	20.000	3.000	97	201.00	1.89	.10	201.00	5.42	-1.23	3400.	5400.						
042	20.000	3.000	99	201.00	1.90	.10	201.00	5.42	-1.23	3400.	5400.						
043	20.000	3.000	101	201.00	1.91	.10	201.00	5.42	-1.23	3400.	5400.						
044	20.000	3.000	103	201.00	1.92	.10	201.00	5.42	-1.23	3400.	5400.						
045	20.000	3.000	105	201.00	1.93	.10	201.00	5.42	-1.23	3400.	5400.						
046	20.000	3.000	107	201.00	1.94	.10	201.00	5.42	-1.23	3400.	5400.						
047	20.000	3.000	109	201.00	1.95	.10	201.00	5.42	-1.23	3400.	5400.						
048	20.000	3.000	111	201.00	1.96	.10	201.00	5.42	-1.23	3400.	5400.						
049	20.000	3.000	113	201.00	1.97	.10	201.00	5.42	-1.23	3400.	5400.						
050	20.000	3.000	115	201.00	1.98	.10	201.00	5.42	-1.23	3400.	5400.						
051	20.000	3.000	117	201.00	1.99	.10	201.00	5.42	-1.23	3400.	5400.						
052	20.000	3.000	119	201.00	2.00	.10	201.00	5.42	-1.23	3400.	5400.						
053	20.000	3.000	121	201.00	2.01	.10	201.00	5.42	-1.23	3400.	5400.						
054	20.000	3.000	123	201.00	2.02	.10	201.00	5.42	-1.23	3400.	5400.						
055	20.000	3.000	125	201.00	2.03	.10	201.00	5.42	-1.23	3400.	5400.						
056	20.000	3.000	127	201.00	2.04	.10	201.00	5.42	-1.23	3400.	5400.						
057	20.000	3.000	129	201.00	2.05	.10	201.00	5.42	-1.23	3400.	5400.						
058	20.000	3.000	131	201.00	2.06	.10	201.00	5.42	-1.23	3400.	5400.						
059	20.000	3.000	133	201.00	2.07	.10	201.00	5.42	-1.23	3400.	5400.						
060	20.000	3.000	135	201.00	2.08	.10	201.00	5.42	-1.23	3400.	5400.						
061	20.000	3.000	137	201.00	2.09	.10	201.00	5.42	-1.23	3400.	5400.						
062	20.000	3.000	139	201.00	2.10	.10	201.00	5.42	-1.23	3400.	5400.						
063	20.000	3.000	141	201.00	2.11	.10	201.00	5.42	-1.23	3400.	5400.						
064	20.000	3.000	143	201.00	2.12	.10	201.00	5.42	-1.23	3400.	5400.						
065	20.000	3.000	145	201.00	2.13	.10	201.00	5.42	-1.23	3400.	5400.						
066	20.000	3.000	147	201.00	2.14	.10	201.00	5.42	-1.23	3400.	5400.						
067	20.000	3.000	149	201.00	2.15	.10	201.00	5.42	-1.23	3400.	5400.						
068	20.000	3.000	151	201.00	2.16	.10	201.00	5.42	-1.23	3400.	5400.						
069	20.000	3.000	153	201.00	2.17	.10	201.00	5.42	-1.23	3400.	5400.						
070	20.000	3.000	155	201.00	2.18	.10	201.00	5.42	-1.23	3400.	5400.						
071	20.000	3.000	157	201.00	2.19	.10	201.00	5.42	-1.23	3400.	5400.						
072	20.000	3.000	159	201.00	2.20	.10	201.00	5.42	-1.23	3400.	5400.						
073	20.000	3.000	161	201.00	2.21	.10	201.00	5.42	-1.23	3400.	5400.						
074	20.000	3.000	163	201.00	2.22	.10	201.00	5.42	-1.23	3400.	5400.						
075	20.000	3.000	165	201.00	2.23	.10	201.00	5.42	-1.23	3400.	5400.						
076	20.000	3.000	167	201.00	2.24	.10	201.00	5.42	-1.23	3400.	5400.						
077	20.000	3.000	169	201.00	2.25	.10	201.00	5.42	-1.23	3400.	5400.						
078	20.000	3.000	171	201.00	2.26	.10	201.00	5.42	-1.23	3400.	5400.						
079	20.000	3.000	173	201.00	2.27	.10	201.00	5.42	-1.23	3400.	5400.						
080	20.000	3.000	175	201.00	2.28	.10	201.00	5.42	-1.23	3400.	5400.						
081	20.000	3.000	177	201.00	2.29	.10	201.00	5.42	-1.23	3400.	5400.						
082	20.000	3.000	179	201.00	2.30	.10	201.00	5.42	-1.23	3400.	5400.						
083	20.000	3.000	181	201.00	2.31	.10	201.00	5.42	-1.23	3400.	5400.						
084	20.000	3.000	183	201.00	2.32	.10	201.00	5.42	-1.23	3400.	5400.						
085	20.000	3.000	185	201.00	2.33	.10	201.00	5.42	-1.23	3400.	5400.						
086	20.000	3.000	187	201.00	2.34	.10	201.00	5.42	-1.23	3400.	5400.						
087	20.000	3.000	189	201.00	2.35	.10	201.00	5.42	-1.23	3400.	5400.						
088	20.000	3.000	191	201.00	2.36	.10	201.00	5.42	-1.23	3400.	5400.						
089	20.000	3.000	193	201.00	2.37	.10	201.00	5.42	-1.23	3400.	5400.						
090	20.000	3.000	195	201.00	2.38	.10	201.00	5.42	-1.23	3400.	5400.						
091	20.000	3.000	197	201.00	2.39	.10	201.00	5.42	-1.23	3400.	5400.						
092	20.000	3.000	199	201.00	2.40	.10	201.00	5.42	-1.23	3400.	5400.						
093	20.000	3.000	201	201.00	2.41	.10	201.00	5.42	-1.23	3400.	5400.						
094	20.000	3.000	203	201.00	2.42	.10	201.00	5.42	-1.23	3400.	5400.						
095	20.000	3.000	205	201.00	2.43	.10	201.00	5.42	-1.23	3400.	5400.						
096	20.000	3.000	207	201.00	2.44	.10	201.00	5.42	-1.23	3400.	5400.						
097	20.000	3.000	209	201.00	2.45	.10	201.00	5.42	-1.23	3400.	5400.						
098	20.0																

TABLE IV-1. HYDROSTATIC MODEL ATMOSPHERE

JANUARY

STATION = 615020		ASCENSION (WIDE AWAKE)		
Z	GEO. HT.	P	D	TV
KM	KM	MB	G/M3	DEG K
.000	.000	1008.5000	1161.0000	302.02
.020	.020	1004.3000	1159.0000	301.52
1.000	.697	997.6300	1067.0000	275.00
2.000	1.934	798.6500	953.2000	260.05
3.000	2.691	700.4100	833.3000	254.63
4.000	3.987	620.5000	787.7000	277.93
5.000	4.693	555.4000	710.3000	272.42
6.000	5.978	460.0300	633.1000	265.63
7.000	6.974	430.3000	575.6000	260.33
8.000	7.969	377.0300	516.4000	253.39
9.000	8.964	329.0400	460.3000	245.02
10.000	9.959	285.0000	418.7000	237.91
11.000	10.953	247.2600	375.1000	229.05
12.000	11.948	212.7400	333.0000	221.55
13.000	12.940	182.1100	295.5000	214.68
14.000	13.933	155.1000	259.7000	208.06
15.000	14.926	131.4600	226.5000	202.16
16.000	15.918	110.0000	195.5000	197.71
17.000	16.911	93.3700	165.5000	193.43
18.000	17.903	78.6500	139.2000	189.52
19.000	18.894	66.2400	114.8000	186.99
20.000	19.883	56.0700	94.0000	185.69
21.000	20.877	47.6300	79.2300	189.47
22.000	21.867	40.5770	66.5000	218.29
23.000	22.853	34.6260	56.2400	214.49
24.000	23.848	29.5370	47.0500	216.40
25.000	24.837	25.3350	40.3500	218.51
26.000	25.827	21.7230	34.7800	221.00
27.000	26.816	18.0810	29.0700	223.04
28.000	27.795	14.0270	24.7400	228.07
29.000	28.793	13.0400	21.1100	223.44
30.000	29.781	11.9400	18.0000	220.49
32.000	31.757	8.0317	13.3000	233.67
34.000	33.731	6.7061	9.9130	225.94
36.000	35.704	5.0584	7.3470	241.15
38.000	37.676	3.6375	5.4510	246.59
40.000	39.646	2.9512	4.0570	253.04
42.000	41.615	2.2531	3.0220	259.85
44.000	43.583	1.7475	2.3030	265.53
46.000	45.550	1.3373	1.7800	267.13
48.000	47.518	1.0566	1.3790	269.38
50.000	49.480	.8234	1.0592	269.84
52.000	51.443	.6423	.8320	270.09
54.000	53.405	.5009	.6517	269.21
56.000	55.366	.3903	.5107	267.66
58.000	57.325	.3034	.4020	263.91
60.000	59.283	.2350	.3174	259.26
62.000	61.240	.1812	.2463	254.53
64.000	63.198	.1391	.1946	250.30
66.000	65.150	.1059	.1547	239.71

TABLE IV-2. HYDROSTATIC MODEL ATMOSPHERE

FEBRUARY

STATION • 618020		ASCENSION (WIDE AREA)		
Z	GEO. HT.	P	D	TV
KM	KM	MB	GM3	°C K
0.000	0.000	1006.3000	1157.0000	323.10
0.000	0.020	1004.0200	1154.0000	322.93
1.000	1.007	897.0000	1054.0000	277.00
2.000	1.954	790.0100	953.0000	232.17
3.000	2.881	709.0100	853.0000	194.50
4.000	3.787	639.7000	767.0000	160.05
5.000	4.683	583.0000	703.0000	128.92
6.000	5.579	539.0000	659.0000	107.42
7.000	6.474	499.0000	629.0000	90.81
8.000	7.369	467.0000	607.0000	78.02
9.000	8.264	439.0000	593.0000	68.42
10.000	9.159	415.0000	583.0000	61.45
11.000	10.054	394.0000	577.0000	56.10
12.000	10.949	375.0000	574.0000	52.32
13.000	11.844	358.0000	573.0000	49.97
14.000	12.739	343.0000	574.0000	47.96
15.000	13.634	330.0000	577.0000	46.23
16.000	14.529	318.0000	581.0000	44.65
17.000	15.424	307.0000	586.0000	43.22
18.000	16.319	297.0000	592.0000	41.92
19.000	17.214	288.0000	599.0000	40.75
20.000	18.109	279.0000	607.0000	39.70
21.000	19.004	271.0000	616.0000	38.77
22.000	19.899	264.0000	626.0000	37.94
23.000	20.794	258.0000	637.0000	37.21
24.000	21.689	253.0000	649.0000	36.55
25.000	22.584	248.0000	662.0000	35.93
26.000	23.479	244.0000	676.0000	35.35
27.000	24.374	240.0000	691.0000	34.81
28.000	25.269	237.0000	707.0000	34.30
29.000	26.164	234.0000	724.0000	33.81
30.000	27.059	231.0000	742.0000	33.34
31.000	27.954	229.0000	761.0000	32.89
32.000	28.849	227.0000	781.0000	32.45
33.000	29.744	225.0000	802.0000	32.02
34.000	30.639	224.0000	824.0000	31.60
35.000	31.534	223.0000	847.0000	31.19
36.000	32.429	222.0000	871.0000	30.79
37.000	33.324	221.0000	896.0000	30.40
38.000	34.219	220.0000	922.0000	30.01
39.000	35.114	219.0000	949.0000	29.63
40.000	36.009	218.0000	977.0000	29.25
41.000	36.904	217.0000	1006.0000	28.88
42.000	37.799	216.0000	1036.0000	28.51
43.000	38.694	215.0000	1067.0000	28.14
44.000	39.589	214.0000	1100.0000	27.78
45.000	40.484	213.0000	1134.0000	27.42
46.000	41.379	212.0000	1169.0000	27.06
47.000	42.274	211.0000	1205.0000	26.71
48.000	43.169	210.0000	1242.0000	26.36
49.000	44.064	209.0000	1280.0000	26.01
50.000	44.959	208.0000	1319.0000	25.66
51.000	45.854	207.0000	1359.0000	25.31
52.000	46.749	206.0000	1400.0000	24.96
53.000	47.644	205.0000	1442.0000	24.61
54.000	48.539	204.0000	1485.0000	24.26
55.000	49.434	203.0000	1529.0000	23.91
56.000	50.329	202.0000	1574.0000	23.56
57.000	51.224	201.0000	1620.0000	23.21
58.000	52.119	200.0000	1667.0000	22.86
59.000	53.014	199.0000	1715.0000	22.51
60.000	53.909	198.0000	1764.0000	22.16
61.000	54.804	197.0000	1814.0000	21.81
62.000	55.699	196.0000	1865.0000	21.46
63.000	56.594	195.0000	1917.0000	21.11
64.000	57.489	194.0000	1970.0000	20.76
65.000	58.384	193.0000	2024.0000	20.41
66.000	59.279	192.0000	2079.0000	20.06

TABLE IV-3. HYDROSTATIC MODEL ATMOSPHERE

MARCH

STATION # 619020		ASCENSION (HIDE ANAKE)			
Z	DEC. HT.	P	D	TV	
KM	KM	MB	G/M3	DEG K	
.000	.000	1006.0000	1153.0000	303.92	
.020	.020	1003.7000	1151.0000	303.78	
1.000	.997	697.7500	1062.0000	294.58	
2.000	1.994	703.9900	960.0000	289.94	
3.000	2.991	709.6700	869.1000	284.44	
4.000	3.987	628.8400	785.5000	278.52	
5.000	4.983	535.6500	703.1000	273.09	
6.000	5.979	490.1200	638.4000	267.46	
7.000	6.974	430.8500	574.5000	261.19	
8.000	7.969	377.7200	517.1000	254.45	
9.000	8.964	329.0500	464.9000	247.18	
10.000	9.958	286.0500	417.7000	239.26	
11.000	10.953	248.2600	374.6000	230.86	
12.000	11.946	213.7500	334.3000	222.76	
13.000	12.940	183.0400	296.7000	214.91	
14.000	13.933	155.6000	261.6000	207.60	
15.000	14.926	132.0000	229.3000	201.49	
16.000	15.918	111.3100	197.0000	197.00	
17.000	16.911	93.0500	167.5000	194.65	
18.000	17.903	78.7900	139.6000	193.57	
19.000	18.894	66.4500	115.1000	201.22	
20.000	19.886	56.2710	95.2500	205.80	
21.000	20.877	47.9070	79.4100	209.60	
22.000	21.867	40.7330	66.6000	212.11	
23.000	22.858	34.7070	56.1300	215.72	
24.000	23.848	29.7650	47.5200	218.19	
25.000	24.837	25.5120	40.3300	210.39	
26.000	25.827	21.9030	34.2500	222.61	
27.000	26.816	18.8260	29.1300	225.22	
28.000	27.805	16.2260	24.8200	227.75	
29.000	28.793	14.0010	21.2000	230.10	
30.000	29.781	12.0335	18.1600	232.10	
32.000	31.757	9.0649	13.4100	235.53	
34.000	33.731	6.0250	9.9290	239.61	
36.000	35.704	5.1635	7.3350	244.60	
38.000	37.676	3.9379	5.4560	251.60	
40.000	39.646	3.0265	4.0620	259.73	
42.000	41.615	2.3436	3.0670	256.33	
44.000	43.593	1.8244	2.3500	270.61	
46.000	45.590	1.4242	1.8240	272.11	
48.000	47.516	1.1123	1.4290	271.27	
50.000	49.480	.8677	1.1230	269.31	
52.000	51.443	.6755	.6335	265.52	
54.000	53.405	.5279	.6032	264.28	
56.000	55.366	.4069	.5423	261.43	
58.000	57.325	.3143	.4252	257.67	
60.000	59.283	.2420	.3520	254.07	
62.000	61.240	.1836	.2562	249.57	
64.000	63.195	.1415	.2006	243.40	
66.000	65.150	.1072	.1572	237.33	

TABLE IV-4. HYDROSTATIC MODEL ATMOSPHERE

APRIL

STATION = 619020		ASCENSION (WIDE AWAKE)		
Z	GEO. HT.	P	D	TV
KM	KM	MB	G/MB	°C K
0.000	0.000	1000.0000	1153.0000	303.83
1.000	0.020	1000.0000	1151.0000	303.87
2.000	0.097	937.8100	1062.0000	294.57
3.000	1.234	793.0700	950.7000	290.05
4.000	2.931	709.8100	869.0000	284.07
5.000	3.997	629.0900	785.4000	279.05
6.000	4.993	556.2000	708.1000	273.53
7.000	5.979	490.5100	630.2000	267.75
8.000	6.974	431.2700	574.2000	261.66
9.000	7.929	379.2000	516.3000	255.16
10.000	8.931	320.4200	464.1000	249.03
11.000	9.958	267.4800	417.2000	240.07
12.000	10.953	248.9200	374.5000	231.05
13.000	11.946	214.4000	334.4000	223.36
14.000	12.940	183.6700	297.1000	215.34
15.000	13.933	155.4000	262.4000	207.71
16.000	14.925	132.5000	229.0000	201.00
17.000	15.918	111.7000	198.0000	193.23
18.000	16.911	93.9170	169.2000	184.10
19.000	17.903	78.0000	140.0000	173.94
20.000	18.884	63.0000	115.0000	161.77
21.000	19.870	50.0000	95.1000	149.49
22.000	20.877	47.0710	79.3400	138.03
23.000	21.857	40.0000	66.0000	124.20
24.000	22.803	34.0000	56.0000	117.20
25.000	23.648	29.0000	47.0000	109.00
26.000	24.607	25.7100	40.0000	100.53
27.000	25.627	22.1000	34.0000	90.00
28.000	26.816	19.0000	29.0000	80.00
29.000	27.605	16.4100	24.9000	70.25
30.000	28.793	14.1770	21.3400	61.50
31.000	29.791	12.0000	18.0000	53.47
32.000	31.757	9.2000	13.5000	47.00
33.000	33.771	6.9000	9.5000	41.00
34.000	35.704	5.2000	7.4100	34.60
35.000	37.676	4.0300	5.9000	28.00
36.000	39.646	3.1000	4.1400	20.00
37.000	41.615	2.4000	3.1500	12.42
38.000	43.583	1.8000	2.4120	6.67
39.000	45.550	1.4500	1.8750	0.54
40.000	47.516	1.1700	1.4000	-30.00
41.000	49.460	0.9200	1.1400	-38.00
42.000	51.403	0.6700	0.9000	-45.00
43.000	53.405	0.5300	0.7079	-52.94
44.000	55.359	0.4100	0.5444	-59.07
45.000	57.305	0.3100	0.4330	-64.24
46.000	59.283	0.2400	0.3300	-68.10
47.000	61.240	0.1800	0.2514	-71.14
48.000	63.156	0.1400	0.2000	-74.10
49.000	65.150	0.1000	0.1500	-77.00

TABLE IV-5. HYDROSTATIC MODEL ATMOSPHERE

MAY

STATION = 619020		ASCENSION (WIDE AREA)		
Z	GEO. HT.	P	D	TV
KM	KM	MB	G/M3	CEG K
.000	.000	1007.4000	1157.0000	303.29
.020	.020	1005.2000	1155.0000	303.16
1.000	.027	823.7800	1055.0000	273.67
2.000	1.024	752.6000	993.0000	263.17
3.000	2.991	710.1000	930.0000	254.24
4.000	3.937	670.4000	869.0000	247.24
5.000	4.903	636.5000	809.0000	241.23
6.000	5.979	600.8000	750.0000	236.76
7.000	6.974	571.0000	694.0000	231.65
8.000	7.939	539.4000	640.0000	225.20
9.000	8.874	506.0000	589.0000	218.08
10.000	9.950	477.6000	541.0000	210.14
11.000	10.953	449.0000	496.0000	201.43
12.000	11.946	424.5000	454.0000	192.06
13.000	12.940	403.7800	417.0000	182.29
14.000	13.933	385.5000	382.0000	172.75
15.000	14.926	369.6000	349.0000	163.51
16.000	15.918	355.8000	319.0000	153.90
17.000	16.911	344.1000	291.0000	143.28
18.000	17.903	334.3000	266.0000	132.01
19.000	18.894	326.0000	243.0000	120.79
20.000	19.885	319.1000	222.0000	109.50
21.000	20.877	313.5000	203.0000	98.59
22.000	21.867	309.1000	186.0000	87.07
23.000	22.859	305.8000	171.0000	76.00
24.000	23.843	303.6000	157.0000	65.57
25.000	24.827	302.4000	145.0000	55.29
26.000	25.827	302.2000	134.0000	45.65
27.000	26.816	303.0000	125.0000	36.59
28.000	27.800	304.8000	117.0000	28.02
29.000	28.783	307.5000	110.0000	20.00
30.000	29.761	311.0000	105.0000	12.60
32.000	31.757	326.5000	13.0000	236.13
34.000	33.731	7.0104	10.1100	243.19
36.000	35.704	5.3347	7.5140	249.78
38.000	37.676	4.0019	5.5100	254.34
40.000	39.646	3.1416	4.2410	258.34
42.000	41.615	2.4302	3.2200	261.46
44.000	43.583	1.8376	2.4710	263.64
46.000	45.550	1.4397	1.9110	265.45
48.000	47.516	1.1405	1.4590	266.60
50.000	49.480	.8928	1.1040	267.66
52.000	51.443	.6946	.8157	268.77
54.000	53.405	.5392	.7173	269.33
56.000	55.366	.4172	.5933	269.31
58.000	57.325	.3217	.4417	269.11
60.000	59.283	.2409	.3450	268.62
62.000	61.240	.1865	.2654	267.24
64.000	63.196	.1429	.2113	265.96
66.000	65.150	.1063	.1630	221.66

TABLE IV-6. HYDROSTATIC MODEL ATMOSPHERE

JUNI

STATION = 610020		ASCENSION (WIDE AREA)		
Z	GEO. HT.	P	D	TV
KM	KM	MB	CM ³	CEG K
0.000	0.000	1009.1000	1164.0000	302.03
0.020	0.020	1006.9000	1162.0000	301.94
1.000	0.937	929.3700	1072.0000	292.45
2.000	1.904	800.1700	959.3000	287.15
3.000	2.991	710.3500	870.1000	284.40
4.000	3.997	629.4500	787.4000	282.47
5.000	4.993	556.3300	710.7000	282.30
6.000	5.979	490.4400	633.9000	287.00
7.000	6.974	431.1700	575.4000	286.84
8.000	7.969	377.6100	517.5000	284.33
9.000	8.964	329.0200	465.5000	246.96
10.000	9.953	285.9100	419.1000	230.60
11.000	10.933	246.2300	375.1000	230.26
12.000	11.946	213.6400	334.9000	222.25
13.000	12.940	182.0900	295.9000	214.56
14.000	13.933	155.7300	261.3000	207.63
15.000	14.925	131.9700	227.5000	202.03
16.000	15.918	111.4100	195.0000	190.41
17.000	16.911	93.8740	165.5000	197.45
18.000	17.903	79.1000	137.7000	200.35
19.000	18.894	66.9330	113.6000	205.01
20.000	19.885	56.8320	94.6000	203.41
21.000	20.877	48.4550	79.3000	210.74
22.000	21.857	41.3710	65.8500	215.62
23.000	22.839	35.3540	56.5000	218.04
24.000	23.848	30.3330	47.8000	220.66
25.000	24.837	26.0480	40.6600	203.03
26.000	25.827	22.4010	34.5000	202.17
27.000	26.815	19.2000	29.3000	224.63
28.000	27.805	16.6370	25.3000	217.58
29.000	28.793	14.3550	21.7800	220.55
30.000	29.781	12.4034	18.6200	221.00
32.000	31.757	9.3017	13.7000	237.14
34.000	33.731	7.0002	10.1500	242.14
36.000	35.704	5.3708	7.5500	246.53
38.000	37.676	4.0645	5.6390	251.25
40.000	39.646	3.1176	4.2600	255.69
42.000	41.615	2.4004	3.2720	260.14
44.000	43.593	1.8507	2.4650	264.05
46.000	45.550	1.4423	1.8700	263.33
48.000	47.516	1.1220	1.4060	267.76
50.000	49.480	.8732	1.1410	267.52
52.000	51.443	.6753	.8843	265.81
54.000	53.405	.5273	.7002	253.94
56.000	55.365	.4082	.5722	259.50
58.000	57.325	.3146	.4724	264.72
60.000	59.285	.2412	.3957	260.53
62.000	61.240	.1875	.3297	244.10
64.000	63.196	.1425	.2670	254.16
65.000	65.150	.1037	.1602	226.41

TABLE IV-7. HYDROSTATIC MODEL ATMOSPHERE

JULY

STATION # 618020		ASCENSION (WIDE AWAKE)		
Z	GEO. HT.	P	D	TV
KM	KM	MB	G/M3	DEG K
.000	.000	1010.4000	1170.0000	230.00
.020	.020	1008.1000	1167.0000	230.00
1.000	.597	900.6000	1077.0000	231.41
2.000	1.924	800.5400	972.1000	205.68
3.000	2.991	710.4500	873.0000	203.51
4.000	3.587	629.3000	783.0000	207.03
5.000	4.993	555.1300	710.6000	202.53
6.000	5.979	490.2300	640.0000	203.62
7.000	6.974	430.5000	576.5000	200.40
8.000	7.909	377.4900	519.1000	203.34
9.000	8.934	329.4200	467.1000	205.66
10.000	9.958	286.2100	419.7000	207.55
11.000	10.953	247.4400	376.2000	209.12
12.000	11.946	212.8100	335.0000	221.32
13.000	12.940	182.0000	296.4000	213.59
14.000	13.933	155.0000	260.1000	207.64
15.000	14.925	131.0000	225.0000	202.02
16.000	15.918	110.0000	193.9000	193.37
17.000	16.911	93.0000	163.6000	182.26
18.000	17.903	79.1200	135.9000	202.53
19.000	18.894	67.0000	112.0000	207.03
20.000	19.885	57.0300	94.2000	210.93
21.000	20.877	48.0000	79.1000	214.01
22.000	21.867	41.0000	66.0000	216.20
23.000	22.859	35.0000	55.7000	219.03
24.000	23.840	30.4700	46.2000	220.02
25.000	24.837	26.1510	41.0000	222.13
26.000	25.827	22.4770	34.9100	224.29
27.000	26.816	19.3450	29.7000	226.19
28.000	27.805	16.6690	25.5300	227.49
29.000	28.793	14.3740	21.9100	228.59
30.000	29.781	12.4078	18.7700	230.33
32.000	31.757	9.2828	13.7600	234.96
34.000	33.731	6.2053	10.1000	239.34
36.000	35.704	5.2832	7.5720	243.26
38.000	37.676	4.0162	5.6300	246.62
40.000	39.646	3.0753	4.2160	254.23
42.000	41.615	2.3563	3.1870	258.93
44.000	43.583	1.8292	2.4220	263.37
46.000	45.550	1.4200	1.8520	267.39
48.000	47.516	1.1052	1.4380	269.44
50.000	49.480	.8608	1.1100	270.42
52.000	51.443	.6702	.8732	257.63
54.000	53.405	.5211	.6820	224.00
56.000	55.366	.4040	.5331	221.34
58.000	57.325	.3120	.4337	255.64
60.000	59.283	.2399	.3320	231.27
62.000	61.240	.1832	.2621	243.71
64.000	63.193	.1380	.2054	273.32
66.000	65.150	.1040	.1576	230.16

TABLE IV-8. HYDROSTATIC MODEL ATMOSPHERE

AUGUST

STATION • 819020		ASCENSION (WIDE AREA)			
Z	GEO. HT.	P	D	TV	
KM	KM	MG	G/M ²	CM K	
.000	.000	1010.6000	1173.0000	250.15	
.020	.020	1009.3900	1171.0000	250.67	
.040	.040	1008.1800	1169.0000	251.19	
.060	.060	1006.9700	1167.0000	251.72	
.080	.080	1005.7600	1165.0000	252.24	
.100	.100	1004.5500	1163.0000	252.77	
.120	.120	1003.3400	1161.0000	253.29	
.140	.140	1002.1300	1159.0000	253.82	
.160	.160	1000.9200	1157.0000	254.34	
.180	.180	1000.0000	1155.0000	254.87	
.200	.200	999.0000	1153.0000	255.39	
.220	.220	998.0000	1151.0000	255.92	
.240	.240	997.0000	1149.0000	256.44	
.260	.260	996.0000	1147.0000	256.97	
.280	.280	995.0000	1145.0000	257.49	
.300	.300	994.0000	1143.0000	258.02	
.320	.320	993.0000	1141.0000	258.54	
.340	.340	992.0000	1139.0000	259.07	
.360	.360	991.0000	1137.0000	259.59	
.380	.380	990.0000	1135.0000	260.12	
.400	.400	989.0000	1133.0000	260.64	
.420	.420	988.0000	1131.0000	261.17	
.440	.440	987.0000	1129.0000	261.69	
.460	.460	986.0000	1127.0000	262.22	
.480	.480	985.0000	1125.0000	262.74	
.500	.500	984.0000	1123.0000	263.27	
.520	.520	983.0000	1121.0000	263.79	
.540	.540	982.0000	1119.0000	264.32	
.560	.560	981.0000	1117.0000	264.84	
.580	.580	980.0000	1115.0000	265.37	
.600	.600	979.0000	1113.0000	265.89	
.620	.620	978.0000	1111.0000	266.42	
.640	.640	977.0000	1109.0000	266.94	
.660	.660	976.0000	1107.0000	267.47	
.680	.680	975.0000	1105.0000	267.99	
.700	.700	974.0000	1103.0000	268.52	
.720	.720	973.0000	1101.0000	269.04	
.740	.740	972.0000	1099.0000	269.57	
.760	.760	971.0000	1097.0000	270.09	
.780	.780	970.0000	1095.0000	270.62	
.800	.800	969.0000	1093.0000	271.14	
.820	.820	968.0000	1091.0000	271.67	
.840	.840	967.0000	1089.0000	272.19	
.860	.860	966.0000	1087.0000	272.72	
.880	.880	965.0000	1085.0000	273.24	
.900	.900	964.0000	1083.0000	273.77	
.920	.920	963.0000	1081.0000	274.29	
.940	.940	962.0000	1079.0000	274.82	
.960	.960	961.0000	1077.0000	275.34	
.980	.980	960.0000	1075.0000	275.87	
1.000	1.000	959.0000	1073.0000	276.39	

TABLE IV-9. HYDROSTATIC MODEL ATMOSPHERE

SEPTEMBER

STATION = 619020		ASCENSION (WIDE AWAKE)			
Z	GEO. HT.	P	D	TV	
KM	KM	MB	G/M3	DEG K	
.000	.000	1010.3000	1174.0000	299.83	
.020	.020	1008.0000	1171.0000	299.79	
1.000	.997	900.1700	1080.0000	293.43	
2.000	1.994	830.3500	974.0000	289.94	
3.000	2.991	710.6100	872.0000	283.50	
4.000	3.987	623.4100	790.0000	277.35	
5.000	4.983	556.0500	711.0000	272.19	
6.000	5.979	493.1500	639.0000	268.83	
7.000	6.974	430.6500	575.0000	266.05	
8.000	7.959	377.5000	518.0000	263.60	
9.000	8.954	329.4700	468.0000	261.30	
10.000	9.959	283.3000	419.4000	257.79	
11.000	10.953	247.0000	375.6000	253.51	
12.000	11.946	212.9700	334.0000	251.63	
13.000	12.940	182.0000	293.4000	214.22	
14.000	13.933	155.1600	260.1000	207.01	
15.000	14.926	131.5500	226.0000	202.20	
16.000	15.918	111.1400	194.1000	199.47	
17.000	16.911	93.7540	164.1000	193.02	
18.000	17.903	79.1370	136.1000	203.63	
19.000	18.894	67.1240	113.0000	203.97	
20.000	19.886	57.0770	94.3400	210.77	
21.000	20.877	48.6520	79.3000	213.79	
22.000	21.867	41.5710	67.0400	215.62	
23.000	22.858	35.5700	56.8400	218.00	
24.000	23.848	30.4760	48.2700	219.53	
25.000	24.837	26.1540	41.0600	221.09	
26.000	25.827	22.4720	34.9700	223.85	
27.000	26.816	19.3350	29.9700	225.51	
28.000	27.805	16.6530	25.0700	226.83	
29.000	28.793	14.3560	21.0100	227.26	
30.000	29.781	12.3310	18.7400	230.33	
32.000	31.757	9.2776	13.6000	233.24	
34.000	33.731	6.9958	10.0000	241.53	
36.000	35.704	5.3062	7.4340	247.11	
38.000	37.676	4.0565	5.5730	253.53	
40.000	39.646	3.1190	4.2010	258.63	
42.000	41.615	2.4004	3.1970	262.52	
44.000	43.583	1.8693	2.4340	267.48	
46.000	45.550	1.4561	1.8770	270.27	
48.000	47.516	1.1265	1.4560	271.93	
50.000	49.480	.8979	1.1400	271.19	
52.000	51.443	.6924	.8933	263.41	
54.000	53.405	.5333	.7075	263.16	
56.000	55.366	.4175	.5574	260.63	
58.000	57.325	.3224	.4370	253.74	
60.000	59.283	.2479	.3424	252.19	
62.000	61.240	.1806	.2674	247.02	
64.000	63.196	.1444	.2067	243.40	
66.000	65.150	.1093	.1615	235.63	

TABLE IV-10. HYDROSTATIC MODEL ATMOSPHERE

OCTOBER

STATION = 619020		ASCENSION (WIDE AREA)		
Z	QEO. HT.	P	D	TV
KM	KM	MG	G/M3	CG K
.000	.000	1009.1000	1172.0000	255.93
.020	.020	1006.8000	1169.0000	255.94
1.000	.937	899.1000	1078.0000	250.64
2.000	1.934	793.0000	989.0000	243.93
3.000	2.931	710.0000	879.0000	234.23
4.000	3.927	653.1700	789.0000	227.82
5.000	4.923	613.0000	711.0000	222.20
6.000	5.919	489.9000	640.0000	205.52
7.000	6.914	430.5700	575.0000	200.57
8.000	7.909	377.3500	510.0000	197.73
9.000	8.904	330.3500	456.0000	195.25
10.000	9.899	286.2000	413.0000	193.23
11.000	10.893	247.0000	375.0000	192.51
12.000	11.888	213.0000	339.0000	191.97
13.000	12.880	182.3000	303.0000	191.31
14.000	13.873	155.2700	269.0000	190.43
15.000	14.866	131.5000	227.0000	189.54
16.000	15.858	111.0500	193.0000	188.45
17.000	16.851	93.5680	165.0000	187.55
18.000	17.843	78.9400	137.0000	186.60
19.000	18.834	66.8000	113.4000	185.30
20.000	19.825	56.7300	94.4300	183.31
21.000	20.817	48.3190	79.2700	181.30
22.000	21.807	41.2730	65.3700	174.83
23.000	22.798	35.2550	56.0500	177.07
24.000	23.788	30.1500	47.9400	219.45
25.000	24.777	25.9030	40.7400	221.50
26.000	25.767	22.2530	34.6700	222.00
27.000	26.758	19.1450	29.5500	222.07
28.000	27.748	16.4250	25.2000	217.02
29.000	28.738	14.2320	21.5700	209.03
30.000	29.728	12.2973	18.4500	222.12
32.000	31.757	9.2252	13.5400	236.23
34.000	33.731	6.8715	10.0500	242.40
36.000	35.704	5.2376	7.4500	243.45
38.000	37.678	4.0510	5.5310	213.77
40.000	39.645	3.1162	4.2010	212.03
42.000	41.615	2.4109	3.1010	209.05
44.000	43.582	1.8743	2.4350	209.10
46.000	45.550	1.4621	1.8700	207.03
48.000	47.516	1.1427	1.4040	202.91
50.000	49.480	.8731	1.1420	201.73
52.000	51.443	.6559	.9057	208.53
54.000	53.405	.5425	.7128	206.02
56.000	55.365	.4209	.5521	201.72
58.000	57.325	.3253	.4405	203.15
60.000	59.283	.2505	.3451	203.70
62.000	61.240	.1918	.2714	207.93
64.000	63.195	.1459	.2123	200.92
66.000	65.150	.1099	.1648	233.08

TABLE IV-11. HYDROSTATIC MODEL ATMOSPHERE

NOVEMBER

STATION = 619020		ASCENSION (WIDE AREA)		
Z	GEOM. HT.	P	D	TV
KM	KM	MB	G/MB	SEC K
0.000	0.000	1005.0000	1159.0000	200.00
0.000	0.000	1005.7000	1168.0000	200.49
1.000	0.997	697.3700	1075.0000	291.19
2.000	1.994	799.9300	931.0000	283.48
3.000	2.991	709.4700	870.0000	282.93
4.000	3.987	628.0000	787.0000	278.15
5.000	4.983	553.0100	703.0000	278.62
6.000	5.979	493.0100	630.0000	278.70
7.000	6.974	430.0000	575.0000	278.31
8.000	7.969	377.0700	510.0000	278.02
9.000	8.964	329.1100	408.0000	278.02
10.000	9.958	285.0000	418.0000	278.00
11.000	10.953	247.3400	375.1000	278.03
12.000	11.946	212.8000	334.2000	278.02
13.000	12.940	182.1200	298.0000	278.05
14.000	13.933	155.0000	250.1000	277.71
15.000	14.925	131.4200	226.7000	278.60
16.000	15.918	110.9100	193.3000	197.03
17.000	16.911	93.4000	165.0000	165.03
18.000	17.903	78.6010	137.0000	150.03
19.000	18.894	65.4000	113.0000	203.02
20.000	19.886	56.0770	94.0000	207.60
21.000	20.877	47.9770	70.1000	211.18
22.000	21.867	40.0100	60.0000	213.97
23.000	22.858	34.0000	55.0000	216.01
24.000	23.848	29.9500	47.0700	216.70
25.000	24.837	25.0000	40.4400	221.00
26.000	25.827	22.0430	34.3400	223.04
27.000	26.816	18.9600	28.1000	220.30
28.000	27.805	16.3540	24.8700	229.07
29.000	28.793	14.1230	21.2600	231.37
30.000	29.781	12.2141	18.0200	233.49
32.000	31.757	9.1723	13.4700	233.01
34.000	33.731	6.9275	9.0000	242.38
35.000	35.704	5.2500	7.4000	247.16
36.000	37.676	4.0189	5.5000	253.45
40.000	39.646	3.0925	4.1540	260.29
42.000	41.615	2.3551	3.1470	263.09
44.000	43.583	1.8533	2.4170	269.48
46.000	45.550	1.4533	1.8730	271.26
48.000	47.516	1.1347	1.4610	271.48
50.000	49.480	.8825	1.1470	267.72
52.000	51.443	.6070	.9013	257.00
54.000	53.405	.5004	.7076	234.90
56.000	55.366	.4159	.5500	261.04
58.000	57.329	.3211	.4032	257.00
60.000	59.293	.2473	.3200	254.41
62.000	61.240	.1804	.2582	246.02
64.000	63.196	.1429	.2103	239.16
65.000	65.150	.1091	.1660	237.48

TABLE IV-12. HYDROSTATIC MODEL ATMOSPHERE

DECEMBER

STATION = 616000		ACCELERATION UNITS		REF.
Z	DEG. HT.	P	C	TV
MM	KM	PO	CM	CM
0.000	0.000	1007.7500	1165.7000	120.41
0.050	0.000	1007.7500	1165.7000	120.41
1.000	0.007	870.0000	1070.0000	111.70
2.000	1.994	780.0000	990.0000	100.00
3.000	2.991	700.0000	920.0000	90.21
4.000	3.987	630.0000	860.0000	82.00
5.000	4.983	570.0000	810.0000	74.00
6.000	5.979	520.0000	770.0000	67.00
7.000	6.974	480.0000	730.0000	61.00
8.000	7.969	440.0000	690.0000	56.00
9.000	8.964	410.0000	660.0000	51.00
10.000	9.959	380.0000	630.0000	47.00
11.000	10.953	347.0000	575.0000	42.00
12.000	11.948	312.0000	520.0000	37.00
13.000	12.940	280.0000	465.0000	33.00
14.000	13.933	250.0000	420.0000	29.00
15.000	14.926	220.0000	380.0000	26.00
16.000	15.919	190.0000	340.0000	23.00
17.000	16.911	160.0000	300.0000	20.00
18.000	17.903	130.0000	260.0000	17.00
19.000	18.894	100.0000	220.0000	14.00
20.000	19.886	80.0000	190.0000	12.00
21.000	20.877	60.0000	160.0000	10.00
22.000	21.867	40.0000	130.0000	8.00
23.000	22.858	30.0000	100.0000	6.00
24.000	23.849	20.0000	80.0000	5.00
25.000	24.839	15.0000	60.0000	4.00
26.000	25.829	10.0000	40.0000	3.00
27.000	26.818	8.0000	30.0000	2.00
28.000	27.808	6.0000	20.0000	1.50
29.000	28.798	4.0000	15.0000	1.00
30.000	29.788	3.0000	10.0000	0.75
32.000	31.757	1.0000	5.0000	0.25
34.000	33.726	0.0000	0.0000	0.00
36.000	35.695	0.0000	0.0000	0.00
38.000	37.664	0.0000	0.0000	0.00
40.000	39.633	0.0000	0.0000	0.00
42.000	41.602	0.0000	0.0000	0.00
44.000	43.571	0.0000	0.0000	0.00
46.000	45.540	0.0000	0.0000	0.00
48.000	47.509	0.0000	0.0000	0.00
50.000	49.478	0.0000	0.0000	0.00
52.000	51.447	0.0000	0.0000	0.00
54.000	53.416	0.0000	0.0000	0.00
56.000	55.385	0.0000	0.0000	0.00
58.000	57.354	0.0000	0.0000	0.00
60.000	59.323	0.0000	0.0000	0.00
62.000	61.292	0.0000	0.0000	0.00
64.000	63.261	0.0000	0.0000	0.00
66.000	65.230	0.0000	0.0000	0.00

TABLE IV-13. HYDROSTATIC MODEL ATMOSPHERE

ANNUAL

STATION - 616020		ASLINGTON (MOE) (1961)		
Z	OC. HT.	P	D	TV
MM	MM	MM	MM	MM
0.000	0.000	1020.0000	1100.0000	251.00
1.000	0.070	1020.7000	1161.0000	251.00
1.000	0.027	098.0000	1071.0000	252.00
2.000	1.924	702.4000	953.0000	253.14
3.000	2.051	702.9000	870.0000	253.25
4.000	3.087	609.0000	767.0000	253.10
5.000	4.003	525.0000	710.0000	252.73
6.000	5.073	450.0000	630.0000	252.00
7.000	6.974	400.0000	575.0000	250.00
8.000	7.903	377.0000	517.0000	250.00
9.000	8.024	320.0000	450.0000	246.52
10.000	9.953	260.0000	410.0000	243.50
11.000	10.533	247.0000	370.0000	239.10
12.000	11.516	213.0000	334.0000	232.18
13.000	12.940	163.0000	295.0000	214.61
14.000	13.033	155.0000	250.0000	207.75
15.000	14.070	131.0000	227.0000	201.00
16.000	15.919	111.0000	199.0000	191.00
17.000	16.911	93.0000	160.0000	181.00
18.000	17.003	70.0000	130.0000	169.10
19.000	19.074	60.0000	114.0000	163.67
20.000	19.040	56.0000	94.0000	157.97
21.000	20.977	48.0000	79.0000	211.54
22.000	21.057	41.0000	66.0000	214.40
23.000	22.073	35.0000	50.0000	216.70
24.000	23.049	30.0000	47.0000	210.00
25.000	24.047	25.0000	40.0000	221.00
26.000	25.027	22.0000	34.0000	223.00
27.000	25.016	19.0000	29.0000	220.76
28.000	27.005	16.0000	25.0000	227.83
29.000	28.793	14.0000	21.0000	229.73
30.000	29.781	12.2000	18.0000	231.59
32.000	31.757	9.1600	13.0000	236.13
34.000	33.731	6.0000	10.0000	240.49
36.000	35.704	5.0000	7.0000	245.42
38.000	37.676	3.9000	5.5000	251.00
40.000	39.646	3.0000	4.1500	257.60
42.000	41.615	2.3000	3.1300	263.29
44.000	43.583	1.6300	2.3300	267.57
46.000	45.550	1.4300	1.8500	269.91
48.000	47.516	1.1100	1.4000	270.46
50.000	49.480	.8700	1.1200	269.55
52.000	51.443	.6700	.8200	267.00
54.000	53.403	.5271	.6000	264.50
56.000	55.363	.4037	.4500	261.50
58.000	57.323	.3159	.4200	257.79
60.000	59.283	.2431	.3300	253.37
62.000	61.240	.1800	.2600	249.12
64.000	63.196	.1418	.2042	242.49
66.000	65.150	.1072	.1520	234.93

APPENDIX A

EXAMPLES OF WIND STATISTICS FOR ASCENSION ISLAND, SOUTH ATLANTIC

Appendix A gives some examples of graphical displays of wind statistics that can be derived from the statistical parameters presented in table I. These illustrations should aid the user of the RRA to understand the functional relationships of the probability wind models and, thus, to develop an appreciation of the powerful properties of the bivariate normal probability distribution function.

All illustrations for this appendix are derived from the five wind component statistical parameters from table I.1 for January and table I.7 for July for eight selected altitudes. These selected altitudes are 4, 12, 20, 30, 40, 50, 60, and 66 km.

1. Frequency of Wind Direction (Figures A-1 through A-16)

The derived frequencies for wind direction shown in figures A-1 through A-16 were obtained using the five wind component parameters from tables I.1 and I.7 as input values in equation (35). The limits of integration (performed numerically) are over the 22.5-degree interval for each of the 16 compass points. These graphs give the percentage frequency that the wind will blow from the direction intervals.

2. Mean Wind Components and 80th Interpercentile Range of Wind Components (Figures A-17 through A-32).

The wind component means with respect to any orthogonal axes are obtained by using the zonal and meridional mean wind components in equations (44) and (45). These component means form the circles shown in figures A-17 through A-32. Further, the zonal and meridional wind component variances and correlation coefficients are used in equations (46) and (47) to obtain the variances with respect to any orthogonal axes. These rotated component variances and the rotated component means are used in equation (8) to obtain the 80th interpercentile range of wind components and are then illustrated in figures A-17 through A-32.

3. Probability Ellipses (Figures A-33 through A-48)

Using the five wind component parameters from tables I.1 and I.7 and $p = 0.50$, $p = 0.95$, and $p = 0.99$ as input values to equation (13), the wind probability ellipses shown in figures A-33 through A-48 were obtained by computer graphics. The statistical inferences are, for example, that 50 percent of the wind vectors lie within the smaller ellipse and 99 percent of the wind vectors lie within the outer ellipse. These probability ellipses are illustrated using the standard meteorological coordinate system explained in section I.B.1.

4. Conditional Windspeed Given the Wind Direction (Figures A-49 through A-64)

The five wind component parameters from table I.1 and table I.7 are used to evaluate the conditional probability distribution function, equation (41). Figures A-49 through A-64 show interpolations of the conditional function made to

obtain the 5th, 15th, 50th (median), 85th, 95th, and 99th conditional percentile values of windspeed, given the wind directions. The conditional mean windspeed, given the wind direction, is obtained from equation (40). The conditional mode (most probable) windspeed, given the wind direction, is obtained from equation (38). The conditional mean windspeed and the conditional windspeed modal value, given the wind direction, are also shown in these figures. For some figures, the conditional windspeed values are invalid for the given wind direction near 270° (from the west). This is caused by the lack of computational precision in evaluating equations (40) and (41) when the arguments for the Gaussian probability distribution have large negative values, i.e., when the coefficients (b/a) become less than -4 in these equations.

This appendix contains only a few of the many options in presenting wind statistics illustrations.

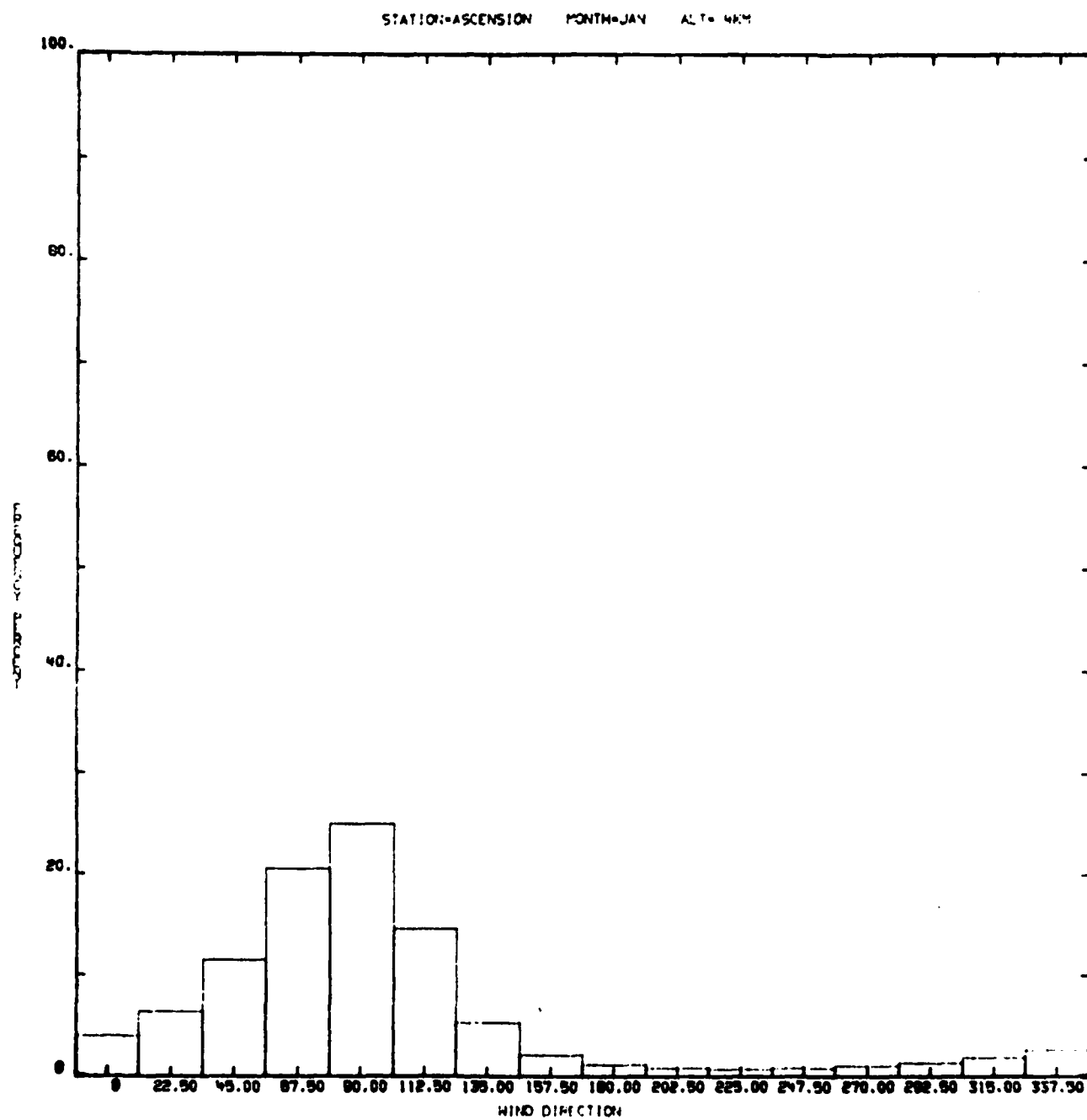


Figure A-1.

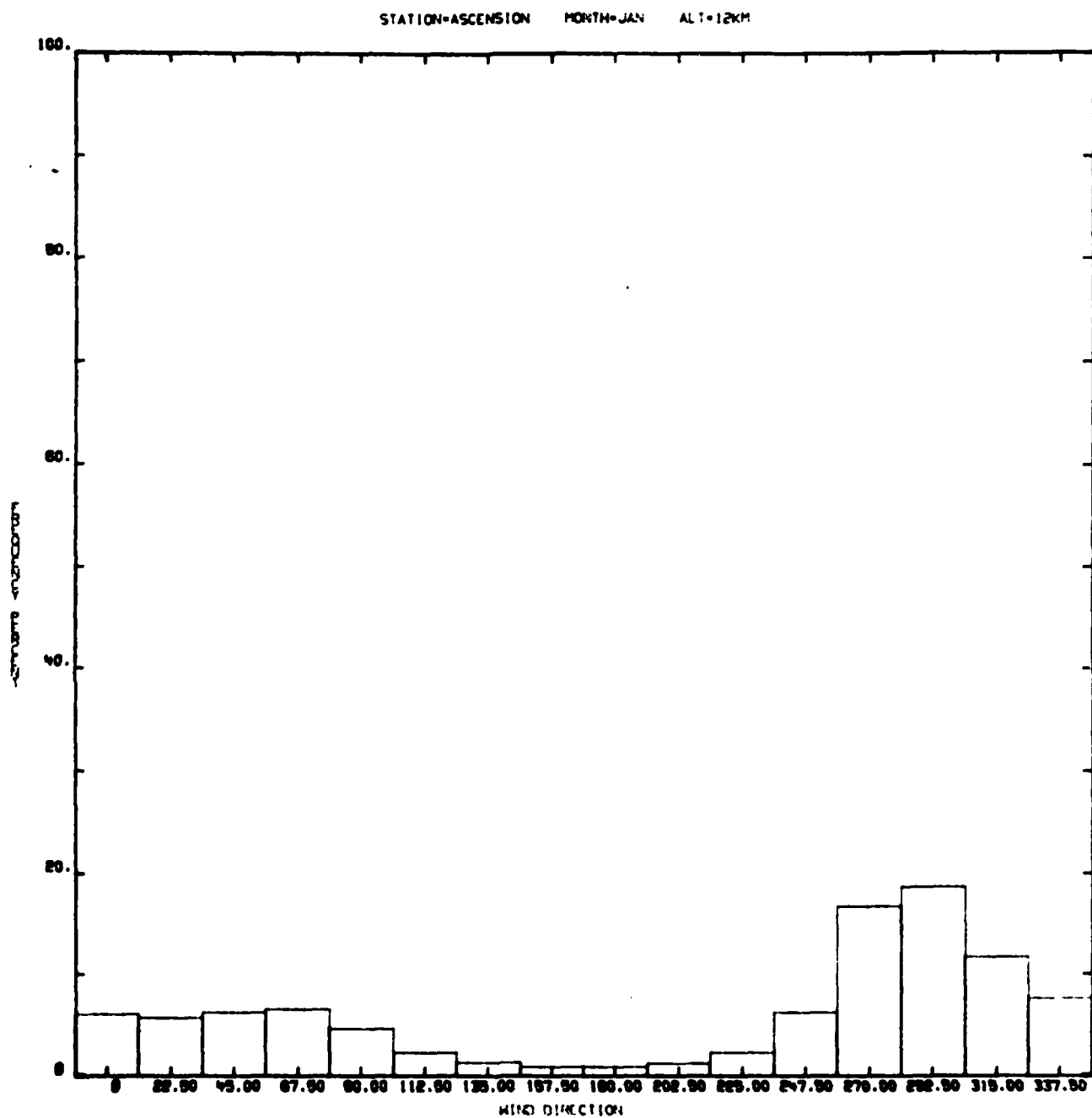


Figure A-2.

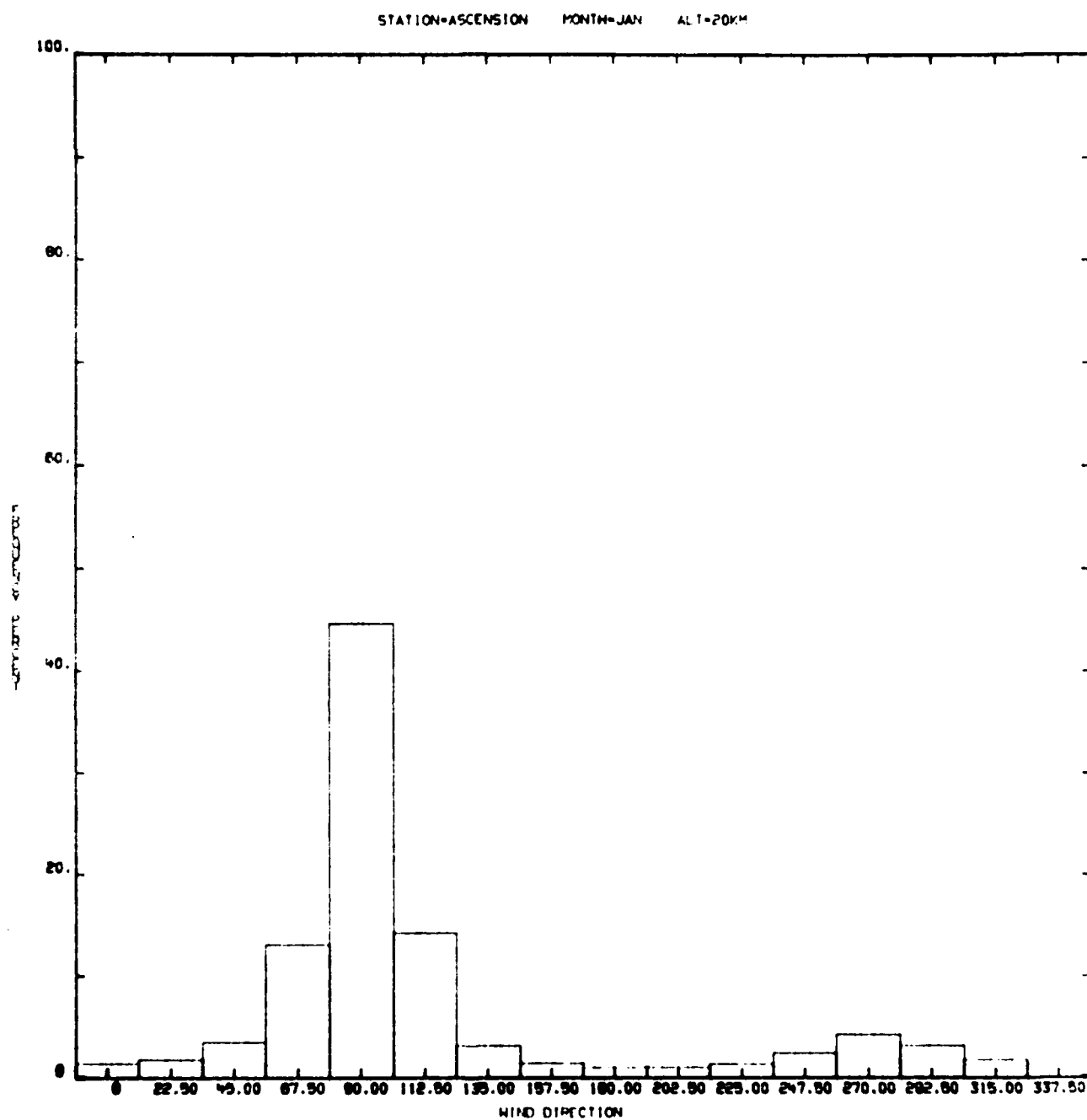


Figure A-3.

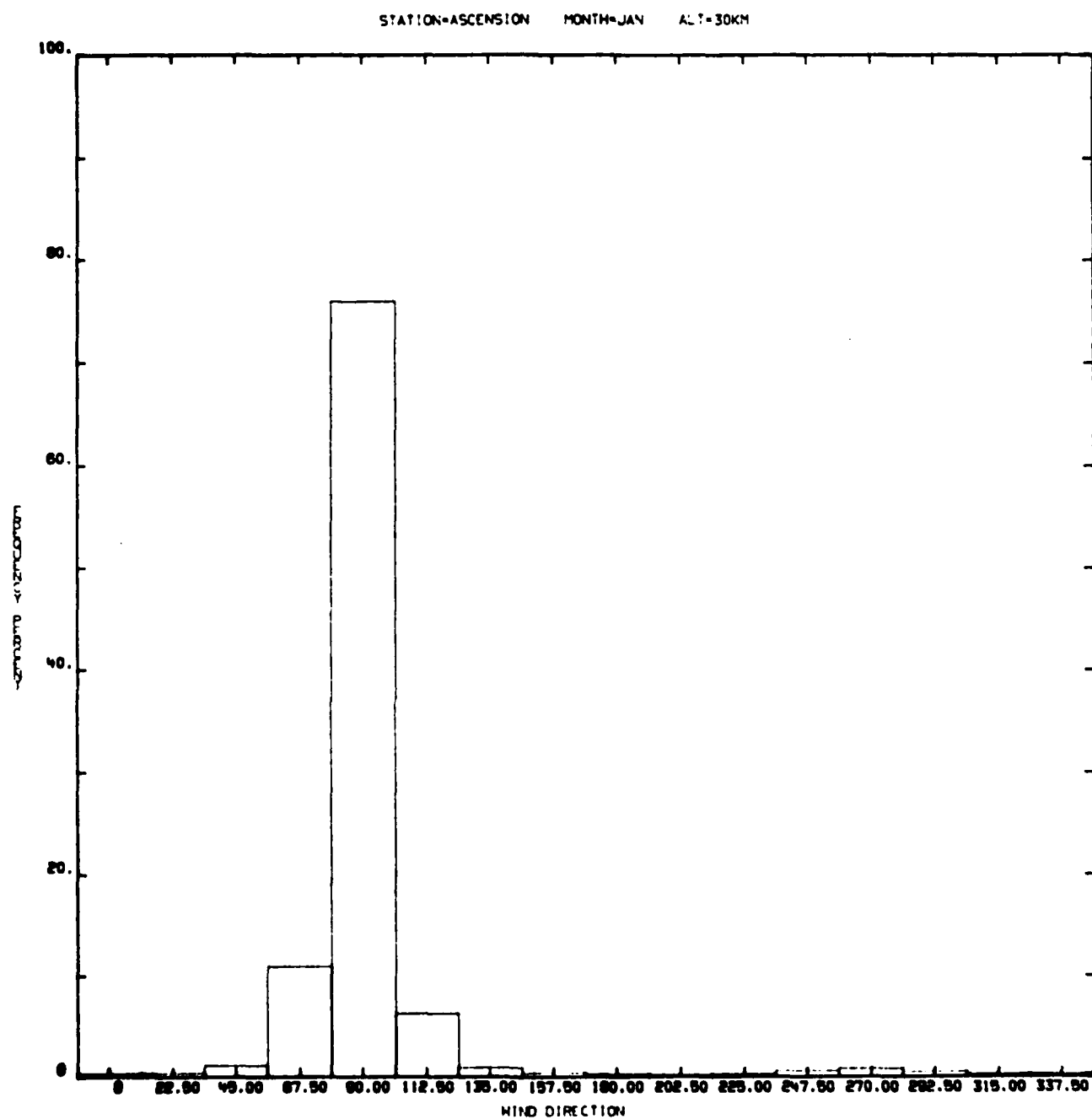


Figure A-4.

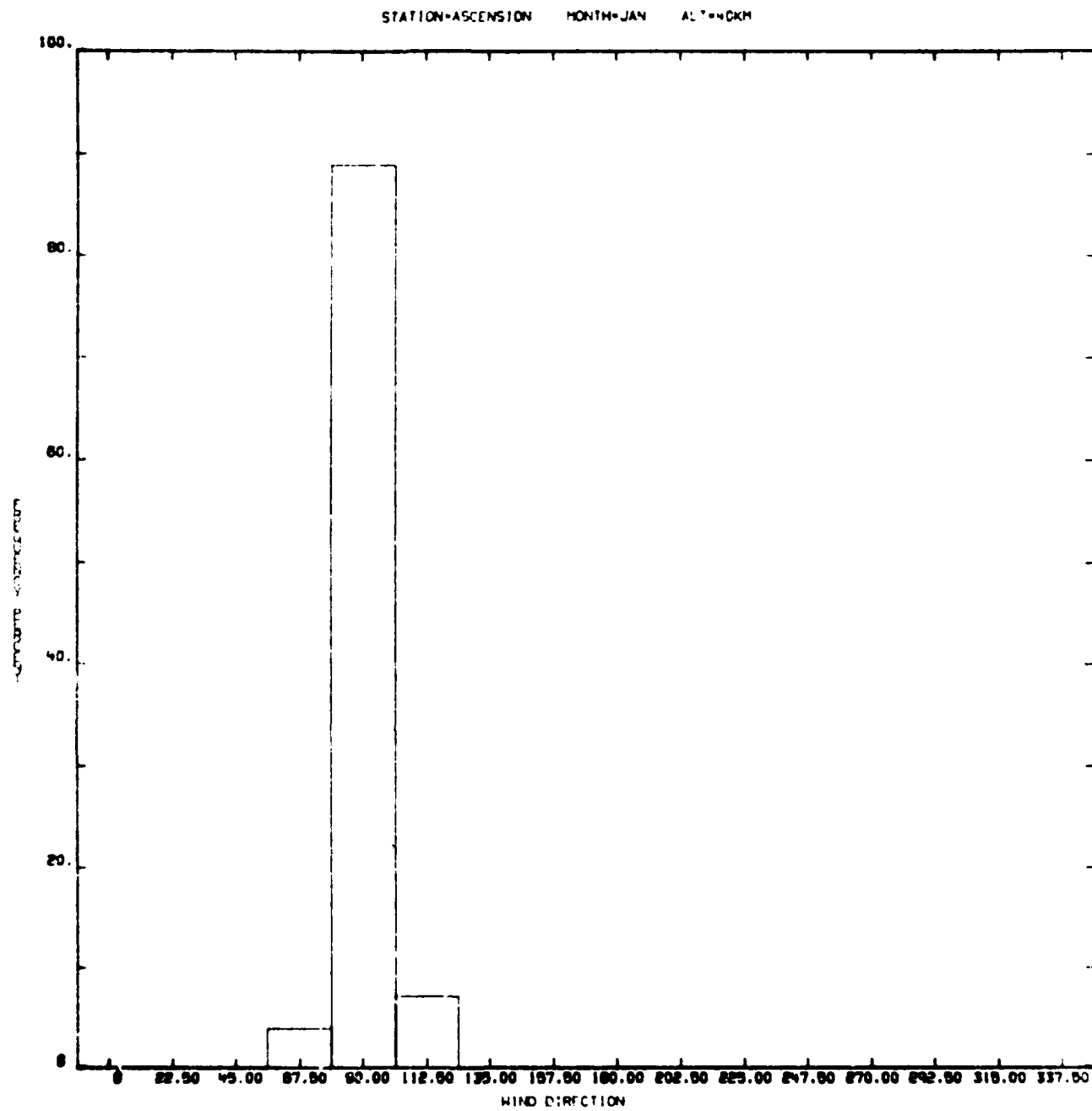


Figure A-5.

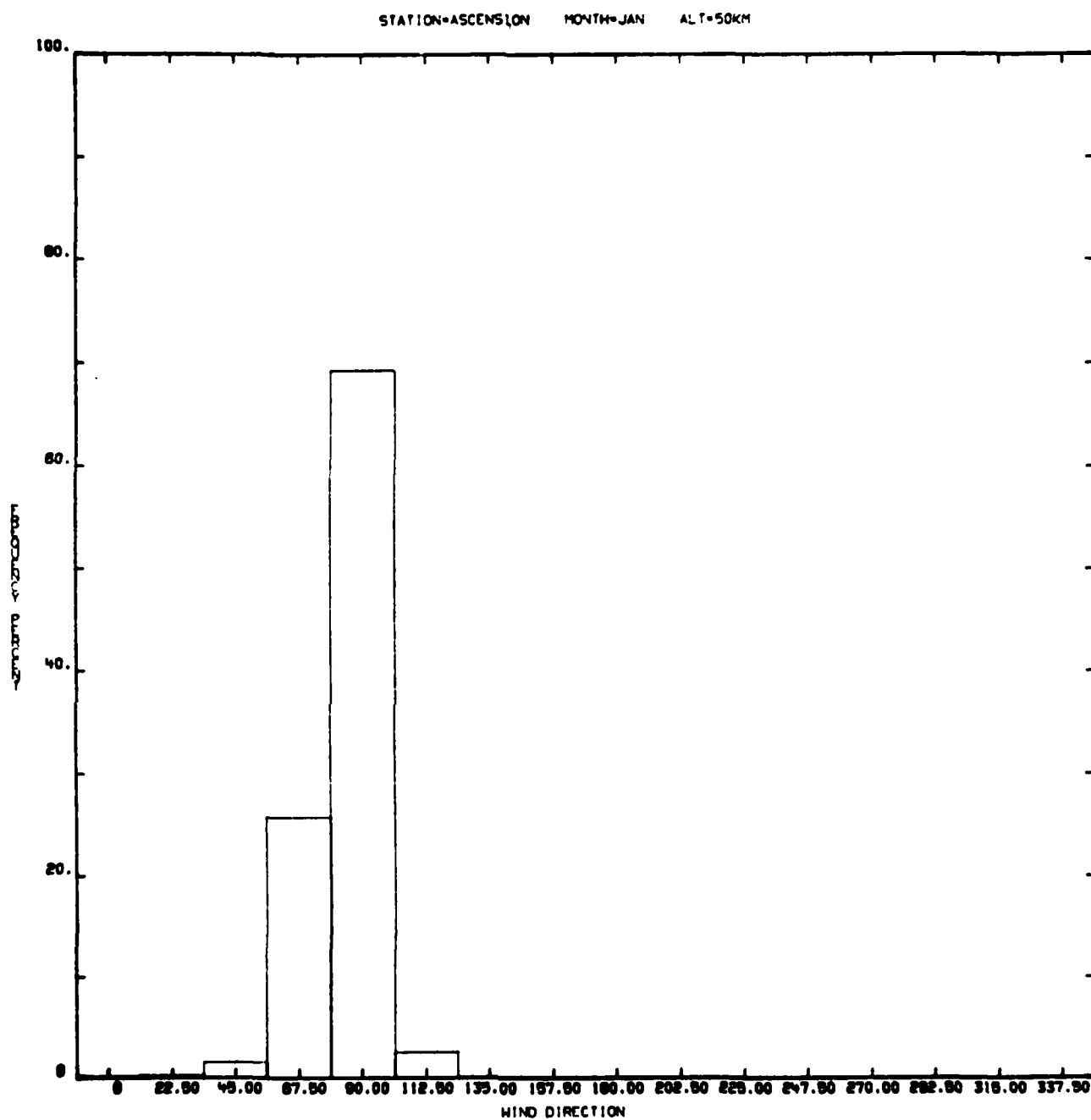


Figure A-6.

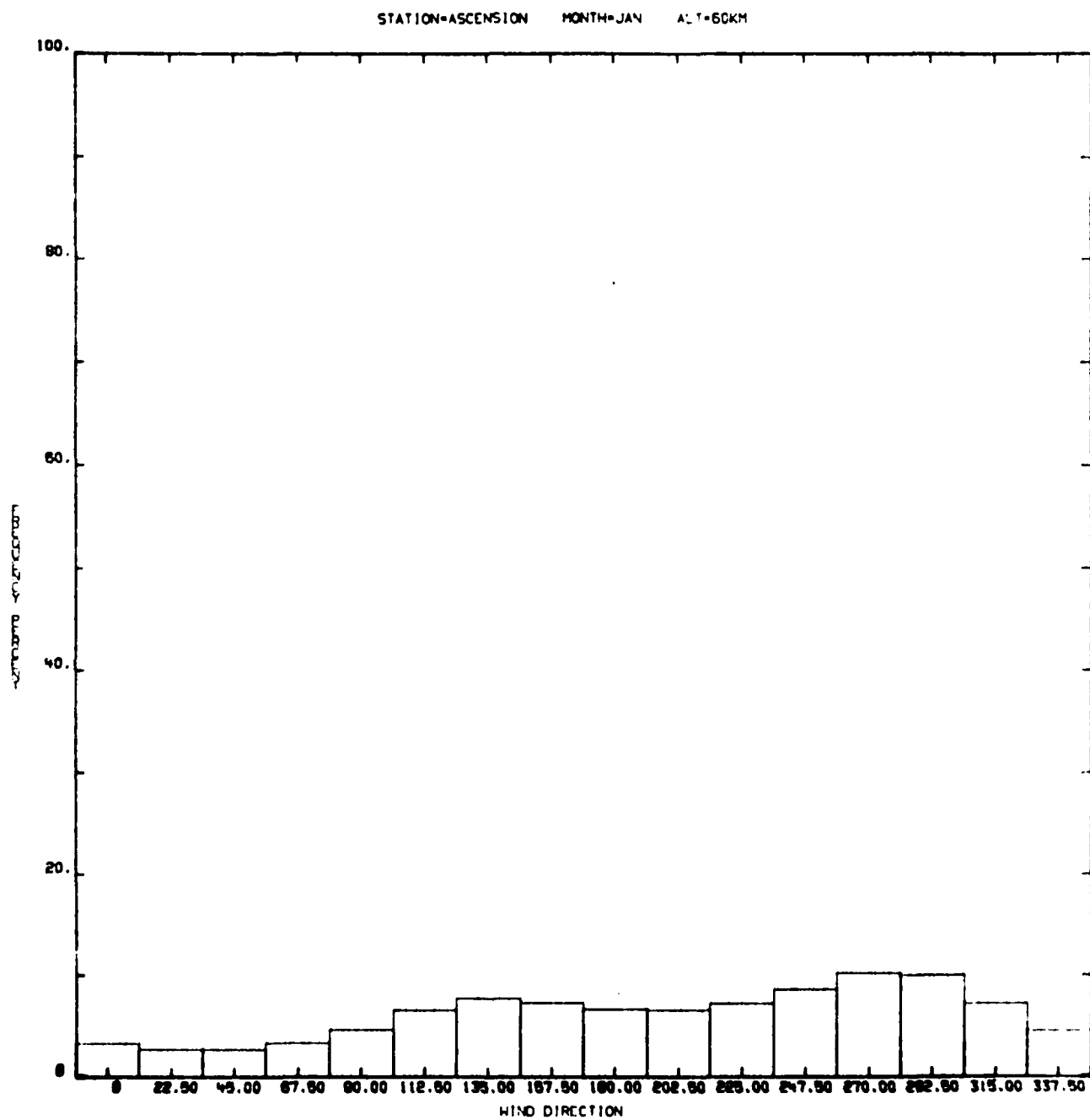


Figure A-7.

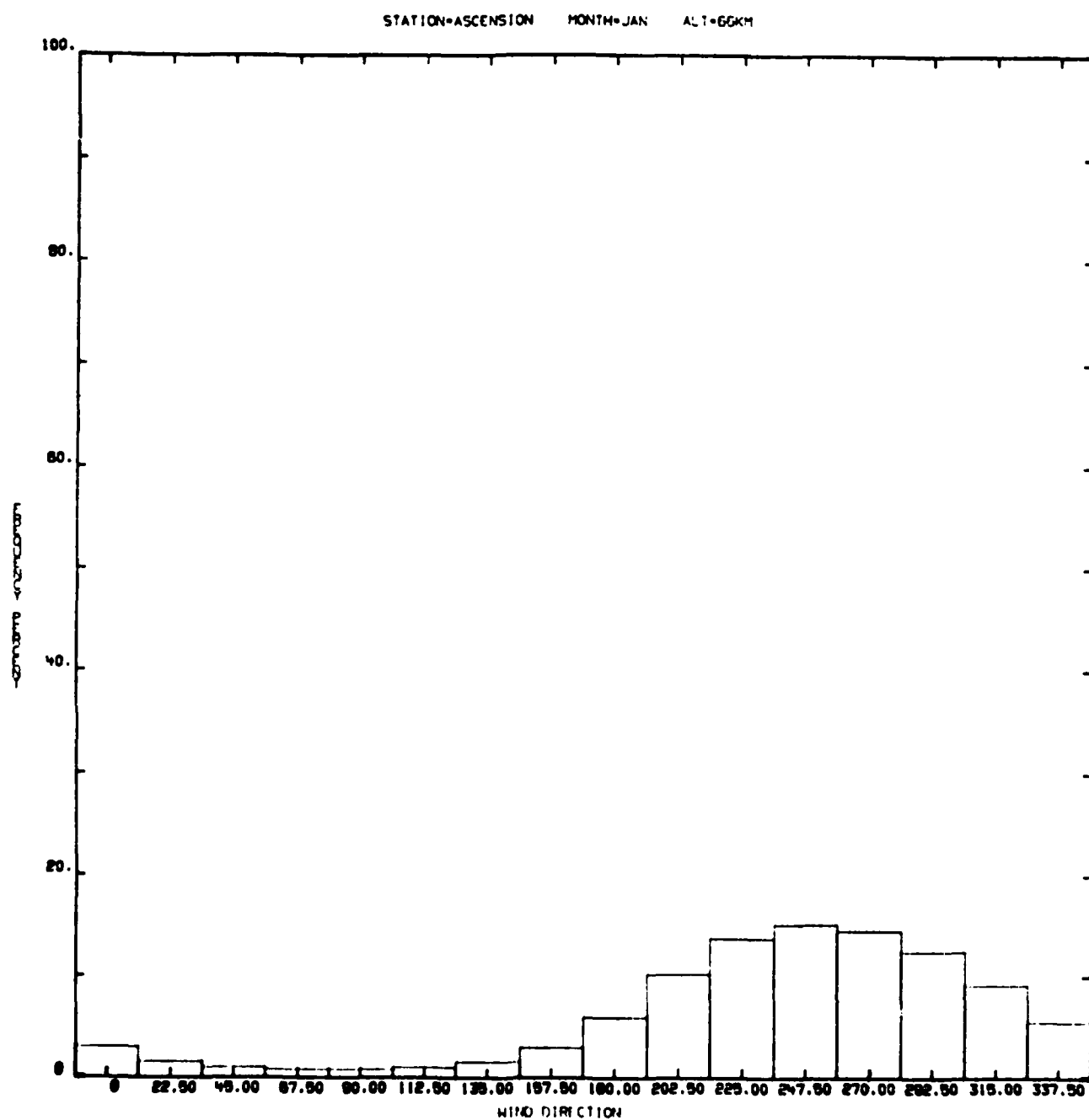


Figure A-8.

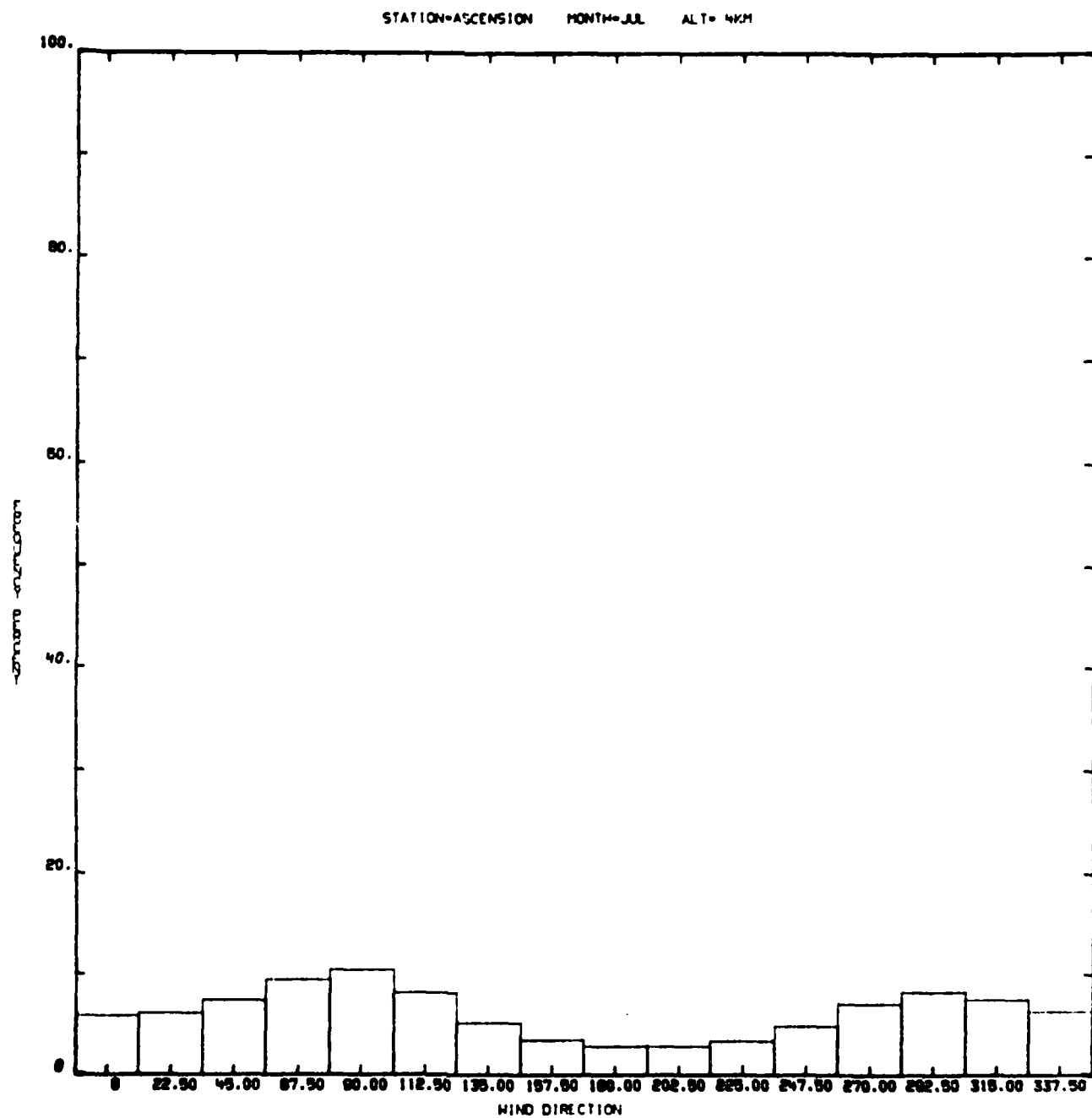


Figure A-9.

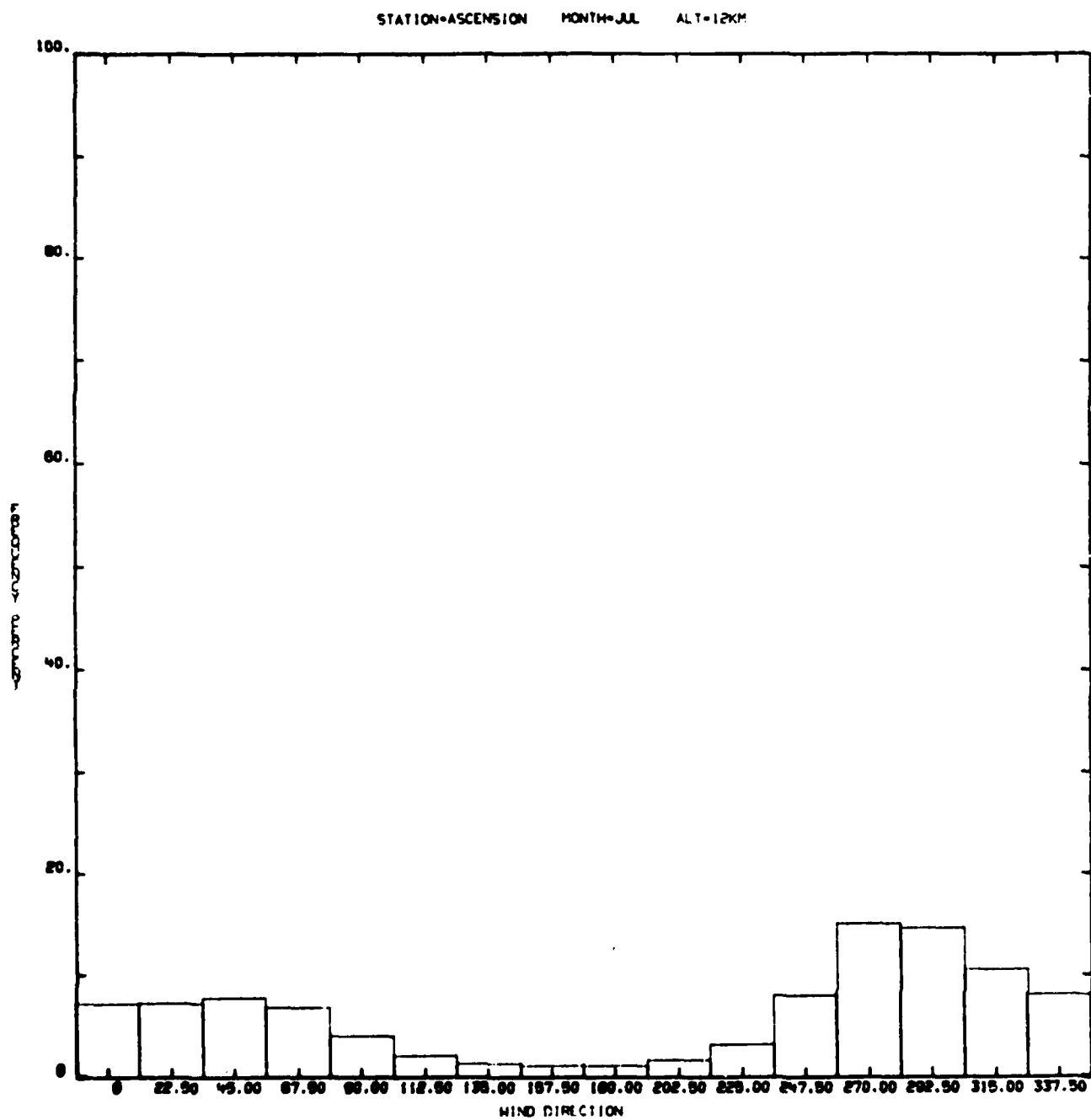


Figure A-10.

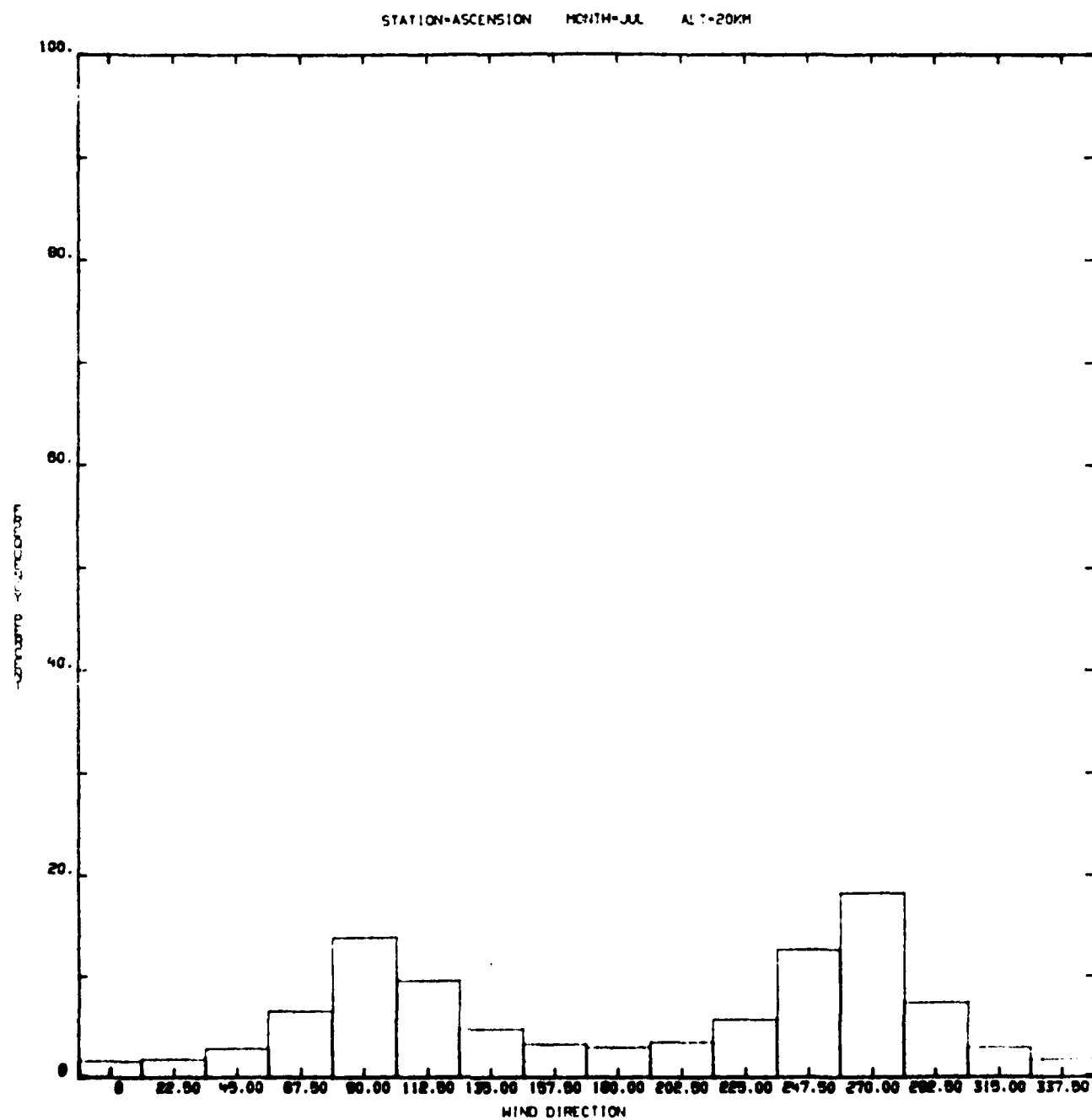


Figure A-11.

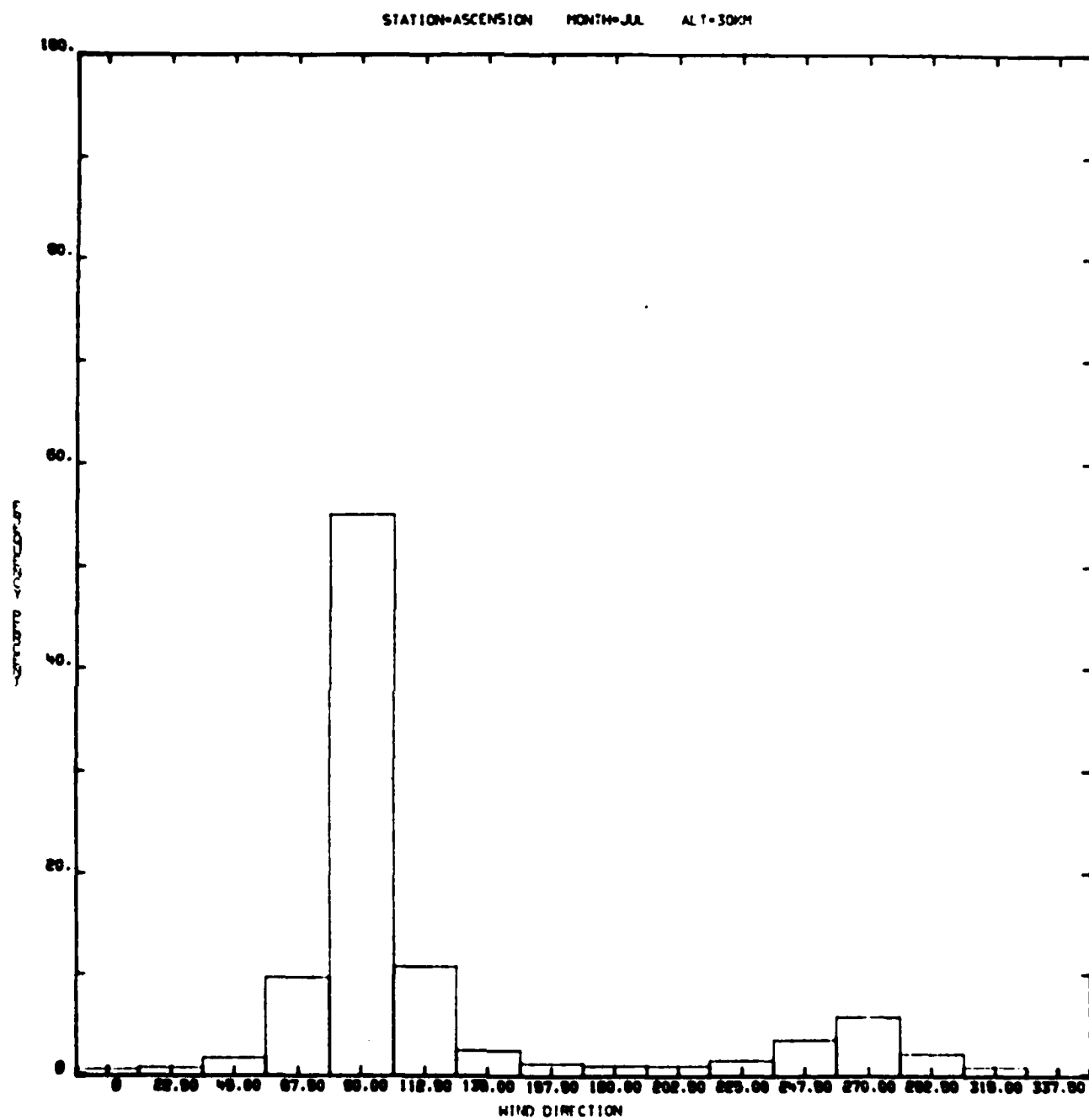


Figure A-12.

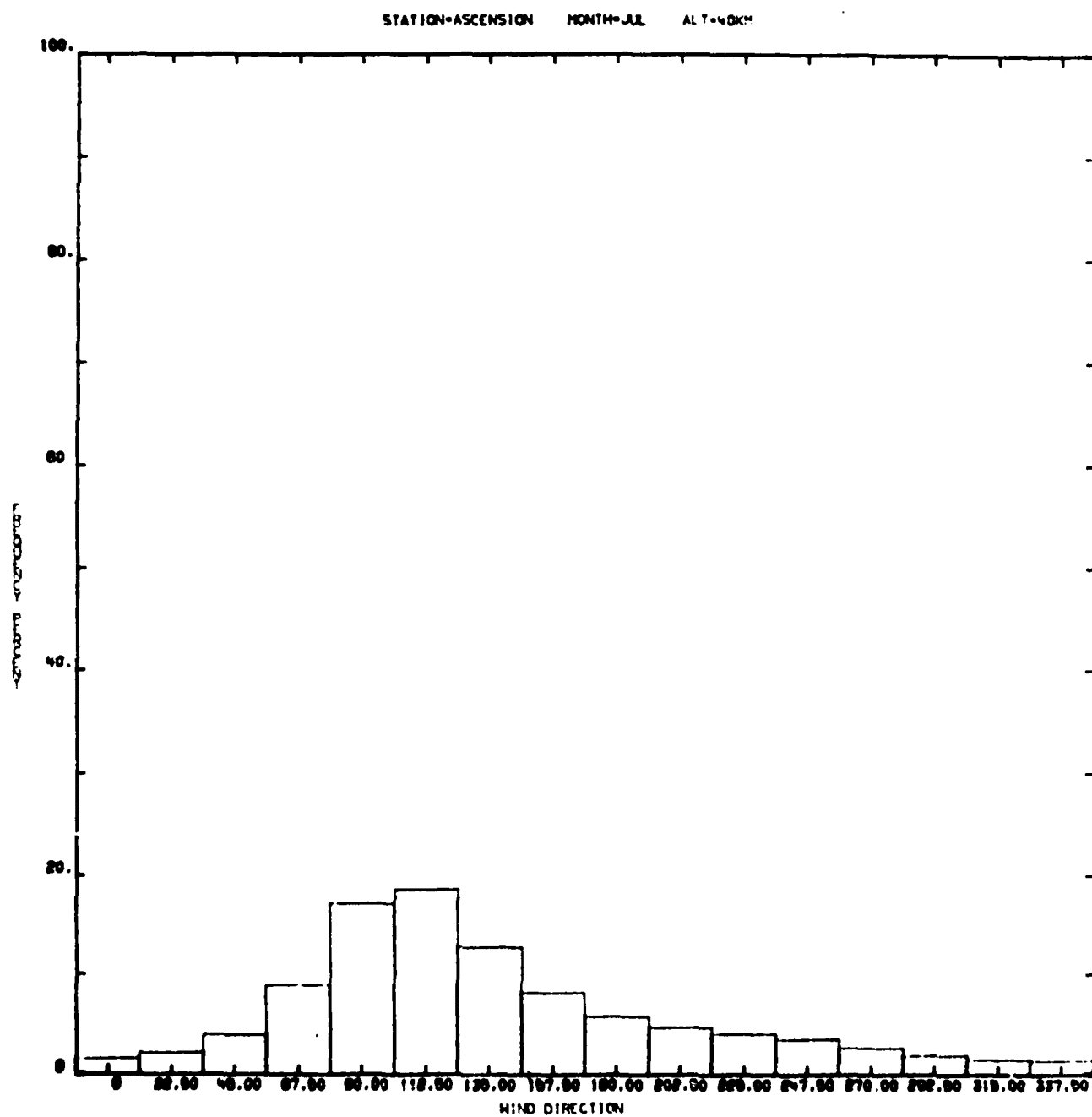


Figure A-13.

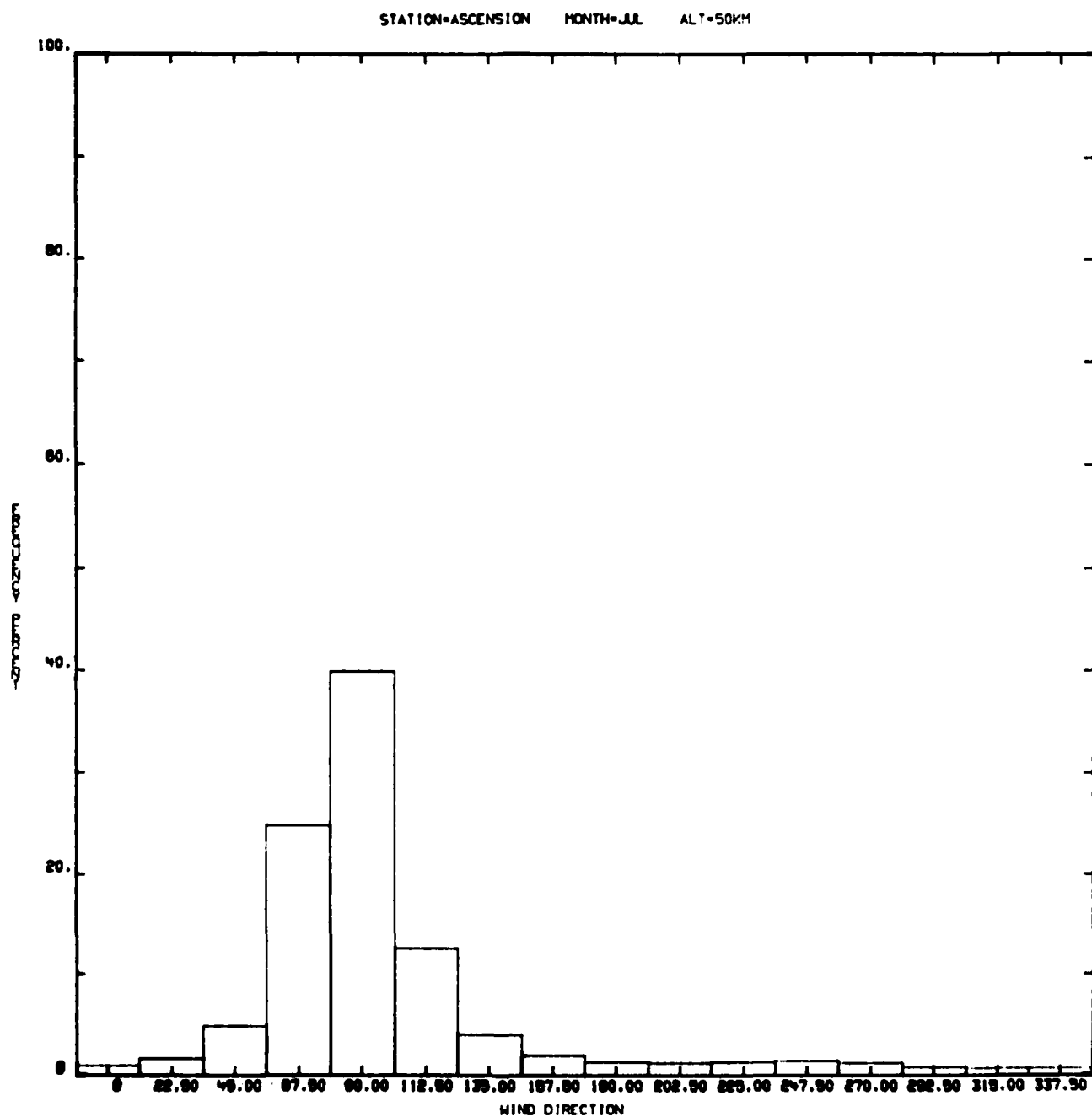


Figure A-14.

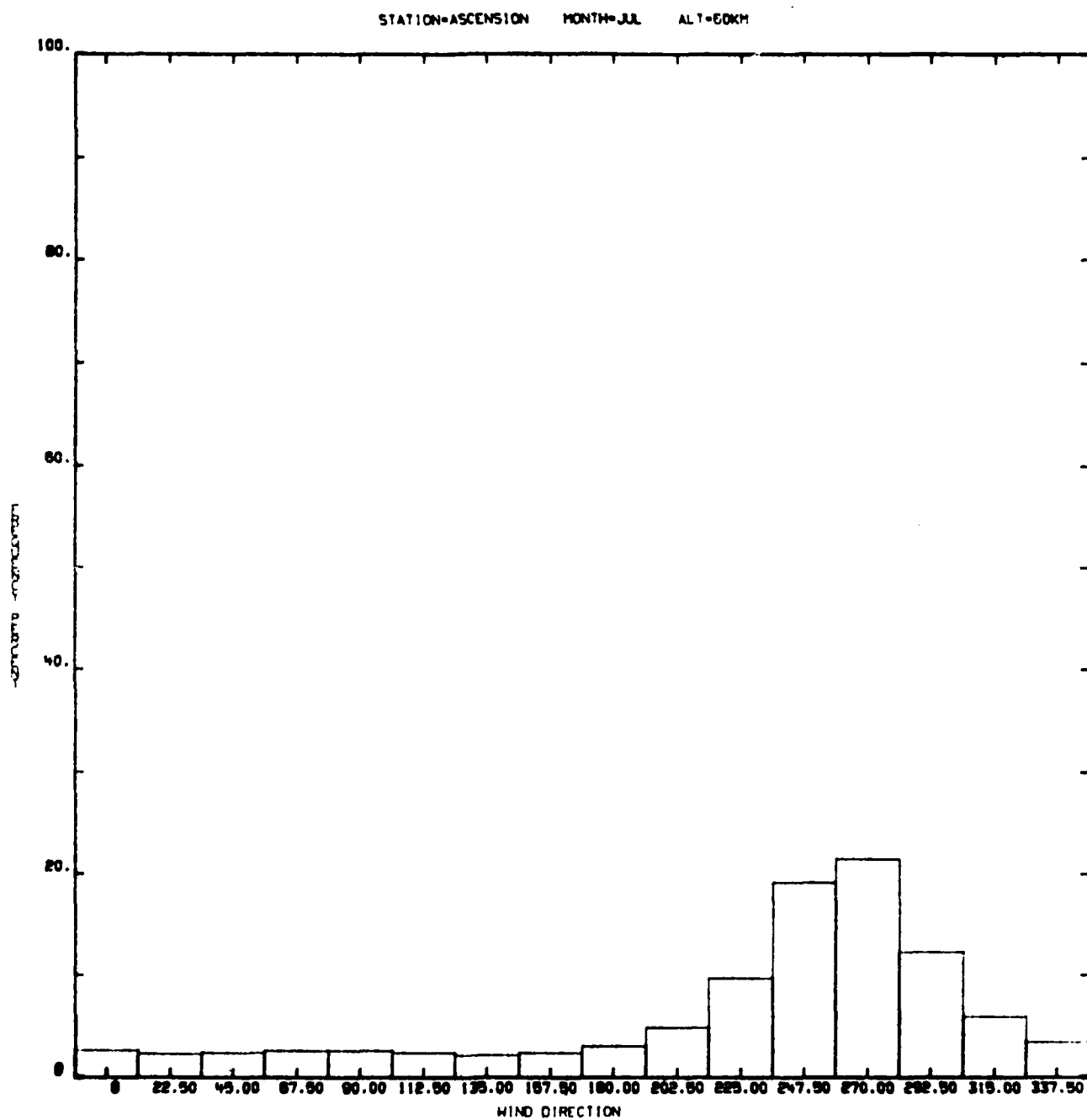


Figure A-15.

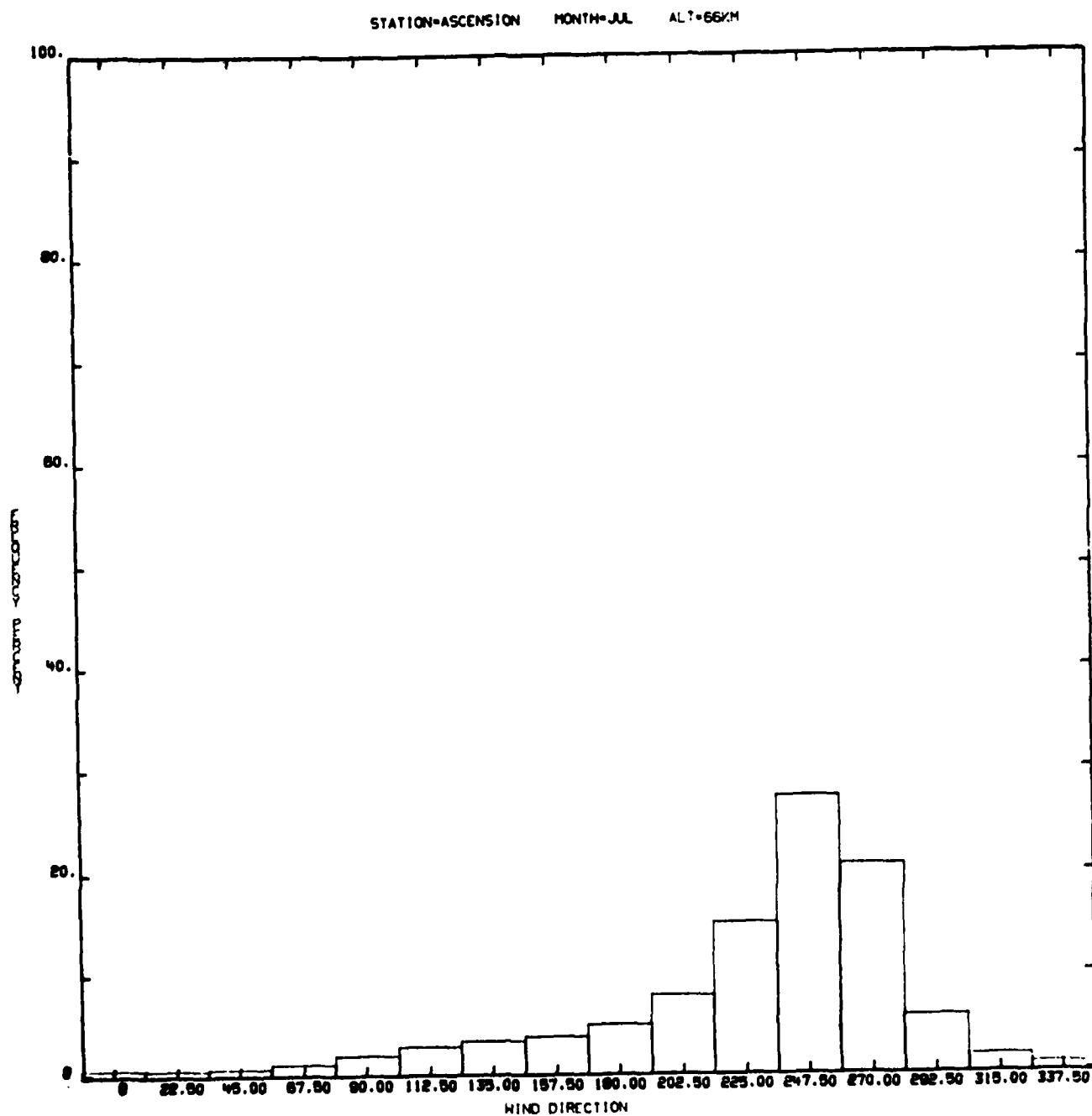


Figure A-16.

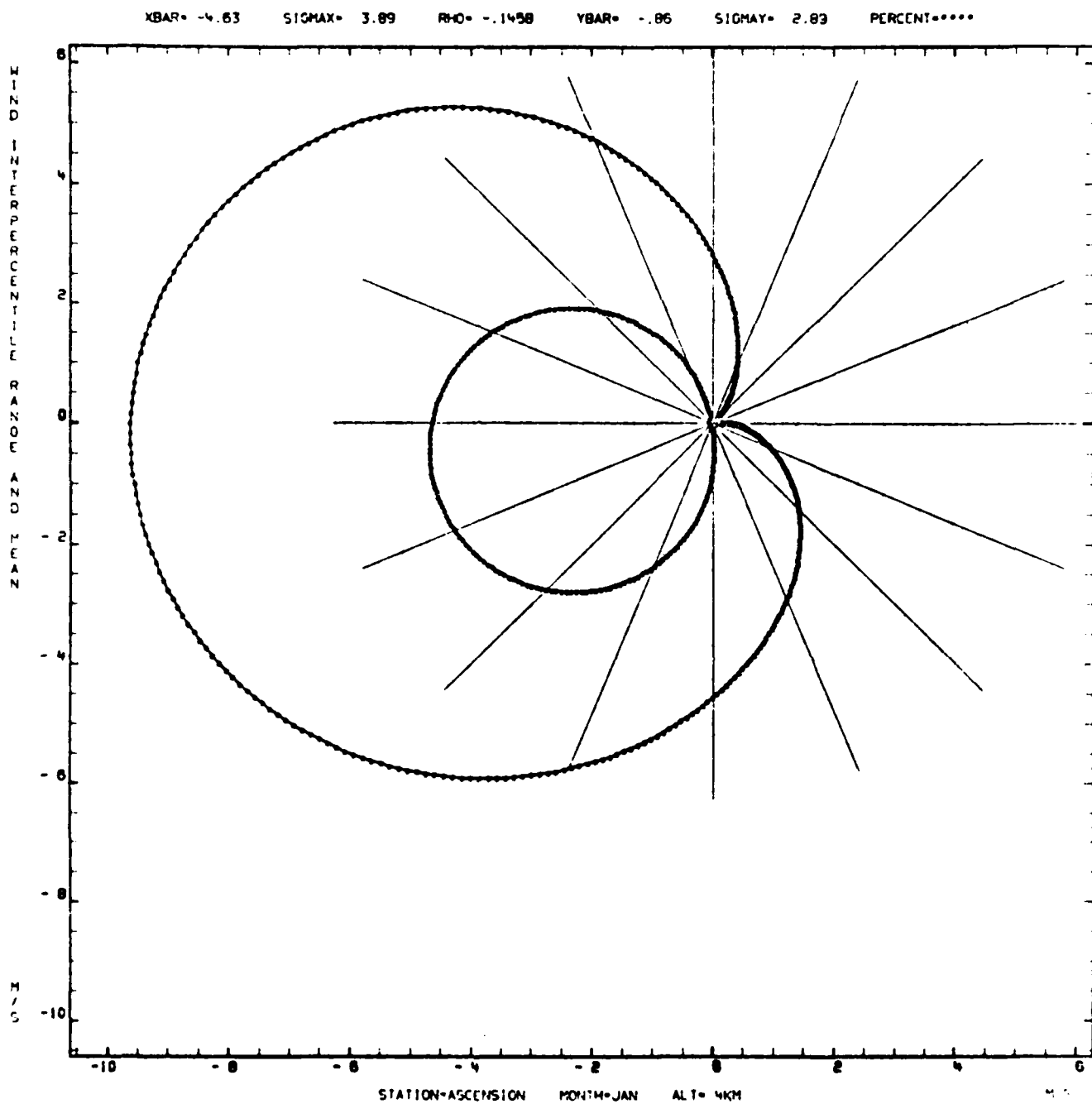


Figure A-17.

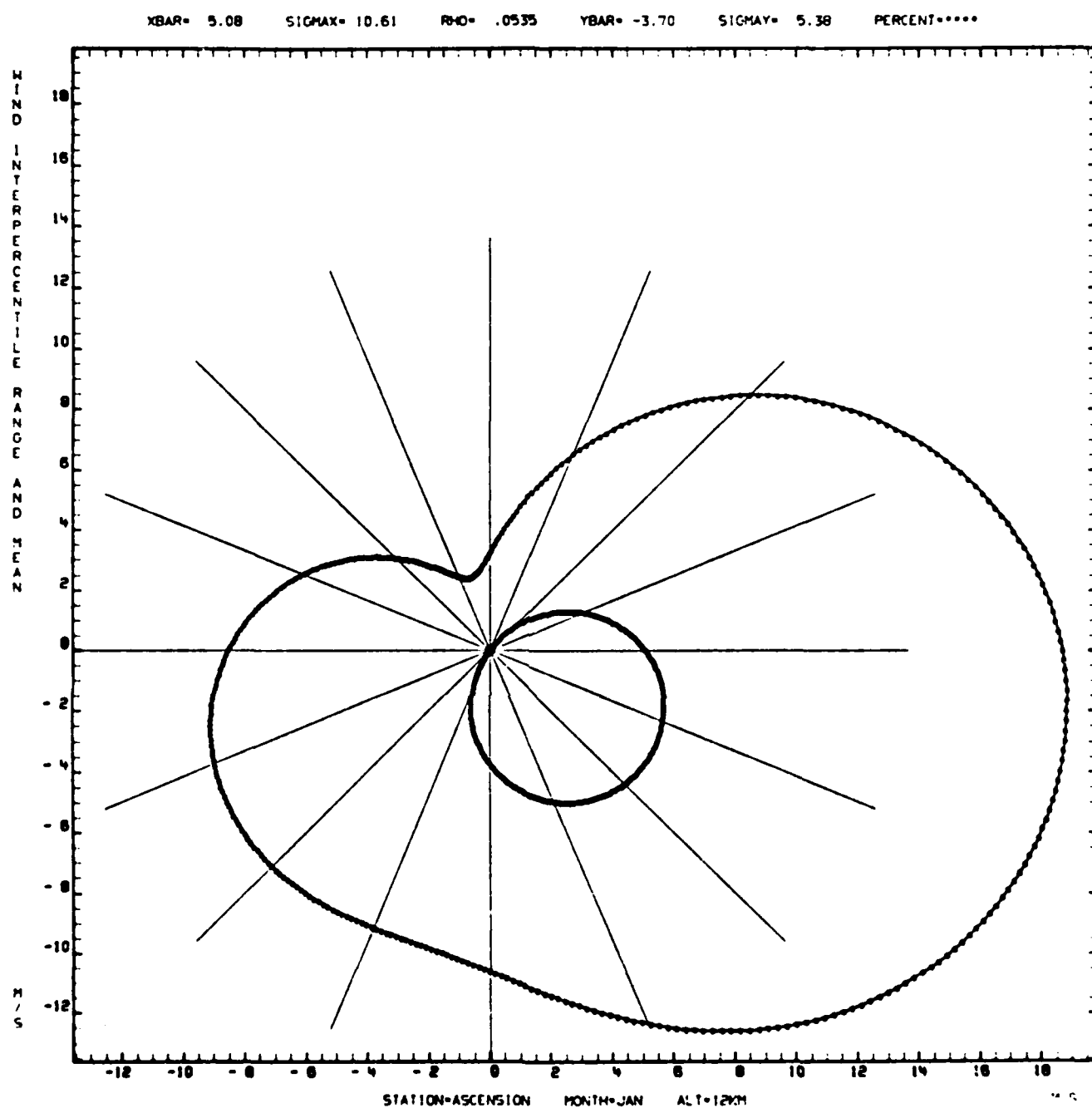


Figure A-18.

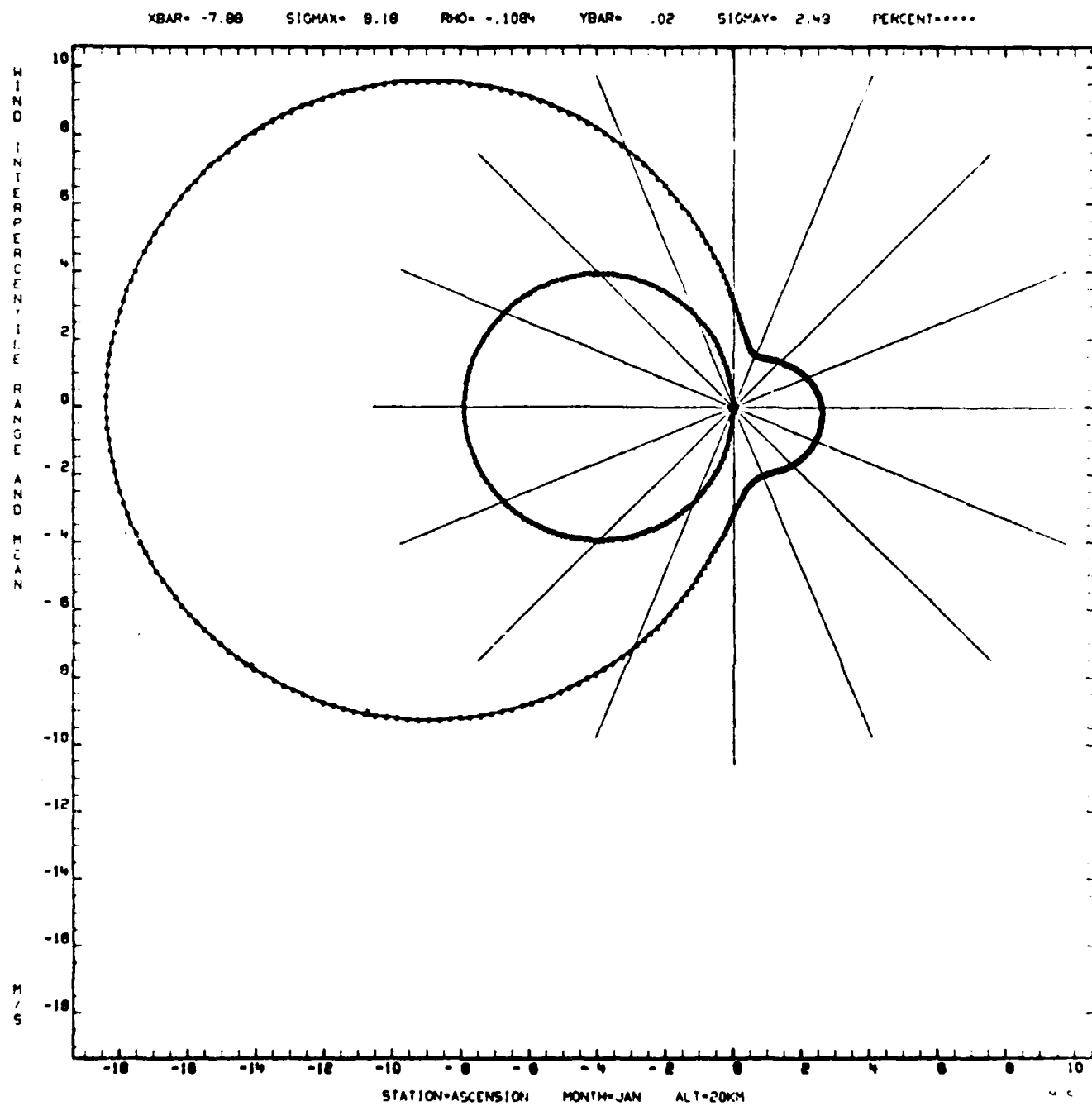


Figure A-19.

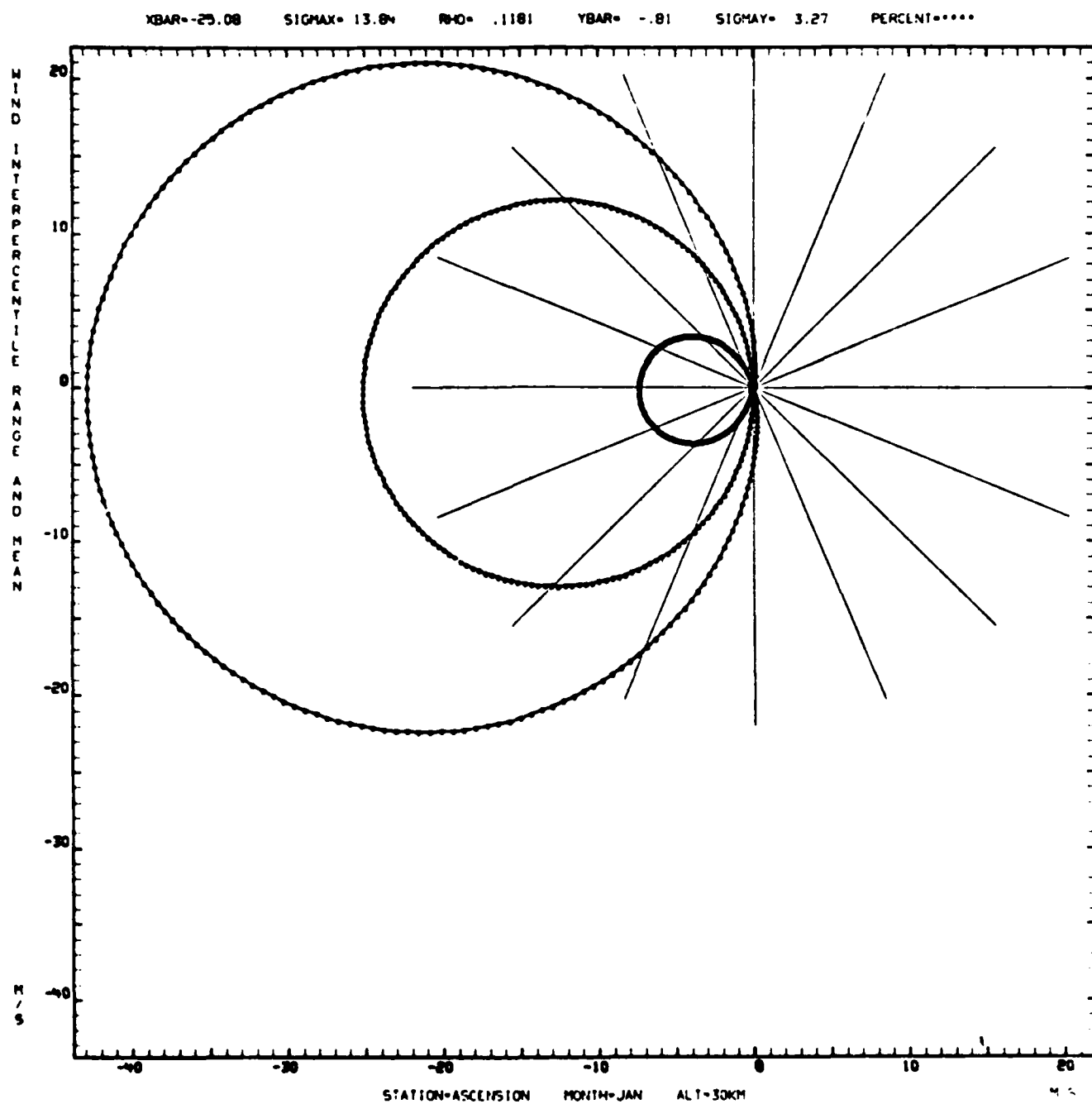


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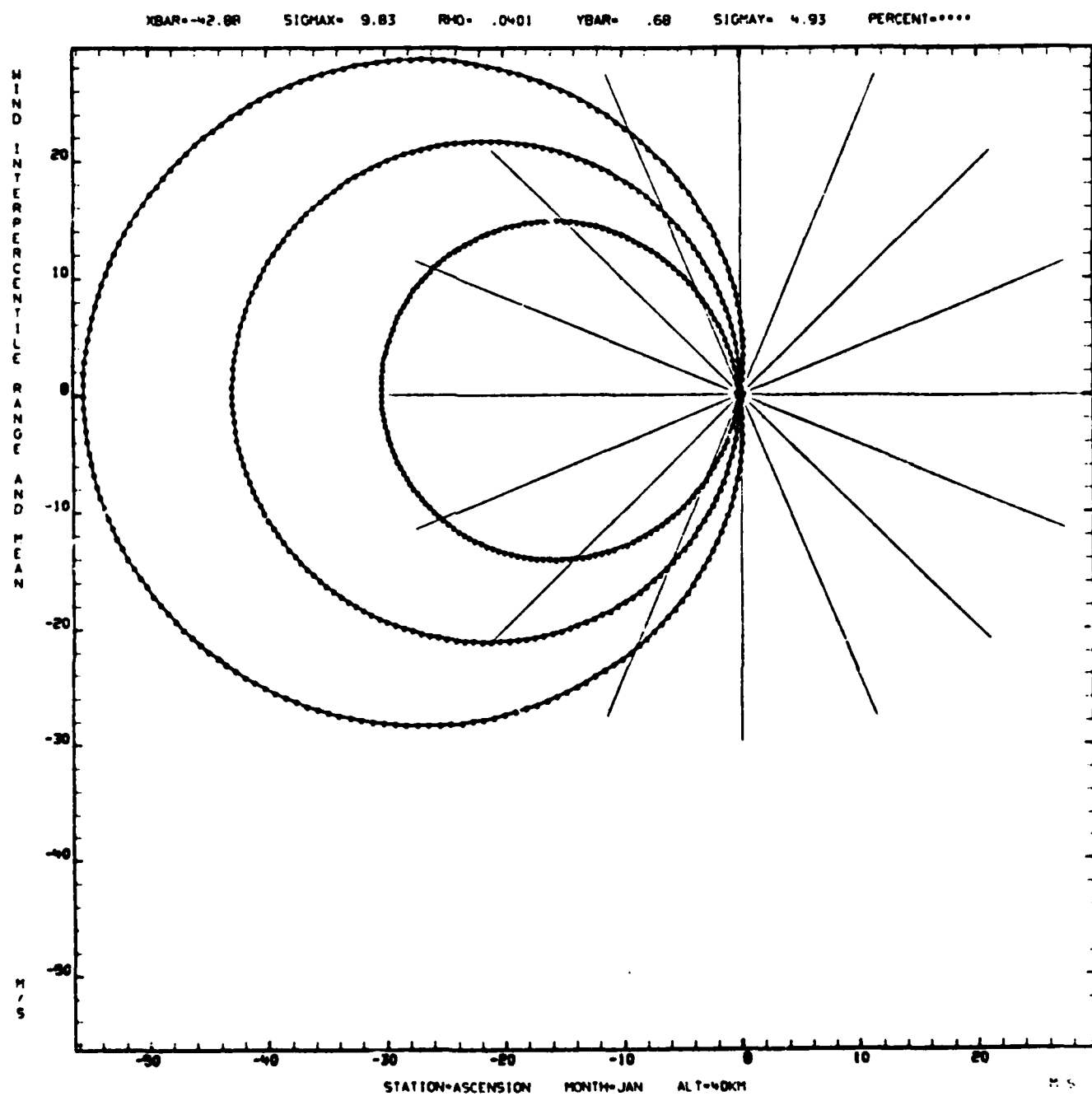


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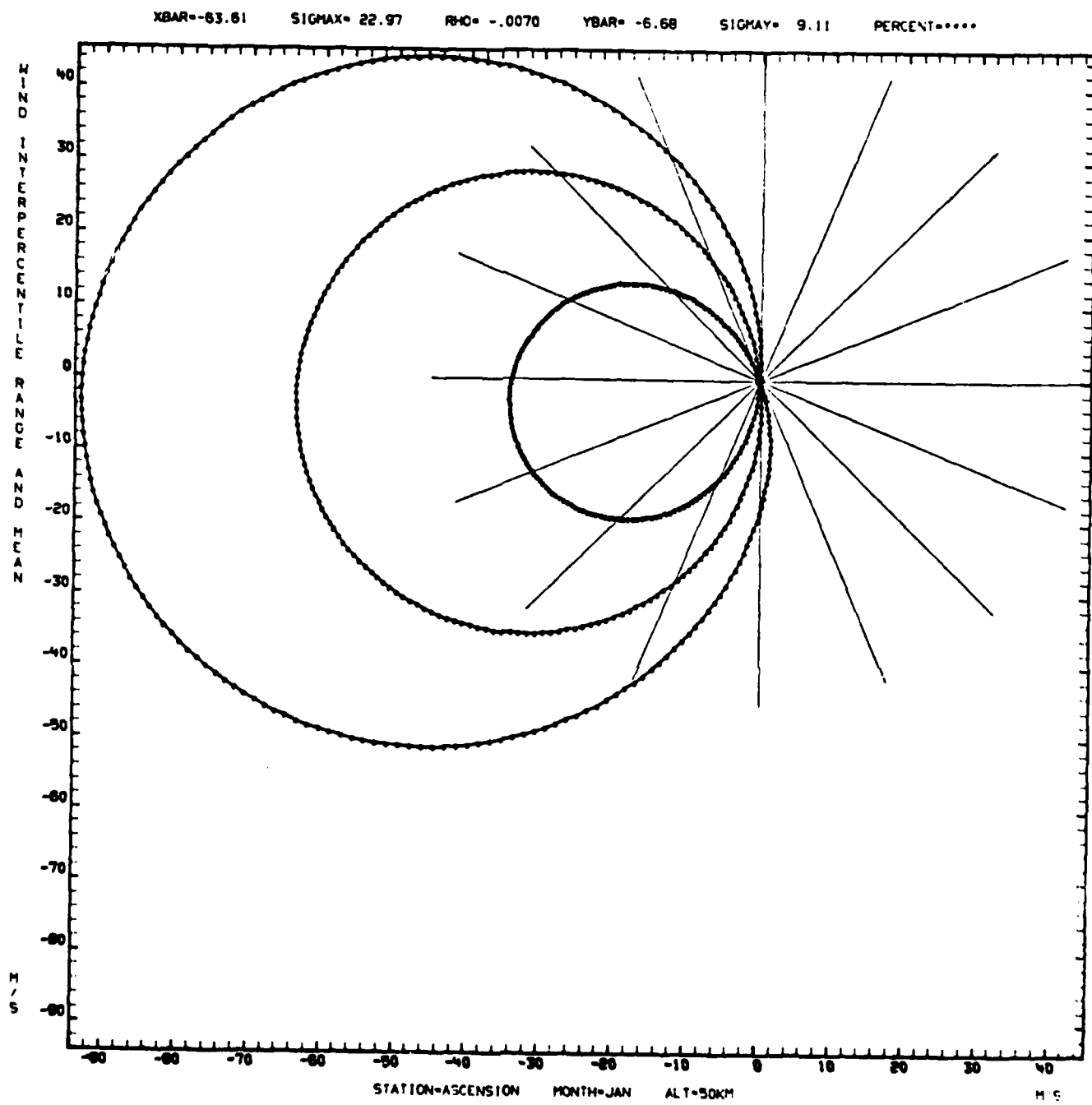


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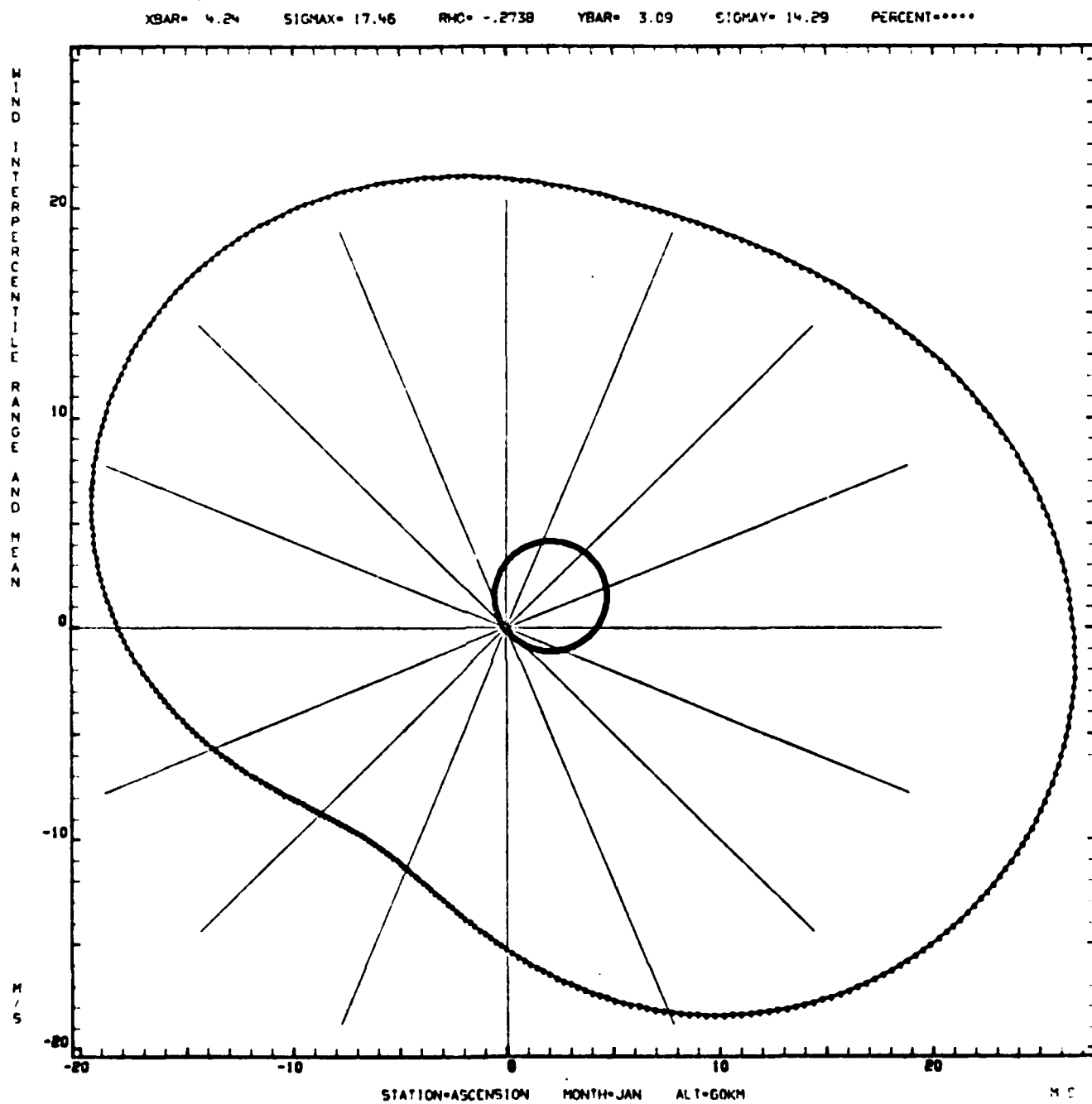


Figure A-23.

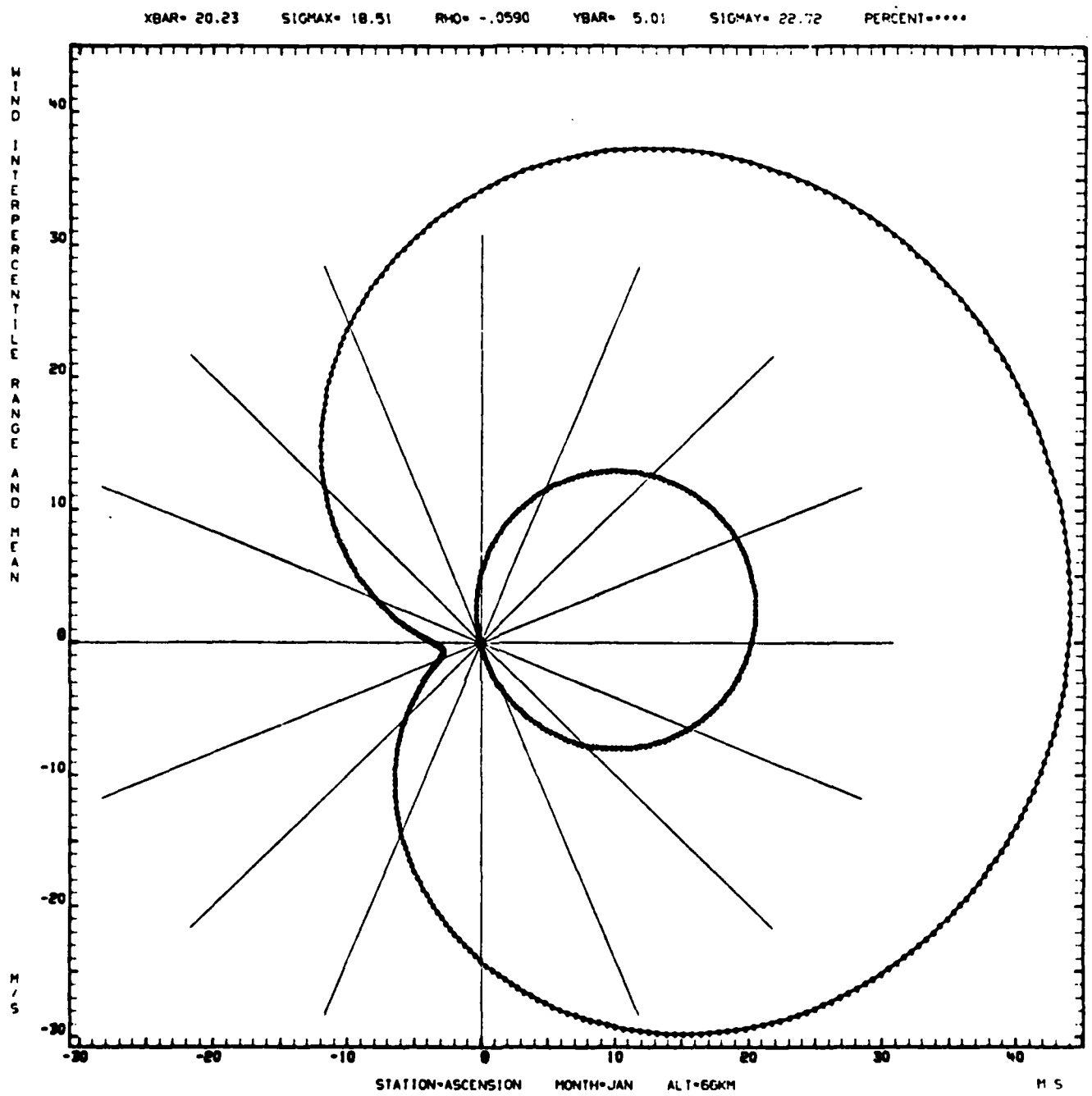


Figure A-24.

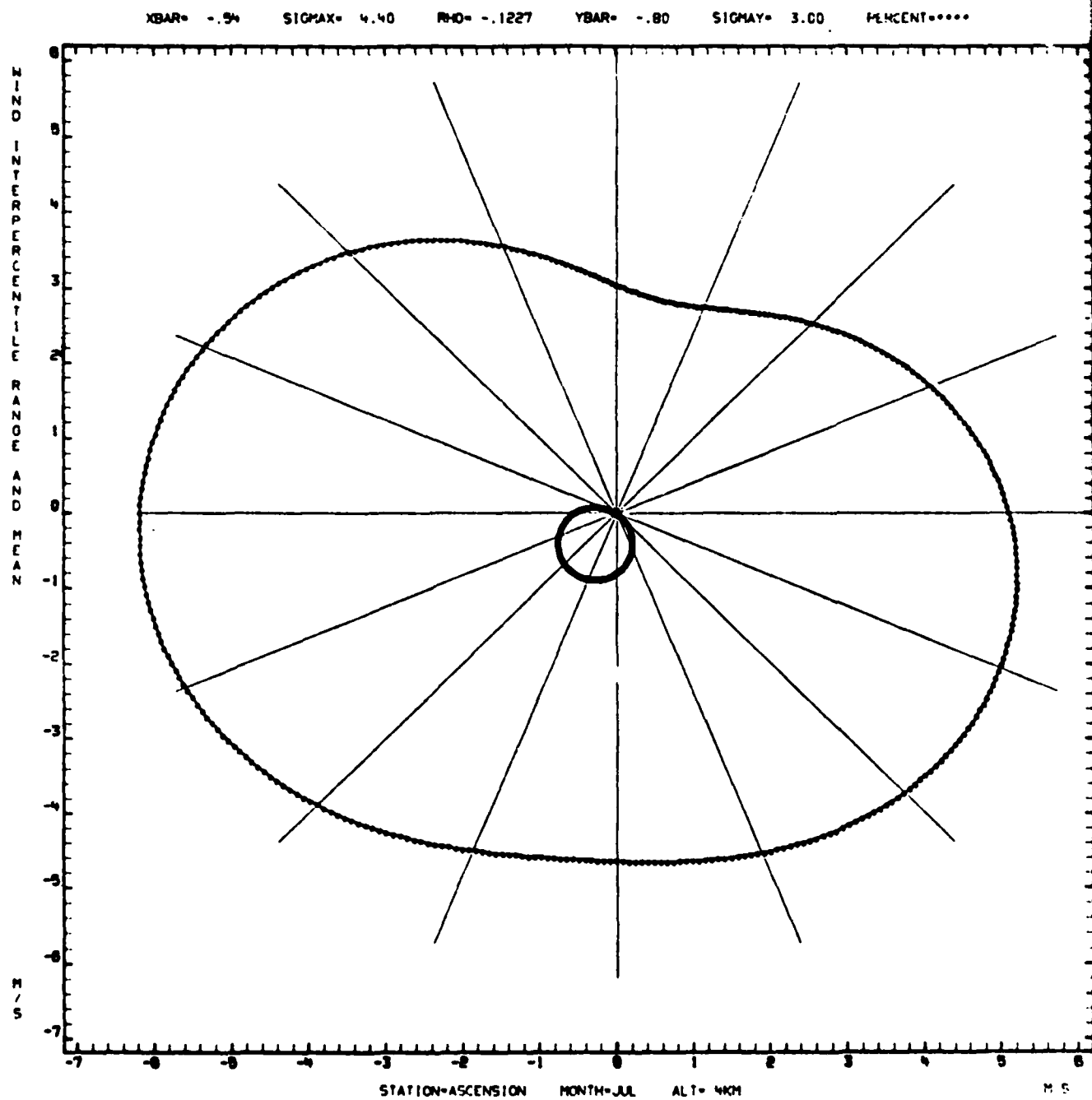


Figure A-25.

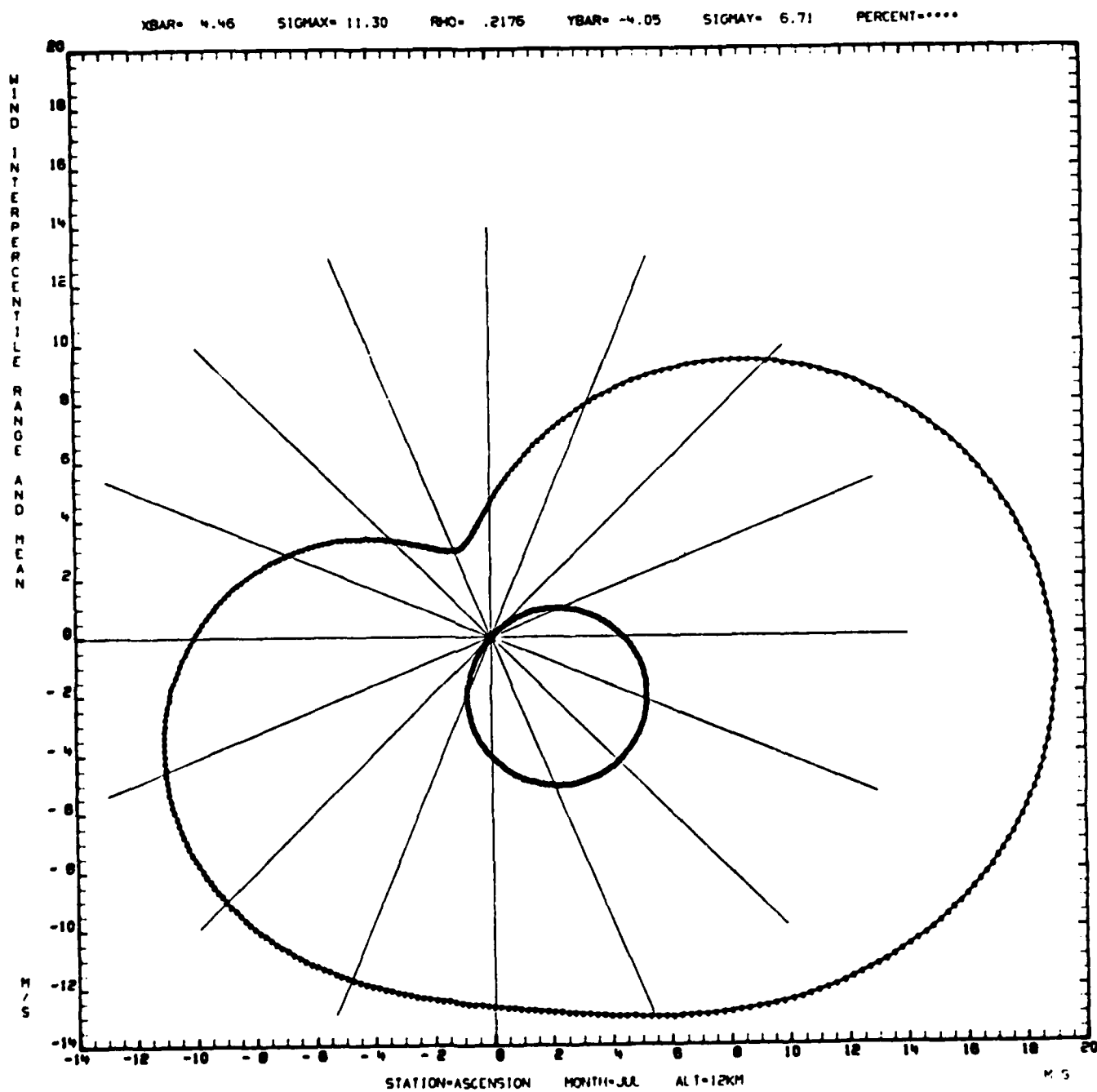


Figure A-26.

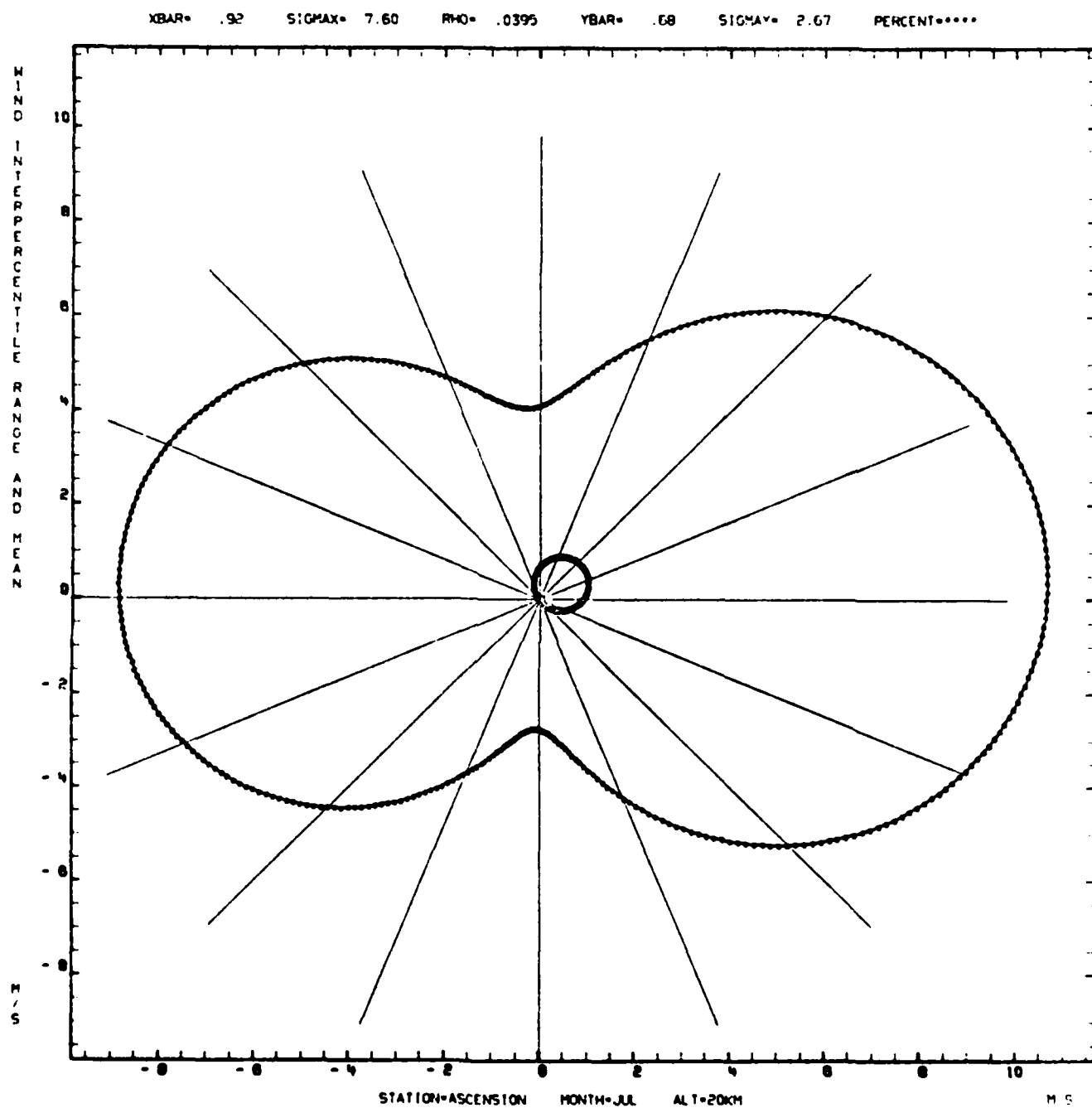


Figure A-27.

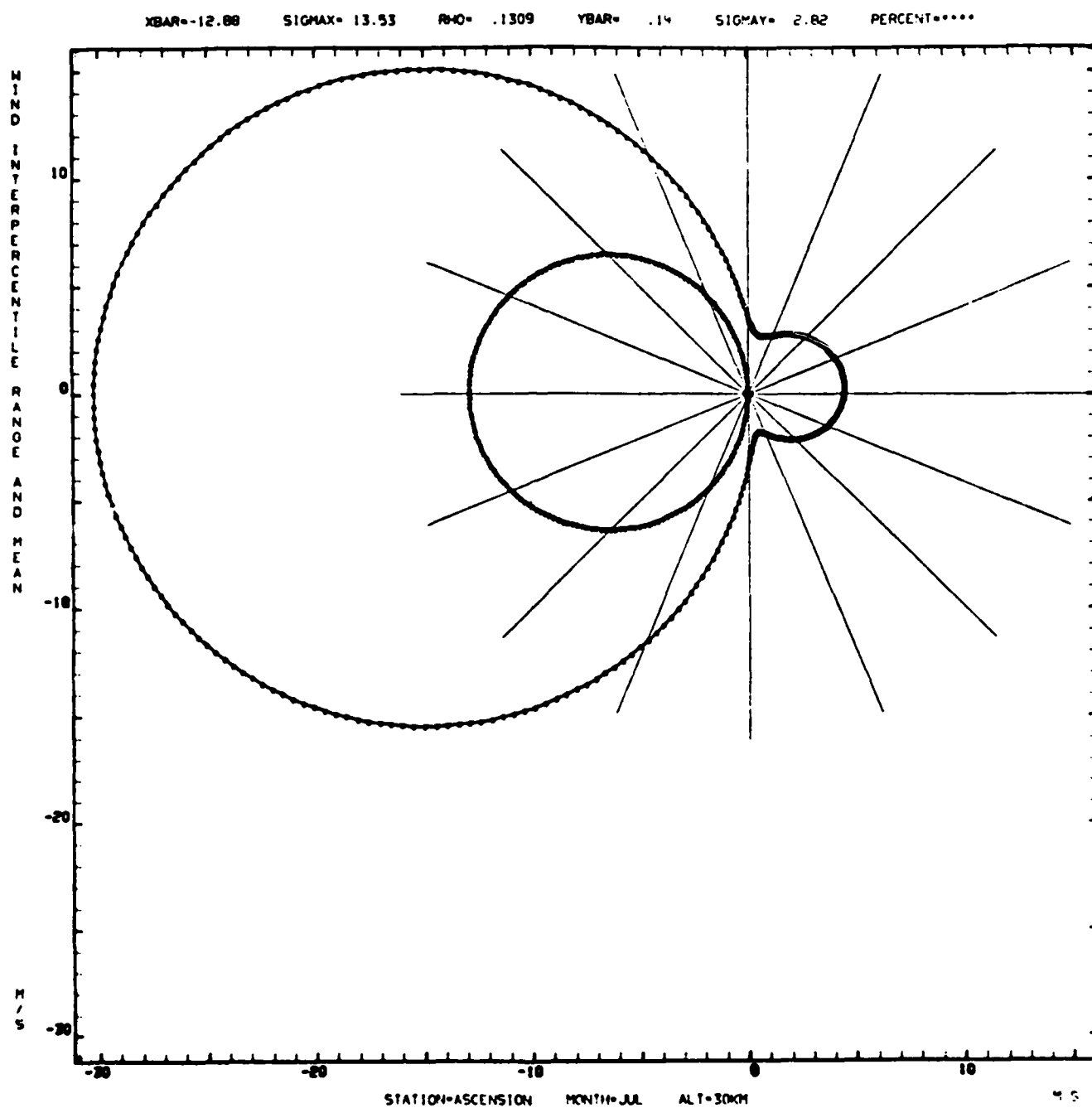


Figure A-28.

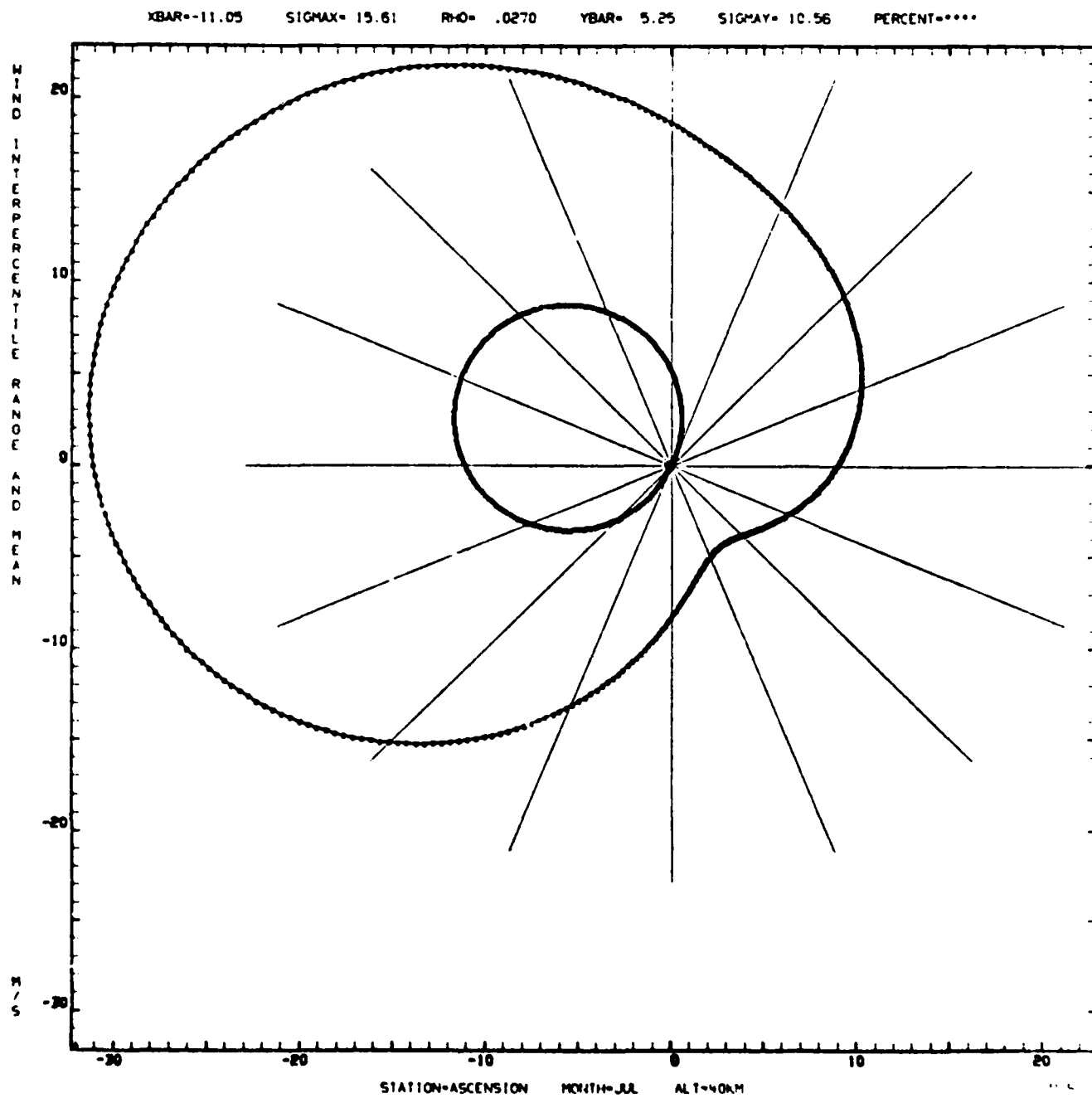


Figure A-29.

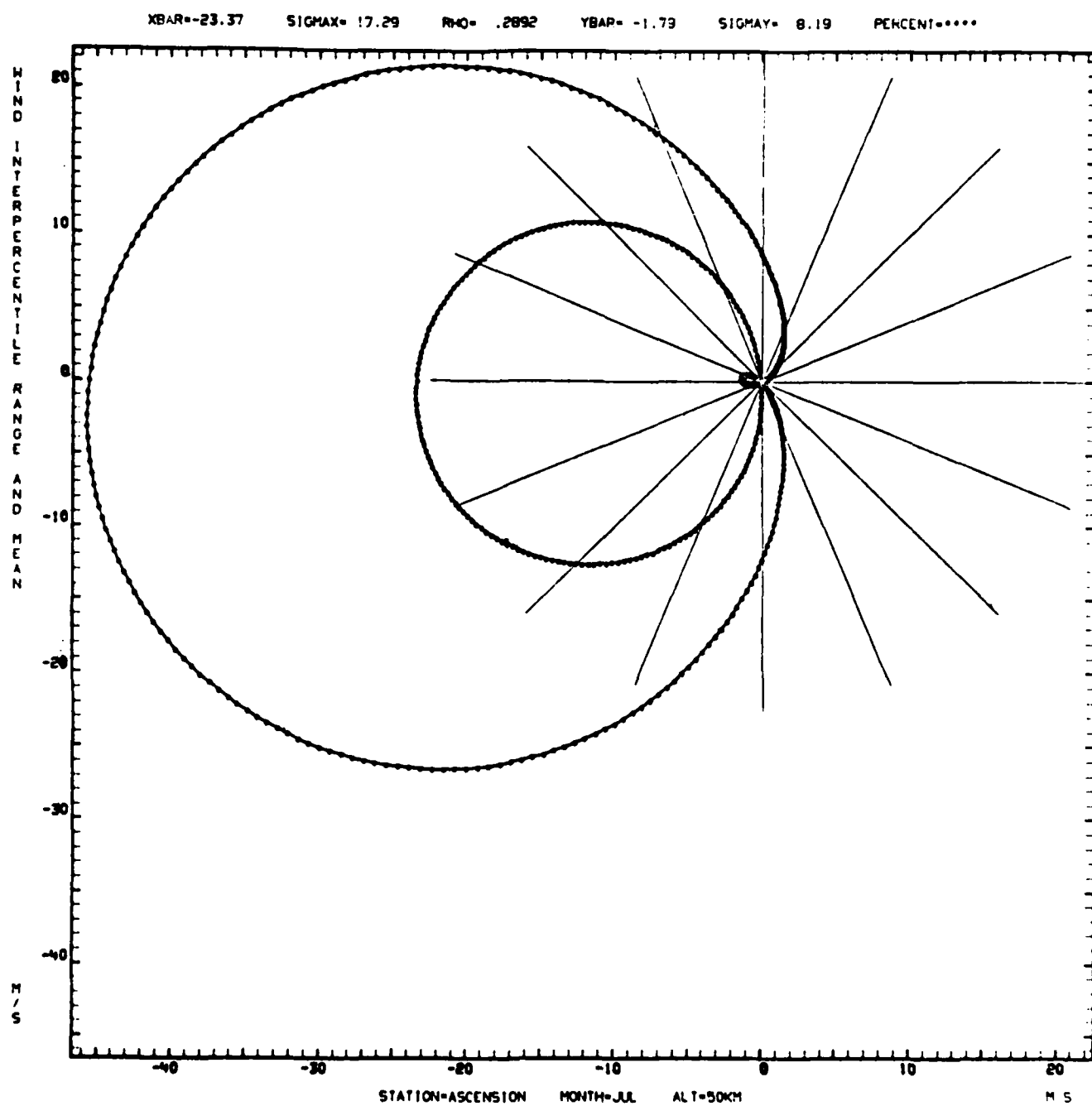


Figure A-30.

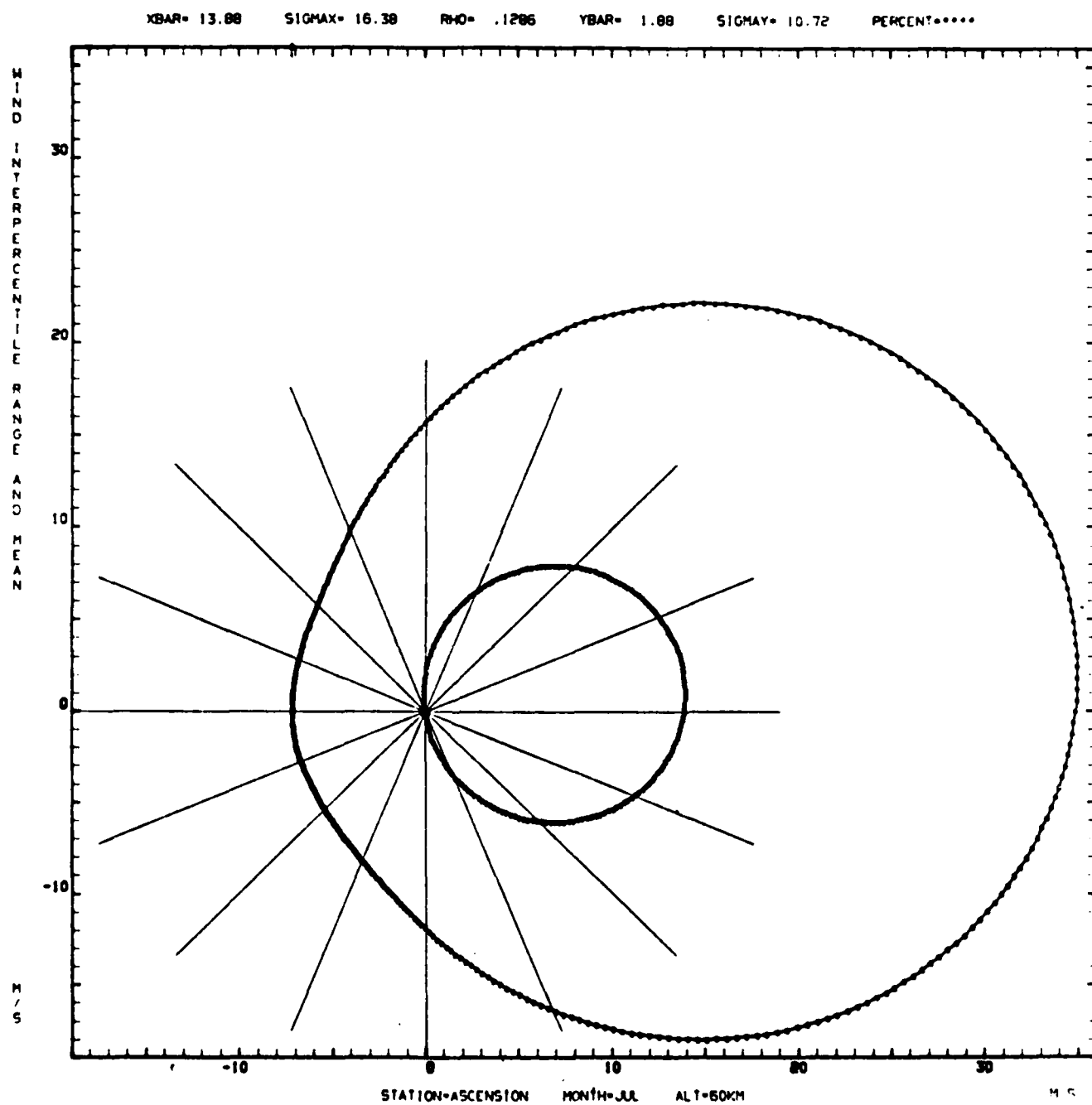


Figure A-31.

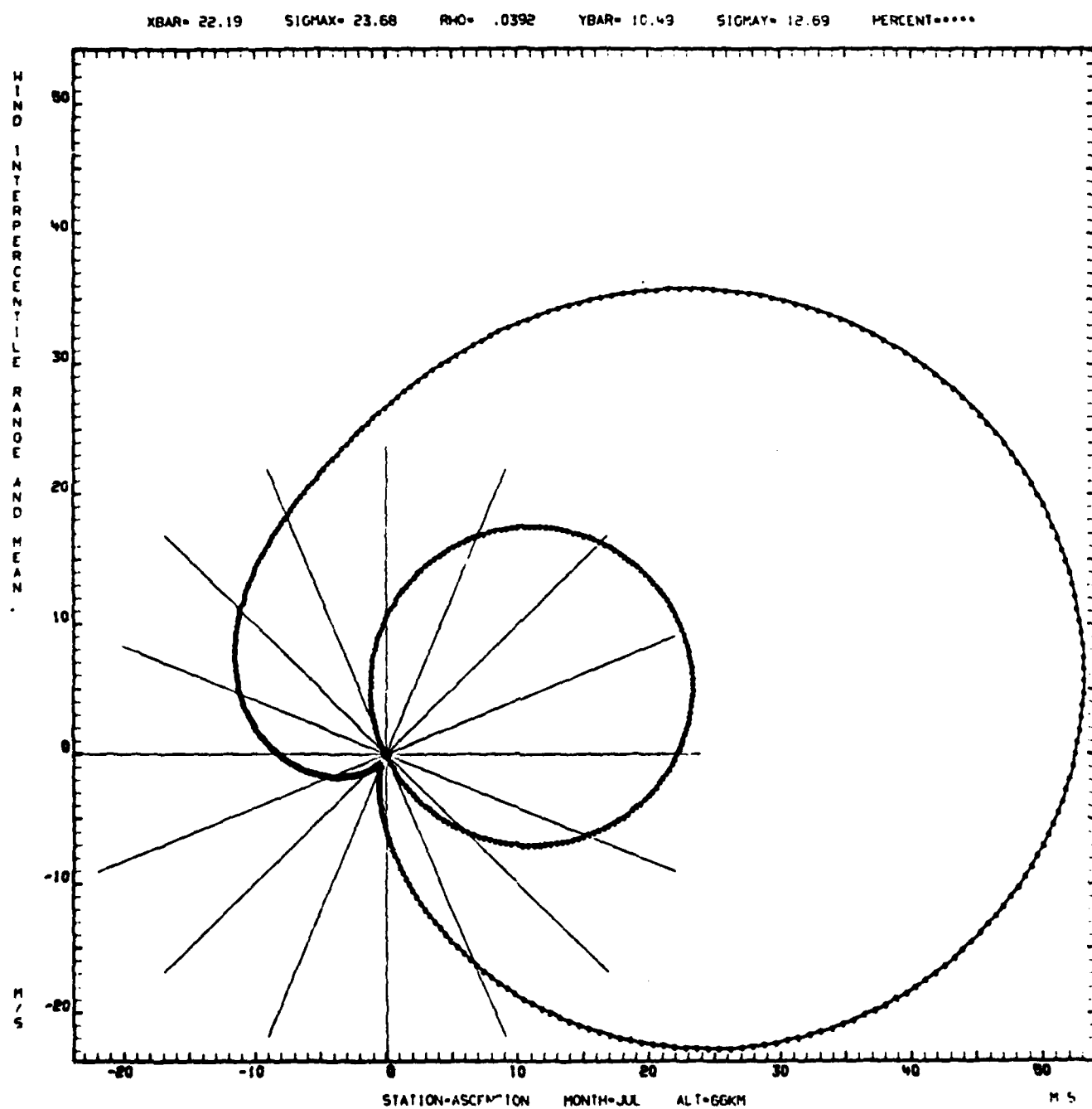


Figure A-32.

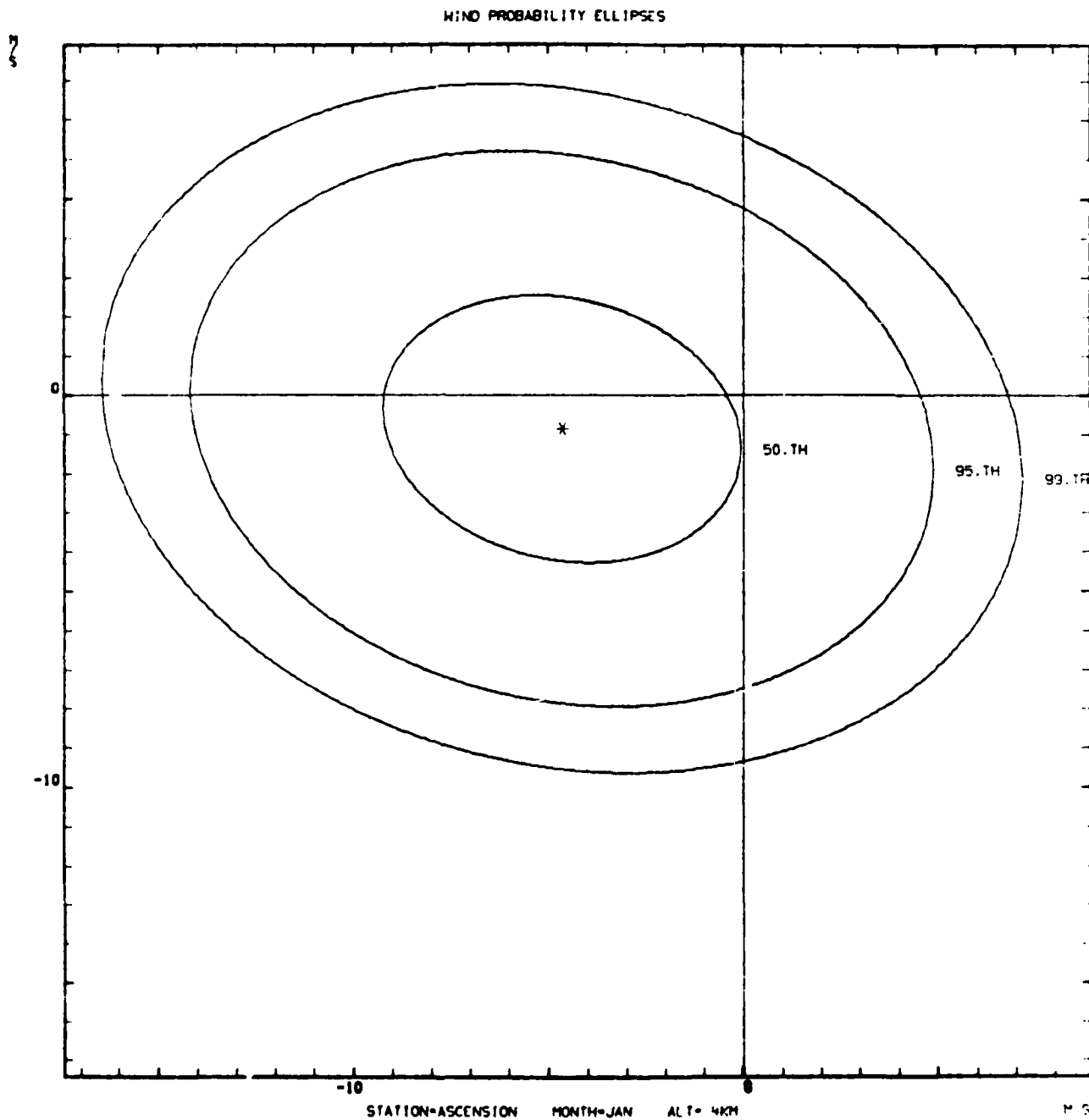


Figure A-33.

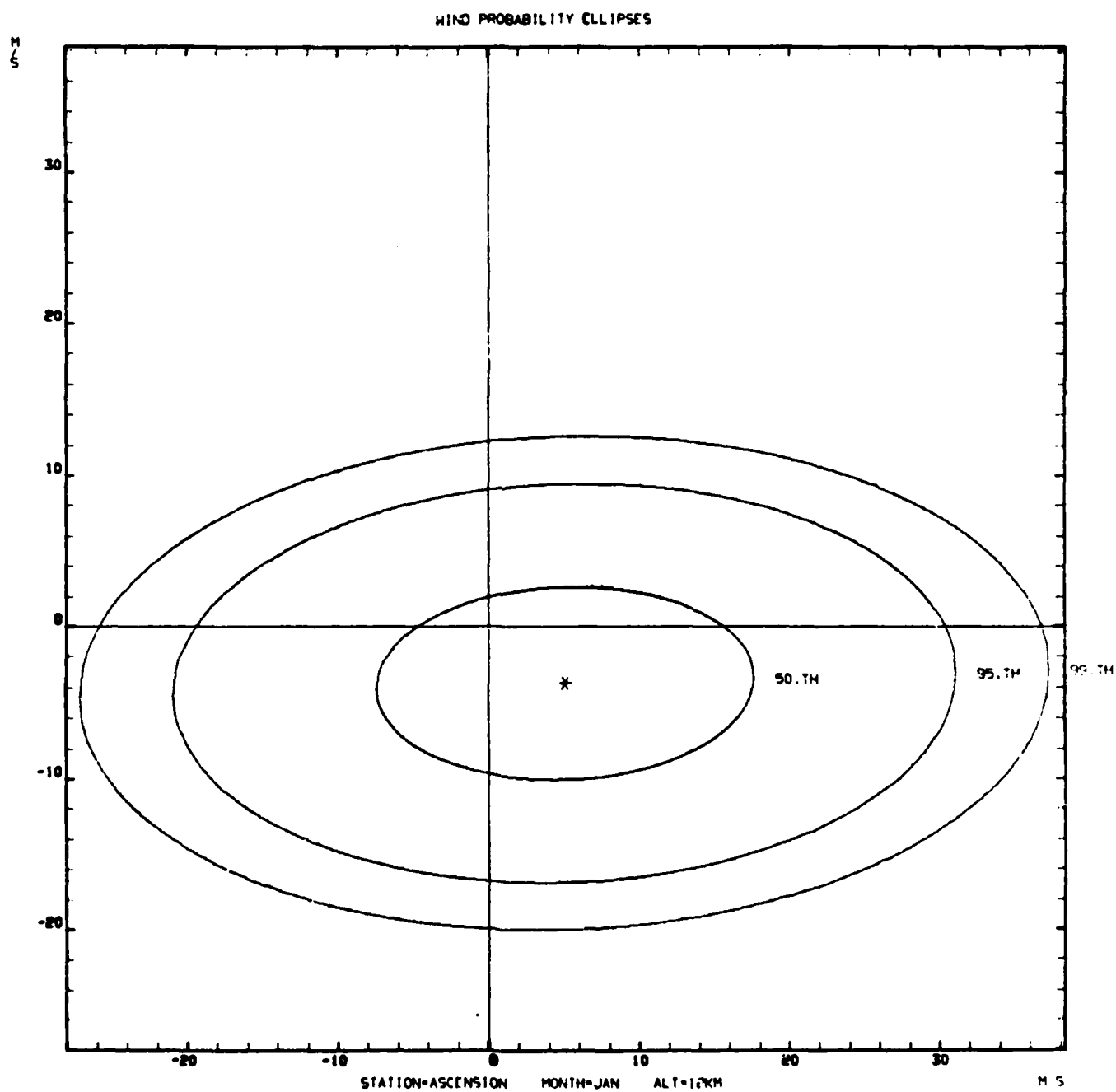


Figure A-34.

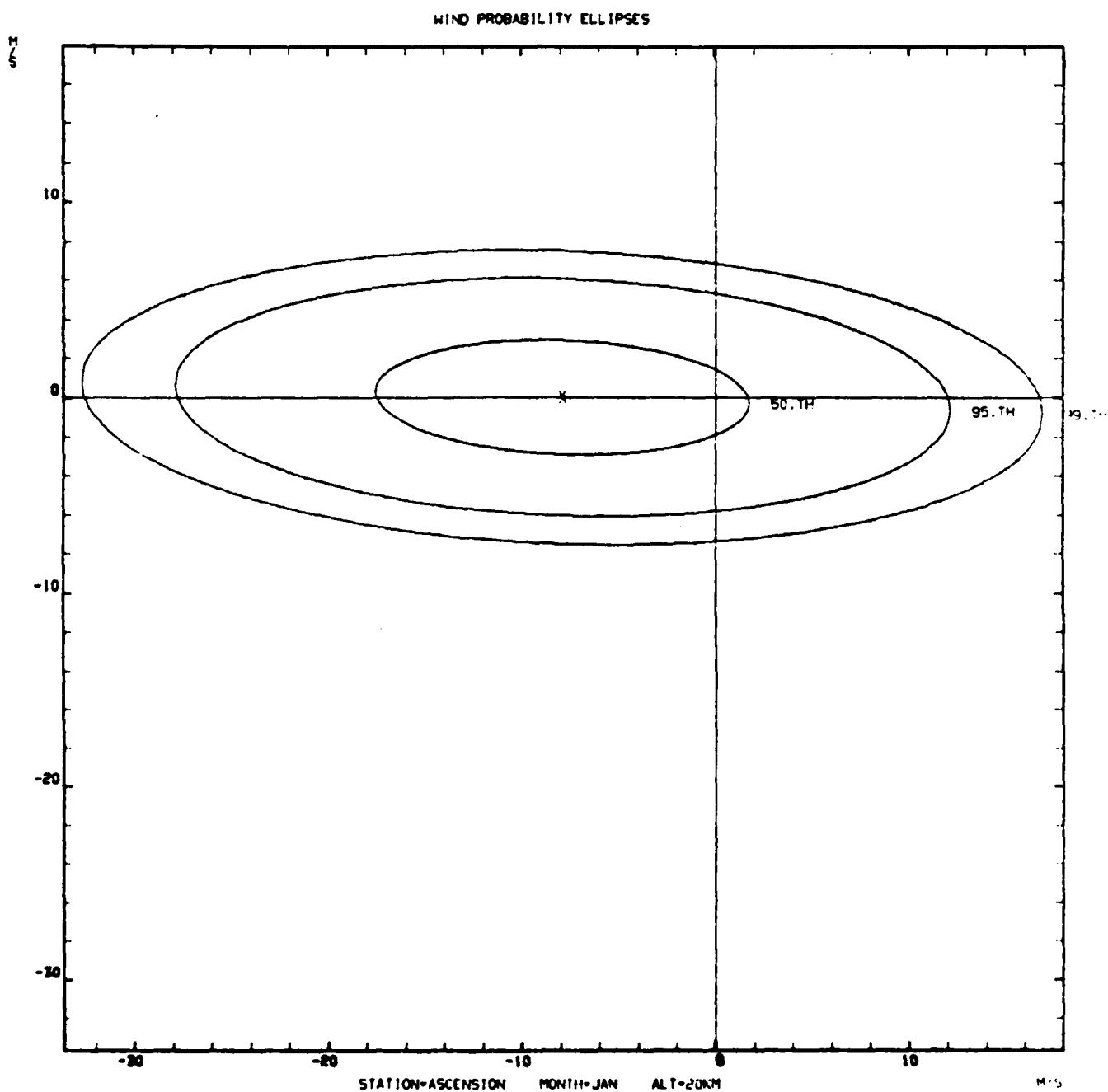


Figure A-35.

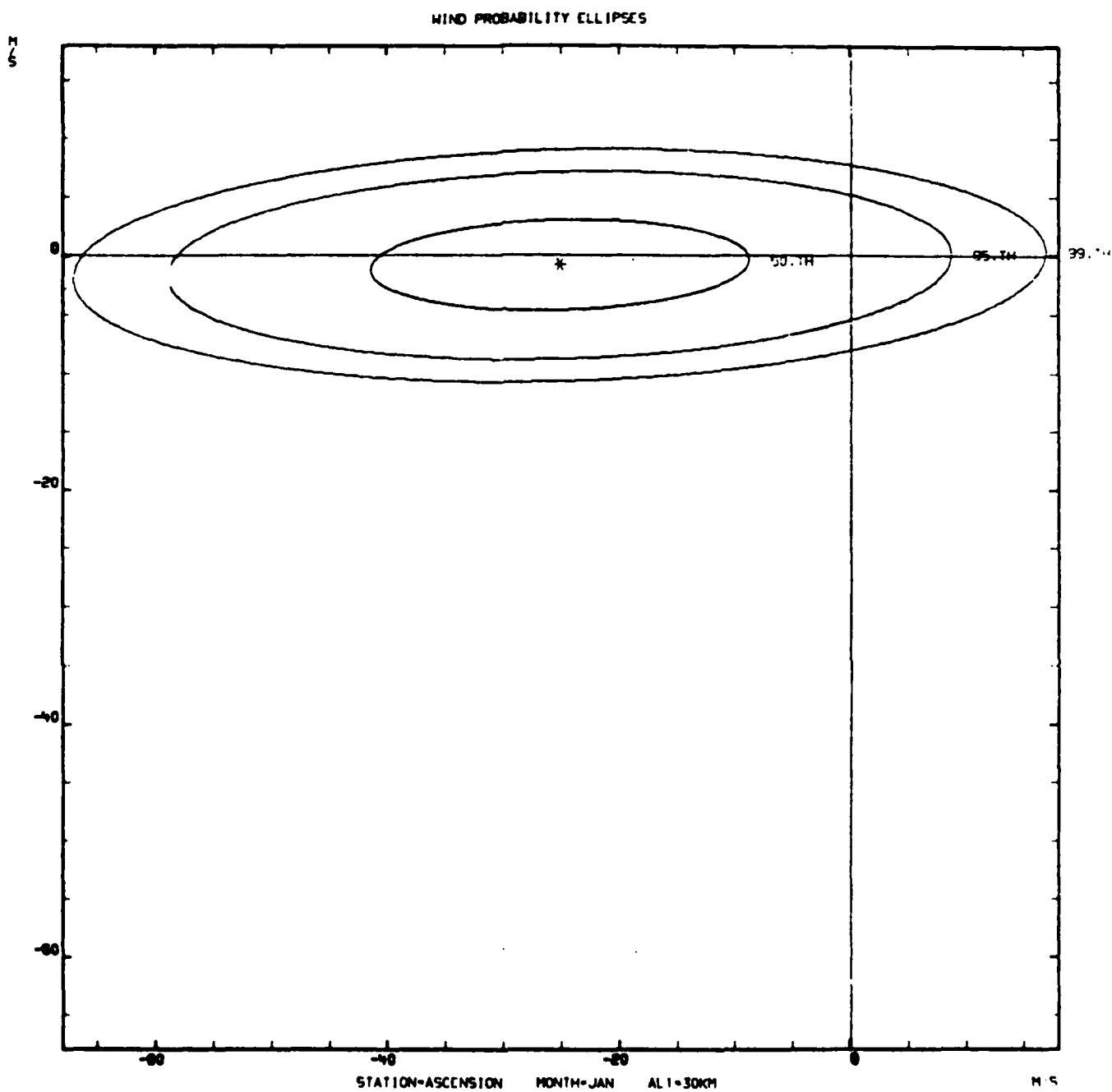


Figure A-36.

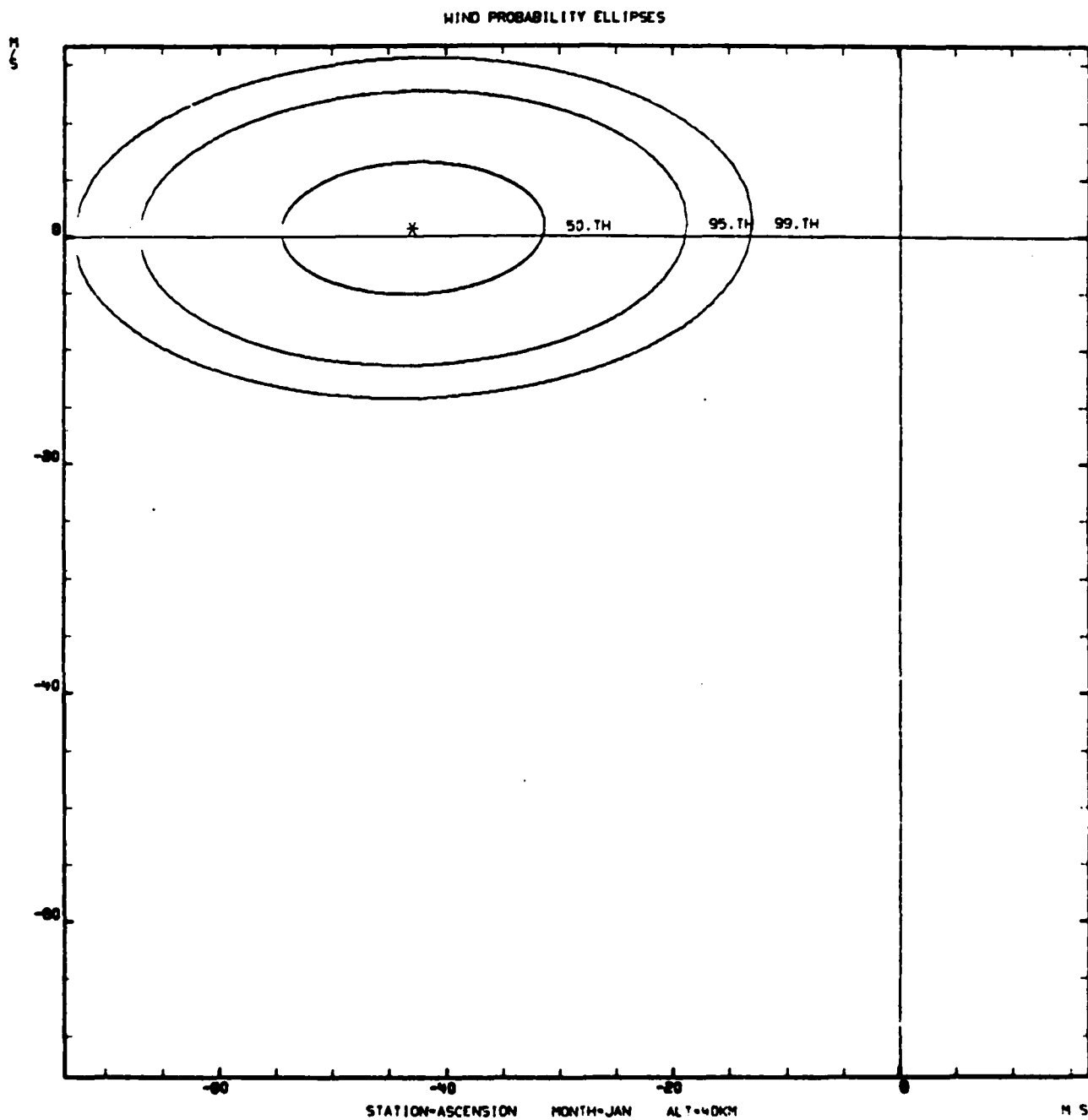


Figure A-37.

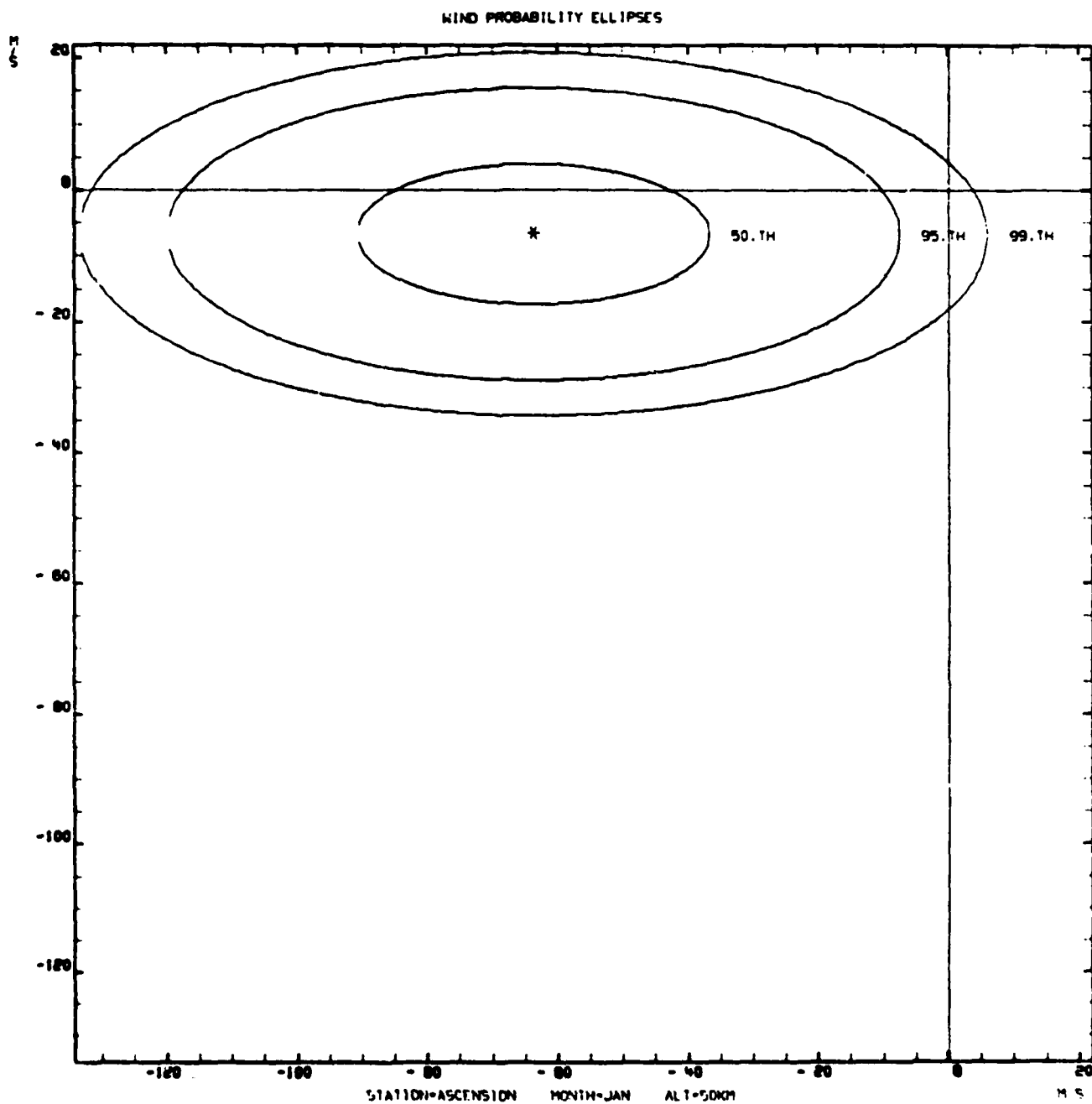


Figure A-38.

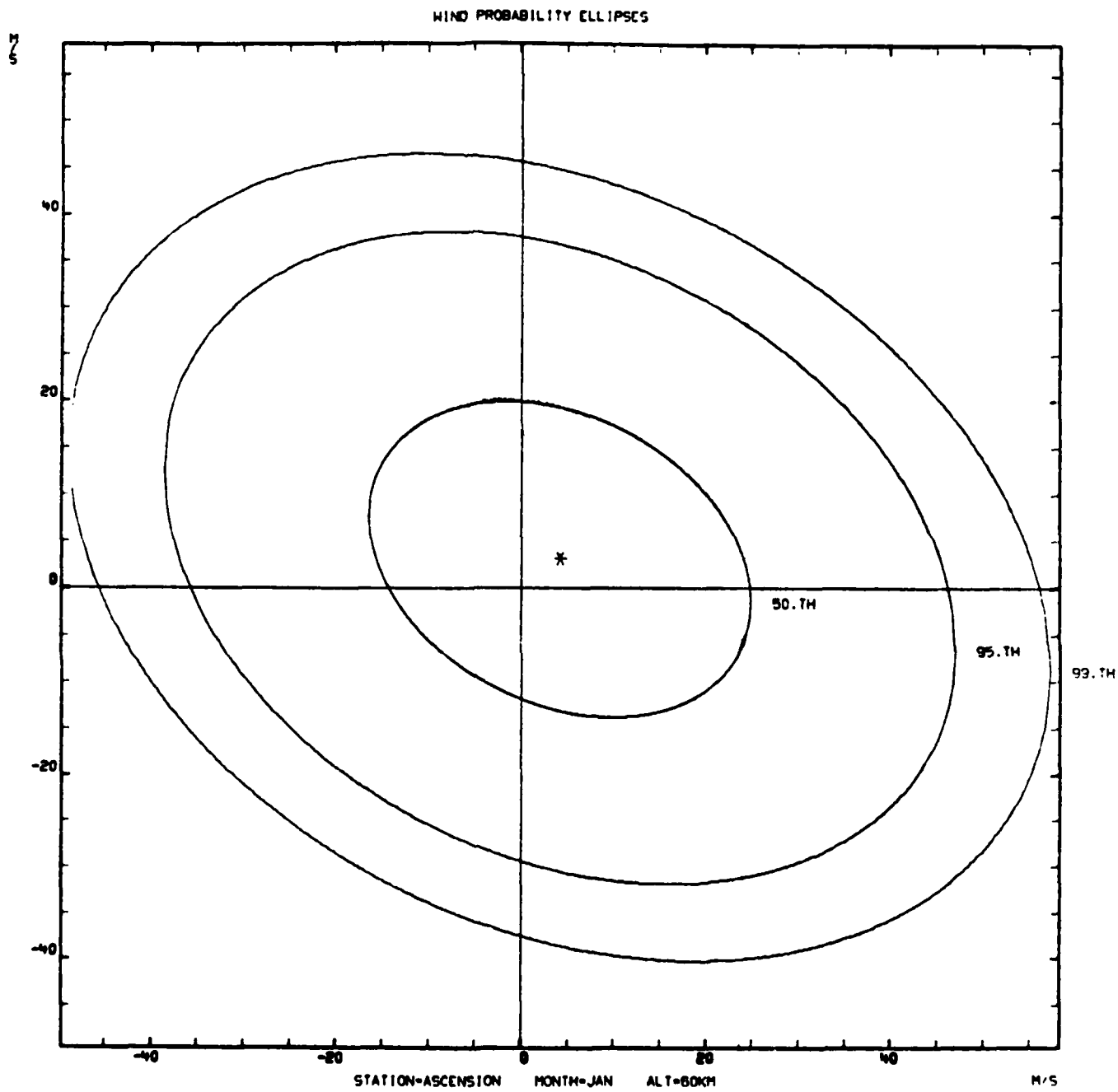


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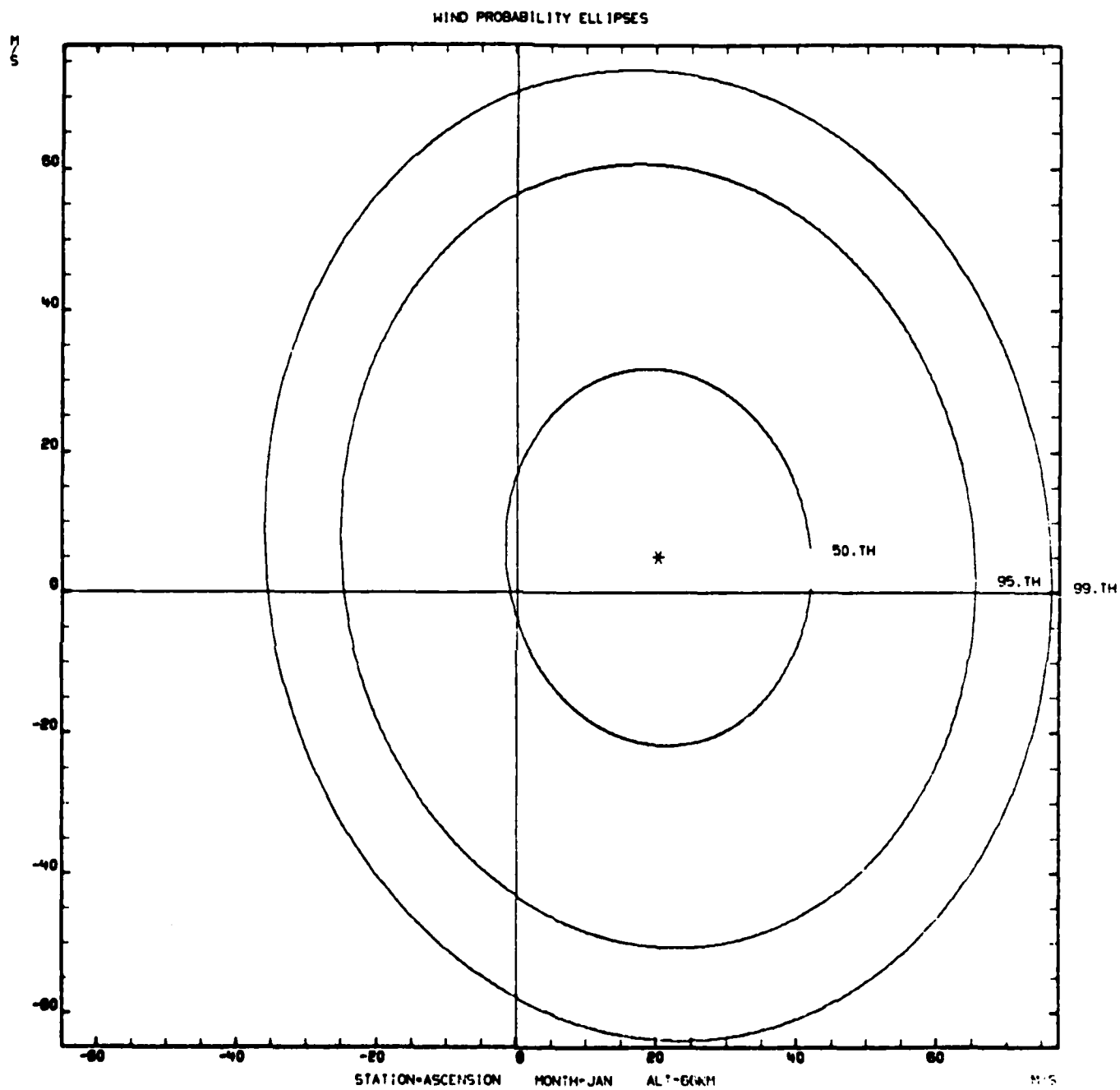


Figure A-40.

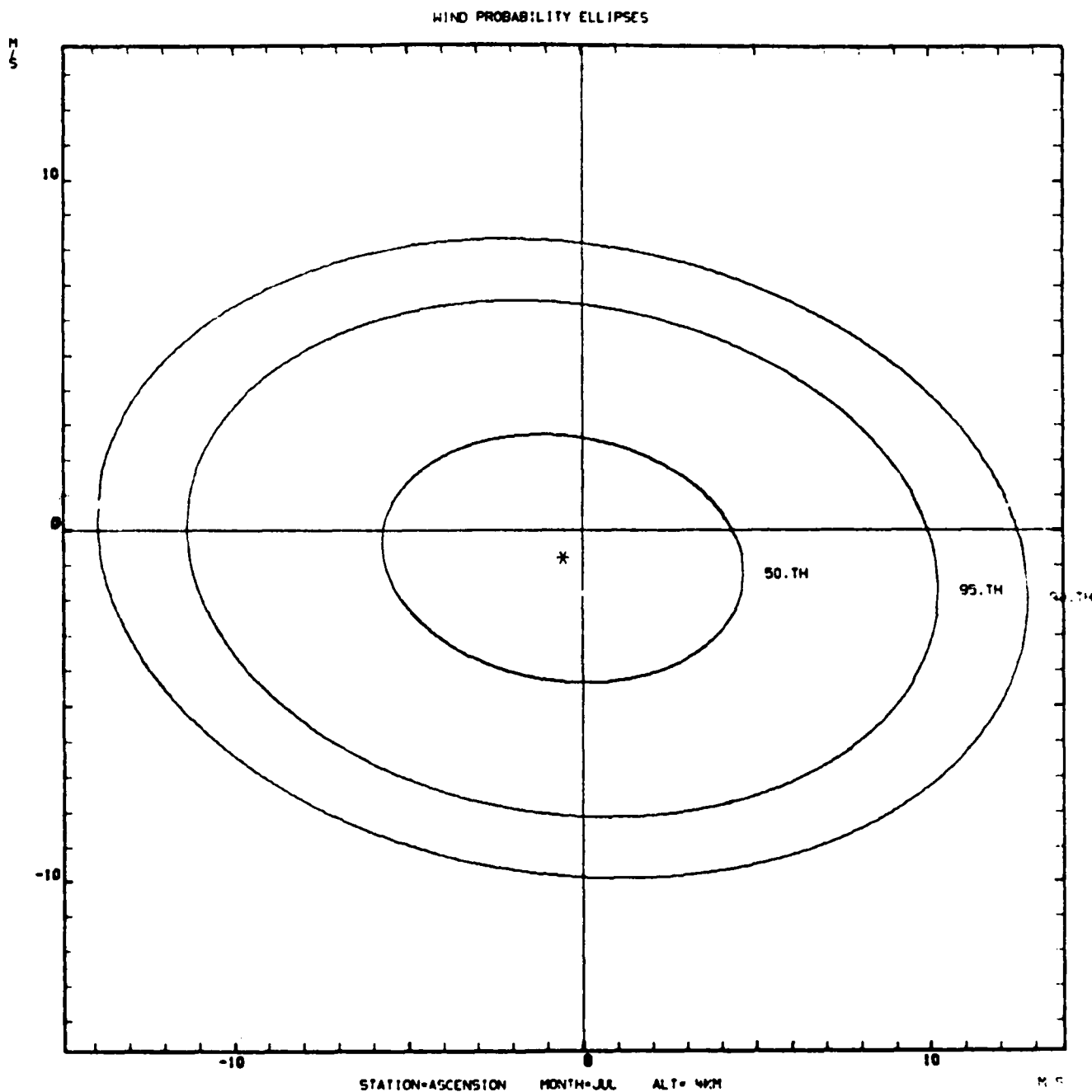


Figure A-41.

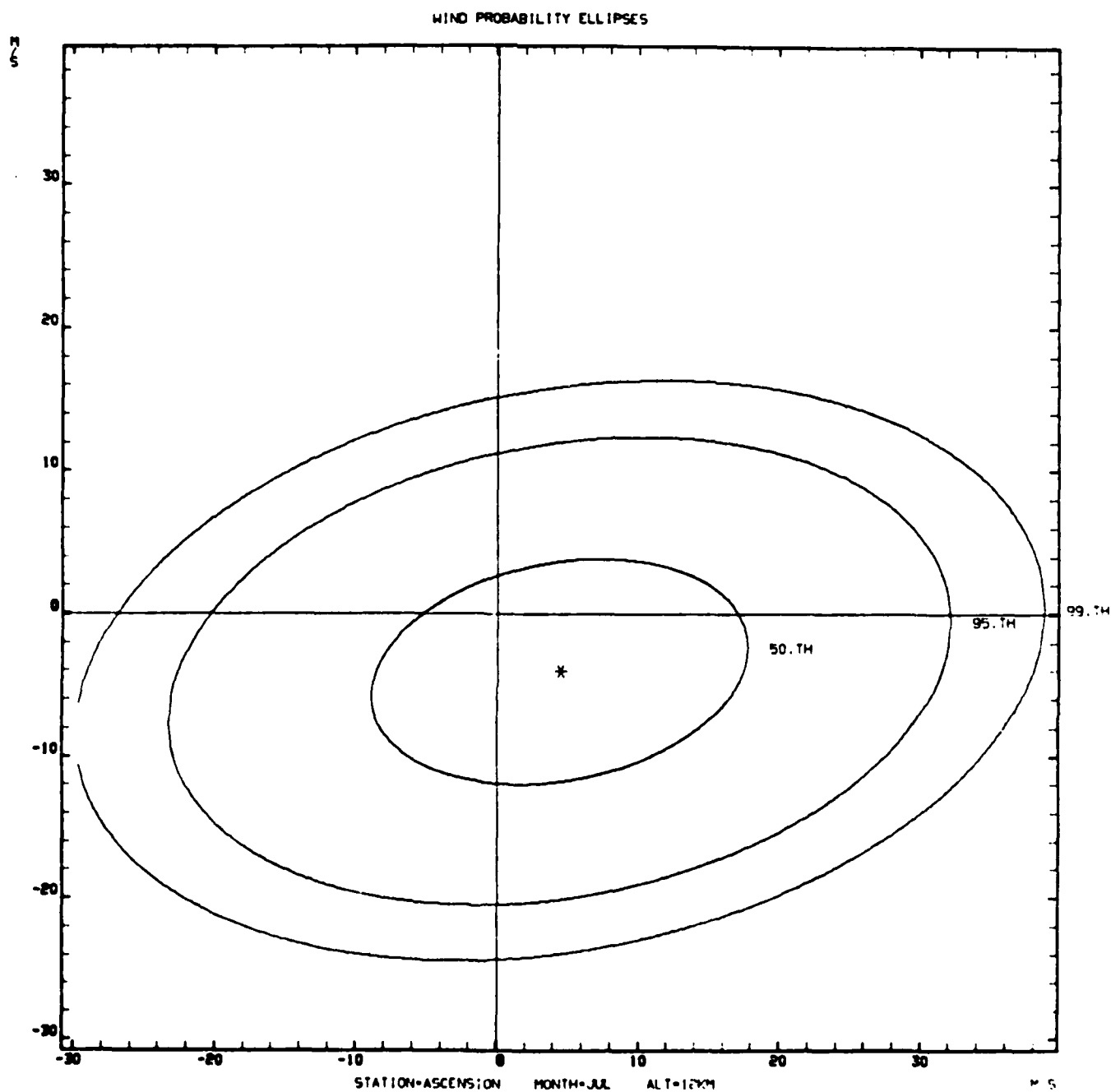


Figure A-42.

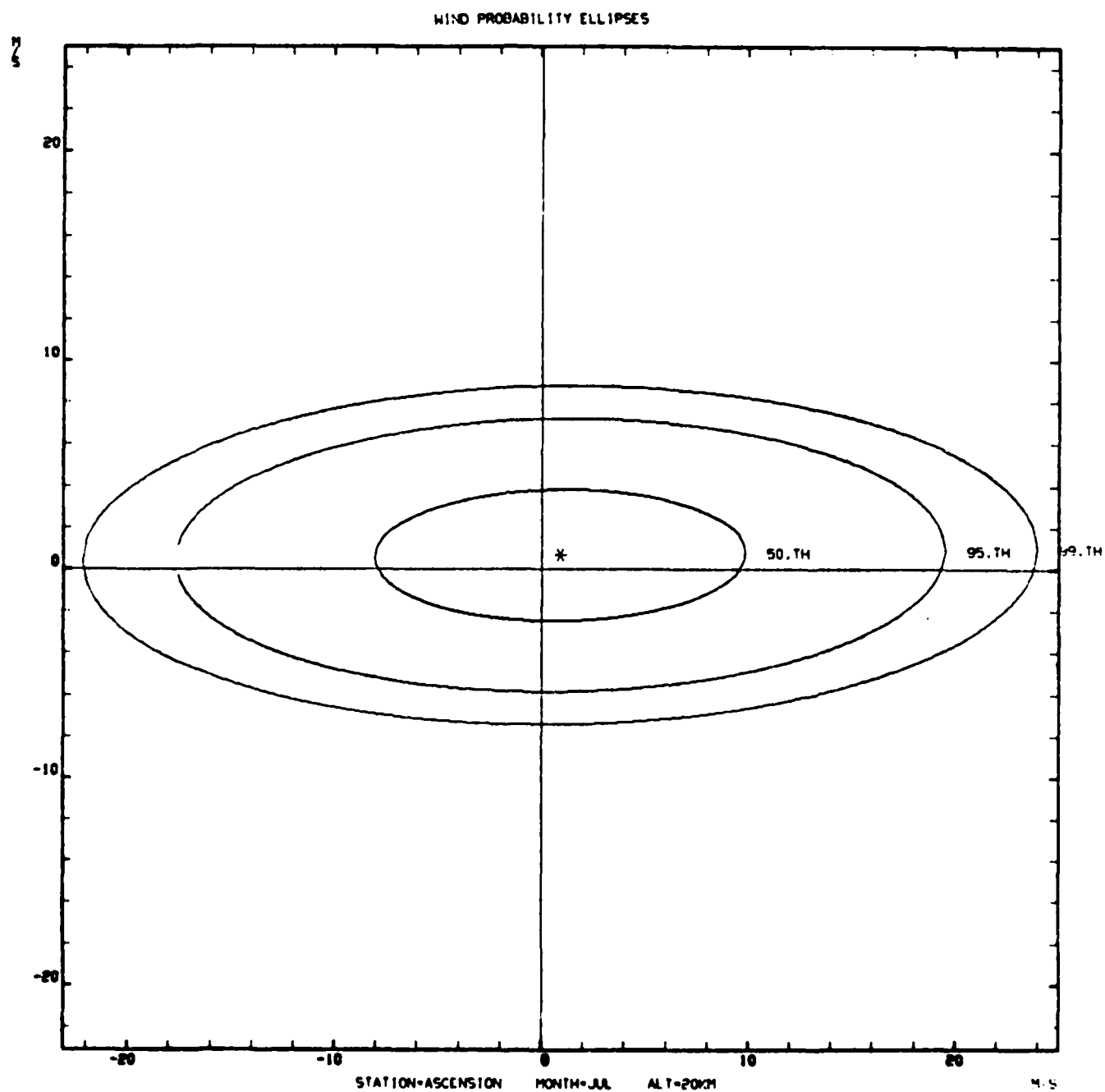


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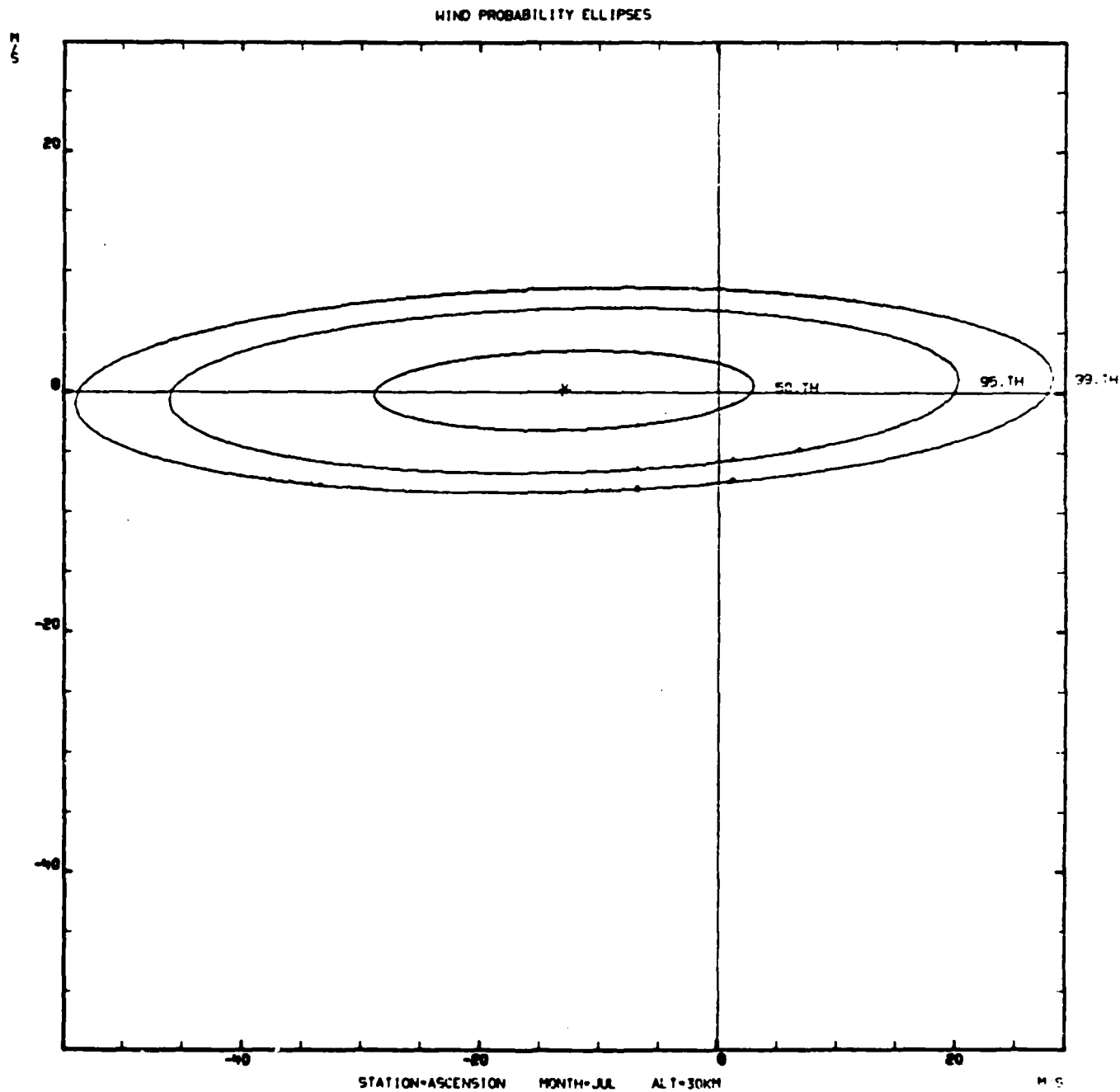


Figure A-44.

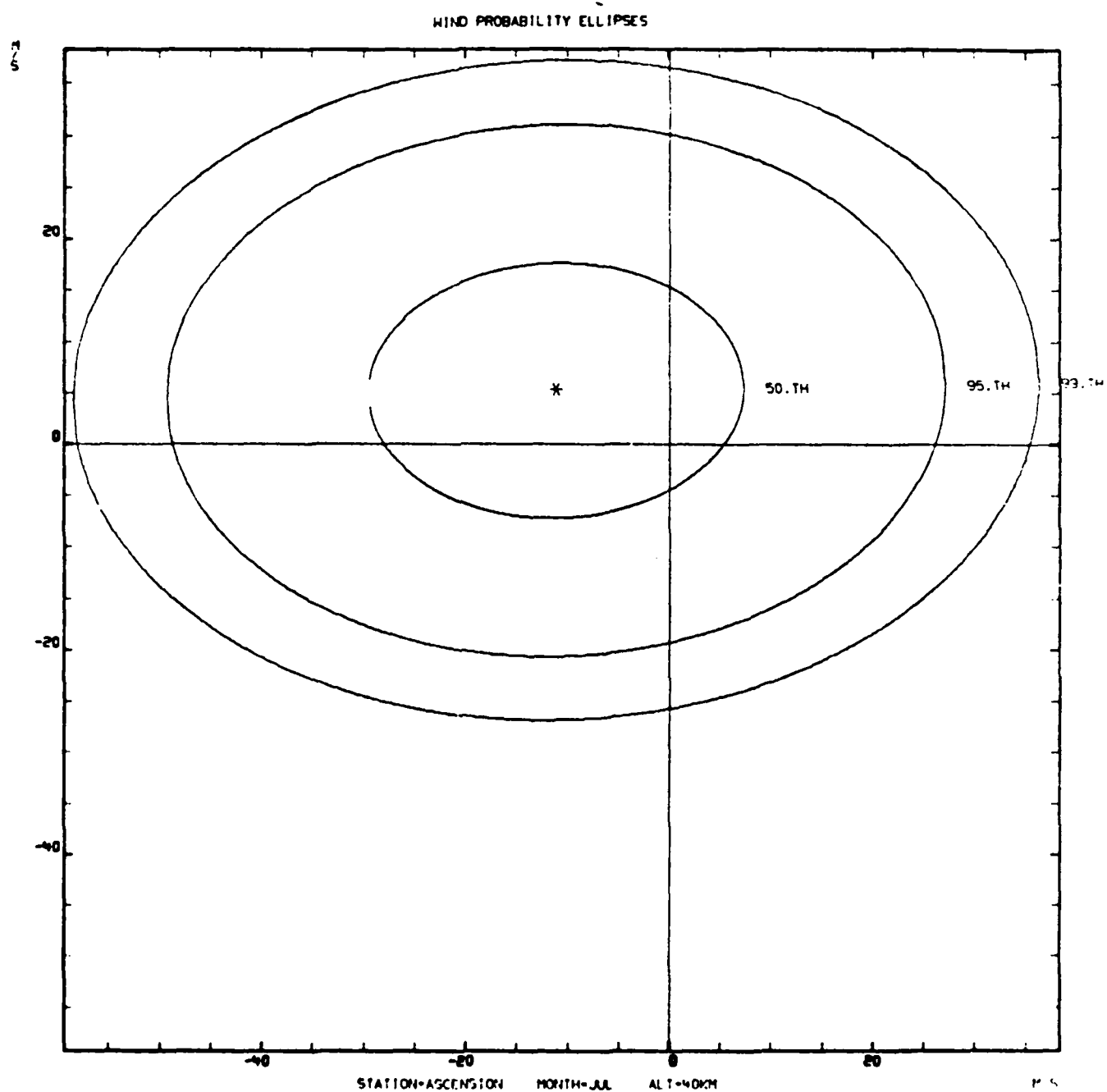


Figure A-45.

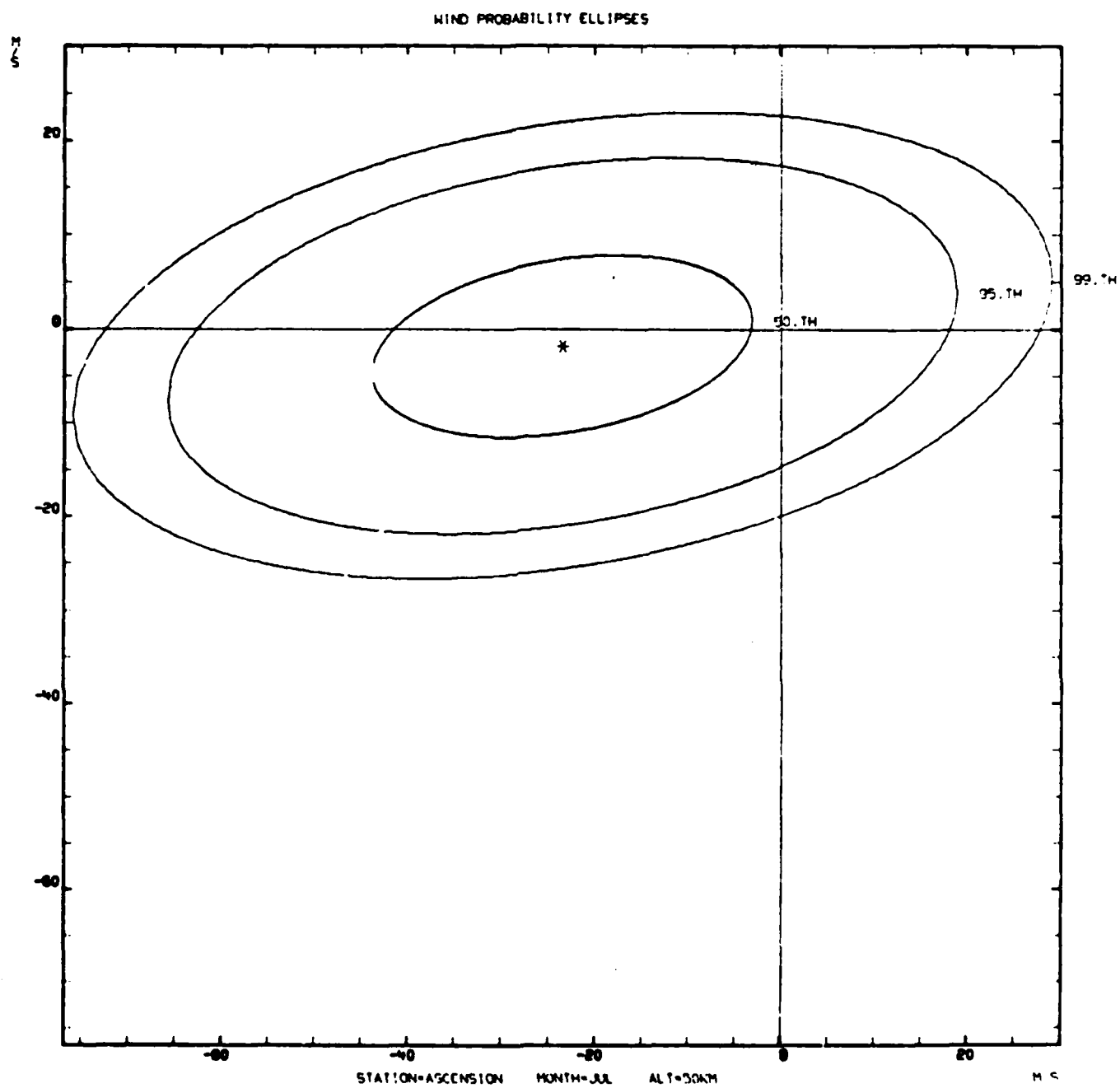


Figure A-46.

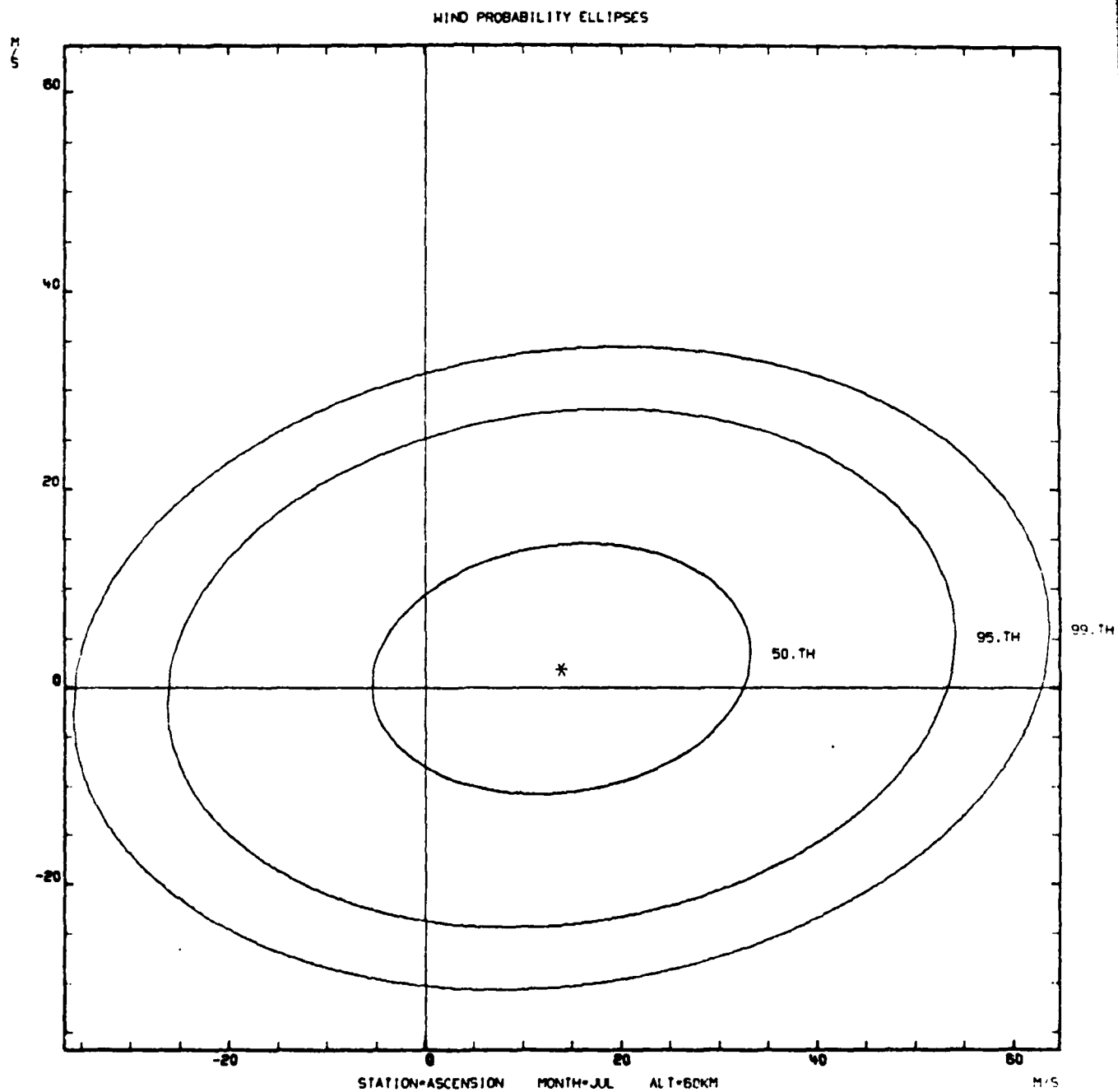


Figure A-47.

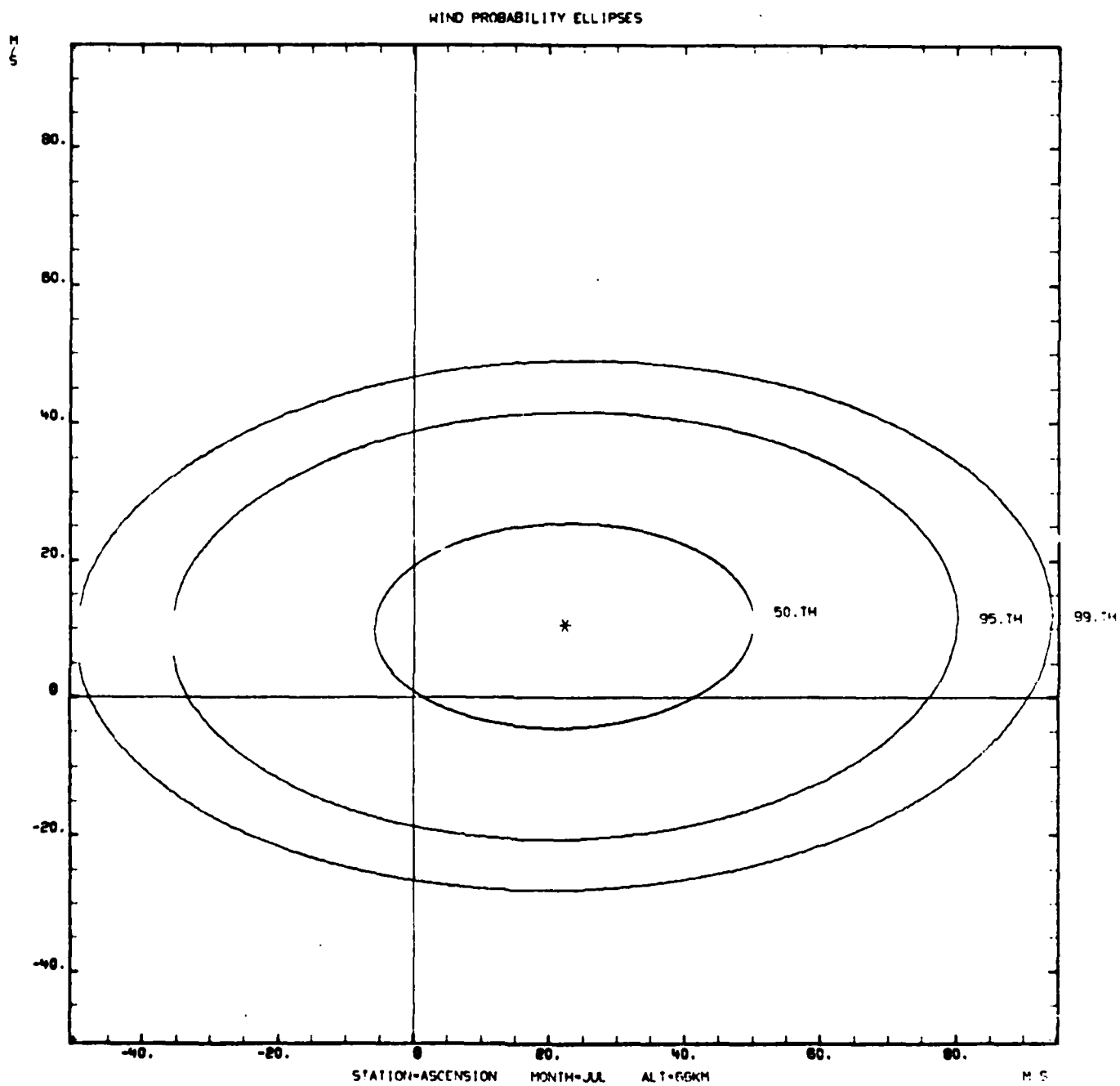


Figure A-48.

STATION-ASCENSION MONTH-JAN ALT= 4KM

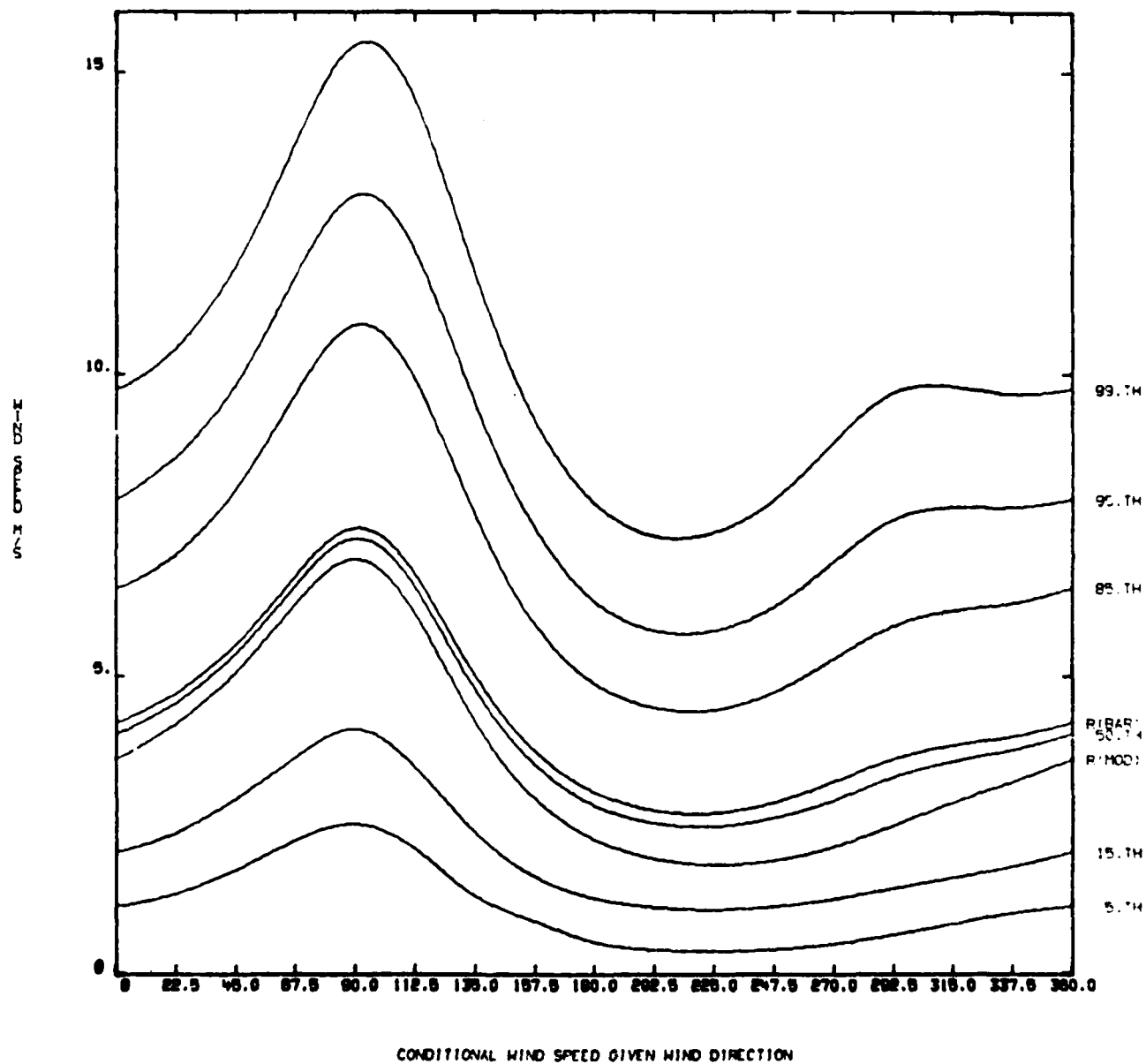


Figure A-49.

STATION-ASCENSION MONTH-JAN ALT-12KM

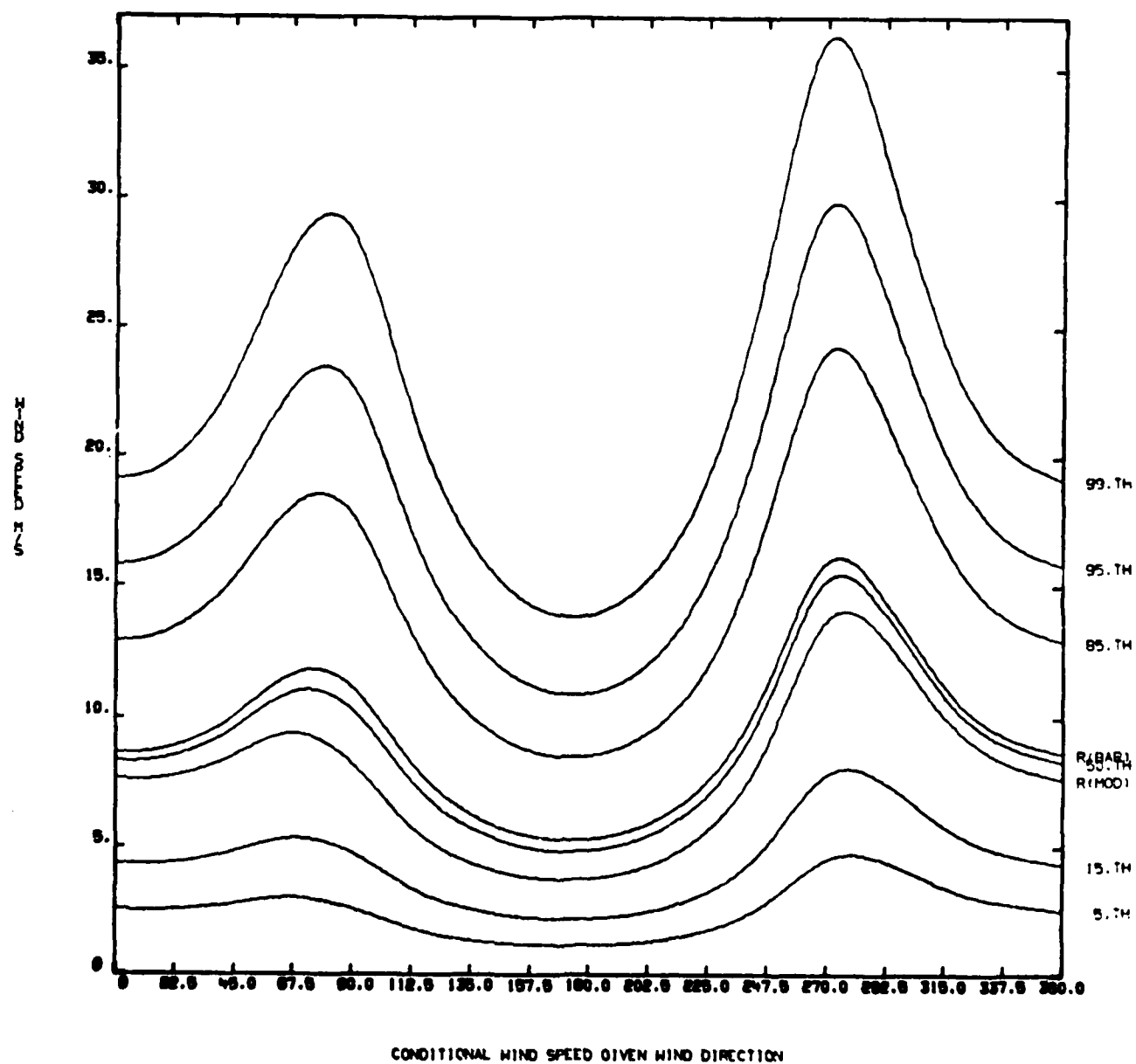


Figure A-50.

STATION=ASCENSION MONTH=JAN ALT=20KM

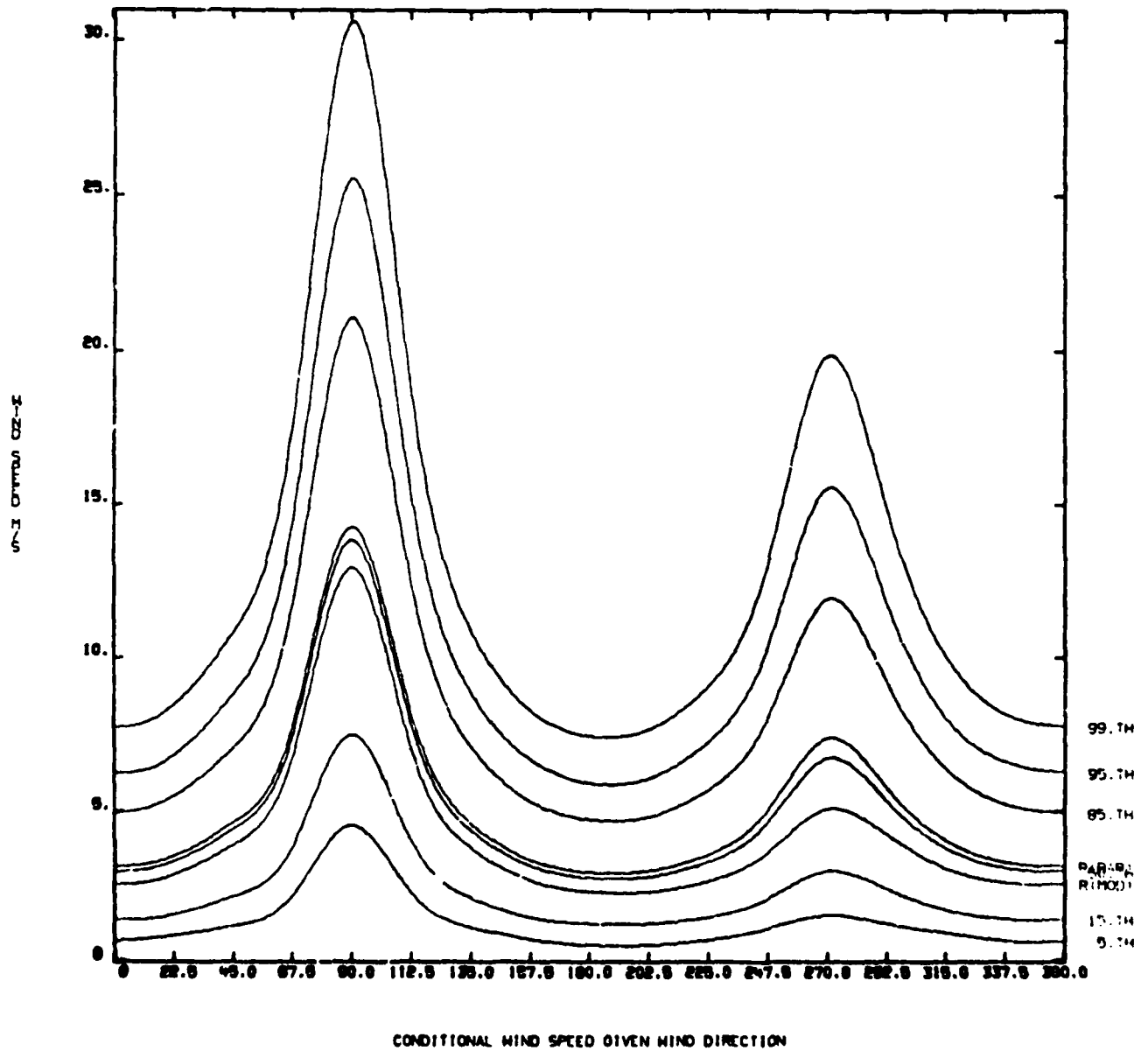


Figure A-51.

STATION=ASCENSION MONTH=JAN ALT=30KM

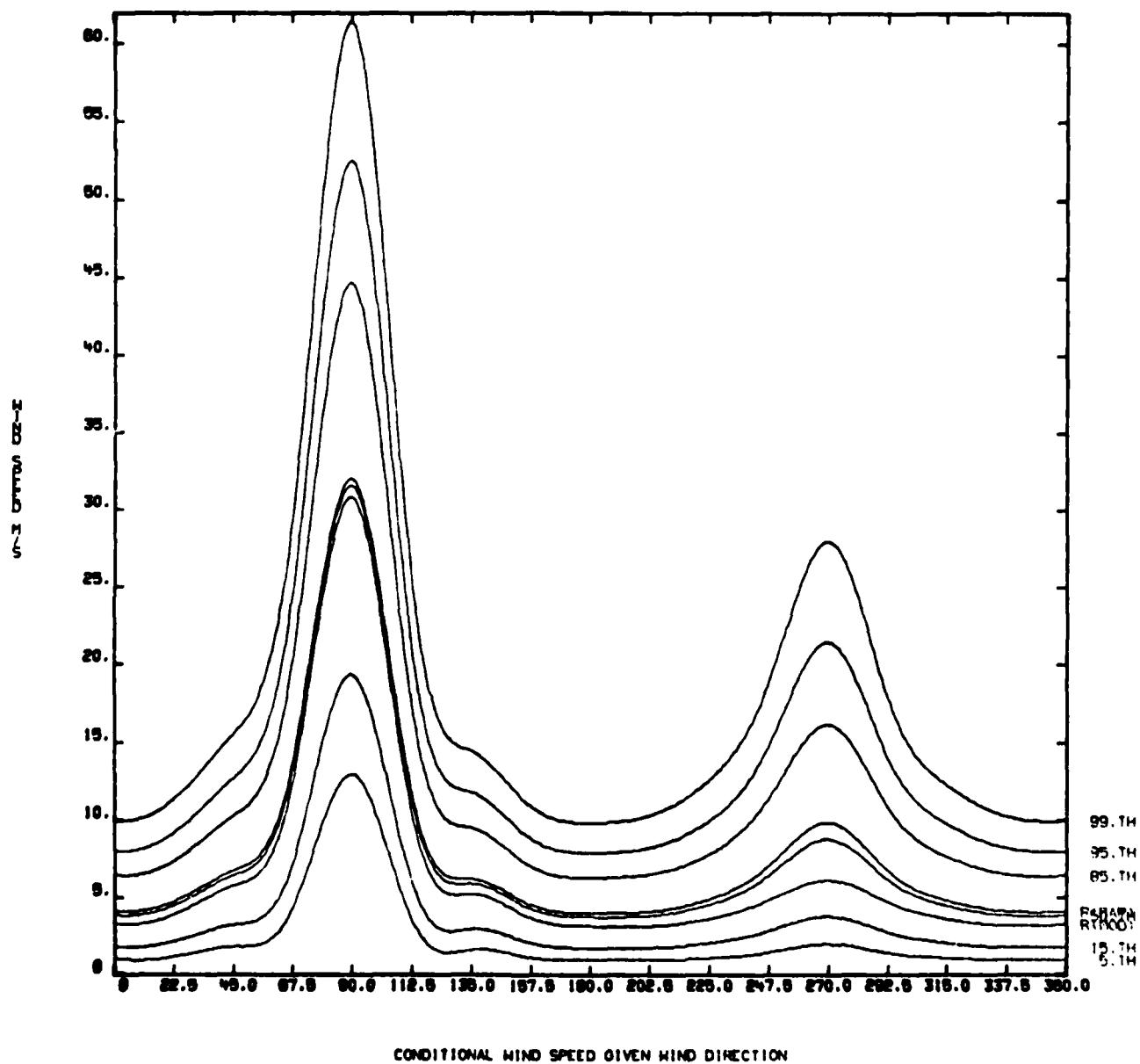


Figure A-52.

STATION=ASCENSION MONTH=JAN ALT=40KM

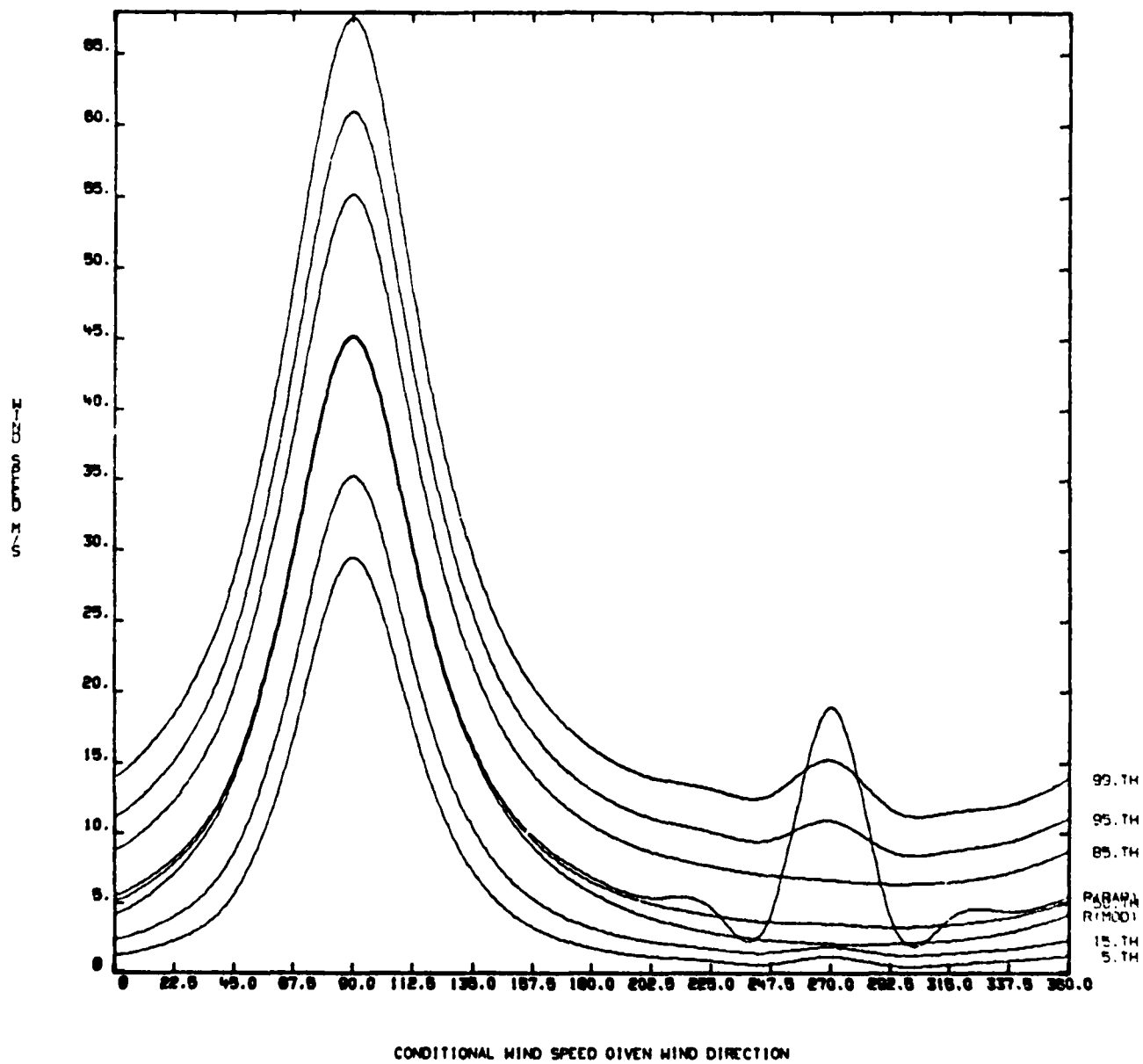


Figure A-53.

STATION=ASCENSION MONTH=JAN ALT=50KM

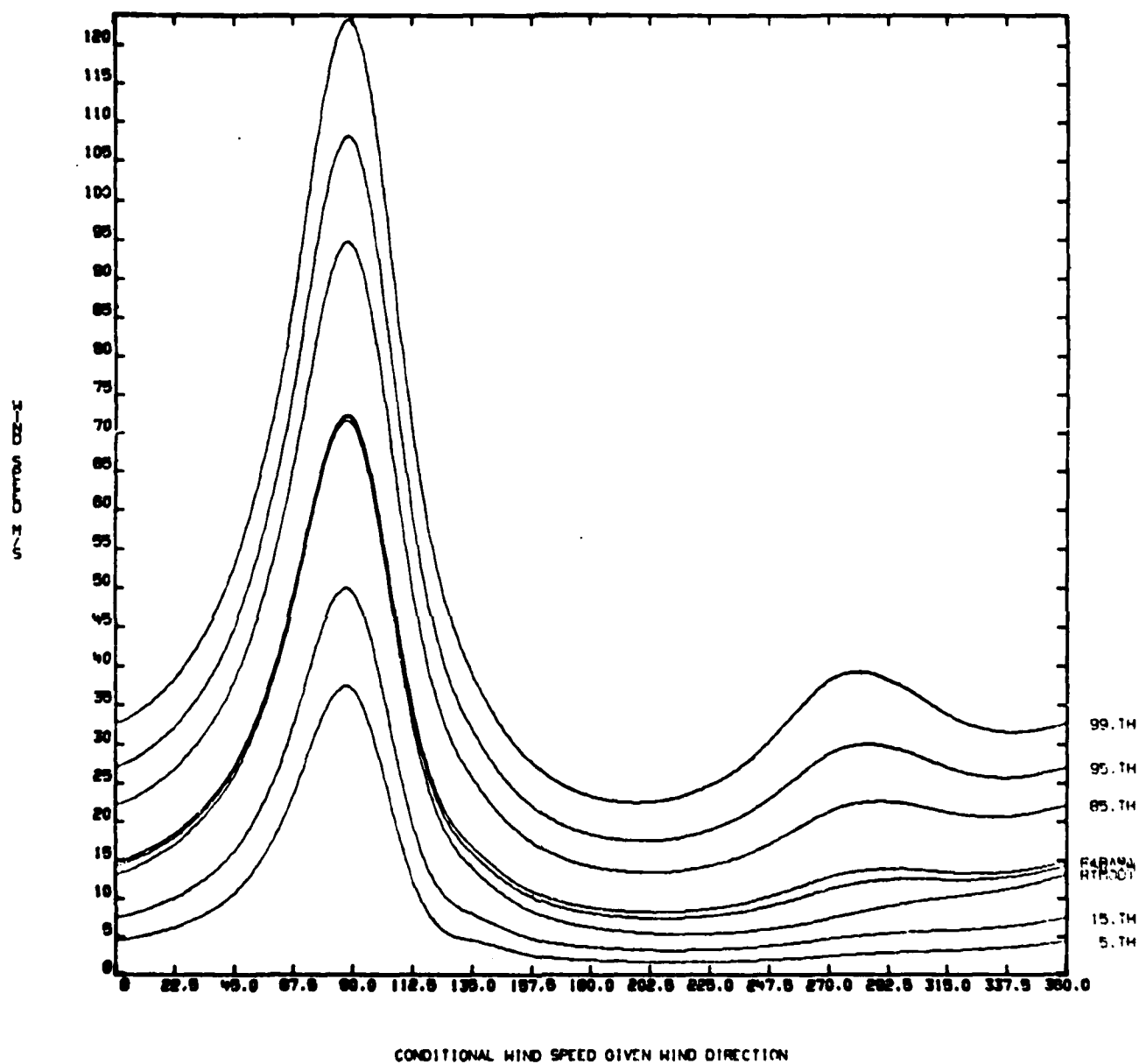


Figure A-54.

STATION=ASCENSION MONTH=JAN ALT=60KM

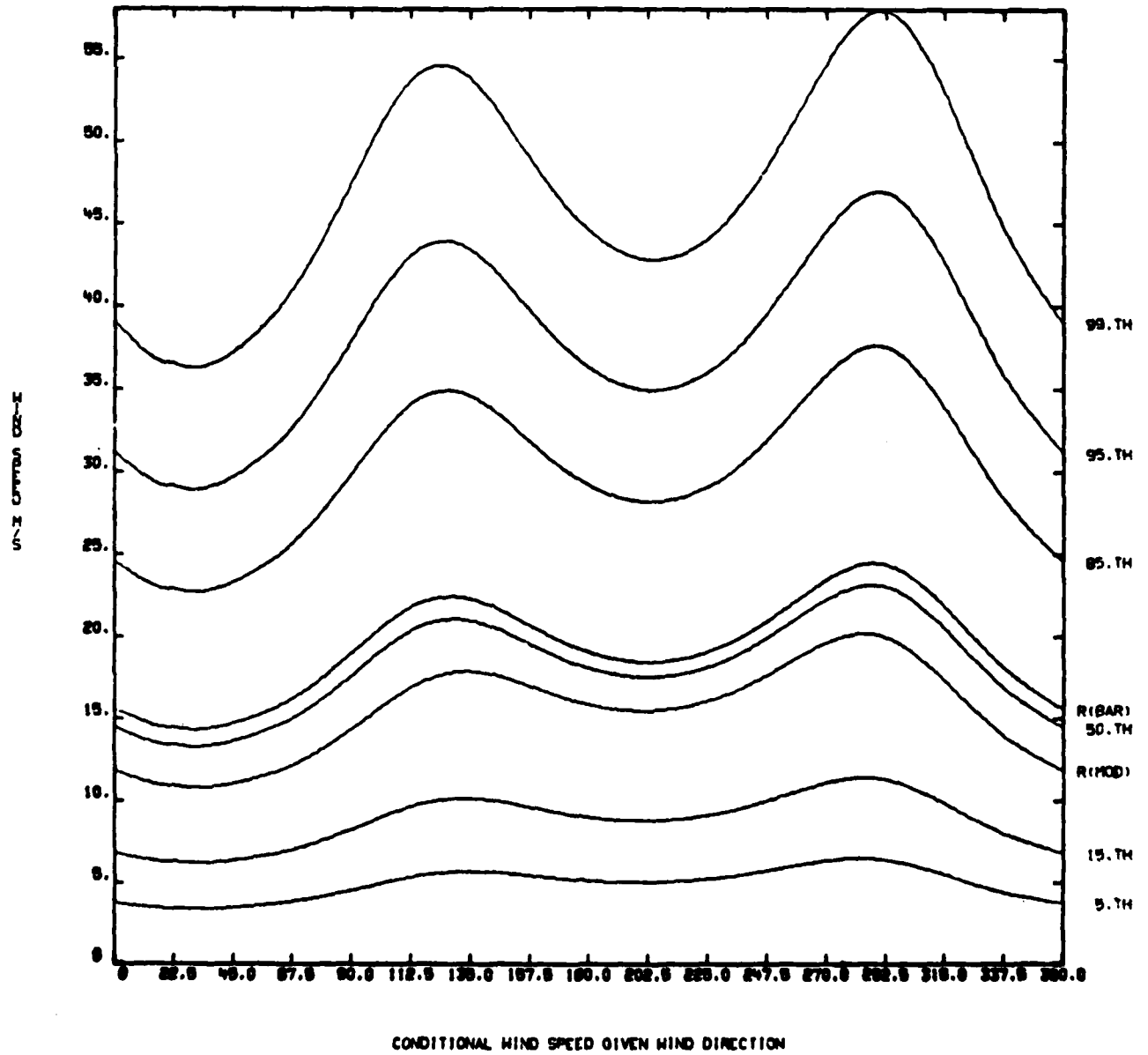


Figure A-55.

STATION=ASCENSION MONTH=JAN ALT=66KM

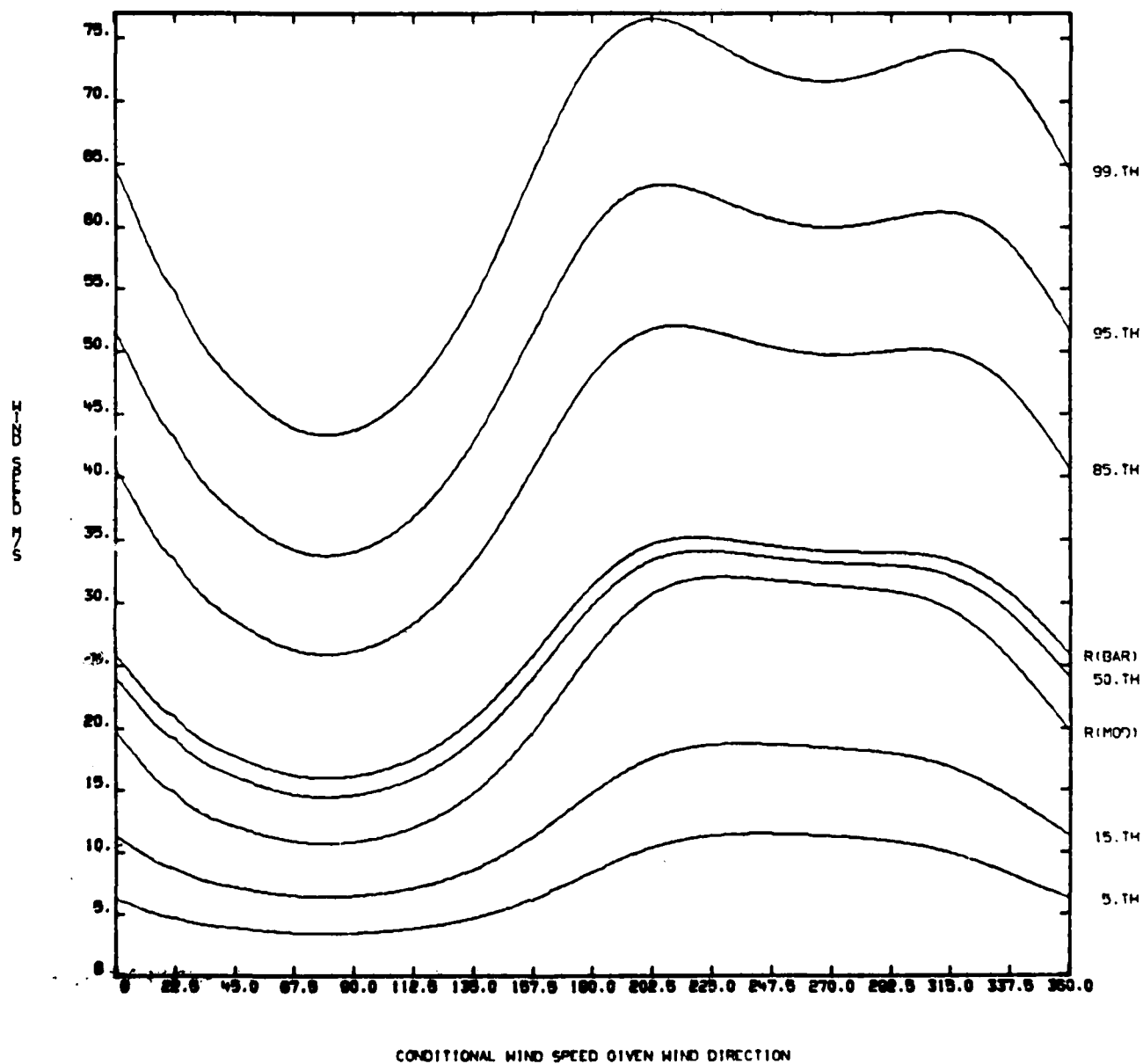


Figure A-56.

STATION=ASCENSION MONTH=JUL ALT= 40M

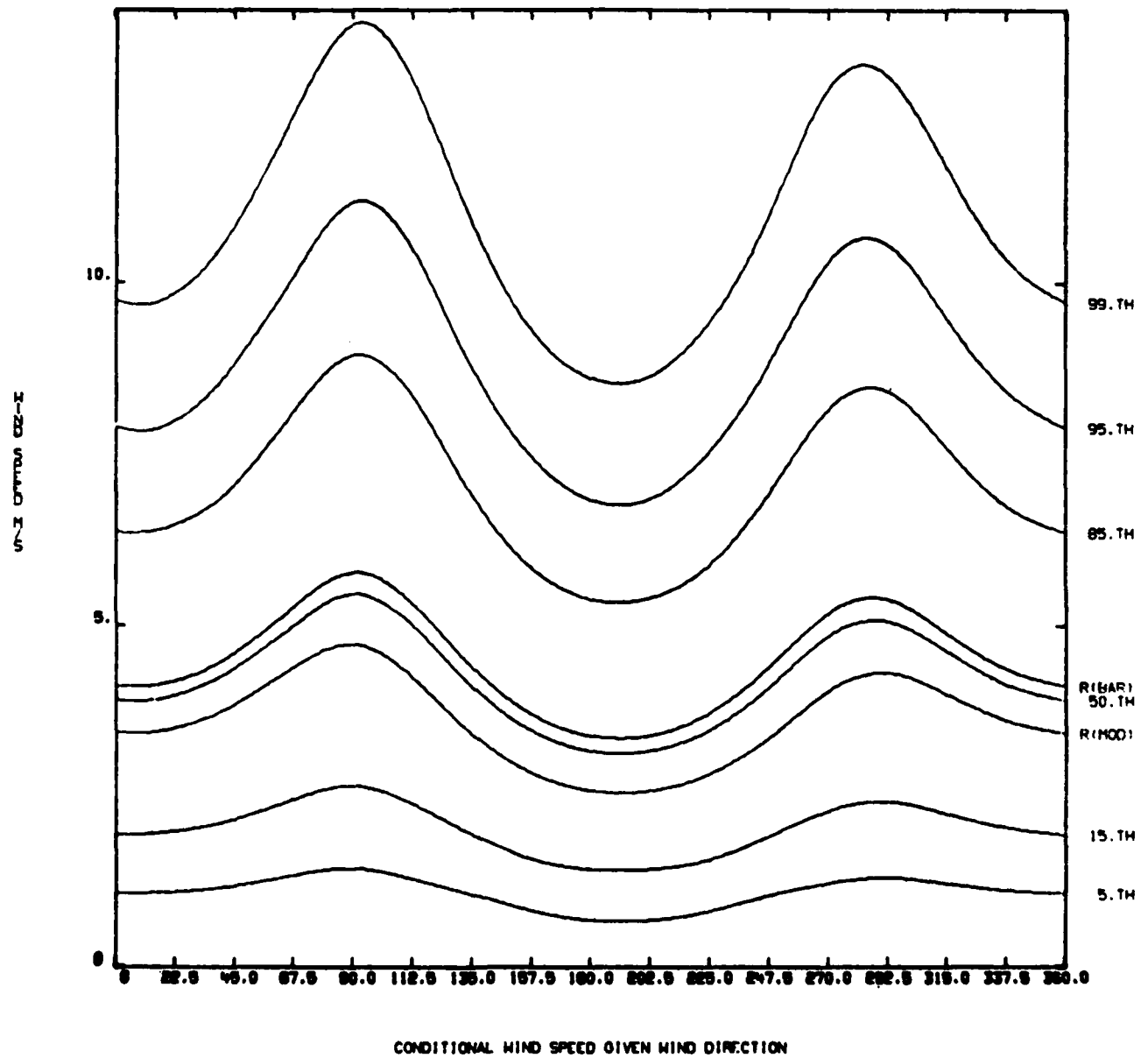
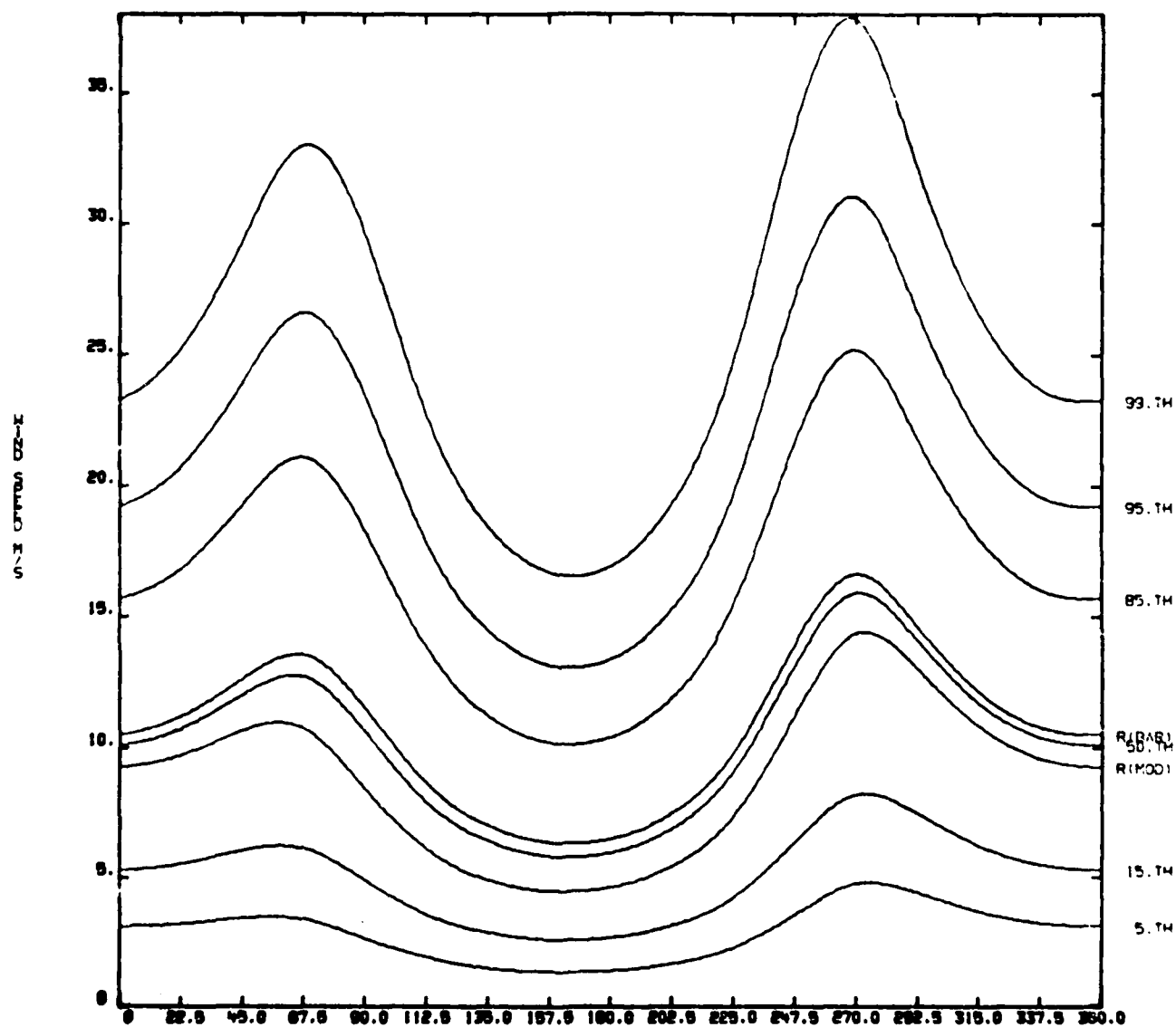


Figure A-57.

STATION=ASCENSION MONTH=JUL ALT=12KM



CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

Figure A-58.

STATION=ASCENSION MONTH=JUL AL=20KM

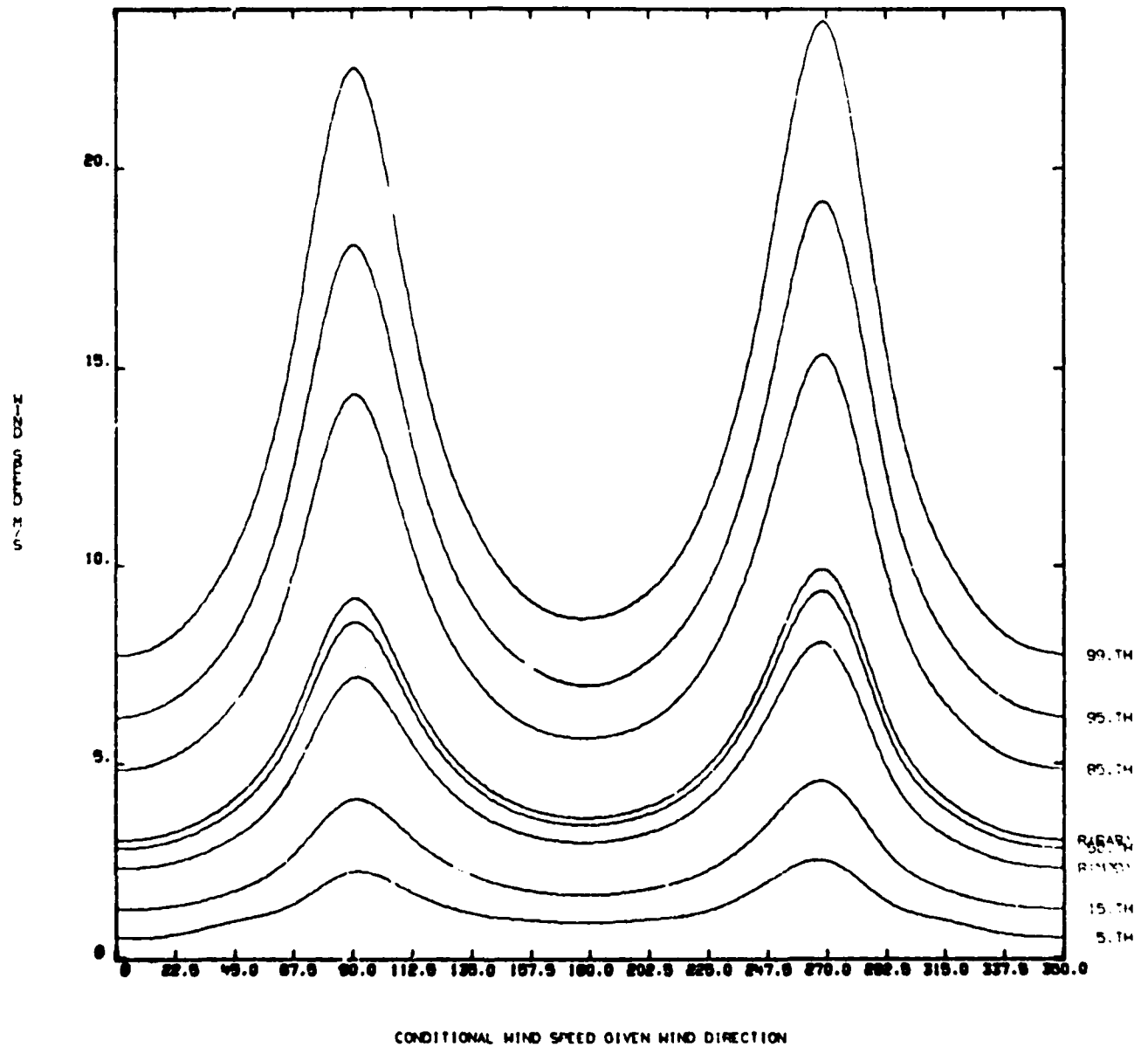


Figure A-59.

STATION=ASCENSION MONTH=JUL ALT=39KM

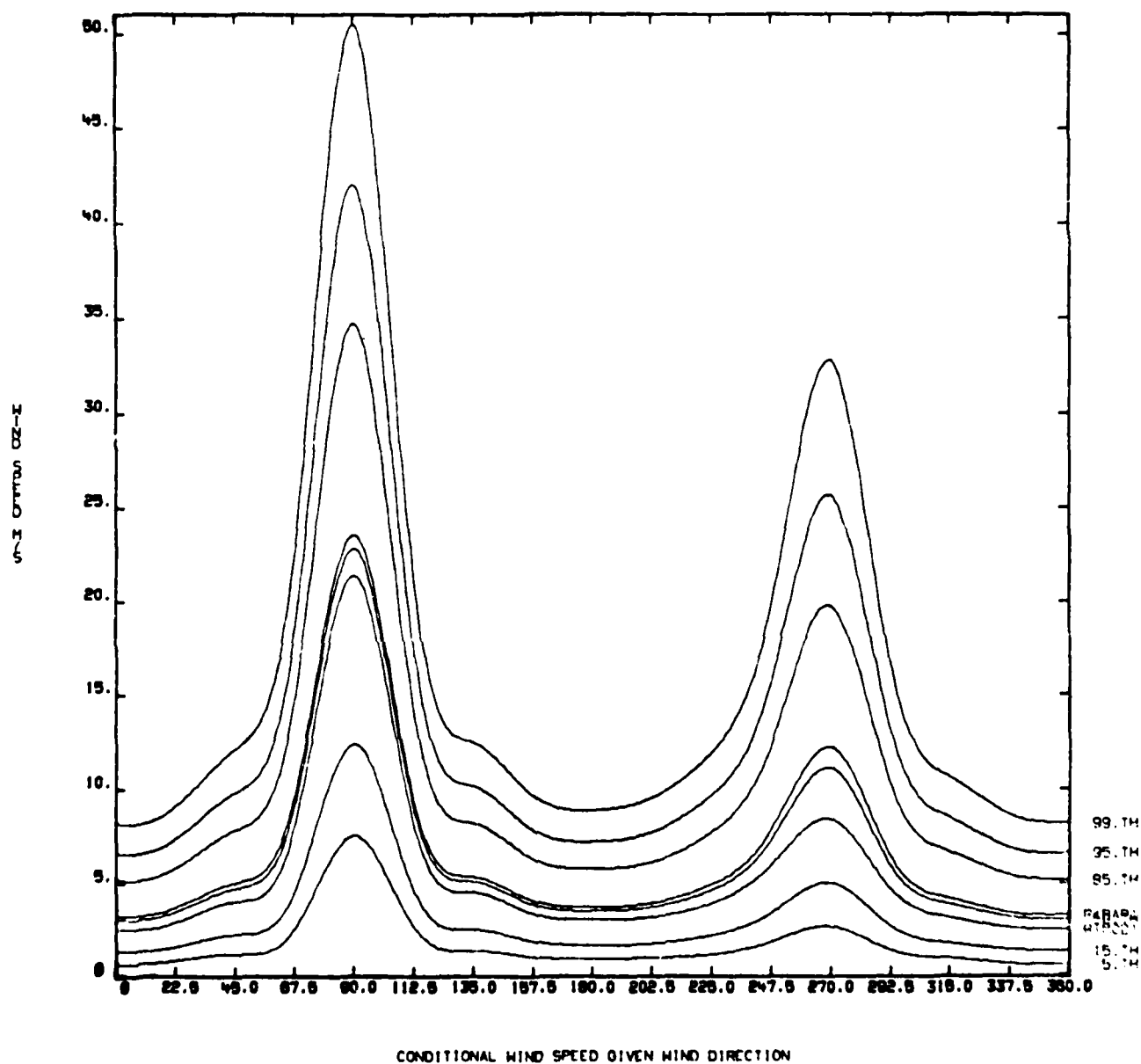


Figure A-60.

STATION=ASCENSION MONTH=JUL ALT=40KM

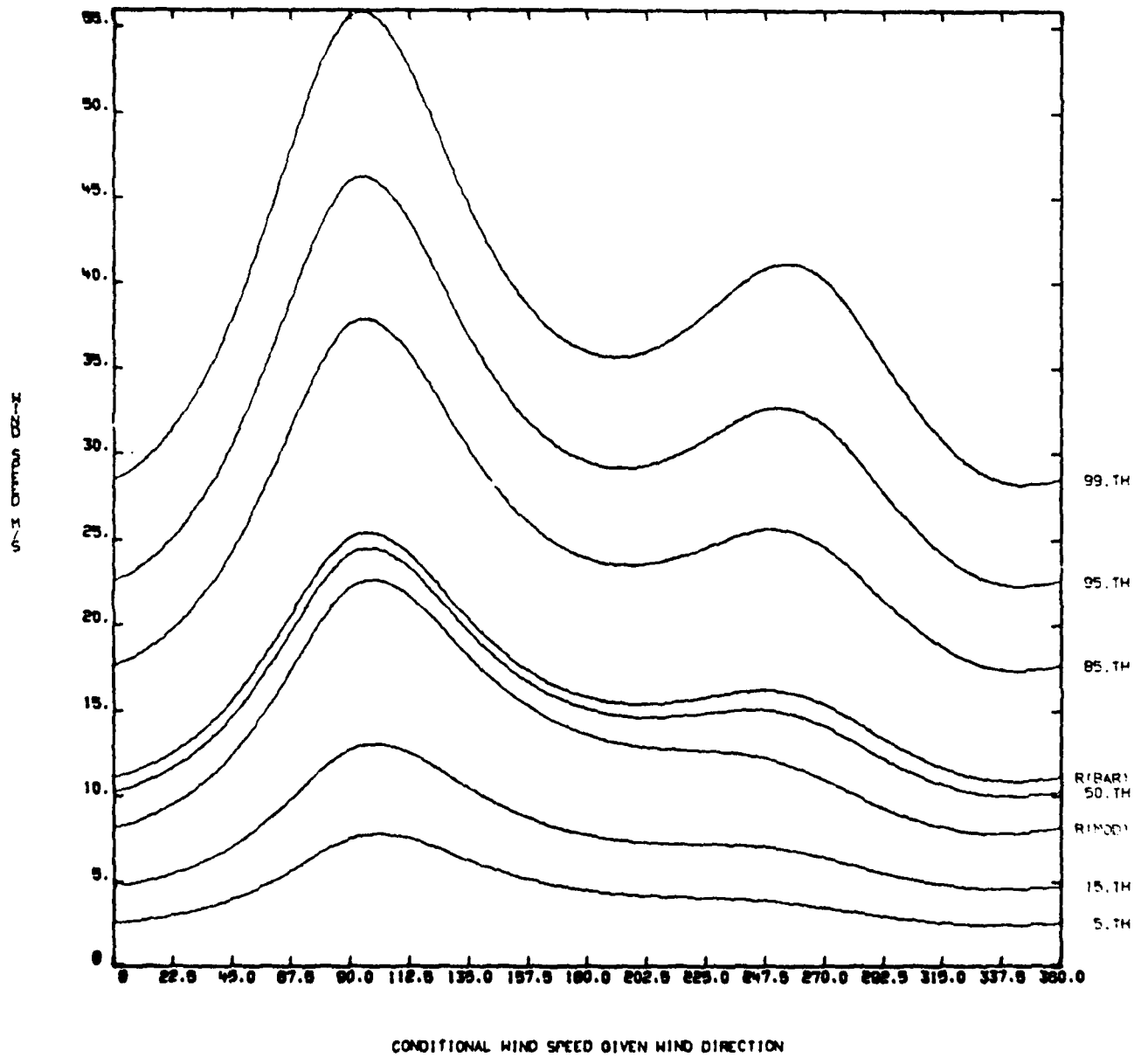


Figure A-61.

STATION=ASCENSION MONTH=JUL ALT=50KM

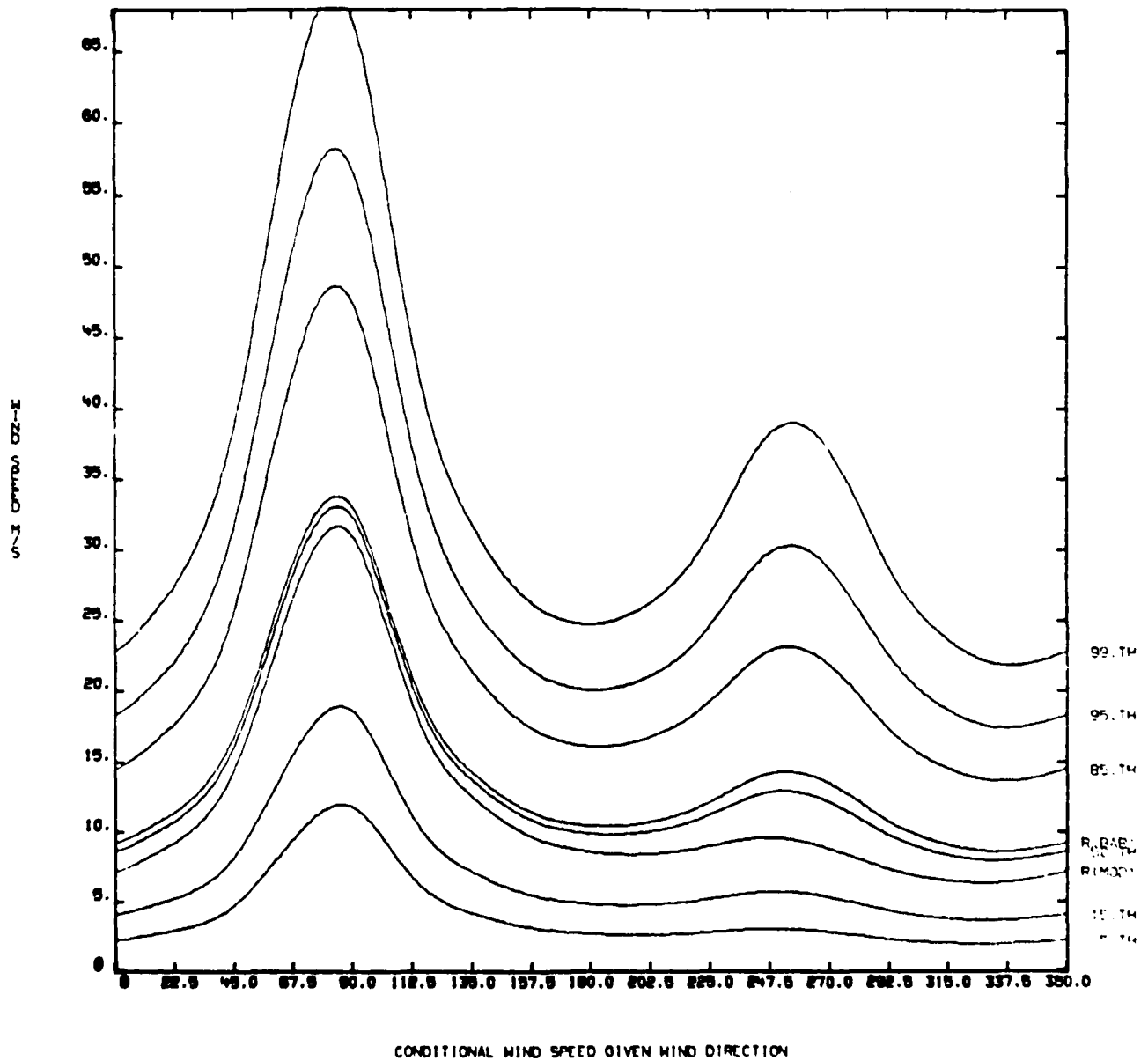


Figure A-62.

STATION=ASCENSION MONTH=JUL ALT=60KM

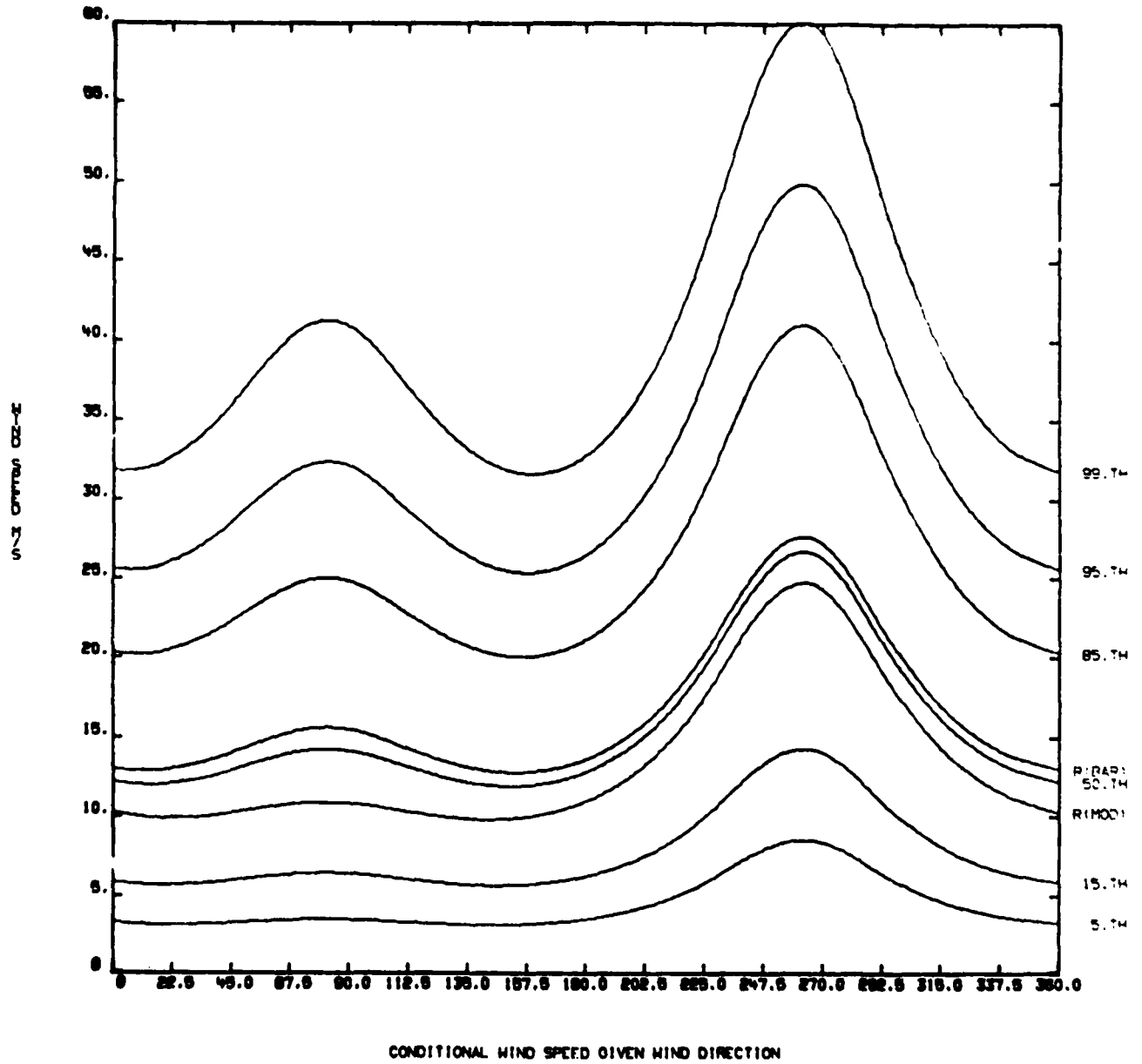
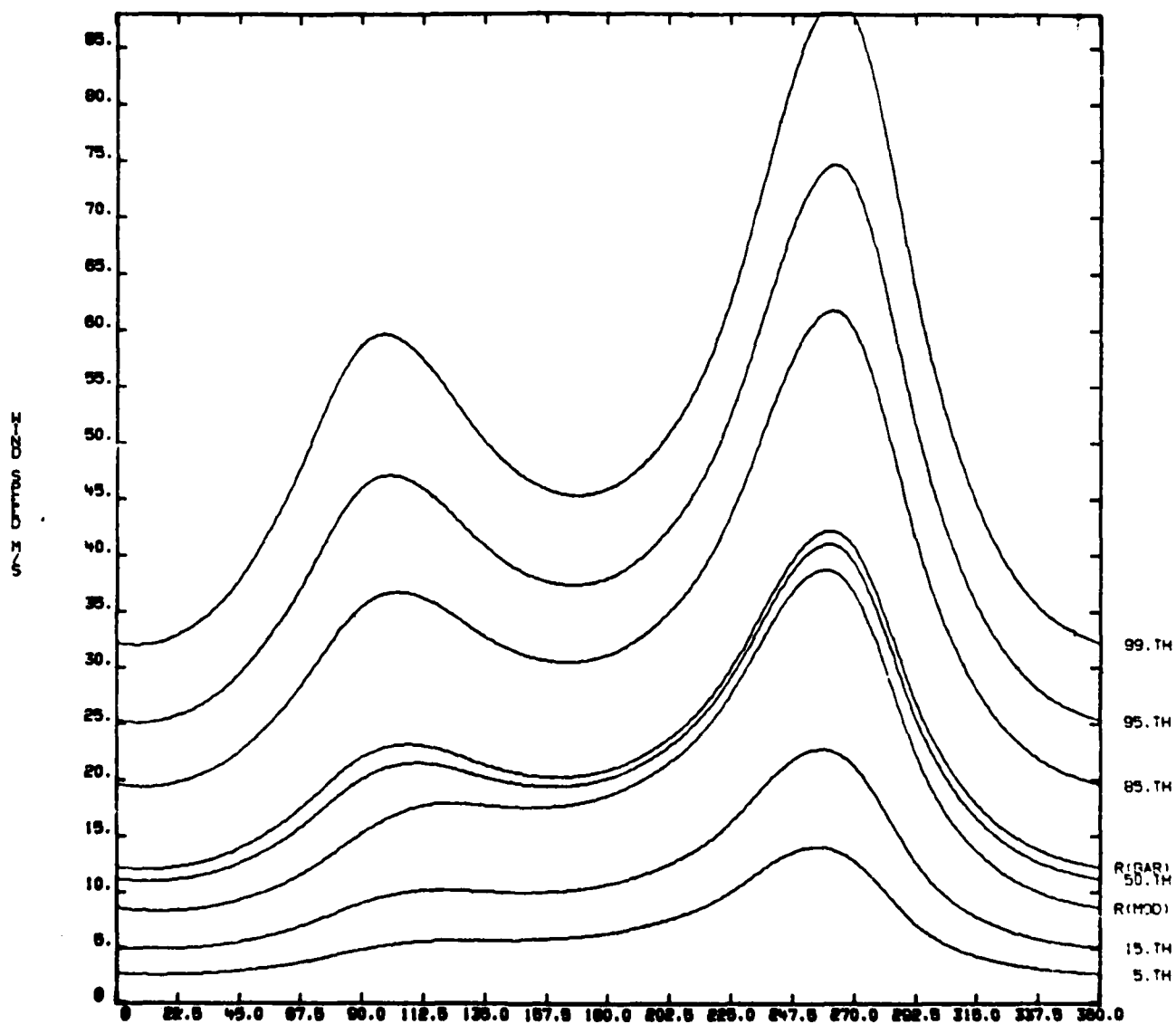


Figure A-63.

STATION=ASCENSION MONTH=JUL ALT=66KM



CONDITIONAL WIND SPEED GIVEN WIND DIRECTION

Figure A-64.

APPENDIX B

RANGE SPECIFIC INFORMATION AND THERMODYNAMIC QUANTITIES FOR ASCENSION ISLAND, SOUTH ATLANTIC

1. Range Specific Information

To prevent further character size reduction for tables I through IV, certain range-specific information has been omitted. This important information is given in table B-1.

TABLE B-1

<u>Header Record 0-30 Km</u>	<u>Header Record 32-66 Km</u>
Table Number-----0	Table Number-----0
Data Source	Data Source
(1 = DATSAV, 2 = WDC-A)-----1	(1 = DATSAV, 2 = WDC-A)-----2
Call Letters-----FHAU	Call Letters-----FHAU
WMO Number-----61902	WMO Number-----61902
Latitude-----7°56'	Latitude-----7°56'
Direction (N or S)-----S	Direction (N or S)-----S
Longitude-----14°25'	Longitude-----14°25'
Direction (E or W)-----W	Direction (E or W)-----W
Elevation in Meters-----20	Elevation in Meters-----20
Start Period of Record	Start Period of Record
(Mo-Yr)-----160	(Mo-Yr)-----169
End Period of Record	End Period of Record
(Mo-Yr)-----1279	(Mo-Yr)-----1278
No. of Time Windows	No. of Time Windows
(0, 1 or 2)-----1	(0, 1 or 2)-----1
Start Time Window #1	Start Time Window #1
(Hr-MNZ)-----900	(Hr-MNZ)-----900
End Time Window #1-----1500	End Time Window #1-----1500
Start Time Window #2-----0	Start Time Window #2-----0
End Time Window #2-----0	End Time Window #2-----0
Date of RRA-----1180	Date of RRA-----1180
Altitude Range of RRA	Altitude Range of RRA
Low Level (Km)-----0	Low Level (Km)-----30
Altitude Range of RRA	Altitude Range of RRA
High Level (Km)-----30	High Level (Km)-----66
Standard Deviation of	Standard Deviation of
Thermodynamic Limits-----6.0	Thermodynamic Limits-----6.0
Wind Limits-----6.0	Wind Limits-----6.0

2. Thermodynamic Quantities

This section presents examples of further computations and graphical displays of pressure, density, and virtual temperature statistics that can be derived from the data given in tables II, III, and IV. No attempt is made to

present complete nor exhaustive illustrations that can be made to aid in visualizing the relations that can be made from the data in tables II and IV. The choices are those that aided the committee to verify the reasonableness of the tabulations.

2.1 Monthly Mean from the Annual Mean

The hydrostatic model values in table IV are used to compute (1) the monthly mean differences relative to the annual mean values of pressure, density, and virtual temperature expressed in percent and (2) the monthly mean difference in virtual temperature for the annual mean virtual temperature expressed in degrees Kelvin. Examples of these four statistics are given in table B-2 for January and table B-3 for July. Graphical displays of the four statistics contained in tables B-2 and B-3 are shown in figures B-1 through B-8. Also, the relative differences between the monthly mean values from table IV-1 through IV-12 for all months from the annual mean values (table IV-13) are illustrated in figure B-9 for pressure, in figure B-10 for density, and in figure B-11 for virtual temperature. The monthly mean virtual temperature differences from the annual mean virtual temperature for all months are given in figure B-12. The simple sum of the monthly mean differences from the annual mean values of these quantities is not zero. This is because the annual mean statistical parameters are computed (see section III. C.3) by weighting the monthly means by the number of observations in each month.

2.2 Coefficients of Variation and Derived Correlation Coefficients

The coefficient of variation, C_V , is defined by the standard deviation with respect to the mean divided by the mean. The coefficients of variation for pressure, C_{VP} , and density, C_{VD} , were computed using the standard deviations from table II and the hydrostatic mean values from table IV. The coefficient of variation for temperature uses the standard deviations of virtual temperature from table III to the altitude where virtual temperature exists. Above this altitude, the standard deviations of temperature are from table II. The mean values for temperature (virtual temperature to the altitude where it exists) are taken from table IV. No distinction is made in the table headings in table B-4 (January) and table B-5 (July) and all related figures between virtual temperature and temperature.

From the coefficients of variation for pressure, density, and temperature (virtual temperature to the altitude where it exists), the correlation coefficients between these quantities are derived using Buell's method (see reference in text). The equations for these derived correlation coefficients are

$$r(P,T) = \frac{(C_{VT})^2 + (C_{VP})^2 - (C_{VD})^2}{2 [C_{VT} \cdot C_{VP}]} \quad (B-1)$$

$$r(P,D) = \frac{(C_{VD})^2 - (C_{VT})^2 + (C_{VP})^2}{2 [C_{VP} \cdot C_{VD}]} \quad (B-2)$$

$$r(T,D) = \frac{(C_{VP})^2 - (C_{VD})^2 - (C_{VT})^2}{2 [C_{VT} \cdot C_{VD}]} \quad (B-3)$$

The correlation coefficients in tables B-4 and B-5 are derived from the above equations.

A test for the validity of the derived correlation coefficient is that all three of the following inequalities be satisfied.

$$\left. \begin{aligned} C_{VP} - [C_{VD} + C_{VT}] &< 0 \\ C_{VD} - [C_{VT} + C_{VP}] &< 0 \\ C_{VT} - [C_{VP} + C_{VD}] &< 0 \end{aligned} \right\} \quad (B-4)$$

In these examples (tables B-4 and B-5) the numerical values from equation (B-4) are all negative; hence, the derived correlation test is considered valid. The rare exceptions to this test for several RRAs occur at the extreme highest altitudes, where sample sizes for the statistical sample are small.

The statistical parameters from table B-4 (January) and table B-5 (July) are illustrated in figures B-13 through B-16.

For all months the C_{VP} values are shown in figure B-17, the C_{VD} values are shown in figure B-18, and C_{VT} values are shown in figure B-19. If the abscissa on the figures for the coefficient of variation were multiplied by 100, these figures would show the percentage of random dispersion of these qualities over the month with respect to the monthly mean for these thermodynamic quantities.

The derived correlation coefficients for all months are illustrated in the following figures:

- a) Figure B-20 gives $r(P,D)$.
- b) Figure B-21 gives $r(P,T)$.
- c) Figure B-22 gives $r(T,D)$.

Table B-2.

STATION 619020 MONTH 1
 DELTAS IN PERCENT RELATIVE TO ANNUAL

LEVEL	PRESSURE	DENSITY	TEMP.	THO-TANN(DEG.K)
.000	-.15	-.26	.07	.20
.020	-.14	-.17	.09	.23
1.000	-.13	-.37	.20	.59
2.000	-.10	-.42	.32	.62
3.000	-.07	-.20	.13	.37
4.000	-.07	-.01	-.06	-.18
5.000	-.08	.03	-.11	-.31
6.000	-.09	-.02	-.07	-.20
7.000	-.11	.05	-.18	-.43
8.000	-.14	.12	-.24	-.61
9.000	-.17	.11	-.28	-.70
10.000	-.21	.05	-.25	-.53
11.000	-.24	-.05	-.20	-.45
12.000	-.26	-.15	-.10	-.23
13.000	-.27	-.30	.03	.07
14.000	-.26	-.38	.15	.31
15.000	-.24	-.31	.07	.14
16.000	-.24	-.10	-.15	-.30
17.000	-.31	.30	-.61	-1.20
18.000	-.47	.60	-1.30	-2.58
19.000	-.69	.61	-1.32	-2.68
20.000	-.69	.21	-1.10	-2.29
21.000	-1.06	-.08	-.98	-2.07
22.000	-1.21	-.27	-.94	-2.01
23.000	-1.37	-.34	-1.04	-2.26
24.000	-1.54	-.36	-1.18	-2.56
25.000	-1.72	-.49	-1.23	-2.72
26.000	-1.90	-.61	-1.11	-2.49
27.000	-2.05	-1.12	-.94	-2.12
28.000	-2.18	-1.43	-.77	-1.76
29.000	-2.28	-1.72	-.56	-1.29
30.000	-2.36	-1.85	-.51	-1.19
32.000	-2.58	-1.25	-1.04	-2.46
34.000	-2.93	-1.17	-1.48	-3.55
36.000	-3.37	-1.36	-1.74	-4.27
38.000	-3.86	-1.68	-1.91	-4.79
40.000	-4.33	-2.29	-1.78	-4.59
42.000	-4.67	-3.47	-.92	-2.43
44.000	-4.87	-3.84	-.76	-2.04
46.000	-5.09	-3.64	-1.03	-2.78
48.000	-5.30	-4.24	-.78	-2.10
50.000	-5.39	-5.15	.07	.18
52.000	-5.27	-5.89	.97	2.60
54.000	-4.86	-6.16	1.59	4.22
55.000	-4.50	-6.35	2.28	6.00
58.000	-3.94	-5.89	2.37	6.12
60.000	-3.36	-5.25	2.32	5.23
62.000	-2.72	-5.04	2.76	6.63
64.000	-1.95	-4.70	3.22	7.81
66.000	-1.24	-2.89	2.03	4.78

Table B-3.

STATION 619020 MONTH 7
 DELTAS IN PERCENT RELATIVE TO ANNUAL

LEVEL	PRESSURE	DENSITY	TEMP.	TMO-TANP DEG.KI
.000	.24	.52	-.28	-.66
.020	.24	.52	-.27	-.81
1.000	.20	.56	-.34	-1.00
2.000	.14	.92	-.78	-2.26
3.000	.07	.34	-.26	-.75
4.000	.05	.14	-.10	-.27
5.000	.04	.11	-.07	-.20
6.000	.03	.13	-.09	-.25
7.000	.01	.17	-.16	-.42
8.000	-.01	.25	-.26	-.65
9.000	-.05	.28	-.35	-.85
10.000	-.11	.29	-.40	-.95
11.000	-.17	.24	-.43	-.98
12.000	-.23	.18	-.39	-.86
13.000	-.28	.00	-.29	-.62
14.000	-.31	-.23	-.05	-.11
15.000	-.29	-.57	.30	.60
16.000	-.21	-.92	.70	1.38
17.000	-.03	-1.45	1.39	2.73
18.000	.25	-1.59	1.90	3.73
19.000	.54	-1.05	1.65	3.25
20.000	.79	-.61	1.42	2.96
21.000	1.00	-.16	1.17	2.47
22.000	1.16	.31	.84	1.00
23.000	1.28	.58	.68	1.48
24.000	1.37	.90	.47	1.04
25.000	1.44	1.01	.43	.96
26.000	1.50	1.16	.33	.74
27.000	1.54	1.33	.19	.43
28.000	1.55	1.71	-.15	-.34
29.000	1.49	2.00	-.50	-1.14
30.000	1.41	2.01	-.58	-1.35
32.000	1.25	1.62	-.50	-1.17
34.000	1.11	1.50	-.43	-1.15
36.000	.92	1.66	-.84	-2.06
38.000	.67	1.55	-.98	-2.46
40.000	.37	1.54	-1.26	-3.24
42.000	-.01	1.56	-1.65	-4.35
44.000	-.42	1.04	-1.57	-4.20
46.000	-.74	.05	-.93	-2.52
48.000	-.95	-.28	-.75	-2.02
50.000	-1.10	-.80	-.46	-1.24
52.000	-1.14	-1.32	.07	.20
54.000	-1.14	-1.24	-.00	-.01
56.000	-1.15	-1.14	-.12	-.32
58.000	-1.21	-.96	-.37	-.95
60.000	-1.33	-.90	-.55	-1.40
62.000	-1.64	.04	-1.78	-4.41
64.000	-2.29	.59	-2.96	-7.17
66.000	-2.99	-1.07	-2.03	-4.77

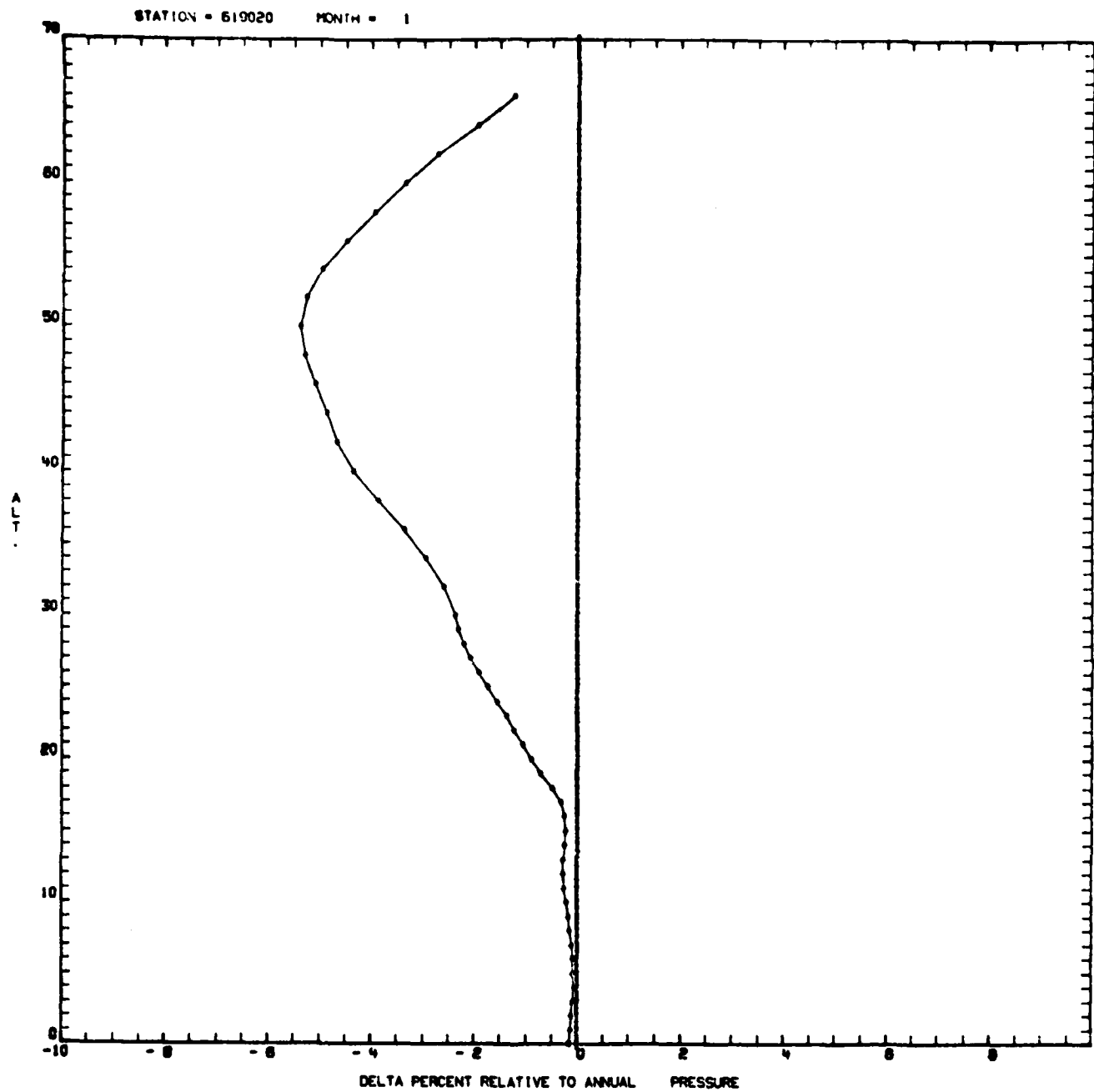


Figure B-1.

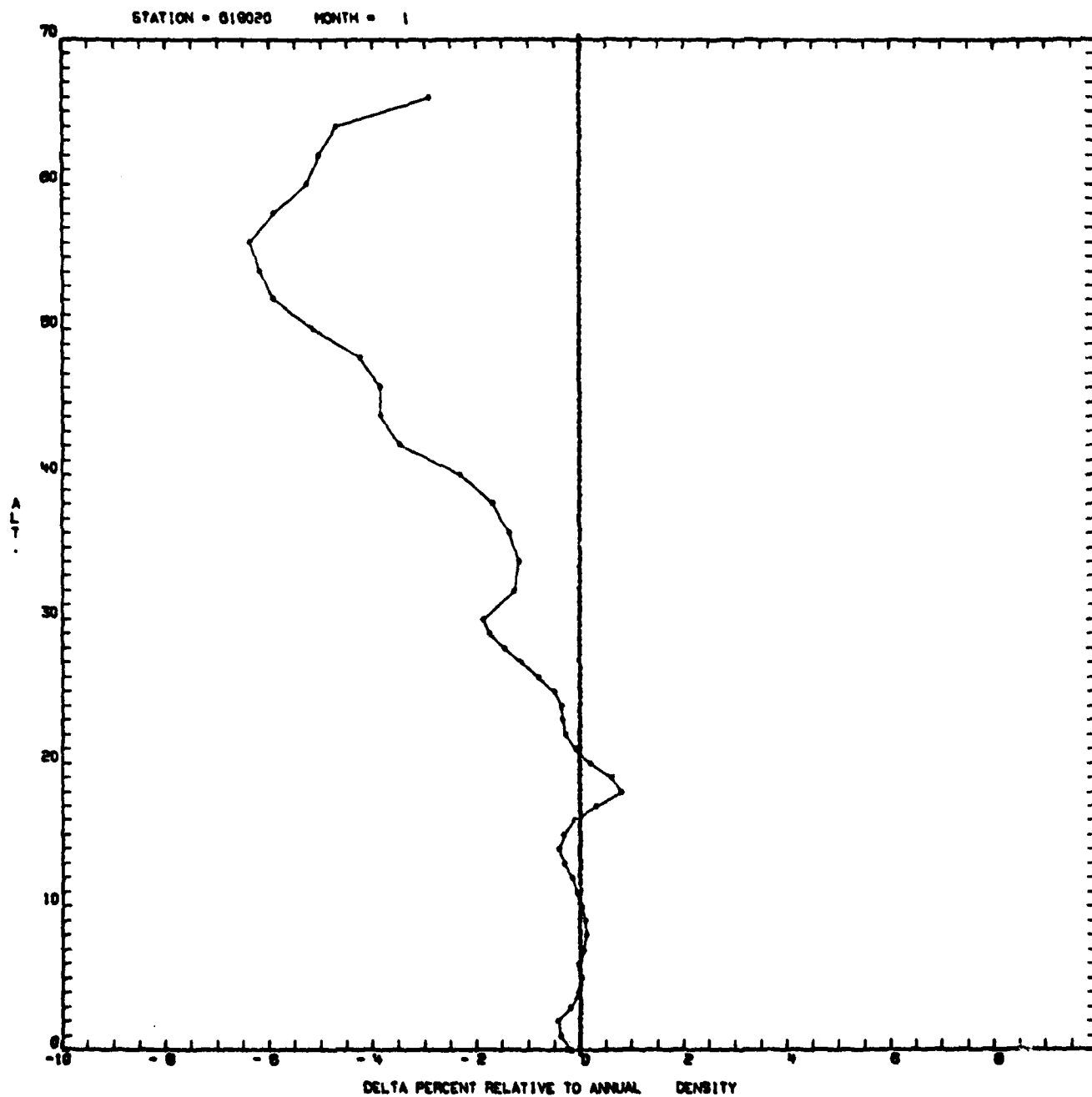


Figure B-2.

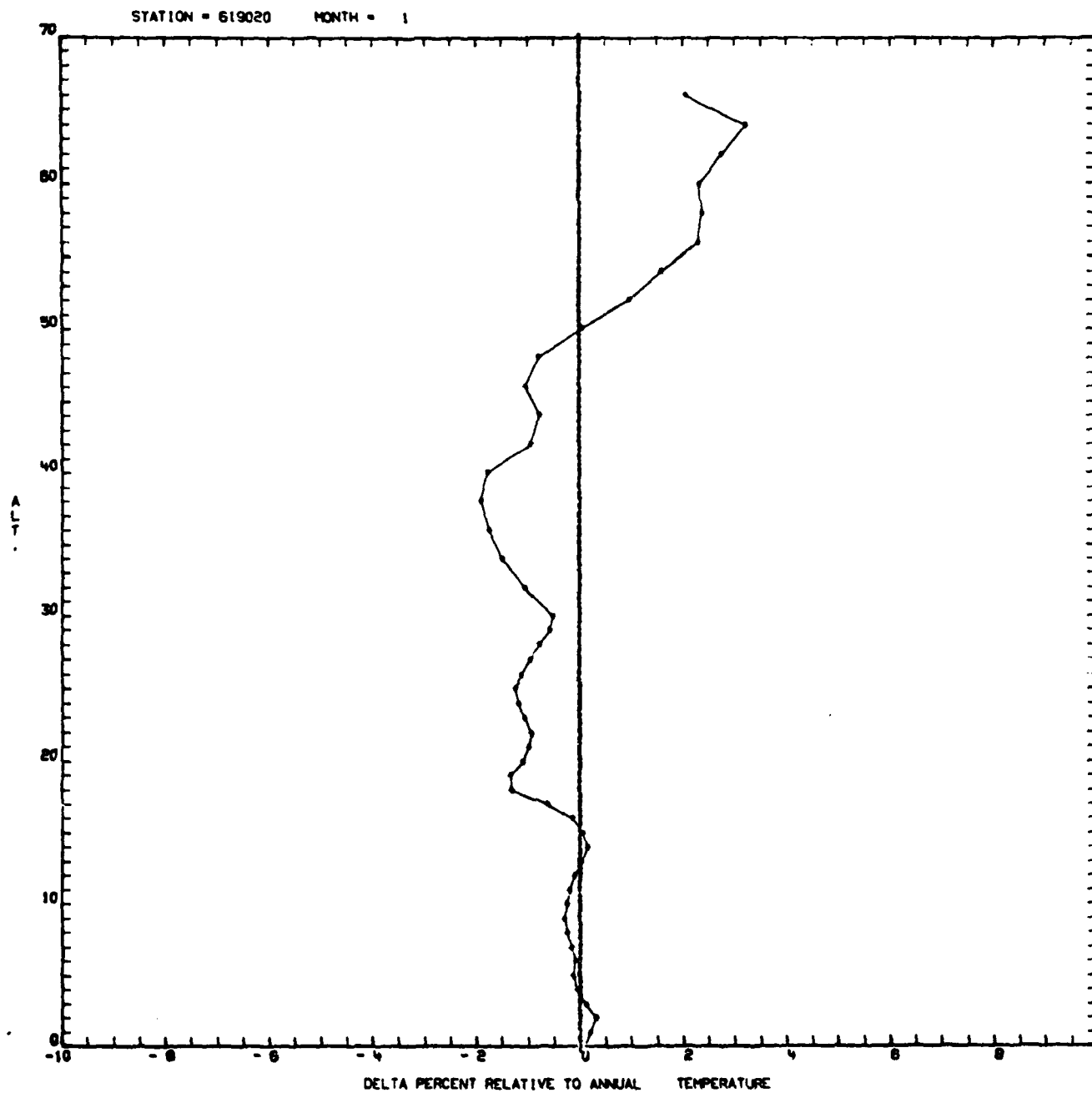


Figure B-3.

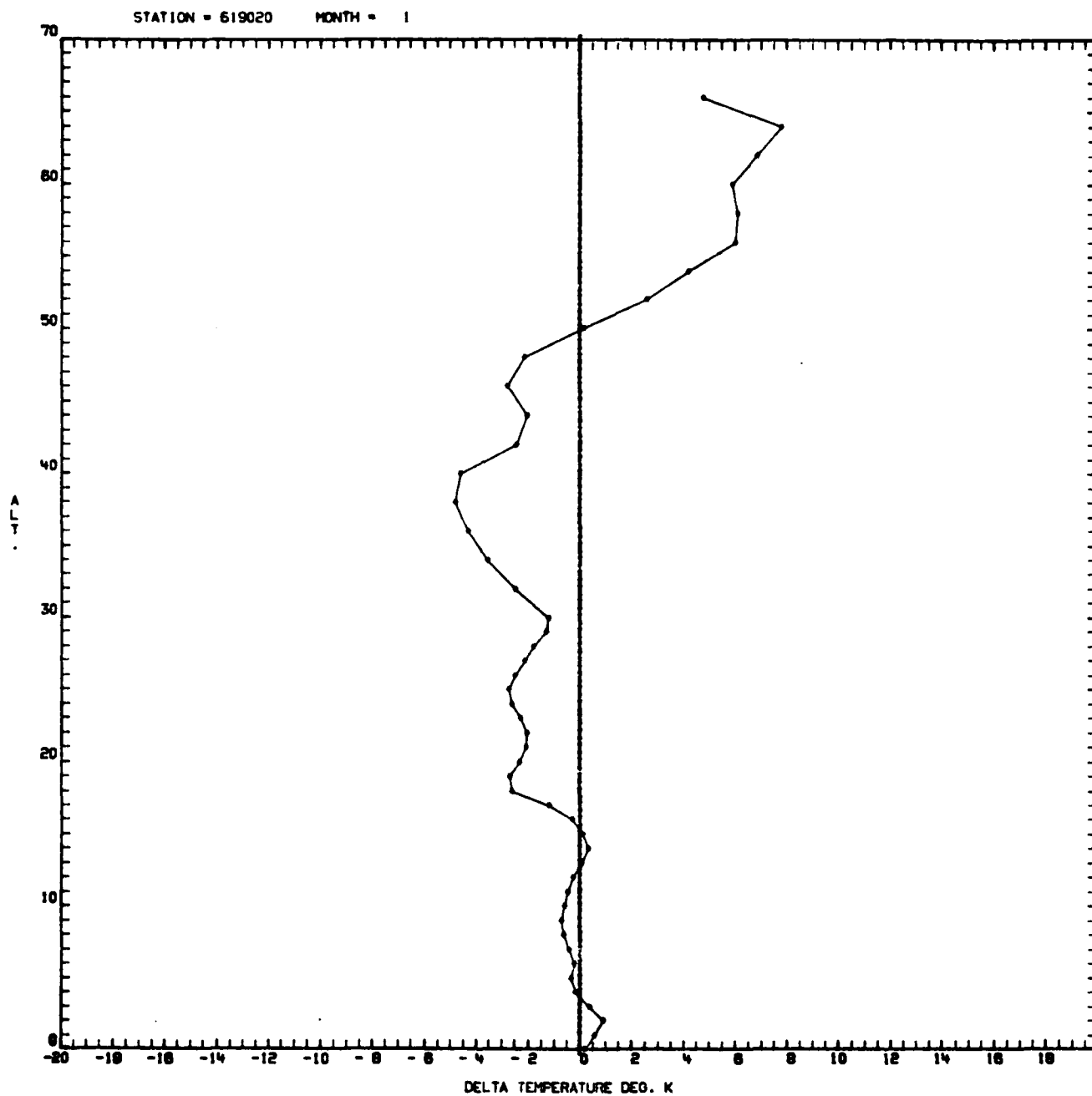


Figure B-4.

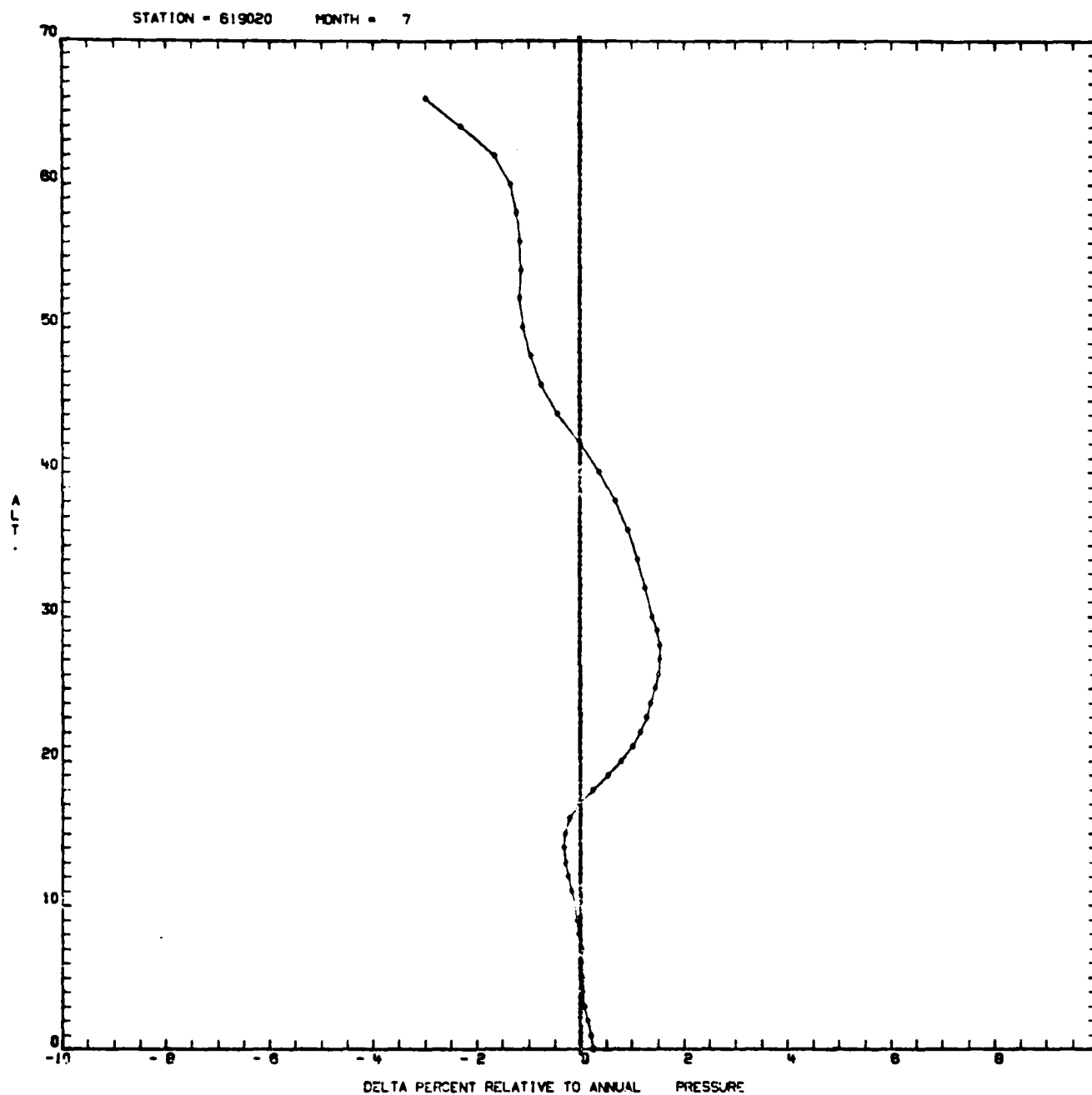


Figure B-5.

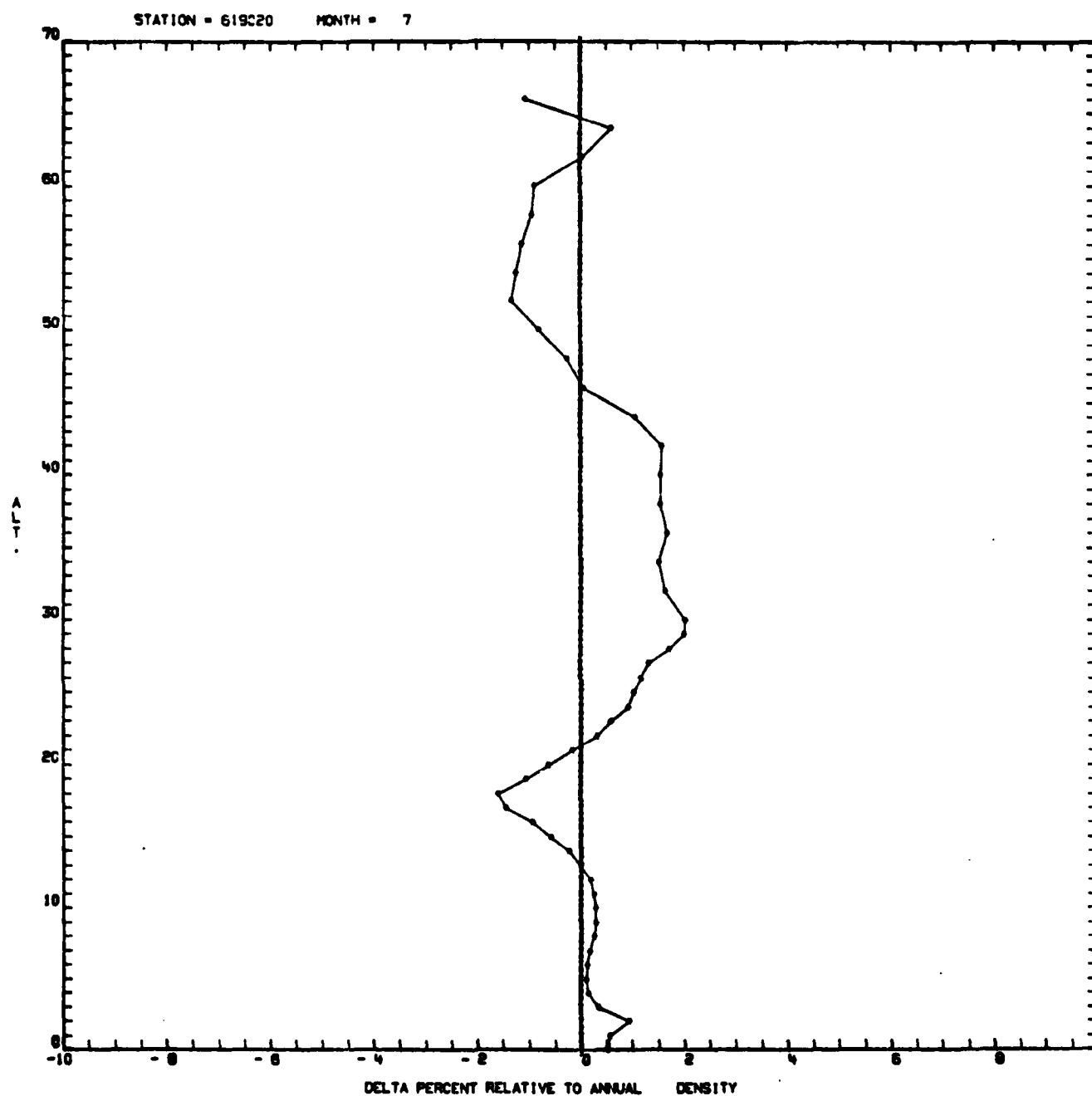


Figure B-6.

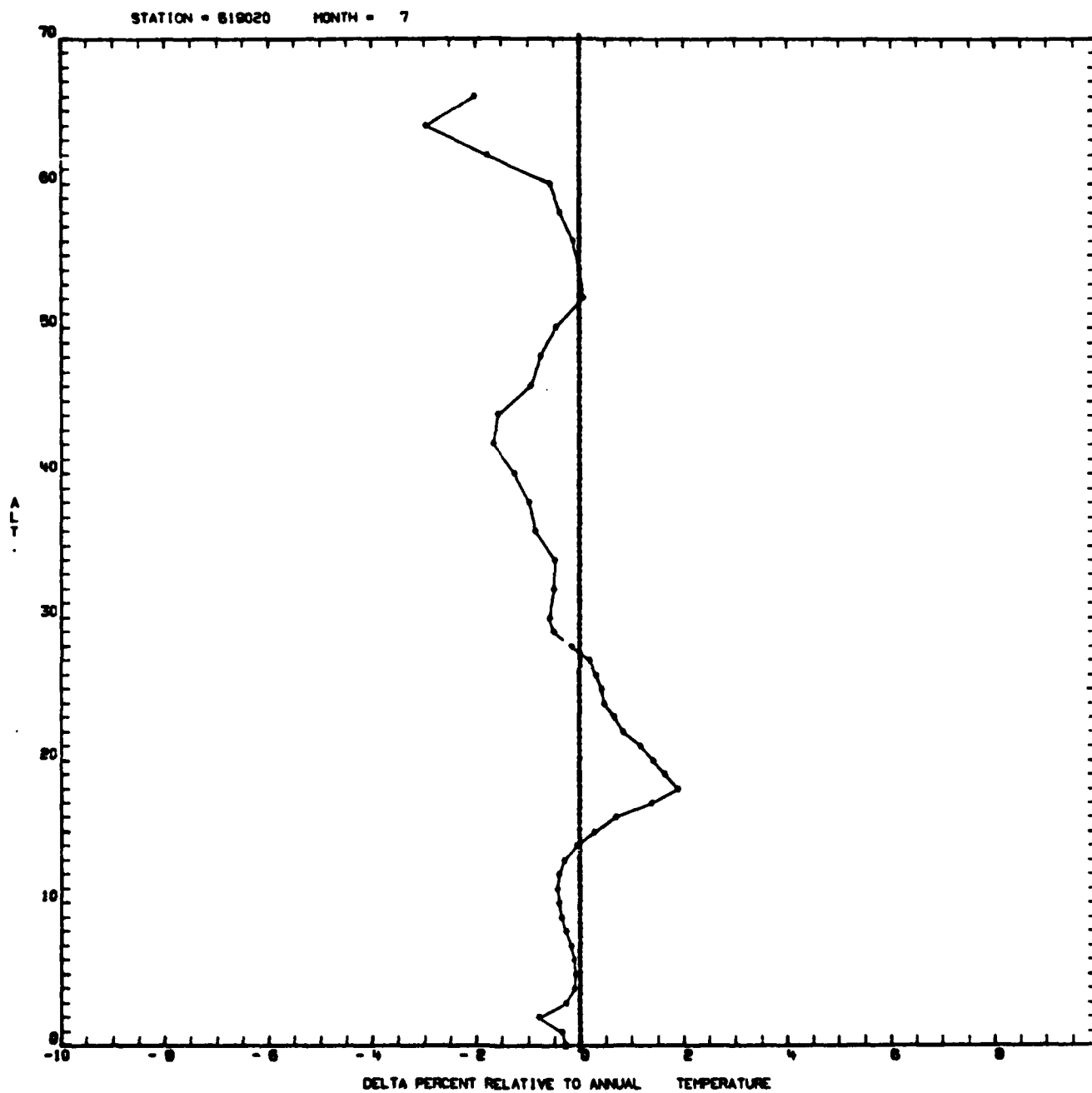


Figure B-7.

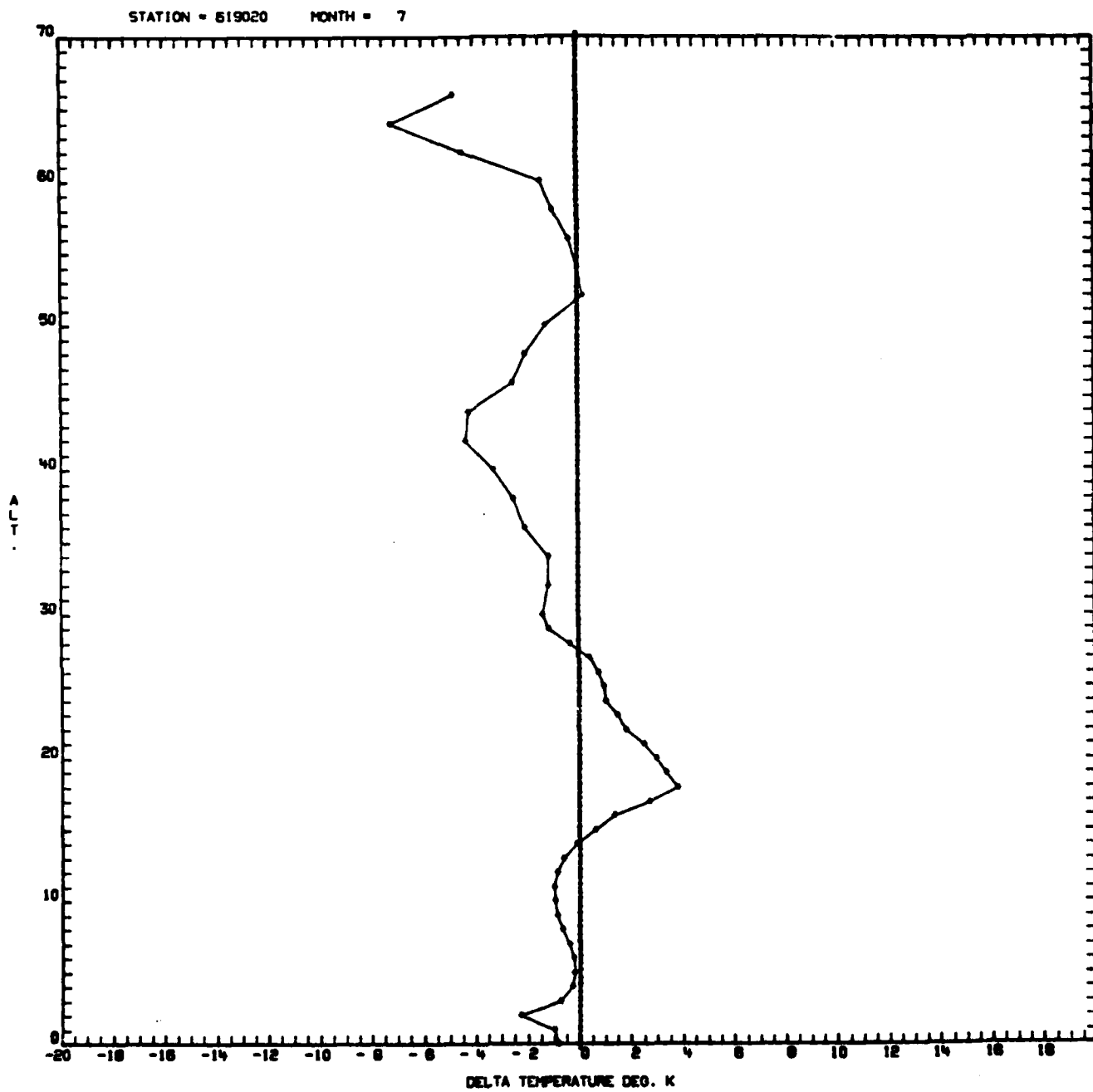


Figure B-8.

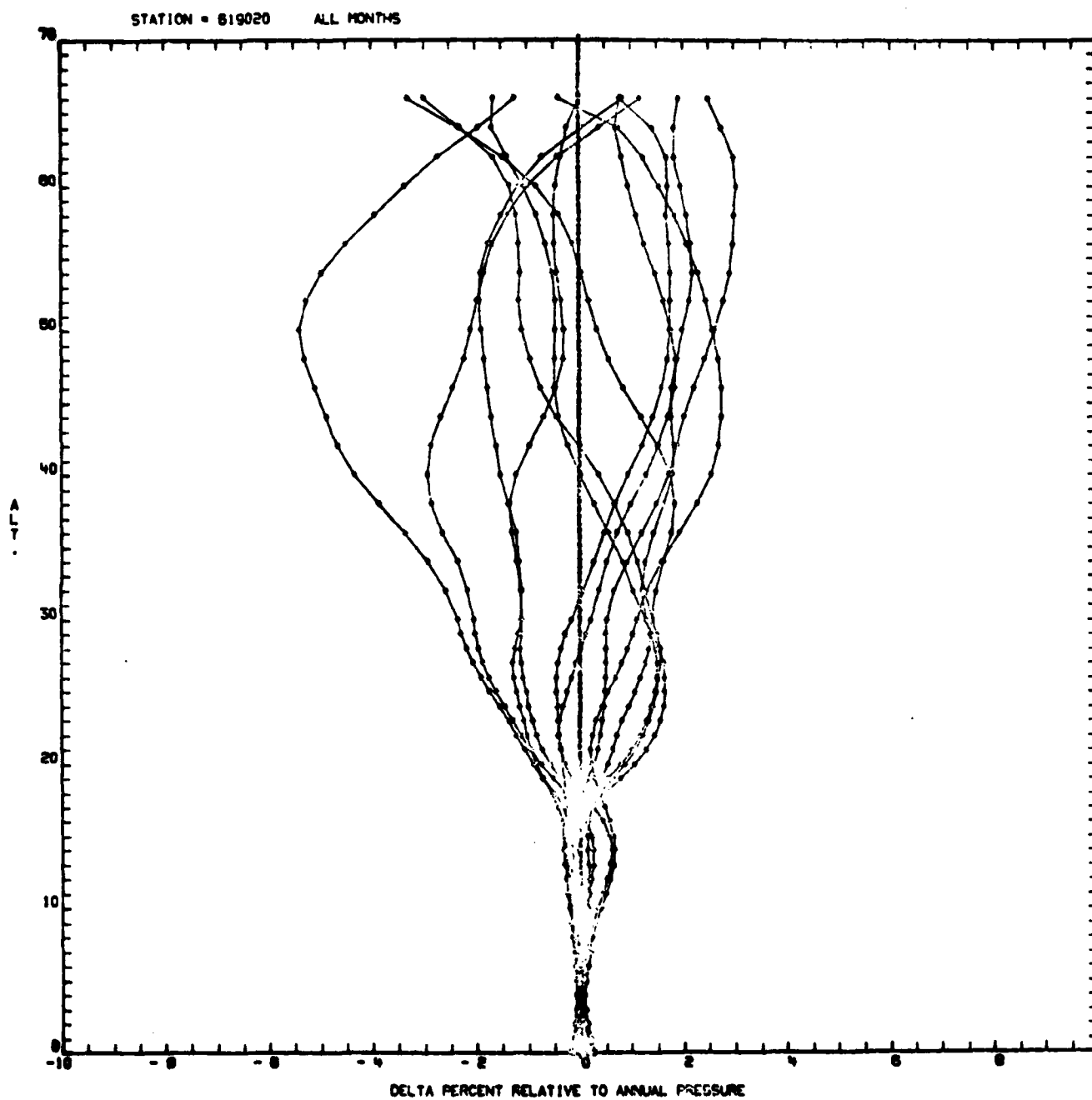


Figure B-9.

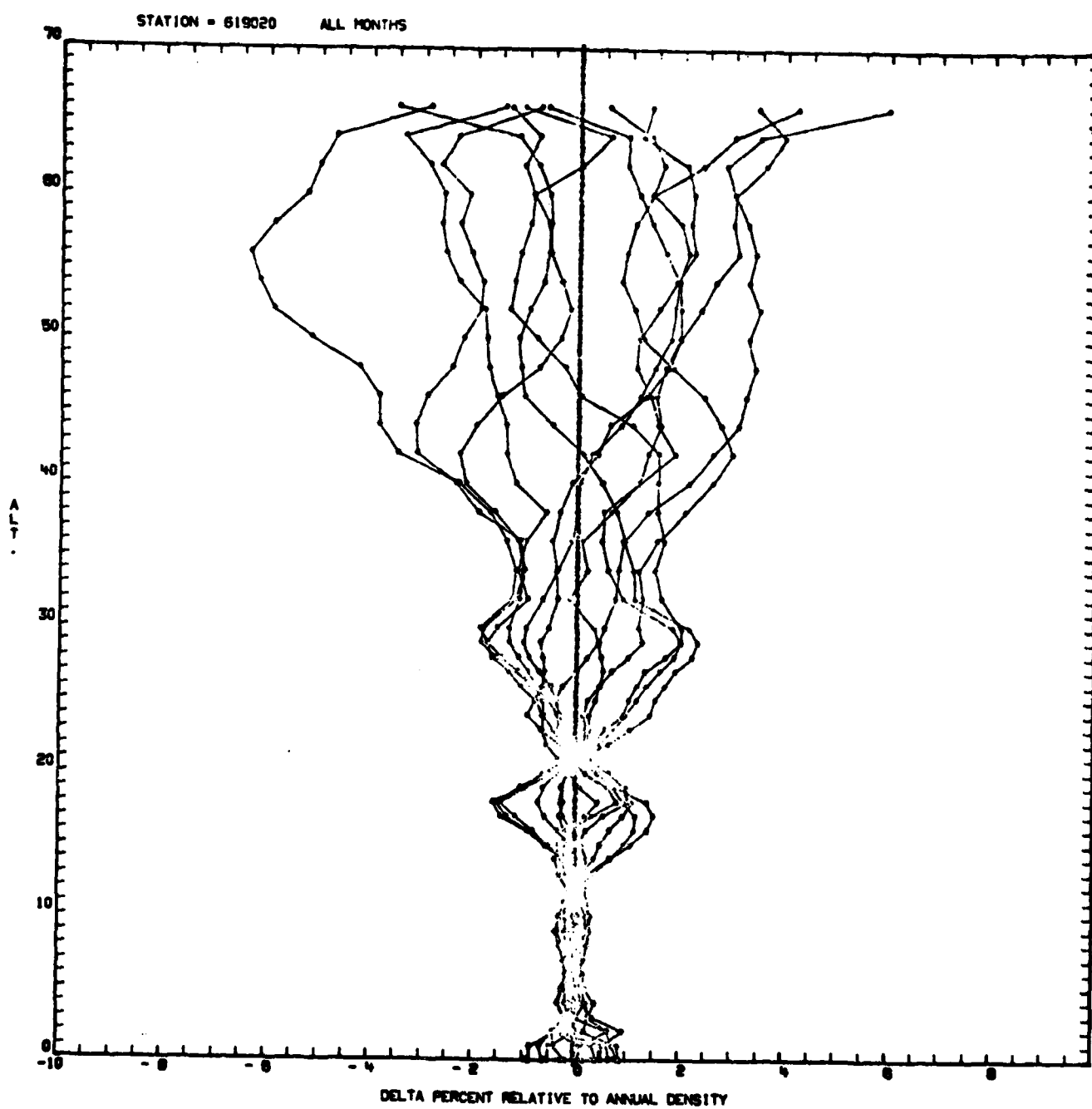


Figure 8-10.

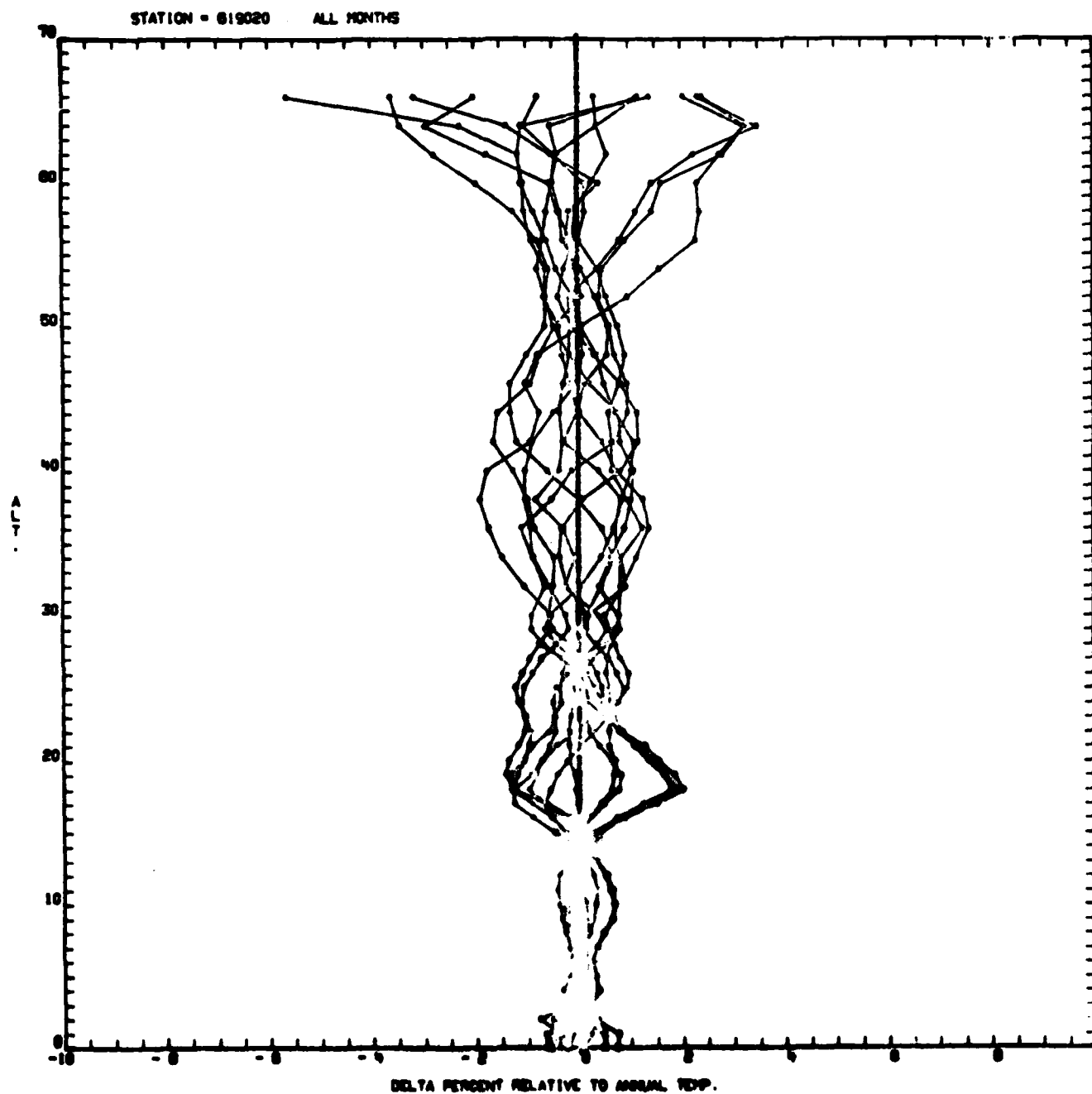


Figure B-11.

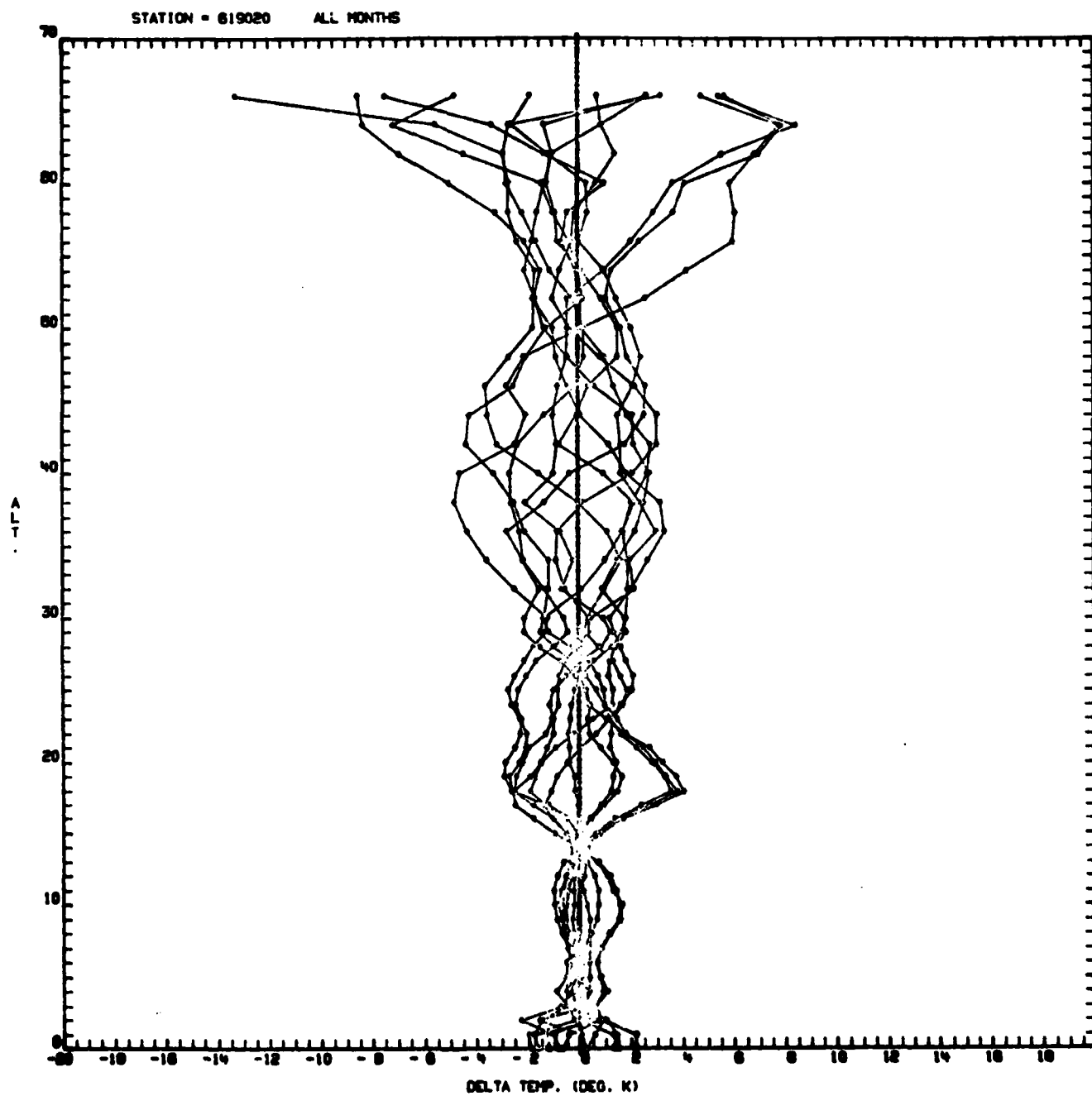


Figure B-12.

Table B-4.

STATION 618020 LEVEL	MONTH CVP	I CVD	CVT	R(P,T)	R(P,D)	R(T,D)	DCVP	DCVD	DCVT
.000	.0015	.0054	.0046	-.3471	.9881	-.9833	-.0085	-.0008	-.0023
.020	.0015	.0052	.0045	-.3374	.9809	-.9623	-.0083	-.0008	-.0022
1.000	.0015	.0047	.0045	.0379	.2848	-.9471	-.0076	-.0013	-.0017
2.000	.0016	.0059	.0059	.1006	.1682	-.9638	-.0102	-.0015	-.0016
3.000	.0018	.0041	.0044	.3343	.0711	-.9163	-.0068	-.0020	-.0015
4.000	.0020	.0045	.0046	.2622	.1735	-.9037	-.0071	-.0021	-.0019
5.000	.0021	.0055	.0053	.1210	.2650	-.9251	-.0087	-.0019	-.0023
6.000	.0023	.0052	.0054	.2848	.1456	-.9059	-.0083	-.0024	-.0021
7.000	.0026	.0051	.0056	.4148	.0475	-.6891	-.0082	-.0031	-.0021
8.000	.0029	.0051	.0058	.4773	.0308	-.8636	-.0080	-.0037	-.0022
9.000	.0034	.0058	.0065	.4716	.0459	-.8592	-.0090	-.0041	-.0026
10.000	.0040	.0062	.0071	.4821	.0902	-.8291	-.0093	-.0048	-.0031
11.000	.0045	.0047	.0063	.6723	.0867	-.6938	-.0064	-.0061	-.0029
12.000	.0050	.0047	.0059	.6400	.2834	-.5535	-.0054	-.0062	-.0039
13.000	.0057	.0060	.0062	.4923	.4384	-.5583	-.0065	-.0059	-.0055
14.000	.0061	.0078	.0076	.3652	.4267	-.6861	-.0093	-.0059	-.0063
15.000	.0065	.0094	.0093	.3402	.3573	-.7567	-.0122	-.0065	-.0068
16.000	.0070	.0105	.0102	.2820	.3038	-.7743	-.0138	-.0066	-.0074
17.000	.0074	.0123	.0105	.0824	.5316	-.8003	-.0154	-.0056	-.0093
18.000	.0077	.0150	.0132	.0419	.4750	-.8593	-.0206	-.0059	-.0095
19.000	.0081	.0142	.0133	.1803	.3978	-.8307	-.0195	-.0071	-.0090
20.000	.0087	.0124	.0125	.3523	.3350	-.7502	-.0162	-.0068	-.0096
21.000	.0094	.0106	.0116	.5083	.3351	-.6411	-.0128	-.0104	-.0085
22.000	.0106	.0104	.0107	.5216	.4756	-.5024	-.0108	-.0109	-.0102
23.000	.0112	.0104	.0097	.5118	.6039	-.3756	-.0089	-.0105	-.0120
24.000	.0120	.0132	.0109	.3356	.6326	-.5172	-.0121	-.0097	-.0143
25.000	.0128	.0148	.0116	.8477	.6948	-.5703	-.0138	-.0093	-.0158
26.000	.0130	.0156	.0118	.2178	.6727	-.5759	-.0143	-.0093	-.0168
27.000	.0134	.0156	.0117	.2288	.6837	-.5542	-.0140	-.0094	-.0173
28.000	.0139	.0162	.0113	.1847	.7292	-.5378	-.0136	-.0090	-.0188
29.000	.0143	.0168	.0115	.1710	.7357	-.5404	-.0140	-.0091	-.0136
30.000	.0148	.0164	.0112	.2261	.7474	-.4782	-.0128	-.0096	-.0200
32.000	.0148	.0157	.0138	.3993	.5912	-.5034	-.0147	-.0129	-.0167
34.000	.0163	.0156	.0154	.5301	.5805	-.4160	-.0143	-.0165	-.0170
36.000	.0182	.0178	.0174	.8420	.5533	-.4002	-.0158	-.0190	-.0193
38.000	.0224	.0185	.0204	.6294	.5179	-.3388	-.0165	-.0243	-.0206
40.000	.0258	.0214	.0224	.8121	.5845	-.3072	-.0180	-.0267	-.0248
42.000	.0291	.0233	.0202	.6083	.7255	-.1049	-.0143	-.0260	-.0322
44.000	.0322	.0254	.0178	.6193	.8381	.0906	-.0108	-.0244	-.0399
46.000	.0351	.0280	.0182	.6094	.8578	.1152	-.0111	-.0252	-.0449
48.000	.0383	.0324	.0187	.5332	.8730	.0528	-.0129	-.0246	-.0520
50.000	.0400	.0349	.0229	.4939	.8218	-.0895	-.0178	-.0279	-.0520
52.000	.0427	.0402	.0228	.3744	.8495	-.1711	-.0203	-.0254	-.0600
54.000	.0449	.0416	.0224	.3901	.8682	-.1183	-.0182	-.0257	-.0641
56.000	.0483	.0434	.0245	.4413	.8618	-.0748	-.0197	-.0294	-.0671
58.000	.0527	.0450	.0271	.5188	.8578	.0084	-.0194	-.0348	-.0708
60.000	.0506	.0427	.0320	.5442	.7773	-.1049	-.0241	-.0399	-.0613
62.000	.0534	.0408	.0315	.6492	.8091	.0783	-.0188	-.0442	-.0627
64.000	.0585	.0443	.0336	.6581	.8203	.1093	-.0195	-.0478	-.0691
66.000	.0548	.0408	.0421	.8779	.8484	-.1228	-.0279	-.0583	-.0533

Table B-5.

STATION 618020 LEVEL	MONTH CVP	7 CVD	CVT	R(P,T)	R(P,D)	R(T,D)	DCVP	DCVD	DCVT
.000	.0014	.0039	.0035	-.1434	.4783	-.9373	-.0050	-.0009	-.0018
.020	.0014	.0038	.0034	-.1495	.4806	-.9350	-.0059	-.0009	-.0018
1.000	.0015	.0039	.0039	.1221	.2611	-.9262	-.0062	-.0014	-.0016
2.000	.0016	.0082	.0082	.1022	.0921	-.9311	-.0148	-.0016	-.0016
3.000	.0018	.0056	.0058	.1505	.1728	-.9478	-.0094	-.0018	-.0018
4.000	.0020	.0056	.0056	.1951	.1611	-.9365	-.0092	-.0020	-.0020
5.000	.0022	.0053	.0054	.2701	.1341	-.9179	-.0085	-.0023	-.0020
6.000	.0025	.0053	.0055	.3088	.1523	-.8930	-.0082	-.0027	-.0023
7.000	.0027	.0057	.0059	.2998	.1661	-.8910	-.0089	-.0029	-.0025
8.000	.0031	.0062	.0056	.3733	.0982	-.8865	-.0097	-.0035	-.0026
9.000	.0035	.0064	.0072	.4521	.0369	-.8747	-.0101	-.0042	-.0027
10.000	.0040	.0063	.0073	.5134	.0437	-.8321	-.0095	-.0051	-.0030
11.000	.0046	.0045	.0062	.6814	.0933	-.6652	-.0061	-.0062	-.0030
12.000	.0052	.0045	.0057	.6703	.3013	-.5056	-.0050	-.0065	-.0039
13.000	.0058	.0053	.0064	.6273	.3358	-.5221	-.0059	-.0070	-.0047
14.000	.0064	.0069	.0068	.4559	.4783	-.5636	-.0073	-.0063	-.0065
15.000	.0069	.0080	.0074	.3751	.6154	-.6010	-.0086	-.0063	-.0075
16.000	.0073	.0091	.0073	.2187	.6207	-.6294	-.0092	-.0095	-.0090
17.000	.0075	.0127	.0094	-.1053	.6733	-.8062	-.0146	-.0043	-.0108
18.000	.0078	.0145	.0117	-.0726	.5950	-.8448	-.0184	-.0050	-.0106
19.000	.0079	.0145	.0115	-.0787	.6077	-.8396	-.0181	-.0050	-.0108
20.000	.0077	.0132	.0106	-.0261	.6022	-.8138	-.0181	-.0050	-.0104
21.000	.0077	.0126	.0102	.0272	.5879	-.7927	-.0152	-.0053	-.0101
22.000	.0081	.0127	.0107	.1071	.5480	-.7723	-.0153	-.0061	-.0101
23.000	.0083	.0114	.0103	.2587	.4824	-.7134	-.0134	-.0071	-.0094
24.000	.0088	.0117	.0109	.3068	.4675	-.6981	-.0138	-.0080	-.0097
25.000	.0087	.0115	.0105	.2911	.4828	-.6991	-.0133	-.0077	-.0098
26.000	.0092	.0115	.0102	.3027	.5314	-.6405	-.0125	-.0079	-.0105
27.000	.0097	.0110	.0101	.3758	.5323	-.5845	-.0115	-.0087	-.0106
28.000	.0101	.0069	.0083	.4702	.5738	-.4442	-.0091	-.0095	-.0108
29.000	.0104	.0110	.0094	.3928	.6101	-.4809	-.0100	-.0089	-.0118
30.000	.0110	.0122	.0102	.3288	.6216	-.5354	-.0115	-.0089	-.0130
32.000	.0150	.0176	.0208	.5568	.1963	-.7094	-.0234	-.0182	-.0118
34.000	.0190	.0169	.0224	.6781	.2262	-.5625	-.0202	-.0245	-.0135
36.000	.0228	.0150	.0174	.7513	.8440	-.0211	-.0097	-.0252	-.0204
38.000	.0261	.0197	.0173	.6581	.7506	-.0021	-.0108	-.0238	-.0285
40.000	.0293	.0219	.0194	.6634	.7489	.0009	-.0120	-.0268	-.0318
42.000	.0325	.0258	.0174	.6084	.8453	.0914	-.0108	-.0240	-.0408
44.000	.0345	.0335	.0183	.3207	.8948	-.2177	-.0173	-.0194	-.0498
46.000	.0358	.0358	.0202	.2853	.8403	-.2900	-.0202	-.0203	-.0514
48.000	.0377	.0363	.0222	.3566	.8214	-.2399	-.0207	-.0238	-.0519
50.000	.0418	.0381	.0208	.4195	.8889	-.0849	-.0170	-.0245	-.0591
52.000	.0437	.0401	.0191	.3989	.8998	-.0411	-.0155	-.0227	-.0648
54.000	.0456	.0432	.0199	.3353	.9016	-.1051	-.0174	-.0223	-.0690
56.000	.0474	.0448	.0204	.3390	.9035	-.0971	-.0178	-.0230	-.0717
58.000	.0514	.0449	.0265	.4695	.8570	-.0288	-.0200	-.0331	-.0698
60.000	.0582	.0525	.0320	.4447	.8377	-.1186	-.0263	-.0377	-.0787
62.000	.0673	.0589	.0320	.4846	.8800	.0110	-.0235	-.0404	-.0942
64.000	.0778	.0687	.0412	.4727	.8480	-.0644	-.0321	-.0503	-.1094
66.000	.1097	.0997	.0640	.4414	.8171	-.1588	-.0540	-.0741	-.1454

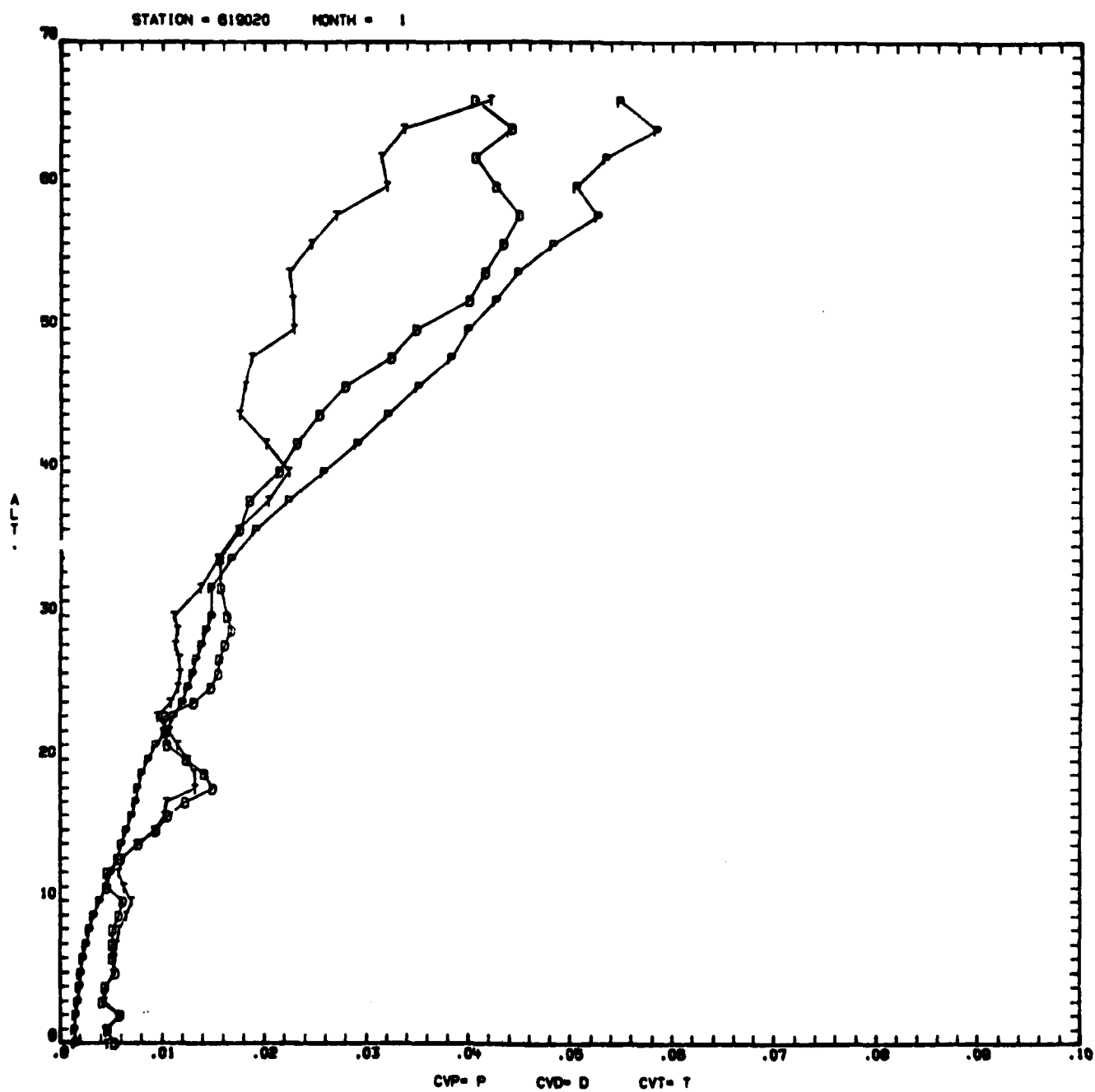


Figure B-13.

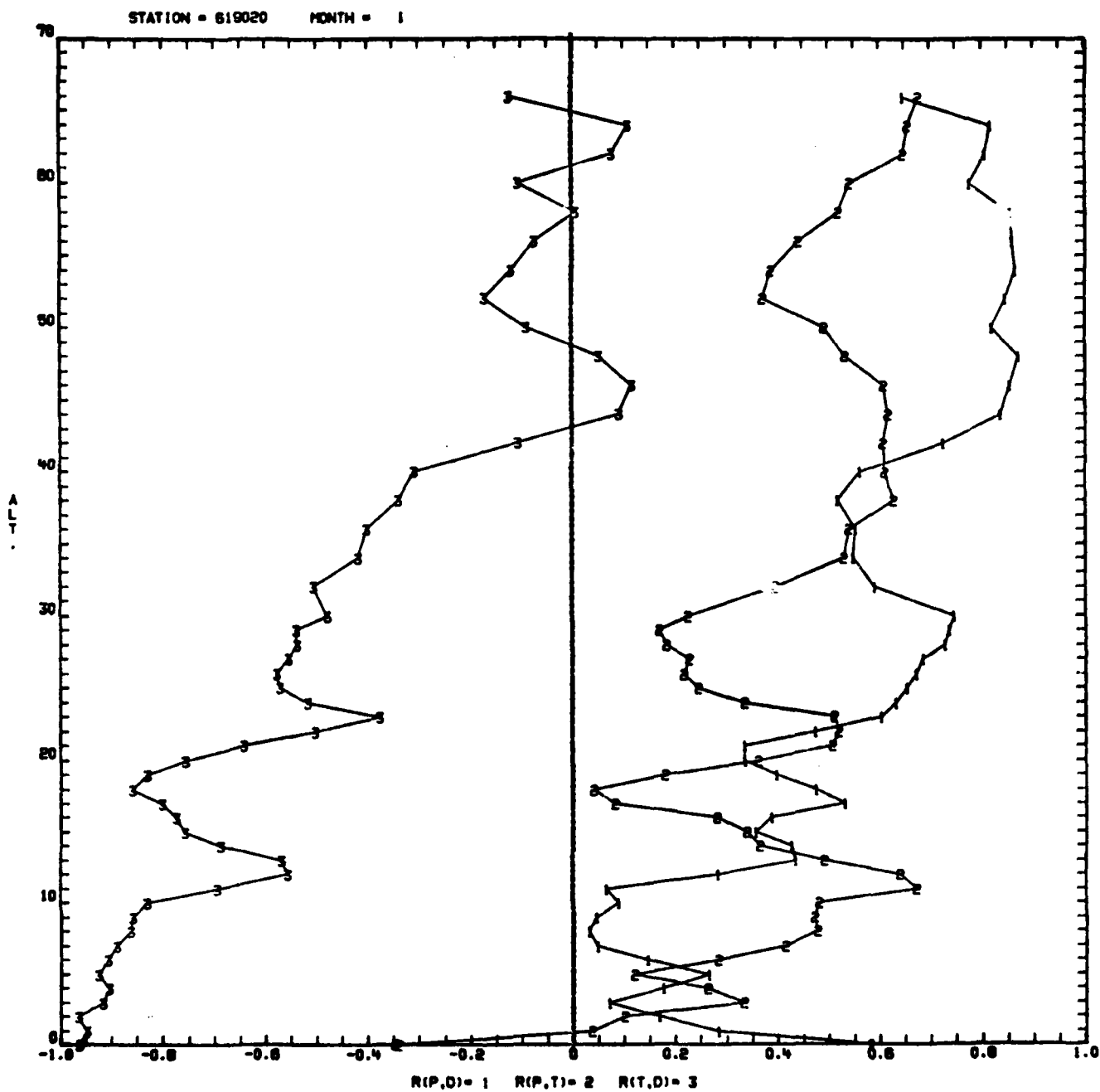


Figure B-14.

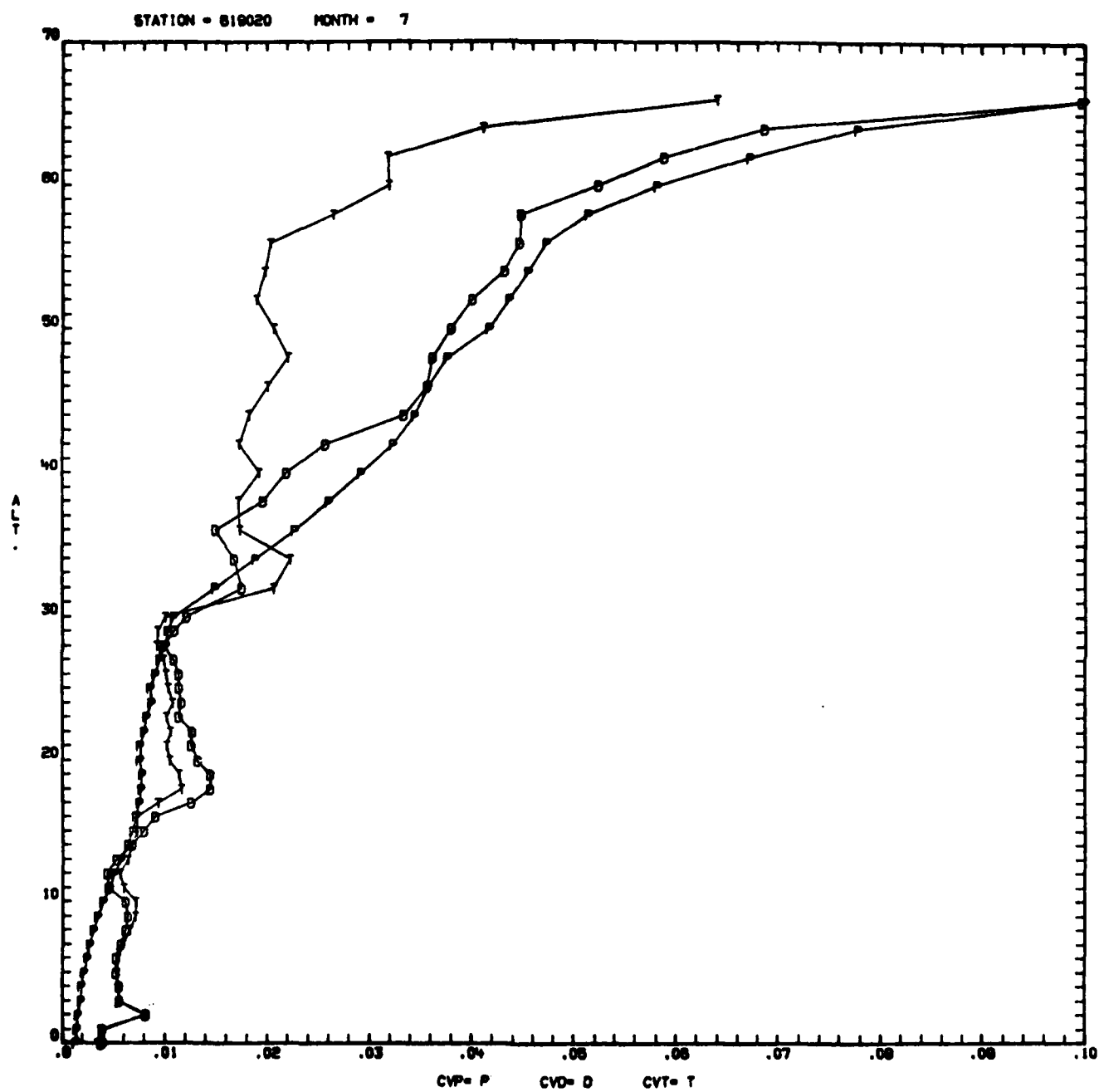


Figure B-15.

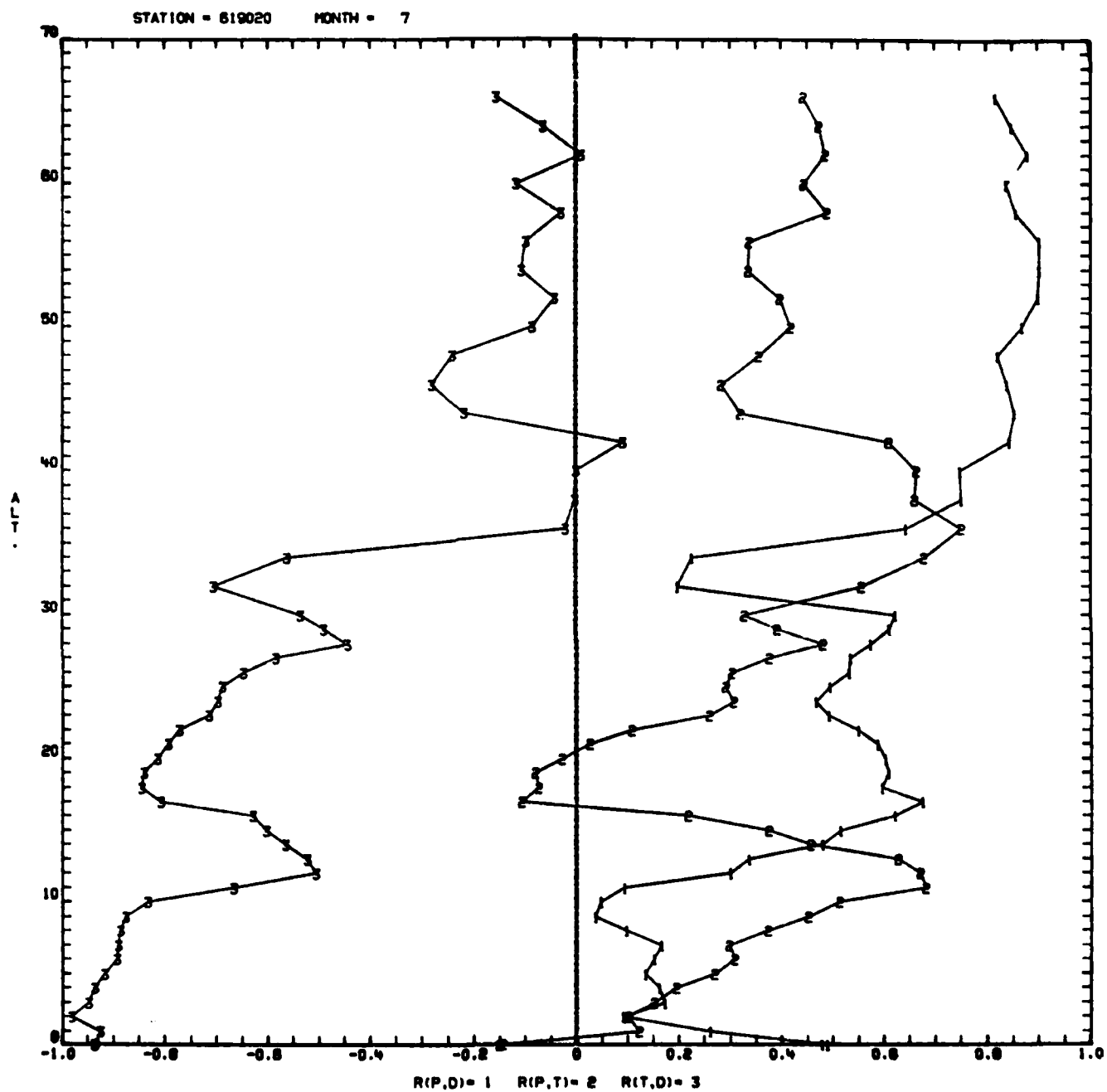


Figure B-16.

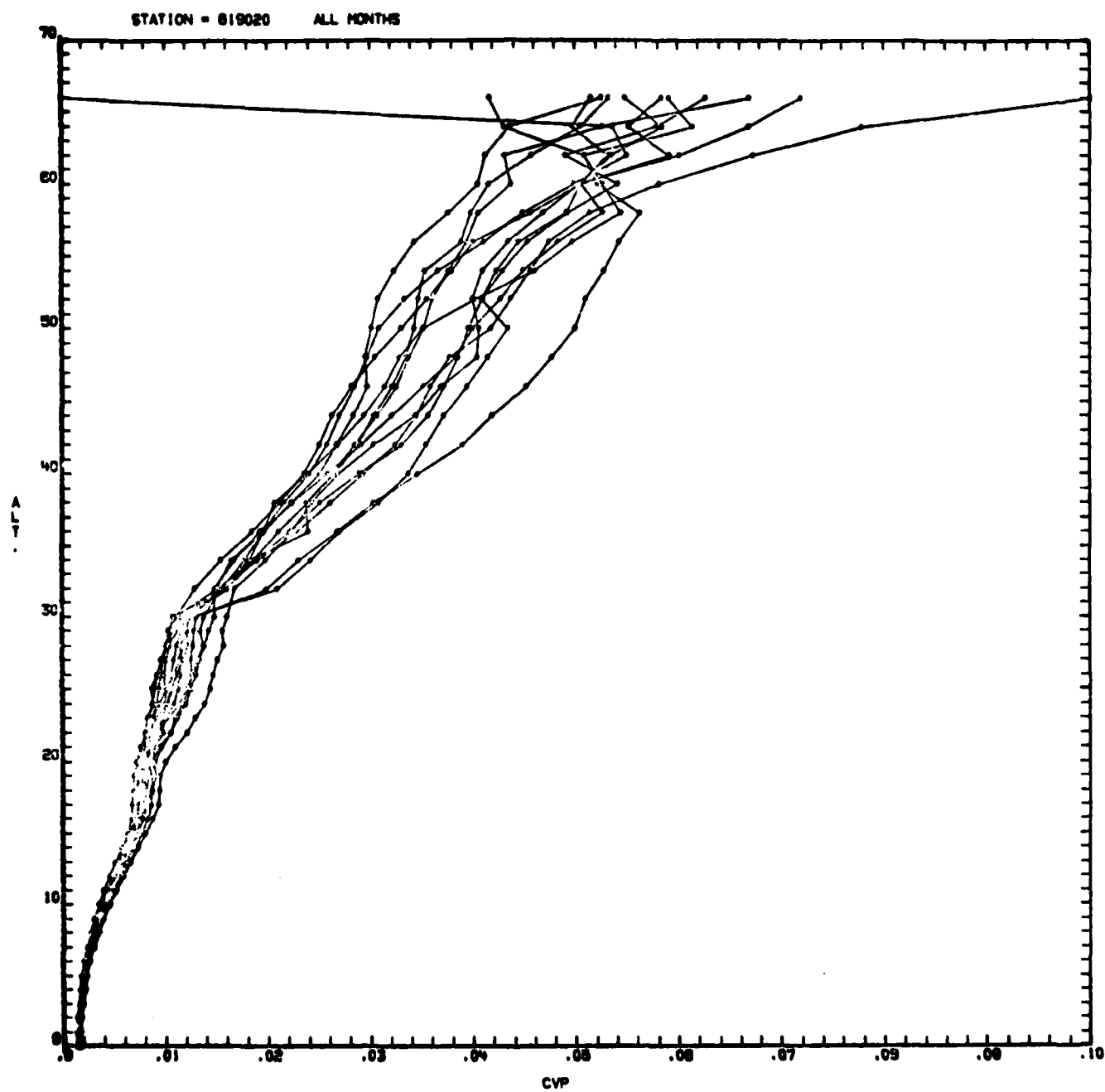


Figure B-17.

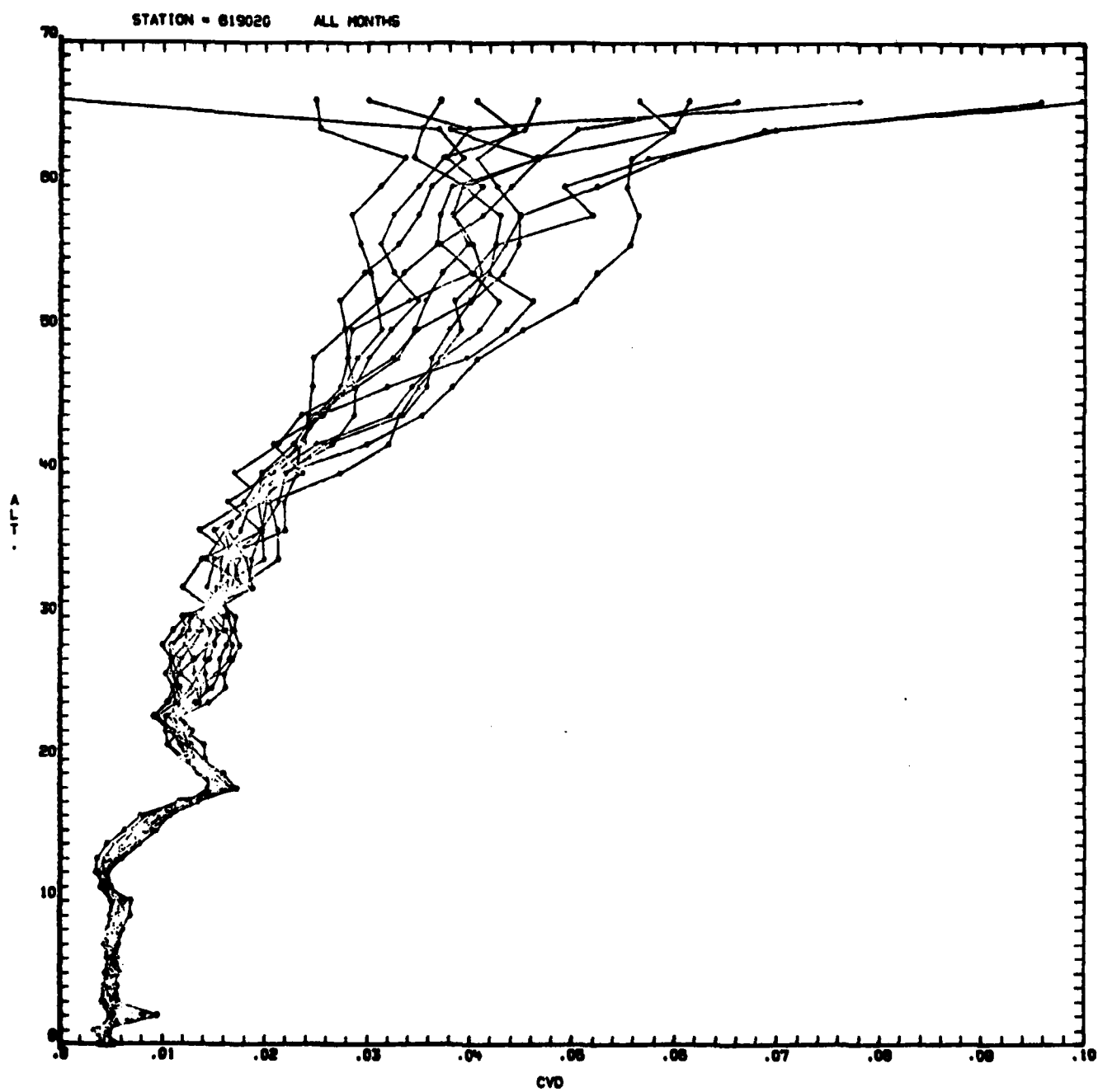


Figure B-18.

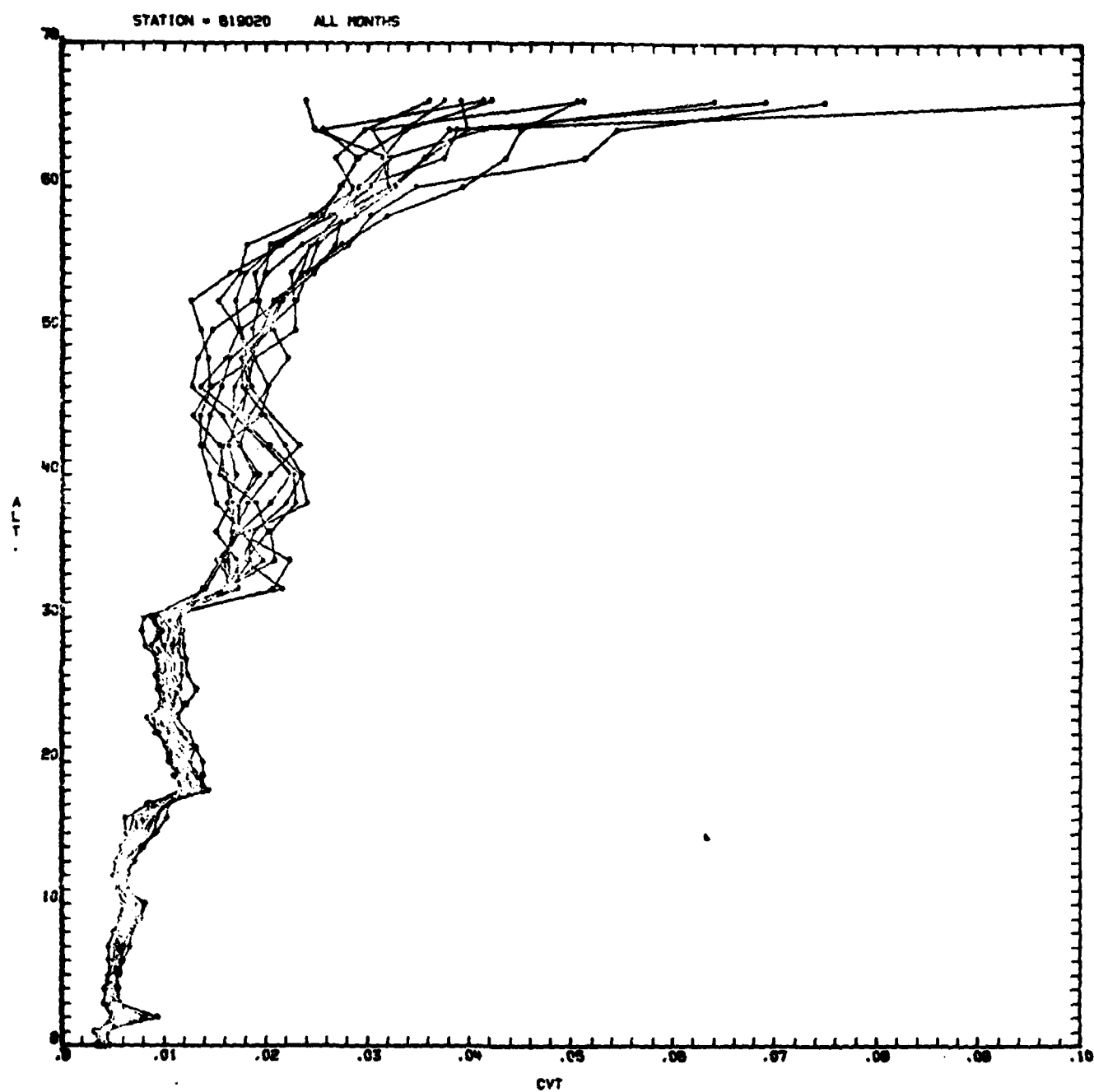


Figure B-19.

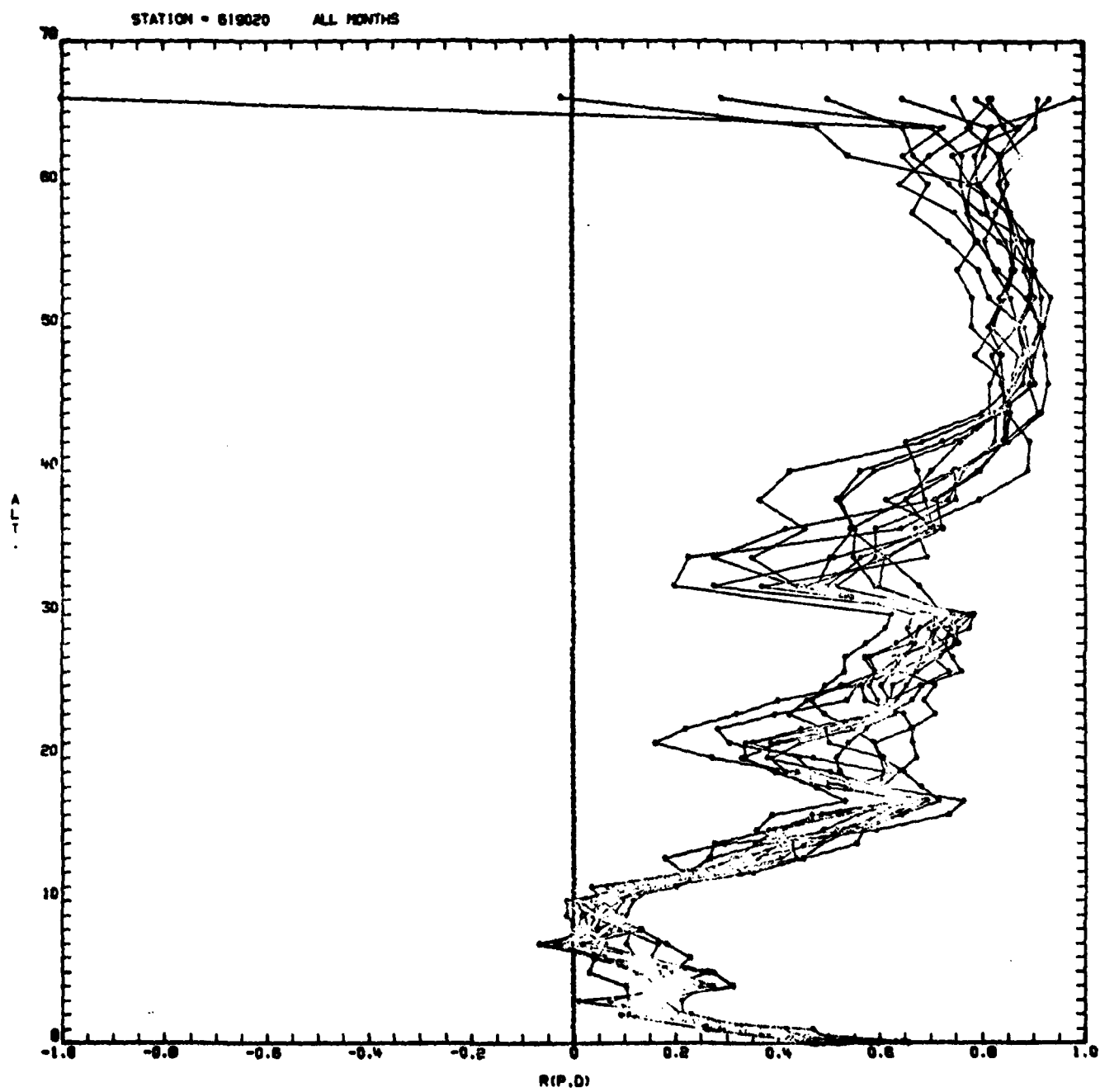


Figure B-20.

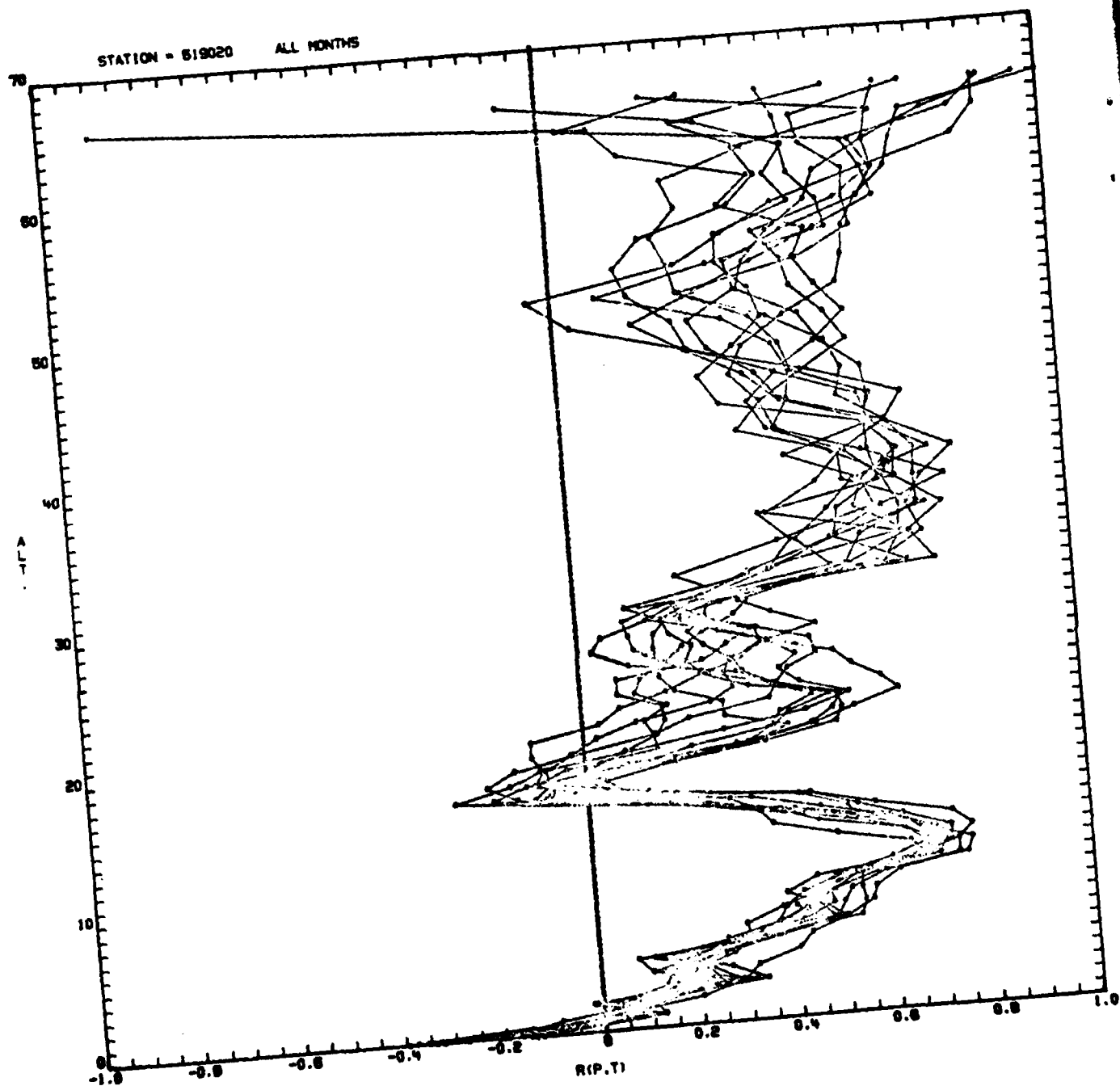


Figure B-21.

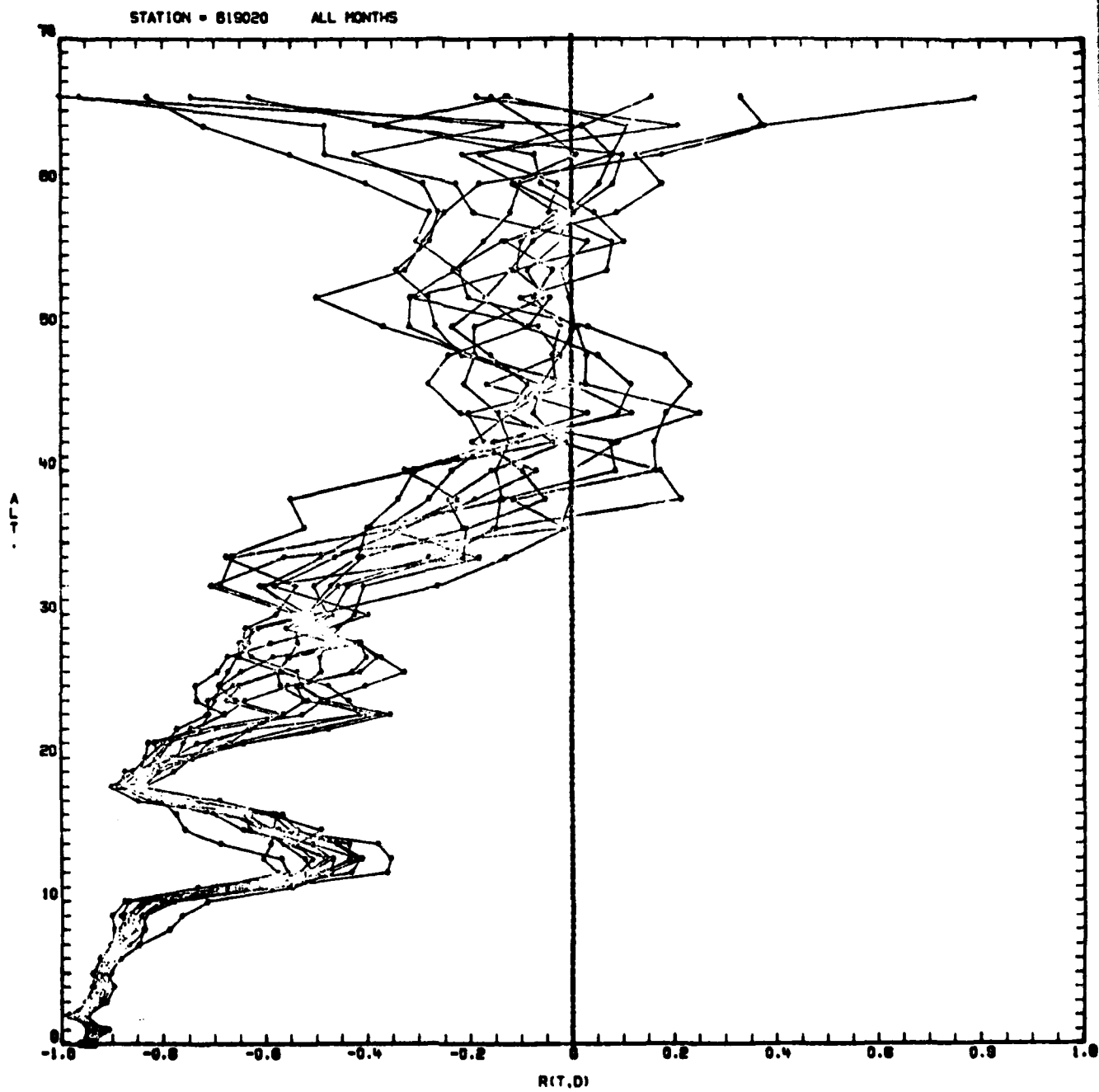


Figure B-22.