AD-A162 210 PROBABILITY AND CONDITIONAL PROBABILITY OF CUMULATIVE CLOUD COVER FOR SEL..(U) OPTIMETRICS INC BEDFORD MA W O GALLERY ET AL. JUL 85 OMI-139 AFGL-TR-85-0154 1/3

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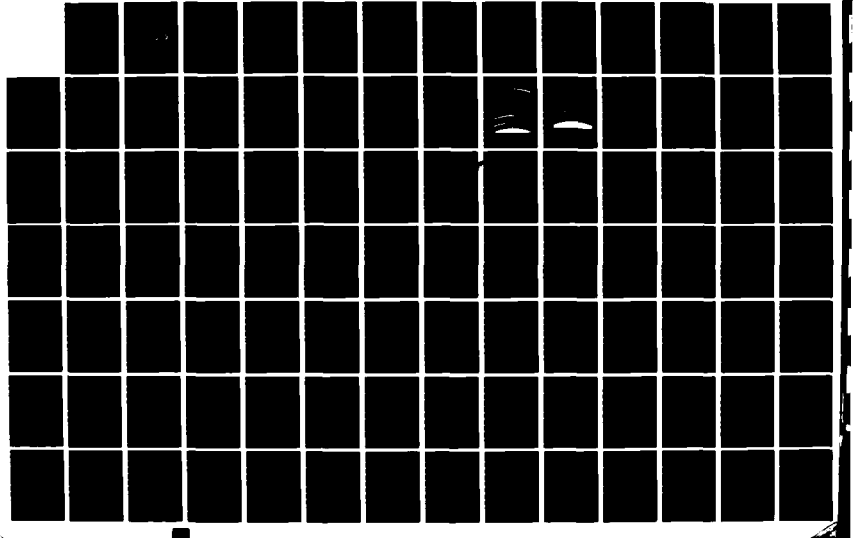

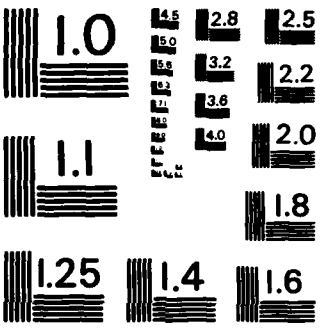

AFGL-TR-85-0154 OMI-139

(12.)

PROBABILITY AND CONDITIONAL PROBABILITY OF CUMULATIVE CLOUD COVER FOR SELECTED STATIONS WORLDWIDE

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July 1985

Final Report
December 1983 - July 1985

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER AFGL-TR-85-0154	2. GOVT ACCESSION NO. AD-A162 210
	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Probability and Conditional Probability of Cumulative Cloud Cover for Selected Stations Worldwide	5. TYPE OF REPORT & PERIOD COVERED December 1983–July 1985 Final Technical Report
	6. PERFORMING ORG. REPORT NUMBER OMI-139
7. AUTHOR(s) William O. Gallery John R. Hummel David A. Farmer	8. CONTRACT OR GRANT NUMBER(s) F19628-84-C-0049
9. PERFORMING ORGANIZATION NAME AND ADDRESS OptiMetrics, Inc. 1 DeAngelo Drive, Suite D Bedford, Massachusetts 01730	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 63707F 268801DG
11. CONTROLLING OFFICE NAME AND ADDRESS Air Force Geophysics Laboratory Hanscom Air Force Base, Massachusetts 01731 Monitor: Frederick Brousaides/LYS	12. REPORT DATE July 1985 13. NUMBER OF PAGES 214
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)	15. SECURITY CLASS. (of this report) Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release: distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Cloud Cover	ETAC DATSAV
Cloud Statistics	Surface Weather Observation
Cloud Profiles	Cloud Observations
Conditional Probability	Clouds

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Cloud cover has a major impact on both visible and infrared electro-optical sensors. Climatological statistics of the probability of cloud cover would be useful to tactical commanders planning missions over hostile or contested territory where observations are not available. This report presents tables of the historical probability, by okta, of cumulative cloud cover at or below 15 given altitudes. The data consists of routine surface weather observations from the ETAC DATSAV database. Out of 41 stations considered from four regions (Germany, Korea, the Middle East, and Central

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America), 29 stations had data suitable for analysis. The analysis were performed for each station, broken down by season and time of day (0000 to 0559, 0600 to 1159, 1200 to 1759, and 1800 to 2359 local time), then averaged separately over season and over time of day, and over all seasons and times of day. Graphical and tabular results are presented here for all stations for the average over all seasons and time of day; for a selected station (Bitburg, Germany) averages by season and time of day are given. The full set of tables is available on tape.

Another goal of this project is to answer the question: suppose that a remote measurement (say from an RPV) indicates that a cloud is or is not present at or below a given altitude, How much additional information does this measurement add to the historical probabilities, that is, how much different are the conditional probabilities of cumulative cloud cover given that a cloud is or is not reported compared to the unconditional (historical) probabilities? Tables of these conditional probabilities are presented.

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1
INTRODUCTION

The performance of precision-guided munition (PGM) systems may be severely compromised by the presence of clouds in the desired target area. The presense of clouds can prevent the acquisition of targets by the mission commander or cause a PGM to lose track of a target. Also, the presence of clouds can lead to an endangering of the flight crew's safety by forcing them to fly below clouds in order to acquire and track targets. For this reason, Air Force commanders must be given information about the distribution of clouds in a given operational area.

1.1 SCOPE OF THE STUDY

OptiMetrics, Inc. (OMI) was contracted by the Air Force Geophysics Laboratory (AFGL) to perform a study using cloud observations from several locations around the world. The ultimate goal of the study was to produce information about cloud cover probabilities that could be used in tactical decision making. The study consisted of five technical tasks:

Task A Data Screening and Selection

Data sets were provided from 41 locations around the world and these data were screened to select data sets for further analysis. Three general criteria were used to evaluate the given data sets:

1. Did the data sets have the required observations?

2. Did the data sets have a sufficient climatological sample?

3. Were the samples geographically diverse?

The last criterion was included to allow the analysis to include as many climatically diverse locations as possible. If two or more locations were found to be similar climatically, one would have been not used in favor of another climatically dissimilar location.

Task B Frequency-of-Occurrence Statistics

Using the selected data sets frequency-of-occurrence statistics were calculated at selected altitude levels from 0 to about 30,000 feet above Mean Sea Level (MSL). The results from this task are the historical probabilities of finding clouds of given amounts at given altitudes.

Task C Calculate Conditional Probabilities of Fractional Cloud Cover

With the knowledge that a cloud is either present or not present at a given altitude and with the results from Task B the conditional probabilities that clouds of specified amounts will be found at given altitudes when a cloud is detected (or not detected) were calculated.

Task D Treatment of Selected Locations for Which Inadequate Data Are Available

This task involved how to treat those locations in which insufficient or inadequate data existed. Either alternate locations were suggested based on climatic comparisons or alternate analysis techniques recommended.

Task E Presentation of Analysis Results

The results from Tasks B and C were quantified and the most efficient method of displaying the results utilized.

1.2 ORGANIZATION OF THE REPORT

Chapter 2 provides a detailed description of the problem and summarizes background results from similar studies. Detailed results from Task A have been presented in an earlier Interim Report [1] and will be summarized in Chapter 3. Chapter 4 discusses the analysis techniques used. Chapter 5 presents and discusses the results from the analyses. Chapter 6 presents the conclusions and recommendations from the study.

2
DESCRIPTION OF THE PROBLEM

Clouds can undergo rapid temporal and spatial variations, thereby making prediction of their presence exceedingly difficult. While the physical processes that govern cloud formation are reasonably well known [e.g. 2] the computational complexity of the problem limits their inclusion in prognostic models to simplified representations. As a result, one is often forced to use statistical formulations to describe cloud details.

2.1 SOURCES OF DATA

The source of data for statistical approaches is the data base of routine surface observations made around the world. Sky cloud coverage is given in terms of oktas (eighths), or tenths, depending on the particular observation protocol of the celestial dome. Two basic types of surface observations are made: airways and synoptic observations. The airways reports are taken to serve aviation interests. The data are collected hourly but may be taken more often depending upon weather conditions. The airways reports contain estimates of the cloud heights and amounts of the observed layers and may have information about the amount of total sky cover. Synoptic observations are taken routinely every three hours, more often if weather conditions warrant it. The synoptic report contains information on the coverage of all low clouds (utilizing World Meteorological Organization (WMO) definitions of what is a low cloud) and information about the types of other clouds present. These data are collected and archived at the National Climatic Center in Asheville, North Carolina and the

USAF Environmental Technical Applications Center (ETAC) at Scott Air Force Base, Illinois.

2.2 PROBLEMS WITH SURFACE OBSERVATIONS OF SKY COVER

2.2.1 THE PRESENCE OF MULTIPLE CLOUD LAYERS

A major problem with cloud observation data involves the presence of multiple cloud layers. The problem manifests itself when multiple cloud layers are present and one cloud layer obscures the other cloud layers making a determination of the extent of the other cloud layers difficult. This is portrayed in Figure 1 in which there are three cloud layers. None of the clouds individually cover the entire sky but all three cloud layers viewed together do. How this case would be reported depends on the type of observation being made because with some types of observations the observer is instructed to estimate the amount of coverage by the individual layers while in others the observer is not. When using the reported data one does not know what the observer was looking at and what the structure was like. Also, one cannot know if the observer had to estimate the amount of obscured cloud or if all cloud layers could be seen distinctly.

2.2.2 THE OBSERVER'S VIEWING PERSPECTIVE

When dealing with regularly spaced clouds such as cumuliform clouds one may see spaces between clouds when looking vertically but one may see a solid mass of clouds when one looks toward the horizon. This is graphically represented in Figure 2. The angle at which the cloud elements visually merge into one varies with the vertical extent of the clouds. This packing effect can result in the cloud amounts being overestimated seeing that the Federal Meteorological

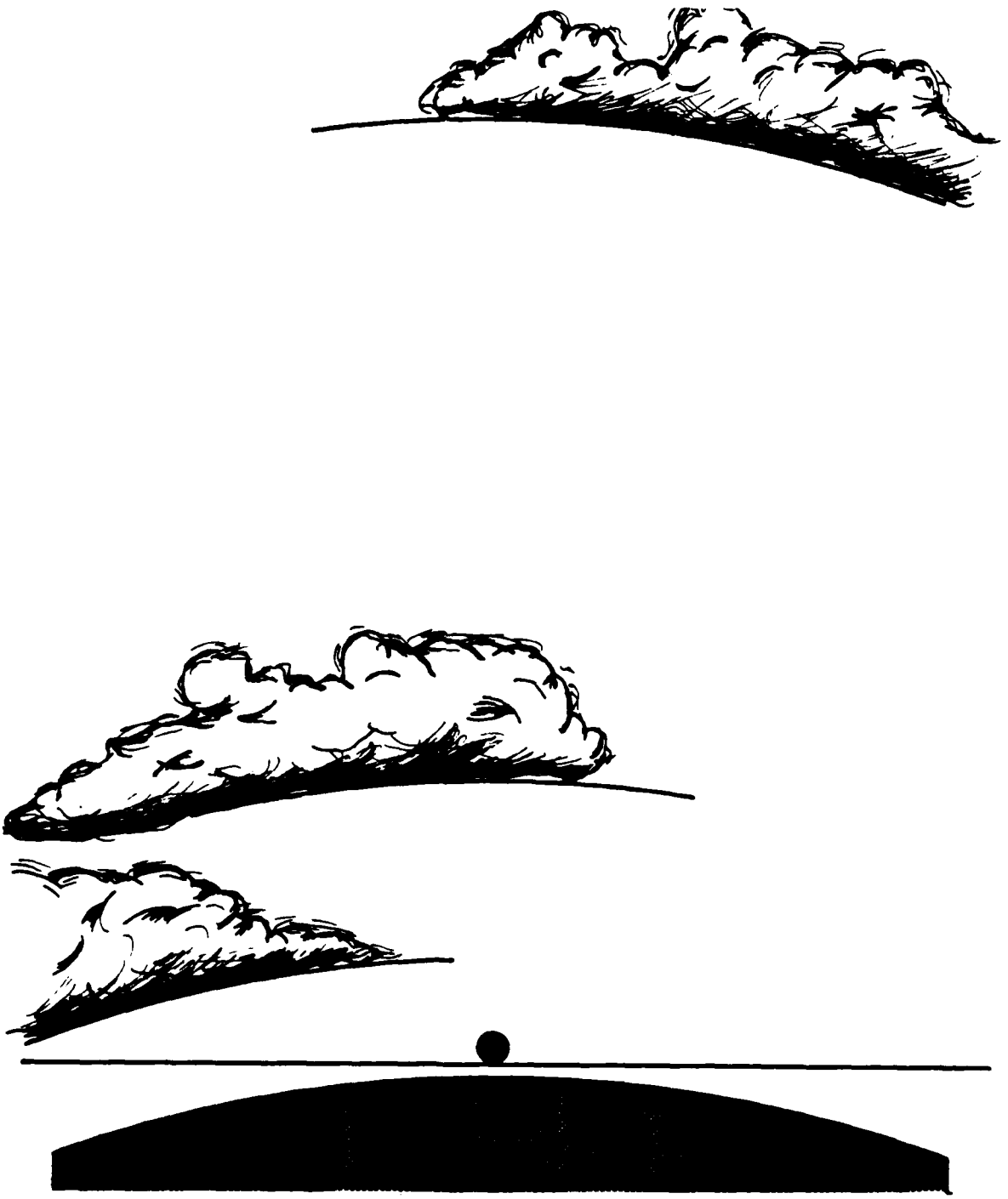

FIGURE 1. SCHEMATIC REPRESENTATION OF THREE INDIVIDUAL CLOUD LAYERS. NONE OF THE CLOUDS INDIVIDUALLY COVER THE ENTIRE SKY BUT ALL THREE CLOUD LAYERS VIEWED TOGETHER DO.

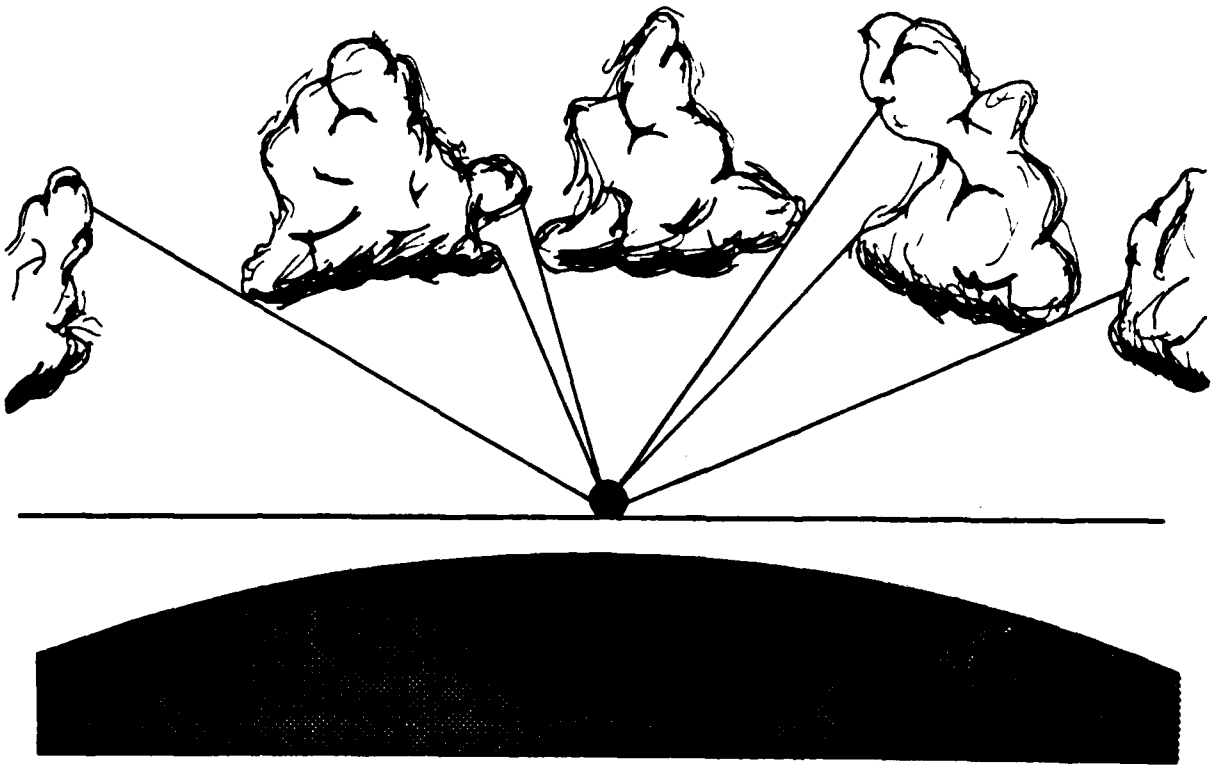

FIGURE 2. CUMULIFORM CLOUDS IN WHICH SPACES BETWEEN THEM CAN BE SEEN WHEN VIEWED VERTICALLY BUT THEY ARE SEEN AS A SOLID MASS WHEN LOOKING TOWARDS THE HORIZON.

Handbook [3] instructs the observer not to compensate for the packing effect (i.e. the observer is instructed to include the sky covered by both the base and sides of the clouds observed).

2.2.3 SUBJECTIVE NATURE OF OBSERVATIONS

Surface observations are by nature subjective and it is difficult to compensate for it. In the Federal Meteorological Handbook, for instance, one is supposed to estimate the amount of sky cover "...on the basis of experience..." [3] as well as generalized concepts that include mentally merging clouds into a continuous sheet.

Also, gauging cloud altitudes is difficult, especially if no vertical reference points exist. One way around this is to lump clouds into the generic low, middle and high cloud categories utilized by the WMO but even this poses problems for the observer in detemining what kind of cloud falls into what category.

2.2.4 RELIABILITY OF OBSERVATIONS

Finally, reliable cloud observations cannot be made under all circumstances. The most obvious example is under nighttime conditions. The Federal Meteorological Handbook advises using the presence of stars to gauge cloud cover. The easiest way around this problem is to not include nighttime observations at all. Another example is the case when the sky is obscured by haze, smoke or fog. Coded information is provided in the reports to let one know that the observation was obscured. For example, when fog exists a report of 10/10 cloudiness at ground level is reported. Obscured situations lead to data gaps that, if they occur often enough, can statistically skew the analyses.

Another reliability problem involves trying to guess if the observers were following the correct procedures when making their observations. On inspection, the ETAC data used in this study showed indications of data that were not consistent with the observation procedures. That is, some reports contained data that were not supposed to be there or were inconsistent with the stated procedures. In discussions with actual observers it was learned that observers may try to estimate individual layer amounts even though they may not be permitted to. The statement most often given was to ask observers what they actually do, not what the book says they should do.

2.3 TYPES OF CLOUD OBSERVATIONS

There are two basic kinds of surface observations made that include cloud data. They are the synoptic and aviation reports mentioned earlier. Table 1 summarizes the features of the different kinds of surface observations.

2.3.1 SYNOPTIC REPORTS

Synoptic reports include the full set of surface observations that are used in forecasting applications. There are three basic groups of cloud data in synoptic reports. The first group is the "sky cover" and represents the total amount of the celestial dome covered by clouds. The second group is called the "cloud group" and consists of the total amount of the celestial dome covered by all low clouds, the type(s) of low clouds present, a code for the altitude range of the low clouds and the types of middle and high clouds present. If no low clouds are present then the amount of the first "cloud layer" present is given. The third cloud group is called the cloud layer group and contains information on the individual layers observed. These data contain informa-

TABLE 1. SUMMARY OF SURFACE OBSERVATION TYPES.

TYPE	TOTAL SKY COVER DATA	INDIVIDUAL LAYER DATA
Synoptic	Yes	Type, Amount (1) & Altitude
Airways	Yes	Type, Amount (2) & Altitude
METAR	No	Type, Amount (1) & Altitude

(1) Amounts are individual layer amounts according to observer discretion.

(2) Amounts are cumulative.

tion on the specific type of clouds observed, their amounts and altitudes of their bases. Using all of the data in the synoptic cloud reports one can make assumptions about the overlapping nature of the cloud layers.

2.3.2 AVIATION REPORTS

Two types of aviation reports are issued depending upon location: Airways and METAR reports. Airways reports are used mainly in North America, Hawaii and Guam. The reports of sky conditions give total sky cloud cover amounts, in tenths, and layer amounts in terms of the implicit descriptors "scattered", "broken", "overcast", "obscured" and "partially obscured". The layer descriptors refer to the cumulative cloud coverage from the surface to the given layer. These implicit descriptors are related to broad categories of cloud coverage. In addition, the Airways code allows the observer to indicate if the clouds are "opaque" or "thin", thin meaning that one half or more of the reported clouds do not constitute a ceiling [4].

METAR reports, which are similar to the standard format approved by the WMO, do not give total sky coverage values but give individual layer amounts, given in oktas. METAR reports also do not differentiate between "thin" and "opaque" clouds.

2.3.3 MERGED SYNOPTIC AND AVIATION REPORTS

One may also find merged reports consisting of synoptic and Airways or synoptic and METAR data. In these cases one can use the data from one report type to augment the data from another type of report. For example, METAR reports do not contain information about the total sky coverage but the synoptic report does.

2.4 SIMILAR STUDIES

Skanklin and Landwehr [5] compiled three years of whole-sky photographs, sky cover observations and cloud type observations taken every hour during the day at Columbia, Missouri over the period 1966 to 1969. The whole-sky photographs were analyzed by placing a template with 33 small circles inscribed representing 33 lines of sight. The lines of sight represented nine look angles from 10 to 90 degrees for each of the four cardinal compass points. For each of the look angles the frequency of occurrence of a cloud-free line-of-sight CFLOS) was tabulated. The resulting data base is widley regarded as the best available of its type and forms the basis for numerous succeeding CFLOS studies [6, 7]. CFLOS studies are relevant to this study because one of the first steps to be performed in a CFLOS study is to compute the frequency of occurrence of clouds at given altitudes. With these frequencies calculated one can then calculate the probabilities of CFLOS for the desired look angles.

The Shanklin and Lund [5] study segregated the Columbia, MO cloud data into six different cloud categories. Rapp, et al. [8] presented a similar analysis of the Columbia data but they used total cloud cover instead of the amounts of given types. They then derived frequency of occurrence statistics for cumulative sky cover with altitude from the surface to 30,000 feet above the surface for a given location. The data so derived were then smoothed and converted to a vertical probability distribution for each cloud fraction. These vertical distributions were then used in the CFLOS calculations.

3
SCREENING OF DATA

3.1 AVAILABLE DATA BASES

AFGL provided data from 41 locations in four geographical regions: West Germany, the Middle East, Korea and Central America. The locations are shown in Figures 3 (a) - (d). The data are standard surface weather observations that have been compiled by ETAC. The data were provided on magnetic tape in the DATSAV format [9]. Tables 2 (a) -(d) give the WMO station numbers, latitudes and longitudes and periods of data coverage for the locations.

3.2 SELECTION CRITERIA

3.2.1 FIRST CUT

The first screening of the data was made based on the total number of meteorological observations made for each location. The goal was to select stations with a relatively long period of record, 5 - 10 years, and with a consistent rate of reporting data on a daily basis (every hour, three hours, etc.). For this screening the emphasis was on the amount of complete surface observations data not just the amount of cloud data present. This screening was performed using data surveys provided by AFGL.

Using these criteria 34 out of the original 41 locations were identified as potentially useful for the study. The stations that were rejected following the first cut and the reasons why are given in Table 3. (Detailed results from the first screening of the data are contained in the Interim report [1].)

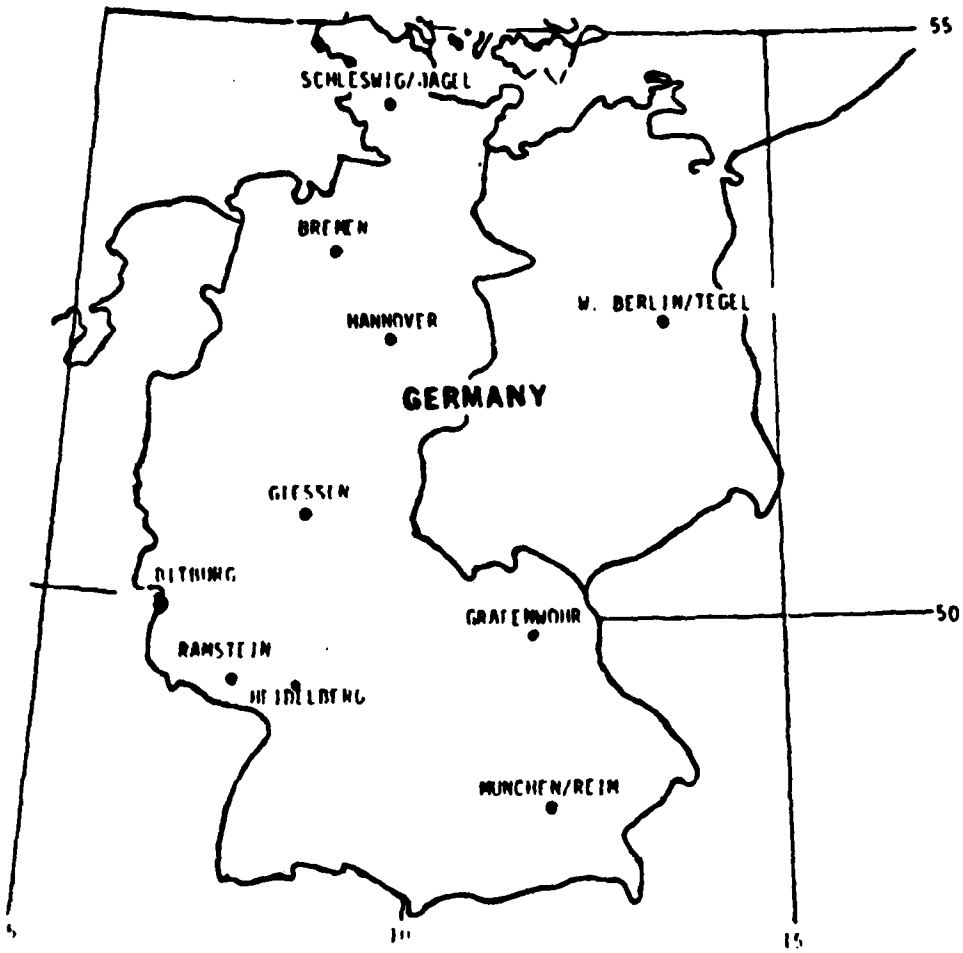

FIGURE 3 (a). LOCATION OF OBSERVING STATIONS IN W. GERMANY.

FIGURE 3 (b). LOCATIONS OF OBSERVING STATIONS IN THE MIDDLE EAST.

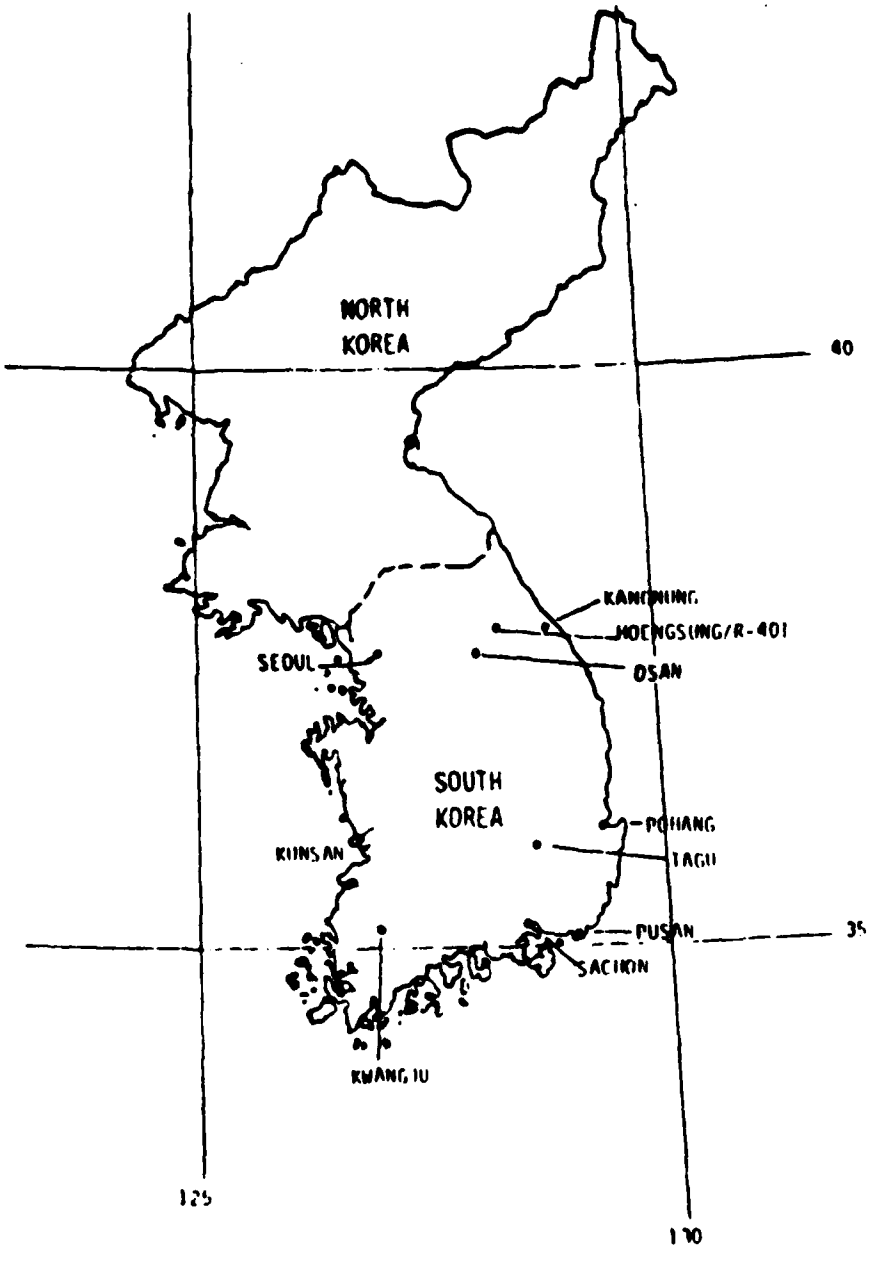

FIGURE 3 (c). LOCATIONS OF OBSERVING STATIONS IN KOREA.

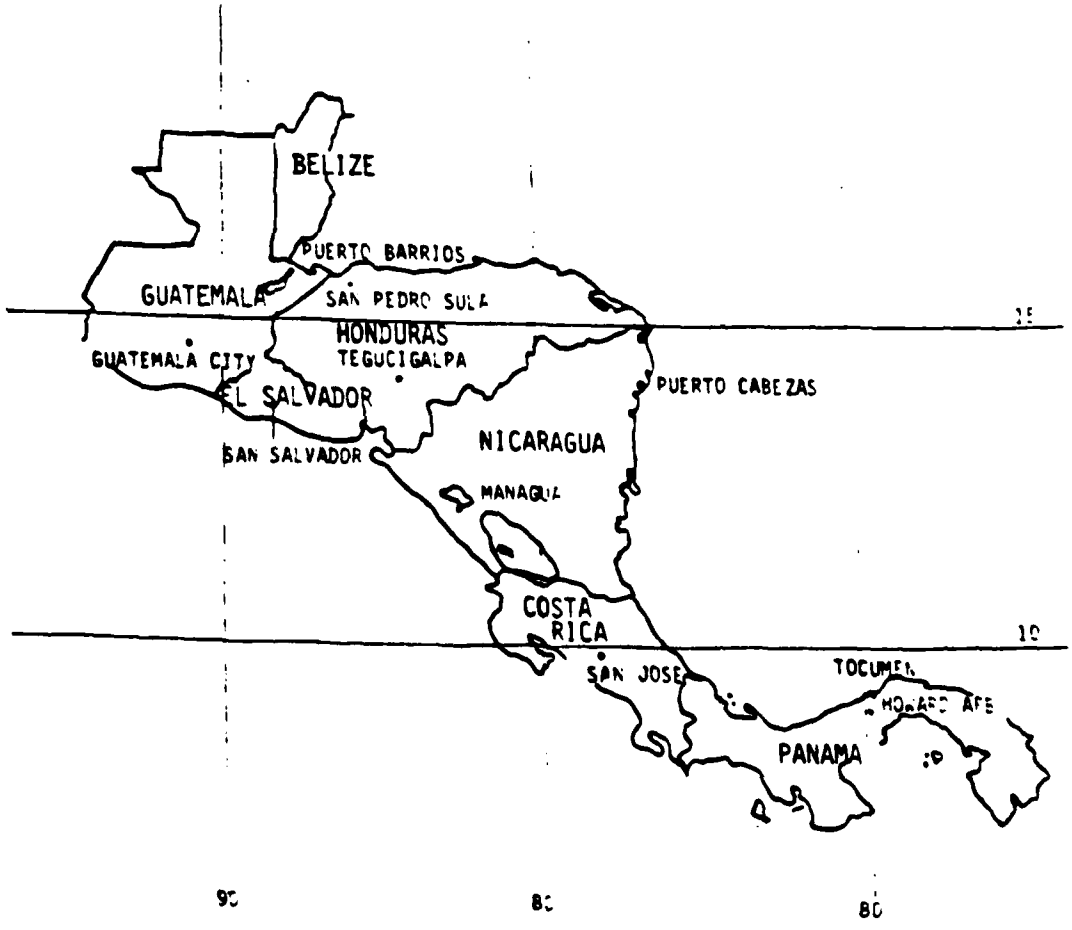

FIGURE 3 (d). LOCATIONS OF OBSERVING STATIONS IN CENTRAL AMERICA.

TABLE 2 . LOCATIONS SUGGESTED FOR USE IN THE CLOUD COVER STUDY. THE DATES IN PARENTHESES REPRESENT TIME PERIODS WHEN DATA ARE NOT AVAILABLE.

(a) West Germany

WMO #	NAME	LATITUDE	LONGITUDE	PERIOD OF RECORD
100370	Schleswig/Jagel	54.47 N	9.53 E	June 68-Mar 82
102240	Bremen	53.05 N	8.80 E	Jan 66-Dec 79
103380	Hannover	52.47 N	9.72 E	Jan 66-Dec 82
103820	Berlin/Tegel	52.57 N	13.33 E	Sept 67-Dec 81
105320	Giessen	50.34 N	8.42 E	Jan 66-Dec 79
106100	Bitburg	49.95 N	6.58 E	Apr 52-Dec 81 (No Jan 71-Dec 72)
106140	Ramstein	49.43 N	7.60 E	Jan 53-Dec 81 (No Jan 71-Dec 72)
106870	Grafenwohr	49.70 N	11.97 E	Jan 59-Dec 80 (No Jan 71-Dec 72)
107340	Heidelberg	49.40 N	8.67 E	Jan 52-Dec 80 (No Jan 71-Dec 73)
108660	Munchen/Reim	48.13 N	11.73 E	Jan 73-Dec 82

TABLE 2. (continued)

(b) The Middle East

WMO #	NAME	LATITUDE	LONGITUDE	PERIOD OF RECORD
400450	Deir Zzor, Syria	35.19 N	40.09 E	Jan 66-May 80
401040	Merdjayoun, Lebanon	33.22 N	35.35 E	Mar 49-Mar 76
403100	Maan, Jordan	30.10 N	35.47 E	June 66-Dec 80
403560	Turaif/Al Turayf, Saudia Arabia	31.41 N	38.40 E	Apr 51-Dec 81 (No Jan 54-Dec 62) (No Jan 65-Dec 65)
406500	Bagdad Intl., Iraq	33.14 N	44.14 E	Jan 66-May 80
407120	Rezaiyeh, Iran	37.40 N	45.04 E	Feb 50-Dec 80
407540	Tehran/Mehrabad, Iran	35.41 N	51.19 E	Jan 67-Dec 81
407660	Kermanshah, Iran	34.21 N	47.09 E	July 57-Sept 80
623060	Mersa Matruh, Egypt	31.20 N	27.13 E	Mar 49-May 81 No Jan 53-Dec 58)
623660	Cairo, Intl., Egypt	30.08 N	31.24 E	Jan 66-Dec 79
623930	Mankabad/Asyut, Egypt	27.11 N	31.06 E	Jan 57-May 81

TABLE 2. (continued)

(c) Korea

WMO #	NAME	LATITUDE	LONGITUDE	PERIOD OF RECORD
471070	Kangnung, Korea	37.75 N	128.97 E	Aug 68-Dec 80
471110	Seoul, Korea	37.31 N	126.56 E	Jan 66-Dec 81 (No Feb 71-Dec 73)
471180	Hoengsung/R-401, Korea	37.43 N	127.97 E	Jan 66-Dec 79
471[illegible]	Osan, Korea	37.10 N	127.05 E	Jan 53-Dec 81 (No Jan 71-Dec 72)
471390	Pohang, Korea	35.98 N	129.43 E	Mar 67-Dec 79
471410	Kunsan, Korea	35.90 N	126.63 E	Aug 51-Dec 81 (No Jan 71-Dec 72)
471420	Taegu & Tonchon, Korea	35.90 N	128.67 E	Jan 66-Dec 79
471530	Pusan/Kimhaf, Korea	35.18 N	128.95 E	Jan 66-Dec 79
471580	Kwangju, Korea	35.07 N	126.49 E	Jan 66-Dec 79
471610	Sachon, Korea	35.08 N	128.10 E	Jan 66-Dec 78

TABLE 2. (continued)

(d) Central America

WMO #	NAME	LATITUDE	LONGITUDE	PERIOD OF RECORD
786370	Puerto Barrios, Guatemala	15.43 N	88.36 W	Apr 70-Dec 78
786410	Guatemala City Guatemala	14.35 N	90.31 W	Jan 68-Dec 79
786630	San Salvador, El Salvador	13.42 N	89.07 W	Jan 68-Dec 79
787080	San Pedro Sula, Honduras	15.27 N	87.56 W	Jan 66-Dec 79
787200	Tegucigalpa, Honduras	14.03 N	87.13 W	Jan 68-Dec 79
787300	Puerto Cabezas, Nicaragua	14.02 N	83.24 W	Jan 66-Dec 77
787410	Managua/Sandino, Nicaragua	12.07 N	86.11 W	Jan 68-Dec 79
787620	San Jose, Costa Rica	9.56 N	84.06 W	Jan 68-Dec 79
787920	Tocumen, Panama	9.05 N	79.22 W	Jan 73-Dec 79
788060	Howard AFB, Panama	8.55 N	79.36 W	Jan 49-Dec 81 (No Jan 50-Nov 61) (No Jan 71-Dec 72)

TABLE 3. LOCATIONS REJECTED FOLLOWING THE FIRST CUT OF THE DATA AND THE REASONS FOR REJECTION.

STATION	WMO NO.	REASON FOR REJECTION
MERDJAYOUN, LEBANON	401040	DATA ONLY COVERS THE HOURS 0600-1800
TURAIF/AL TURAYF, SAUDIA ARABIA	403560	POOR DATA COVERAGE
MERSA MATRUH, EGYPT	623060	POOR DATA COVERAGE
MANKABAD/ASYUT, EGYPT	623930	POOR DATA COVERAGE
PUERTO BARRIOS, GUATEMALA	786370	DATA ONLY COVERS THE HOURS 1200-2400
SAN PEDRO SULA, HONDURAS	787080	DATA PRIMARILY COVERS THE HOURS 1200-2400
PUERTO CABEZAS, NICARGUA	787300	DATA PRIMARILY COVERS THE HOURS 1200-2400

3.2.2 SECOND CUT

A second screening of the data was performed focusing on the cloud data for the stations. The screening focused on the amounts of cloud data and the "reasonableness" of the data. After this screening was performed five additional stations were eliminated because they contained little or no cloud layer data: Maan, Jordan; Rezaizeh, Iran; Kermanshah, Iran. Kangnung, Korea and Pohang, Korea were also excluded when it was found that their data tapes were no longer available.

The remaining 29 stations were then examined to see if the data were "reasonable". This examination was made by performing a set of diagnositc statistics on the remaining 31 sets of data. The goal was to define the years of data to be used in the cloud cover analysis.

The statistics consisted of yearly averages of: the numbers of valid and invalid observations, the percent of observations of a given type, the percent occurrence of reported total sky cover amount by okta and the percent of the total cloud cover amount calculated from the individual layer amounts. Invalid observations were those in which the data given violated the rules governing the given observation type or were inconsistent with other companion data that were also reported. A set of these statistics was performed for every station and are given in Appendix A.

An example of "unreasonable" data is found in the cloud data from Korea for 1966 and 1967. During these years the number of total surface observations was significantly smaller than in other years and the observations that were made indicated that the skies were clear nearly 100% of the time. This is quite unrealistic climatically. A more likely explanation is that observations of total sky coverage

were not made but incorrectly recorded as 0 sky coverage instead of missing data. This is based on the fact that a more "normal" distribution of sky cover observations began to appear in the data around 1968. Another example of suspect data was found in many stations around the time period 1968 - 1973. During this time period many stations switched from Airways to METAR observations and there are periods in which there were no data or data indicating 100% clear skies. The years in which these obvious inconsistencies occurred were eliminated from the data base and then a final set of time periods of record assdembled for the remaining stations. Table 4 lists the stations by region and the years of data that were used in the analysis. Table 5 also lists the stations and gives the distribution of observation type over the categories data set.

Finally, the observations for the early year for several of the German stations gave very few reports of clear sky: apparently zero cloud cover was reported as missing data. But since there were also periods of genuinely missing data, it was not possible to assume that missing data implied clear sky. The years in which these obvious inconsistencies occurred were eliminated from the data base and then a final set of time periods of record assembled for the remaining stations. Table 4 lists the stations by region and the years of data that were used in the analysis. Table 5 also lists the stations and gives the distribution of observation type over the complete data set.

TABLE 4. TIME PERIODS SELECTED FOR ANALYSIS.

STATION	YEARS
West Germany	
Schleswig/Jagel	1969 - 1981
Bremen	1969 - 1979
Hannover	1969 - 1982
Berlin/Tegel	1969 - 1979
Giessen	1966 - 1979
Bitburg	1953 - 1963
	1968 - 1981
Ramstein	1953 - 1963
	1968 - 1981
Grafenwohr	1968 - 1980
Heidelberg	1952 - 1963
	1974 - 1980
Munchen	1973 - 1982
The Middle East	
Deir Zzor, Syria	1967 - 1979
Bagdad Intl., Iraq	1969 - 1979
Tehran/Mehrabad, Iran	1969 - 1979
Cairo, Egypt	1969 - 1979
Korea	
Seoul	1966 - 1979
	1974 - 1981
Hoengsung/R-401	1968 - 1970
	1973 - 1979
Osan	1953 - 1963
	1968 - 1981
Kunsan	1951 - 1963
	1968 - 1981
Taegu & Tonchon	1968 - 1970
	1973 - 1979
Pusan/Kimhaf	1974 - 1979
Kwangju	1973 - 1979
Sachon	1973 - 1978
Central America	
Guatemala City, Guatemala	1979 - 1979
San Salvador, El Salvador	1970 - 1979
Tegucigalpa, Honduras	1971 - 1979
Managua/Sandino, Nicaragua	1973 - 1979
San Jose, Costa Rica	1974 - 1979
Tocumen, Panama	1973 - 1979
Howard AFB, Panama	1962 - 1963
	1968 - 1981

TABLE 5. PERCENTAGE OF EACH TYPE OF OBSERVATION OVER ALL YEARS.

(A) GERMANY

STATION	SYNOPTIC	AIRWAYS	METAR	SYNOPTIC+ AIRWAYS	SYNOPTIC+ METAR
Schleswig	8.9	0.8	85.8	0	4.5
Bremen	86.9	0.1	3.3	0	9.7
Hannover	82.1	<0.1	2.8	0	15.0
Berlin	0	1.2	98.8	0	0
Giessen	100.0	0	0	0	0
Bitburg	0	51.7	48.3	0	0
Ramstein	0	51.7	48.3	0	0
Grafenwöhr	0	18.1	81.9	0	0
Heidelberg	0	58.0	42.0	0	0
Munchen/Reim	82.5	0	4.8	0	12.7

(B) MIDDLE EAST

STATION	SYNOPTIC	AIRWAYS	METAR	SYNOPTIC+ AIRWAYS	SYNOPTIC+ METAR
Dier Zzor	100.0	0	0	0	0
Maan	100.0	0	0	0	0
Bagdad	34.3	0.1	14.8	0	50.8
Rezaiyeh	100.0	0	0	0	0
Tehran	20.2	0.1	26.2	0	53.5
Kermanshah	100.0	0	0	0	0
Cairo	9.7	0.4	73.8	0	16.1

TABLE 5. (continued)

(C) KOREA

STATION	SYNOPTIC	AIRWAYS	METAR	SYNOPTIC+ AIRWAYS	SYNOPTIC+ METAR
Seoul	0	34.0	66.0	0	0
Hoengsung/R-401	0	31.8	68.1	0	0.1
Osan	0	52.3	47.7	0	0
Kunsan	0	53.8	46.2	0	0
Taegu and Tonchon	0	30.3	69.7	0	0
Pusan/Kimhaf	0	31.4	68.6	0	0
Kwangju	0	34.9	65.1	0	0
Sachon	0	35.1	64.9	0	0

(D) CENTRAL AMERICA

STATION	SYNOPTIC	AIRWAYS	METAR	SYNOPTIC+ AIRWAYS	SYNOPTIC+ METAR
Guatelmala City	43.8	0	5.2	0	51.0
San Salvador	32.9	0	11.1	0	56.0
Tegucigapla	29.4	0	70.1	0	0.5
Managua/Sandino	53.1	0	9.1	0	37.8
San Jose	26.2	0	14.4	0	59.4
Tocumen	1.0	0	89.4	0	9.6
Howard AFB	0	23.2	54.1	0	22.7

4
ANALYSIS TECHNIQUE

This chapter describes the calculations performed to obtain the probability of cloud cover and conditional probability of cloud cover statistics. The data used in the analysis are the amount and layer height data contained in the surface observations. The height data contained in the surface observations describe altitude ranges for the observed clouds rather than precise altitude determinations. For the purposes of this study the cloud cover statistics will be calculated for the altitudes given in Table 6. A cloud observed at an altitude between any of the values given in Table 6 will be assigned to the lower altitude. This is consistent with the reporting techniques used with the surface observations but may tend to overestimate cloud amounts at a given altitude. Also, if two individual clouds are reported at altitudes between any of the values given in the Table they will be treated as a single cloud located at the upper altitude of the layer with an amount appropriate for the given observation type.

4.1 GENERATING A PROFILE OF CUMULATIVE CLOUD COVER

The observations used in the analysis consist of up to four pairs of cloud layer reports (s_j, h_j)

where

s_j = fraction of the total sky covered by the layer,

h_j = base height of the cloud layer.

TABLE 6. ALTITUDE GRID TO BE USED IN THE CLOUD COVER PROBABILITY ANALYSIS.

Altitude (Feet)
100,000
30,000
20,000
15,000
10,000
5,000
3,000
2,000
1,500
1,000
700
500
300
200
100

The first step in the analysis is to convert the cloud layer report (s_j, h_j) to a profile of cumulative cloud cover (x_i, z_i) on a vertical grid. For a single cloud layer, say with a base at h_1 and an amount s_1, the procedure is simple: $x_i = 0$ for $z_i < h_1$ and $x_i = s_1$ for $z_i >= h_1$. For multiple cloud layers, the generation of a profile of cumulative cloud cover depends on the type of observation made. If the observation is an Airways report the reported layer amounts are by definition the profile of cumulative cloud cover. In the case of synoptic and METAR observations it is not that simple and some assumptions must be made regarding the spatial correlation of the clouds in the different layers. The two extremes are that the clouds are spatially uncorrelated, (randomly overlapping) or that they are completely correlated (stacked). The assumption to be made here will depend upon whether or not the total cloud cover parameter, SKY, is included in the observation. If it is included one can use it and the individual layer amount information to deduce whether or not the layers or correlated or uncorrelated. For example, assume that SKY is given and has the value 4/8 and two cloud layers are reported, the lowest cloud having 1/8 coverage and the upper having 4/8. In this case we deduce that the total cloud cover profile is a cumulative one. On the other hand, suppose that SKY was given as 5/8 and the lowest layer had 2/8 and the upper had 4/8. In this case, the profile is clearly not cumulative and there must be some overlapping of the clouds. In this particular case the profile of total cloud cover corresponds to that given by two randomly overlapping clouds [10.]

$$TCC = s_1 + s_2 (1 - s_1) \qquad (1a)$$

where s_1 and s_2 are the fractions of cloud cover by each layer (the cloud layer amounts in oktas divided by 8). The corresponding expressions for three and four cloud layers are, respectively,

$$TCC = s_1 + s_2 (1 - s_1) + s_3 (1 - s_1) (1 - s_2) \quad (1b)$$

$$TCC = s_1 + s_2 (1 - s_1) + s_3 (1 - s_1) (1 - s_2) + s_4 (1 - s_1) (1 - s_2) (1 - s_3) \quad (1c)$$

In using the above expressions when the total sky cover parameter is given one must check to see that the calculated value of TCC does not exceed that given by the total sky cover parameter. If it does you use the value given by SKY rather than that given by TCC. With this procedure, a profile of cumulative cloud cover is calculated for each surface cloud observation.

4.2 CALCULATING FREQUENCIES-OF-OCCURRENCE OF CUMULATIVE CLOUD COVER AMOUNT

The total of all observations for a given location is processed into tables of frequency of occurrence of cumulative cloud cover, one for each altitude z_i. The frequency of occurrence statistics are used as the estimators of the probability of cumulative cloud cover, $P(x_i)$

where

z_i, i = 0,1..,N = is a set of altitudes of interest from the ground to some maximum z_N (here 100,000 feet),

x_i = the cumulative cloud fraction for the layer extending from the ground up to and including z_i.

4.3 CONDITIONAL CLOUD COVER PROBABILITY

The conditional cloud cover probability is calculated as follows. Define the following symbols:

c_i The cumulative cloud presense (0 or 1) between the ground up to and including z_i: if the lowest cloud is detected at z_n, then c_i = 0 for i = 1 to n-1 and c_i = 1 for i = n to N.

$P(c_i)$ Probability of cloud presence: for c_i = 1, $P(c_i)$ is the probability that a cloud exists somewhere along a randomly chosen vertical line of sight between the ground and z_i.

$P(c_i|x_i)$ Conditional probability of c_i given that the cumulative cloud fraction is x_i. By definition, for c_i = 1 (cloud), $P(c_i|x_i) = x_i/8$ and for c_i = 0 (no cloud), $P(c_i|x_i) = 1-x_i/8$

$P(x_i|c_i)$ Conditional probability that the cumulative cloud fraction up to the level z_i is x_i given that there either exists a cloud between the ground and z_i (c_i = 1) or there is not a cloud (c_i = 0).

The second goal of this project is to calculate $P(x_i|c_i)$ for each altitude z_i. Note the distinction between cumulative cloud fraction x and cumulative cloud presence c. The fraction x refers to the fraction of the sky as a whole obscured by clouds: x can range from 0 to 8 eighths. The presence c refers to the presence or absence of a cloud along a single vertical line of sight and can be either 0 (no cloud) or 1 (cloud). If the cloud fraction over a given

area is 4 eighths, then the probability of encountering a cloud along a single vertical line of sight randomly selected within that area is 50 percent. If a randomly chosen vertical line of sight intersects a cloud, then the cloud fraction can still have any value except 0.

$P(x_i|c_i)$ is calculated using Bayes' Theorem [11] which states the following: let $E = e_1, e_2, \ldots e_N$ be a set of mutually exclusive and exhaustive events and let $F = f_1, f_2, \ldots f_3$ be some other events in the sample space. The conditional probability of $E=e_i$ given that $F=f_i$ has occurred is:

$$P(E=e_i|F=f_i) = \frac{P(F-f_1|E=e_i)\ P(E=e_i)}{\sum_{E=e}^{e_N} P(F-f_i|E)\ P(E)} \qquad (2)$$

In this problem, the cumulative cloud fractions x_i are independent (only one can occur at a time) and exhaustive (all possible cloud fractions are accounted for.) The other events F are the cloud presence c. Therefore:

$$P(x|c) = \frac{P(c|x)\ P(x)}{\sum_{x=}^{8} P(c|x)\ P(x)} \qquad (3)$$

(The subscript i refers to the altitude z_i and is omitted here for clarity.) By definition, for c=1 (a cloud present):

$$P(c=1|x) = x/8 \tag{4}$$

The probabilities P(x) are estimated by the frequency of occurence statistics described previously. The desired conditional probability $P(c|x)$ for c=1 can now be calculated as:

$$P(x|c=1) = \frac{x\ P(x)}{\sum_{x=0}^{8} x\ P(x)} \tag{5}$$

Similarly for c = 0:

$$P(c-0|x) = 1-x/8 \tag{6}$$

and

$$P(x|c=0) = \frac{(1-x/8)\ P(x)}{\sum_{x=0}^{8} (1-x/8)\ P(x)} \tag{7}$$

5

RESULTS AND DISCUSSION

Tables 7 - 35 give the probability results for the stations averaged over all of the data. The (a.) tables are the historical probabilities of finding a cumulative cloud cover amount of a given okta at the specified altitudes. The (b.) and (c.) tables are the conditional probabilities of finding a cumulative cloud cover amount of a given okta at the specified altitudes. The (b.) tables are for the cases of no clouds being reported and (c.) the cases of clouds being reported. Figures 4 - 32 are the graphical results of the historical probabilities.

Results as a function of season and time of day are not presented in this report due to the voluminous nature of the required tables and figures. They have, however, been put onto a magnetic tape. However, selected results from a randomly selected station, Bitburg, West Germany, have been included in this report.

5.1 AVERAGES OVER ALL OF THE DATA

5.1.1 WEST GERMANY

For altitudes above 2000 feet the distributions of probability tend to be similar from one location to another. This appears to indicate that large scale dynamic features influence the cloud formation processes over West Germany. For altitudes below 2000 feet there are differences in the distributions from one location to another. One could interpet this as indicating the role of site-specific orographic processes in influencing cloud formation at these

altitudes. Also, the German stations tend to favor large cloud cover amounts with the cloud layers being found at or below about 2000 feet. It is not known if this is a real result or an artifact from the observation process.

5.1.2 MIDDLE EAST

There were regretablly few stations in the Middle East with useable data so drawing general conclusions will be difficult. Both the Deir Zzor, Syria and Bagdad, Iraq show low probabilities of clouds at all altitudes. Both stations show essentially no clouds below 2000 feet and very few above. Tehran, Iran shows a more pronounced distribution of clouds at nearly all altitudes but does still tend to favor clear skies. The contrast between Tehran and Deir Zzor and Bagdad is consistent with the precipitation differences between the locations. Tehran has a higher annual precipitation rate, 9.7 inches per year, than Deir Zzor (6.2 inches per year) or Bagdad (5.5 inches per year) [12]. The higher clouds reported for Deir Zzor and Bagdad would tend to not be precipitation producing clouds.

5.1.3 KOREA

The Korean results are similar to the German results in that above about 2000 feet the distributions are similar. Again, it is believed that the differences between the distributions for altitudes below 2,000 feet are due to site-specific orographic effects. At the altitudes above 2,000 feet the probabilities of finding clouds with oktal amounts between 2 and 7 are nearly equal.

5.1.4 CENTRAL AMERICA

The stations in Central America show somewhat significant differences between the distributions from one location to another. This is especially true for the distributions of clouds at the lower altitudes. Managua, Nicaragua, for instance, shows essentially no clouds at altitudes below 2000 feet. Guatemala City, Guatemala, on the other hand, shows clouds at all altitudes except the 200 foot level and shows them with nearly constant probabilities for oktal amounts between 2 and 7.

5.2 SEASONAL RESULTS

The results on magnetic tape contain results for each of the individual seasons. Results from only one station, Bitburg, West Germany, are presented for each season. Tables 36 - 39 present the tabulated, seasonally averaged results over all times of the day and Figures 33 to 36 present the graphical results.

The fall and winter results are similar to one another and the spring and summer results are similar. The fall/winter results show higher probabilities for clouds at or below 1000 feet than do the spring/summer results. This would appear to be climatically consistent with the passage of fall and winter storm systems that would be expected to have more low clouds associated with them than high clouds. This is also seen in the probabilities of overcast conditions (okta=8). The fall/winter results show larger probabilities of overcast conditions at or below all altitudes than do the spring/summer results.

5.3 DIURNAL RESULTS

A representative set of results are presented for two time periods, 0600 - 1159 local time and 1800-2359. The results are given for summer conditions in Bitburg, West Germany and are given in Tables 40 and 41 and shown in Figures 37 and 38. For altitudes above 2000 feet the results are similar but for the altitudes below 2000 feet the 0600 - 1159 results show larger probabilities for cloud amounts above 4 oktas than do the 1800 - 2359 results.

5.4 CONDITIONAL PROBABILITY RESULTS

A representative set of conditional probabilities are presented in Figures 39 - 40. They are for Bitburg and are averaged over all of the data. The use of the information relating to whether or not a cloud is reported improves the probabilities for the extreme oktal conditions. That is, having the information that a cloud is not reported increases the probability of finding a clear sky. For oktal amounts in the 2 to 6 range, the range where a go/no go decision would most likely be made, the conditional probabilities appear to be only marginally better than the historical values. This also holds generally for the other German stations.

For the Middle East stations having knowledge that a cloud has been reported enhances the probability of finding clouds with oktal values 4 or above. Conversely, having knowledge that a cloud has not been reported only has a significant improvement on the clear sky case.

For the Korean stations having information about the existence of clouds improves the probabilities for altitudes below about 10,000 feet. This also holds for nearly all oktal values. Above this altitude there is a marginal improvement.

No general conclusions about the role of the conditional probabilities on the Central American data seems to be able to be drawn. For example, Guatemala City shows little improvement while Managua shows improvement for lower altitudes.

5.5 IMPACT OF ANALYSIS ASSUMPTIONS

5.5.1 RANDOM OVERLAP ASSUMPTION

When information that specifically defined the degree of overlapping between clouds was not available this study assumed that cloud layers were independent and could be given by the random overlap assumption. Satellite and aircraft observations tend to support making this assumption [13]. The assumption breaks down, however, when the cloud layers are very close together.

A more sophisticated approach to the problem of cloud overlapping is utilized in the 3DNEPH data base, a data base of climatic and meteorology data developed and maintained by ETAC [e.g. 14]. In this approach independence between layers is assumed if the reported cloud layers are widely separated and stacking is assumed if the reported layers are adjacent. If the clouds layers are separated by less than several hundred meters the cumulative cloud cover amount is interpolated between the stacked and random overlap estimates.

5.5.2 ASSIGNING HEIGHTS TO CLOUD LAYERS

Clouds heights are given by code numbers that correspond to specified layers in the atmosphere. The height code is then interpreted as the estimated cloud base. If a cloud is observed at an altitude between two height codes the observer is instructed to report the cloud at the lower

of the two heights. This will tend to overestimate the amount of cloud at a given altitude. Seeing that one has no way of knowing where the actual clouds were found one cannot say if the cloud should be really assigned to the upper or lower cloud height code. If a cloud is observed between two heights it should, for the purposes of this analysis, be reported at the upper height because the calculations represent the probabilities of finding clouds **at or below** a given height. This is probably not a major problem, however, due to the uncertain nature of cloud heights in general. Even with the use of ceilometers and radiosonde data cloud altitudes cannot be determined with precision.

TABLE 7. PROBABILITES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM SCHLESWIG/JEGEL, WEST GERMANY, WMO STATION 100370.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	99	00	00	00	00	00	00	00	01	01
200	96	00	00	00	00	00	00	01	02	02
300	93	00	00	00	00	00	00	02	03	03
500	87	00	01	01	00	01	00	05	04	04
700	82	01	01	01	01	02	01	08	04	05
1,000	74	02	02	02	01	03	01	10	05	06
1,500	59	06	04	04	02	04	02	13	07	07
2,000	48	08	05	05	03	05	02	15	09	08
3,000	33	10	06	06	04	05	03	19	13	09
5,000	18	11	05	06	05	07	06	26	18	10
10,000	12	11	05	05	04	06	06	28	23	11
15,000	11	12	05	05	04	06	06	28	23	12
20,000	10	11	05	05	05	06	06	28	24	13
30,000	06	11	05	04	05	07	06	30	25	14
100,000	06	11	05	04	05	07	06	30	25	15
STD DEV	05	02	01	00	01	00	01	03	02	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	99	00	00	00	00	00	00	00	00	3
500	97	00	00	01	00	01	00	01	00	4
700	96	01	01	01	00	01	00	01	00	5
1,000	91	02	02	02	01	02	00	02	00	6
1,500	80	07	04	03	01	02	01	02	00	7
2,000	71	11	05	05	02	03	01	03	00	8
3,000	57	16	08	07	04	04	02	04	00	9
5,000	40	21	09	08	05	06	03	07	00	10
10,000	32	25	10	08	06	06	04	09	00	11
15,000	30	27	10	08	06	06	04	09	00	12
20,000	28	27	10	08	06	06	04	10	00	13
30,000	19	29	11	08	08	08	05	11	00	14
100,000	19	29	11	08	08	08	05	11	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	00	00	01	01	03	02	09	83	1
200	00	00	00	01	01	03	01	20	74	2
300	00	00	01	02	01	04	02	37	54	3
500	00	00	01	03	02	07	02	47	37	4
700	00	00	01	03	02	09	03	50	31	5
1,000	00	01	02	05	03	11	04	48	26	6
1,500	00	03	04	06	04	11	05	44	25	7
2,000	00	03	04	06	04	09	05	41	28	8
3,000	00	03	03	05	05	08	06	39	31	9
5,000	00	02	02	04	04	08	08	40	32	10
10,000	00	02	02	03	04	06	07	39	37	11
15,000	00	02	02	03	04	06	07	39	37	12
20,000	00	02	02	03	04	06	07	39	38	13
30,000	00	02	02	02	04	06	07	39	38	14
100,000	00	02	02	02	04	06	07	39	38	15

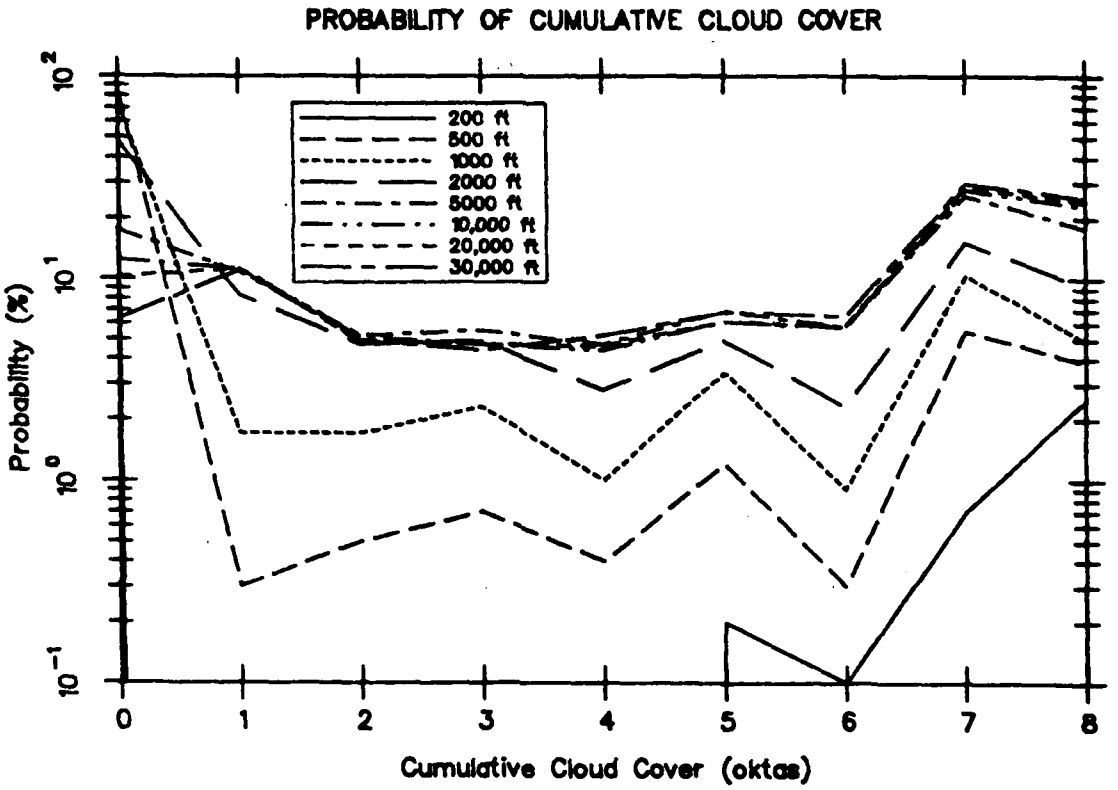

FIGURE 4. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR SCHLESWIG/JEGEL, WEST GERMANY, WMO STATION 100370.

TABLE 8. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM BREMEN, WEST GERMANY, WMO STATION 102240.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	98	00	00	00	00	00	00	00	01	02
300	96	00	00	00	00	00	00	00	02	03
500	92	00	00	01	00	01	01	01	03	04
700	89	00	01	01	01	01	01	01	05	05
1,000	80	01	01	02	01	02	01	02	08	06
1,500	70	02	03	03	02	03	02	03	12	07
2,000	60	04	04	04	02	03	03	05	16	08
3,000	46	06	05	05	03	04	04	07	20	09
5,000	28	08	05	06	04	05	06	14	24	10
10,000	21	08	04	05	04	04	07	19	28	11
15,000	19	09	04	05	04	04	07	20	29	12
20,000	18	09	04	05	04	04	07	20	29	13
30,000	10	09	05	06	04	05	09	23	30	14
100,000	10	09	05	06	04	05	09	23	30	15
STD DEV	02	01	01	01	01	01	02	02	03	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	99	00	00	00	00	00	00	00	00	3
500	98	00	00	01	00	00	00	00	00	4
700	97	00	01	01	00	01	00	00	00	5
1,000	94	01	01	01	01	01	00	00	00	6
1,500	89	03	03	02	01	01	01	00	00	7
2,000	83	05	04	03	02	02	01	01	00	8
3,000	73	09	06	05	03	02	01	01	00	9
5,000	57	14	07	07	04	04	03	04	00	10
10,000	50	17	08	07	05	04	04	06	00	11
15,000	46	19	08	08	05	04	04	06	00	12
20,000	46	19	08	08	05	04	04	06	00	13
30,000	30	22	10	10	06	06	06	08	00	14
100,000	30	22	10	10	06	06	06	08	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	00	02	13	06	15	11	17	36	1
200	00	00	02	06	05	11	10	10	54	2
300	00	00	02	06	04	10	08	12	58	3
500	00	00	02	06	04	12	08	10	57	4
700	00	00	02	05	04	10	07	12	60	5
1,000	00	01	03	05	04	09	07	12	59	6
1,500	00	01	03	05	04	08	06	13	59	7
2,000	00	02	03	05	04	07	07	15	57	8
3,000	00	02	03	05	04	07	07	18	54	9
5,000	00	02	02	04	04	06	09	25	48	10
10,000	00	02	02	03	03	05	08	28	49	11
15,000	00	02	02	03	03	04	08	29	49	12
20,000	00	02	02	03	03	04	09	29	49	13
30,000	00	02	02	03	03	05	10	30	45	14
100,000	00	02	02	03	03	05	10	30	45	15

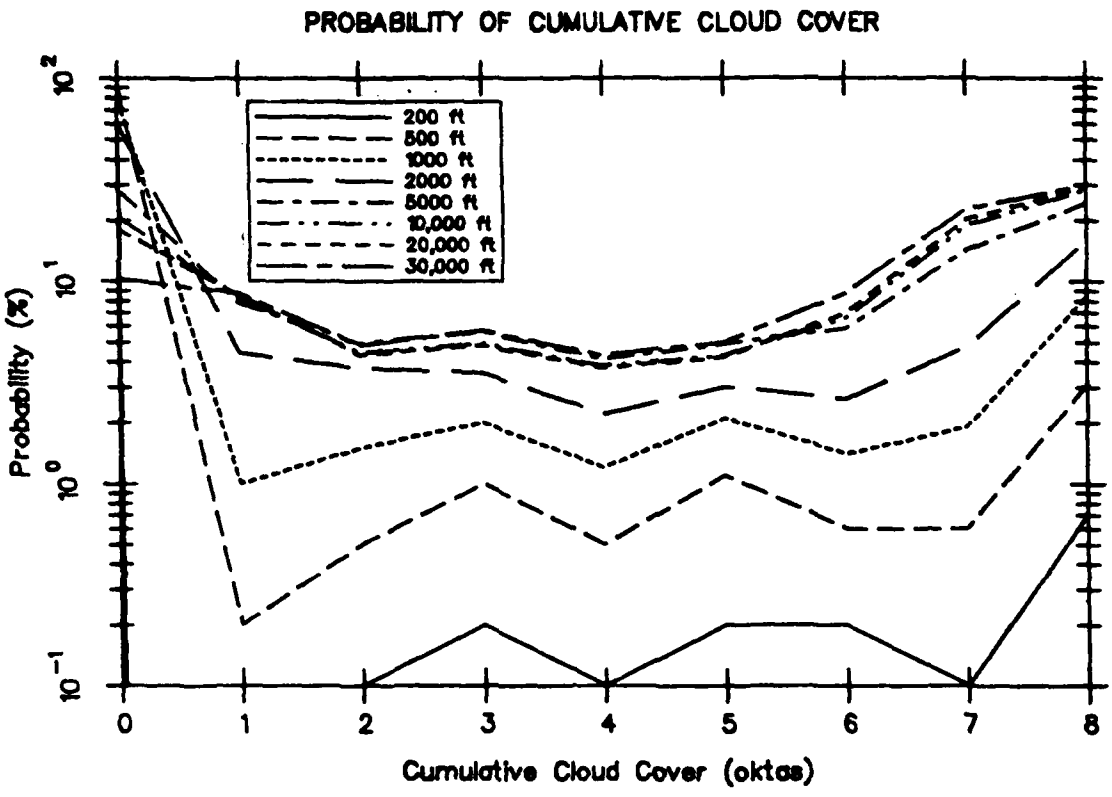

FIGURE 5. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR BREMEN, WEST GERMANY, WMO STATION 102240.

TABLE 9. PROBABILITES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM HANNOVER, WEST GERMANY, WMO STATION 103380.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	99	00	00	00	00	00	00	00	00	01
200	97	00	00	00	00	00	00	00	01	02
300	95	00	00	01	00	01	01	00	02	03
500	91	00	01	01	01	01	01	01	03	04
700	88	00	01	01	01	01	01	02	05	05
1,000	80	01	02	02	01	02	02	02	08	06
1,500	71	02	03	03	02	02	02	03	11	07
2,000	61	04	04	03	02	03	03	05	15	08
3,000	47	06	05	05	03	04	04	07	20	09
5,000	29	08	05	05	04	05	05	13	26	10
10,000	21	08	04	05	04	04	05	18	31	11
15,000	17	09	04	04	03	04	06	21	32	12
20,000	16	09	04	04	03	04	06	22	32	13
30,000	11	08	04	04	04	05	08	25	33	14
100,000	11	08	04	04	04	05	08	25	33	15
STD DEV	02	01	00	01	00	00	01	02	02	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	99	00	00	00	00	00	00	00	00	2
300	99	00	00	00	00	00	00	00	00	3
500	97	00	01	01	00	00	00	00	00	4
700	96	00	01	01	00	00	00	00	00	5
1,000	93	01	02		01	01	00	00	00	6
1,500	89	03	03	02	01	01	01	01	00	7
2,000	84	05	04	03	01	02	01	01	00	8
3,000	74	08	06	05	02	02	01	01	00	9
5,000	58	14	08	07	04	04	03	03	00	10
10,000	51	17	08	07	04	04	03	06	00	11
15,000	46	20	08	07	04	04	04	07	00	12
20,000	45	20	08	07	05	04	04	07	00	13
30,000	34	21	09	09	06	06	06	10	00	14
100,000	34	21	09	09	06	06	06	10	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	00	04	11	08	20	19	06	31	1
200	00	00	04	07	05	13	14	10	47	2
300	00	00	03	07	04	10	12	12	51	3
500	00	00	04	07	04	09	11	13	52	4
700	00	00	03	06	03	08	10	15	55	5
1,000	00	01	03	06	04	07	09	13	56	6
1,500	00	01	03	06	04	07	08	15	56	7
2,000	00	02	03	05	04	07	08	15	57	8
3,000	00	02	03	05	04	07	08	16	55	9
5,000	00	02	03	04	04	06	08	23	51	10
10,000	00	02	02	03	03	05	07	27	52	11
15,000	00	02	02	02	03	04	07	29	51	12
20,000	00	02	02	02	03	04	07	30	51	13
30,000	00	01	01	02	03	04	08	32	48	14
100,000	00	01	01	02	03	04	08	32	48	15

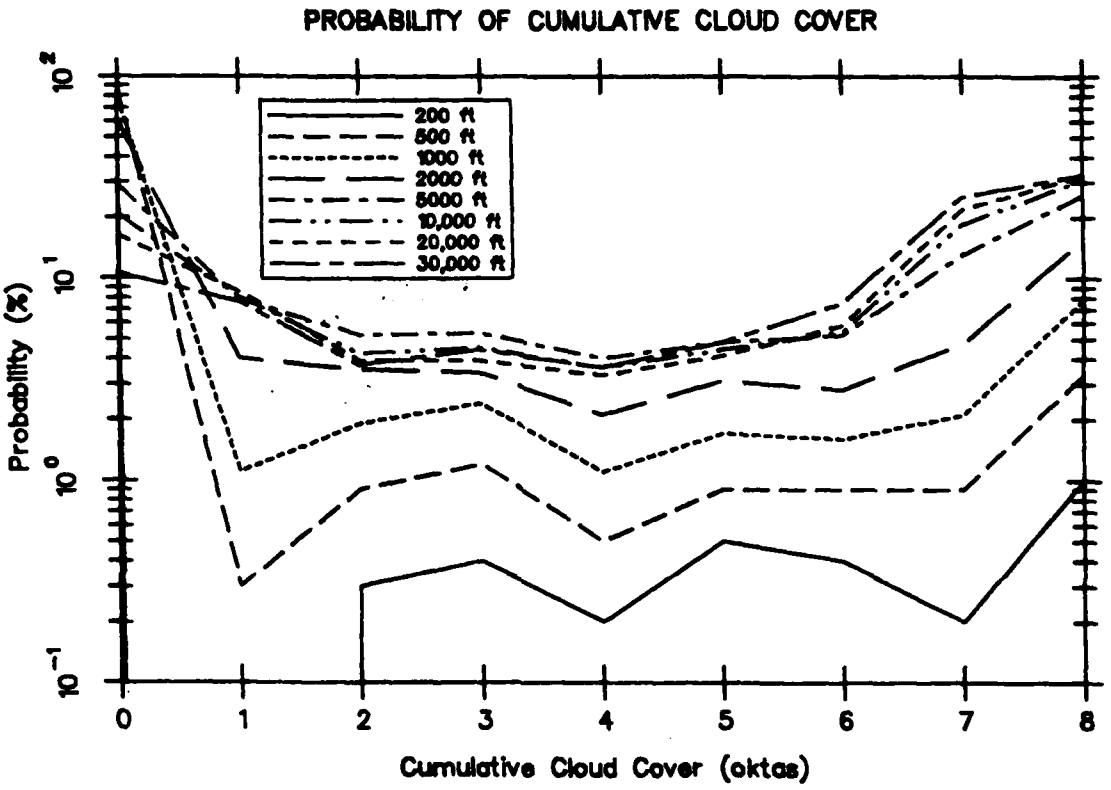

FIGURE 6. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR HANNOVER, WEST GERMANY, WMO STATION 103380.

TABLE 10. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM BERLIN/TEGEL, WEST GERMANY, WMO STATION 103820.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	98	00	00	00	00	00	00	00	00	02
300	96	00	00	01	00	00	00	00	02	03
500	90	00	01	02	01	01	01	01	03	04
700	84	00	01	02	01	01	01	02	07	05
1,000	75	01	02	03	01	02	02	02	11	06
1,500	64	02	03	04	02	03	03	03	17	07
2,000	53	04	03	05	02	03	03	03	23	08
3,000	35	07	05	06	03	05	03	05	31	09
5,000	14	09	06	06	04	05	05	09	42	10
10,000	09	07	04	04	04	05	05	10	52	11
15,000	07	07	03	04	04	05	04	10	55	12
20,000	07	07	03	04	04	05	04	10	55	13
30,000	03	06	03	03	04	06	05	12	58	14
100,000	03	06	03	03	04	06	05	12	58	15
STD DEV	03	01	01	01	01	01	01	01	03	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	99	00	00	00	00	00	00	00	00	2
300	99	00	00	00	00	00	00	00	00	3
500	97	00	01	01	00	00	00	00	00	4
700	96	00	01	01	00	01	00	00	00	5
1,000	92	01	02	02	01	01	01	00	00	6
1,500	87	03	03	03	01	01	01	01	00	7
2,000	81	05	04	04	02	02	01	01	00	8
3,000	66	11	07	07	03	03	02	01	00	9
5,000	39	21	11	11	06	05	03	03	00	10
10,000	33	24	10	09	07	08	04	05	00	11
15,000	29	26	11	10	07	08	04	05	00	12
20,000	28	26	11	10	07	08	05	05	00	13
30,000	15	26	12	11	10	11	07	08	00	14
100,000	15	26	12	11	10	11	07	08	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	01	09	25	09	14	17	12	13	1
200	00	01	05	15	08	18	15	06	33	2
300	00	00	03	09	05	10	11	08	53	3
500	00	00	03	10	06	11	12	08	51	4
700	00	00	03	07	03	07	09	12	59	5
1,000	00	01	03	07	03	06	08	10	62	6
1,500	00	01	03	06	03	06	07	10	63	7
2,000	00	01	02	05	03	06	06	09	67	8
3,000	00	02	03	05	04	06	05	10	66	9
5,000	00	02	02	04	03	05	06	12	66	10
10,000	00	01	01	02	03	05	05	12	71	11
15,000	00	01	01	02	02	04	04	12	73	12
20,000	00	01	01	02	02	04	04	12	73	13
30,000	00	01	01	02	02	04	05	13	72	14
100,000	00	01	01	02	02	04	05	13	72	15

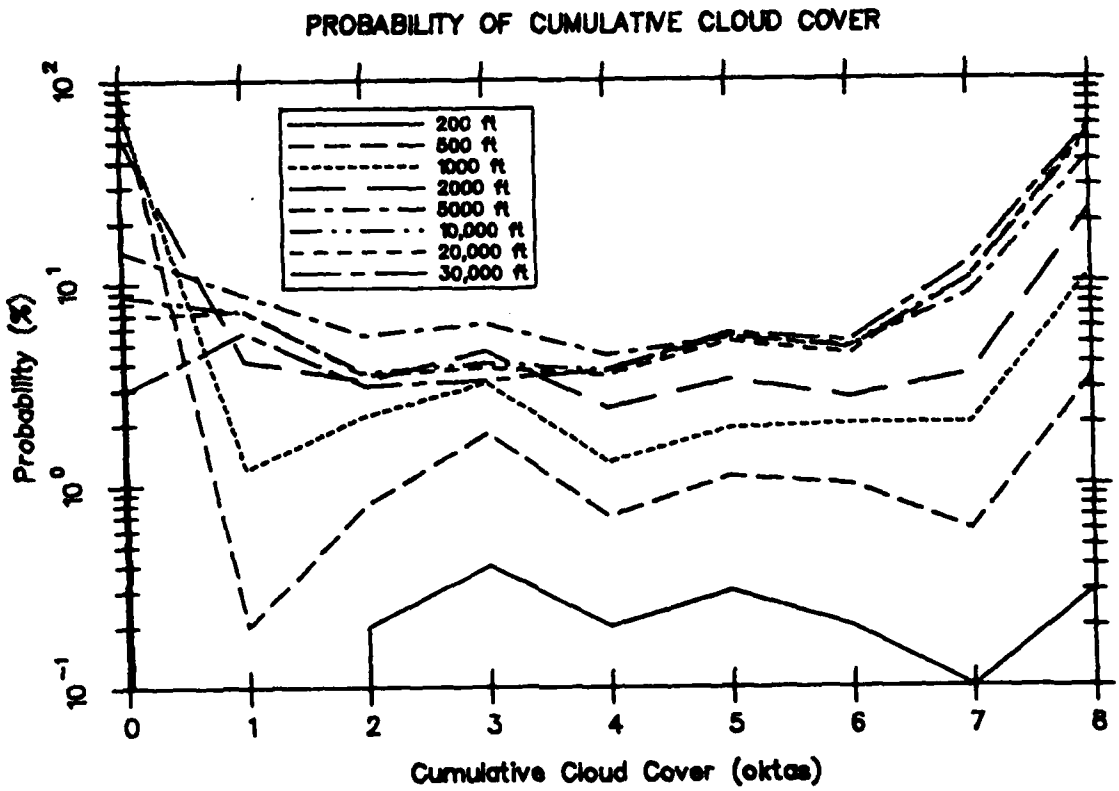

FIGURE 7. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR BERLIN/TEGEL, WEST GERMANY, WMO STATION 103820.

TABLE 11. PROBABILITES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM GIESSEN, WEST GERMANY, WMO STATION 105320.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT (FT)	% OF OCCURRENCES IN EACH OCTA -00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	100	00	00	00	00	00	00	00	00	02
300	100	00	00	00	00	00	00	00	00	03
500	99	00	00	00	00	00	00	00	01	04
700	98	00	00	00	00	00	00	00	01	05
1,000	95	00	00	00	00	00	00	01	03	06
1,500	91	00	00	00	00	00	00	02	05	07
2,000	80	01	01	01	01	01	01	05	08	08
3,000	48	04	03	04	03	04	03	20	12	09
5,000	25	07	05	06	04	06	06	28	14	10
10,000	19	07	04	05	03	05	07	31	18	11
15,000	18	07	04	05	03	05	07	32	18	12
20,000	18	07	04	05	03	05	07	32	18	13
30,000	11	07	05	06	04	07	09	33	19	14
100,000	11	07	05	06	04	07	09	33	19	15
STD DEV	04	02	02	02	01	01	01	06	02	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	100	00	00	00	00	00	00	00	00	3
500	100	00	00	00	00	00	00	00	00	4
700	100	00	00	00	00	00	00	00	00	5
1,000	99	00	00	00	00	00	00	00	00	6
1,500	99	00	00	00	00	00	00	00	00	7
2,000	95	01	01	01	01	00	00	01	00	8
3,000	77	06	04	04	02	02	01	04	00	9
5,000	52	12	08	08	05	05	03	07	00	10
10,000	46	15	08	08	04	05	04	10	00	11
15,000	45	15	08	08	04	05	04	10	00	12
20,000	45	15	08	08	04	05	04	10	00	13
30,000	32	18	10	10	05	07	06	12	00	14
100,000	32	18	10	10	05	07	06	12	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	00	00	00	00	00	00	00	100	1
200	00	00	00	01	00	02	00	11	87	2
300	00	00	00	01	01	01	01	06	90	3
500	00	00	01	00	01	01	01	08	88	4
700	00	00	01	01	01	01	01	10	86	5
1,000	00	00	01	01	01	01	01	14	80	6
1,500	00	00	01	02	02	02	02	19	71	7
2,000	00	01	02	03	04	04	03	30	53	8
3,000	00	01	02	04	04	06	06	46	32	9
5,000	00	02	02	04	04	07	08	46	27	10
10,000	00	01	02	03	03	06	09	46	30	11
15,000	00	01	02	03	03	06	09	46	30	12
20,000	00	01	02	03	03	06	09	46	30	13
30,000	00	01	02	03	03	06	10	45	29	14
100,000	00	01	02	03	03	06	10	45	29	15

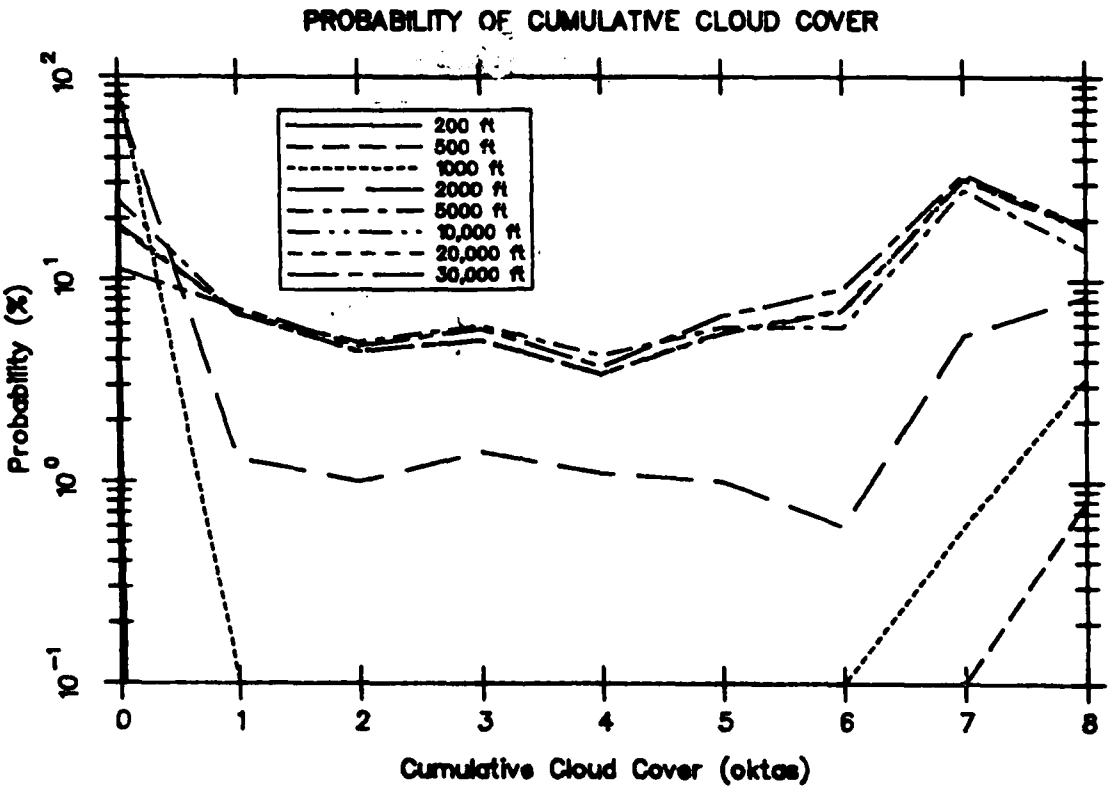

FIGURE 8. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR GIESSEN, WEST GERMANY, WMO STATION 105320.

TABLE 12. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM BITBURG, WEST GERMANY, WMO STATION 106100.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	95	02	01	01	00	00	00	00	00	01
200	95	02	01	01	00	00	00	00	00	02
300	93	02	01	01	00	00	00	00	01	03
500	89	02	02	01	01	01	01	01	03	04
700	85	02	02	01	01	01	01	01	05	05
1,000	77	03	03	02	01	02	02	02	08	06
1,500	66	04	04	03	02	03	03	03	13	07
2,000	59	04	05	03	02	03	04	04	16	08
3,000	45	05	07	04	03	05	05	05	21	09
5,000	30	06	07	05	04	06	07	08	27	10
10,000	22	06	07	04	04	06	08	11	33	11
15,000	20	06	07	04	04	06	08	11	34	12
20,000	16	06	07	04	04	05	09	13	36	13
30,000	14	05	07	04	04	05	09	14	37	14
100,000	11	05	07	04	04	06	10	14	38	15
STD DEV	05	01	02	01	01	01	02	09	07	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	97	02	01	00	00	00	00	00	00	1
200	97	02	01	00	00	00	00	00	00	2
300	96	02	01	00	00	00	00	00	00	3
500	95	02	02	01	00	00	00	00	00	4
700	93	02	02	01	01	01	00	00	00	5
1,000	90	03	03	01	01	01	01	00	00	6
1,500	86	04	04	02	01	01	01	00	00	7
2,000	82	05	05	03	02	02	01	01	00	8
3,000	72	08	08	04	02	03	02	01	00	9
5,000	60	11	11	06	03	04	03	02	00	10
10,000	52	12	12	06	04	05	05	03	00	11
15,000	50	13	13	07	04	05	05	03	00	12
20,000	45	13	14	07	05	05	06	04	00	13
30,000	41	13	14	08	06	06	07	05	00	14
100,000	36	14	15	08	06	07	08	06	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	17	22	17	12	11	11	09	01	1
200	00	11	16	12	10	08	09	11	25	2
300	00	07	11	09	08	08	09	12	36	3
500	00	04	08	07	06	09	10	11	45	4
700	00	03	06	06	05	09	11	12	49	5
1,000	00	03	06	05	05	08	11	10	52	6
1,500	00	02	05	04	04	07	10	11	56	7
2,000	00	02	05	04	04	08	10	11	57	8
3,000	00	02	04	04	04	07	10	12	56	9
5,000	00	02	04	04	04	07	10	15	55	10
10,000	00	01	03	03	03	06	11	16	57	11
15,000	00	01	03	03	03	06	11	16	57	12
20,000	00	01	03	02	03	05	10	18	57	13
30,000	00	01	03	02	03	05	11	19	57	14
100,000	00	01	02	02	03	05	11	18	56	15

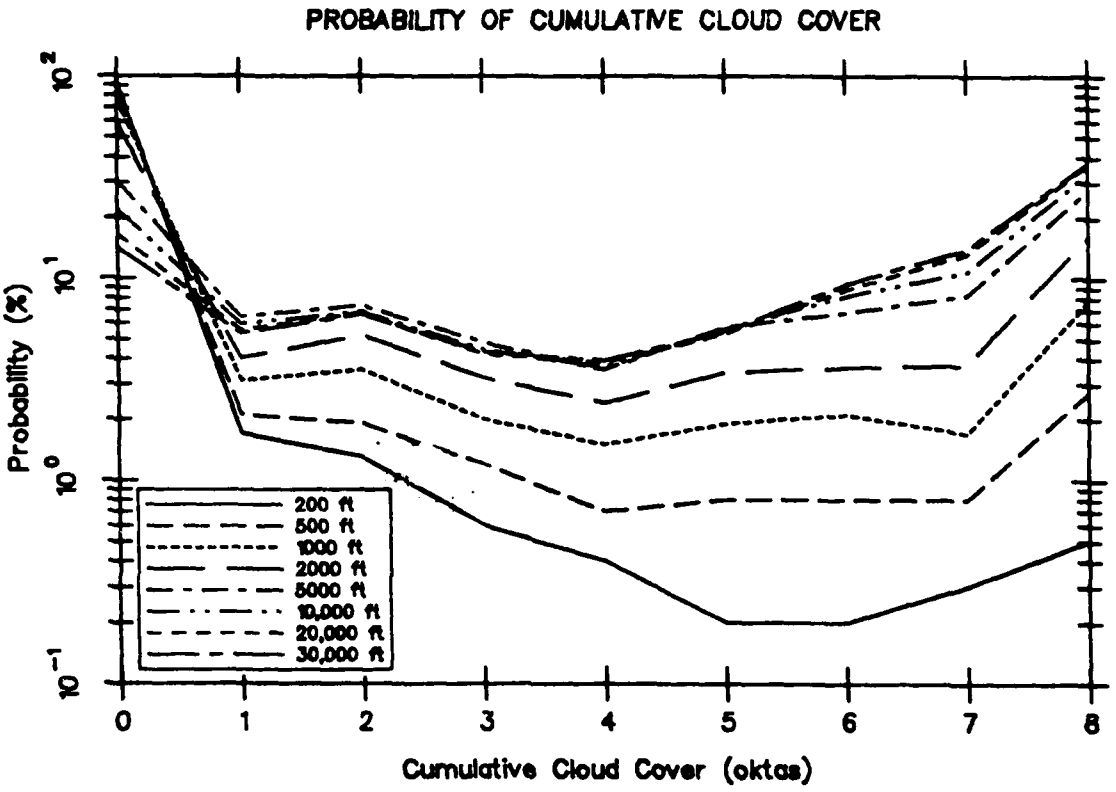

FIGURE 9. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR BITBURG, WEST GERMANY, WMO STATION 106100.

TABLE 13. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM RAMSTEIN, WEST GERMANY, WMO STATION 106140.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	96	01	01	01	00	00	00	00	00	01
200	96	01	01	01	00	00	00	00	00	02
300	95	01	01	01	00	00	00	00	00	03
500	94	02	01	01	00	00	00	00	01	04
700	91	02	02	01	01	01	01	01	02	05
1,000	85	02	03	01	01	01	01	01	05	06
1,500	74	03	04	02	02	02	02	02	09	07
2,000	66	04	05	03	02	03	03	03	12	08
3,000	50	05	06	05	03	04	04	05	17	09
5,000	32	06	08	05	04	06	07	08	24	10
10,000	22	06	07	04	04	06	08	11	31	11
15,000	21	06	07	04	04	06	08	12	33	12
20,000	17	05	06	04	04	05	09	14	35	13
30,000	15	05	06	04	04	05	10	15	36	14
100,000	12	05	06	04	04	06	11	15	38	15
STD DEV	04	01	02	01	01	01	02	10	08	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03	-04-	-05-	-06-	-07-	-08-	
100	97	01	01	00	00	00	00	00	00	1
200	97	01	01	00	00	00	00	00	00	2
300	97	01	01	00	00	00	00	00	00	3
500	97	01	01	00	00	00	00	00	00	4
700	96	02	01	01	00	00	00	00	00	5
1,000	93	02	02	01	01	00	00	00	00	6
1,500	89	03	03	02	01	01	01	00	00	7
2,000	85	04	04	02	01	01	01	00	00	8
3,000	75	07	07	04	02	02	02	01	00	9
5,000	60	11	11	06	04	04	03	02	00	10
10,000	52	12	12	07	04	05	05	03	00	11
15,000	50	13	12	07	04	05	05	04	00	12
20,000	46	12	13	07	05	05	06	05	00	13
30,000	42	13	14	08	05	06	07	05	00	14
100,000	37	13	15	08	06	07	08	06	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	13	20	17	13	12	11	12	01	1
200	00	12	18	16	12	11	10	13	09	2
300	00	09	15	13	11	10	10	13	19	3
500	00	06	10	09	08	08	09	11	38	4
700	00	04	07	07	06	08	09	10	49	5
1,000	00	03	07	06	06	08	09	09	53	6
1,500	00	02	06	05	05	08	10	10	54	7
2,000	00	02	05	05	05	08	09	11	54	8
3,000	00	02	05	05	05	08	09	13	53	9
5,000	00	02	04	04	04	08	11	15	52	10
10,000	00	01	03	03	03	07	11	17	55	11
15,000	00	01	03	03	03	06	11	18	55	12
20,000	00	01	03	03	03	05	11	19	55	13
30,000	00	01	02	02	03	05	11	20	55	14
100,000	00	01	02	02	03	05	12	19	55	15

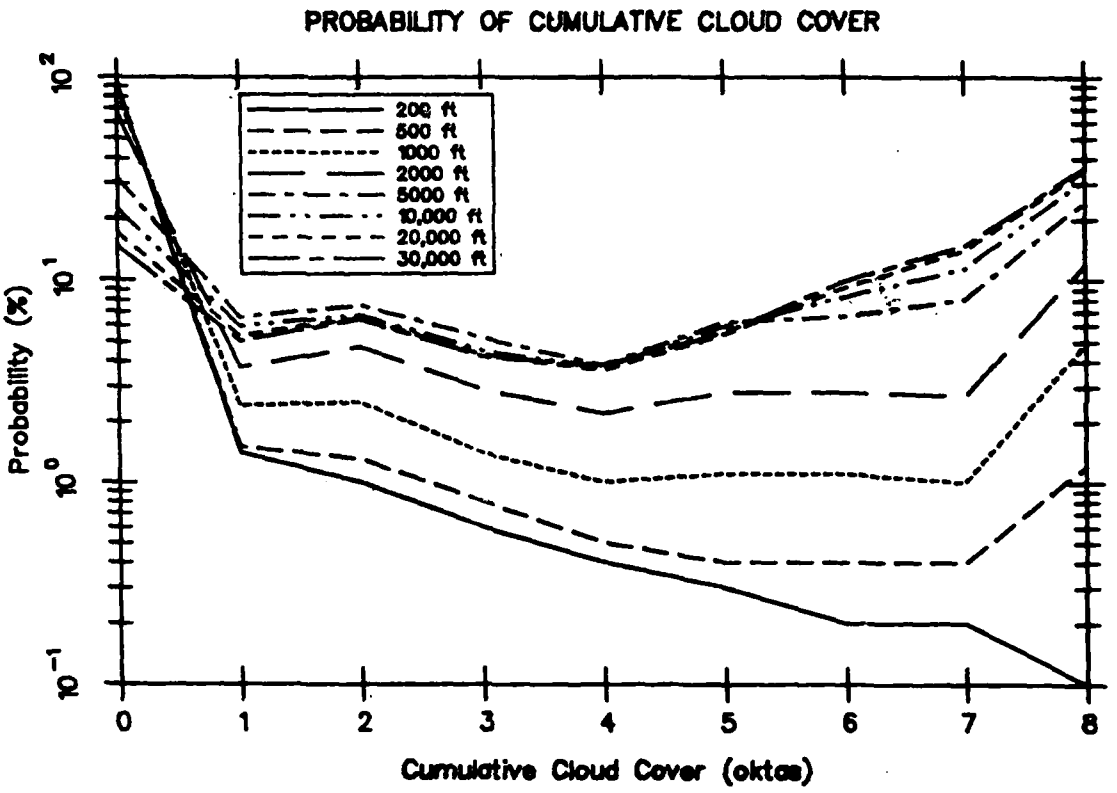

FIGURE 10. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR RAMSTEIN, WEST GERMANY, WMO STATION 106140.

TABLE 14. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM GRAFENWÖHR, WEST GERMANY, WMO STATION 106870.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT (FT)	% OF OCCURRENCES IN EACH OCTA -00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	93	02	02	01	01	00	00	00	00	01
200	92	02	02	01	01	00	00	00	00	02
300	92	02	02	01	01	00	00	00	01	03
500	89	03	02	01	01	01	01	01	02	04
700	85	03	02	02	01	01	01	01	04	05
1,000	78	04	03	02	02	02	01	01	07	06
1,500	68	04	04	03	02	02	02	02	12	07
2,000	60	05	04	04	03	03	03	03	15	08
3,000	43	07	06	05	04	05	04	05	21	09
5,000	26	08	07	06	05	07	06	08	27	10
10,000	16	07	06	06	05	06	07	12	36	11
15,000	15	07	06	05	05	06	07	12	37	12
20,000	08	05	05	05	05	06	08	16	42	13
30,000	06	05	05	05	05	06	08	16	43	14
100,000	06	05	05	05	05	06	08	16	43	15
STD DEV	05	01	01	01	01	01	02	04	09	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	95	02	01	01	00	00	00	00	00	1
200	95	02	01	01	00	00	00	0	00	2
300	95	02	02	01	00	00	00	00	00	3
500	94	02	02	01	00	00	00	00	00	4
700	93	03	02	01	01	00	00	00	00	5
1,000	90	04	03	02	01	01	00	00	00	6
1,500	86	05	03	02	01	01	01	00	00	7
2,000	82	06	04	03	02	02	01	00	00	8
3,000	69	09	07	05	03	03	02	01	00	9
5,000	52	14	10	08	06	05	03	02	00	10
10,000	42	16	11	09	06	06	05	04	00	11
15,000	41	17	12	09	06	06	05	04	00	12
20,000	28	16	13	11	09	08	07	07	00	13
30,000	24	16	14	11	10	09	08	08	00	14
100,000	24	16	14	11	10	09	08	08	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	13	20	16	16	09	13	11	03	1
200	00	11	18	13	14	08	11	11	14	2
300	00	09	15	11	12	07	10	10	26	3
500	00	06	09	09	08	07	08	09	43	4
700	00	04	07	07	07	07	08	09	50	5
1,000	00	04	06	06	07	07	07	08	54	6
1,500	00	03	05	05	06	07	08	09	58	7
2,000	00	02	04	05	06	08	08	10	58	8
3,000	00	02	04	05	06	08	08	12	55	9
5,000	00	02	03	05	05	09	08	14	54	10
10,000	00	01	02	03	04	06	08	17	58	11
15,000	00	01	02	03	04	06	08	17	58	12
20,000	00	01	02	02	04	05	08	19	59	13
30,000	00	01	02	02	04	05	08	19	59	14
100,000	00	01	02	02	04	05	08	19	59	15

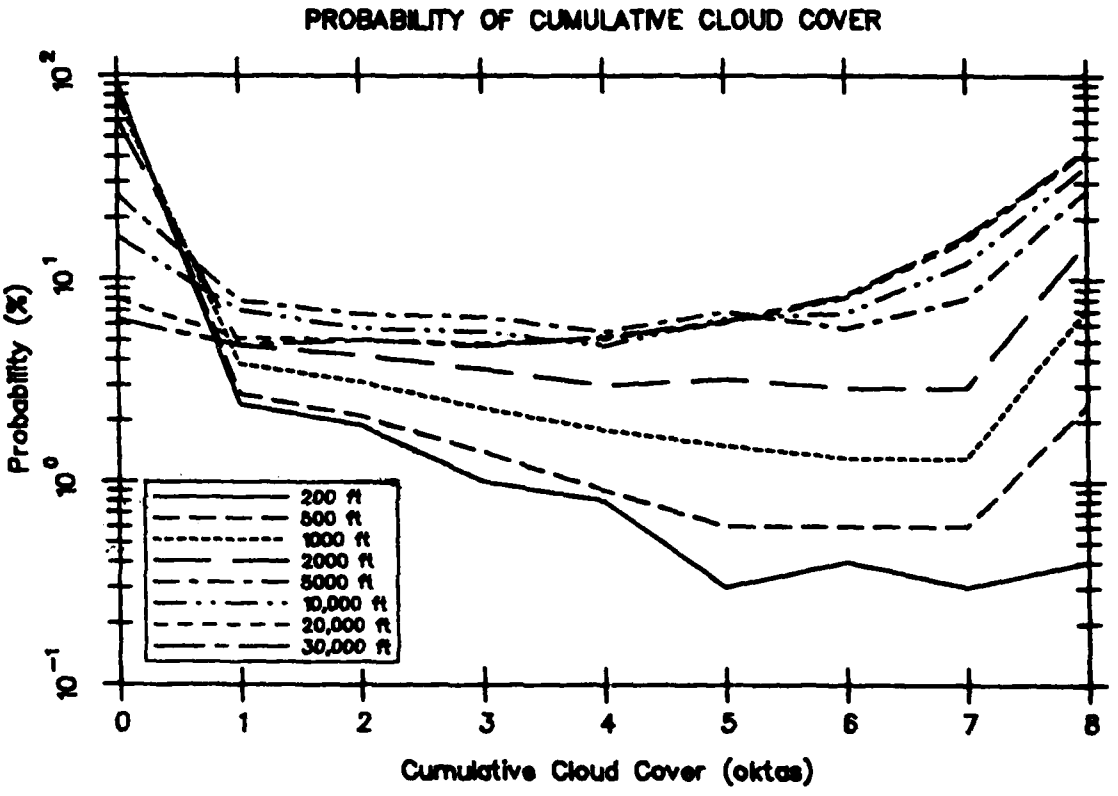

FIGURE 11. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR GRAFENWÖHR, WEST GERMANY, WMO STATION 106870.

TABLE 15. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM HEIDELBERG, WEST GERMANY, WMO STATION 107340.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT (FT)	% OF OCCURRENCES IN EACH OCTA -00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	98	01	00	00	00	00	00	00	00	01
200	98	01	00	00	00	00	00	00	00	02
300	98	01	01	00	00	00	00	00	00	03
500	97	01	01	00	00	00	00	00	00	04
700	95	01	01	01	00	00	00	00	01	05
1,000	91	02	03	01	01	01	01	00	01	06
1,500	82	04	05	02	01	01	01	01	03	07
2,000	77	05	06	02	01	01	01	01	06	08
3,000	61	06	07	03	02	03	03	02	12	09
5,000	37	07	09	05	04	06	07	05	20	10
10,000	25	07	09	04	04	06	10	08	27	11
15,000	22	07	09	04	04	06	10	09	29	12
20,000	20	06	09	04	04	06	11	10	30	13
30,000	17	06	09	04	04	07	12	11	31	14
100,000	13	05	09	04	04	07	13	11	33	15
STD DEV	04	01	03	01	01	01	04	09	04	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	99	01	00	00	00	00	00	00	00	1
200	99	01	00	00	00	00	00	00	00	2
300	99	01	00	00	00	00	00	00	00	3
500	98	01	01	00	00	00	00	00	00	4
700	97	01	01	00	00	00	00	00	00	5
1,000	95	02	02	01	00	00	00	00	00	6
1,500	90	04	04	01	01	00	00	00	00	7
2,000	87	05	05	02	01	01	00	00	00	8
3,000	80	06	07	03	01	02	01	00	00	9
5,000	62	11	12	05	03	04	03	01	00	10
10,000	52	12	14	06	04	05	05	02	00	11
15,000	49	13	15	06	04	05	06	03	00	12
20,000	47	13	15	06	05	05	06	03	00	13
30,000	43	12	16	07	05	06	07	03	00	14
100,000	36	13	17	07	06	07	09	04	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	17	25	20	14	09	09	06	00	1
200	00	16	22	18	13	09	09	08	05	2
300	00	13	19	15	11	08	10	10	15	3
500	00	08	16	12	09	09	11	08	26	4
700	00	05	14	10	08	11	12	07	32	5
1,000	00	06	15	10	07	10	12	07	34	6
1,500	00	06	14	08	06	09	10	07	38	7
2,000	00	05	12	07	06	08	09	07	46	8
3,000	00	03	07	06	05	09	11	08	51	9
5,000	00	02	06	05	05	09	13	10	50	10
10,000	00	02	04	03	04	08	14	14	52	11
15,000	00	02	04	03	03	07	14	15	53	12
20,000	00	01	04	03	03	07	14	16	52	13
30,000	00	01	04	03	03	07	15	16	52	14
100,000	00	01	03	03	03	07	16	16	51	15

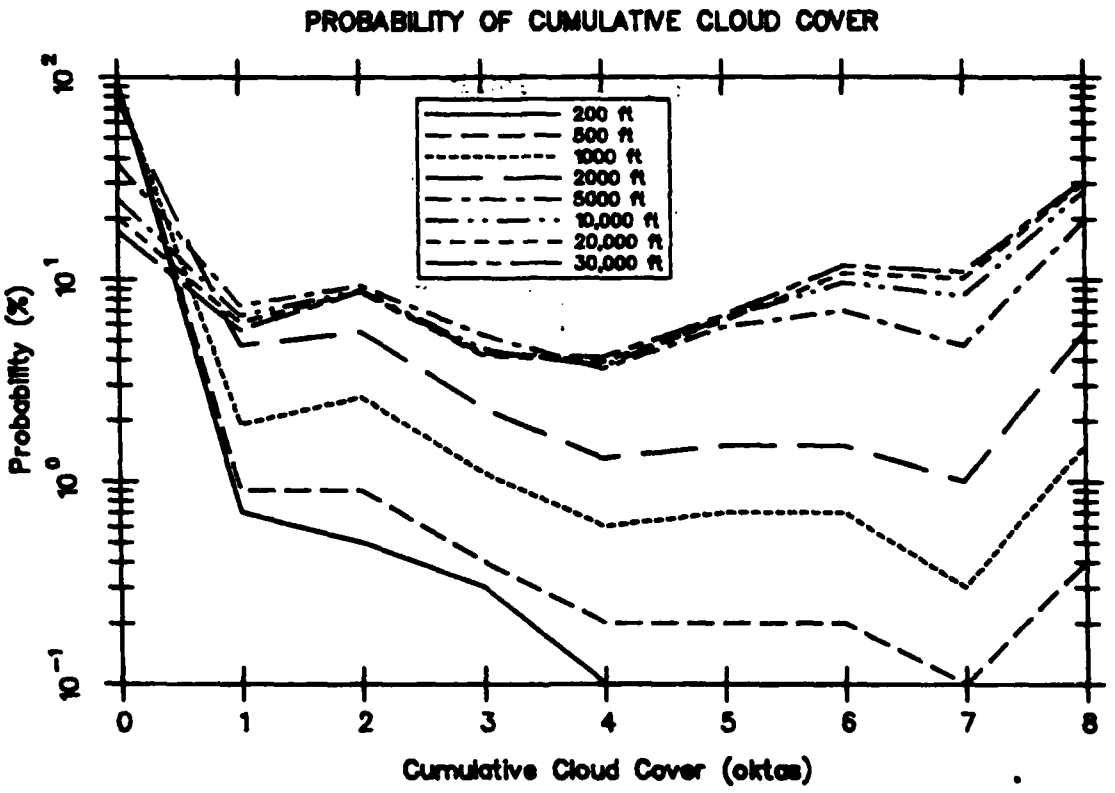

FIGURE 12. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR HEIDELBERG, WEST GERMANY, WMO STATION 107340.

TABLE 16. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM MUNCHEN/REIM, WEST GERMANY, WMO STATION 108660.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	99	00	00	00	00	00	00	00	00	02
300	97	00	00	00	00	00	00	00	02	03
500	93	00	00	01	00	01	01	00	03	04
700	90	00	01	01	01	01	01	01	04	05
1,000	83	01	02	02	01	02	01	01	06	06
1,500	73	03	03	03	02	03	02	02	10	07
2,000	66	04	04	04	02	03	02	02	13	08
3,000	55	06	05	04	03	03	03	04	17	09
5,000	38	09	05	05	04	05	04	08	22	10
10,000	24	10	05	05	04	04	06	15	28	11
15,000	20	11	05	04	04	04	06	17	30	12
20,000	20	11	04	04	04	04	06	18	30	13
30,000	11	10	05	05	05	05	08	20	30	14
100,000	11	10	05	05	05	05	08	20	30	15
STD DEV	03	02	01	00	01	01	01	03	03	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	99	00	00	00	00	00	00	00	00	3
500	98	00	00	00	00	00	00	00	00	4
700	97	00	01	01	00	01	00	00	00	5
1,000	94	01	01	01	01	01	00	00	00	6
1,500	89	03	03	02	01	01	01	00	00	7
2,000	85	05	04	03	02	01	01	00	00	8
3,000	78	08	05	04	02	02	01	01	00	9
5,000	65	13	07	05	04	03	02	02	00	10
10,000	52	19	08	06	04	03	03	04	00	11
15,000	47	22	08	06	05	04	04	05	00	12
20,000	47	22	08	06	04	04	04	05	00	13
30,000	32	25	10	09	07	05	06	07	00	14
100,000	32	25	10	09	07	05	06	07	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	01	04	05	11	19	11	16	33	1
200	00	00	03	06	06	10	06	11	57	2
300	00	00	02	04	04	09	07	08	67	3
500	00	01	02	05	05	11	09	07	61	4
700	00	01	02	04	05	12	10	08	58	5
1,000	00	01	04	06	06	12	09	07	55	6
1,500	00	02	04	07	06	11	08	08	55	7
2,000	00	02	04	06	06	09	07	10	57	8
3,000	00	03	04	05	05	07	07	12	58	9
5,000	00	03	03	05	05	08	08	17	53	10
10,000	00	02	02	03	04	05	08	24	52	11
15,000	00	02	02	03	03	04	08	26	51	12
20,000	00	02	02	03	03	04	08	26	51	13
30,000	00	02	02	03	04	05	10	28	47	14
100,000	00	02	02	03	04	05	10	28	47	15

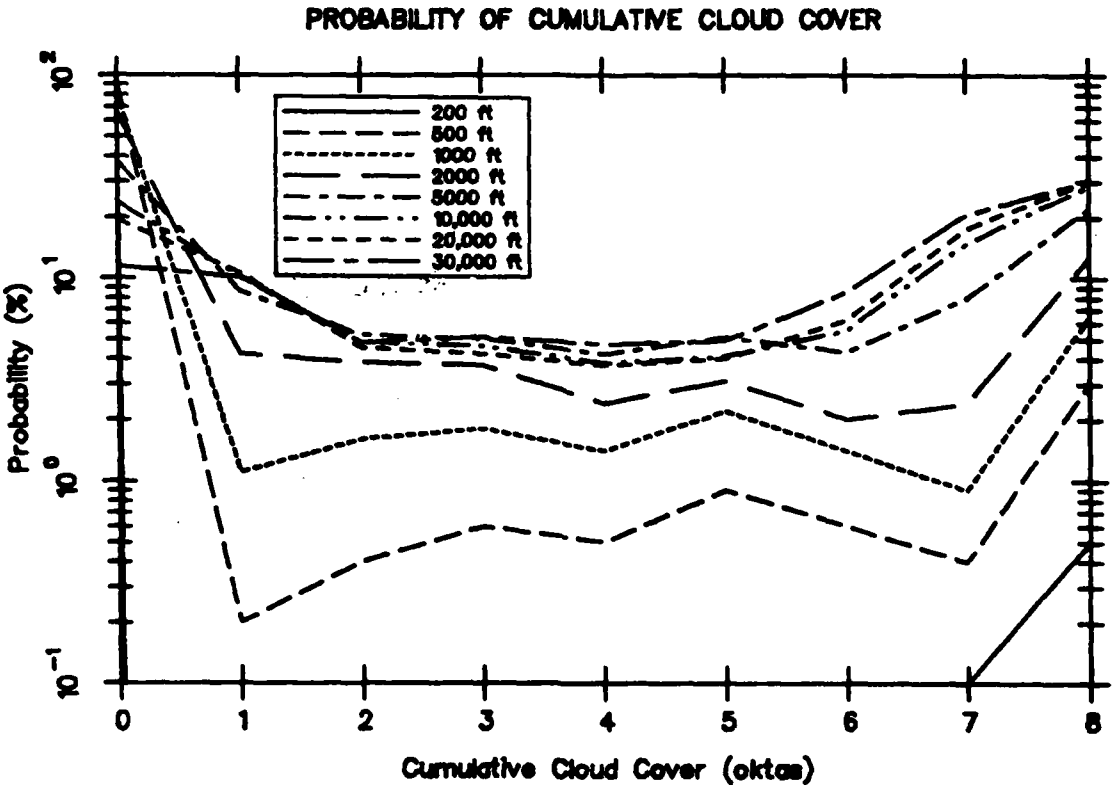

FIGURE 13. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR MUNCHEN/REIM, WEST GERMANY, WMO STATION 108660.

TABLE 17. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM DEIR ZZOR, SYRIA, WMO STATION 400450.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT (FT)	% OF OCCURRENCES IN EACH OCTA -00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	100	00	00	00	00	00	00	00	00	02
300	100	00	00	00	00	00	00	00	00	03
500	100	00	00	00	00	00	00	00	00	04
700	100	00	00	00	00	00	00	00	00	05
1,000	100	00	00	00	00	00	00	00	00	06
1,500	100	00	00	00	00	00	00	00	00	07
2,000	99	00	00	00	00	00	00	00	00	08
3,000	83	04	04	04	02	02	01	00	00	09
5,000	75	06	05	05	03	04	02	01	00	10
10,000	68	07	05	04	02	03	02	03	04	11
15,000	68	07	05	04	02	03	02	03	04	12
20,000	59	08	06	05	03	04	04	06	05	13
30,000	59	08	06	05	03	04	04	06	05	14
100,000	59	08	06	05	03	04	04	06	05	15
STD DEV	08	04	01	01	01	01	01	02	02	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	100	00	00	00	00	00	00	00	00	3
500	100	00	00	00	00	00	00	00	00	4
700	100	00	00	00	00	00	00	00	00	5
1,000	100	00	00	00	00	00	00	00	00	6
1,500	100	00	00	00	00	00	00	00	00	7
2,000	100	00	00	00	00	00	00	00	00	8
3,000	89	03	03	02	01	01	00	00	00	9
5,000	83	06	04	03	02	02	00	00	00	10
10,000	81	07	05	03	01	01	01	00	00	11
15,000	81	07	05	03	01	01	01	00	00	12
20,000	75	09	06	04	02	02	01	01	00	13
30,000	75	09	06	04	02	02	01	01	00	14
100,000	75	09	06	04	02	02	01	01	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	21	00	00	00	36	43	00	00	1
200	00	13	08	00	00	21	25	00	33	2
300	00	04	02	15	00	18	22	00	39	3
500	00	02	02	12	00	12	20	12	40	4
700	00	02	03	13	05	13	15	09	41	5
1,000	00	03	05	12	01	26	12	07	33	6
1,500	00	03	04	13	02	24	17	08	29	7
2,000	00	04	07	13	03	18	23	08	23	8
3,000	00	07	16	22	13	24	12	03	02	9
5,000	00	08	14	19	15	25	13	05	01	10
10,000	00	06	08	10	08	12	11	19	26	11
15,000	00	06	08	10	08	12	11	19	26	12
20,000	00	05	07	09	08	12	13	24	22	13
30,000	00	05	07	09	08	12	13	24	22	14
100,000	00	05	07	09	08	12	13	24	22	15

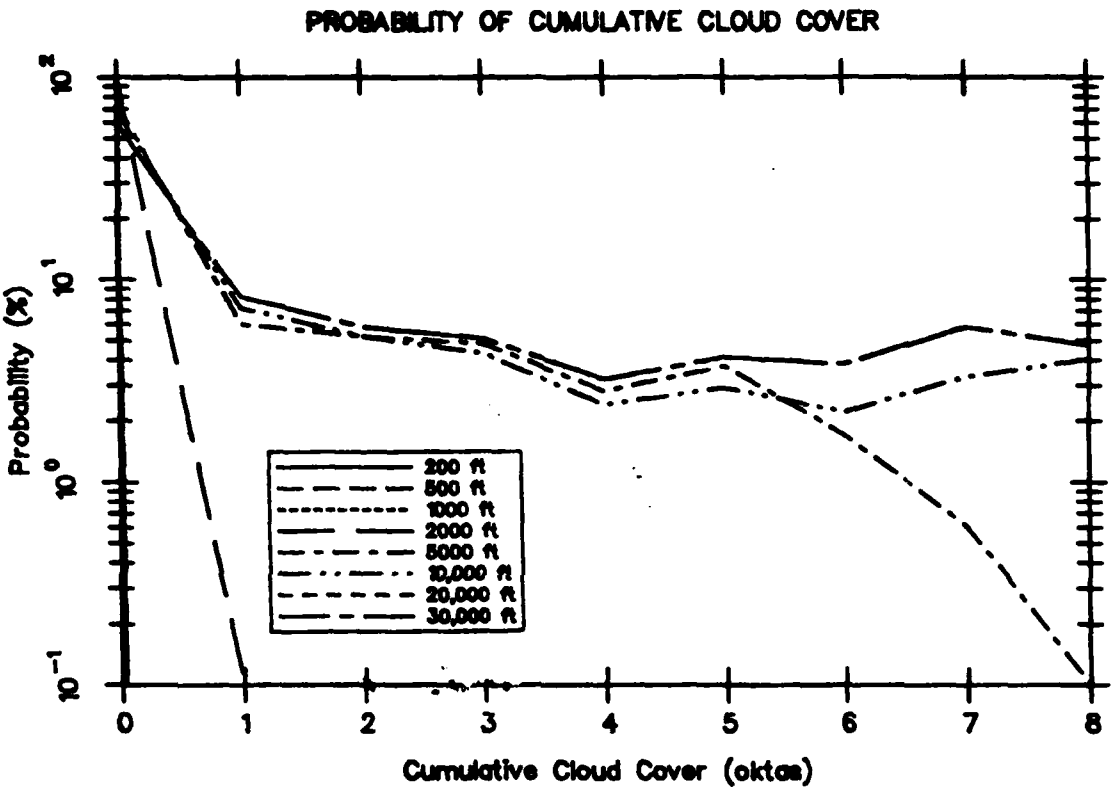

FIGURE 14. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR DEIR ZZOR, SYRIA, WMO STATION 400450.

TABLE 18. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM BAGDAD INTL., SYRIA, WMO STATION 406500.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	100	00	00	00	00	00	00	00	00	02
300	100	00	00	00	00	00	00	00	00	03
500	100	00	00	00	00	00	00	00	00	04
700	100	00	00	00	00	00	00	00	00	05
1,000	99	00	00	00	00	00	00	00	00	06
1,500	99	00	00	00	00	00	00	00	00	07
2,000	98	00	00	00	00	00	00	00	00	08
3,000	93	01	01	01	01	01	01	00	00	09
5,000	86	02	03	02	02	02	01	01	01	10
10,000	84	02	02	02	01	02	02	03	03	11
15,000	83	02	02	02	02	02	02	03	03	12
20,000	82	02	02	02	01	02	02	03	03	13
30,000	82	02	02	02	01	02	02	03	03	14
100,000	82	02	02	02	01	02	02	03	03	15
STD DEV	06	01	01	00	01	01	01	02	02	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	100	00	00	00	00	00	00	00	00	3
500	100	00	00	00	00	00	00	00	00	4
700	100	00	00	00	00	00	00	00	00	5
1,000	100	00	00	00	00	00	00	00	00	6
1,500	100	00	00	00	00	00	00	00	00	7
2,000	99	00	00	00	00	00	00	00	00	8
3,000	96	01	01	01	01	00	00	00	00	9
5,000	91	02	02	02	01	01	00	00	00	10
10,000	93	02	02	01	01	01	01	00	00	11
15,000	92	02	02	01	01	01	01	00	00	12
20,000	92	02	02	01	01	01	01	00	00	13
30,000	92	02	02	01	01	01	01	00	00	14
100,000	92	02	02	01	01	01	01	00	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	00	11	00	21	13	16	18	21	1
200	00	01	05	00	11	07	16	28	32	2
300	00	01	04	04	21	10	16	14	31	3
500	00	00	04	05	21	11	21	09	28	4
700	00	01	06	05	24	16	19	07	22	5
1,000	00	01	05	07	14	14	23	13	24	6
1,500	00	01	05	09	14	15	23	12	22	7
2,000	00	02	07	07	11	16	23	12	21	8
3,000	00	03	10	10	14	20	21	11	11	9
5,000	00	05	12	14	16	19	16	09	09	10
10,000	00	03	05	06	07	10	14	23	32	11
15,000	00	03	05	06	07	10	15	23	31	12
20,000	00	02	04	06	06	09	16	26	30	13
30,000	00	02	04	06	06	09	16	26	30	14
100,000	00	02	04	06	06	09	16	26	30	15

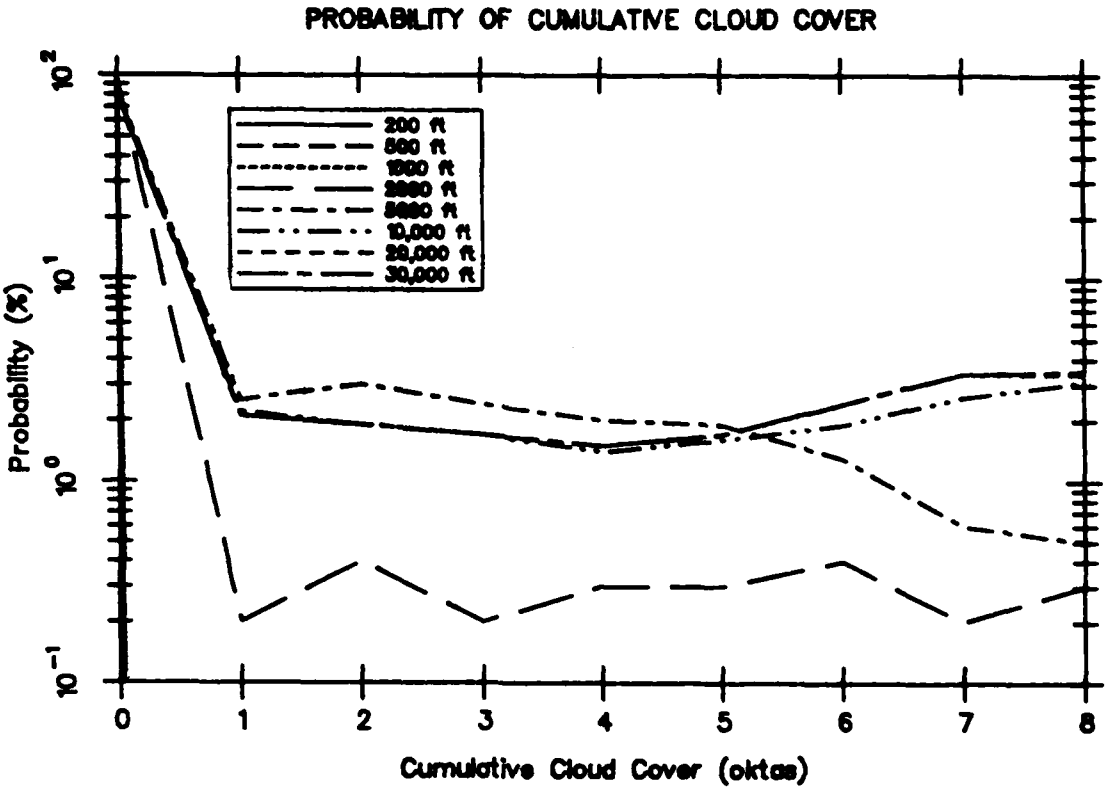

FIGURE 15. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR BAGDAD INTL., SYRIA, WMO STATION 406500.

TABLE 19. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM TEHRAN/MEHRABAD, IRAN, WMO STATION 407540.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT (FT)	% OF OCCURRENCES IN EACH OCTA -00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	100	00	00	00	00	00	00	00	00	02
300	100	00	00	00	00	00	00	00	00	03
500	100	00	00	00	00	00	00	00	00	04
700	100	00	00	00	00	00	00	00	00	05
1,000	99	00	00	00	00	00	00	00	00	06
1,500	98	00	00	00	00	00	00	00	00	07
2,000	97	00	01	00	00	01	00	00	00	08
3,000	93	01	01	01	01	01	01	00	00	09
5,000	59	20	11	04	02	02	01	00	01	10
10,000	58	10	07	05	04	05	03	03	04	11
15,000	57	10	06	04	03	05	04	07	06	12
20,000	55	08	04	03	04	05	05	09	06	13
30,000	55	08	04	03	04	05	05	09	06	14
100,000	55	08	04	03	04	05	05	09	06	15
STD DEV	11	02	01	01	01	02	01	02	02	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	100	00	00	00	00	00	00	00	00	3
500	100	00	00	00	00	00	00	00	00	4
700	100	00	00	00	00	00	00	00	00	5
1,000	100	00	00	00	00	00	00	00	00	6
1,500	99	00	00	00	00	00	00	00	00	7
2,000	98	00	00	00	00	00	00	00	00	8
3,000	96	01	01	01	01	00	00	00	00	9
5,000	66	19	09	03	01	01	00	00	00	10
10,000	72	11	06	04	03	02	01	00	00	11
15,000	74	11	05	03	02	02	01	01	00	12
20,000	75	10	04	03	02	03	02	02	00	13
30,000	75	10	04	03	02	03	02	02	00	14
100,000	75	10	04	03	02	03	02	02	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	00	40	60	00	00	00	00	00	1
200	00	00	11	17	00	00	33	39	00	2
300	00	00	07	10	14	00	21	48	00	3
500	00	03	06	06	08	17	29	24	06	4
700	00	01	04	08	10	15	43	13	06	5
1,000	00	02	05	07	13	25	34	11	04	6
1,500	00	02	07	09	15	25	28	07	07	7
2,000	00	03	10	11	15	24	21	05	11	8
3,000	00	05	12	17	17	18	15	04	10	9
5,000	00	22	24	15	10	11	06	03	09	10
10,000	00	07	09	11	12	17	10	14	21	11
15,000	00	05	06	06	07	13	12	26	25	12
20,000	00	04	04	04	07	12	14	30	24	13
30,000	00	04	04	04	07	13	14	30	24	14
100,000	00	04	04	04	07	13	14	30	24	15

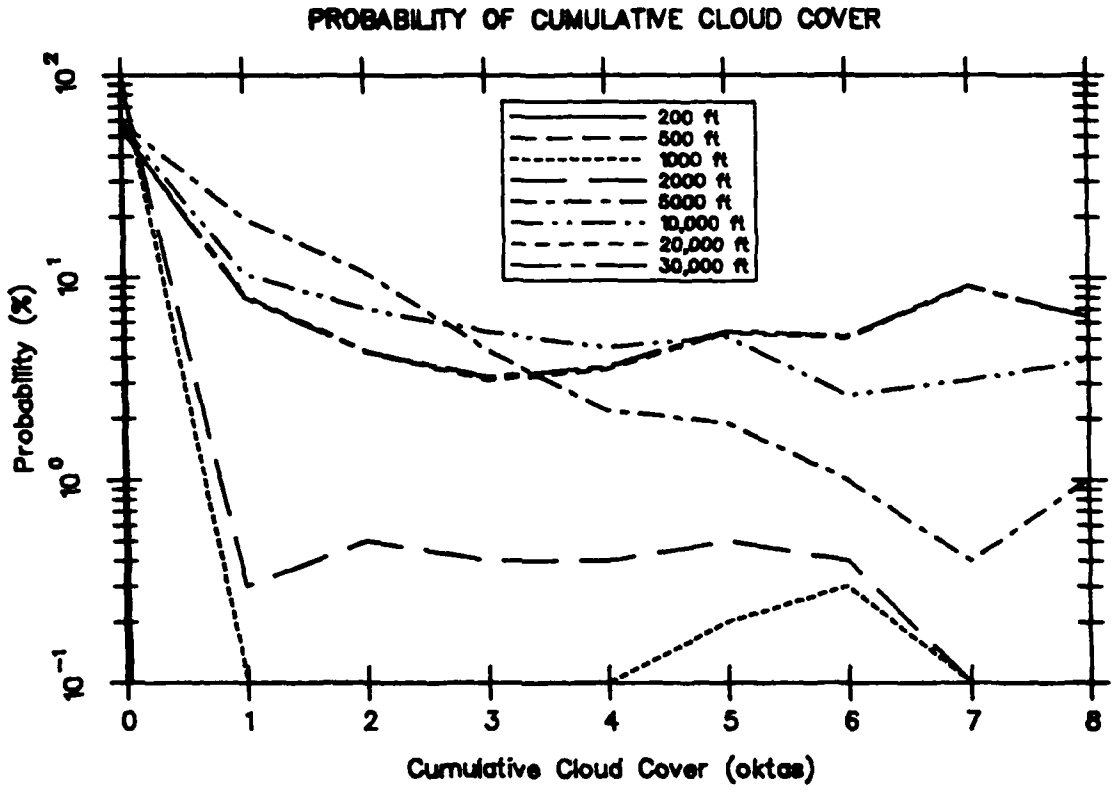

FIGURE 16. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR TEHRAN/MEHRABAD, IRAN, WMO STATION 407540.

TABLE 20. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM CAIRO, EGYPT, WMO STATION 623660.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	100	00	00	00	00	00	00	00	00	02
300	100	00	00	00	00	00	00	00	00	03
500	100	00	00	00	00	00	00	00	00	04
700	99	00	00	00	00	00	00	00	00	05
1,000	98	00	00	00	00	00	00	00	00	06
1,500	96	00	00	00	01	01	01	01	00	07
2,000	70	03	06	06	04	05	04	01	00	08
3,000	62	05	08	08	05	06	04	02	00	09
5,000	62	05	08	08	06	06	05	02	00	10
10,000	61	05	07	07	05	06	05	03	01	11
15,000	61	05	07	07	05	06	05	03	01	12
20,000	59	04	07	07	05	07	06	03	01	13
30,000	59	04	07	07	05	07	06	03	01	14
100,000	59	04	07	07	05	07	06	03	01	15
STD DEV	07	01	02	02	01	02	01	01	00	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	100	00	00	00	00	00	00	00	00	3
500	100	00	00	00	00	00	00	00	00	4
700	100	00	00	00	00	00	00	00	00	5
1,000	99	00	00	00	00	00	00	00	00	6
1,500	98	00	00	00	00	00	00	00	00	7
2,000	81	03	05	04	03	02	01	00	00	8
3,000	75	05	07	06	03	03	01	00	00	9
5,000	74	05	07	06	03	03	01	00	00	10
10,000	75	05	07	06	03	03	02	00	00	11
15,000	75	05	07	06	03	03	02	00	00	12
20,000	74	05	06	06	03	03	02	01	00	13
30,000	74	05	06	06	03	03	02	01	00	14
100,000	74	05	06	06	03	03	02	01	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	04	03	12	16	00	56	09	00	1
200	00	04	03	17	13	04	43	11	06	2
300	00	05	03	16	15	04	41	11	06	3
500	00	02	02	07	06	06	25	25	27	4
700	00	01	02	05	05	12	30	22	23	5
1,000	00	01	02	03	08	15	31	22	18	6
1,500	00	01	03	06	10	17	30	22	12	7
2,000	00	03	10	16	16	22	21	09	03	8
3,000	00	03	11	17	16	21	20	08	03	9
5,000	00	03	11	17	16	21	20	09	03	10
10,000	00	03	09	15	14	21	21	12	05	11
15,000	00	03	09	15	14	21	21	12	05	12
20,000	00	03	08	13	13	21	22	14	06	13
30,000	00	03	08	13	13	21	22	14	06	14
100,000	00	03	08	13	13	21	22	14	06	15

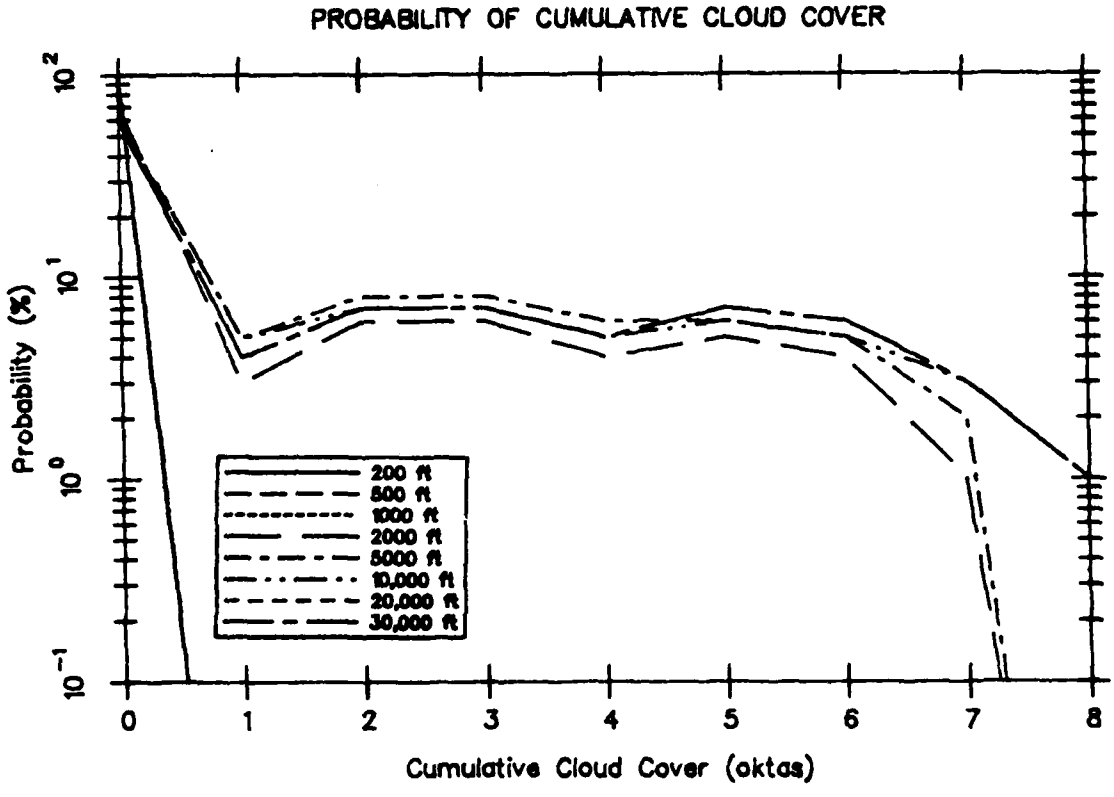

FIGURE 17. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR CAIRO, EGYPT, WMO STATION 623660.

TABLE 21. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM SEOUL, KOREA, WMO STATION 471110.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	93	03	02	01	01	00	00	00	00	01
200	93	03	02	01	01	00	00	00	00	02
300	92	03	02	01	01	00	00	00	00	03
500	92	03	02	01	01	00	00	00	00	04
700	92	03	02	01	01	00	00	00	00	05
1,000	89	03	02	02	01	01	01	01	00	06
1,500	85	03	03	02	01	01	02	01	01	07
2,000	80	03	03	03	02	02	02	02	03	08
3,000	55	07	06	05	03	05	05	04	10	09
5,000	46	08	07	06	04	07	06	05	12	10
10,000	38	08	06	05	04	05	05	07	23	11
15,000	36	08	06	06	04	05	05	07	24	12
20,000	25	08	06	06	05	05	06	10	29	13
30,000	25	08	06	06	05	05	06	10	29	14
100,000	25	08	06	06	05	05	06	10	29	15
STD DEV	04	01	01	01	01	01	01	02	04	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	94	03	01	01	00	00	00	00	00	1
200	94	03	01	01	00	00	00	00	00	2
300	94	03	01	01	00	00	00	00	00	3
500	94	03	01	01	00	00	00	00	00	4
700	94	03	01	01	00	00	00	00	00	5
1,000	93	03	02	01	01	00	00	00	00	6
1,500	91	03	02	02	01	01	00	00	00	7
2,000	89	03	03	02	01	01	01	00	00	8
3,000	74	09	06	04	02	03	02	01	00	9
5,000	67	11	07	05	03	04	02	01	00	10
10,000	64	12	08	06	03	03	02	01	00	11
15,000	62	13	08	06	04	03	02	02	00	12
20,000	53	14	10	08	05	04	03	03	00	13
30,000	52	14	10	08	05	04	03	03	00	14
100,000	52	14	10	08	05	04	03	03	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	23	25	25	14	08	03	01	00	1
200	00	22	25	25	14	08	04	01	01	2
300	00	21	24	24	14	08	04	02	02	3
500	00	19	21	22	14	08	07	05	04	4
700	00	15	18	19	14	09	10	09	07	5
1,000	00	09	14	17	13	12	14	11	09	6
1,500	00	06	11	13	10	12	16	17	15	7
2,000	00	04	08	09	07	10	14	17	31	8
3,000	00	04	06	07	06	13	14	14	36	9
5,000	00	03	05	07	06	13	14	14	37	10
10,000	00	02	04	05	05	07	08	14	55	11
15,000	00	02	04	05	05	07	08	14	55	12
20,000	00	02	03	04	05	06	09	16	55	13
30,000	00	02	03	04	05	06	09	16	55	14
100,000	00	02	03	04	05	06	09	16	55	15

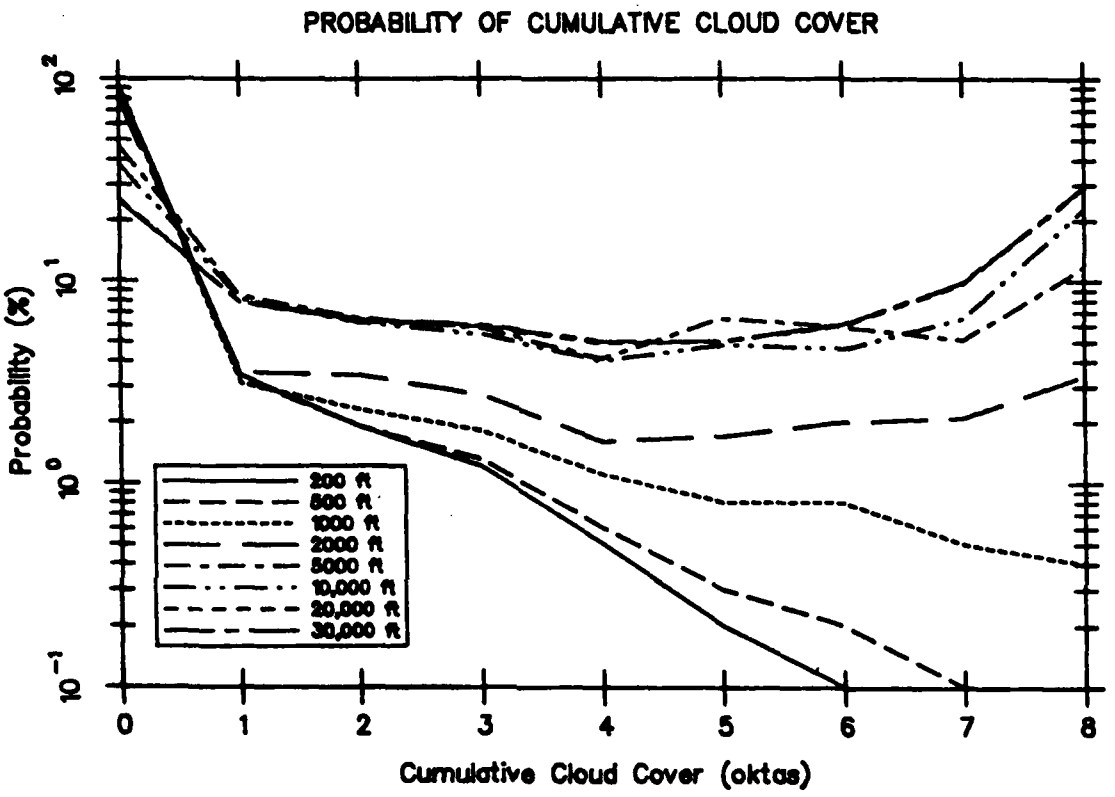

FIGURE 18. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR SEOUL, KOREA, WMO STATION 471110.

TABLE 22. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM HOENGSUNG/R-401, KOREA, WMO STATION 471180.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT (FT)	% OF OCCURRENCES IN EACH OCTA									
	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	95	02	02	01	01	00	00	00	00	01
200	95	02	02	01	01	00	00	00	00	02
300	95	02	02	01	01	00	00	00	00	03
500	94	02	02	01	01	00	00	00	00	04
700	94	02	02	01	01	00	00	00	00	05
1,000	92	02	02	01	01	01	01	01	00	06
1,500	89	02	02	02	01	01	01	01	01	07
2,000	83	02	03	02	01	01	02	02	03	08
3,000	45	06	07	06	04	06	07	06	12	09
5,000	42	06	07	06	04	07	07	06	15	10
10,000	34	06	06	06	04	05	05	06	27	11
15,000	33	06	06	06	04	05	05	07	28	12
20,000	22	05	06	06	04	05	06	09	35	13
30,000	22	05	06	06	04	05	06	09	35	14
100,000	22	05	06	06	04	05	06	09	35	15
STD DEV	05	01	01	01	01	01	02	01	06	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	96	01	01	01	00	00	00	00	00	1
200	96	01	01	01	00	00	00	00	00	2
300	96	01	01	01	00	00	00	00	00	3
500	96	01	01	01	00	00	00	00	00	4
700	96	01	01	01	00	00	00	00	00	5
1,000	95	02	02	01	00	00	00	00	00	6
1,500	94	02	02	01	01	00	00	00	00	7
2,000	92	02	02	01	01	01	00	00	00	8
3,000	68	08	08	06	03	04	03	01	00	9
5,000	66	09	08	06	03	04	03	01	00	10
10,000	63	10	09	07	04	03	02	02	00	11
15,000	62	10	09	07	04	04	02	02	00	12
20,000	54	11	11	08	05	05	04	03	00	13
30,000	53	11	11	08	05	05	04	03	00	14
100,000	53	11	11	08	05	05	04	03	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	13	28	28	19	07	04	01	00	1
200	00	13	28	27	18	07	05	01	01	2
300	00	13	27	27	18	08	05	02	01	3
500	00	12	25	25	15	08	07	06	02	4
700	00	09	19	17	12	10	08	16	08	5
1,000	00	06	15	15	11	11	11	19	13	6
1,500	00	04	10	12	09	10	15	19	21	7
2,000	00	03	08	09	06	09	13	15	37	8
3,000	00	02	05	07	06	12	16	15	37	9
5,000	00	02	05	07	06	11	15	15	40	10
10,000	00	02	03	05	04	07	08	12	59	11
15,000	00	02	03	05	04	07	08	12	59	12
20,000	00	01	03	04	04	06	08	14	61	13
30,000	00	01	03	04	04	06	08	14	61	14
100,000	00	01	03	04	04	06	08	14	61	15

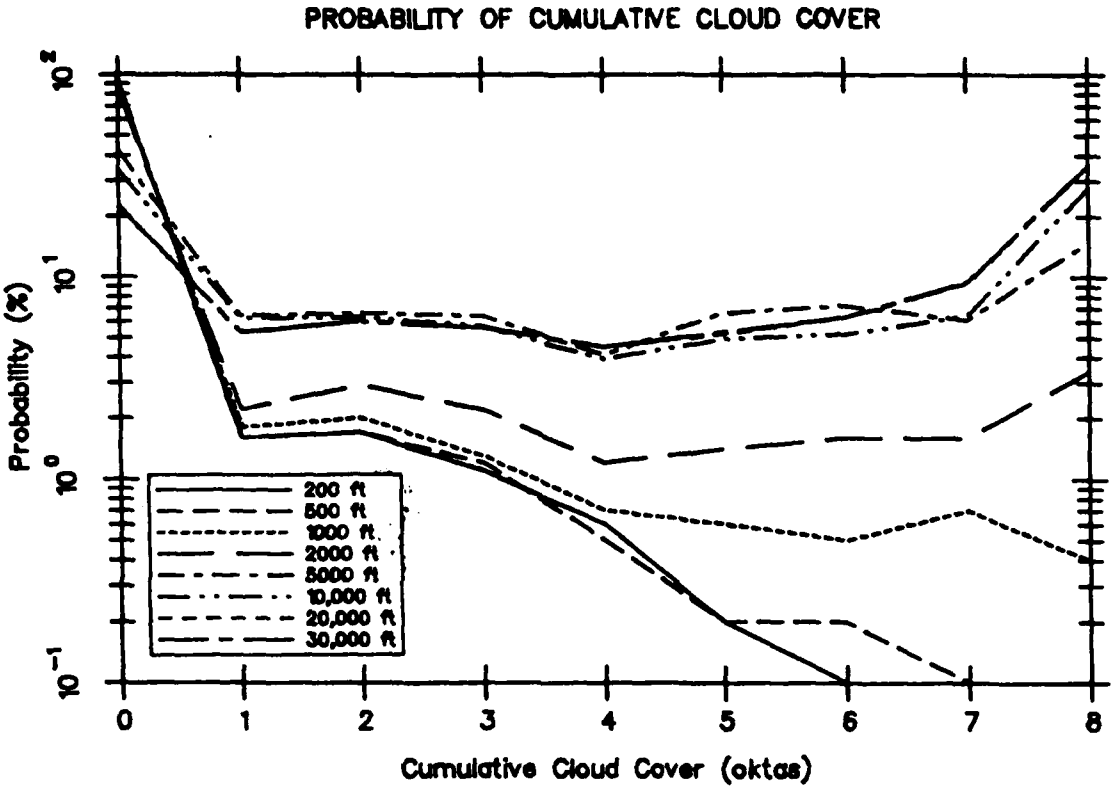

FIGURE 19. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR HOENGSUNG/R-401, KOREA, WMO STATION 471180.

TABLE 23. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM OSAN,KOREA, WMO STATION 471220.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	98	01	01	00	00	00	00	00	00	01
200	98	01	01	00	00	00	00	00	00	02
300	97	01	01	00	00	00	00	00	00	03
500	96	01	01	01	00	00	00	00	01	04
700	94	01	01	01	00	00	00	00	01	05
1,000	91	02	02	01	01	01	01	00	02	06
1,500	87	03	02	01	01	01	01	01	03	07
2,000	82	04	03	02	01	01	01	01	05	08
3,000	67	07	05	03	02	02	03	02	08	09
5,000	54	09	07	04	03	04	04	03	12	10
10,000	45	09	07	04	03	04	05	04	19	11
15,000	41	09	08	04	03	04	05	05	21	12
20,000	35	08	08	04	04	04	06	06	25	13
30,000	29	08	08	05	04	05	07	07	28	14
100,000	24	08	08	05	04	05	08	07	30	15
STD DEV	05	02	02	01	01	01	02	04	04	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	99	01	00	00	00	00	00	00	00	1
200	98	01	00	00	00	00	00	00	00	2
300	98	01	00	00	00	00	00	00	00	3
500	98	01	01	00	00	00	00	00	00	4
700	97	01	01	00	00	00	00	00	00	5
1,000	96	02	01	01	00	00	00	00	00	6
1,500	94	02	02	01	00	00	00	00	00	7
2,000	91	03	03	01	01	00	00	00	00	8
3,000	81	08	05	02	01	01	01	00	00	9
5,000	73	11	07	03	02	02	01	01	00	10
10,000	69	12	08	04	02	02	02	01	00	11
15,000	66	12	09	04	03	02	02	01	00	12
20,000	61	13	11	05	03	03	03	01	00	13
30,000	57	13	12	06	04	03	03	02	00	14
100,000	51	14	13	07	05	04	04	02	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	16	20	18	10	06	14	13	01	1
200	00	14	18	16	10	06	11	15	09	2
300	00	13	17	14	09	06	10	14	17	3
500	00	08	12	11	08	08	12	11	30	4
700	00	06	11	10	07	08	13	10	35	5
1,000	00	05	09	08	06	08	12	09	42	6
1,500	00	05	08	07	06	08	11	08	47	7
2,000	00	05	08	06	06	07	11	08	49	8
3,000	00	05	08	07	06	08	11	08	46	9
5,000	00	04	07	06	06	09	12	10	47	10
10,000	00	03	05	04	05	07	11	11	54	11
15,000	00	03	05	04	05	07	11	11	55	12
20,000	00	02	05	04	04	06	10	11	57	13
30,000	00	02	04	04	04	06	11	12	57	14
100,000	00	02	04	04	04	06	11	12	58	15

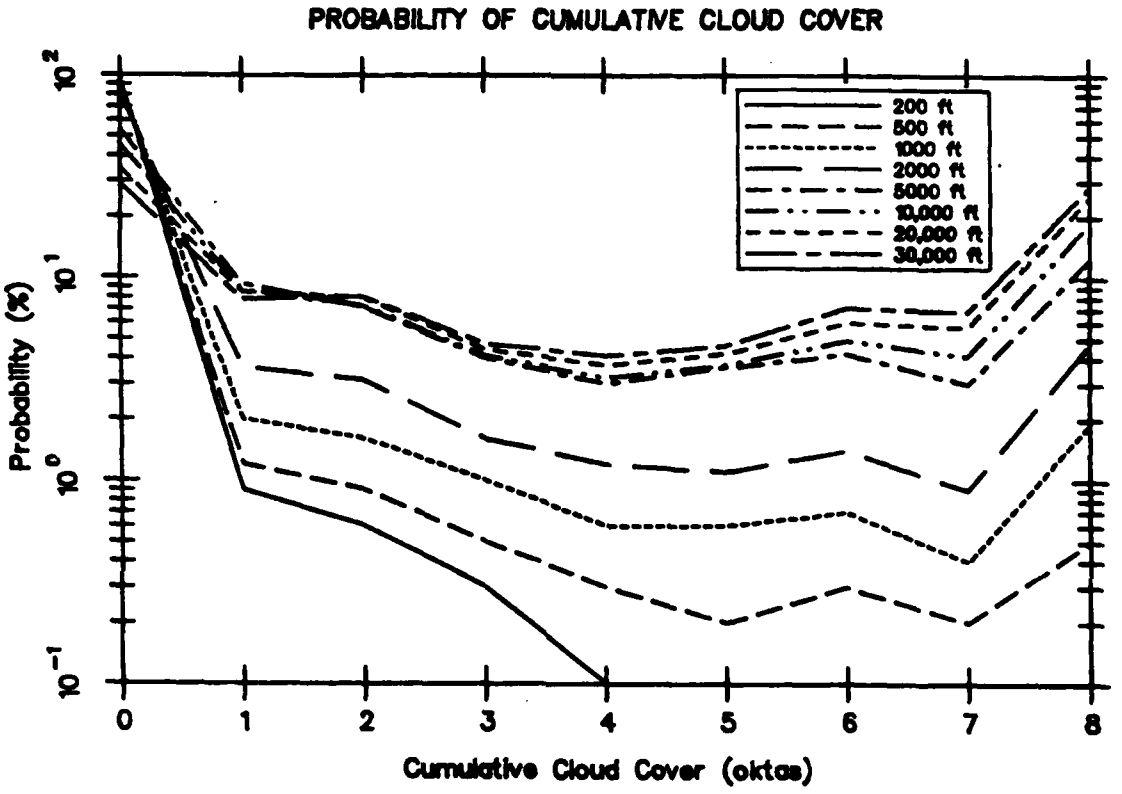

FIGURE 20. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR OSAN, KOREA, WMO STATION 471220.

TABLE 24. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM KUNSAN, KOREA, WMO STATION 471410.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	99	01	00	00	00	00	00	00	00	01
200	98	01	00	00	00	00	00	00	00	02
300	98	01	00	00	00	00	00	00	00	03
500	95	01	01	01	00	00	00	00	01	04
700	94	02	01	01	00	01	00	00	01	05
1,000	90	03	02	01	01	01	01	00	02	06
1,500	85	04	03	01	01	01	01	01	03	07
2,000	79	06	04	02	01	01	01	01	05	08
3,000	63	10	07	03	02	02	03	02	08	09
5,000	48	11	09	04	03	04	05	04	13	10
10,000	38	10	09	04	03	04	06	05	19	11
15,000	33	10	09	05	04	05	07	06	22	12
20,000	26	09	10	05	04	05	08	08	26	13
30,000	22	08	10	05	05	05	08	09	28	14
100,000	17	08	10	05	05	06	09	09	30	15
STD DEV	06	02	03	02	02	02	02	06	08	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	99	00	00	00	00	00	00	00	00	1
200	99	01	00	00	00	00	00	00	00	2
300	99	01	00	00	00	00	00	00	00	3
500	97	01	01	00	00	00	00	00	00	4
700	96	02	01	00	00	00	00	00	00	5
1,000	94	02	02	01	00	00	00	00	00	6
1,500	92	04	02	01	01	00	00	00	00	7
2,000	88	06	03	01	01	01	00	00	00	8
3,000	78	10	06	02	01	01	01	00	00	9
5,000	67	14	09	04	02	02	02	01	00	10
10,000	62	15	11	04	03	03	02	01	00	11
15,000	57	16	12	05	03	03	03	01	00	12
20,000	51	16	14	06	04	04	04	02	00	13
30,000	47	15	15	07	05	04	04	02	00	14
100,000	39	17	17	08	06	05	05	03	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	18	16	19	18	10	12	04	03	1
200	00	13	13	13	13	09	10	07	23	2
300	00	10	12	11	10	09	10	07	30	3
500	00	08	10	10	08	10	11	07	36	4
700	00	07	10	09	07	11	12	08	37	5
1,000	00	07	11	08	07	09	11	08	39	6
1,500	00	07	10	07	06	09	11	08	43	7
2,000	00	07	10	07	06	08	11	08	44	8
3,000	00	07	10	06	06	08	11	09	44	9
5,000	00	05	07	05	06	08	13	11	45	10
10,000	00	03	06	04	05	07	12	12	51	11
15,000	00	03	06	04	04	07	12	12	52	12
20,000	00	02	05	04	04	06	12	14	53	13
30,000	00	02	05	04	04	06	12	15	53	14
100,000	00	02	04	04	04	06	12	14	53	15

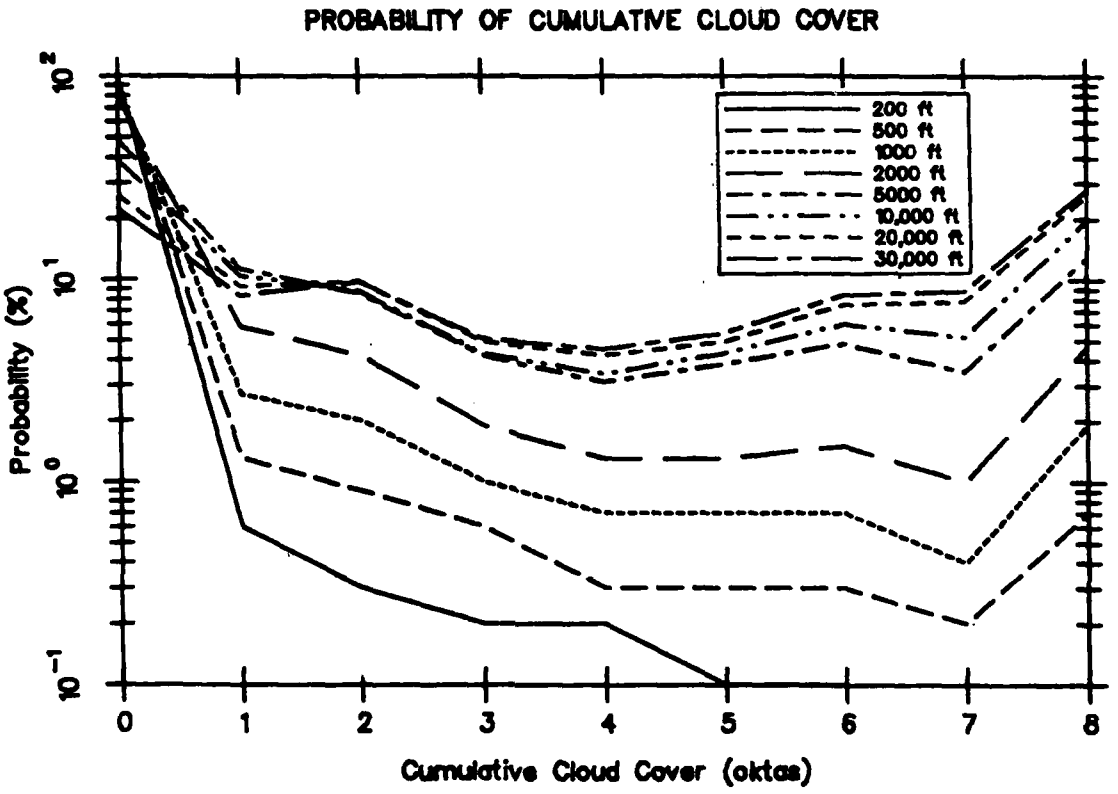

FIGURE 21. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR KUNSAN, KOREA, WMO STATION 471410.

TABLE 25. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM TAEGU & TONCHON, KOREA, WMO STATION 471420.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	93	03	02	01	00	00	00	00	00	01
200	93	03	02	01	00	00	00	00	00	02
300	93	03	02	01	00	00	00	00	00	03
500	93	03	02	01	00	00	00	00	00	04
700	92	03	02	01	00	00	00	00	00	05
1,000	91	04	02	02	01	00	00	00	00	06
1,500	88	04	03	02	01	00	01	01	00	07
2,000	84	04	03	02	01	01	02	02	02	08
3,000	60	08	05	04	02	05	05	05	06	09
5,000	43	13	07	07	03	06	06	05	10	10
10,000	36	12	07	06	04	05	04	05	21	11
15,000	33	12	07	06	04	04	05	06	23	12
20,000	22	10	07	07	05	05	06	09	30	13
30,000	21	10	07	07	05	05	06	10	30	14
100,000	21	10	07	07	05	05	06	10	30	15
STD DEV	05	02	01	01	01	01	01	04	03	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	95	03	01	01	00	00	00	00	00	1
200	95	03	01	01	00	00	00	00	00	2
300	95	03	01	01	00	00	00	00	00	3
500	94	03	01	01	00	00	00	00	00	4
700	94	03	02	01	00	00	00	00	00	5
1,000	93	03	02	01	00	00	00	00	00	6
1,500	92	04	02	01	00	00	00	00	00	7
2,000	91	04	03	01	00	00	00	00	00	8
3,000	77	09	05	03	01	02	02	01	00	9
5,000	61	16	08	06	02	03	02	01	00	10
10,000	59	17	09	06	03	03	02	01	00	11
15,000	57	18	09	07	03	03	02	01	00	12
20,000	46	19	11	09	05	04	03	03	00	13
30,000	45	19	11	10	05	04	03	03	00	14
100,000	45	19	11	10	05	04	03	03	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	28	31	25	09	03	02	02	00	1
200	00	28	31	24	10	04	02	02	00	2
300	00	27	30	24	09	04	02	03	00	3
500	00	23	27	24	10	05	04	06	03	4
700	00	20	25	23	10	05	05	07	04	5
1,000	00	16	21	20	09	06	08	13	06	6
1,500	00	11	17	15	07	07	13	20	11	7
2,000	00	06	10	08	04	07	16	26	23	8
3,000	00	05	06	07	05	13	19	19	26	9
5,000	00	05	06	08	06	13	15	14	32	10
10,000	00	04	05	06	05	07	09	12	53	11
15,000	00	04	04	06	05	07	08	12	55	12
20,000	00	02	03	05	05	06	08	15	56	13
30,000	00	02	03	05	05	06	08	16	55	14
100,000	00	02	03	05	05	06	08	16	55	15

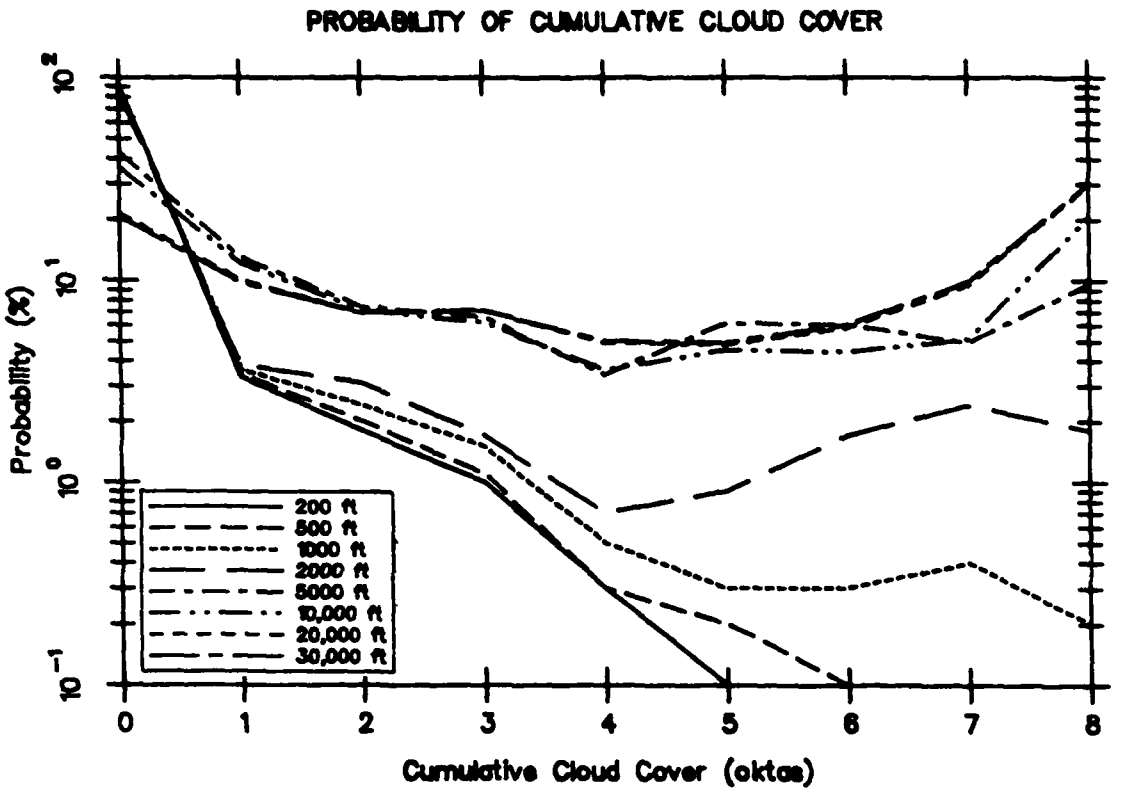

FIGURE 22. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR TAEGU AND TONCHON, KOREA, WMO STATION 471420.

TABLE 26. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM PUSAN/KIMHAF, KOREA, WMO STATION 471530.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT (FT)	% OF OCCURRENCES IN EACH OCTA -00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	93	03	02	01	00	00	00	00	00	01
200	93	03	02	01	00	00	00	00	00	02
300	93	03	02	02	00	00	00	00	00	03
500	92	03	02	02	01	00	00	00	00	04
700	92	03	03	02	01	00	00	00	00	05
1,000	90	03	03	02	01	00	00	01	00	06
1,500	86	04	04	02	01	01	01	01	01	07
2,000	81	04	04	02	01	01	01	02	03	08
3,000	52	10	08	06	02	05	05	05	07	09
5,000	48	11	08	06	03	05	05	04	09	10
10,000	39	11	07	05	03	04	04	04	23	11
15,000	36	11	07	06	03	04	04	05	24	12
20,000	23	09	07	07	05	04	05	08	32	13
30,000	22	09	07	07	05	04	05	08	32	14
100,000	22	09	07	07	05	04	05	08	32	15
STD DEV	01	01	01	01	01	00	00	01	03	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	95	02	02	01	00	00	00	00	00	1
200	95	02	02	01	00	00	00	00	00	2
300	94	02	02	01	00	00	00	00	00	3
500	94	02	02	01	00	00	00	00	00	4
700	94	02	02	01	00	00	00	00	00	5
1,000	94	02	02	01	00	00	00	00	00	6
1,500	91	03	03	02	01	00	00	00	00	7
2,000	90	03	03	02	01	00	00	00	00	8
3,000	69	12	08	05	02	02	02	01	00	9
5,000	66	14	08	05	02	03	02	01	00	10
10,000	64	15	09	06	02	02	02	01	00	11
15,000	61	16	09	06	03	03	02	01	00	12
20,000	49	17	12	09	05	03	03	02	00	13
30,000	48	17	12	09	05	03	03	02	00	14
100,000	48	17	12	09	05	03	03	02	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	18	32	30	13	03	02	01	00	1
200	00	18	32	30	13	04	03	01	00	2
300	00	18	32	30	13	04	03	01	00	3
500	00	16	29	27	14	05	04	03	01	4
700	00	13	26	24	14	06	05	08	04	5
1,000	00	10	21	19	11	07	08	15	09	6
1,500	00	08	17	15	09	07	10	19	15	7
2,000	00	05	11	09	06	06	11	23	29	8
3,000	00	05	08	09	05	12	15	17	29	9
5,000	00	05	07	09	05	11	14	14	35	10
10,000	00	03	05	05	04	06	08	10	59	11
15,000	00	03	04	05	04	06	08	10	59	12
20,000	00	02	03	05	04	05	07	13	60	13
30,000	00	02	03	05	05	05	08	13	60	14
100,000	00	02	03	05	05	05	08	13	60	15

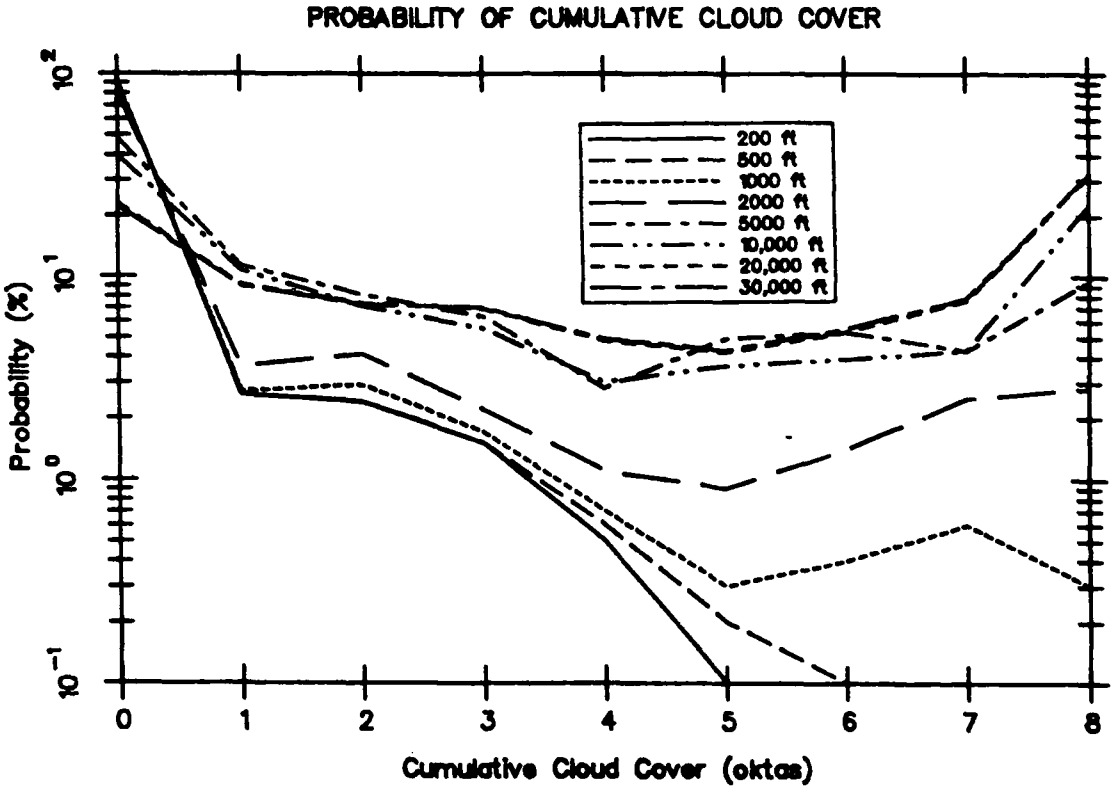

FIGURE 23. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR PUSAN/KIMHAF, KOREA, WMO STATION 471530.

TABLE 27. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM KWANGJU, KOREA, WMO STATION 471580.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	93	03	01	01	01	00	00	00	00	01
200	93	03	02	01	01	00	00	00	00	02
300	93	03	02	01	01	00	00	00	00	03
500	92	03	02	02	01	00	00	00	00	04
700	92	03	02	02	01	01	00	00	00	05
1,000	90	03	02	02	01	01	01	01	00	06
1,500	85	04	03	02	01	01	01	01	01	07
2,000	77	04	03	02	01	02	03	02	05	08
3,000	39	13	08	06	03	07	06	05	11	09
5,000	35	14	08	07	03	07	07	06	14	10
10,000	28	13	07	06	03	06	05	06	25	11
15,000	25	12	07	06	04	06	06	07	26	12
20,000	13	10	08	07	05	06	07	10	34	13
30,000	13	10	08	07	06	06	07	10	34	14
100,000	13	10	08	07	06	06	07	10	34	15
STD DEV	02	01	01	01	01	01	00	02	04	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	95	02	01	01	00	00	00	00	00	1
200	95	02	01	01	00	00	00	00	00	2
300	95	02	01	01	00	00	00	00	00	3
500	95	02	01	01	00	00	00	00	00	4
700	94	02	01	01	00	00	00	00	00	5
1,000	94	03	02	01	00	00	00	00	00	6
1,500	91	03	02	02	01	01	00	00	00	7
2,000	89	04	03	02	01	01	01	00	00	8
3,000	59	17	09	06	02	04	02	01	00	9
5,000	55	19	09	07	02	04	03	01	00	10
10,000	52	20	10	07	03	04	02	01	00	11
15,000	49	21	11	08	04	04	03	02	00	12
20,000	33	22	14	11	07	06	04	03	00	13
30,000	33	22	14	11	07	06	04	03	00	14
100,000	33	22	14	11	07	06	05	03	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	17	19	26	17	10	05	04	00	1
200	00	17	19	26	16	11	06	05	01	2
300	00	16	18	25	15	11	06	06	02	3
500	00	14	17	23	14	11	09	07	05	4
700	00	11	15	19	14	13	10	10	07	5
1,000	00	09	13	15	10	12	14	16	10	6
1,500	00	07	11	13	09	13	15	18	15	7
2,000	00	04	06	07	04	11	16	16	36	8
3,000	00	05	06	07	04	13	15	14	35	9
5,000	00	05	06	07	04	13	14	14	38	10
10,000	00	03	04	05	04	08	09	12	54	11
15,000	00	03	04	05	04	08	09	13	54	12
20,000	00	02	03	04	05	06	09	14	56	13
30,000	00	02	03	04	05	06	09	14	56	14
100,000	00	02	03	04	05	06	09	14	56	15

AD-A162 210 PROBABILITY AND CONDITIONAL PROBABILITY OF CUMULATIVE CLOUD COVER FOR SEL..(U) OPTIMETRICS INC BEDFORD MA W O GALLERY ET AL. JUL 85 OMI-139 AFGL-TR-85-0154 2/3

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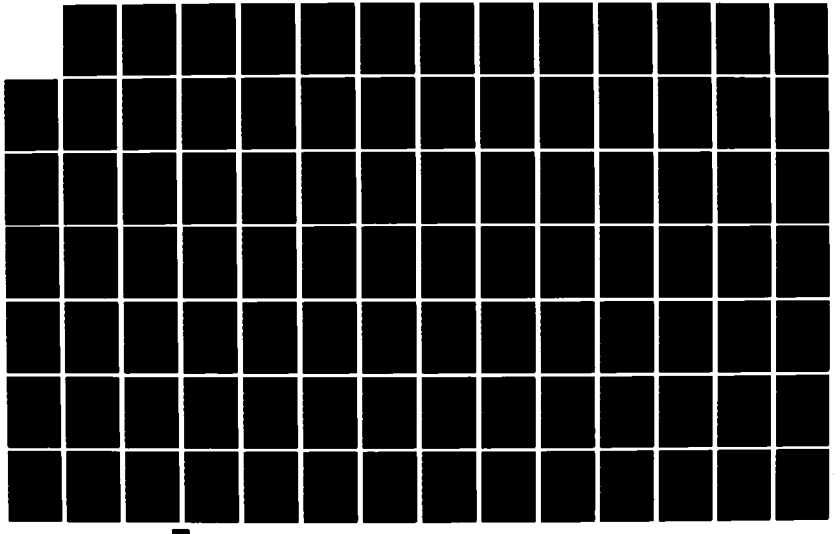

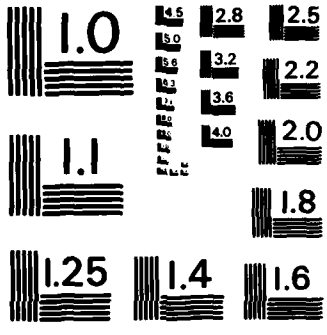

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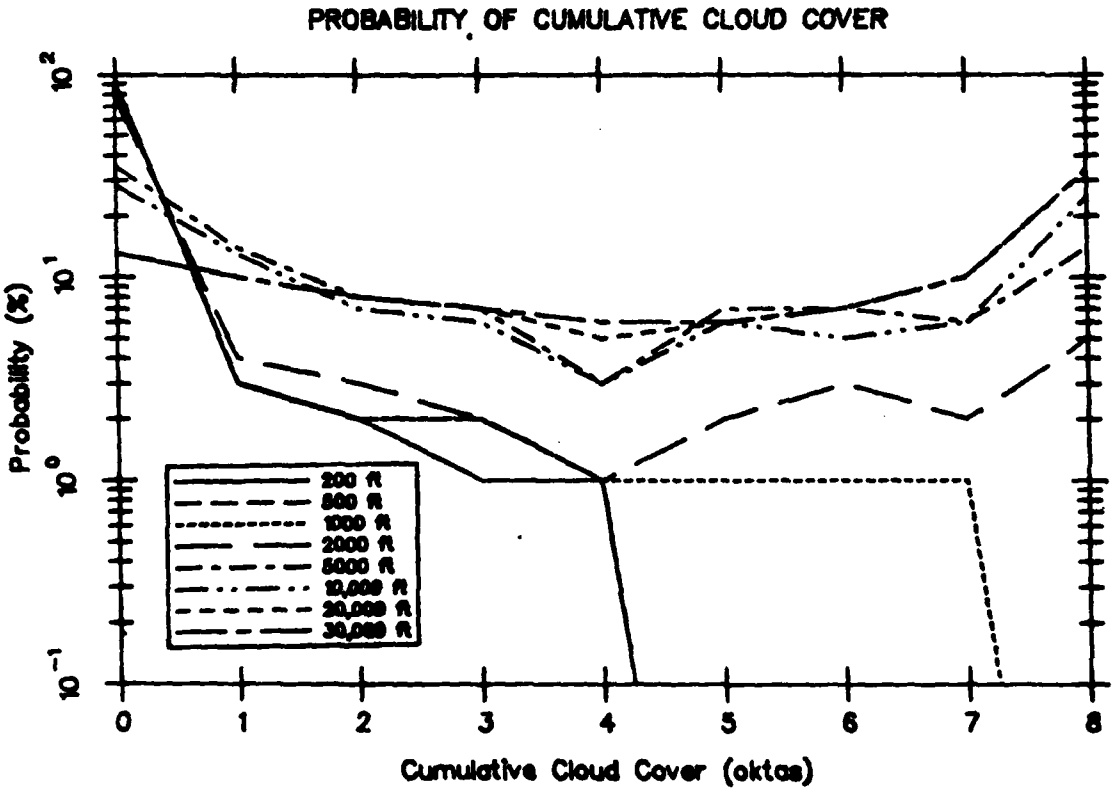

FIGURE 24. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR KWANGJU, KOREA, WMO STATION 471580.

TABLE 27. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM KWANGJU, KOREA, WMO STATION 471580.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	93	03	01	01	01	00	00	00	00	01
200	93	03	02	01	01	00	00	00	00	02
300	93	03	02	01	01	00	00	00	00	03
500	92	03	02	02	01	00	00	00	00	04
700	92	03	02	02	01	01	00	00	00	05
1,000	90	03	02	02	01	01	01	01	00	06
1,500	85	04	03	02	01	01	01	01	01	07
2,000	77	04	03	02	01	02	03	02	05	08
3,000	39	13	08	06	03	07	06	05	11	09
5,000	35	14	08	07	03	07	07	06	14	10
10,000	28	13	07	06	03	06	05	06	25	11
15,000	25	12	07	06	04	06	06	07	26	12
20,000	13	10	08	07	05	06	07	10	34	13
30,000	13	10	08	07	06	06	07	10	34	14
100,000	13	10	08	07	06	06	07	10	34	15
STD DEV	02	01	01	01	01	01	00	02	04	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	95	02	01	01	00	00	00	00	00	1
200	95	02	01	01	00	00	00	00	00	2
300	95	02	01	01	00	00	00	00	00	3
500	95	02	01	01	00	00	00	00	00	4
700	94	02	01	01	00	00	00	00	00	5
1,000	94	03	02	01	00	00	00	00	00	6
1,500	91	03	02	02	01	01	00	00	00	7
2,000	89	04	03	02	01	01	01	00	00	8
3,000	59	17	09	06	02	04	02	01	00	9
5,000	55	9	09	07	02	04	03	01	00	10
10,000	52	20	10	07	03	04	02	01	00	11
15,000	49	21	11	08	04	04	03	02	00	12
20,000	33	22	14	11	07	06	04	03	00	13
30,000	33	22	14	11	07	06	04	03	00	14
100,000	33	22	14	11	07	06	05	03	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	17	19	26	17	10	05	04	00	1
200	00	17	19	26	16	11	06	05	01	2
300	00	16	18	25	16	11	06	06	02	3
500	00	14	17	23	14	11	09	07	05	4
700	00	11	15	19	14	13	10	10	07	5
1,000	00	09	13	15	10	12	14	16	10	6
1,500	00	07	11	13	09	13	15	18	15	7
2,000	00	04	06	07	04	11	16	16	36	8
3,000	00	05	06	07	04	13	15	14	35	9
5,000	00	05	06	07	04	13	14	14	38	10
10,000	00	03	04	05	04	08	09	12	54	11
15,000	00	03	04	05	04	08	09	13	54	12
20,000	00	02	03	04	05	06	09	14	56	13
30,000	00	02	03	04	05	06	09	14	56	14
100,000	00	02	03	04	05	06	09	14	56	15

TABLE 28. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM SACHON, KOREA, WMO STATION 471610.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT (FT)	% OF OCCURRENCES IN EACH OCTA -00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	94	03	02	01	00	00	00	00	00	01
200	94	03	02	01	00	00	00	00	00	02
300	94	03	02	01	00	00	00	00	00	03
500	94	03	02	01	00	00	00	00	00	04
700	93	03	02	01	01	00	00	00	00	05
1,000	92	03	02	01	01	00	00	00	00	06
1,500	87	03	03	02	01	01	01	01	01	07
2,000	83	04	03	02	01	01	02	01	03	08
3,000	54	11	07	05	03	05	04	03	08	09
5,000	46	13	07	06	03	05	05	03	11	10
10,000	39	12	07	06	03	04	04	04	21	11
15,000	36	12	07	06	04	04	04	04	23	12
20,000	21	10	08	07	05	05	06	07	30	13
30,000	21	10	08	07	05	05	06	07	30	14
100,000	21	10	08	07	05	05	06	07	30	15
STD DEV	03	02	01	01	01	01	00	01	03	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	96	02	01	01	00	00	00	00	00	1
200	96	02	01	01	00	00	00	00	00	2
300	95	02	01	01	00	00	00	00	00	3
500	95	02	01	01	00	00	00	00	00	4
700	95	02	01	01	00	00	00	00	00	5
1,000	94	03	02	01	00	00	00	00	00	6
1,500	92	03	02	01	01	00	00	00	00	7
2,000	91	03	02	01	01	00	00	00	00	8
3,000	70	13	07	04	02	02	01	01	00	9
5,000	65	15	08	05	02	03	02	01	00	10
10,000	62	16	08	06	03	02	02	01	00	11
15,000	59	17	09	06	03	03	02	01	00	12
20,000	44	19	13	09	05	04	03	02	00	13
30,000	44	19	13	09	06	04	03	02	00	14
100,000	44	19	13	09	05	04	03	02	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	24	29	22	12	07	07	01	00	1
200	00	23	28	22	12	07	07	01	01	2
300	00	22	27	22	12	08	07	01	01	3
500	00	20	25	21	13	09	07	02	02	4
700	00	17	23	19	14	10	08	05	05	5
1,000	00	14	20	16	13	09	12	07	09	6
1,500	00	07	13	12	11	10	16	15	16	7
2,000	00	05	09	10	08	09	15	15	32	8
3,000	00	06	07	08	06	12	14	12	35	9
5,000	00	06	06	08	06	11	13	11	39	10
10,000	00	04	05	06	04	07	08	09	57	11
15,000	00	04	04	06	05	07	08	10	57	12
20,000	00	02	04	05	05	06	09	12	57	13
30,000	00	02	04	05	05	06	09	12	57	14
100,000	00	02	04	05	05	06	09	12	57	15

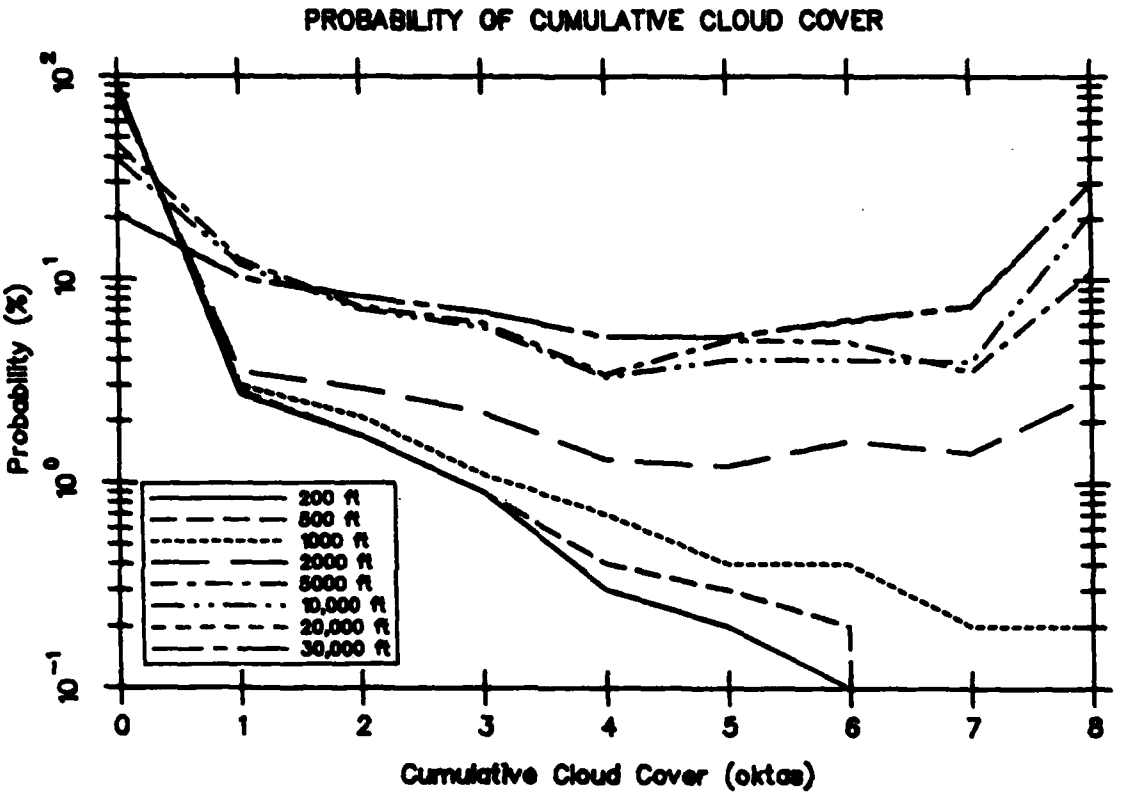

FIGURE 25. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR SACHON, KOREA, WMO STATION 471610.

TABLE 29. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM GUATEMALA CITY, GUATEMALA, WMO STATION 786410.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT (FT)	% OF OCCURRENCES IN EACH OCTA -00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	99	00	00	00	00	00	00	00	00	02
300	98	00	00	00	00	00	00	00	01	03
500	95	00	01	01	01	01	01	00	02	04
700	90	01	01	01	01	01	01	01	03	05
1,000	78	03	03	03	02	02	02	02	05	06
1,500	64	04	04	04	03	03	04	04	09	07
2,000	27	12	10	10	08	08	08	07	11	08
3,000	17	13	11	11	10	09	09	08	12	09
5,000	17	13	11	11	10	09	09	08	13	10
10,000	14	11	08	09	07	07	07	08	28	11
15,000	14	11	08	08	07	07	07	08	29	12
20,000	11	08	06	07	06	06	08	10	38	13
30,000	11	08	06	07	06	06	08	10	38	14
100,000	11	08	06	07	06	06	08	10	38	15
STD DEV	01	01	01	01	01	01	01	01	04	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	99	00	00	00	00	00	00	00	00	3
500	98	00	01	00	00	00	00	00	00	4
700	96	01	01	01	01	00	00	00	00	5
1,000	89	03	03	02	01	01	01	00	00	6
1,500	82	05	04	03	02	02	01	01	00	7
2,000	45	17	12	10	07	05	03	01	00	8
3,000	31	21	15	13	09	06	04	02	00	9
5,000	31	21	15	13	09	06	04	02	00	10
10,000	32	21	14	12	08	06	04	02	00	11
15,000	32	22	14	12	08	06	04	02	00	12
20,000	31	21	13	12	08	07	05	03	00	13
30,000	31	21	13	12	08	07	05	03	00	14
100,000	31	21	13	12	08	07	05	03	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	01	03	03	01	07	09	05	70	1
200	00	02	03	04	03	06	14	07	61	2
300	00	02	04	07	05	07	10	08	58	3
500	00	02	05	07	08	09	11	12	46	4
700	00	02	05	08	09	09	11	12	42	5
1,000	00	03	06	08	09	09	11	14	41	6
1,500	00	02	05	07	08	10	13	15	40	7
2,000	00	04	06	10	11	12	15	15	28	8
3,000	00	04	06	09	11	13	15	15	28	9
5,000	00	04	06	09	11	13	15	15	28	10
10,000	00	02	04	06	07	08	10	13	51	11
15,000	00	02	04	06	06	08	10	13	52	12
20,000	00	02	02	04	05	06	09	13	59	13
30,000	00	02	02	04	05	06	09	13	59	14
100,000	00	02	02	04	05	06	09	13	59	15

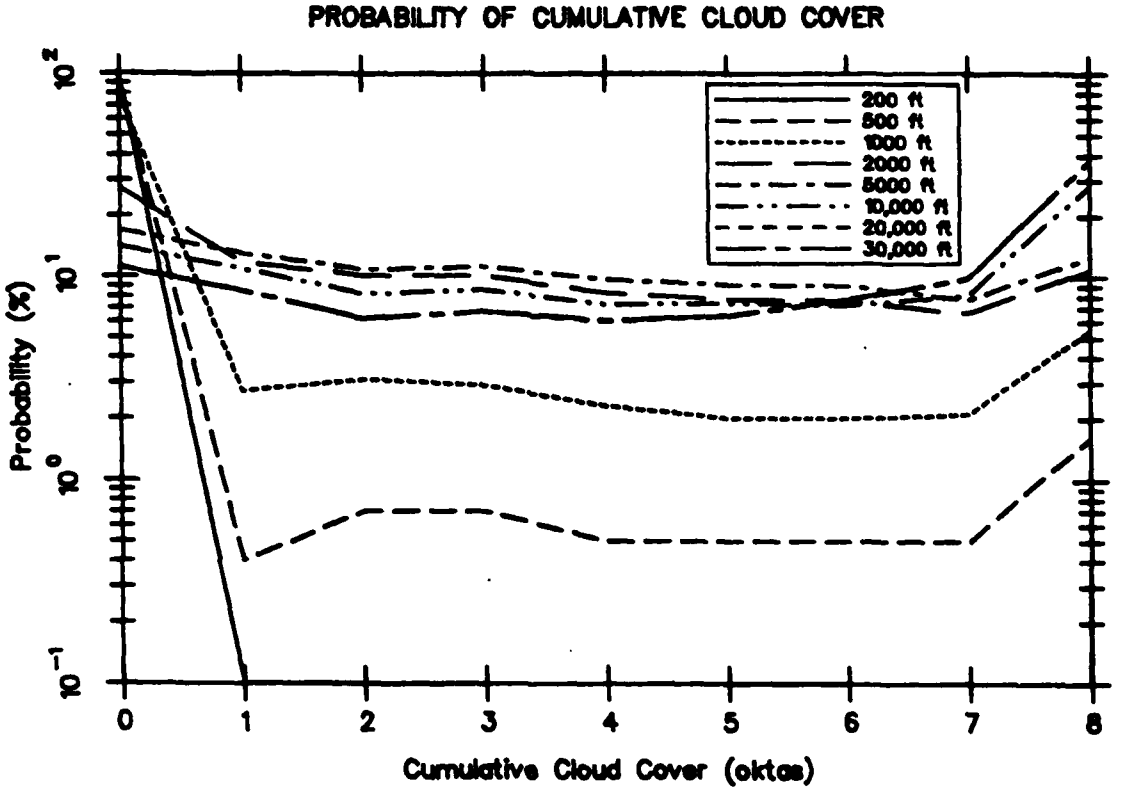

FIGURE 26. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR GUATEMALA CITY, GUATEMALA, WMO STATION 786410.

TABLE 30. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM SAN SALVADOR, EL SALVADOR, WMO STATION 786630.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	100	00	00	00	00	00	00	00	00	02
300	99	00	00	00	00	00	00	00	00	03
500	98	00	00	00	00	00	00	00	00	04
700	97	01	01	01	00	00	00	00	00	05
1,000	92	03	02	01	01	00	00	00	00	06
1,500	89	04	03	02	01	00	00	00	00	07
2,000	79	08	05	04	02	01	01	01	01	08
3,000	66	12	08	06	03	02	01	01	01	09
5,000	26	23	14	12	08	06	04	04	03	10
10,000	23	17	13	12	09	08	06	07	04	11
15,000	19	16	12	11	09	08	07	11	06	12
20,000	19	16	11	10	08	07	07	13	09	13
30,000	13	11	08	08	07	08	12	23	11	14
100,000	12	11	08	08	07	08	12	23	11	15
STD DEV	05	02	01	01	01	01	02	03	04	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	99	00	00	00	00	00	00	00	00	3
500	99	00	00	00	00	00	00	00	00	4
700	98	01	01	00	00	00	00	00	00	5
1,000	94	03	02	01	00	00	00	00	00	6
1,500	92	04	02	01	01	00	00	00	00	7
2,000	85	07	04	02	01	00	00	00	00	8
3,000	74	12	07	04	02	01	00	00	00	9
5,000	36	28	15	10	06	03	01	01	00	10
10,000	35	23	15	11	07	04	02	01	00	11
15,000	32	24	15	12	08	05	03	02	00	12
20,000	33	24	14	11	07	05	03	03	00	13
30,000	28	21	13	11	07	07	07	06	00	14
100,000	27	22	13	11	08	07	07	06	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	09	11	16	11	20	00	00	32	1
200	00	07	07	15	16	11	03	04	36	2
300	00	09	15	15	18	10	08	07	19	3
500	00	07	14	13	16	11	09	09	20	4
700	00	09	15	17	14	10	08	08	19	5
1,000	00	13	19	18	14	08	09	07	14	6
1,500	00	13	19	19	14	08	08	07	12	7
2,000	00	15	20	21	13	08	07	07	10	8
3,000	00	14	19	21	13	10	07	06	09	9
5,000	00	10	13	16	15	14	11	12	10	10
10,000	00	06	09	13	14	14	13	18	13	11
15,000	00	05	07	10	11	13	13	24	15	12
20,000	00	05	06	09	09	11	12	26	22	13
30,000	00	03	04	05	06	09	17	36	20	14
100,000	00	03	04	05	06	09	17	36	20	15

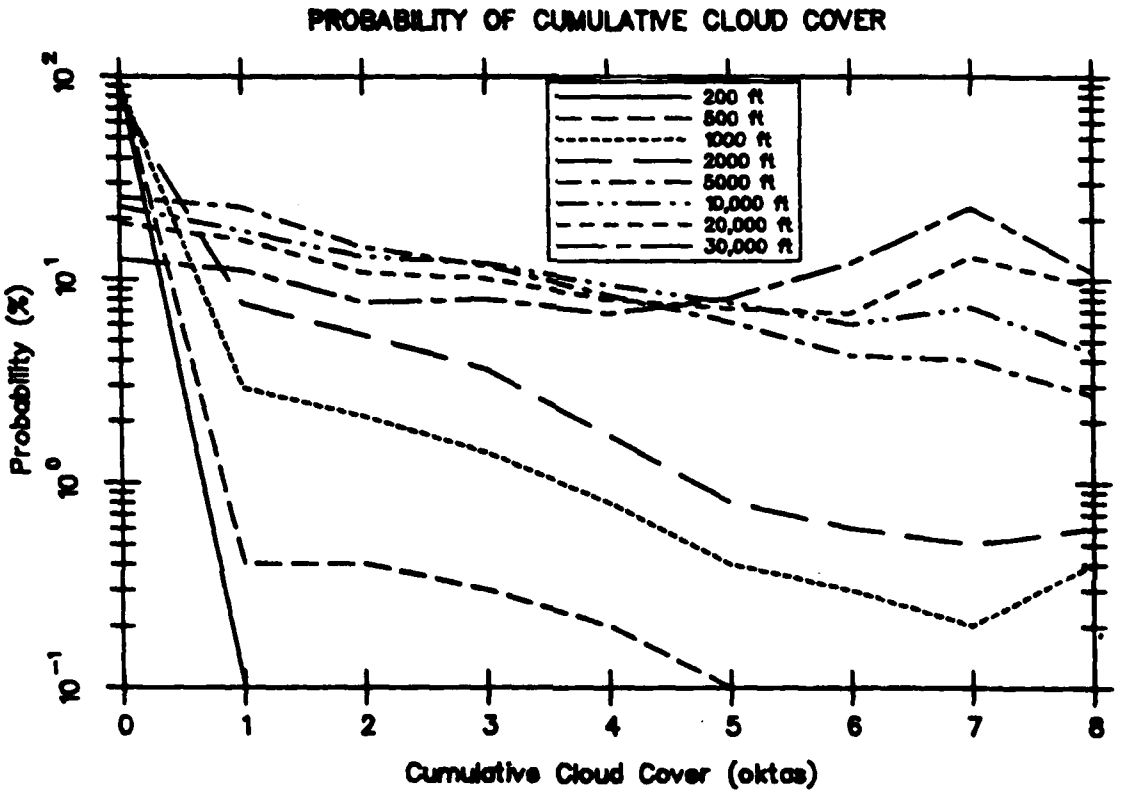

FIGURE 27. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR SAN SALVADOR, EL SALVADOR, WMO STATION 786630.

TABLE 31. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM TEGUCIGALPA, HONDURAS, WMO STATION 787200.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	100	00	00	00	00	00	00	00	00	02
300	99	00	00	00	00	00	00	00	00	03
500	96	02	02	01	00	00	00	00	00	04
700	93	03	03	01	00	00	00	00	00	05
1,000	84	10	04	01	00	00	00	00	00	06
1,500	82	11	05	01	01	00	00	00	00	07
2,000	78	12	05	01	01	01	01	01	01	08
3,000	40	11	09	07	07	08	08	08	02	09
5,000	06	15	12	11	13	14	13	12	03	10
10,000	05	10	09	09	11	13	15	18	09	11
15,000	05	10	09	09	10	12	15	19	10	12
20,000	05	10	09	09	10	12	15	19	10	13
30,000	04	08	07	07	08	11	18	25	12	14
100,000	04	08	07	07	08	11	18	25	12	15
STD DEV	02	02	02	01	01	02	01	02	03	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	99	00	00	00	00	00	00	00	00	3
500	97	01	01	00	00	00	00	00	00	4
700	94	03	02	01	00	00	00	00	00	5
1,000	87	09	03	01	00	00	00	00	00	6
1,500	85	10	04	01	00	00	00	00	00	7
2,000	83	11	04	01	01	00	00	00	00	8
3,000	57	14	09	06	05	04	03	01	00	9
5,000	12	25	18	14	12	10	06	03	00	10
10,000	12	21	16	14	12	11	08	05	00	11
15,000	13	21	16	13	12	11	09	06	00	12
20,000	13	21	16	13	12	11	09	06	00	13
30,000	12	19	13	12	11	11	12	08	00	14
100,000	12	19	13	12	11	12	12	08	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	14	05	24	22	14	00	00	22	1
200	00	09	23	30	30	03	00	00	05	2
300	00	13	25	28	24	08	00	00	02	3
500	00	18	35	25	16	03	00	00	02	4
700	00	25	38	20	11	03	00	00	01	5
1,000	00	40	34	14	07	03	00	01	02	6
1,500	00	36	30	12	07	05	03	04	04	7
2,000	00	23	19	08	07	10	09	14	09	8
3,000	00	05	07	09	11	16	20	24	08	9
5,000	00	04	06	09	13	19	21	22	07	10
10,000	00	02	04	06	09	14	19	28	17	11
15,000	00	02	04	06	09	14	19	29	17	12
20,000	00	02	04	06	09	14	19	29	17	13
30,000	00	02	03	04	07	11	21	35	18	14
100,000	00	02	03	04	07	11	21	35	18	15

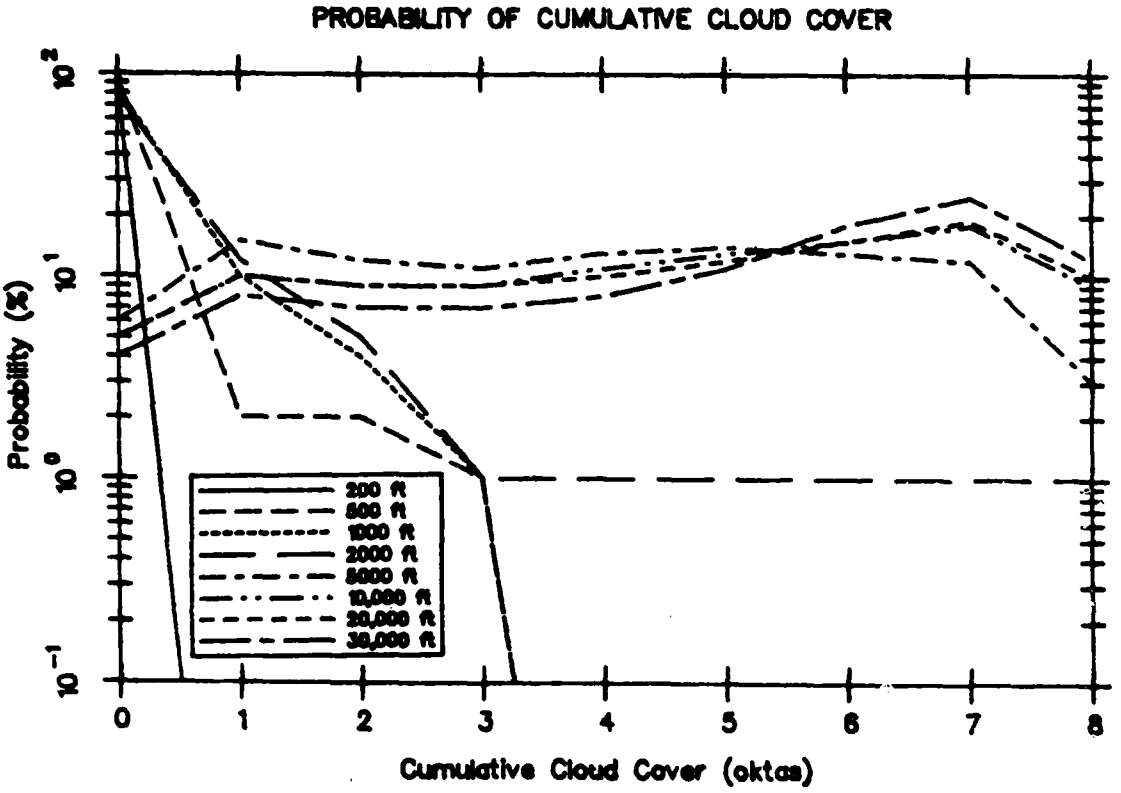

FIGURE 28. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR TEGUCIGALPA, HONDURAS, WMO STATION 787200.

TABLE 32. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM MANAGUA/SANDINO, NICARAGUA, WMO STATION 787410.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	100	00	00	00	00	00	00	00	00	02
300	100	00	00	00	00	00	00	00	00	03
500	100	00	00	00	00	00	00	00	00	04
700	100	00	00	00	00	00	00	00	00	05
1,000	100	00	00	00	00	00	00	00	00	06
1,500	99	00	00	00	00	00	00	00	00	07
2,000	76	06	05	04	03	02	02	01	01	08
3,000	18	21	19	16	11	07	05	02	02	09
5,000	15	21	19	16	12	07	05	02	02	10
10,000	12	14	12	10	09	09	08	08	19	11
15,000	12	14	12	10	09	09	08	08	19	12
20,000	11	13	10	09	08	09	08	09	22	13
30,000	10	09	08	08	07	08	09	11	29	14
100,000	10	09	08	08	07	08	09	11	30	15
STD DEV	07	02	02	02	02	01	01	01	04	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	100	00	00	00	00	00	00	00	00	3
500	100	00	00	00	00	00	00	00	00	4
700	100	00	00	00	00	00	00	00	00	5
1,000	100	00	00	00	00	00	00	00	00	6
1,500	100	00	00	00	00	00	00	00	00	7
2,000	84	06	04	03	02	01	00	00	00	8
3,000	26	26	20	14	08	04	02	00	00	9
5,000	23	27	21	15	09	04	02	00	00	10
10,000	24	25	18	13	09	07	04	02	00	11
15,000	24	24	18	12	09	07	04	02	00	12
20,000	24	24	17	12	09	07	05	03	00	13
30,000	25	20	16	13	09	08	06	04	00	14
100,000	25	20	15	13	09	07	06	04	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	00	00	00	40	00	60	00	00	1
200	00	07	14	00	41	17	21	00	00	2
300	00	05	11	08	32	13	32	00	00	3
500	00	07	09	07	37	12	28	00	00	4
700	00	06	08	06	31	10	24	00	16	5
1,000	00	07	05	10	24	17	16	00	21	6
1,500	00	04	06	12	16	14	15	14	18	7
2,000	00	09	13	17	17	14	14	07	10	8
3,000	00	09	15	19	19	15	11	06	06	9
5,000	00	08	15	19	19	15	11	07	07	10
10,000	00	03	06	07	09	11	12	14	37	11
15,000	00	03	06	07	09	11	12	14	38	12
20,000	00	03	05	06	08	10	12	15	41	13
30,000	00	02	03	05	06	08	12	16	48	14
100,000	00	02	03	05	06	08	11	16	49	15

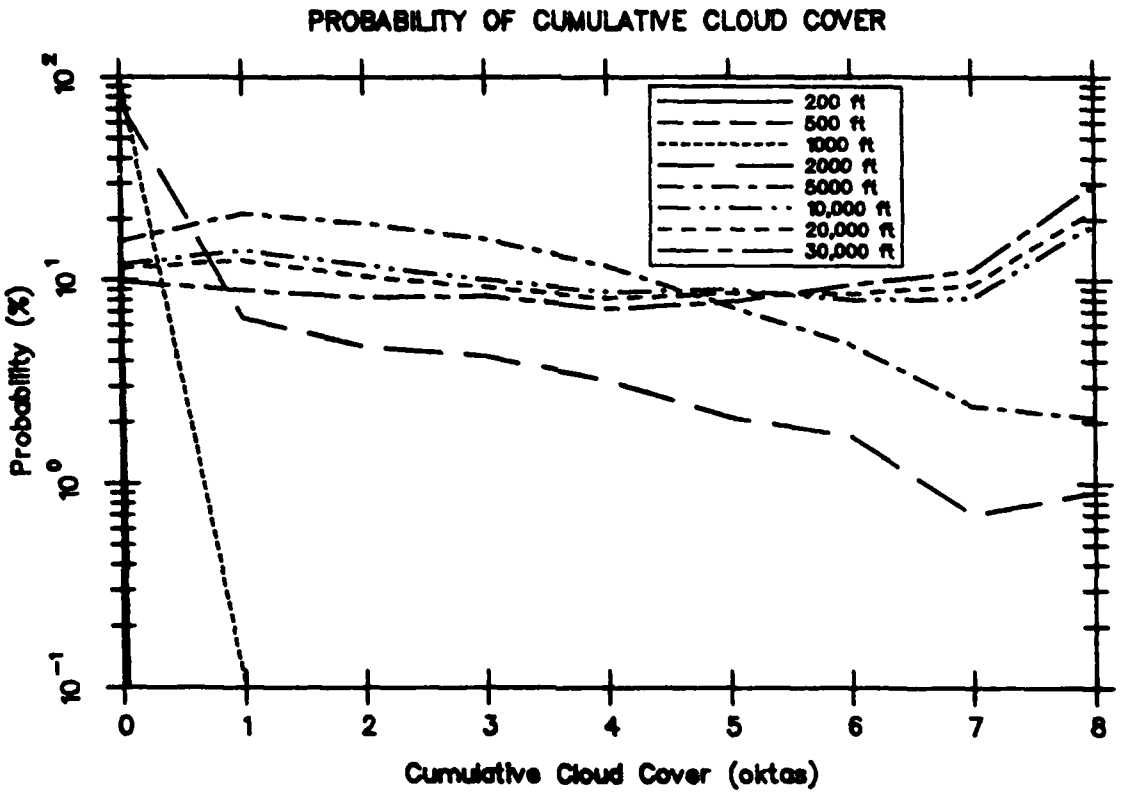

FIGURE 29. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR MANAGUA/SANDINO, NICARAGUA, WMO STATION 787410.

TABLE 33. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM SAN JOSE, COSTA RICA, WMO STATION 787620.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT (FT)	% OF OCCURRENCES IN EACH OCTA -00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	97	01	01	01	00	00	00	00	00	01
200	94	01	02	02	00	00	00	00	00	02
300	93	01	02	03	00	00	00	00	00	03
500	90	02	03	03	01	00	00	00	00	04
700	89	03	03	03	01	00	00	00	01	05
1,000	84	04	04	03	01	01	01	01	01	06
1,500	81	05	05	03	01	01	01	01	01	07
2,000	76	07	06	04	01	02	02	01	02	08
3,000	63	12	08	05	03	03	03	01	02	09
5,000	39	21	13	09	05	06	04	02	02	10
10,000	35	18	10	08	05	06	04	03	09	11
15,000	26	14	08	06	06	07	05	07	21	12
20,000	26	14	08	06	05	07	05	07	22	13
30,000	18	09	05	05	04	06	08	13	31	14
100,000	18	09	05	05	05	06	08	13	31	15
STD DEV	03	02	01	01	01	00	01	01	04	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	98	00	01	01	00	00	00	00	00	1
200	96	01	01	02	00	00	00	00	00	2
300	95	01	02	02	00	00	00	00	00	3
500	93	02	02	02	00	00	00	00	00	4
700	92	02	03	02	00	00	00	00	00	5
1,000	89	04	03	02	00	00	00	00	00	6
1,500	87	05	04	02	01	00	00	00	00	7
2,000	84	07	05	03	01	01	00	00	00	8
3,000	73	12	07	04	02	02	01	00	00	9
5,000	50	23	12	08	03	03	01	00	00	10
10,000	50	22	11	07	04	03	02	01	00	11
15,000	47	22	11	07	05	04	02	02	00	12
20,000	47	22	11	07	05	05	02	02	00	13
30,000	44	19	09	08	05	05	05	04	00	14
100,000	44	19	09	08	05	05	05	04	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	05	15	41	12	05	03	05	14	1
200	00	07	20	43	09	03	02	04	11	2
300	00	07	22	41	09	03	03	04	11	3
500	00	09	22	34	09	04	03	05	14	4
700	00	09	21	31	08	05	05	06	15	5
1,000	00	10	20	22	07	08	10	08	16	6
1,500	00	09	18	17	07	11	12	09	17	7
2,000	00	10	17	15	07	12	14	09	17	8
3,000	00	10	14	14	10	15	14	08	14	9
5,000	00	12	14	16	12	16	13	07	11	10
10,000	00	08	09	10	09	13	11	10	30	11
15,000	00	04	04	05	06	09	09	14	48	12
20,000	00	04	04	05	06	09	09	14	49	13
30,000	00	02	02	03	04	06	10	19	53	14
100,000	00	02	02	03	04	06	10	19	53	15

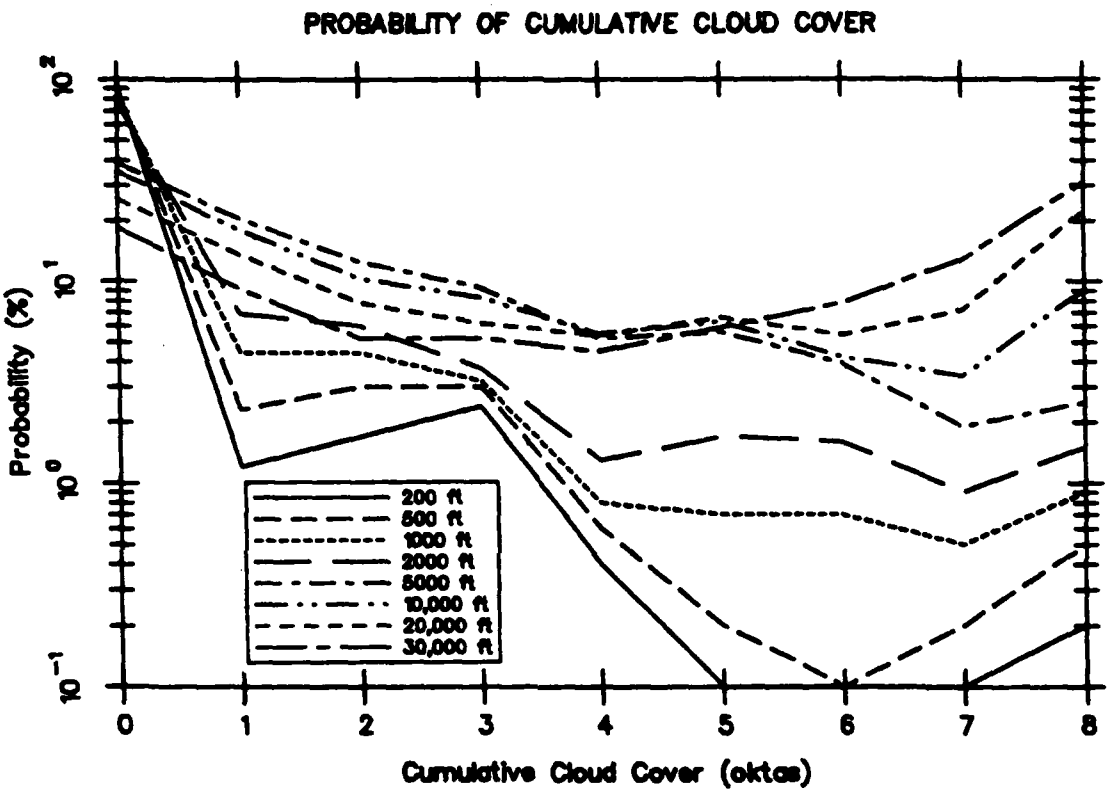

FIGURE 30. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR SAN JOSE, COSTA RICA, WMO STATION 787620.

TABLE 34. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FROM TOCUMEN, PANAMA, WMO STATION 787920.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	100	00	00	00	00	00	00	00	00	02
300	99	00	00	00	00	00	00	00	00	03
500	98	01	01	00	00	00	00	00	00	04
700	96	02	01	00	00	00	00	00	00	05
1,000	93	04	02	01	00	00	00	00	00	06
1,500	84	06	04	02	01	02	00	00	00	07
2,000	09	40	26	13	06	04	01	00	00	08
3,000	01	43	28	14	07	05	01	00	00	09
5,000	01	43	28	14	07	05	01	01	00	10
10,000	01	32	18	09	10	12	05	07	07	11
15,000	00	31	17	08	10	13	06	07	08	12
20,000	00	31	17	08	10	13	06	07	08	13
30,000	00	19	09	04	09	12	09	16	21	14
100,000	00	19	09	04	09	12	09	16	22	15
STD DEV	00	08	03	01	01	01	01	03	08	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	99	00	00	00	00	00	00	00	00	3
500	98	01	01	00	00	00	00	00	00	4
700	97	01	01	00	00	00	00	00	00	5
1,000	94	04	02	00	00	00	00	00	00	6
1,500	89	05	03	01	01	01	00	00	00	7
2,000	12	46	26	11	04	02	00	00	00	8
3,000	02	50	28	12	05	03	00	00	00	9
5,000	01	51	28	12	05	03	00	00	00	10
10,000	01	48	22	09	08	08	02	01	00	11
15,000	01	47	22	09	09	08	02	02	00	12
20,000	01	47	22	09	09	08	02	02	00	13
30,000	00	43	16	07	12	11	06	05	00	14
100,000	00	43	16	07	12	11	06	05	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	16	05	24	11	27	16	00	00	1
200	00	18	30	25	13	08	05	00	00	2
300	00	15	38	29	13	04	02	00	00	3
500	00	23	40	24	08	04	01	00	00	4
700	00	26	42	21	08	03	01	00	00	5
1,000	00	31	31	14	08	08	04	03	00	6
1,500	00	15	21	17	15	21	06	04	01	7
2,000	00	22	29	22	13	11	03	02	00	8
3,000	00	21	27	21	13	12	04	02	00	9
5,000	00	21	27	21	13	13	04	02	00	10
10,000	00	10	11	08	12	18	10	15	17	11
15,000	00	09	10	07	12	18	10	15	18	12
20,000	00	09	10	07	12	19	10	15	18	13
30,000	00	04	04	03	08	12	11	23	36	14
100,000	00	04	04	03	08	12	11	23	36	15

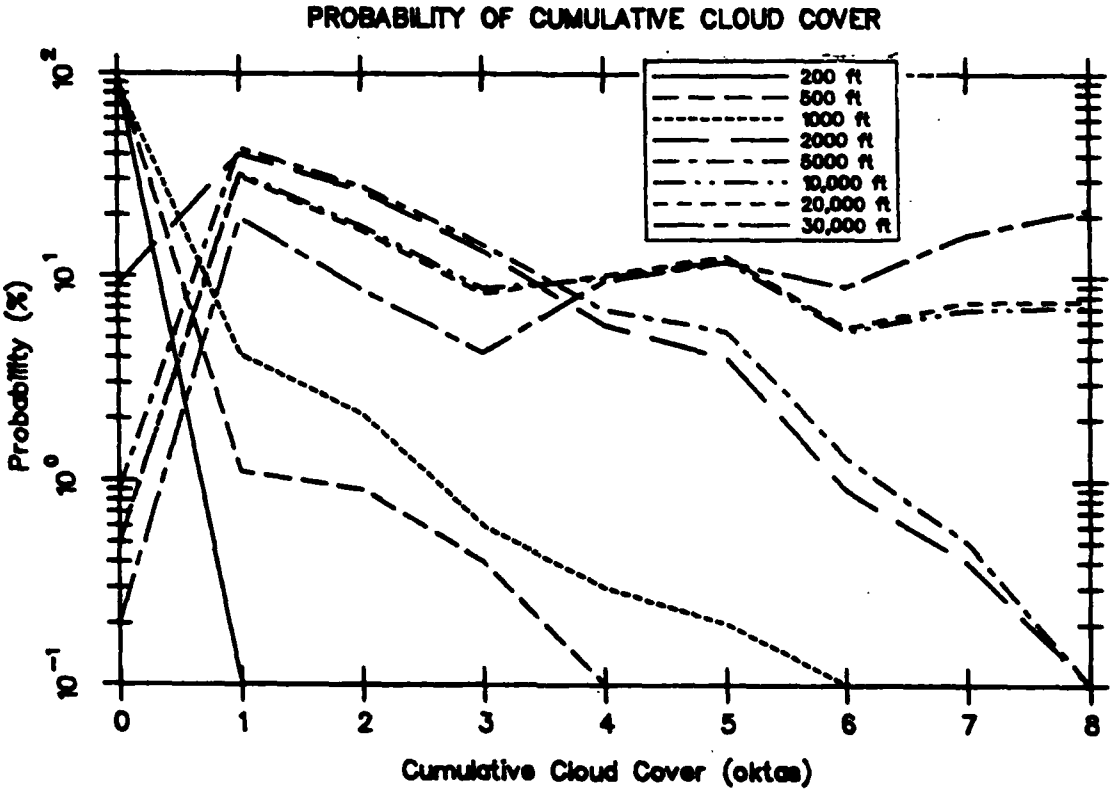

FIGURE 31. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR TOCUMEN, PANAMA, WMO STATION 787920.

TABLE 35. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE DATA FOR HOWARD AFB, PANAMA, WMO STATION 788060.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	01
200	100	00	00	00	00	00	00	00	00	02
300	100	00	00	00	00	00	00	00	00	03
500	99	00	00	00	00	00	00	00	00	04
700	99	01	00	00	00	00	00	00	00	05
1,000	95	04	01	00	00	00	00	00	00	06
1,500	74	20	04	01	00	00	00	00	00	07
2,000	39	32	17	08	03	01	00	00	00	08
3,000	23	31	22	13	06	03	01	01	00	09
5,000	17	27	22	15	09	05	02	01	01	10
10,000	13	16	16	13	11	12	08	06	06	11
15,000	11	13	14	13	11	13	09	08	07	12
20,000	11	12	13	12	11	13	09	08	10	13
30,000	05	06	07	07	07	08	10	12	38	14
100,000	05	05	06	06	07	08	10	13	39	15
STD DEV	04	02	02	01	01	01	02	03	08	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	100	00	00	00	00	00	00	00	00	1
200	100	00	00	00	00	00	00	00	00	2
300	100	00	00	00	00	00	00	00	00	3
500	99	00	00	00	00	00	00	00	00	4
700	99	01	00	00	00	00	00	00	00	5
1,000	96	03	01	00	00	00	00	00	00	6
1,500	78	19	03	01	00	00	00	00	00	7
2,000	45	33	15	06	02	00	00	00	00	8
3,000	29	34	21	10	04	01	00	00	00	9
5,000	23	32	22	13	06	03	01	00	00	10
10,000	21	24	20	14	09	07	03	01	00	11
15,000	21	20	19	15	10	09	04	02	00	12
20,000	21	20	19	14	10	09	04	02	00	13
30,000	18	16	17	14	12	10	08	05	00	14
100,000	18	16	16	13	12	10	08	05	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	25	32	17	18	00	07	00	00	1
200	00	25	32	20	17	00	06	00	00	2
300	00	29	31	19	15	00	05	00	00	3
500	00	40	28	13	13	00	06	00	00	4
700	00	43	26	12	11	02	05	01	00	5
1,000	00	54	21	09	06	03	04	02	01	6
1,500	00	57	20	10	05	03	02	01	01	7
2,000	00	29	30	21	11	04	02	01	01	8
3,000	00	19	26	23	15	08	04	02	02	9
5,000	00	13	21	22	18	12	07	04	03	10
10,000	00	05	10	12	14	18	14	14	14	11
15,000	00	04	08	11	13	19	15	15	16	12
20,000	00	03	07	10	12	17	15	15	22	13
30,000	00	01	02	03	05	07	11	16	54	14
100,000	00	01	02	03	05	07	11	16	55	15

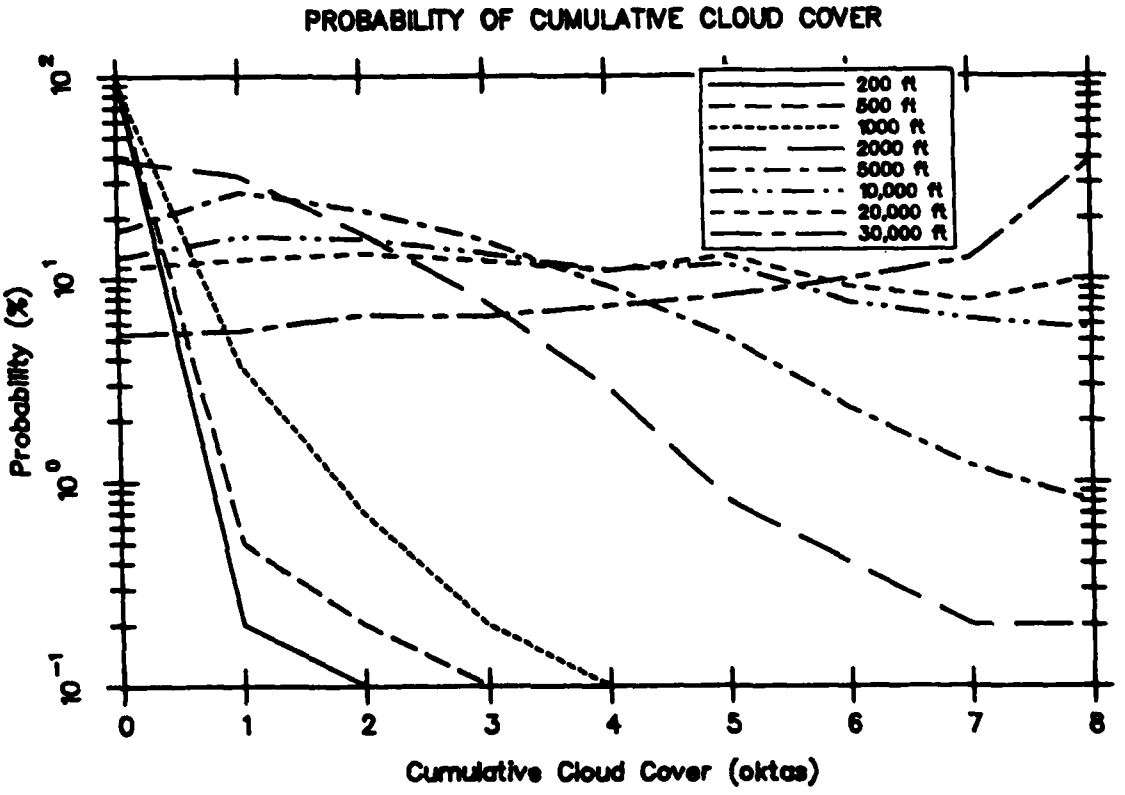

FIGURE 32. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR HOWARD AFB, PANAMA, WMO STATION 788060.

TABLE 36. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE WINTER DATA FROM BITBURG, WEST GERMANY, WMO STATION 106100.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	93	02	02	01	01	00	00	00	00	01
200	92	02	02	01	01	00	00	00	01	02
300	90	02	02	01	01	01	01	01	02	03
500	83	02	03	02	01	01	01	01	05	04
700	77	02	03	02	01	02	02	02	09	05
1,000	66	03	04	03	02	03	03	03	14	06
1,500	52	03	05	03	02	03	04	04	23	07
2,000	43	04	06	03	03	04	04	06	28	08
3,000	33	04	05	03	03	05	05	08	35	09
5,000	26	03	04	03	02	05	06	10	41	10
10,000	20	03	05	03	02	04	07	11	45	11
15,000	18	04	05	03	03	04	07	11	46	12
20,000	15	03	05	03	03	04	07	12	48	13
30,000	14	03	05	03	03	04	07	13	49	14
100,000	11	04	05	03	03	04	08	13	49	15
STD DEV	09	02	02	01	01	01	03	10	08	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	95	02	01	01	00	00	00	00	00	1
200	95	02	01	01	00	00	00	00	00	2
300	95	02	02	01	00	00	00	00	00	3
500	93	02	02	01	01	01	00	00	00	4
700	91	02	02	02	01	01	01	00	00	5
1,000	86	03	04	02	01	01	01	00	00	6
1,500	81	05	06	03	02	02	01	01	00	7
2,000	75	05	07	04	02	03	02	01	00	8
3,000	69	07	08	04	03	04	03	02	00	9
5,000	65	08	08	04	03	04	04	03	00	10
10,000	59	09	10	05	04	05	05	04	00	11
15,000	56	10	11	06	04	05	05	04	00	12
20,000	52	09	12	06	05	05	06	05	00	13
30,000	49	10	12	06	05	05	06	06	00	14
100,000	42	12	14	07	05	06	07	06	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	14	22	18	14	14	14	05	00	1
200	00	08	14	11	09	07	08	10	32	2
300	00	04	09	08	07	07	08	11	44	3
500	00	03	06	06	05	08	09	11	52	4
700	00	02	05	05	04	07	09	12	56	5
1,000	00	02	05	04	04	07	08	10	60	6
1,500	00	01	04	03	03	06	07	11	65	7
2,000	00	01	03	03	03	06	07	12	65	8
3,000	00	01	02	02	03	06	07	12	66	9
5,000	00	01	02	02	02	05	07	14	68	10
10,000	00	01	02	02	02	04	08	14	68	11
15,000	00	01	02	02	02	04	08	14	68	12
20,000	00	01	02	01	02	04	07	15	68	13
30,000	00	01	02	01	02	04	07	16	68	14
100,000	00	01	02	01	02	04	08	15	67	15

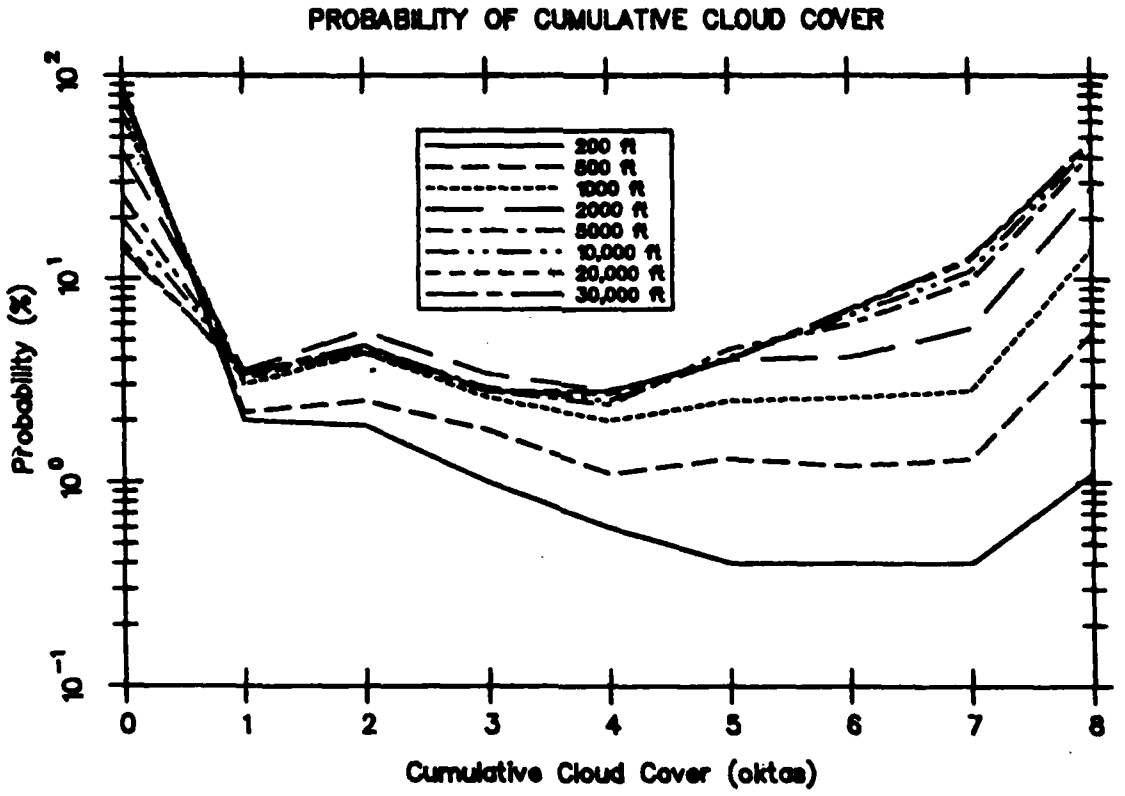

FIGURE 33. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES IN WINTER FOR BITBURG, WEST GERMANY, WMO STATION 106100.

TABLE 37. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE SPRING DATA FOR BITBURG, WEST GERMANY, WMO STATION 106100.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	97	01	01	00	00	00	00	00	00	01
200	97	01	01	00	00	00	00	00	00	02
300	96	01	01	00	00	00	00	00	00	03
500	94	02	01	01	00	00	00	00	01	04
700	91	02	01	01	01	01	01	01	02	05
1,000	86	03	02	01	01	01	01	01	03	06
1,500	78	03	03	02	02	02	02	02	06	07
2,000	70	04	04	03	02	03	03	02	09	08
3,000	54	06	07	04	03	04	05	04	13	09
5,000	34	08	09	06	04	06	07	07	19	10
10,000	24	07	08	05	04	07	09	10	25	11
15,000	22	08	08	05	04	07	09	10	26	12
20,000	17	07	08	05	04	06	10	13	29	13
30,000	14	06	08	05	04	06	11	14	31	14
100,000	11	06	08	05	05	07	12	14	32	15
STD DEV	05	02	03	02	01	02	03	09	08	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	98	01	01	00	00	00	00	00	00	1
200	98	01	01	00	00	00	00	00	00	2
300	98	01	01	00	00	00	00	00	00	3
500	97	02	01	00	00	00	00	00	00	4
700	96	02	01	01	00	00	00	00	00	5
1,000	93	03	02	01	01	00	00	00	00	6
1,500	90	03	03	01	01	01	01	00	00	7
2,000	86	04	04	02	01	01	01	00	00	8
3,000	75	07	07	04	02	02	02	01	00	9
5,000	58	12	12	06	04	04	03	01	00	10
10,000	50	13	13	07	04	05	05	02	00	11
15,000	48	14	14	07	05	05	05	03	00	12
20,000	42	15	15	07	05	06	06	04	00	13
30,000	38	15	16	08	06	06	07	04	00	14
100,000	32	15	17	09	06	08	08	05	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	26	25	17	13	05	07	08	00	1
200	00	19	21	13	14	07	07	11	08	2
300	00	14	15	11	13	10	08	14	15	3
500	00	08	10	09	09	10	12	13	27	4
700	00	05	08	08	07	10	15	13	34	5
1,000	00	04	08	07	06	09	14	11	40	6
1,500	00	03	06	06	06	10	12	12	46	7
2,000	00	03	06	06	05	09	12	11	48	8
3,000	00	03	06	06	06	09	12	12	46	9
5,000	00	02	05	05	05	10	13	15	45	10
10,000	00	02	04	04	04	08	13	16	49	11
15,000	00	02	04	04	04	08	13	17	49	12
20,000	00	01	04	03	04	07	12	19	50	13
30,000	00	01	03	03	04	07	13	19	50	14
100,000	00	01	03	03	04	07	14	19	50	15

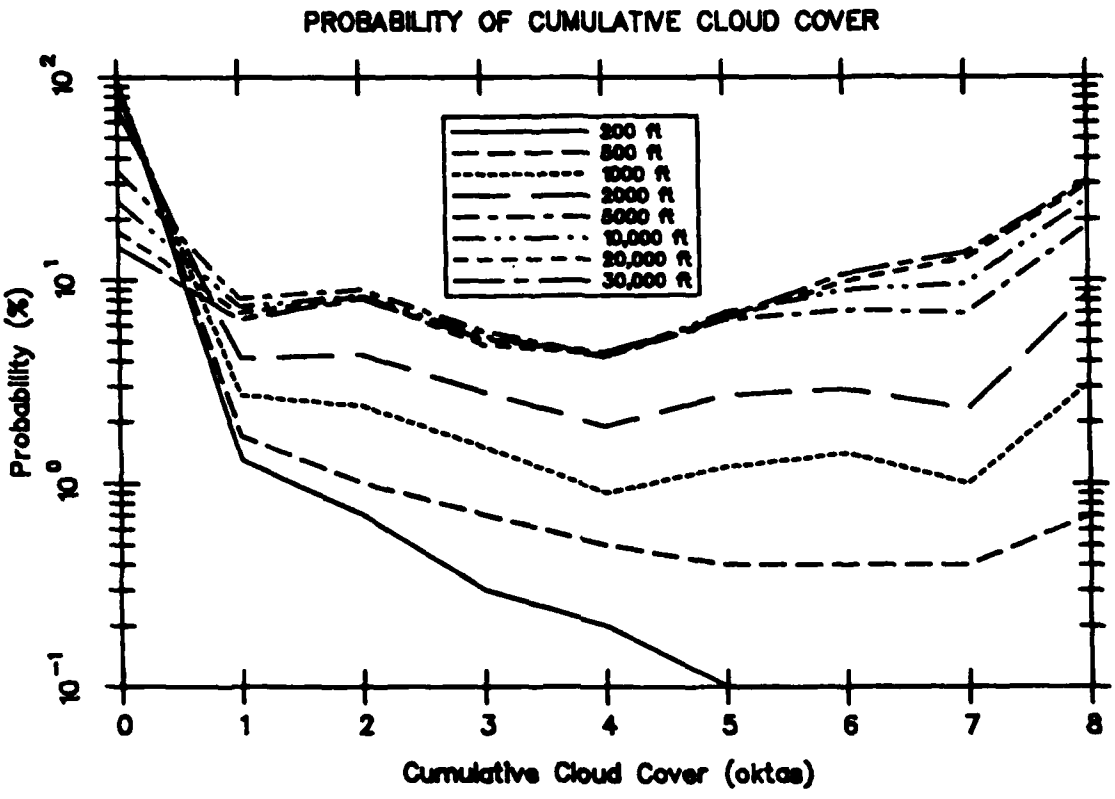

FIGURE 34. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES IN SPRING FOR BITBURG, WEST GERMANY, WMO STATION 106100.

TABLE 38. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE SUMMER DATA FOR RITBURG, WEST GERMANY, WMO STATION 106100.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT (FT)	% OF OCCURRENCES IN EACH OCTA -00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	97	01	01	00	00	00	00	00	00	01
200	97	01	01	00	00	00	00	00	00	02
300	96	01	01	00	00	00	00	00	00	03
500	94	02	02	01	00	01	00	00	01	04
700	91	02	02	01	01	01	01	00	01	05
1,000	86	03	03	01	01	01	01	01	02	06
1,500	78	03	04	02	02	02	02	01	05	07
2,000	72	04	05	03	02	03	03	02	06	08
3,000	55	07	08	05	03	04	04	03	09	09
5,000	35	09	10	07	05	07	07	06	14	10
10,000	24	08	09	06	05	07	10	11	22	11
15,000	23	08	09	05	05	07	10	11	23	12
20,000	19	07	08	05	05	06	10	14	25	13
30,000	16	07	08	05	05	06	11	15	26	14
100,000	13	07	08	05	05	07	12	15	27	15
STD DEV	06	02	03	01	01	02	03	09	09	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	98	01	01	00	00	00	00	00	00	1
200	98	01	01	00	00	00	00	00	00	2
300	97	01	01	00	00	00	00	00	00	3
500	96	02	01	00	00	00	00	00	00	4
700	95	02	01	01	00	00	00	00	00	5
1,000	93	03	02	01	01	01	00	00	00	6
1,500	89	03	04	02	01	01	01	00	00	7
2,000	85	04	05	02	01	01	01	00	00	8
3,000	73	08	08	04	02	02	01	00	00	9
5,000	56	13	12	07	04	04	03	01	00	10
10,000	48	14	13	07	05	05	05	03	00	11
15,000	47	15	14	07	05	05	05	03	00	12
20,000	42	15	14	08	06	06	06	04	00	13
30,000	39	15	15	08	06	06	07	05	00	14
100,000	34	15	16	09	07	07	08	05	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	23	26	15	11	10	08	07	01	1
200	00	19	24	14	09	09	10	06	10	2
300	00	14	22	12	10	10	09	07	16	3
500	00	08	16	09	08	13	10	08	27	4
700	00	06	12	08	07	13	13	09	33	5
1,000	00	05	10	07	07	12	14	09	35	6
1,500	00	04	09	07	06	11	14	10	40	7
2,000	00	03	08	07	07	11	13	10	40	8
3,000	00	04	09	08	07	11	13	11	38	9
5,000	00	03	07	06	06	12	14	14	38	10
10,000	00	02	04	04	05	08	14	18	44	11
15,000	00	02	04	04	04	08	14	19	44	12
20,000	00	02	04	04	04	07	14	21	45	13
30,000	00	01	03	03	04	07	14	22	44	14
100,000	00	01	03	03	04	07	14	22	44	15

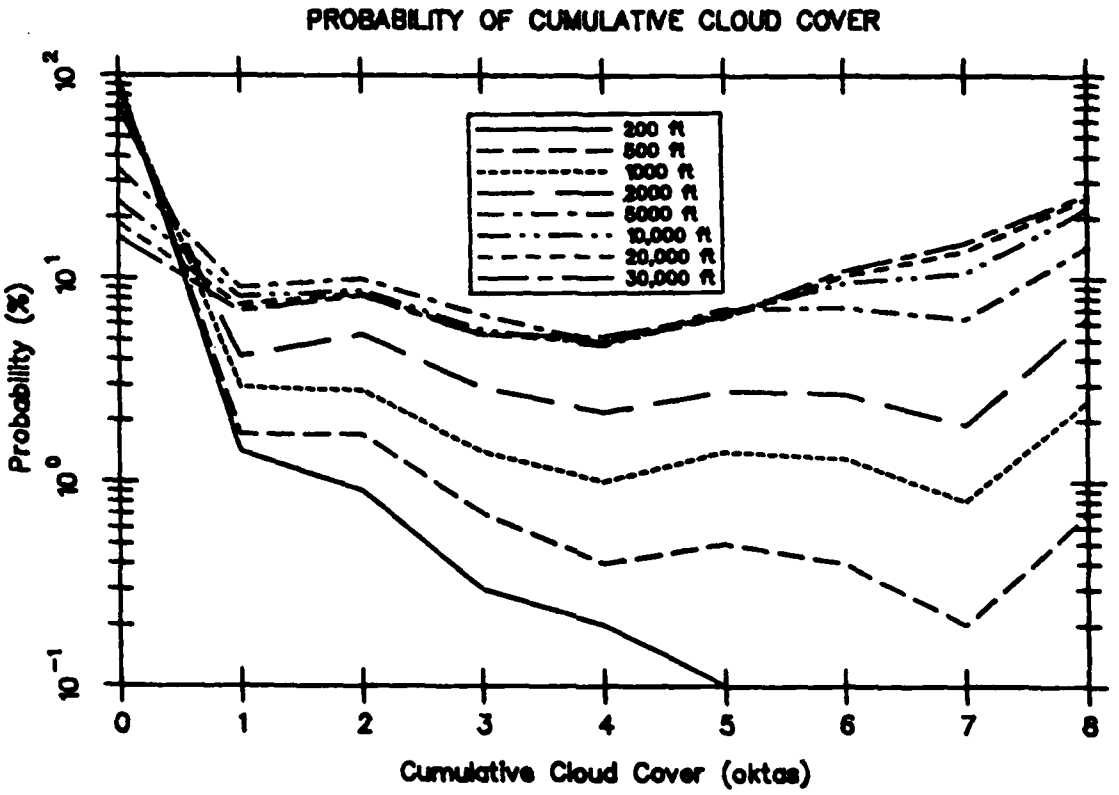

FIGURE 35. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES IN SUMMER FOR BITBURG, WEST GERMANY, WMO STATION 106100.

TABLE 39. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER ALL OF THE FALL DATA FOR BITBURG, WEST GERMANY, WMO STATION 106100.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	94	02	02	01	00	00	00	00	00	01
200	92	02	02	01	01	00	00	01	01	02
300	90	02	02	01	01	01	01	01	02	03
500	83	03	03	02	01	01	01	01	05	04
700	77	03	03	02	01	02	02	02	08	05
1,000	66	04	05	03	02	03	03	03	12	06
1,500	54	04	05	03	02	04	05	04	19	07
2,000	46	04	06	04	03	04	05	05	23	08
3,000	35	05	06	04	03	05	06	07	30	09
5,000	26	04	05	04	03	04	06	10	37	10
10,000	19	04	05	03	03	04	07	12	42	11
15,000	18	05	05	04	03	04	07	12	42	12
20,000	14	04	05	03	03	04	07	14	45	13
30,000	12	04	05	04	03	04	08	14	45	14
100,000	10	04	05	04	03	05	08	15	46	15
STD DEV	06	02	03	02	01	01	03	11	11	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	96	02	01	01	00	00	00	00	00	1
200	96	02	01	01	00	00	00	00	00	2
300	95	02	01	01	00	00	00	00	00	3
500	92	03	02	01	01	01	00	00	00	4
700	90	03	03	01	01	01	01	00	00	5
1,000	85	04	05	02	01	01	01	00	00	6
1,500	79	06	06	03	02	02	02	01	00	7
2,000	75	06	07	04	02	03	02	01	00	8
3,000	67	08	09	05	03	03	03	02	00	9
5,000	61	09	10	06	03	04	04	03	00	10
10,000	55	11	11	06	04	05	05	04	00	11
15,000	52	12	12	06	04	05	05	04	00	12
20,000	47	12	12	07	05	05	06	06	00	13
30,000	42	12	13	08	05	06	07	06	00	14
100,000	38	13	14	09	06	06	08	07	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	14	20	16	11	10	12	14	03	1
200	00	08	13	11	10	08	09	15	26	2
300	00	05	10	08	07	08	11	14	38	3
500	00	03	07	07	06	08	10	11	48	4
700	00	02	06	05	04	08	11	12	53	5
1,000	00	02	05	05	05	08	11	10	55	6
1,500	00	02	04	04	04	07	10	11	58	7
2,000	00	01	04	03	03	07	10	12	60	8
3,000	00	01	03	03	03	06	09	13	61	9
5,000	00	01	02	02	02	05	08	15	64	10
10,000	00	01	02	02	02	04	08	16	65	11
15,000	00	01	02	02	02	04	08	16	64	12
20,000	00	01	02	02	02	04	08	17	64	13
30,000	00	01	02	02	02	04	08	18	64	14
100,000	00	01	02	02	02	04	09	18	63	15

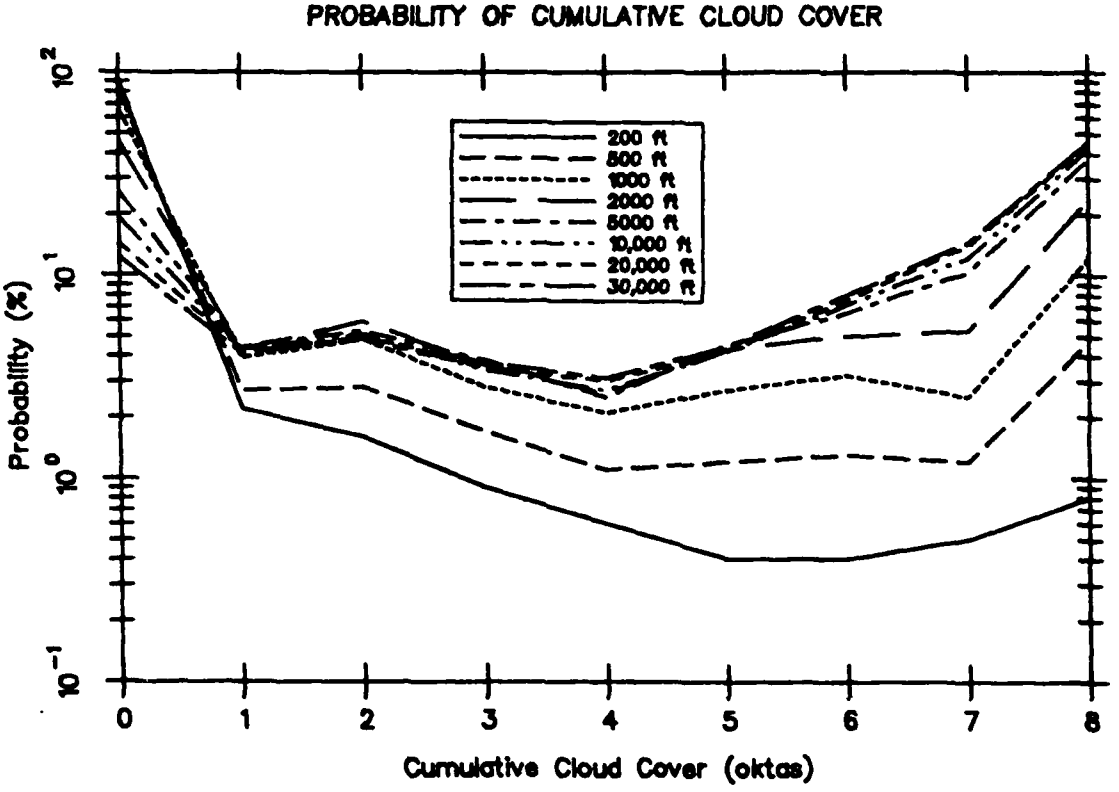

FIGURE 36. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES IN FALL FOR BITBURG, WEST GERMANY, WMO STATION 108100.

TABLE 40. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER 0600-1159 LST FOR THE SUMMER DATA FOR BITBURG, WEST GERMANY, WMO STATION 106100.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT	% OF OCCURRENCES IN EACH OCTA									
(FT)	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	94	03	02	01	00	00	00	00	00	01
200	93	03	02	01	00	00	00	00	00	02
300	92	03	02	01	00	00	00	00	00	03
500	88	04	03	01	01	01	01	01	01	04
700	83	04	03	01	01	02	02	01	03	05
1,000	73	06	05	02	02	03	03	02	05	06
1,500	61	07	06	03	02	04	04	03	08	07
2,000	54	07	07	04	03	05	05	04	11	08
3,000	43	08	07	05	04	06	06	06	14	09
5,000	32	09	07	05	04	06	08	09	20	10
10,000	23	09	06	04	04	05	09	13	27	11
15,000	21	09	07	04	03	05	09	14	28	12
20,000	17	08	07	04	04	05	10	15	30	13
30,000	14	07	06	04	04	05	11	17	31	14
100,000	10	07	07	05	05	06	12	17	32	15
STD DEV	07	04	03	03	02	03	04	10	11	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	95	03	01	00	00	00	00	00	00	1
200	95	03	01	00	00	00	00	00	00	2
300	95	03	02	00	00	00	00	00	00	3
500	92	04	02	01	00	00	00	00	00	4
700	91	04	03	01	01	01	00	00	00	5
1,000	84	06	04	02	01	01	01	00	00	6
1,500	79	07	06	03	02	02	01	00	00	7
2,000	74	08	07	03	02	03	02	01	00	8
3,000	66	11	08	05	03	04	02	01	00	9
5,000	58	14	09	05	04	04	04	02	00	10
10,000	50	16	11	06	04	04	05	04	00	11
15,000	49	17	11	06	04	04	05	04	00	12
20,000	42	17	13	07	05	05	06	05	00	13
30,000	37	18	13	08	06	06	07	06	00	14
100,000	29	19	14	09	07	06	09	06	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	24	24	13	11	12	09	06	00	1
200	00	20	22	12	10	10	10	05	10	2
300	00	16	20	09	09	11	09	06	20	3
500	00	09	15	08	07	14	12	09	26	4
700	00	06	10	07	06	14	14	10	33	5
1,000	00	06	09	07	07	13	14	12	33	6
1,500	00	04	07	06	06	13	15	12	38	7
2,000	00	03	06	05	06	12	14	13	39	8
3,000	00	03	05	05	06	11	13	15	41	9
5,000	00	03	04	04	05	08	14	18	44	10
10,000	00	02	03	03	03	06	12	21	50	11
15,000	00	02	03	03	03	06	12	21	50	12
20,000	00	02	03	03	03	05	13	22	50	13
30,000	00	01	03	03	03	05	13	23	49	14
100,000	00	01	02	03	04	05	13	23	48	15

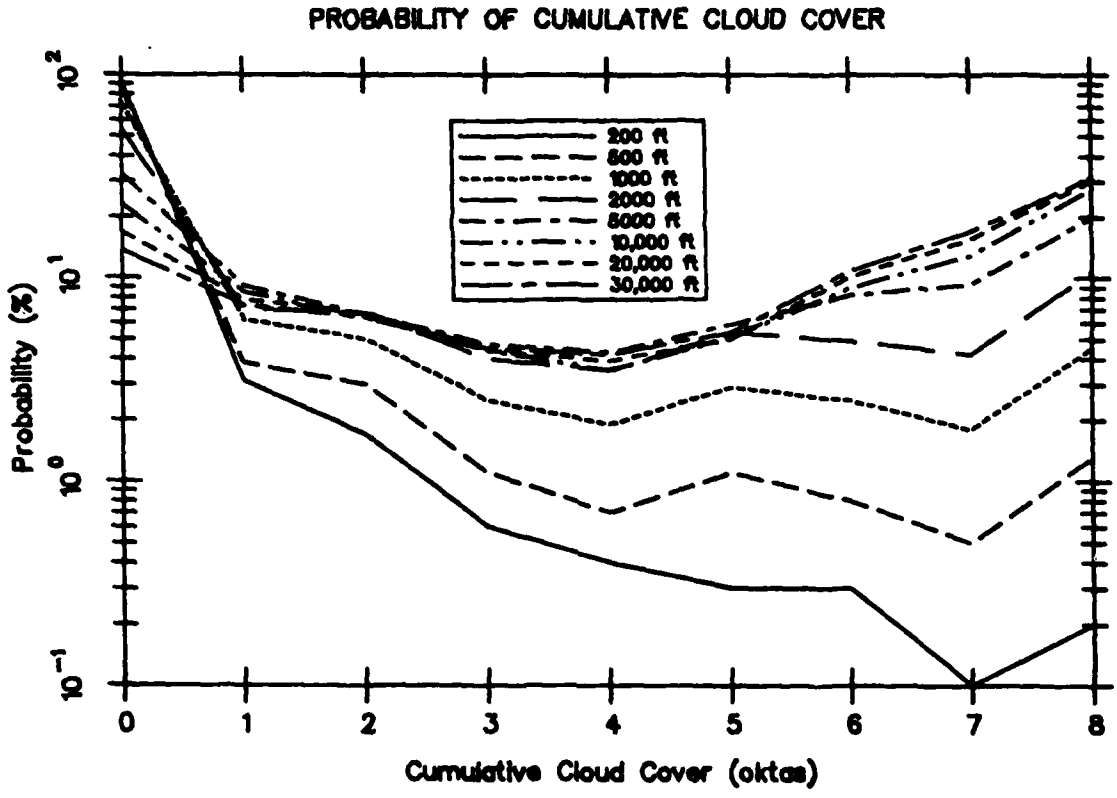

FIGURE 37. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES IN SUMMER DURING THE HOURS 0500 - 1159 LST FOR BITBURG, WEST GERMANY, WMO STATION 106100.

TABLE 41. PROBABILITIES AS A FUNCTION OF ALTITUDE OF CUMULATIVE CLOUD AMOUNTS AVERAGED OVER 1800-2359 LST FOR THE SUMMER DATA FOR BITBURG, WEST GERMANY, WMO STATION 106100.

(a) PROBABILITY OF CUMULATIVE CLOUD COVER

HEIGHT (FT)	% OF OCCURRENCES IN EACH OCTA -00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	99	00	00	00	00	00	00	00	00	01
200	99	01	00	00	00	00	00	00	00	02
300	98	01	00	00	00	00	00	00	00	03
500	97	01	01	00	00	00	00	00	00	04
700	96	01	01	00	00	00	00	00	01	05
1,000	93	01	01	01	01	01	01	00	02	06
1,500	88	02	02	01	01	01	01	00	03	07
2,000	84	03	03	02	01	01	01	01	04	08
3,000	68	07	07	03	02	02	02	01	06	09
5,000	40	12	12	06	04	06	05	04	10	10
10,000	25	10	11	06	05	07	09	08	18	11
15,000	23	10	11	06	05	07	09	09	19	12
20,000	18	09	11	06	06	07	10	12	21	13
30,000	14	08	11	06	06	07	11	14	23	14
100,000	11	08	11	07	06	08	12	14	24	15
STD DEV	06	03	04	02	03	03	03	10	09	

(b) CONDITIONAL PROBABILITY, NO CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	99	00	00	00	00	00	00	00	00	1
200	99	00	00	00	00	00	00	00	00	2
300	99	01	00	00	00	00	00	00	00	3
500	98	01	01	00	00	00	00	00	00	4
700	98	01	01	00	00	00	00	00	00	5
1,000	96	01	01	00	00	00	00	00	00	6
1,500	94	02	02	01	00	00	00	00	00	7
2,000	92	02	03	01	01	01	00	00	00	8
3,000	81	08	07	02	01	01	01	00	00	9
5,000	57	16	13	06	03	03	02	01	00	10
10,000	46	16	15	07	05	05	04	02	00	11
15,000	43	17	16	07	05	05	04	02	00	12
20,000	37	17	18	08	06	05	05	03	00	13
30,000	33	17	19	09	07	06	06	04	00	14
100,000	26	17	20	10	07	07	08	04	00	15

(c) CONDITIONAL PROBABILITY, CLOUD OBSERVED

	-00-	-01-	-02-	-03-	-04-	-05-	-06-	-07-	-08-	
100	00	24	35	24	00	07	00	09	00	1
200	00	18	27	19	00	05	11	06	14	2
300	00	15	24	18	05	03	04	09	21	3
500	00	06	18	15	12	08	03	06	31	4
700	00	05	15	08	07	11	12	09	33	5
1,000	00	05	10	06	07	10	15	07	41	6
1,500	00	04	10	06	07	08	10	05	49	7
2,000	00	04	10	08	07	10	10	07	45	8
3,000	00	06	12	08	06	10	11	07	40	9
5,000	00	05	10	08	07	12	13	12	33	10
10,000	00	03	06	05	05	10	15	16	39	11
15,000	00	03	06	05	05	10	14	17	40	12
20,000	00	02	05	04	05	08	14	20	41	13
30,000	00	02	05	04	05	08	14	22	40	14
100,000	00	02	04	04	05	08	15	21	40	15

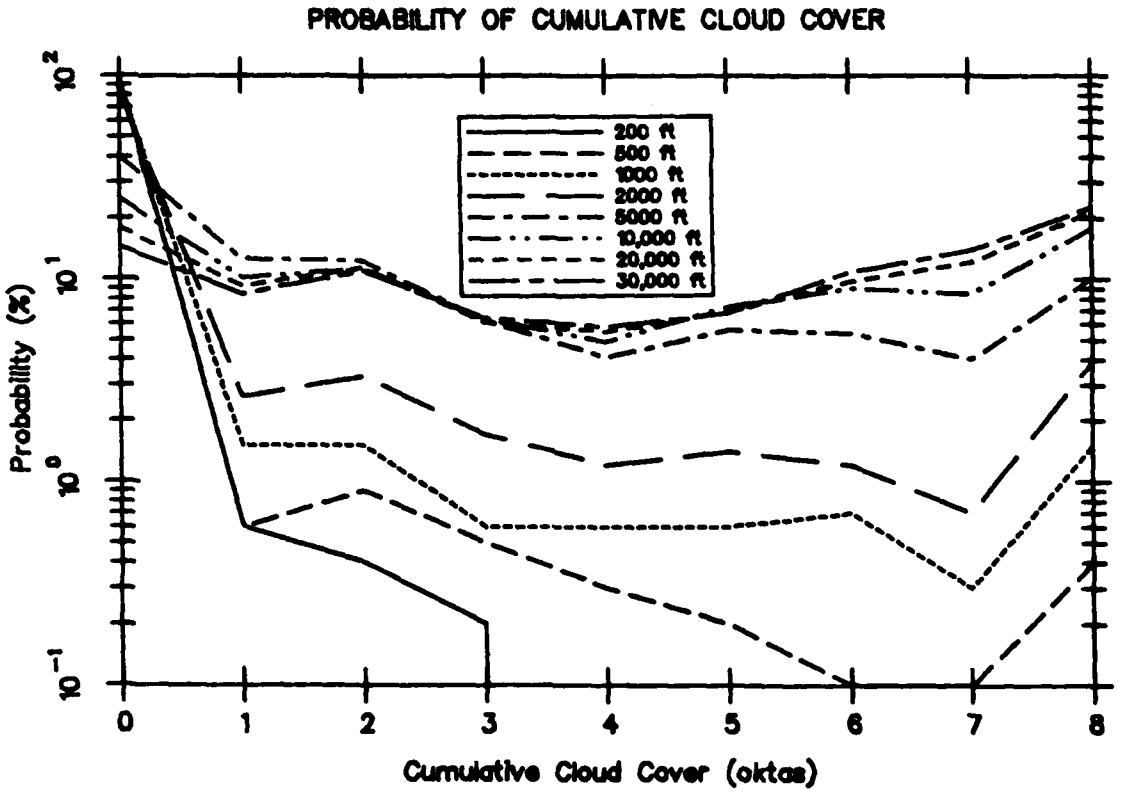

FIGURE 38. PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES IN SUMMER DURING THE HOURS 1800 - 2359 LST FOR BITBURG, WEST GERMANY, WMO STATION 106100.

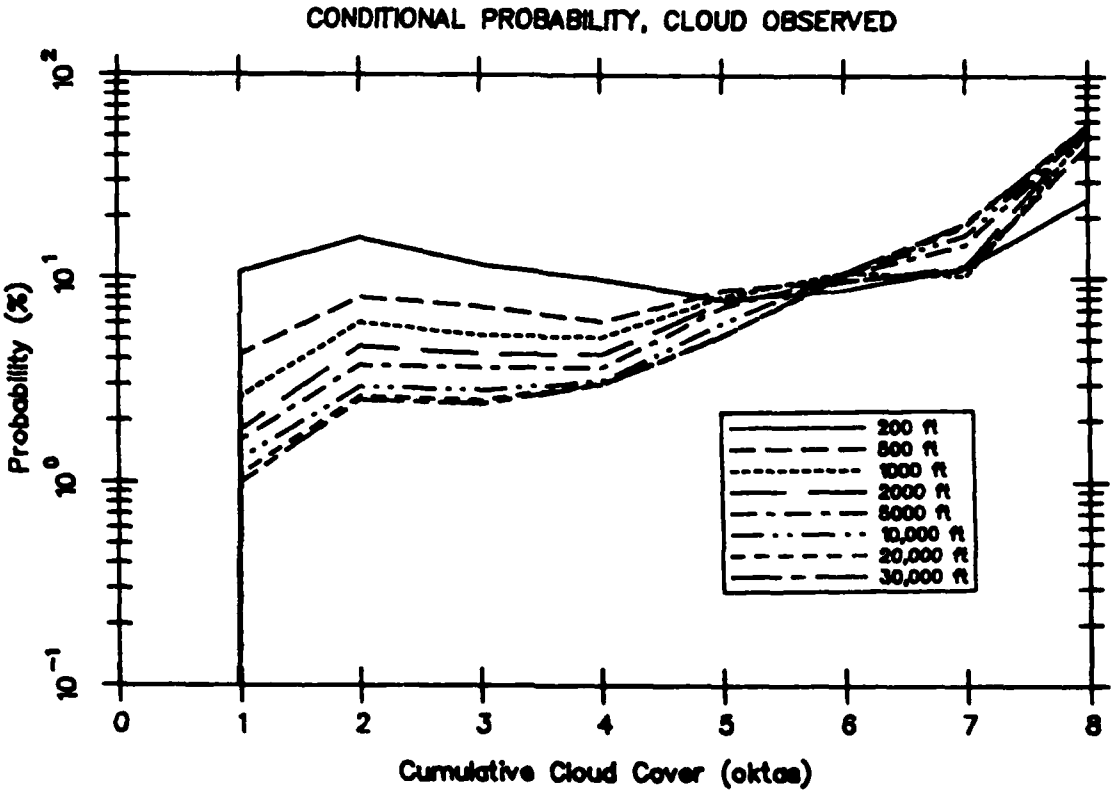

FIGURE 39. CONDITIONAL PROBABILITY OF CUMULATIVE CLOUD AMOUNTS OF SELECTED ALTITUDES FOR BITBURG, WEST GERMANY, WMO STATION 106100. THE RESULTS ASSUME THAT A CLOUD HAS BEEN REPORTED AT OR BELOW A GIVEN ALTITUDE.

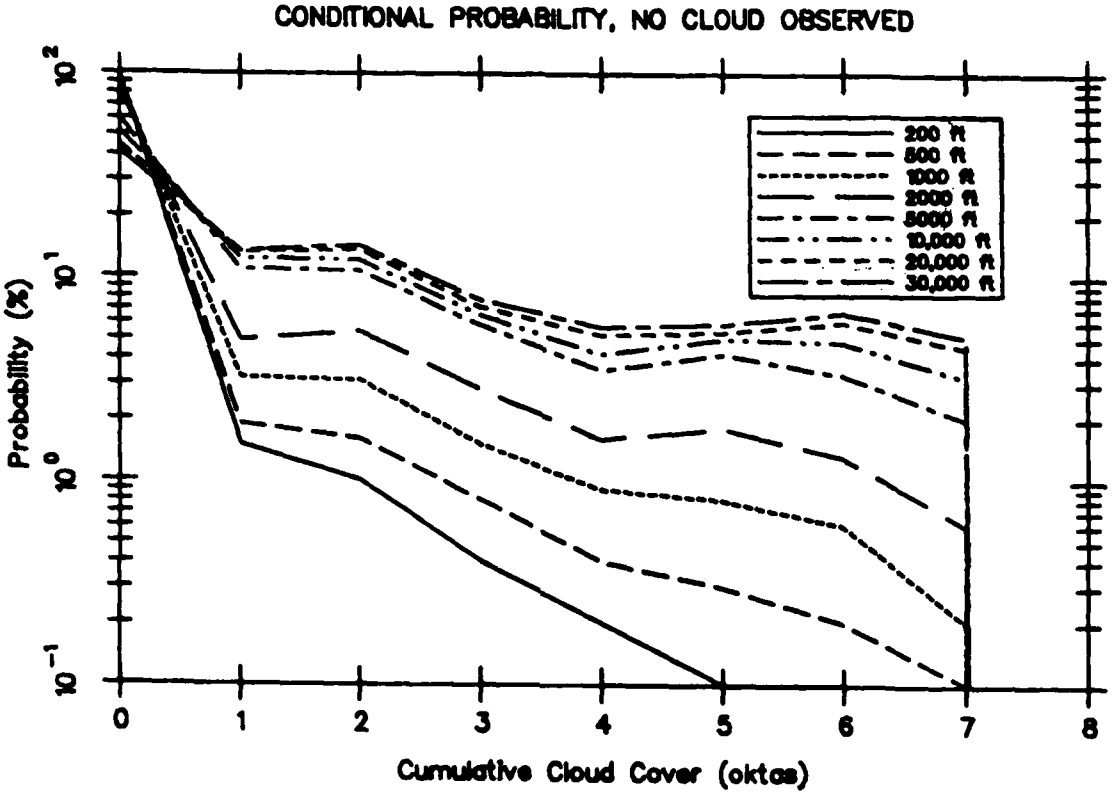

FIGURE 40. CONDITIONAL PROBABILITY OF CUMULATIVE CLOUD AMOUNTS AT SELECTED ALTITUDES FOR BITBURG, WEST GERMANY, WMO STATION 106100. THE RESULTS ASSUME THAT A CLOUD HAS NOT BEEN REPORTED AT OR BELOW A GIVEN ALTITUDE.

6

CONCLUSIONS AND RECOMMENDATIONS

This study reported on an analysis of cloud data from 41 stations from around the world. The data from the stations were examined to determine the amount of data and an assessment of the quality of the data made. From the orginal set of stations a smaller set of 29 stations was selected for analysis. The analysis made was of the historical probabilities of cumulative cloud cover at and below given altitudes and the probabilities of cumulative cloud cover with the additional knowledge that a cloud has or has not been reported at or below a given altitude. The analyses have been performed over the entire data set for each station, for each season and for the time periods 0000-0599, 0600-1159, 1200-1759 and 1800-2359 local time. Graphical and tabulated results have only been presented in this report for the complete data sets. The other results are contained on a magnetic tape.

6.1 HISTORICAL PROBABILITIES

The historical probabilities for Germany and Korea show general agreement from one location to another for altitudes above about 2,000 feet. For altitudes below this there are differences from one location to another that are most likely due to site-specific orographic differences. They also tend to show the existence of extensive cloud layers with amounts above 5/8 for altitudes below about 3,000 feet. The Middle East results show a tendency for low cloud amounts in general, as would be expected from a simple climatic examination. There appear to be few general conclusions that can be drawn concerning the results for Central America.

6.2 CONDITIONAL PROBABILITIES

The conditional probabilities have a marginal impact on the results for the German stations except for nearly clear or nearly overcast conditions. For the Middle East stations the conditional probabilities significantly increase the results for oktal values 4 or more when clouds are reported at or below given altitudes. For the Korean stations having knowledge of a cloud existing improves the probabilities for altitudes at and below about 1,000 feet. There seems to be no general conclusions to be drawn about the role of the conditional probabilities from the Central American results.

6.3 DATA QUALITY PROBLEMS

On examination the data were not always found to be following the guidelines for the particular type of observation. For example, METAR reports are not supposed to contain a value of the total cloud cover amount yet many reports did. Also, Airways cloud reports of layer amounts are supposed to be cumulative yet Howard AFB yielded Airways data in which the layer amounts were decreasing with altitude instead of increasing as required in the reporting rules. These data were discarded instead of attempting to guess what the observer was really doing.

6.4 PROBLEMS IN INTERPRETING THE DATA

One problem inherent with these results is how to utilize them with the new generation of EO systems. That is, clouds may be reported as "opaque" or "thin", as with Airways data, but how is one to relate those descriptors to the performance capabilities of EO systems? Also, with cumuliform clouds there is no information in the cloud data relat-

ing to the cellular nature of the clouds. That is, the sky may be half covered with clouds but the coverage may be by numerous small clouds that have enough gaps to enable a pilot the opportunity to survey a targeted area.

6.5 RECOMMENDATIONS FOR FUTURE WORK

The results presented form a basis for providing climatological data that can be used by field commanders for planning purposes. However, the results sutfer from inadequacies in the data that were used in the analysis. For example, METAR observations do not contain reports of the total sky coverage, thereby forcing one to make assumptions about the altitude distribution of cumulative cloud cover amount. This can be alleviated somewhat by augmenting METAR reports with satellite data of cloud cover amounts. The satellite data have the advantage of looking down on the atmosphere, as would a pilot on a mission, and so "see" the total amount of cloud coverage. Granted, the satellite data do not go back as many years as do the surface observations, but they do represent a data resource that we recommend should be utilized in further studies of this type.

Estimating cloud altitudes is extremely difficult. Without landmarks or other sources of information (ie. ceilometers, pilot reports and/or radiosonde data) the observer is forced to rely on experience, a factor that cannot be quantified. Also, the WMO altitude coding scheme tends to overestimate cloud amounts at given altitudes by instructing observers to code a cloud that is between two layers as being at the lower of the two layers. Instead of using the altitudes given in the various reports one could use generic altitudes that are based on the type of cloud that is reported. The types of clouds are generally easier to report and various climatologies of cloud bases versus type have

been assembled (e.g. 13). These climatologies also contain information on the thickness of the clouds so that one could provide estimates on cloud thickness at given altitudes as well as information on the cloud amounts. Therefore, we recommend that further studies of this type utilize generic cloud altitudes based on climatic analyses of cloud types rather than the coded cloud altitudes contained in the surface observation reports. In this way one could give probabilities of cloud amounts at given altitudes and estimates of the cloud thicknesses.

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APPENDIX A
DIAGNOSTIC STATISTICS ON THE PROVIDED ETAC DATA SETS

A set of diagnostic statistics were performed on the 41 data sets provided by AFGL. The analyses were done to determine if a given data set 1.) had enough data to evaluate and 2.) to make a first order assessment of the quality of the data. The results of the analyses are given in Tables A-1 to A-29. Four separate analyses were done on each station's data. The results are given for each year of data and over the entire data set. The analyses are described below.

A.1 NUMBER AND VALIDITY OF THE OBSERVATION

The (a) Tables in Tables A-1 to A-32 give the results from an analysis that focused upon the total number of reported 3-hourly weather observation and the number of valid and invalid observations of the cloud parameter OBS, SKY, and CLOUD layers. The parameter OBS refers to the type of character reported, SKY to the reported total sky cover amount, and CLOUD LAYERS to the parameter involving individual cloud layers (amount and base altitude).

For the cloud layers, four checks in the validity were made. If any of the individual layer amounts are outside the valid range for that parameter (-1 to 9, -1 = missing, 9 = obscured) this observation was included under ERR#1. Observation where the height code for the layers was either out of range (-1 to 89) or decreasing with altitude were listed under ERR#2. ERR#3 includes observations which violate both of the first two rules. Finally, ERR#4 includes observation where both SKY is not zero and the layer observation are missing. This last category is not actually an error but rather indicates an observation with missing cloud data.

Valid reports for SKY are those which fall within the legal range (0 to 9, missing SKY reports are not included).

A.2 FREQUENCY-OF-OCCURRENCE OF OBSERVATION TYPES

The (b) tables in Tables A-1 to A-32 list the frequencies-of-occurence of the types of observations reported as given by the parameter OBS. In the ETAC data tapes they are given by a numerical code. The key to the codes is given in Table A-30.

A.3 FREQUENCY-OF-OCCURRENCE OF TOTAL SKY COVER PARAMETER

The (c) tables in Tables A-1 to A-32 list the frequencies-of-occurrence of the total sky cover parameter SKY given in terms of oktal values. The average and standard deviation values of SKY are also given for each year and over the entire data set.

A.4 FREQUENCY-OF-OCCURRENCE OF TOTAL CUMULATIVE

The (d) tables in Tables A-1 to A-32 list the frequencies-of-occurrence of the total cloud cover, TCC, as a function of okta. For those observations in which the total sky cover parameter SKY is given, TCC will be equal to SKY. For those observations in which SKY is not given TCC is calculated as described in the text. For those cases in which TCC is calculated the number is rounded off to the nearest okta for the purposes of this analysis.

TABLE A-1. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR SCHLESWIG/JEGEL, WEST GERMANY, WMO STATION 100370.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1969	02474	2200	0270	0003	0001	0000	0301
1970	02625	2400	0225	0000	0000	0000	0000
1971	02720	2494	0223	0000	0002	0001	0000
1972	02352	2063	0289	0000	0000	0000	0000
1973	02691	2534	0156	0000	0000	0001	0000
1974	02702	2403	0185	0000	0114	0000	0000
1975	02688	2412	0159	0000	0117	0000	0000
1976	02788	2469	0200	0000	0119	0000	0000
1977	02853	2561	0149	0000	0143	0000	0577
1978	02899	2619	0139	0000	0141	0000	1026
1979	02882	2620	0147	0000	0115	0000	1007
1980	02839	2570	0164	0000	0103	0002	0987
1981	02886	2598	0139	0000	0149	0000	0989
1982	00701	0637	0047	0000	0017	0000	0231
			TOTALS FOR 14 YEARS				
14	36100	32580	2492	0003	1021	0004	5118

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1969	02474	.00	12.21	87.79	.00	.00	.00	.00	.00	.00	.00	1.878	.327	00000
1970	02625	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1971	02720	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1972	02352	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02691	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1974	02702	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1975	02688	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1976	02788	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02853	20.12	.00	79.71	.00	.18	.00	.00	.00	.00	.00	1.601	.808	00000
1978	02899	35.39	.00	64.61	.00	.00	.00	.00	.00	.00	.00	1.292	.957	00000
1979	02882	19.12	.00	65.06	.00	15.82	.00	.00	.00	.00	.00	1.934	1.181	00000
1980	02839	1.73	.00	65.27	.00	33.00	.00	.00	.00	.00	.00	2.626	.999	00000
1981	02886	26.72	.00	65.70	.00	7.59	.00	.00	.00	.00	.00	1.617	1.107	00000
1982	00701	32.81	.00	67.05	.00	.14	.00	.00	.00	.00	.00	1.347	.945	00000
						TOTALS FOR 14 YEARS								
14	36100	8.87	.84	85.81	.00	4.48	.00	.00	.00	.00	.00			00000

TABLE A-1. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1969	00301	.00	7.64	3.99	5.65	2.66	5.32	3.99	40.53	30.23	.00	6.193	2.193	02173
1970	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02625
1971	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02720
1972	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02352
1973	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02691
1974	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02702
1975	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02688
1976	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02788
1977	00577	10.40	8.84	7.11	6.76	6.76	5.55	7.63	18.20	24.26	4.51	5.059	2.952	02276
1978	01026	12.67	9.26	5.07	4.78	3.70	5.75	5.36	16.47	31.29	5.65	5.259	3.116	01873
1979	01007	13.51	8.34	5.06	5.66	3.97	5.36	5.86	15.69	32.77	3.77	5.193	3.106	01875
1980	00987	15.30	8.11	5.47	6.28	4.05	5.27	5.07	12.26	33.03	5.17	5.074	3.202	01852
1981	00989	16.48	9.40	7.28	5.66	3.54	5.46	4.55	14.66	29.02	3.94	4.800	3.223	01897
1982	00231	33.77	3.03	2.60	4.33	2.60	1.73	3.46	8.23	27.71	12.55	4.532	3.751	00470
						TOTALS FOR 14 YEARS								
14	05118	14.03	8.46	5.63	5.67	4.03	5.30	5.33	16.39	30.46	4.71			30982

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1969	02200	.05	13.59	4.09	4.50	6.14	7.27	7.00	29.14	24.73	3.50	5.715	2.512	00274
1970	02400	.00	12.50	4.29	3.46	5.79	6.58	5.83	31.08	25.08	5.38	5.892	2.492	00225
1971	02494	.08	13.07	5.73	4.33	4.85	6.50	6.38	30.23	24.02	4.81	5.747	2.549	00226
1972	02063	.05	9.69	5.38	4.56	5.48	6.50	6.16	31.27	25.16	5.77	5.975	2.416	00289
1973	02534	4.81	13.14	4.97	4.93	5.37	7.14	7.58	27.66	20.72	3.67	5.330	2.745	00157
1974	02403	9.07	10.24	4.33	4.70	5.41	7.49	6.53	27.42	24.76	.04	5.217	2.809	00299
1975	02412	10.45	13.23	4.60	4.44	4.77	6.26	5.64	24.46	22.43	3.73	5.042	3.003	00276
1976	02469	10.73	10.85	4.74	4.41	4.33	6.28	6.64	27.58	21.75	2.67	5.133	2.934	00319
1977	02561	5.70	8.20	4.33	4.22	4.88	6.13	6.76	29.44	25.58	4.76	5.738	2.667	00292
1978	02619	7.29	7.98	3.78	3.59	4.70	6.15	5.69	30.51	24.44	5.88	5.719	2.745	00280
1979	02620	8.44	7.21	4.62	4.20	4.20	6.03	6.18	29.96	26.07	3.09	5.592	2.764	00262
1980	02570	10.12	9.22	4.47	3.97	4.09	6.07	5.14	26.03	26.96	3.93	5.409	2.931	00269
1981	02598	9.74	9.51	5.62	4.20	4.81	6.62	5.70	26.91	23.52	3.39	5.268	2.898	00288
1982	00637	21.51	4.87	4.40	2.98	2.51	2.04	4.87	25.59	17.11	14.13	5.152	3.400	00064
						TOTALS FOR 14 YEARS								
14	32580	6.35	10.48	4.68	4.24	4.91	6.44	6.21	28.50	24.10	4.09			03520

TABLE A-2. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR BREMEN, WEST GERMANY, WMO STATION 102240.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1969	02899	2879	0015	0000	0005	0000	2819
1970	02890	2853	0026	0000	0011	0000	2792
1971	02919	2896	0021	0000	0002	0000	2869
1972	02911	2857	0051	0000	0003	0000	2704
1973	02907	2872	0033	0000	0001	0001	2786
1974	02911	2858	0049	0000	0000	0004	2765
1975	02805	2790	0013	0000	0000	0002	2748
1976	02925	2911	0008	0000	0000	0006	2885
1977	02918	2909	0007	0000	0000	0002	2879
1978	02919	2906	0008	0000	0000	0005	2883
1979	02920	2767	0150	0000	0001	0002	2726
		TOTALS FOR 11 YEARS					
11	31924	31498	0381	0000	0023	0022	30856

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1969	02899	96.52	.79	2.69	.00	.00	.00	.00	.00	.00	.00	.062	.334	00000
1970	02890	33.94	.00	3.32	.00	62.73	.00	.00	.00	.00	.00	2.576	1.881	00000
1971	02919	95.99	.00	1.61	.00	2.40	.00	.00	.00	.00	.00	.128	.657	00000
1972	02911	92.65	.00	7.08	.00	.27	.00	.00	.00	.00	.00	.153	.551	00000
1973	02907	95.49	.00	4.13	.00	.34	.00	.00	.00	.03	.00	.099	.482	00000
1974	02911	94.54	.00	4.81	.00	.65	.00	.00	.00	.00	.00	.122	.531	00000
1975	02805	97.11	.00	1.85	.00	.89	.00	.00	.00	.14	.00	.084	.549	00000
1976	02925	98.19	.00	1.33	.00	.48	.00	.00	.00	.00	.00	.046	.358	00000
1977	02918	97.57	.00	1.23	.00	1.20	.00	.00	.00	.00	.00	.073	.486	00000
1978	02919	97.91	.00	1.23	.00	.86	.00	.00	.00	.00	.00	.059	.428	00000
1979	02920	55.79	.00	6.61	.00	37.60	.00	.00	.00	.00	.00	1.636	1.899	00000
		TOTALS FOR 11 YEARS												
11	31924	86.88	.07	3.27	.00	9.76	.00	.00	.00	.02	.00			00000

TABLE A-2. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1969	02819	10.29	8.05	4.22	4.75	4.04	3.97	6.14	23.66	32.21	2.66	5.509	2.924	00080
1970	02792	10.64	8.17	4.08	4.66	4.33	4.41	6.73	21.35	33.17	2.47	5.471	2.940	00098
1971	02869	12.16	7.88	4.78	5.82	4.46	4.22	6.83	18.68	33.15	2.02	5.290	3.008	00050
1972	02704	13.42	7.69	4.40	4.77	4.96	4.44	7.32	20.86	29.96	2.18	5.220	3.022	00207
1973	02786	10.91	6.82	5.17	6.78	5.60	5.92	8.18	19.60	29.72	1.29	5.252	2.881	00121
1974	02765	10.13	5.82	4.30	6.18	4.56	5.39	9.76	22.46	31.39	.00	5.451	2.786	00146
1975	02748	11.86	7.42	5.82	6.40	4.33	4.66	8.92	19.83	29.15	1.60	5.188	2.951	00057
1976	02885	11.82	9.12	6.27	7.14	4.75	5.23	7.94	18.23	27.73	1.77	5.012	2.984	00040
1977	02879	7.54	6.11	5.97	6.15	4.03	5.45	10.84	22.02	29.73	2.15	5.563	2.717	00039
1978	02883	6.97	5.24	5.93	4.75	4.27	5.41	10.48	20.19	34.06	2.71	5.765	2.679	00036
1979	02726	8.51	5.80	4.40	4.88	4.44	5.58	11.26	18.97	34.01	2.16	5.667	2.743	00194
							TOTALS FOR 11 YEARS							
11	30856	10.37	7.10	5.04	5.67	4.52	4.97	8.58	20.53	31.30	1.92			01068

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1969	02879	10.07	9.31	4.10	4.41	3.65	3.82	6.29	23.34	32.37	2.64	5.483	2.948	00020
1970	02853	9.46	9.50	4.07	4.49	4.31	4.38	6.87	21.49	32.95	2.49	5.478	2.922	00037
1971	02896	11.98	8.91	4.66	5.42	4.11	4.18	6.87	20.27	31.56	2.04	5.258	3.013	00023
1972	02857	12.67	8.47	4.38	4.83	4.55	4.38	7.32	20.76	30.45	2.21	5.244	3.016	00054
1973	02872	10.72	7.76	4.98	6.55	5.54	5.81	8.08	20.26	28.59	1.71	5.229	2.894	00035
1974	02858	9.97	7.70	3.67	6.16	4.06	5.53	9.83	24.35	28.73	.00	5.367	2.805	00053
1975	02790	11.72	9.39	4.80	6.38	3.84	4.70	8.67	23.12	25.63	1.76	5.116	2.958	00015
1976	02911	11.85	11.03	5.74	6.63	4.47	5.02	7.76	21.37	24.42	1.72	4.923	2.993	00014
1977	02909	7.53	7.77	5.36	5.81	3.88	5.57	10.69	23.89	27.36	2.13	5.488	2.740	00009
1978	02906	6.99	7.16	5.30	4.99	3.75	5.47	10.29	23.54	29.97	2.55	5.643	2.710	00013
1979	02767	8.46	7.23	4.12	5.24	4.30	5.38	11.28	21.40	30.68	1.92	5.554	2.762	00153
							TOTALS FOR 11 YEARS							
11	31498	10.13	8.57	4.66	5.54	4.22	4.93	8.53	22.16	29.34	1.92			00426

TABLE A-3. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR HANNOVER, WEST GERMANY, WMO STATION 103380.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1969	02914	2896	0014	0000	0004	0000	2858
1970	02917	2898	0014	0000	0005	0000	2865
1971	02918	2888	0019	0000	0010	0001	2858
1972	02911	2846	0065	0000	0000	0000	2716
1973	02911	2889	0017	0000	0004	0001	2829
1974	02918	2894	0020	0000	0000	0004	2865
1975	02871	2860	0009	0000	0000	0002	2839
1976	02928	2921	0006	0000	0000	0001	2894
1977	02920	2896	0013	0000	0000	0011	2888
1978	02920	2913	0004	0000	0000	0003	2906
1979	02920	2763	0152	0000	0000	0005	2735
1980	02808	2601	0205	0000	0000	0002	2553
1981	02920	2874	0044	0000	0000	0002	2858
1982	02919	2905	0014	0000	0000	0000	2872
			TOTALS FOR 14 YEARS				
14	40695	40044	0596	0000	0023	0032	39536

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1969	02914	97.84	.38	1.78	.00	.00	.00	.00	.00	.00	.00	.039	.271	00000
1970	02917	34.73	.00	1.68	.00	63.59	.00	.00	.00	.00	.00	2.577	1.898	00000
1971	02918	95.00	.00	2.06	.00	2.95	.00	.00	.00	.00	.00	.159	.727	00000
1972	02911	93.16	.00	6.60	.00	.24	.00	.00	.00	.00	.00	.142	.531	00000
1973	02911	97.15	.00	2.61	.00	.17	.00	.00	.00	.07	.00	.065	.414	00000
1974	02918	98.01	.00	1.78	.00	.21	.00	.00	.00	.00	.00	.044	.320	00000
1975	02871	98.50	.00	1.11	.00	.28	.00	.00	.00	.10	.00	.042	.393	00000
1976	02928	98.36	.00	1.16	.00	.48	.00	.00	.00	.00	.00	.042	.348	00000
1977	02920	97.95	.00	1.03	.00	1.03	.00	.00	.00	.00	.00	.062	.449	00000
1978	02920	98.73	.00	.48	.00	.79	.00	.00	.00	.00	.00	.041	.379	00000
1979	02920	56.03	.00	6.34	.00	37.64	.00	.00	.00	.00	.00	1.632	1.901	00000
1980	02808	5.73	.00	9.12	.00	85.15	.00	.00	.00	.00	.00	3.588	1.055	00000
1981	02920	78.15	.00	2.12	.00	19.73	.00	.00	.00	.00	.00	.832	1.597	00000
1982	02919	97.88	.00	1.58	.00	.55	.00	.00	.00	.00	.00	.053	.385	00000
						TOTALS FOR 14 YEARS								
14	40695	82.13	.03	2.80	.00	15.03	.00	.00	.00	.01	.00			00000

TABLE A-3. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY										*** SKY *** AVG	SDV	INVALID SKY
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**			
1969	02858	11.23	6.89	3.32	3.64	3.22	5.04	6.96	24.84	32.72	2.13	5.591	2.897	00056
1970	02865	9.11	5.90	4.54	4.68	4.05	4.68	7.50	24.43	33.65	1.47	5.670	2.780	00052
1971	02858	10.74	7.66	5.11	4.58	3.92	5.04	8.15	24.04	29.81	.94	5.367	2.888	00060
1972	02716	11.89	6.48	3.87	5.52	4.53	5.23	8.03	22.42	29.86	2.17	5.386	2.914	00195
1973	02829	11.88	6.15	4.52	4.81	3.78	4.77	7.42	23.79	31.99	.88	5.435	2.907	00082
1974	02865	9.42	4.43	4.15	4.08	4.47	5.13	8.76	27.05	32.50	.00	5.704	2.692	00053
1975	02839	11.73	6.34	4.33	4.93	4.23	5.35	7.64	25.04	29.09	1.30	5.391	2.886	00032
1976	02894	12.54	7.53	4.25	5.04	3.94	4.94	6.15	24.05	29.75	1.80	5.311	2.977	00034
1977	02888	7.55	5.40	4.26	5.12	2.94	4.33	8.38	28.88	31.58	1.56	5.818	2.652	00032
1978	02906	9.05	4.61	3.79	4.27	3.89	4.13	7.30	26.81	34.27	1.89	5.838	2.717	00014
1979	02735	10.02	4.97	3.11	3.95	3.47	4.06	6.76	26.51	35.72	1.43	5.820	2.770	00185
1980	02553	13.71	4.23	2.98	3.37	3.13	4.35	6.66	23.35	36.82	1.41	5.652	2.942	00255
1981	02858	8.89	5.39	4.16	4.90	3.50	4.06	7.80	26.00	33.80	1.50	5.754	2.743	00062
1982	02872	15.84	7.87	5.75	5.64	4.63	5.26	7.35	21.17	24.79	1.71	4.870	3.069	00047
							TOTALS FOR 14 YEARS							
14	39536	10.95	6.00	4.17	4.62	3.84	4.74	7.50	24.90	31.84	1.44			01159

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC										*** TCC *** AVG	SDV	INVALID TCC
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**			
1969	02896	11.08	7.98	3.21	3.38	2.97	4.77	7.22	24.62	32.63	2.14	5.562	2.920	00018
1970	02898	7.97	7.87	4.42	4.28	3.93	4.76	7.21	24.33	33.78	1.45	5.659	2.783	00019
1971	02888	10.49	9.70	4.47	4.12	3.57	4.92	7.93	24.07	29.78	.97	5.328	2.924	00030
1972	02846	11.31	8.19	3.97	5.02	4.39	5.17	7.94	21.68	30.25	2.07	5.347	2.937	00065
1973	02889	11.91	7.55	3.88	4.36	3.84	4.60	7.44	23.40	31.98	1.04	5.404	2.939	00022
1974	02894	9.50	6.19	3.80	3.46	4.11	5.22	8.81	26.33	32.58	.00	5.645	2.747	00024
1975	02860	11.57	8.39	3.81	4.34	3.74	5.49	7.62	24.69	29.09	1.26	5.340	2.926	00011
1976	02921	12.56	9.72	3.36	4.83	3.53	4.66	6.44	23.62	29.51	1.78	5.244	3.020	00007
1977	02896	7.53	7.25	3.66	4.59	2.83	4.35	8.46	28.87	30.87	1.59	5.755	2.700	00024
1978	02913	9.03	6.08	3.09	4.60	3.54	4.39	7.17	26.81	33.37	1.92	5.771	2.755	00007
1979	02763	9.99	6.12	2.97	4.42	3.18	4.27	6.51	25.81	35.25	1.48	5.745	2.812	00157
1980	02601	13.30	5.57	2.96	3.77	3.11	4.61	6.46	22.53	36.02	1.65	5.579	2.968	00207
1981	02874	8.87	6.72	4.04	4.98	3.51	4.14	7.38	25.61	33.23	1.53	5.676	2.787	00046
1982	02905	15.66	9.40	5.09	5.27	4.65	4.99	7.71	21.27	24.34	1.62	4.834	3.080	00014
							TOTALS FOR 14 YEARS							
14	40044	10.76	7.64	3.77	4.39	3.64	4.74	7.46	24.56	31.58	1.46			00651

TABLE A-4. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR BERLIN/TEGEL, WEST GERMANY, WMO STATION 103820.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1969	02789	2204	0585	0000	0000	0000	0364
1970	02869	2028	0841	0000	0000	0000	0000
1971	02902	1794	1108	0000	0000	0000	0000
1972	02889	1806	1083	0000	0000	0000	0000
1973	02878	1846	1032	0000	0000	0000	0000
1974	02885	1816	1068	0000	0000	0001	0000
1975	02860	1750	1110	0000	0000	0000	0000
1976	02899	1814	1085	0000	0000	0000	0000
1977	02900	2011	0889	0000	0000	0000	0000
1978	02915	2024	0891	0000	0000	0000	0000
1979	02917	1896	1016	0000	0000	0005	0000
		TOTALS FOR 11 YEARS					
11	31703	20989	10708	0000	0000	0006	0364

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1969	02789	.00	13.05	86.95	.00	.00	.00	.00	.00	.00	.00	1.869	.337	00000
1970	02869	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1971	02902	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1972	02889	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02878	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1974	02885	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1975	02860	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1976	02899	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02900	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02915	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1979	02917	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
						TOTALS FOR 11 YEARS								
11	31703	.00	1.15	98.85	.00	.00	.00	.00	.00	.00	.00			00000

TABLE A-4. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1969	00364	.00	3.30	2.47	4.95	3.02	6.32	6.04	13.74	60.16	.00	6.805	1.938	02425
1970	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02869
1971	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02902
1972	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02889
1973	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02878
1974	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02885
1975	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02860
1976	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02899
1977	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02900
1978	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02915
1979	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02917
TOTALS FOR 11 YEARS														
11	00364	.00	3.30	2.47	4.95	3.02	6.32	6.04	13.74	60.16	.00			31339

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1969	02204	.00	8.30	3.68	4.08	4.04	7.08	6.22	13.88	52.68	.05	6.358	2.321	00585
1970	02028	.00	4.78	3.50	3.40	3.45	5.47	5.82	12.72	60.55	.30	6.742	2.069	00841
1971	01794	.00	5.13	3.46	3.62	3.79	5.02	5.63	11.65	61.43	.28	6.724	2.107	01108
1972	01806	.06	5.65	3.88	3.99	4.60	5.87	5.20	12.62	57.03	1.11	6.589	2.195	01083
1973	01846	3.09	5.25	2.82	3.68	3.36	5.63	3.74	10.56	60.89	.98	6.558	2.391	01032
1974	01816	3.63	3.52	2.20	2.86	3.58	4.35	4.68	12.11	63.00	.06	6.699	2.268	01069
1975	01750	5.77	5.77	2.23	2.97	3.31	4.86	4.69	11.83	56.11	2.46	6.386	2.601	01110
1976	01814	7.83	7.00	2.81	2.87	2.65	5.24	5.18	11.08	54.69	.66	6.101	2.790	01085
1977	02011	2.78	4.87	3.08	3.03	3.33	5.47	4.62	13.82	57.28	1.69	6.588	2.327	00889
1978	02024	5.39	5.14	3.16	2.87	3.41	6.18	4.15	11.56	56.42	1.73	6.374	2.565	00891
1979	01896	3.38	6.38	2.69	2.27	4.38	5.22	5.27	13.29	56.07	1.05	6.449	2.438	01021
TOTALS FOR 11 YEARS														
11	20989	2.84	5.65	3.06	3.25	3.63	5.53	5.04	12.33	57.74	.93			10714

TABLE A-5. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR GIESSEN, WEST GERMANY WMO STATION 105320.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1966	02016	2011	0003	0000	0002	0000	2013
1967	02371	2368	0002	0000	0001	0000	2363
1968	01751	1747	0003	0000	0001	0000	1750
1969	01811	1800	0007	0000	0004	0000	1804
1970	02594	2584	0009	0000	0001	0000	2592
1971	02499	2493	0005	0000	0001	0000	2497
1972	02566	2558	0005	0000	0003	0000	2564
1973	02773	2769	0002	0000	0001	0001	2772
1974	02749	2745	0001	0000	0000	0003	2746
1975	02819	2815	0002	0000	0000	0002	2816
1976	02877	2875	0002	0000	0000	0000	2876
1977	02875	2874	0000	0000	0000	0001	2875
1978	02692	2691	0001	0000	0000	0000	2692
1979	02868	2866	0000	0000	0000	0002	2868
		TOTALS FOR 14 YEARS					
14	35261	35196	0042	0000	0014	0009	35228

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1966	02016	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	02371	99.96	.00	.00	.00	.00	.00	.04	.00	.00	.00	.003	.123	00000
1968	01751	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1969	01811	99.94	.00	.06	.00	.00	.00	.00	.00	.00	.00	.001	.047	00000
1970	02594	99.96	.00	.00	.00	.00	.00	.04	.00	.00	.00	.002	.118	00000
1971	02499	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1972	02566	99.96	.00	.00	.00	.00	.00	.04	.00	.00	.00	.002	.118	00000
1973	02773	99.78	.00	.00	.00	.00	.00	.04	.00	.18	.00	.017	.358	00000
1974	02749	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1975	02819	99.75	.00	.00	.00	.00	.00	.00	.00	.25	.00	.020	.398	00000
1976	02877	99.79	.00	.00	.00	.00	.00	.00	.00	.21	.00	.017	.365	00000
1977	02875	99.44	.00	.00	.00	.00	.00	.03	.00	.52	.00	.044	.587	00000
1978	02692	99.63	.00	.00	.00	.00	.00	.00	.00	.37	.00	.030	.487	00000
1979	02868	99.83	.00	.00	.00	.00	.00	.00	.00	.17	.00	.014	.334	00000
		TOTALS FOR 14 YEARS												
14	35261	99.85	.00	.00	.00	.00	.00	.01	.00	.14	.00			00000

TABLE A-5. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1966	02013	6.61	5.37	4.67	6.66	2.63	7.10	11.97	18.38	34.67	1.94	5.761	2.633	00003
1967	02363	11.30	5.92	4.95	6.64	4.74	6.98	11.17	15.23	30.05	3.00	5.307	2.889	00008
1968	01750	7.49	5.14	4.00	5.09	2.97	7.71	9.77	14.34	40.57	2.91	5.887	2.701	00001
1969	01804	10.03	4.82	3.22	4.10	2.94	5.38	8.65	13.64	43.07	4.16	5.915	2.847	00007
1970	02592	9.34	4.21	3.90	5.02	3.67	6.17	10.61	16.47	37.38	3.24	5.798	2.759	00002
1971	02497	12.45	6.13	5.45	6.25	3.96	7.45	10.05	12.29	33.76	2.20	5.252	2.966	00002
1972	02564	14.70	5.85	5.11	6.79	3.16	6.51	9.17	12.13	33.46	3.12	5.173	3.072	00002
1973	02772	16.20	6.13	4.76	7.11	3.21	7.32	9.31	12.19	33.01	.76	4.985	3.074	00001
1974	02746	10.01	5.75	4.73	5.90	3.86	6.19	9.43	15.08	39.00	.04	5.538	2.838	00003
1975	02816	14.24	6.04	4.30	6.00	3.20	5.93	8.45	13.35	36.26	2.24	5.294	3.056	00003
1976	02876	16.55	7.86	5.63	6.19	3.41	6.12	7.96	12.27	32.51	1.50	4.892	3.148	00001
1977	02875	7.20	5.67	5.15	5.57	3.17	6.19	8.21	21.18	35.13	2.54	5.777	2.706	00000
1978	02692	7.58	5.46	4.64	4.64	2.53	5.98	8.40	20.17	38.78	1.82	5.869	2.705	00000
1979	02868	8.26	6.73	5.33	4.85	3.63	5.75	7.60	21.23	34.55	2.06	5.644	2.794	00000
TOTALS FOR 14 YEARS														
14	35228	11.05	5.86	4.76	5.80	3.38	6.45	9.25	15.65	35.63	2.17			00033

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1966	02011	6.61	6.46	4.53	6.51	2.78	7.56	11.34	29.89	22.38	1.94	5.577	2.586	00005
1967	02368	11.32	7.39	4.90	6.67	4.65	6.80	10.77	26.65	17.86	3.00	5.108	2.832	00003
1968	01747	7.50	5.72	3.84	5.09	2.98	7.78	9.44	27.07	27.65	2.92	5.732	2.640	00004
1969	01800	10.06	5.50	2.78	4.06	2.89	5.56	8.33	31.39	25.33	4.11	5.719	2.756	00011
1970	02584	9.37	5.11	3.48	5.11	3.75	6.73	9.83	34.71	18.77	3.13	5.564	2.660	00010
1971	02493	12.43	7.30	5.50	5.70	4.01	7.62	9.51	30.45	15.24	2.25	5.018	2 844	00006
1972	02558	14.78	6.80	4.85	6.45	3.32	6.53	8.87	29.36	15.83	3.21	4.961	2.952	00008
1973	02769	16.22	7.04	4.84	6.54	3.39	7.37	8.85	28.78	16.22	.76	4.779	2.947	00004
1974	02745	9.95	6.78	4.63	5.83	4.26	5.90	9.14	37.16	16.36	.00	5.259	2.692	00004
1975	02815	14.17	6.93	4.16	5.93	3.52	5.65	8.03	34.88	14.53	2.20	5.038	2.904	00004
1976	02875	16.49	9.50	5.57	5.43	3.79	5.67	7.83	28.21	16.10	1.43	4.665	3.029	00002
1977	02874	7.17	7.13	4.70	5.11	3.76	6.37	8.18	35.87	19.21	2.51	5.551	2.635	00001
1978	02691	7.58	6.76	4.57	4.31	3.16	5.91	7.62	39.46	18.84	1.78	5.598	2.622	00001
1979	02866	8.23	8.69	4.71	4.75	4.05	5.44	7.05	36.22	18.74	2.13	5.406	2.736	00002
TOTALS FOR 14 YEARS														
14	35196	11.04	7.04	4.56	5.55	3.64	6.44	8.82	32.44	18.32	2.16			00065

TABLE A-6. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR BITBURG, WEST GERMANY, WMO STATION 106100.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1953	02917	2222	0590	0105	0000	0000	2917
1954	02919	2333	0347	0239	0000	0000	2919
1955	02909	2252	0397	0259	0001	0000	2909
1956	02926	2234	0398	0292	0001	0001	2926
1957	02917	2233	0282	0402	0000	0000	2917
1958	02500	1973	0177	0350	0000	0000	2500
1959	02919	2434	0167	0318	0000	0000	2919
1960	02928	2379	0122	0427	0000	0000	2928
1961	02920	2404	0113	0403	0000	0000	2920
1962	02919	2278	0148	0493	0000	0000	2919
1963	02920	2325	0216	0376	0003	0000	2920
1964	02928	0352	2541	0000	0035	0000	2927
1965	01596	0276	1320	0000	0000	0000	1596
1966	00159	0159	0000	0000	0000	0000	0159
1967	00292	0292	0000	0000	0000	0000	0292
1968	02318	2252	0066	0000	0000	0000	2284
1969	02852	2634	0218	0000	0000	0000	2840
1970	02920	2612	0308	0000	0000	0000	2917
1973	02919	2742	0175	0000	0000	0002	0000
1974	02919	2865	0053	0000	0000	0001	0000
1975	02919	2919	0000	0000	0000	0000	0000
1976	02928	2926	0001	0000	0000	0001	0000
1977	02920	2917	0001	0000	0000	0002	0000
1978	02920	2919	0000	0000	0000	0001	0000
1979	02920	2917	0002	0000	0000	0001	0000
1980	02928	2924	0002	0000	0000	0002	0000
1981	02811	2808	0000	0000	0000	0003	0000
			TOTALS FOR 27 YEARS				
27	70943	59581	7644	3664	0040	0014	44709

TABLE A-6. (continued)

(b)

YEAR	VALID OBS	% OF OBSERVATIONS OF EACH TYPE **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1953	02917	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1954	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1955	02909	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1956	02926	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1957	02917	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1958	02500	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1959	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1960	02928	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1961	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1962	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1963	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1964	02928	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1965	01596	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1966	00159	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1967	00292	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1968	02318	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1969	02852	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1970	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02919	.00	.00	99.93	.00	.07	.00	.00	.00	.00	.00	2.001	.052	00000
1974	02919	.00	.00	99.86	.00	.14	.00	.00	.00	.00	.00	2.003	.074	00000
1975	02919	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1976	02928	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1979	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1980	02928	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1981	02811	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
TOTALS FOR 27 YEARS														
27	70943	.00	51.69	48.30	.00	.01	.00	.00	.00	.00	.00			00000

TABLE A-6. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1953	02917	14.67	.00	18.72	.00	.00	.00	.00	25.20	31.95	9.46	5.546	3.234	00000
1954	02919	11.48	.00	14.70	.00	.00	.00	.00	25.15	43.88	4.80	5.997	2.987	00000
1955	02909	11.07	.00	21.04	.00	.00	.00	.00	25.71	35.06	7.12	5.666	3.089	00000
1956	02926	11.69	.00	16.68	.00	.00	.00	.00	22.42	44.50	4.72	5.887	3.049	00000
1957	02917	9.19	.00	20.71	.00	.00	.00	.00	24.92	40.66	4.53	5.819	2.979	00000
1958	02500	7.88	.00	15.60	.00	.00	.00	.00	25.76	46.00	4.76	6.224	2.795	00000
1959	02919	18.43	.00	21.31	.00	.00	.00	.00	22.44	33.33	4.49	5.067	3.338	00000
1960	02928	7.89	.00	14.45	.00	.00	.00	.00	23.80	48.09	5.77	6.322	2.781	00000
1961	02920	13.12	.00	14.79	.00	.00	.00	.00	19.59	47.74	4.76	5.915	3.101	00000
1962	02919	11.78	.00	17.54	.00	.00	.00	.00	21.62	44.64	4.42	5.833	3.070	00000
1963	02920	13.32	.00	14.93	.00	.00	.00	.00	19.42	46.23	6.10	5.905	3.126	00000
1964	02927	11.99	.00	17.05	.00	.00	.00	.00	15.27	55.69	.00	5.865	3.068	00001
1965	01596	17.29	.00	12.97	.00	.00	.00	.00	14.72	55.01	.00	5.691	3.250	00000
1966	00159	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00292	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02284	8.41	4.07	4.03	4.12	3.50	3.94	6.87	13.22	44.79	7.05	6.137	2.790	00034
1969	02840	9.89	5.74	4.37	4.01	4.93	4.82	7.01	13.63	40.60	5.00	5.776	2.909	00012
1970	02917	6.75	6.51	4.42	4.66	5.14	5.42	7.06	14.91	40.18	4.94	5.896	2.764	00003
1973	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02919
1974	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02919
1975	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02919
1976	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02928
1977	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02920
1978	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02920
1979	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02920
1980	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02928
1981	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02811
TOTALS FOR 27 YEARS														
27	44709	12.36	1.00	14.64	.77	.83	.86	1.26	20.51	42.84	4.93			26234

TABLE A-6. (continued)

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC										*** TCC ***		INVALID TCC
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1953	02222	19.26	2.70	9.09	4.46	3.15	4.23	14.00	6.48	25.29	11.34	5.018	3.282	00695
1954	02333	14.36	3.13	7.16	3.81	2.31	4.54	13.97	5.83	39.61	5.27	5.498	3.074	00586
1955	02252	14.30	4.66	10.61	5.64	3.33	7.64	12.92	3.73	28.86	8.30	5.036	3.121	00657
1956	02234	15.31	4.97	7.61	3.04	2.64	4.74	10.03	3.72	42.66	5.28	5.386	3.201	00692
1957	02233	12.00	5.91	10.66	6.09	3.49	6.36	10.70	3.49	35.65	5.64	5.159	3.086	00684
1958	01973	9.93	4.41	7.60	4.05	3.90	6.89	12.37	3.09	42.42	5.32	5.650	2.928	00527
1959	02434	22.10	7.44	9.78	3.74	2.88	6.04	10.52	3.33	29.01	5.18	4.449	3.340	00485
1960	02379	9.71	4.08	7.06	3.99	3.24	7.40	11.64	5.72	40.23	6.94	5.742	2.904	00549
1961	02404	15.93	5.95	6.45	2.20	2.41	5.16	10.11	4.03	42.35	5.41	5.372	3.230	00516
1962	02278	15.06	5.97	7.46	2.55	2.90	4.78	9.92	3.95	42.23	5.18	5.357	3.207	00641
1963	02325	16.69	3.83	7.44	3.01	2.88	5.59	9.63	4.04	40.22	6.67	5.351	3.229	00595
1964	00352	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02576
1965	00276	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	01320
1966	00159	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00292	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02252	8.53	3.91	4.09	4.04	3.46	3.95	6.93	13.23	44.89	6.97	6.139	2.789	00066
1969	02634	10.67	5.54	4.25	3.80	4.56	4.86	7.06	14.09	40.70	4.48	5.748	2.931	00218
1970	02612	7.54	6.70	4.13	4.56	5.13	5.74	7.24	15.54	39.24	4.17	5.816	2.792	00308
1973	02742	9.41	8.61	5.84	4.19	4.60	7.66	9.37	23.81	24.80	1.71	5.263	2.820	00177
1974	02865	6.77	4.54	4.47	4.47	4.71	6.63	9.53	25.41	33.33	.14	5.818	2.552	00054
1975	02919	8.32	5.04	5.17	5.00	3.77	6.85	8.80	22.30	31.59	3.15	5.697	2.727	00000
1976	02926	11.45	6.25	5.84	4.96	4.78	4.85	8.51	19.38	31.41	2.56	5.373	2.932	00002
1977	02917	4.90	3.81	4.15	4.70	4.46	4.39	9.05	28.56	32.53	3.46	6.116	2.431	00003
1978	02919	5.72	4.86	5.04	4.08	4.73	3.91	8.36	28.13	30.28	4.90	5.990	2.571	00001
1979	02917	5.93	3.57	4.97	4.66	5.25	6.27	8.88	21.19	36.44	2.85	5.986	2.538	00003
1980	02924	9.64	4.24	4.45	3.93	3.63	4.38	6.84	15.36	45.35	2.19	5.923	2.819	00004
1981	02808	5.77	3.88	4.52	4.27	4.81	6.02	7.48	16.67	43.38	3.21	6.125	2.566	00003
TOTALS FOR 27 YEARS														
27	59581	12.55	4.88	6.15	4.09	3.79	5.49	9.41	13.34	35.79	4.51			11362

TABLE A-7. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR RAMSTEIN, WEST GERMANY, WMO STATION 106140.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1953	02920	2011	0533	0376	0000	0000	2920
1954	02918	2168	0464	0286	0000	0000	2918
1955	02918	2223	0604	0091	0000	0000	2918
1956	02927	2548	0299	0079	0001	0000	2927
1957	02920	2526	0150	0244	0000	0000	2920
1958	02920	2308	0217	0395	0000	0000	2920
1959	02918	2364	0272	0282	0000	0000	2918
1960	02927	2283	0168	0476	0000	0000	2927
1961	02919	2316	0186	0417	0000	0000	2919
1962	02868	2327	0109	0432	0000	0000	2868
1963	02744	2075	0233	0435	0001	0000	2744
1964	02921	0334	2550	0000	0037	0000	2919
1965	01577	0260	1315	0000	0002	0000	1577
1966	00226	0226	0000	0000	0000	0000	0226
1967	00357	0357	0000	0000	0000	0000	0357
1968	02807	2737	0070	0000	0000	0000	2788
1969	02583	2280	0303	0000	0000	0000	2531
1970	02920	2669	0251	0000	0000	0000	2920
1973	02919	2771	0144	0000	0002	0002	0415
1974	02919	2888	0028	0000	0000	0003	0172
1975	02920	2916	0004	0000	0000	0000	0102
1976	02928	2926	0001	0000	0000	0001	0029
1977	02920	2916	0000	0000	0000	0004	0043
1978	02920	2918	0001	0000	0000	0001	0008
1979	02919	2913	0005	0000	0000	0001	0001
1980	02928	2921	0004	0000	0000	0003	0153
1981	02920	2913	0002	0000	0000	0005	0118
		TOTALS FOR 27 YEARS					
27	71583	60094	7913	3513	0043	0020	46258

TABLE A-7. (continued)

(b)

YEAR	VALID OBS	% OF OBSERVATIONS OF EACH TYPE										*** OBS ***		INVALID OBS
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1953	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1954	02918	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1955	02918	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1956	02927	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1957	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1958	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1959	02918	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1960	02927	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1961	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1962	02868	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1963	02744	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1964	02921	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1965	01577	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1966	00226	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1967	00357	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1968	02807	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1969	02583	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1970	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02919	.00	.00	99.97	.00	.03	.00	.00	.00	.00	.00	2.001	.037	00000
1974	02919	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1975	02920	.00	.00	99.97	.00	.03	.00	.00	.00	.00	.00	2.001	.037	00000
1976	02928	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1979	02919	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1980	02928	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1981	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
TOTALS FOR 27 YEARS														
27	71583	.00	51.66	48.34	.00	.00	.00	.00	.00	.00	.00			00000

TABLE A-7. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY										*** SKY ***		INVALID SKY
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1953	02920	14.42	3.90	8.90	4.52	3.56	4.55	12.53	7.95	36.03	3.63	5.240	3.076	00000
1954	02918	9.84	3.77	6.89	3.63	3.29	4.18	12.78	11.10	41.06	3.46	5.765	2.846	00000
1955	02918	8.70	3.22	8.43	3.67	2.84	4.22	14.22	8.91	37.53	8.26	5.858	2.844	00000
1956	02927	10.59	2.56	7.45	3.45	3.11	4.30	12.78	6.83	44.00	4.92	5.826	2.893	00000
1957	02920	11.54	2.60	7.95	4.01	3.15	4.69	12.88	7.09	42.84	3.25	5.655	2.928	00000
1958	02920	8.94	2.74	7.50	3.53	2.67	3.87	12.74	7.43	46.03	4.55	5.960	2.809	00000
1959	02918	17.37	5.31	9.49	4.18	2.30	4.25	12.47	3.53	36.67	4.42	5.000	3.243	00000
1960	02927	8.99	2.60	6.49	3.04	2.36	3.01	10.83	5.30	54.70	2.70	6.131	2.791	00000
1961	02919	13.81	3.22	5.41	2.64	1.85	2.30	9.32	6.54	50.67	4.25	5.861	3.072	00000
1962	02868	12.17	4.57	7.22	4.08	3.31	3.38	10.88	6.42	45.36	2.62	5.580	3.025	00000
1963	02744	12.43	4.66	6.63	2.99	3.13	2.33	9.00	6.74	47.67	4.41	5.733	3.070	00000
1964	02919	11.44	3.60	8.02	2.64	2.71	3.46	11.99	6.27	49.88	.00	5.705	2.942	00002
1965	01577	16.49	2.85	5.52	2.66	2.35	1.97	12.18	5.33	50.67	.00	5.568	3.128	00000
1966	00226	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00357	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02788	7.42	4.70	3.41	3.16	4.12	4.77	9.36	14.92	45.23	2.91	6.099	2.665	00019
1969	02531	9.40	4.07	3.91	4.07	3.28	4.70	8.22	13.35	43.82	5.18	6.006	2.816	00052
1970	02920	6.44	5.45	5.17	5.86	4.52	6.06	9.93	14.25	38.49	3.84	5.835	2.698	00000
1973	00415	11.57	6.75	6.51	5.06	5.54	5.78	4.82	10.84	42.17	.96	5.369	3.022	02504
1974	00172	8.72	2.33	1.74	4.65	2.91	6.40	9.30	11.05	51.16	1.74	6.215	2.628	02747
1975	00102	10.78	4.90	2.94	4.90	8.82	1.96	6.86	10.78	47.06	.98	5.725	2.912	02818
1976	00029	13.79	13.79	3.45	3.45	.00	6.90	6.90	6.90	41.38	3.45	5.172	3.328	02899
1977	00043	2.33	2.33	4.65	4.65	9.30	.00	9.30	11.63	53.49	2.33	6.488	2.303	02877
1978	00008	.00	.00	12.50	.00	.00	.00	.00	12.50	25.00	50.00	7.625	2.387	02912
1979	00001	.00	.00	.00	.00	.00	.00	.00	.00	.00	100.00	9.000	.000	02918
1980	00153	9.80	6.54	3.27	5.88	3.92	3.92	4.58	11.76	49.67	.65	5.791	2.930	02775
1981	00118	7.63	5.93	3.39	.85	5.08	3.39	11.02	14.41	48.31	.00	6.059	2.687	02802
TOTALS FOR 27 YEARS														
27	46258	12.21	3.75	6.71	3.63	3.06	3.90	11.15	8.24	43.70	3.65			25325

TABLE A-7. (continued)

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC										*** TCC ***		INVALID TCC
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1953	02011	20.84	5.92	11.34	5.27	4.48	6.32	9.95	5.37	25.21	5.32	4.407	3.243	00909
1954	02168	13.24	4.38	7.10	3.09	3.09	5.81	11.58	7.56	40.68	3.46	5.483	3.035	00750
1955	02223	11.43	3.64	7.24	3.19	1.98	5.53	14.26	8.37	38.15	6.21	5.685	2.946	00695
1956	02548	12.17	2.79	6.95	2.32	2.24	4.95	11.89	5.89	46.94	3.89	5.803	2.964	00379
1957	02526	13.34	2.93	9.22	3.40	2.45	5.46	11.28	4.75	43.47	3.68	5.506	3.057	00394
1958	02308	11.31	2.99	8.23	3.86	2.56	5.29	10.70	4.33	45.36	5.37	5.735	2.985	00612
1959	02364	21.45	4.99	9.35	4.31	3.00	5.80	10.66	1.90	33.04	5.50	4.687	3.339	00554
1960	02283	11.52	3.85	7.62	3.33	3.55	6.31	10.56	3.46	46.56	3.24	5.640	2.983	00644
1961	02316	17.40	4.10	6.61	2.68	1.86	4.62	8.46	3.76	45.55	4.97	5.421	3.269	00603
1962	02327	15.00	6.40	8.29	4.60	2.97	5.97	9.20	3.22	41.43	2.92	5.140	3.184	00541
1963	02075	16.43	6.46	7.23	3.28	3.52	4.39	7.86	4.05	41.78	5.01	5.216	3.274	00669
1964	00334	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02587
1965	00260	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	01317
1966	00226	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00357	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02737	7.56	4.68	3.47	3.14	4.20	4.86	9.24	15.24	44.98	2.63	6.077	2.670	00070
1969	02280	10.44	3.86	3.51	3.60	3.11	4.82	8.33	13.51	45.00	3.82	5.971	2.839	00303
1970	02669	7.04	5.40	4.91	5.51	4.27	6.33	10.19	15.14	38.29	2.92	5.802	2.704	00251
1973	02771	9.38	8.19	5.59	4.91	5.02	7.47	12.31	21.76	25.23	.14	5.208	2.766	00148
1974	02888	7.31	5.06	4.33	3.36	3.77	5.26	13.95	29.22	27.63	.10	5.755	2.538	00031
1975	02916	10.05	6.10	4.22	4.29	5.28	5.25	9.57	21.95	31.21	2.09	5.543	2.814	00004
1976	02926	14.08	6.08	5.30	5.19	6.05	6.66	10.05	19.51	25.67	1.40	5.046	2.942	00002
1977	02916	6.10	3.12	4.39	4.22	4.49	6.31	11.66	29.01	28.67	2.02	5.947	2.433	00004
1978	02918	7.33	3.39	4.97	4.15	4.73	6.48	10.38	25.09	31.73	1.75	5.846	2.563	00002
1979	02913	7.07	3.98	4.87	6.01	5.53	5.90	9.75	25.71	29.35	1.82	5.731	2.582	00006
1980	02921	11.02	4.28	3.97	3.80	4.04	4.01	7.84	23.59	36.15	1.30	5.729	2.819	00007
1981	02913	8.20	4.67	4.50	4.81	3.67	5.53	8.07	20.97	38.69	.89	5.832	2.699	00007
TOTALS FOR 27 YEARS														
27	60094	13.11	4.57	5.92	3.97	3.74	5.53	10.14	14.33	35.85	2.83			11489

TABLE A-8. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR GRAFENWOHR, WEST GERMANY, WMO STATION 106870.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1963	02920	2066	0396	0458	0000	0000	2920
1964	01952	0266	1671	0000	0015	0000	1952
1965	01589	0240	1349	0000	0000	0000	1588
1966	00232	0232	0000	0000	0000	0000	0232
1967	00334	0334	0000	0000	0000	0000	0334
1968	02928	2530	0393	0000	0005	0000	0000
1969	02917	2369	0548	0000	0000	0000	0000
1970	02920	2507	0412	0000	0001	0000	0000
1973	02920	2801	0118	0000	0000	0001	0863
1974	02909	2868	0040	0000	0000	0001	0691
1975	02890	2885	0000	0000	0000	0005	0315
1976	02900	2896	0001	0000	0000	0003	0202
1977	02821	2815	0005	0000	0000	0001	0007
1978	02860	2839	0020	0000	0000	0001	0003
1979	02844	2830	0013	0000	0000	0001	0001
1980	02885	2883	0001	0000	0000	0001	0232
TOTALS FOR 16 YEARS							
16	38821	33361	4967	0458	0021	0014	9340

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1963	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1964	01952	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1965	01589	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1966	00232	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1967	00334	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1968	02928	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1969	02917	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1970	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1974	02909	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1975	02890	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1976	02900	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02821	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02860	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1979	02844	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1980	02885	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
TOTALS FOR 16 YEARS														
16	38821	.00	18.10	81.90	.00	.00	.00	.00	.00	.00	.00			00000

TABLE A-8. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1963	02920	10.92	.00	19.66	.00	.00	.00	.00	20.51	45.14	3.77	5.779	3.063	00000
1964	01952	13.63	.00	18.60	.00	.00	.00	.00	21.36	46.41	.00	5.580	3.127	00000
1965	01588	15.18	.00	10.77	.00	.00	.00	.00	18.07	55.98	.00	5.959	3.100	00001
1966	00232	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00334	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02928
1969	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02917
1970	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02920
1973	00863	10.66	5.33	8.34	5.21	6.26	10.08	8.57	10.31	31.17	4.06	5.226	2.907	02057
1974	00691	5.50	2.89	4.34	5.50	6.51	12.16	12.88	10.85	38.06	1.30	5.844	2.451	02218
1975	00315	16.51	5.71	6.03	5.40	6.35	6.35	5.40	9.84	36.51	1.90	5.016	3.152	02575
1976	00202	15.84	7.43	5.94	5.45	6.44	4.46	7.92	1.98	38.61	5.94	5.074	3.255	02698
1977	00007	.00	.00	.00	.00	.00	.00	.00	.00	.00	100.00	9.000	.000	02814
1978	00003	.00	.00	.00	.00	.00	.00	.00	.00	.00	100.00	9.000	.000	02857
1979	00001	.00	.00	.00	.00	.00	.00	.00	.00	.00	100.00	9.000	.000	02843
1980	00232	5.60	1.72	4.74	2.59	3.88	7.33	6.90	16.38	49.14	1.72	6.358	2.419	02653
TOTALS FOR 16 YEARS														
16	09340	17.33	1.10	13.40	1.25	1.51	2.32	2.27	16.49	42.31	2.00			29481

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1963	02066	15.44	5.71	9.68	4.70	3.92	5.47	7.79	2.47	39.40	5.42	5.102	3.234	00854
1964	00266	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	01686
1965	00240	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	01349
1966	00232	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00334	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02530	.00	5.14	3.64	4.03	3.91	5.42	6.88	10.75	56.36	3.87	6.695	2.161	00398
1969	02369	.00	5.49	4.98	4.43	5.28	6.75	6.37	12.58	50.15	3.97	6.468	2.262	00548
1970	02507	.00	5.38	5.11	4.51	4.95	5.70	7.14	13.88	50.54	2.79	6.469	2.240	00413
1973	02801	10.14	5.39	6.28	5.78	5.75	6.75	7.35	12.14	39.02	1.39	5.458	2.888	00119
1974	02868	7.50	3.59	4.85	4.57	5.23	5.47	9.76	18.27	40.38	.38	5.882	2.621	00041
1975	02885	12.31	5.20	5.48	5.48	5.23	6.90	8.70	19.97	28.18	2.56	5.285	2.903	00005
1976	02896	12.81	5.66	6.39	5.42	5.11	6.15	6.94	10.81	38.92	1.80	5.307	3.025	00004
1977	02815	5.19	4.33	3.45	3.77	4.40	5.61	6.68	14.88	48.45	3.23	6.292	2.524	00006
1978	02839	6.09	3.17	3.77	3.77	4.86	5.21	7.64	14.16	48.19	3.13	6.262	2.542	00021
1979	02830	5.23	3.71	4.77	4.52	5.97	5.76	9.19	20.04	39.29	1.52	6.029	2.487	00014
1980	02883	5.48	4.20	4.44	4.54	5.10	6.56	12.17	24.21	31.56	1.73	5.905	2.463	00002
TOTALS FOR 16 YEARS														
16	33361	9.71	4.55	4.98	4.49	4.85	5.80	7.85	14.41	40.89	2.47			05460

TABLE A-9. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR HEIDELBERG, WEST GERMANY, WMO STATION 107340.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1952	02927	2203	0250	0474	0000	0000	2927
1953	02913	2208	0366	0339	0000	0000	2913
1954	02920	2421	0176	0322	0000	0001	2920
1955	02914	2426	0187	0301	0000	0000	2914
1956	02927	2343	0141	0443	0000	0000	2927
1957	02916	2323	0114	0479	0000	0000	2916
1958	02917	2300	0122	0495	0000	0000	2917
1959	02920	2319	0187	0414	0000	0000	2920
1960	02927	2014	0153	0760	0000	0000	2927
1961	02920	1923	0381	0616	0000	0000	2920
1962	02919	2080	0419	0420	0000	0000	2919
1963	02920	2136	0463	0321	0000	0000	2920
1964	02919	0376	2529	0000	0014	0000	2912
1965	01621	0310	1307	0000	0004	0000	1617
1966	00287	0287	0000	0000	0000	0000	0287
1967	00389	0389	0000	0000	0000	0000	0389
1968	02928	2636	0292	0000	0000	0000	0031
1969	02920	2399	0521	0000	0000	0000	0000
1970	02920	2592	0328	0000	0000	0000	0000
1974	02920	2886	0030	0000	0000	0004	0512
1975	02920	2908	0003	0000	0000	0009	0376
1976	02906	2904	0001	0000	0000	0001	0176
1977	02920	2917	0001	0000	0000	0002	0094
1978	02852	2849	0001	0000	0000	0002	0293
1979	02920	2915	0004	0000	0000	0001	0170
1980	02928	2920	0007	0000	0000	0001	0274
			TOTALS FOR 26 YEARS				
26	69390	55984	7983	5384	0018	0021	42171

TABLE A-9. (continued)

(b)

YEAR	VALID OBS	% OF OBSERVATIONS OF EACH TYPE										*** OBS ***		INVALID OBS
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1952	02927	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1953	02913	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1954	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1955	02914	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1956	02927	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1957	02916	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1958	02917	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1959	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1960	02927	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1961	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1962	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1963	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1964	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1965	01621	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1966	00287	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1967	00389	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1968	02928	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1969	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1970	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1974	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1975	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1976	02906	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02852	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1979	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1980	02928	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
TOTALS FOR 26 YEARS														
26	69390	.00	58.01	41.99	.00	.00	.00	.00	.00	.00	.00			00000

TABLE A-9. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1952	02927	10.25	.00	19.85	.00	.00	.00	.00	27.74	39.84	2.32	5.735	2.980	00000
1953	02913	14.80	.00	22.18	.00	.00	.00	.00	25.92	33.95	3.16	5.258	3.198	00000
1954	02920	12.77	.00	18.46	.00	.00	.00	.00	28.60	39.21	.96	5.594	3.055	00000
1955	02914	12.08	.00	19.42	.00	.00	.00	.00	27.14	36.75	4.60	5.643	3.080	00000
1956	02927	12.13	.00	18.48	.00	.00	.00	.00	27.09	38.85	3.45	5.684	3.060	00000
1957	02916	12.48	.00	18.14	.00	.00	.00	.00	28.77	38.58	2.02	5.645	3.047	00000
1958	02917	9.50	.00	17.11	.00	.00	.00	.00	28.25	42.30	2.85	5.960	2.896	00000
1959	02920	16.44	.00	21.27	.00	.00	.00	.00	23.08	34.90	4.32	5.221	3.276	00000
1960	02927	8.06	.00	16.57	.00	.00	.00	.00	25.93	48.00	1.43	6.116	2.802	00000
1961	02920	12.02	.00	16.03	.00	.00	.00	.00	21.64	48.25	2.05	5.881	3.035	00000
1962	02919	9.97	.00	20.18	.00	.00	.00	.00	22.64	45.08	2.12	5.787	2.999	00000
1963	02920	10.79	.00	20.31	.00	.00	.00	.00	19.52	46.13	3.25	5.756	3.068	00000
1964	02912	12.88	.00	16.45	.00	.00	.00	.00	17.86	52.82	.00	5.804	3.086	00007
1965	01617	19.17	.00	10.70	.00	.00	.00	.00	14.66	55.47	.00	5.678	3.299	00004
1966	00287	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00389	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	00031	3.23	3.23	3.23	.00	3.23	3.23	3.23	12.90	67.74	.00	6.903	2.196	02897
1969	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02920
1970	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02920
1974	00512	10.35	5.27	4.49	3.71	4.88	6.64	8.20	11.91	43.95	.59	5.676	2.864	02408
1975	00376	15.43	3.99	5.05	6.91	6.38	4.26	7.98	14.10	35.64	.27	5.157	3.030	02544
1976	00176	19.32	6.82	3.41	3.98	3.98	3.41	4.55	9.09	44.32	1.14	5.142	3.324	02730
1977	00094	6.38	7.45	4.26	5.32	9.57	6.38	7.45	10.64	42.55	.00	5.617	2.740	02826
1978	00293	10.92	8.19	3.75	6.14	5.12	4.10	6.48	6.48	48.81	.00	5.498	3.029	02559
1979	00170	4.71	2.94	6.47	4.71	4.12	5.29	9.41	11.76	50.59	.00	6.165	2.501	02750
1980	00274	13.14	2.92	3.65	4.01	6.20	5.47	5.84	12.41	45.26	1.09	5.682	2.945	02654
TOTALS FOR 26 YEARS														
26	42171	13.55	.23	17.53	.22	.25	.23	.33	23.52	41.85	2.27			27219

TABLE A-9. (continued)

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC										*** TCC ***		INVALID TCC
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1952	02203	13.62	4.45	12.98	5.22	4.45	6.99	13.48	4.77	30.91	3.13	4.886	3.023	00724
1953	02208	19.52	4.62	13.81	4.98	4.62	5.25	12.14	5.93	24.73	4.39	4.437	3.175	00705
1954	02421	15.41	3.80	9.95	4.13	3.80	6.07	16.69	5.20	33.66	1.28	4.990	3.029	00499
1955	02426	14.51	4.58	9.56	4.29	3.26	7.79	16.69	5.07	28.65	5.61	5.038	3.045	00488
1956	02343	15.15	4.44	10.24	4.74	2.65	9.86	19.97	3.88	24.75	4.31	4.829	2.980	00584
1957	02323	15.67	4.82	11.11	3.40	2.67	8.14	18.21	2.88	30.18	2.93	4.858	3.052	00593
1958	02300	12.04	4.09	10.39	3.17	2.83	7.78	15.57	3.78	35.83	4.52	5.318	2.985	00617
1959	02319	20.70	7.37	9.96	3.02	2.37	7.68	11.56	2.16	29.67	5.52	4.557	3.310	00601
1960	02014	11.72	4.97	10.53	3.67	3.33	9.29	16.19	3.38	34.71	2.23	5.153	2.934	00913
1961	01923	18.25	4.89	8.89	2.70	2.39	6.92	13.52	3.02	36.25	3.17	4.957	3.210	00997
1962	02080	13.99	6.06	9.62	3.94	3.13	7.55	11.39	4.04	37.16	3.13	5.094	3.104	00839
1963	02136	14.75	5.06	9.46	3.46	2.62	6.23	10.30	4.35	39.23	4.54	5.230	3.162	00784
1964	00376	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02543
1965	00310	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	01311
1966	00287	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00389	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02636	.04	6.41	4.67	3.60	4.14	5.31	5.54	12.22	56.41	1.67	6.547	2.267	00292
1969	02399	.00	5.46	4.17	3.17	4.04	4.34	5.59	11.25	56.98	5.00	6.743	2.194	00521
1970	02592	.00	5.17	3.97	3.97	5.02	5.56	6.33	10.84	56.29	2.85	6.627	2.183	00328
1974	02886	9.60	3.95	3.81	5.16	5.20	6.31	6.41	16.39	43.07	.10	5.781	2.764	00034
1975	02908	12.48	6.84	5.71	4.57	5.33	6.02	7.26	15.17	35.63	1.00	5.271	2.990	00012
1976	02904	13.84	8.95	6.82	4.99	5.96	6.82	8.02	13.74	30.10	.76	4.874	3.035	00002
1977	02917	6.92	5.49	3.87	5.11	6.03	6.58	11.55	21.84	31.37	1.23	5.698	2.597	00003
1978	02849	6.88	4.84	4.35	5.05	5.05	6.32	10.04	23.03	33.80	.63	5.780	2.588	00003
1979	02915	5.59	3.95	4.19	4.60	5.56	6.83	11.15	28.13	29.57	.45	5.869	2.421	00005
1980	02920	10.03	4.01	3.97	4.25	4.83	6.20	10.55	27.19	28.32	.65	5.611	2.684	00008
TOTALS FOR 26 YEARS														
26	55984	13.19	5.09	7.31	4.10	4.08	6.59	11.19	11.03	34.96	2.46			13406

TABLE A-10. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR MUNCHEN/REIM, WEST GERMANY, WMO STATION 108660.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1973	02909	2857	0045	0000	0004	0003	2804
1974	02910	2848	0061	0000	0000	0001	2816
1975	02801	2790	0008	0000	0000	0003	2773
1976	02928	2911	0017	0000	0000	0000	2887
1977	02920	2903	0013	0000	0000	0004	2881
1978	02920	2901	0016	0000	0000	0003	2876
1979	02919	2599	0320	0000	0000	0000	2564
1980	02815	2315	0498	0000	0000	0002	2262
1981	02920	2820	0100	0000	0000	0000	2809
1982	02919	2902	0016	0000	0000	0001	2870
		TOTALS FOR 10 YEARS					
10	28961	27846	1094	0000	0004	0017	27542

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1973	02909	96.18	.00	3.40	.00	.34	.00	.00	.00	.07	.00	.087	.477	00000
1974	02910	96.56	.00	3.06	.00	.38	.00	.00	.00	.00	.00	.076	.421	00000
1975	02801	98.57	.00	.93	.00	.29	.00	.00	.00	.21	.00	.047	.467	00000
1976	02928	98.36	.00	1.37	.00	.27	.00	.00	.00	.00	.00	.038	.311	00000
1977	02920	97.50	.00	1.34	.00	1.16	.00	.00	.00	.00	.00	.073	.484	00000
1978	02920	97.57	.00	1.51	.00	.92	.00	.00	.00	.00	.00	.067	.451	00000
1979	02919	56.32	.00	12.16	.00	31.52	.00	.00	.00	.00	.00	1.504	1.808	00000
1980	02815	6.22	.00	19.64	.00	74.14	.00	.00	.00	.00	.00	3.358	1.170	00000
1981	02920	78.18	.00	3.80	.00	18.01	.00	.00	.00	.00	.00	.797	1.549	00000
1982	02919	97.09	.00	1.58	.00	1.34	.00	.00	.00	.00	.00	.085	.519	00000
		TOTALS FOR 10 YEARS												
10	28961	82.46	.00	4.84	.00	12.67	.00	.00	.00	.03	.00			00000

TABLE A-10. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY										*** SKY ***		INVALID SKY
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1973	02804	13.48	9.09	5.14	5.28	4.32	4.49	7.99	17.58	31.56	1.07	5.081	3.055	00105
1974	02816	9.41	7.21	5.18	5.40	4.97	5.36	10.37	19.78	32.24	.07	5.397	2.809	00094
1975	02773	13.38	9.59	6.09	5.41	4.22	4.04	7.10	18.75	28.99	2.42	5.027	3.083	00028
1976	02887	14.62	10.22	5.40	5.23	4.16	4.54	7.14	16.18	28.85	3.67	4.959	3.151	00041
1977	02881	7.39	6.91	5.03	5.38	5.87	6.04	9.55	22.01	29.09	2.74	5.555	2.722	00039
1978	02876	9.39	7.55	5.29	5.11	4.94	5.11	9.28	20.20	30.32	2.82	5.438	2.859	00044
1979	02564	9.95	7.68	4.37	5.34	4.49	4.25	8.46	20.75	33.70	1.01	5.464	2.875	00355
1980	02262	13.13	3.18	2.83	3.40	4.33	4.77	8.75	23.83	34.08	1.68	5.674	2.855	00553
1981	02809	8.65	7.16	5.84	5.80	5.09	6.30	9.83	23.96	26.31	1.07	5.349	2.755	00111
1982	02870	13.41	9.44	6.76	5.89	5.51	5.40	8.08	20.42	22.33	2.75	4.845	3.015	00049
TOTALS FOR 10 YEARS														
10	27542	11.25	7.90	5.25	5.26	4.80	5.05	8.66	20.27	29.61	1.95			01419

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC										*** TCC ***		INVALID TCC
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1973	02857	13.41	10.54	4.31	5.11	4.24	4.48	7.77	17.15	31.96	1.05	5.056	3.079	00052
1974	02848	9.41	9.13	4.56	4.95	5.02	5.06	9.83	19.49	32.48	.07	5.343	2.858	00062
1975	02790	13.30	11.79	5.13	4.84	3.98	4.12	6.88	18.49	29.10	2.37	4.980	3.117	00011
1976	02911	14.50	12.20	4.77	4.53	4.05	4.43	6.90	16.01	28.86	3.74	4.918	3.183	00017
1977	02903	7.34	8.58	4.44	4.99	5.65	5.96	9.27	21.84	29.14	2.79	5.516	2.763	00017
1978	02901	9.34	9.93	4.41	5.14	4.52	4.79	8.86	19.99	30.06	2.96	5.364	2.917	00019
1979	02599	9.62	9.39	5.08	5.00	4.16	3.81	8.35	20.32	33.05	1.23	5.380	2.921	00320
1980	02315	12.40	5.10	3.11	3.93	4.28	4.32	8.12	23.37	33.65	1.73	5.589	2.894	00500
1981	02820	8.55	9.57	5.21	5.39	5.00	5.85	9.33	23.87	25.92	1.31	5.276	2.814	00100
1982	02902	13.27	11.85	5.93	5.51	4.76	5.17	7.82	20.54	22.33	2.83	4.799	3.056	00017
TOTALS FOR 10 YEARS														
10	27846	11.10	9.90	4.72	4.96	4.58	4.82	8.32	20.04	29.54	2.03			01115

TABLE A-11. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR DEIR ZZOR, SYRIA, WMO STATION 400450.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1966	01095	1087	0008	0000	0000	0000	1094
1967	01706	1653	0051	0000	0002	0000	1705
1968	02379	2349	0016	0000	0014	0000	2375
1969	02052	2034	0011	0000	0007	0000	2048
1970	02134	2120	0006	0000	0008	0000	2133
1971	02409	2397	0006	0000	0006	0000	2407
1972	02325	2307	0010	0000	0008	0000	2325
1973	02148	2141	0003	0000	0001	0003	2142
1974	01766	1763	0001	0000	0000	0002	1761
1975	01654	1647	0005	0000	0000	0002	1651
1976	01386	1384	0002	0000	0000	0000	1385
1977	01438	1433	0002	0000	0001	0002	1438
1978	01230	1222	0006	0000	0000	0002	1230
1979	00935	0933	0001	0000	0000	0001	0935
1980	00301	0300	0000	0000	0000	0001	0301
		TOTALS FOR 15 YEARS					
15	24958	24770	0128	0000	0047	0013	24930

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1966	01095	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	01706	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02379	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1969	02052	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1970	02134	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1971	02409	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1972	02325	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1973	02148	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1974	01766	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1975	01654	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1976	01386	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1977	01438	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1978	01230	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1979	00935	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1980	00301	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
		TOTALS FOR 15 YEARS												
15	24958	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			00000

TABLE A-11. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY										*** SKY ***		INVALID SKY
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1966	01094	97.17	.73	.18	.64	.18	.18	.18	.18	.55	.00	.114	.801	00001
1967	01705	61.47	11.09	5.10	4.87	2.35	3.58	2.52	4.28	3.75	1.00	1.473	2.464	00001
1968	02375	47.49	10.53	6.61	6.19	3.54	5.31	4.55	9.47	6.02	.29	2.274	2.832	00004
1969	02048	48.68	8.84	5.66	5.42	3.08	5.27	5.86	8.06	8.74	.39	2.401	2.970	00004
1970	02133	59.26	7.74	5.06	5.58	3.05	5.49	4.83	6.56	2.30	.14	1.688	2.517	00001
1971	02407	57.62	7.35	5.94	5.61	3.03	4.20	3.70	6.40	5.86	.29	1.856	2.713	00002
1972	02325	51.78	9.55	7.44	5.98	5.03	4.39	4.00	5.55	6.11	.17	1.977	2.671	00000
1973	02142	64.33	7.47	6.82	4.86	2.75	2.85	3.03	4.76	3.08	.05	1.375	2.342	00006
1974	01761	55.42	4.88	4.66	5.22	2.61	4.66	4.77	8.97	8.52	.28	2.257	2.999	00005
1975	01651	66.26	3.09	6.60	4.48	3.69	3.57	2.79	5.45	3.69	.36	1.501	2.503	00003
1976	01385	64.40	2.60	5.05	5.27	4.04	3.32	4.33	5.20	5.56	.22	1.701	2.671	00001
1977	01438	69.61	2.43	5.70	4.66	2.92	3.41	3.13	3.89	3.96	.28	1.368	2.433	00000
1978	01230	69.27	3.50	5.37	5.85	3.01	2.85	3.66	3.25	3.01	.24	1.290	2.311	00000
1979	00935	64.92	3.53	6.31	5.67	2.35	4.49	4.06	5.99	2.57	.11	1.528	2.469	00000
1980	00301	34.88	3.99	7.97	7.97	6.31	7.31	6.98	15.95	8.64	.00	3.282	3.004	00000
		TOTALS FOR 15 YEARS												
15	24930	60.15	6.61	5.71	5.21	3.15	4.06	3.86	6.06	4.90	.28			00028

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC										*** TCC ***		INVALID TCC
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1966	01087	97.79	.92	.28	.37	.18	.09	.18	.09	.09	.00	.063	.522	00008
1967	01653	63.34	12.58	4.48	4.17	2.06	3.27	2.24	3.51	3.45	.91	1.324	2.355	00053
1968	02349	47.98	13.03	6.73	4.81	3.41	4.94	4.51	8.90	5.41	.30	2.145	2.775	00030
1969	02034	49.02	11.21	5.56	4.72	3.49	5.26	5.65	7.52	7.18	.39	2.243	2.871	00018
1970	02120	59.53	9.58	5.28	5.57	3.16	5.05	4.10	5.85	1.75	.14	1.555	2.395	00014
1971	02397	57.82	8.30	6.13	5.42	2.80	3.96	3.55	6.01	5.63	.38	1.796	2.676	00012
1972	02307	52.10	11.40	6.55	5.64	4.72	4.33	3.86	5.42	5.81	.17	1.911	2.641	00018
1973	02141	64.04	8.36	6.31	4.72	2.76	2.99	2.99	4.72	3.13	.00	1.371	2.337	00007
1974	01763	55.19	6.01	4 82	5.16	2.55	4.65	4.65	8.34	8.39	.23	2.201	2.961	00003
1975	01647	66.24	3.58	6.62	4.68	3.58	3.64	2.67	5.22	3.58	.18	1.463	2.456	00007
1976	01384	64.38	3.03	5.35	5.27	4.05	3.25	4.19	4.84	5.56	.07	1.662	2.631	00002
1977	01433	69.71	2.86	5.51	4.82	3.14	3.28	2.93	3.77	3.77	.21	1.333	2.391	00005
1978	01222	69.56	4.17	5.24	5.65	3.11	2.62	3.60	3.03	2.95	.08	1.242	2.259	00008
1979	00933	64.95	3.64	6.11	5.89	2.47	4.50	3.75	6.22	2.36	.11	1.518	2.455	00002
1980	00300	35.00	4.67	8.33	8.67	6.00	7.00	6.67	16.00	7.67	.00	3.197	2.971	00001
		TOTALS FOR 15 YEARS												
15	24770	60.44	7.84	5.60	4.93	3.12	3.93	3.67	5.70	4.53	.24			00188

TABLE A-12. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR MANN, JORDAN, WMO STATION 403100.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1966	00943	0943	0000	0000	0000	0000	0943
1967	01473	1258	0215	0000	0000	0000	1472
1968	00707	0706	0000	0000	0001	0000	0706
1969	00591	0591	0000	0000	0000	0000	0591
1970	00387	0386	0001	0000	0000	0000	0387
1971	00435	0435	0000	0000	0000	0000	0435
1972	01012	1007	0005	0000	0000	0000	1012
1973	01171	1171	0000	0000	0000	0000	1171
1974	00964	0964	0000	0000	0000	0000	0964
1975	01096	1096	0000	0000	0000	0000	1096
1976	00989	0988	0001	0000	0000	0000	0989
1977	01201	1200	0001	0000	0000	0000	1201
1978	01284	1283	0001	0000	0000	0000	1284
1979	01384	1384	0000	0000	0000	0000	1384
1980	01464	1462	0002	0000	0000	0000	1464
		TOTALS FOR 15 YEARS					
15	15101	14874	0226	0000	0001	0000	15099

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1966	00943	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	01473	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	00707	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1969	00591	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1970	00387	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1971	00435	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1972	01012	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1973	01171	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1974	00964	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1975	01096	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1976	00989	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1977	01201	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1978	01284	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1979	01384	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1980	01464	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
						TOTALS FOR 15 YEARS								
15	15101	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			00000

TABLE A-12 (continued).

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1966	00943	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	01472	66.51	14.88	4.01	3.33	2.04	2.17	1.83	4.62	.61	.00	1.001	1.948	00001
1968	00706	99.01	.28	.00	.00	.28	.14	.00	.14	.14	.00	.042	.492	00001
1969	00591	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1970	00387	99.22	.00	.26	.00	.00	.26	.00	.26	.00	.00	.036	.448	00000
1971	00435	99.08	.00	.23	.00	.00	.00	.00	.69	.00	.00	.053	.587	00000
1972	01012	99.41	.20	.00	.00	.00	.00	.20	.00	.20	.00	.030	.446	00000
1973	01171	99.83	.09	.00	.00	.00	.00	.00	.09	.00	.00	.007	.207	00000
1974	00964	99.90	.00	.10	.00	.00	.00	.00	.00	.00	.00	.002	.064	00000
1975	01096	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1976	00989	99.80	.00	.00	.00	.00	.20	.00	.00	.00	.00	.010	.225	00000
1977	01201	99.83	.00	.00	.00	.00	.08	.00	.00	.08	.00	.011	.272	00000
1978	01284	99.69	.00	.00	.00	.00	.00	.08	.00	.16	.08	.024	.436	00000
1979	01384	99.78	.07	.07	.07	.00	.00	.00	.00	.00	.00	.004	.101	00000
1980	01464	99.66	.00	.07	.00	.00	.07	.00	.00	.07	.14	.023	.417	00000
							TOTALS FOR 15 YEARS							
15	15099	96.48	1.49	.42	.33	.21	.25	.20	.49	.11	.02			00002

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1966	00943	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	01258	77.82	12.80	2.94	1.83	1.67	.56	.64	1.19	.56	.00	.502	1.317	00215
1968	00706	99.01	.28	.00	.00	.28	.14	.00	.14	.14	.00	.042	.492	00001
1969	00591	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1970	00386	99.48	.00	.00	.00	.26	.00	.00	.26	.00	.00	.028	.410	00001
1971	00435	99.08	.23	.23	.00	.00	.00	.00	.46	.00	.00	.039	.486	00000
1972	01007	99.50	.00	.00	.00	.00	.10	.00	.00	.30	.10	.038	.543	00005
1973	01171	99.83	.09	.00	.09	.00	.00	.00	.00	.00	.00	.003	.092	00000
1974	00964	99.69	.00	.10	.00	.00	.00	.00	.00	.21	.00	.019	.370	00000
1975	01096	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1976	00988	99.80	.00	.00	.00	.00	.10	.00	.00	.10	.00	.013	.300	00001
1977	01200	99.83	.00	.00	.00	.00	.00	.00	.00	.17	.00	.013	.326	00001
1978	01283	99.77	.00	.08	.00	.00	.00	.08	.00	.08	.00	.012	.285	00001
1979	01384	99.78	.07	.00	.00	.00	.00	.00	.14	.00	.00	.011	.267	00000
1980	01462	99.79	.07	.00	.00	.00	.00	.00	.00	.14	.00	.012	.297	00002
							TOTALS FOR 15 YEARS							
15	14874	97.88	1.12	.27	.16	.16	.07	.06	.14	1				

TABLE A-13. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR BAGDAD INTL., SYRIA, WMO STATION 406500.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1969	01264	1185	0076	0000	0003	0000	1163
1970	01999	1676	0295	0000	0028	0000	1589
1971	01950	1699	0218	0000	0033	0000	1703
1972	01759	1565	0164	0000	0030	0000	1559
1973	01925	1774	0151	0000	0000	0000	1721
1974	01973	1767	0200	0000	0006	0000	1709
1975	01739	1558	0165	0000	0016	0000	1529
1976	01358	1151	0192	0000	0015	0000	1069
1977	01756	1471	0269	0000	0016	0000	1268
1978	01699	1449	0239	0000	0011	0000	1375
1979	01712	1563	0132	0000	0017	0000	1563
1980	00555	0519	0029	0000	0007	0000	0512
			TOTALS FOR 12 YEARS				
12	19689	17377	2130	0000	0182	0000	16760

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1969	01264	91.14	.87	7.99	.00	.00	.00	.00	.00	.00	.00	.169	.548	00000
1970	01999	28.61	.00	20.51	.00	50.88	.00	.00	.00	.00	.00	2.445	1.727	00000
1971	01950	21.64	.00	12.46	.00	65.90	.00	.00	.00	.00	.00	2.885	1.649	00000
1972	01759	19.56	.00	11.14	.00	69.30	.00	.00	.00	.00	.00	2.995	1.602	00000
1973	01925	21.56	.00	10.34	.05	68.05	.00	.00	.00	.00	.00	2.930	1.649	00000
1974	01973	14.55	.00	13.13	.00	72.33	.00	.00	.00	.00	.00	3.156	1.463	00000
1975	01739	32.55	.00	12.02	.00	55.43	.00	.00	.00	.00	.00	2.458	1.820	00000
1976	01358	57.51	.00	21.21	.00	21.28	.00	.00	.00	.00	.00	1.275	1.621	00000
1977	01756	44.87	.00	27.79	.00	27.33	.00	.00	.00	.00	.00	1.649	1.663	00000
1978	01699	39.85	.00	19.07	.00	41.08	.00	.00	.00	.00	.00	2.025	1.800	00000
1979	01712	35.40	.00	8.64	.00	55.96	.00	.00	.00	.00	.00	2.411	1.867	00000
1980	00555	26.49	.00	7.75	.00	65.77	.00	.00	.00	.00	.00	2.786	1.755	00000
						TOTALS FOR 12 YEARS								
12	19689	34.32	.06	14.77	.01	50.85	.00	.00	.00	.00	.00			00000

TABLE A-13. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1969	01163	98.80	.00	.17	.09	.09	.09	.34	.26	.17	.00	.066	.637	00101
1970	01589	89.80	.94	.94	1.20	.82	1.20	2.14	1.64	1.32	.00	.505	1.658	00410
1971	01703	79.33	1.41	1.47	2.29	1.23	2.00	3.46	4.76	3.70	.35	1.130	2.436	00247
1972	01559	75.95	1.54	1.73	1.99	3.01	2.50	3.78	6.41	2.57	.51	1.283	2.509	00200
1973	01721	83.09	1.57	2.03	2.50	1.51	1.57	2.09	2.73	2.79	.12	.820	2.063	00204
1974	01709	71.91	2.87	2.57	2.46	2.63	2.40	2.81	4.86	6.79	.70	1.494	2.730	00264
1975	01529	79.66	1.70	1.83	2.09	1.70	2.62	2.42	4.45	2.94	.59	1.060	2.344	00210
1976	01069	87.75	.65	.84	1.12	.65	1.22	2.06	2.99	2.15	.56	.700	2.026	00289
1977	01268	85.02	1.26	1.89	1.26	1.50	1.10	1.34	2.68	2.52	1.42	.801	2.154	00488
1978	01375	88.15	.95	1.31	1.31	1.24	.73	1.53	2.33	1.96	.51	.618	1.881	00324
1979	01563	77.54	1.28	1.86	2.37	1.86	3.07	3.97	3.13	3.39	1.54	1.216	2.504	00149
1980	00512	60.16	2.54	3.32	2.93	3.13	4.10	6.05	8.79	8.40	.59	2.213	3.067	00043
TOTALS FOR 12 YEARS														
12	16760	81.96	1.40	1.63	1.82	1.59	1.83	2.57	3.58	3.06	.57			02929

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1969	01185	96.96	.00	.34	.51	.17	.51	.68	.34	.51	.00	.159	.960	00079
1970	01676	85.08	1.37	1.61	1.55	1.43	1.91	2.63	2.21	2.15	.06	.734	1.959	00323
1971	01699	79.46	1.94	2.35	2.12	1.06	1.82	3.18	4.06	4.00	.00	1.059	2.347	00251
1972	01565	75.65	3.19	1.85	2.04	2.62	1.98	3.26	6.20	3.13	.06	1.220	2.447	00194
1973	01774	84.22	2.42	1.75	1.63	1.07	1.47	1.92	2.65	2.87	.00	.755	2.010	00151
1974	01767	72.72	3.45	2.43	2.04	2.15	2.43	2.49	4.87	7.30	.11	1.436	2.693	00206
1975	01558	80.81	2.44	2.18	1.99	1.16	2.05	2.31	3.85	3.15	.06	.942	2.211	00181
1976	01151	83.67	1.74	1.48	1.65	1.39	1.13	1.74	3.82	3.30	.09	.852	2.166	00207
1977	01471	78.79	3.06	2.72	1.84	1.97	1.63	2.31	3.20	4.42	.07	1.022	2.295	00285
1978	01449	87.16	1.38	1.10	1.38	.97	.76	2.00	2.83	2.42	.00	.665	1.934	00250
1979	01563	80.49	1.86	2.11	1.73	1.86	2.50	3.07	2.82	3.58	.00	.980	2.236	00149
1980	00519	62.62	3.47	3.47	2.31	2.12	3.85	5.78	7.71	8.67	.00	2.031	2.997	00036
TOTALS FOR 12 YEARS														
12	17377	81.23	2.19	1.91	1.73	1.49	1.77	2.49	3.54	3.61	.04			02312

TABLE A-14. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR REZAIYEH, IRAN, WMO STATION 407120.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1967	00481	0454	0025	0000	0002	0000	0479
1968	00385	0381	0002	0000	0002	0000	0385
1969	00347	0345	0002	0000	0000	0000	0347
1970	00311	0311	0000	0000	0000	0000	0311
1971	00591	0590	0001	0000	0000	0000	0591
1972	00458	0456	0001	0000	0001	0000	0458
1973	00572	0572	0000	0000	0000	0000	0572
1974	00370	0370	0000	0000	0000	0000	0370
1975	00523	0520	0003	0000	0000	0000	0522
1976	00244	0244	0000	0000	0000	0000	0244
1977	00397	0395	0002	0000	0000	0000	0396
1978	00626	0615	0011	0000	0000	0000	0626
1979	00394	0393	0001	0000	0000	0000	0394
1980	00555	0552	0002	0000	0000	0001	0555
		TOTALS FOR 14 YEARS					
14	06254	6198	0050	0000	0005	0001	6250

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1967	00481	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	00385	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1969	00347	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1970	00311	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1971	00591	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1972	00458	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1973	00572	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1974	00370	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1975	00523	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1976	00244	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1977	00397	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1978	00626	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1979	00394	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1980	00555	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
						TOTALS FOR 14 YEARS								
14	06254	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			00000

TABLE A-14. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1967	00479	73.49	5.85	2.30	2.71	2.09	2.09	1.67	3.34	6.47	.00	1.225	2.478	00002
1968	00385	98.96	.00	.26	.00	.00	.00	.00	.52	.26	.00	.062	.655	00000
1969	00347	98.27	.00	.00	.00	.29	.00	.00	.29	1.15	.00	.124	.955	00000
1970	00311	99.36	.00	.00	.00	.00	.00	.00	.00	.64	.00	.051	.641	00000
1971	00591	99.66	.17	.00	.00	.00	.00	.00	.17	.00	.00	.014	.291	00000
1972	00458	98.47	.22	.00	.87	.00	.00	.00	.00	.44	.00	.063	.598	00000
1973	00572	99.13	.35	.00	.17	.17	.00	.17	.00	.00	.00	.026	.331	00000
1974	00370	97.30	.00	.54	.27	.00	.27	.54	.81	.27	.00	.143	.927	00000
1975	00522	99.23	.00	.00	.00	.00	.00	.00	.19	.00	.57	.065	.746	00001
1976	00244	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1977	00396	98.23	.00	.00	.25	.25	.25	.00	.00	.76	.25	.114	.897	00001
1978	00626	95.85	.00	.48	.16	.00	.48	.16	.32	.80	1.76	.292	1.490	00000
1979	00394	98.98	.51	.25	.00	.00	.00	.00	.25	.00	.00	.028	.373	00000
1980	00555	97.66	.36	.00	.00	.00	.54	.18	.54	.54	.18	.139	.971	00000
TOTALS FOR 14 YEARS														
14	06250	96.53	.58	.29	.34	.21	.29	.21	.48	.83	.26			00004

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1967	00454	77.75	6.61	5.07	2.86	1.76	1.98	1.32	.88	1.76	.00	.705	1.688	00027
1968	00381	99.74	.00	.00	.00	.00	.00	.00	.00	.26	.00	.021	.410	00004
1969	00345	99.13	.00	.00	.00	.00	.00	.00	.00	.87	.00	.070	.744	00002
1970	00311	99.68	.00	.00	.00	.32	.00	.00	.00	.00	.00	.013	.227	00000
1971	00590	99.49	.17	.00	.00	.17	.00	.00	.17	.00	.00	.020	.334	00001
1972	00456	99.56	.22	.00	.00	.00	.00	.00	.00	.22	.00	.020	.377	00002
1973	00572	98.95	.35	.00	.35	.00	.17	.17	.00	.00	.00	.033	.375	00000
1974	00370	97.30	.54	.54	1.08	.27	.00	.00	.27	.00	.00	.078	.543	00000
1975	00520	99.62	.19	.00	.00	.00	.00	.00	.19	.00	.00	.015	.310	00003
1976	00244	99.59	.41	.00	.00	.00	.00	.00	.00	.00	.00	.004	.064	00000
1977	00395	98.48	.25	.25	.00	.00	.00	.25	.00	.76	.00	.084	.764	00002
1978	00615	97.40	.49	.98	.33	.00	.16	.00	.00	.49	.16	.096	.741	00011
1979	00393	99.24	.51	.00	.00	.25	.00	.00	.00	.00	.00	.015	.214	00001
1980	00552	98.19	.72	.00	.18	.00	.18	.18	.18	.36	.00	.074	1	

TABLE A-15. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR TEHRAN/MEHRABAD, IRAN, WMO STATION 407540.

(a)

YEAR	DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR 1	ERR 2	ERR 3	ERR4	SKY VALID
1969	00888	0813	0073	0002	0000	0000	0724
1970	01795	1522	0273	0000	0000	0000	1255
1971	01814	1629	0185	0000	0000	0000	1538
1972	01508	1370	0137	0000	0001	0000	1249
1973	01573	1390	0183	0000	0000	0000	1335
1974	01358	1134	0223	0000	0001	0000	1001
1975	01377	1116	0261	0000	0000	0000	0977
1976	01299	1077	0221	0000	0001	0000	0906
1977	01576	1324	0251	0000	0000	0001	1074
1978	02021	1639	0382	0000	0000	0000	1320
1979	01495	1225	0270	0000	0000	0000	0924
			TOTALS FOR 11 YEARS				
11	16704	14239	2459	0002	0003	0001	12303

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1969	00888	79.28	2.25	18.47	.00	.00	.00	.00	.00	.00	.00	.392	.780	00000
1970	01795	17.33	.00	29.97	.00	52.70	.00	.00	.00	.00	.00	2.708	1.517	00000
1971	01814	12.73	.00	14.99	.00	72.27	.00	.00	.00	.00	.00	3.191	1.408	00000
1972	01508	16.58	.00	17.11	.00	66.31	.00	.00	.00	.00	.00	2.995	1.526	00000
1973	01573	29.24	.00	15.07	.00	55.69	.00	.00	.00	.00	.00	2.529	1.766	00000
1974	01358	18.04	.00	26.07	.00	55.89	.00	.00	.00	.00	.00	2.757	1.545	00000
1975	01377	23.75	.00	28.90	.00	47.35	.00	.00	.00	.00	.00	2.472	1.620	00000
1976	01299	23.33	.00	30.10	.00	46.57	.00	.00	.00	.00	.00	2.465	1.607	00000
1977	01576	18.72	.00	31.73	.00	49.56	.00	.00	.00	.00	.00	2.617	1.534	00000
1978	02021	6.73	.00	34.69	.00	58.58	.00	.00	.00	.00	.00	3.037	1.240	00000
1979	01495	7.49	.00	38.13	.00	54.38	.00	.00	.00	.00	.00	2.938	1.264	00000
						TOTALS FOR 11 YEARS								
11	16704	20.20	.12	26.24	.00	53.44	.00	.00	.00	.00	.00			00000

TABLE A-15. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1969	00724	96.27	.14	.28	.14	.41	.28	.41	.83	1.24	.00	.224	1.210	00164
1970	01255	72.83	2.87	3.35	3.82	3.59	3.51	3.03	5.58	1.43	.00	1.216	2.286	00540
1971	01538	53.90	5.40	4.55	5.07	4.62	5.85	5.20	11.83	3.58	.00	2.201	2.831	00276
1972	01249	51.56	5.68	5.36	6.33	4.72	5.36	5.20	9.45	5.76	.56	2.296	2.884	00259
1973	01335	72.81	3.37	2.10	3.22	2.70	3.75	3.22	5.09	3.75	.00	1.317	2.469	00238
1974	01001	54.55	3.80	5.09	5.69	2.90	4.40	5.39	9.09	8.99	.10	2.335	3.018	00357
1975	00977	61.82	3.68	3.48	3.89	3.48	3.79	5.42	8.09	5.94	.41	1.955	2.874	00400
1976	00906	60.38	5.19	4.19	3.31	2.98	3.75	4.30	9.38	6.29	.22	1.980	2.894	00393
1977	01074	57.45	5.21	4.93	3.35	2.89	3.82	4.66	10.43	6.98	.28	2.151	2.972	00502
1978	01320	56.89	5.15	4.24	5.23	4.02	5.83	4.92	10.91	2.65	.15	2.030	2.759	00701
1979	00924	52.27	5.74	5.74	5.52	5.19	6.28	5.41	8.98	4.76	.11	2.203	2.797	00571
						TOTALS FOR 11 YEARS								
11	12303	61.81	4.34	4.02	4.31	3.54	4.42	4.39	8.44	4.58	.16			04401

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1969	00813	85.73	3.08	1.48	.62	1.23	1.23	1.60	2.95	2.09	.00	.659	1.892	00075
1970	01522	59.86	7.75	4.99	2.63	3.42	5.78	4.86	6.64	4.07	.00	1.764	2.647	00273
1971	01629	50.77	8.53	5.03	3.25	4.30	6.57	5.46	12.22	3.87	.00	2.276	2.857	00185
1972	01370	46.93	9.85	4.96	5.33	4.09	6.13	5.18	9.85	7.01	.66	2.448	2.947	00138
1973	01390	70.94	4.32	3.09	2.52	2.45	3.60	3.31	5.25	4.53	.00	1.387	2.536	00183
1974	01134	49.65	8.02	4.59	4.41	3.00	4.85	6.00	9.35	10.05	.09	2.493	3.64	00224
1975	01116	55.56	6.81	3.23	3.49	3.94	4.48	6.00	9.23	6.90	.36	2.210	2.963	00261
1976	01077	52.74	9.66	3.53	2.51	3.71	5.11	4.46	9.56	8.73	.00	2.281	3.002	00222
1977	01324	50.08	8.38	4.23	3.17	4.23	4.98	5.29	10.65	8.91	.08	2.465	3.047	00252
1978	01639	48.99	9.33	4.21	2.68	3.78	7.26	6.22	11.17	6.16	.18	2.437	2.966	00382
1979	01225	42.45	10.29	5.88	3.59	4.57	7.35	6.53	10.37	8.73	.24	2.717	3.013	00270
						TOTALS FOR 11 YEARS								
11	14239	54.79	7.99	4.24	3.17	3.61	5.44	5.11	9.09	6.40	.15			02465

TABLE A-16. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR KERMANSHEH, IRAN, WMO STATION 407660.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1967	00948	0937	0011	0000	0000	0000	0946
1968	00845	0845	0000	0000	0000	0000	0845
1969	00548	0548	0000	0000	0000	0000	0548
1970	00828	0828	0000	0000	0000	0000	0828
1971	00915	0913	0002	0000	0000	0000	0915
1972	00798	0797	0001	0000	0000	0000	0798
1973	00789	0788	0000	0000	0000	0001	0789
1974	00369	0369	0000	0000	0000	0000	0368
1975	00773	0744	0029	0000	0000	0000	0773
1976	00484	0479	0005	0000	0000	0000	0484
1977	00667	0655	0012	0000	0000	0000	0667
1978	00725	0720	0005	0000	0000	0000	0725
1979	00447	0442	0005	0000	0000	0000	0447
1980	00654	0646	0008	0000	0000	0000	0654
		TOTALS FOR 14 YEARS					
14	09790	9711	0078	0000	0000	0001	9787

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1967	00948	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	00845	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1969	00548	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1970	00828	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1971	00915	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1972	00798	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1973	00789	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1974	00369	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1975	00773	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1976	00484	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1977	00667	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1978	00725	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1979	00447	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1980	00654	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
						TOTALS FOR 14 YEARS								
14	09790	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00			00000

TABLE A-16. (continued).

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1967	00946	95.77	.85	.42	.42	.32	.53	.42	.42	.74	.11	.192	1.063	00002
1968	00845	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1969	00548	98.91	.00	.18	.00	.00	.00	.18	.18	.55	.00	.071	.713	00000
1970	00828	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1971	00915	99.67	.00	.11	.11	.00	.00	.11	.00	.00	.00	.012	.231	00000
1972	00798	99.50	.00	.00	.00	.00	.00	.00	.13	.13	.25	.041	.586	00000
1973	00789	97.47	.51	.38	.38	.51	.13	.38	.00	.25	.00	.094	.677	00000
1974	00368	95.65	.27	.82	.00	.00	.27	.82	.54	1.63	.00	.250	1.284	00001
1975	00773	95.99	.00	.00	.13	.00	.13	.00	.00	.00	3.75	.348	1.722	00000
1976	00484	98.76	.00	.21	.00	.00	.00	.00	.00	.00	1.03	.097	.915	00000
1977	00667	97.45	.00	.15	.00	.00	.30	.00	.00	.15	1.95	.205	1.310	00000
1978	00725	96.83	.00	.28	.55	.14	.28	.55	.69	.14	.55	.183	1.092	00000
1979	00447	97.99	.22	.00	.45	.00	.00	.00	.22	.22	.89	.130	1.003	00000
1980	00654	97.86	.00	.00	.00	.00	.15	.00	.61	.15	1.22	.173	1.183	00000
						TOTALS FOR 14 YEARS								
14	09787	98.07	.14	.16	.15	.08	.13	.16	.18	.24	.67			00003

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1967	00937	96.69	.53	.53	.85	.64	.32	.32	.00	.11	.00	.111	.677	00011
1968	00845	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1969	00548	98.91	.00	.18	.36	.00	.36	.00	.00	.18	.00	.047	.496	00000
1970	00828	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1971	00913	99.78	.11	.11	.00	.00	.00	.00	.00	.00	.00	.003	.074	00002
1972	00797	99.50	.00	.00	.00	.13	.00	.00	.13	.00	.25	.036	.533	00001
1973	00788	97.59	.51	.76	.76	.25	.13	.00	.00	.00	.00	.060	.416	00001
1974	00369	95.12	.27	2.44	.81	.00	.00	.54	.00	.81	.00	.173	.928	00000
1975	00744	99.73	.13	.13	.00	.00	.00	.00	.00	.00	.00	.004	.082	00029
1976	00479	99.79	.00	.21	.00	.00	.00	.00	.00	.00	.00	.004	.091	00005
1977	00655	99.08	.00	.15	.00	.15	.15	.00	.31	.00	.15	.052	.583	00012
1978	00720	97.08	.14	1.25	.42	.56	.14	.14	.14	.14	.00	.097	.641	00005
1979	00442	98.87	.23	.00	.45	.00	.00	.00	.23	.23	.00	.050	.545	00005
1980	00646	98.76	.46	.15	.15	.31	.00	.15	.00	.00	.00	FILE 'FREQ17' NOT FOUND.		

TABLE A-17. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR CAIRO, EGYPT, WMO STATION 623660.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1969	02811	2290	0521	0000	0000	0000	2677
1970	02692	2041	0651	0000	0000	0000	1940
1971	02613	2076	0537	0000	0000	0000	2009
1972	02261	1915	0346	0000	0000	0000	1706
1973	02155	1918	0237	0000	0000	0000	1786
1974	02182	1919	0263	0000	0000	0000	1654
1975	02094	1745	0349	0000	0000	0000	1458
1976	02136	1675	0460	0000	0000	0001	1301
1977	02298	1736	0562	0000	0000	0000	1234
1978	02293	1399	0894	0000	0000	0000	0874
1979	02099	1727	0372	0000	0000	0000	1477
			TOTALS FOR 11 YEARS				
11	25634	20441	5192	0000	0000	0001	18116

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1969	02811	95.23	.21	4.55	.00	.00	.00	.00	.00	.00	.00	.093	.419	00000
1970	02692	33.66	.00	27.82	.00	38.52	.00	.00	.00	.00	.00	2.097	1.697	00000
1971	02613	14.93	.00	22.77	.00	62.30	.00	.00	.00	.00	.00	2.948	1.481	00000
1972	02261	16.72	.00	24.33	.00	58.96	.00	.00	.00	.00	.00	2.845	1.521	00000
1973	02155	19.77	.00	16.66	.00	63.57	.00	.00	.00	.00	.00	2.876	1.602	00000
1974	02182	23.69	.00	24.11	.00	52.20	.00	.00	.00	.00	.00	2.570	1.647	00000
1975	02094	24.83	.00	30.28	.00	44.89	.00	.00	.00	.00	.00	2.401	1.621	00000
1976	02136	10.96	.00	39.00	.00	50.05	.00	.00	.00	.00	.00	2.782	1.353	00000
1977	02298	9.05	.00	46.17	.00	44.78	.00	.00	.00	.00	.00	2.715	1.282	00000
1978	02293	6.37	.00	61.88	.00	31.75	.00	.00	.00	.00	.00	2.508	1.126	00000
1979	02099	18.96	.00	29.54	.00	51.50	.00	.00	.00	.00	.00	2.651	1.548	00000
						TOTALS FOR 11 YEARS								
11	25634	26.53	.02	29.16	.00	44.29	.00	.00	.00	.00	.00			00000

TABLE A-17. (continued).

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1969	02677	45.16	5.64	7.84	8.70	6.16	8.03	10.12	5.72	2.05	.56	2.345	2.620	00134
1970	01940	54.59	4.28	7.06	7.06	5.98	8.35	6.70	4.12	1.60	.26	1.894	2.467	00752
1971	02009	58.93	4.23	7.52	6.67	5.43	5.33	5.82	4.28	1.39	.40	1.672	2.399	00604
1972	01706	71.75	2.81	3.75	5.86	4.22	4.40	4.16	1.88	1.00	.18	1.144	2.091	00555
1973	01786	75.20	2.58	4.26	3.86	3.47	3.98	3.47	2.52	.62	.06	1.003	2.003	00369
1974	01654	75.15	2.42	3.93	3.51	2.36	3.99	3.81	3.33	1.39	.12	1.085	2.165	00528
1975	01458	73.18	2.33	4.18	5.01	3.43	4.39	4.18	1.92	.89	.48	1.114	2.111	00636
1976	01301	66.33	2.77	4.30	4.61	4.69	6.69	5.53	3.84	.85	.38	1.477	2.364	00835
1977	01234	70.18	2.35	3.40	4.62	3.57	5.67	5.02	3.32	1.30	.57	1.345	2.342	01064
1978	00874	71.85	1.72	4.81	4.00	5.15	5.15	4.81	1.03	1.14	.34	1.180	2.131	01419
1979	01477	74.34	2.98	2.51	4.27	3.39	5.01	4.87	1.62	.81	.20	1.083	2.091	00622
						TOTALS FOR 11 YEARS								
11	18116	65.05	3.37	5.19	5.62	4.49	5.72	5.65	3.33	1.25	.33			07518

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1969	02290	52.79	7.21	10.09	10.00	5.85	5.15	6.11	2.05	.74	.00	1.635	2.147	00521
1970	02041	51.64	5.73	9.16	7.55	7.06	8.13	6.08	3.43	1.22	.00	1.858	2.338	00651
1971	02076	57.03	4.43	7.95	7.42	5.64	6.41	6.07	3.52	1.54	.00	1.705	2.350	00537
1972	01915	63.55	3.76	4.91	7.00	5.22	6.11	5.07	2.66	1.72	.00	1.488	2.290	00346
1973	01918	70.28	2.76	5.11	5.01	4.07	4.80	4.01	2.92	.94	.10	1.212	2.151	00237
1974	01919	66.65	3.28	4.95	5.05	3.75	5.47	5.05	4.22	1.56	.00	1.431	2.345	00263
1975	01745	63.04	3.38	5.79	6.82	4.93	6.30	5.62	3.27	.86	.00	1.501	2.273	00349
1976	01675	53.97	4.00	6.33	7.76	5.55	9.25	7.10	5.01	1.01	.00	1.943	2.467	00461
1977	01736	53.28	3.57	6.80	6.85	6.28	9.16	8.70	4.21	1.15	.00	1.995	2.484	00562
1978	01399	52.39	3.57	7.43	8.36	6.43	9.79	8.08	2.43	1.50	.00	1.957	2.408	00894
1979	01727	66.13	3.53	4.05	5.62	4.69	7.12	5.62	2.37	.81	.06	1.402	2.241	00372
						TOTALS FOR 11 YEARS								
11	20441	59.17	4.21	6.70	7.07	5.40	6.92	6.06	3.26	1.18	.01			05193

TABLE A-18. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR SEOUL, KOREA, WMO STATION 471110.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1966	00773	0773	0000	0000	0000	0000	0773
1967	00938	0938	0000	0000	0000	0000	0938
1968	02928	2633	0192	0003	0100	0000	2926
1969	02920	2883	0000	0037	0000	0000	2920
1970	02811	2587	0183	0040	0001	0000	2181
1971	00184	0157	0027	0000	0000	0000	0000
1974	02325	2241	0083	0000	0000	0001	0000
1975	02148	2002	0145	0000	0000	0001	0004
1976	01873	1836	0035	0000	0000	0002	0000
1977	02101	2079	0020	0000	0000	0002	0000
1978	02712	2685	0025	0000	0000	0002	0000
1979	02311	2258	0047	0000	0000	0006	0000
1980	02295	2218	0072	0000	0001	0004	0000
1981	02394	2304	0085	0000	0001	0004	0000
		TOTALS FOR 14 YEARS					
14	28713	27594	0914	0080	0103	0022	9742

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1966	00773	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1967	00938	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1968	02928	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1969	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1970	02811	.00	77.62	22.38	.00	.00	.00	.00	.00	.00	.00	1.224	.417	00000
1971	00184	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1974	02325	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1975	02148	.00	.00	99.81	.00	.19	.00	.00	.00	.00	.00	2.004	.086	00000
1976	01873	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02101	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02712	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1979	02311	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1980	02295	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1981	02394	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
						TOTALS FOR 14 YEARS								
14	28713	.00	33.93	66.06	.00	.01	.00	.00	.00	.00	.00			00000

TABLE A-18. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1966	00773	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00938	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02926	30.62	7.21	5.40	4.75	4.92	5.67	6.53	12.17	21.39	1.33	3.878	3.312	00002
1969	02920	23.90	6.44	4.83	6.85	4.38	3.94	7.77	13.56	27.74	.58	4.426	3.262	00000
1970	02181	21.09	4.81	5.82	6.14	5.41	6.51	8.30	12.29	29.02	.60	4.624	3.164	00630
1971	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00184
1974	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02325
1975	00004	.00	.00	.00	.00	.00	.00	25.00	25.00	50.00	.00	7.250	.957	02144
1976	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	01873
1977	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02101
1978	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02712
1979	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02311
1980	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02295
1981	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02394
TOTALS FOR 14 YEARS														
14	09742	38.65	5.17	4.37	4.86	4.00	4.34	6.16	10.48	21.26	.71			18971

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1966	00773	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00938	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02633	34.03	7.03	4.86	4.25	4.37	5.09	5.51	11.62	21.61	1.63	3.744	3.382	00295
1969	02883	24.21	6.52	5.06	6.56	3.95	4.06	7.87	13.25	24.63	3.88	4.444	3.316	00037
1970	02587	17.78	6.69	7.77	6.65	4.99	6.73	7.54	12.06	24.31	5.49	4.693	3.172	00224
1971	00157	.00	12.74	15.92	3.82	3.82	3.82	9.55	10.19	38.22	1.91	5.420	2.790	00027
1974	02241	24.59	8.08	6.25	5.40	5.27	3.93	5.71	8.26	32.49	.04	4.298	3.332	00084
1975	02002	26.52	6.44	5.94	5.24	6.04	4.90	6.09	8.89	29.47	.45	4.213	3.316	00146
1976	01836	23.75	7.35	5.88	7.41	5.12	4.96	5.50	7.30	32.14	.60	4.332	3.299	00037
1977	02079	23.57	8.61	6.97	6.01	6.11	5.15	6.54	9.33	26.55	1.15	4.181	3.248	00022
1978	02685	22.64	7.97	6.67	5.62	5.44	5.10	5.62	8.31	31.84	.78	4.391	3.291	00027
1979	02258	23.34	7.88	6.33	5.80	4.56	4.47	4.56	8.64	34.10	.31	4.420	3.335	00053
1980	02218	22.54	9.69	7.57	5.86	3.56	4.42	5.00	8.12	32.69	.54	4.320	3.329	00077
1981	02304	25.30	8.72	6.16	6.12	4.77	5.60	5.38	8.16	29.30	.48	4.146	3.307	00090
TOTALS FOR 14 YEARS														
14	27594	28.96	7.24	5.96	5.50	4.57	4.64	5.65	9.03	27.01	1.44			01119

TABLE A-19. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR HOENGSUNG/R-401, KOREA, WMO STATION 471180.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1966	00846	0846	0000	0000	0000	0000	0846
1967	00998	0998	0000	0000	0000	0000	0998
1968	02928	2556	0211	0006	0155	0000	2928
1969	02920	2904	0000	0016	0000	0000	2919
1970	02765	2599	0154	0012	0000	0000	2174
1971	02249	1772	0477	0000	0000	0000	0000
1972	02460	1863	0597	0000	0000	0000	0000
1973	02508	2158	0350	0000	0000	0000	0003
1974	02485	2409	0074	0000	0000	0002	0007
1975	02182	2061	0121	0000	0000	0000	0012
1976	01782	1740	0039	0000	0000	0003	0000
1977	02042	2021	0021	0000	0000	0000	0000
1978	02659	2635	0023	0000	0000	0001	0000
1979	02237	2183	0052	0000	0000	0002	0000
		TOTALS FOR 14 YEARS					
14	31061	28745	2119	0034	0155	0008	9887

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1966	00846	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1967	00998	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1968	02928	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1969	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1970	02765	.00	78.88	21.12	.00	.00	.00	.00	.00	.00	.00	1.211	.408	00000
1971	02249	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1972	02460	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02508	.00	.00	99.88	.00	.12	.00	.00	.00	.00	.00	2.002	.069	00000
1974	02485	.00	.00	99.72	.00	.28	.00	.00	.00	.00	.00	2.006	.106	00000
1975	02182	.00	.00	99.45	.00	.55	.00	.00	.00	.00	.00	2.011	.148	00000
1976	01782	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02042	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02659	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1979	02237	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
					TOTALS FOR 14 YEARS									
14	31061	.00	31.79	68.14	.00	.07	.00	.00	.00	.00	.00			00000

TABLE A-19. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1966	00846	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00998	99.90	.00	.00	.00	.00	.00	.00	.00	.10	.00	.008	.253	00000
1968	02928	27.42	4.85	6.59	6.39	4.85	6.42	6.63	10.25	25.58	1.02	4.140	3.277	00000
1969	02919	23.26	4.83	5.96	4.80	4.69	5.00	7.06	10.48	33.40	.51	4.625	3.287	00001
1970	02174	21.94	4.05	5.29	5.57	4.19	6.53	9.84	12.56	29.76	.28	4.683	3.178	00591
1971	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02249
1972	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02460
1973	00003	33.33	.00	.00	.00	.00	.00	.00	33.33	33.33	.00	5.000	4.359	02505
1974	00007	14.29	.00	.00	.00	.00	14.29	14.29	14.29	42.86	.00	6.000	2.887	02478
1975	00012	33.33	.00	.00	8.33	8.33	.00	16.67	8.33	25.00	.00	4.167	3.433	02170
1976	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	01782
1977	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02042
1978	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02659
1979	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02237
TOTALS FOR 14 YEARS														
14	09887	38.52	3.75	4.88	4.54	3.75	4.82	6.24	8.92	24.06	.52			21174

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1966	00846	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00998	99.90	.00	.00	.00	.00	.00	.00	.00	.10	.00	.008	.253	00000
1968	02556	31.42	4.97	5.91	5.48	4.15	5.91	5.79	9.23	25.70	1.45	3.974	3.371	00372
1969	02904	23.38	4.96	5.89	4.79	4.65	4.89	7.02	10.33	33.26	.83	4.622	3.298	00016
1970	02599	18.39	6.04	6.27	5.62	4.73	6.66	9.35	12.00	29.17	1.77	4.770	3.136	00166
1971	01772	.00	7.73	9.99	6.26	5.02	8.58	9.42	9.65	42.21	1.13	5.814	2.497	00477
1972	01863	.05	3.92	7.09	6.87	5.21	7.14	8.32	10.25	49.06	2.09	6.282	2.282	00597
1973	02158	12.93	3.20	6.58	5.61	3.43	6.26	8.57	8.16	44.76	.51	5.494	2.979	00350
1974	02409	24.37	4.40	6.31	6.02	4.07	4.23	6.31	7.18	37.07	.04	4.576	3.341	00076
1975	02061	22.90	6.60	6.50	6.45	5.14	6.40	5.29	9.32	30.76	.63	4.403	3.259	00121
1976	01740	19.31	6.49	5.98	5.57	4.77	3.85	4.25	9.48	39.20	1.09	4.888	3.285	00042
1977	02021	22.51	5.49	5.94	5.20	4.95	4.85	4.75	8.66	36.07	1.58	4.689	3.332	00021
1978	02635	21.90	6.15	5.65	4.86	4.59	3.83	4.78	9.18	38.33	.72	4.757	3.337	00024
1979	02183	20.80	4.03	4.40	6.28	4.08	5.13	5.54	8.93	40.45	.37	4.963	3.263	00054
TOTALS FOR 14 YEARS														
14	28745	24.23	4.95	5.88	5.32	4.25	5.21	6.19	8.79	34.24	.94			02316

TABLE A-20. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR OSAN, KOREA, WMO STATION 471220.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1953	02850	2571	0041	0238	0000	0000	2850
1954	02919	2778	0058	0083	0000	0000	2919
1955	02919	2658	0104	0157	0000	0000	2919
1956	02928	2735	0059	0133	0000	0001	2928
1957	02920	2644	0101	0174	0000	0001	2920
1958	02920	2557	0130	0233	0000	0000	2920
1959	02919	2533	0064	0322	0000	0000	2919
1960	02928	2523	0039	0366	0000	0000	2928
1961	02920	2428	0039	0453	0000	0000	2920
1962	02919	2478	0059	0382	0000	0000	2919
1963	02919	2397	0078	0444	0000	0000	2919
1964	02925	0606	2284	0000	0035	0000	2920
1965	01785	0809	0965	0000	0011	0000	1785
1966	00673	0673	0000	0000	0000	0000	0673
1967	00817	0817	0000	0000	0000	0000	0817
1968	02903	2862	0038	0000	0002	0001	2902
1969	02894	2804	0090	0000	0000	0000	2892
1970	02796	2703	0093	0000	0000	0000	2792
1973	02920	2685	0235	0000	0000	0000	0365
1974	02919	2889	0030	0000	0000	0000	0296
1975	02920	2918	0001	0000	0000	0001	0088
1976	02928	2926	0002	0000	0000	0000	0023
1977	02920	2916	0003	0000	0000	0001	0050
1978	02908	2905	0002	0000	0000	0001	0000
1979	02917	2913	0003	0000	0000	0001	0168
1980	02928	2907	0017	0000	0000	0004	0937
1981	02920	2910	0006	0000	0000	0004	0151
			TOTALS FOR 27 YEARS				
27	73134	65545	4541	2985	0048	0015	48920

TABLE A-20. (continued)

(b)

YEAR	VALID OBS	% OF OBSERVATIONS OF EACH TYPE										*** OBS ***		INVALID OBS
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1953	02850	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1954	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1955	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1956	02928	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1957	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1958	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1959	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1960	02928	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1961	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1962	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1963	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1964	02925	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1965	01785	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1966	00673	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1967	00817	.00	99.76	.24	.00	.00	.00	.00	.00	.00	.00	1.002	.049	00000
1968	02903	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1969	02894	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1970	02796	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02920	.00	.00	99.86	.00	.14	.00	.00	.00	.00	.00	2.003	.074	00000
1974	02919	.00	.00	99.90	.00	.10	.00	.00	.00	.00	.00	2.002	.064	00000
1975	02920	.00	.00	99.93	.00	.07	.00	.00	.00	.00	.00	2.001	.052	00000
1976	02928	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02908	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1979	02917	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1980	02928	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1981	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
TOTALS FOR 27 YEARS														
27	73134	.00	52.31	47.67	.00	.01	.00	.00	.00	.00	.00			00000

TABLE A-20. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1953	02850	26.42	.00	17.79	.00	.00	.00	.00	21.12	33.09	1.58	4.624	3.485	00000
1954	02919	26.10	.00	18.23	.00	.00	.00	.00	18.94	34.81	1.92	4.648	3.499	00000
1955	02919	25.80	.00	21.58	.00	.00	.00	.00	18.05	32.44	2.12	4.482	3.480	00000
1956	02928	28.14	.00	19.13	.00	.00	.00	.00	17.83	34.05	.85	4.431	3.515	00000
1957	02920	27.95	.00	18.87	.00	.00	.00	.00	16.10	34.90	2.19	4.493	3.545	00000
1958	02920	24.25	.00	19.45	.00	.00	.00	.00	16.03	37.02	3.25	4.765	3.501	00000
1959	02919	25.76	.00	21.79	.00	.00	.00	.00	19.80	31.62	1.03	4.444	3.449	00000
1960	02928	25.89	.00	21.76	.00	.00	.00	.00	20.59	30.50	1.26	4.430	3.447	00000
1961	02920	24.62	.00	21.16	.00	.00	.00	.00	19.62	33.53	1.06	4.575	3.443	00000
1962	02919	24.60	.00	22.85	.00	.00	.00	.00	18.91	32.55	1.10	4.483	3.436	00000
1963	02919	22.47	.00	21.21	.00	.00	.00	.00	17.13	38.10	1.10	4.769	3.430	00000
1964	02920	20.65	.00	19.49	.00	.00	.00	.00	16.61	43.25	.00	5.013	3.388	00005
1965	01785	45.32	.00	15.85	.00	.00	.00	.00	11.09	27.73	.00	3.312	3.585	00000
1966	00673	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00817	99.76	.12	.00	.00	.00	.00	.00	.00	.12	.00	.011	.282	00000
1968	02902	22.36	12.03	6.00	6.10	5.41	3.69	5.41	12.30	25.47	1.24	4.159	3.269	00001
1969	02892	17.53	11.65	5.74	4.74	3.60	4.36	5.88	11.48	33.20	1.83	4.712	3.272	00002
1970	02792	18.05	10.92	6.84	4.91	5.05	4.98	6.88	12.61	28.83	.93	4.530	3.197	00004
1973	00365	15.07	8.77	5.75	3.84	7.95	10.14	13.15	10.68	23.29	1.37	4.666	2.951	02555
1974	00296	9.12	2.03	2.03	2.70	8.45	22.64	16.89	8.45	26.01	1.69	5.449	2.432	02623
1975	00088	30.68	5.68	7.95	4.55	4.55	6.82	9.09	9.09	21.59	.00	3.784	3.250	02832
1976	00023	30.43	8.70	4.35	4.35	.00	.00	17.39	8.70	21.74	4.35	4.087	3.528	02905
1977	00050	12.00	10.00	.00	8.00	2.00	10.00	6.00	8.00	42.00	2.00	5.380	3.077	02870
1978	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02908
1979	00168	17.26	8.33	3.57	10.12	7.74	4.76	7.14	11.31	27.38	2.38	4.631	3.121	02749
1980	00937	12.59	8.32	6.51	6.19	5.76	5.34	8.22	10.03	35.75	1.28	5.067	3.047	01991
1981	00151	21.85	13.25	4.64	7.95	3.97	2.65	5.96	9.27	29.80	.66	4.205	3.319	02769
TOTALS FOR 27 YEARS														
27	48920	26.74	2.36	16.39	1.16	1.09	1.12	1.49	16.10	32.21	1.33			24214

TABLE A-20. (continued)

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC										*** TCC ***		INVALID TCC
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1953	02571	29.13	3.73	9.53	3.58	2.57	3.70	10.50	3.54	31.35	2.37	4.222	3.428	00279
1954	02778	27.36	4.00	8.64	3.06	2.38	4.07	9.43	4.00	34.92	2.16	4.436	3.440	00141
1955	02658	28.03	5.94	9.59	4.06	2.75	4.10	8.35	2.14	32.51	2.52	4.167	3.438	00261
1956	02735	29.84	4.79	8.34	2.74	2.71	3.99	8.99	2.96	33.97	1.68	4.220	3.470	00193
1957	02644	30.71	5.64	9.23	2.72	2.04	4.16	8.13	2.00	32.64	2.72	4.097	3.502	00276
1958	02557	27.61	6.10	8.72	3.09	2.62	4.42	8.06	1.96	34.38	3.05	4.299	3.474	00363
1959	02533	29.53	5.80	11.45	4.97	3.99	5.88	9.28	2.01	25.94	1.14	3.765	3.279	00386
1960	02523	30.00	6.58	11.53	4.99	4.24	5.11	9.75	2.93	23.35	1.51	3.665	3.258	00405
1961	02428	29.53	6.96	12.03	4.24	3.42	5.52	10.21	2.14	24.46	1.48	3.703	3.276	00492
1962	02478	28.53	6.34	11.02	4.08	4.92	6.05	11.54	2.62	22.07	2.82	3.802	3.252	00441
1963	02397	27.24	6.68	9.89	4.59	4.38	5.63	9.35	2.92	27.70	1.63	3.987	3.307	00522
1964	00606	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02319
1965	00809	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00976
1966	00673	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00817	99.76	.12	.00	.00	.00	.00	.00	.00	.12	.00	.011	.282	00000
1968	02862	22.68	11.91	5.97	5.94	5.35	3.63	5.49	12.26	25.51	1.26	4.154	3.276	00041
1969	02804	18.08	11.70	5.67	4.81	3.53	4.28	5.96	11.66	32.95	1.36	4.662	3.275	00090
1970	02703	18.65	10.73	6.70	4.99	4.88	4.88	6.92	12.69	28.67	.89	4.508	3.208	00093
1973	02685	12.96	9.94	7.41	7.08	6.63	4.36	7.78	9.87	33.67	.30	4.821	3.061	00235
1974	02889	19.97	9.24	7.10	5.47	5.99	5.64	7.10	8.27	31.05	.17	4.424	3.207	00030
1975	02918	21.73	7.33	7.54	6.27	5.96	5.72	7.20	8.53	29.37	.34	4.346	3.207	00002
1976	02926	19.10	8.65	6.90	5.64	4.96	6.60	6.56	11.21	29.90	.48	4.536	3.182	00002
1977	02916	19.65	9.57	8.30	6.31	5.28	6.24	6.82	10.32	26.68	.82	4.315	3.169	00004
1978	02905	23.51	7.06	6.68	4.89	5.99	4.54	6.16	9.81	30.74	.62	4.389	3.288	00003
1979	02913	20.25	7.62	6.32	5.90	4.94	6.14	5.90	9.44	32.72	.76	4.585	3.236	00004
1980	02907	20.95	9.32	6.36	6.16	4.78	5.16	6.05	10.11	30.07	1.03	4.424	3.256	00021
1981	02910	21.51	9.66	6.63	6.01	4.64	5.84	6.36	9.42	29.00	.93	4.332	3.250	00010
							TOTALS FOR 27 YEARS							
27	65545	27.36	7.35	7.86	4.68	4.15	4.81	7.47	6.54	28.48	1.30			07589

TABLE A-21. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR KUNSAN, KOREA, WMO STATION 471410.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1952	02927	2628	0017	0281	0000	0001	2927
1953	02918	2658	0043	0216	0000	0001	2918
1954	02913	2557	0037	0318	0001	0000	2913
1955	02919	2658	0043	0216	0002	0000	2919
1956	02928	2759	0031	0138	0000	0000	2928
1957	02920	2805	0030	0085	0000	0000	2920
1958	02920	2745	0047	0127	0001	0000	2920
1959	02919	2490	0078	0351	0000	0000	2919
1960	02927	2576	0024	0326	0000	0001	2927
1961	02916	2379	0072	0465	0000	0000	2916
1962	02868	2347	0062	0459	0000	0000	2868
1963	02920	2352	0094	0472	0001	0001	2920
1964	02902	0000	2252	0000	0000	0650	2897
1965	01706	0235	1013	0000	0000	0458	1705
1966	00506	0506	0000	0000	0000	0000	0506
1967	00666	0666	0000	0000	0000	0000	0666
1968	02928	2870	0051	0000	0000	0007	2920
1969	02920	2842	0078	0000	0000	0000	2914
1970	02895	2870	0025	0000	0000	0000	2893
1973	02920	2708	0211	0000	0000	0001	0250
1974	02920	2897	0023	0000	0000	0000	0171
1975	02920	2917	0000	0000	0000	0003	0065
1976	02928	2926	0001	0000	0000	0001	0020
1977	02920	2919	0001	0000	0000	0000	0020
1978	02918	2915	0002	0000	0000	0001	0030
1979	02919	2918	0000	0000	0000	0001	0097
1980	02928	2927	0001	0000	0000	0000	0707
1981	02920	2918	0002	0000	0000	0000	0097
			TOTALS FOR 28 YEARS				
28	75811	66988	4238	3454	0005	1126	50953

TABLE A-21. (continued)

(b)

YEAR	VALID OBS	% OF OBSERVATIONS OF EACH TYPE **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1952	02927	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1953	02918	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1954	02913	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1955	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1956	02928	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1957	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1958	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1959	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1960	02927	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1961	02916	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1962	02868	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1963	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1964	02902	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1965	01706	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1966	00506	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1967	00666	.00	99.70	.30	.00	.00	.00	.00	.00	.00	.00	1.003	.055	00000
1968	02928	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1969	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1970	02895	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1974	02920	.00	.00	99.66	.00	.34	.00	.00	.00	.00	.00	2.007	.117	00000
1975	02920	.00	.00	99.86	.00	.14	.00	.00	.00	.00	.00	2.003	.074	00000
1976	02928	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02918	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1979	02919	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1980	02928	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1981	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
TOTALS FOR 28 YEARS														
28	75811	.00	53.78	46.20	.00	.02	.00	.00	.00	.00	.00			00000

TABLE A-21. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1952	02927	21.22	.00	22.28	.00	.00	.00	.00	22.89	32.90	.72	4.744	3.352	00000
1953	02918	22.04	.00	19.95	.00	.00	.00	.00	22.55	33.55	1.92	4.834	3.392	00000
1954	02913	15.79	.00	24.79	.00	.00	.00	.00	21.63	36.94	.86	5.042	3.241	00000
1955	02919	19.42	.00	22.17	.00	.00	.00	.00	23.33	33.16	1.92	4.902	3.327	00000
1956	02928	20.70	.00	18.20	.00	.00	.00	.00	22.51	35.62	2.97	5.057	3.376	00000
1957	02920	20.45	.00	22.81	.00	.00	.00	.00	19.04	35.27	2.43	4.830	3.386	00000
1958	02920	19.18	.00	21.88	.00	.00	.00	.00	20.03	36.88	2.02	4.973	3.348	00000
1959	02919	17.71	.00	28.88	.00	.00	.00	.00	21.65	29.26	2.50	4.659	3.288	00000
1960	02927	20.16	.00	21.80	.00	.00	.00	.00	21.66	34.61	1.78	4.881	3.355	00000
1961	02916	18.35	.00	22.91	.00	.00	.00	.00	22.26	34.26	2.23	4.957	3.314	00000
1962	02868	18.79	.00	25.42	.00	.00	.00	.00	23.88	30.51	1.39	4.747	3.294	00000
1963	02920	17.19	.00	19.90	.00	.00	.00	.00	22.29	37.64	2.98	5.238	3.285	00000
1964	02897	16.67	.00	20.54	.00	.00	.00	.00	18.71	44.08	.00	5.247	3.267	00005
1965	01705	36.66	.00	19.88	.00	.00	.00	.00	15.13	28.33	.00	3.723	3.533	00001
1966	00506	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00666	99.70	.00	.00	.00	.00	.00	.00	.00	.30	.00	.024	.438	00000
1968	02920	14.21	9.73	7.57	6.82	6.61	5.14	8.80	14.66	24.66	1.82	4.664	3.034	00008
1969	02914	12.49	11.60	5.73	5.97	4.36	5.22	7.52	17.43	27.56	2.13	4.912	3.060	00006
1970	02893	11.03	10.34	8.09	6.43	6.12	4.67	7.40	16.70	28.34	.90	4.897	2.981	00002
1973	00250	15.20	8.80	8.80	3.20	4.40	3.60	6.80	10.00	37.60	1.60	4.976	3.213	02670
1974	00171	14.04	8.19	4.68	9.94	4.68	8.19	11.11	11.70	26.90	.58	4.760	2.962	02749
1975	00065	12.31	13.85	13.85	4.62	4.62	4.62	7.69	12.31	26.15	.00	4.385	3.076	02855
1976	00020	5.00	5.00	10.00	5.00	5.00	5.00	5.00	15.00	40.00	5.00	5.850	2.815	02908
1977	00020	.00	5.00	.00	10.00	.00	5.00	10.00	5.00	65.00	.00	6.750	2.124	02900
1978	00030	6.67	10.00	13.33	3.33	6.67	.00	33.33	16.67	10.00	.00	4.700	2.588	02888
1979	00097	13.40	8.25	15.46	11.34	5.15	3.09	11.34	8.25	23.71	.00	4.247	2.944	02822
1980	00707	9.48	8.77	8.06	5.66	5.52	6.65	8.20	10.47	36.92	.28	5.175	2.938	02221
1981	00097	9.28	7.22	5.15	8.25	6.19	2.06	11.34	13.40	35.05	2.06	5.381	2.899	02823
						TOTALS FOR 28 YEARS								
28	50953	20.17	2.06	18.80	1.28	1.12	1.01	1.62	19.76	32.54	1.65			24858

TABLE A-21. (continued)

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC										*** TCC ***		INVALID TCC
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	AVG	SDV	
1952	02628	23.63	6.35	10.77	4.57	4.07	5.25	10.24	3.73	30.56	.84	4.236	3.267	00299
1953	02658	24.19	5.87	10.91	3.54	2.97	4.36	10.65	3.24	31.90	2.37	4.351	3.348	00260
1954	02557	17.99	8.41	12.44	4.34	4.18	5.20	11.38	3.32	31.68	1.06	4.435	3.183	00356
1955	02658	21.33	7.04	10.01	3.57	3.24	4.97	10.53	4.78	32.39	2.14	4.506	3.294	00261
1956	02759	21.93	5.94	8.66	3.01	2.61	4.49	9.64	3.88	36.57	3.26	4.721	3.369	00169
1957	02805	21.28	6.77	10.94	3.57	3.14	4.10	9.20	2.25	36.22	2.53	4.559	3.350	00115
1958	02745	20.36	5.90	11.04	3.93	3.35	4.85	9.29	3.35	35.70	2.22	4.622	3.298	00175
1959	02490	20.76	8.55	16.59	5.22	4.34	6.55	10.40	2.97	21.61	3.01	3.906	3.124	00429
1960	02576	22.83	6.37	10.71	4.39	3.96	6.79	9.39	3.77	29.70	2.10	4.299	3.267	00351
1961	02379	22.45	6.56	13.07	4.79	5.34	5.04	10.42	2.77	26.61	2.94	4.150	3.232	00537
1962	02347	22.41	7.37	14.10	5.16	5.11	6.48	11.84	3.15	21.52	2.85	3.948	3.138	00521
1963	02352	21.05	5.91	10.71	3.83	4.04	5.53	11.56	3.78	30.40	3.19	4.504	3.261	00568
1964	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02902
1965	00235	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	01471
1966	00506	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00666	99.70	.00	.00	.00	.00	.00	.00	.00	.30	.00	.024	.438	00000
1968	02870	14.46	9.83	7.63	6.83	6.52	5.47	8.82	14.49	24.81	1.15	4.622	3.026	00058
1969	02842	12.81	11.37	5.70	6.05	4.43	5.35	7.60	17.63	27.13	1.94	4.888	3.057	00078
1970	02870	11.11	10.28	8.12	6.48	6.10	4.60	7.25	16.83	28.19	1.05	4.895	2.986	00025
1973	02708	8.60	11.45	8.42	7.75	6.20	6.39	7.83	12.81	30.32	.22	4.895	2.909	00212
1974	02897	12.53	8.84	9.25	6.45	5.04	6.45	8.28	12.43	30.69	.03	4.816	3.001	00023
1975	02917	10.46	9.60	8.40	6.27	6.48	7.99	6.92	12.38	30.75	.75	4.920	2.945	00003
1976	02926	11.11	9.57	7.48	6.02	4.75	6.46	9.23	12.78	32.02	.58	5.001	2.975	00002
1977	02919	13.57	8.36	6.47	5.96	6.06	5.82	7.71	13.81	31.69	.55	4.939	3.030	00001
1978	02915	13.83	9.50	9.06	7.99	7.24	8.44	8.99	15.61	18.83	.51	4.412	2.887	00003
1979	02918	12.54	7.92	9.12	6.89	6.31	7.20	9.46	14.91	25.26	.41	4.749	2.921	00001
1980	02927	12.16	8.61	8.37	6.05	5.64	5.94	8.10	12.33	32.18	.61	4.937	3.006	00001
1981	02918	12.71	8.84	7.71	5.62	5.93	4.59	8.19	14.32	30.67	1.41	4.952	3.035	00002
TOTALS FOR 28 YEARS														
28	66988	18.41	8.02	9.48	5.28	4.81	5.65	9.02	8.92	28.91	1.49			08823

TABLE A-22. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR TAEGU AND TONCHON, KOREA, WMO STATION 471420.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1966	00756	0750	0006	0000	0000	0000	0756
1967	00787	0787	0000	0000	0000	0000	0787
1968	02927	2437	0191	0131	0168	0000	2925
1969	02920	2819	0000	0101	0000	0000	2920
1970	02793	2563	0153	0076	0001	0000	2182
1971	02369	1869	0499	0000	0001	0000	0000
1972	02521	2004	0516	0000	0001	0000	0000
1973	02517	2238	0278	0000	0001	0000	0000
1974	02479	2436	0042	0000	0000	0001	0001
1975	02274	2140	0128	0000	0000	0006	0000
1976	02012	1971	0041	0000	0000	0000	0000
1977	02227	2212	0013	0000	0000	0002	0000
1978	02672	2644	0025	0000	0000	0003	0000
1979	02308	2252	0046	0000	0001	0009	0000
			TOTALS FOR 14 YEARS				
14	31562	29122	1938	0308	0173	0021	9571

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1966	00756	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1967	00787	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1968	02927	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1969	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1970	02793	.00	78.12	21.88	.00	.00	.00	.00	.00	.00	.00	1.219	.413	00000
1971	02369	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1972	02521	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02517	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1974	02479	.00	.00	99.96	.00	.04	.00	.00	.00	.00	.00	2.001	.040	00000
1975	02274	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1976	02012	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02227	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02672	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1979	02308	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
						TOTALS FOR 14 YEARS								
14	31562	.00	30.33	69.67	.00	.00	.00	.00	.00	.00	.00			00000

TABLE A-22. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1966	00756	99.74	.00	.13	.00	.00	.13	.00	.00	.00	.00	.009	.196	00000
1967	00787	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02925	23.11	9.26	5.71	6.56	6.36	4.62	6.26	12.00	25.06	1.06	4.204	3.231	00002
1969	02920	17.40	10.65	4.97	5.48	4.66	5.68	6.03	15.55	28.94	.65	4.664	3.170	00000
1970	02182	15.44	6.51	5.27	4.72	3.99	4.31	7.20	22.27	30.02	.27	5.104	3.051	00611
1971	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02369
1972	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02521
1973	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02517
1974	00001	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	02478
1975	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02274
1976	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02012
1977	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02227
1978	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02672
1979	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02308
TOTALS FOR 14 YEARS														
14	09571	31.99	7.56	4.48	4.75	4.27	4.14	5.39	13.49	23.33	.59			21991

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1966	00750	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00006
1967	00787	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02437	27.74	10.55	5.25	6.24	4.43	4.60	5.05	9.31	25.56	1.27	3.919	3.340	00490
1969	02819	18.02	11.78	5.68	5.82	3.94	5.96	5.78	13.20	23.13	6.70	4.586	3.278	00101
1970	02563	13.15	9.44	5.77	6.01	3.82	5.15	7.53	18.45	25.67	4.99	5.048	3.086	00230
1971	01869	.05	15.94	7.01	6.63	5.56	7.76	9.95	12.20	34.67	.21	5.353	2.672	00500
1972	02004	.15	11.38	7.58	5.94	6.19	7.34	9.18	10.83	40.77	.65	5.687	2.583	00517
1973	02238	13.36	8.49	7.28	7.51	5.50	6.97	8.09	8.94	33.87	.00	4.845	3.029	00279
1974	02436	20.07	9.85	6.44	5.75	4.27	4.89	5.91	8.13	34.69	.00	4.514	3.274	00043
1975	02140	18.97	10.37	8.04	8.27	5.70	3.97	5.79	8.55	29.95	.37	4.315	3.195	00134
1976	01971	21.61	6.65	7.20	8.37	5.68	3.81	4.72	7.61	34.25	.10	4.444	3.264	00041
1977	02212	23.55	8.41	7.87	8.18	5.42	3.84	5.33	6.69	30.15	.54	4.146	3.274	00015
1978	02644	25.49	9.57	7.68	7.07	5.22	4.46	4.77	6.35	29.12	.26	3.978	3.295	00028
1979	02252	22.29	10.75	6.93	7.24	5.60	3.86	5.95	7.42	29.80	.18	4.156	3.259	00056
TOTALS FOR 14 YEARS														
14	29122	21.90	9.69	6.48	6.50	4.77	4.91	6.07	9.38	28.93	1.37			02440

TABLE A-23. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR PUSAN/KIMHAF, KOREA, WMO STATION 471530.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1966	00868	0868	0000	0000	0000	0000	0868
1967	00844	0831	0013	0000	0000	0000	0844
1968	02928	2727	0090	0000	0111	0000	2926
1969	02919	2911	0000	0008	0000	0000	2919
1970	02763	2588	0174	0001	0000	0000	2180
1971	01990	1493	0497	0000	0000	0000	0002
1972	02379	1881	0498	0000	0000	0000	0000
1973	02392	2139	0253	0000	0000	0000	0000
1974	02411	2357	0052	0000	0000	0002	0000
1975	02026	1941	0081	0000	0000	0004	0001
1976	01909	1874	0035	0000	0000	0000	0000
1977	02088	2049	0036	0000	0000	0003	0000
1978	02833	2759	0063	0000	0000	0011	0000
1979	02664	2513	0141	0000	0000	0010	0000
			TOTALS FOR 14 YEARS				
14	31014	28931	1933	0009	0111	0030	9740

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1966	00868	.23	99.77	.00	.00	.00	.00	.00	.00	.00	.00	.998	.048	00000
1967	00844	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1968	02928	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1969	02919	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1970	02763	.00	78.90	21.10	.00	.00	.00	.00	.00	.00	.00	1.211	.408	00000
1971	01990	.00	.00	99.90	.00	.10	.00	.00	.00	.00	.00	2.002	.063	00000
1972	02379	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02392	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1974	02411	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1975	02026	.00	.00	99.95	.00	.05	.00	.00	.00	.00	.00	2.001	.044	00000
1976	01909	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02088	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02833	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1979	02664	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
						TOTALS FOR 14 YEARS								
14	31014	.01	31.40	68.59	.00	.01	.00	.00	.00	.00	.00			00000

TABLE A-23. (continued)

(c)

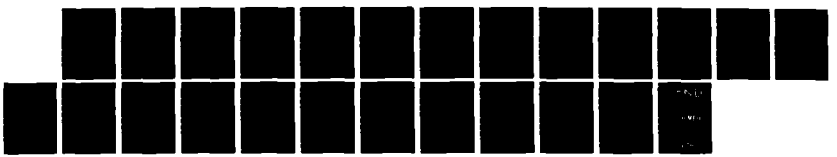
YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1966	00868	99.77	.00	.00	.12	.00	.00	.00	.12	.00	.00	.012	.258	00000
1967	00844	98.82	.00	.36	.24	.36	.12	.00	.12	.00	.00	.043	.422	00000
1968	02926	29.56	5.71	6.29	5.54	4.37	5.57	5.88	11.65	25.09	.34	4.009	3.316	00002
1969	02919	22.13	6.24	5.62	6.65	5.76	5.76	6.41	12.40	29.05	.00	4.469	3.202	00000
1970	02180	15.78	4.50	5.00	6.10	5.69	5.78	7.43	10.28	39.40	.05	5.166	3.071	00583
1971	00002	.00	.00	.00	.00	.00	.00	.00	50.00	50.00	.00	7.500	.707	01988
1972	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02379
1973	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02392
1974	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02411
1975	00001	.00	.00	.00	100.00	.00	.00	.00	.00	.00	.00	3.000	.000	02025
1976	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	01909
1977	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02088
1978	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02833
1979	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02664
TOTALS FOR 14 YEARS														
14	09740	36.50	4.59	4.72	5.06	4.34	4.70	5.35	9.55	25.07	.11			21274

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1966	00868	99.77	.00	.00	.12	.00	.00	.00	.12	.00	.00	.012	.258	00000
1967	00831	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00013
1968	02727	31.72	5.87	5.76	5.02	4.18	4.80	5.57	10.60	25.23	1.25	3.939	3.385	00201
1969	02911	22.19	6.29	5.60	6.66	5.77	5.74	6.46	12.30	27.17	1.82	4.479	3.226	00008
1970	02588	13.33	6.41	5.95	6.34	5.91	6.03	7.42	10.05	37.60	.97	5.154	3.033	00175
1971	01493	.00	7.23	9.11	8.57	5.16	8.91	8.64	10.72	41.19	.47	5.770	2.466	00497
1972	01881	.00	9.94	7.92	7.81	6.54	5.79	5.74	10.15	45.67	.43	5.791	2.589	00498
1973	02139	11.64	10.33	7.95	7.90	5.70	4.68	6.73	7.85	37.12	.09	4.893	3.063	00253
1974	02357	21.09	9.29	6.24	6.83	4.96	4.50	5.69	7.21	34.20	.00	4.428	3.278	00054
1975	01941	23.39	9.89	7.11	8.14	4.48	4.48	4.43	7.78	30.04	.26	4.125	3.283	00085
1976	01874	20.33	7.47	6.40	6.99	3.84	3.68	5.60	8.43	37.14	.11	4.657	3.288	00035
1977	02049	23.82	9.18	8.59	7.47	4.59	4.20	5.81	8.20	28.11	.05	4.057	3.253	00039
1978	02759	22.83	9.31	7.68	6.85	5.07	4.82	5.73	8.01	29.61	.07	4.176	3.255	00074
1979	02513	21.33	8.56	6.88	6.13	6.01	3.98	5.53	7.40	34.18	.00	4.431	3.276	00151
TOTALS FOR 14 YEARS														
14	28931	23.46	7.73	6.55	6.52	4.90	4.76	5.72	8.58	31.31	.48			02083

AD-A162 210 PROBABILITY AND CONDITIONAL PROBABILITY OF CUMULATIVE CLOUD COVER FOR SEL..(U) OPTIMETRICS INC BEDFORD MA W O GALLERY ET AL. JUL 85 OMI-139 AFGL-TR-85-0154 3/3

UNCLASSIFIED F19628-84-C-0049 F/G 4/2 NL



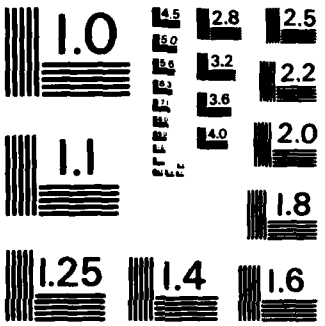


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TABLE A-24. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR KWANGJU, KOREA, WMO STATION 471580.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1966	00575	0545	0030	0000	0000	0000	0575
1967	00726	0726	0000	0000	0000	0000	0726
1968	02927	2528	0211	0039	0149	0000	2927
1969	02920	2892	0000	0028	0000	0000	2915
1970	02739	2609	0093	0037	0000	0000	2160
1971	02177	1750	0427	0000	0000	0000	0000
1972	02461	2080	0380	0000	0000	0001	0000
1973	02420	2215	0205	0000	0000	0000	0004
1974	02420	2356	0063	0000	0000	0001	0008
1975	02039	1930	0106	0000	0000	0003	0012
1976	01824	1795	0027	0000	0000	0002	0000
1977	02109	2093	0015	0000	0000	0001	0000
1978	02654	2631	0020	0000	0000	0003	0000
1979	02292	2241	0047	0000	0000	0004	0000
			TOTALS FOR 14 YEARS				
14	30283	28391	1624	0104	0149	0015	9327

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1966	00575	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1967	00726	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1968	02927	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1969	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1970	02739	.00	78.90	21.10	.00	.00	.00	.00	.00	.00	.00	1.211	.408	00000
1971	02177	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1972	02461	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02420	.00	.00	99.83	.00	.17	.00	.00	.00	.00	.00	2.003	.081	00000
1974	02420	.00	.00	99.67	.00	.33	.00	.00	.00	.00	.00	2.007	.115	00000
1975	02039	.00	.00	99.41	.00	.59	.00	.00	.00	.00	.00	2.012	.153	00000
1976	01824	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02109	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02654	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1979	02292	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
					TOTALS FOR 14 YEARS									
14	30283	.00	30.74	69.18	.00	.08	.00	.00	.00	.00	.00			00000

TABLE A-24. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1966	00575	97.04	.00	.35	.00	.17	.17	.52	.00	1.74	.00	.193	1.162	00000
1967	00726	99.72	.00	.00	.00	.00	.00	.00	.00	.28	.00	.022	.420	00000
1968	02927	18.89	5.81	5.88	6.56	5.43	6.32	8.68	13.77	27.98	.68	4.690	3.110	00000
1969	02915	15.37	6.21	5.63	6.59	4.87	6.42	8.75	15.75	29.57	.86	4.958	3.028	00005
1970	02160	9.21	4.95	5.28	6.02	4.72	7.36	11.44	22.64	28.10	.28	5.437	2.695	00579
1971	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02177
1972	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02461
1973	00004	50.00	.00	25.00	.00	.00	.00	.00	.00	25.00	.00	2.500	3.786	02416
1974	00008	25.00	.00	.00	.00	.00	.00	25.00	12.50	37.50	.00	5.375	3.420	02412
1975	00012	33.33	25.00	8.33	.00	.00	.00	8.33	.00	25.00	.00	2.917	3.476	02027
1976	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	01824
1977	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02109
1978	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02654
1979	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02292
TOTALS FOR 14 YEARS														
14	09327	26.70	4.94	4.87	5.51	4.33	5.70	8.17	14.50	24.73	.55			20956

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1966	00545	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00030
1967	00726	99.72	.00	.00	.00	.00	.00	.00	.00	.28	.00	.022	.420	00000
1968	02528	21.88	5.54	4.98	5.85	4.35	6.33	7.83	13.05	28.76	1.42	4.634	3.220	00399
1969	02892	15.49	6.78	5.12	6.40	4.67	6.43	8.89	15.70	28.08	2.46	4.970	3.059	00028
1970	02609	7.67	7.67	5.40	5.90	3.91	7.74	10.31	20.58	29.32	1.49	5.445	2.741	00130
1971	01750	.06	10.11	5.94	5.03	3.83	9.03	10.57	14.69	39.94	.80	5.905	2.451	00427
1972	02080	.10	7.64	5.48	5.10	3.75	7.50	8.32	10.77	50.19	1.15	6.236	2.382	00381
1973	02215	9.39	9.48	6.64	6.55	4.02	8.44	7.27	11.65	36.43	.14	5.185	2.928	00205
1974	02356	16.89	9.17	6.54	5.81	4.07	6.11	7.34	11.25	32.81	.00	4.718	3.155	00064
1975	01930	12.12	10.21	8.03	7.31	4.30	7.20	7.82	11.71	30.98	.31	4.810	3.013	00109
1976	01795	11.64	7.91	5.91	6.24	5.24	4.68	7.30	8.13	42.51	.45	5.276	3.039	00029
1977	02093	12.80	8.93	7.84	7.60	5.73	4.49	7.02	9.13	35.88	.57	4.910	3.074	00016
1978	02631	14.41	11.25	7.64	7.83	7.15	4.87	6.88	9.08	30.14	.76	4.558	3.090	00023
1979	02241	12.90	12.00	9.50	7.63	7.45	5.31	6.56	7.94	29.94	.76	4.516	3.058	00051
TOTALS FOR 14 YEARS														
14	28391	15.70	8.41	6.24	6.17	4.68	6.19	7.65	11.64	32.42	.88			01892

TABLE A-25. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR SACHON, KOREA, WMO STATION 471610.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1966	00861	0861	0000	0000	0000	0000	0861
1967	00871	0871	0000	0000	0000	0000	0871
1968	02909	2425	0275	0030	0179	0000	2909
1969	02920	2895	0000	0025	0000	0000	2920
1970	02743	2609	0125	0009	0000	0000	2180
1971	02034	1483	0550	0000	0001	0000	0000
1972	02416	1839	0576	0000	0001	0000	0000
1973	02261	1960	0301	0000	0000	0000	0002
1974	02379	2328	0051	0000	0000	0000	0002
1975	02058	2000	0056	0000	0000	0002	0000
1976	01798	1763	0034	0000	0000	0001	0000
1977	02078	2062	0015	0000	0000	0001	0000
1978	02581	2562	0018	0000	0000	0001	0000
			TOTALS FOR 13 YEARS				
13	27909	25658	2001	0064	0181	0005	9745

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1966	00861	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1967	00871	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1968	02909	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1969	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1970	02743	.00	79.51	20.49	.00	.00	.00	.00	.00	.00	.00	1.205	.404	00000
1971	02034	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1972	02416	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02261	.00	.00	99.91	.00	.09	.00	.00	.00	.00	.00	2.002	.059	00000
1974	02379	.00	.00	99.92	.00	.08	.00	.00	.00	.00	.00	2.002	.058	00000
1975	02058	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1976	01798	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02078	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02581	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
						TOTALS FOR 13 YEARS								
13	27909	.00	34.91	65.08	.00	.01	.00	.00	.00	.00	.00			00000

TABLE A-25. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1966	00861	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00871	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02909	24.96	6.53	7.49	6.98	5.81	4.85	7.77	11.55	23.72	.34	4.102	3.197	00000
1969	02920	21.82	7.91	7.36	6.71	4.73	4.35	8.18	10.27	28.56	.10	4.339	3.216	00000
1970	02180	17.29	6.56	5.64	5.78	5.83	5.18	8.12	12.34	33.07	.18	4.857	3.120	00563
1971	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02034
1972	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02416
1973	00002	.00	.00	.00	.00	.00	.00	50.00	50.00	.00	.00	6.500	.707	02259
1974	00002	.00	.00	.00	.00	.00	50.00	.00	50.00	.00	.00	6.000	1.414	02377
1975	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02058
1976	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	01798
1977	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02078
1978	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02581
TOTALS FOR 13 YEARS														
13	09745	35.63	5.79	5.71	5.39	4.45	3.92	6.60	9.31	23.04	.17			18164

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1966	00861	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00871	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02425	29.90	7.05	6.35	6.14	3.67	5.44	6.76	9.40	24.87	.41	3.891	3.313	00484
1969	02895	22.00	8.70	6.91	6.39	4.42	4.42	8.19	10.29	27.25	1.42	4.334	3.248	00025
1970	02609	14.45	9.39	6.06	6.02	5.83	5.52	7.93	12.11	29.51	3.18	4.876	3.111	00134
1971	01483	.13	15.64	9.44	6.95	7.22	6.47	8.02	10.45	35.27	.40	5.237	2.724	00551
1972	01839	.00	11.09	9.46	8.70	5.22	7.18	7.01	9.35	41.49	.49	5.568	2.639	00577
1973	01960	18.01	9.03	8.72	8.11	6.12	6.84	6.68	8.27	27.76	.46	4.336	3.107	00301
1974	02328	25.52	8.16	6.83	6.96	5.33	3.91	6.31	6.79	30.15	.04	4.106	3.300	00051
1975	02000	21.00	11.10	8.30	7.40	5.45	5.50	6.75	7.40	26.80	.30	4.086	3.181	00058
1976	01763	18.43	8.79	8.39	6.52	4.82	4.59	5.73	6.35	36.19	.17	4.573	3.240	00035
1977	02062	20.37	11.78	8.10	6.21	4.36	5.63	6.11	7.08	30.07	.29	4.216	3.238	00016
1978	02562	20.30	11.48	8.74	6.21	5.00	5.00	6.17	7.96	28.81	.35	4.109	3.220	00019
TOTALS FOR 13 YEARS														
13	25658	23.79	9.30	7.25	6.33	4.79	5.04	6.45	8.18	28.16	.71			02251

TABLE A-26. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR GUATEMALA CITY, GUATEMALA, WMO STATION 786410.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1970	00969	0963	0005	0000	0001	0000	0964
1971	01474	1466	0005	0000	0003	0000	1463
1972	01085	1077	0005	0000	0002	0001	1069
1973	01873	1865	0005	0000	0001	0002	1826
1974	02145	2141	0000	0000	0000	0004	2102
1975	02389	2362	0013	0000	0000	0014	2201
1976	02149	2109	0032	0000	0000	0008	1917
1977	02499	2459	0035	0000	0000	0005	2305
1978	02387	2354	0027	0000	0000	0006	2240
1979	02369	2342	0023	0000	0000	0004	2226
		TOTALS FOR 10 YEARS					
10	19339	19138	0150	0000	0007	0044	18313

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1970	00969	98.97	.00	.41	.00	.62	.00	.00	.00	.00	.00	.033	.339	00000
1971	01474	98.85	.00	.61	.00	.54	.00	.00	.00	.00	.00	.034	.332	00000
1972	01085	98.71	.00	1.29	.00	.00	.00	.00	.00	.00	.00	.026	.226	00000
1973	01873	90.07	.00	2.24	.05	7.63	.00	.00	.00	.00	.00	.352	1.092	00000
1974	02145	94.27	.00	1.91	.00	3.82	.00	.00	.00	.00	.00	.191	.807	00000
1975	02389	21.05	.00	7.79	.00	71.16	.00	.00	.00	.00	.00	3.002	1.639	00000
1976	02149	9.73	.00	10.61	.00	79.66	.00	.00	.00	.00	.00	3.399	1.273	00000
1977	02499	8.28	.00	7.56	.00	84.15	.00	.00	.00	.00	.00	3.517	1.181	00000
1978	02387	9.43	.00	6.45	.00	84.12	.00	.00	.00	.00	.00	3.494	1.229	00000
1979	02369	5.83	.00	6.16	.00	88.01	.00	.00	.00	.00	.00	3.644	1.026	00000
						TOTALS FOR 10 YEARS								
10	19339	43.84	.00	5.24	.01	50.92	.00	.00	.00	.00	.00			00000

TABLE A-26. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1970	00964	11.10	6.85	5.39	6.22	6.12	8.82	8.09	11.51	35.68	.21	5.214	2.901	00005
1971	01463	12.65	6.22	4.51	6.02	6.56	7.04	7.11	11.00	38.69	.21	5.258	2.972	00011
1972	01069	11.23	7.86	7.39	7.11	6.17	6.55	7.58	12.35	33.49	.28	5.037	2.951	00016
1973	01826	6.96	5.86	4.22	4.65	5.97	5.20	6.41	8.82	51.86	.05	5.937	2.742	00047
1974	02102	11.75	7.80	6.14	5.99	6.47	5.42	7.75	8.61	40.06	.00	5.183	3.007	00043
1975	02201	14.36	8.13	5.82	6.09	6.36	6.91	7.95	9.54	34.12	.73	4.920	3.061	00188
1976	01917	11.37	7.98	7.09	7.04	6.62	7.20	8.03	9.13	34.90	.63	5.027	2.966	00232
1977	02305	12.62	6.46	5.16	6.98	5.77	6.33	8.16	10.11	37.83	.56	5.199	2.990	00194
1978	02240	11.96	7.77	6.29	6.38	6.47	5.76	7.37	7.59	39.91	.49	5.152	3.025	00147
1979	02226	8.94	5.08	6.33	5.62	4.54	4.90	7.05	9.48	47.66	.40	5.708	2.862	00143
						TOTALS FOR 10 YEARS								
10	18313	11.35	6.99	5.83	6.19	6.07	6.23	7.55	9.53	39.88	.38			01026

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1970	00963	10.90	7.68	6.02	7.27	6.33	9.66	8.31	11.01	32.50	.31	5.049	2.891	00006
1971	01466	12.48	7.57	4.71	6.75	6.68	7.09	7.09	10.98	36.43	.20	5.121	2.984	00008
1972	01077	11.23	9.19	7.34	7.52	6.50	6.78	7.99	11.79	31.38	.28	4.903	2.954	00008
1973	01865	6.81	6.81	4.02	5.20	5.63	5.36	6.76	9.38	50.03	.00	5.862	2.761	00008
1974	02141	11.63	9.01	6.26	6.21	6.49	5.28	7.43	8.92	38.77	.00	5.097	3.024	00004
1975	02362	13.63	9.06	6.35	6.52	6.14	7.20	8.04	9.70	32.60	.76	4.856	3.043	00027
1976	02109	10.72	10.00	6.92	7.54	6.31	7.21	8.49	10.05	32.15	.62	4.917	2.957	00040
1977	02459	12.20	7.93	5.73	7.89	5.69	6.30	8.13	10.53	34.97	.61	5.052	2.993	00040
1978	02354	11.77	9.43	7.18	6.46	6.29	6.58	7.14	7.39	37.26	.51	4.984	3.037	00033
1979	02342	8.97	7.05	6.83	5.89	4.91	4.70	7.43	9.65	44.15	.43	5.507	2.918	00027
						TOTALS FOR 10 YEARS								
10	19138	11.08	8.42	6.17	6.67	6.03	6.40	7.66	9.72	37.45	.40			00201

TABLE A-27. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR SAN SALVADOR, EL SALVADOR, WMO STATION 786630.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1970	00812	0803	0004	0000	0002	0003	0804
1971	00931	0922	0007	0000	0001	0001	0925
1972	00978	0880	0073	0000	0001	0024	0669
1973	01996	1899	0064	0000	0000	0033	1792
1974	02256	2165	0064	0000	0000	0027	2047
1975	02192	2092	0080	0000	0001	0019	1999
1976	02284	2172	0095	0000	0000	0017	2012
1977	01897	1814	0071	0000	0000	0012	1705
1978	02211	2114	0083	0000	0000	0014	1929
1979	01601	1503	0088	0000	0001	0009	1345
			TOTALS FOR 10 YEARS				
10	17158	16364	0629	0000	0006	0159	15227

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1970	00812	98.77	.00	.74	.00	.49	.00	.00	.00	.00	.00	.034	.328	00000
1971	00931	99.25	.00	.54	.00	.21	.00	.00	.00	.00	.00	.019	.236	00000
1972	00978	68.61	.00	31.39	.00	.00	.00	.00	.00	.00	.00	.628	.929	00000
1973	01996	34.02	.00	10.12	.00	55.86	.00	.00	.00	.00	.00	2.437	1.846	00000
1974	02256	35.51	.00	8.87	.00	55.63	.00	.00	.00	.00	.00	2.402	1.867	00000
1975	02192	26.78	.00	8.49	.00	64.74	.00	.00	.00	.00	.00	2.759	1.757	00000
1976	02284	14.67	.00	11.78	.00	73.56	.00	.00	.00	.00	.00	3.178	1.464	00000
1977	01897	14.87	.00	9.80	.00	75.33	.00	.00	.00	.00	.00	3.209	1.465	00000
1978	02211	12.48	.00	12.84	.00	74.67	.00	.00	.00	.00	.00	3.244	1.393	00000
1979	01601	18.43	.00	15.87	.00	65.71	.00	.00	.00	.00	.00	2.946	1.572	00000
						TOTALS FOR 10 YEARS								
10	17158	32.94	.00	11.07	.00	55.99	.00	.00	.00	.00	.00			00000

TABLE A-27. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1970	00804	7.84	13.06	10.70	11.07	8.33	8.71	16.29	21.52	2.49	.00	4.128	2.456	00008
1971	00925	7.14	9.08	7.35	11.78	8.97	9.41	14.27	26.49	5.51	.00	4.572	2.446	00006
1972	00669	8.52	9.57	8.37	11.81	9.27	9.12	12.86	28.10	2.39	.00	4.374	2.462	00309
1973	01792	9.71	6.19	6.64	6.81	6.81	7.76	12.61	28.85	14.51	.11	5.006	2.639	00204
1974	02047	11.77	8.79	8.79	8.60	6.74	8.79	13.68	23.25	9.57	.00	4.446	2.679	00209
1975	01999	11.06	7.55	6.75	8.20	5.95	8.30	12.56	27.66	11.31	.65	4.763	2.696	00193
1976	02012	15.11	8.25	8.10	9.29	7.41	7.41	11.88	19.43	12.82	.30	4.316	2.812	00272
1977	01705	16.01	8.91	6.39	7.74	6.39	8.62	10.91	22.76	11.50	.76	4.372	2.857	00192
1978	01929	15.19	5.29	6.32	7.36	7.00	8.29	11.35	23.33	15.55	.31	4.681	2.824	00282
1979	01345	20.52	6.39	6.62	6.25	5.35	5.65	10.93	22.01	16.21	.07	4.380	3.022	00256
						TOTALS FOR 10 YEARS								
10	15227	12.92	7.89	7.40	8.43	6.94	8.11	12.46	24.15	11.43	.27			01931

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1970	00803	7.85	17.56	11.96	10.09	7.60	7.47	14.57	20.55	2.37	.00	3.897	2.509	00009
1971	00922	7.16	13.45	7.92	10.41	8.13	8.68	13.23	25.92	5.10	.00	4.381	2.530	00009
1972	00880	6.25	13.18	8.52	10.34	8.30	8.98	13.86	25.80	4.66	.11	4.414	2.491	00098
1973	01899	9.11	8.32	6.58	6.42	6.79	8.32	12.37	28.01	14.06	.00	4.924	2.652	00097
1974	02165	11.18	12.79	8.08	8.04	7.11	8.55	13.44	21.76	9.05	.00	4.296	2.700	00091
1975	02092	10.76	10.61	7.12	7.50	6.36	8.17	12.33	26.05	10.90	.19	4.589	2.721	00100
1976	02172	14.04	11.60	8.66	8.52	6.22	7.87	12.20	18.37	12.43	.09	4.208	2.813	00112
1977	01814	15.05	11.74	6.89	7.22	6.39	8.93	10.69	21.83	11.08	.17	4.245	2.838	00083
1978	02114	14.19	7.76	7.19	8.51	6.67	7.85	10.83	22.23	14.71	.05	4.524	2.819	00097
1979	01503	18.83	10.18	7.19	6.39	5.92	7.32	10.25	20.09	13.84	.00	4.168	2.960	00098
						TOTALS FOR 10 YEARS								
10	16364	12.13	11.12	7.74	8.02	6.76	8.20	12.14	22.89	10.93	.07			00794

TABLE A-28. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR TEGUEIGALPA, HONDURAS, WMO STATION 787200.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1971	01495	1424	0011	0000	0049	0011	1487
1972	01364	1298	0010	0000	0045	0011	1295
1973	01339	1310	0009	0000	0003	0017	1311
1974	01970	1953	0003	0000	0000	0014	1957
1975	01949	1934	0004	0000	0000	0011	1916
1976	01834	1821	0001	0000	0000	0012	1822
1977	01812	1788	0007	0000	0000	0017	1781
1978	01916	1900	0004	0000	0000	0012	1885
1979	01871	1860	0001	0000	0000	0010	1845
		TOTALS FOR 09 YEARS					
09	15550	15288	0050	0000	0097	0115	15299

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1971	01495	99.33	.00	.33	.00	.33	.00	.00	.00	.00	.00	.020	.258	00000
1972	01364	95.23	.00	4.77	.00	.00	.00	.00	.00	.00	.00	.095	.426	00000
1973	01339	89.32	.00	1.94	.00	8.74	.00	.00	.00	.00	.00	.388	1.151	00000
1974	01970	98.48	.00	.56	.05	.91	.00	.00	.00	.00	.00	.049	.413	00000
1975	01949	98.10	.00	.77	.00	1.13	.00	.00	.00	.00	.00	.061	.456	00000
1976	01834	97.16	.00	.65	.00	2.18	.00	.00	.00	.00	.00	.100	.604	00000
1977	01812	97.19	.00	1.32	.00	1.49	.00	.00	.00	.00	.00	.086	.533	00000
1978	01916	97.23	.00	1.62	.00	1.15	.00	.00	.00	.00	.00	.078	.492	00000
1979	01871	97.76	.00	1.18	.00	1.07	.00	.00	.00	.00	.00	.066	.462	00000
		TOTALS FOR 09 YEARS												
09	15550	96.89	.00	1.36	.01	1.74	.00	.00	.00	.00	.00			00000

TABLE 28. (continued).

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY										*** SKY *** AVG	SDV	INVALID SKY
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**			
1971	01487	7.40	3.23	8.74	5.45	5.65	9.41	21.12	23.13	15.87	.00	5.223	2.438	00008
1972	01295	8.34	3.78	6.56	7.49	6.72	8.96	15.37	28.96	13.82	.00	5.165	2.486	00069
1973	01311	4.42	3.59	4.88	5.42	7.70	11.37	21.13	28.22	13.20	.08	5.478	2.174	00028
1974	01957	3.58	6.49	6.54	6.23	8.18	11.09	18.40	27.95	11.50	.05	5.249	2.267	00013
1975	01916	5.27	6.68	5.58	6.68	9.76	10.70	17.07	25.31	12.89	.05	5.136	2.364	00033
1976	01822	4.72	5.87	5.82	8.12	9.77	11.31	17.84	27.83	8.73	.00	5.091	2.267	00012
1977	01781	5.05	7.30	6.12	8.14	9.55	11.23	18.25	25.94	8.37	.06	4.968	2.321	00031
1978	01885	3.45	5.36	5.62	8.01	8.81	14.32	20.21	25.46	8.70	.05	5.171	2.149	00031
1979	01845	1.25	3.69	4.01	6.18	7.70	12.57	19.67	31.71	13.17	.05	5.698	1.939	00026
TOTALS FOR 09 YEARS														
09	15299	4.65	5.26	5.94	6.91	8.33	11.34	18.77	27.16	11.60	.04			00251

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC										*** TCC *** AVG	SDV	INVALID TCC
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**			
1971	01424	6.04	7.02	10.18	5.13	5.62	9.13	18.40	22.40	15.87	.21	5.070	2.520	00071
1972	01298	8.09	6.70	6.39	6.55	7.24	9.09	14.95	26.73	14.02	.23	5.046	2.554	00066
1973	01310	4.35	5.50	5.50	5.57	7.40	10.99	20.46	26.87	13.21	.15	5.356	2.265	00029
1974	01953	3.64	8.86	6.81	7.42	8.19	10.91	17.51	25.35	11.32	.00	5.051	2.351	00017
1975	01934	5.22	9.10	6.31	7.24	9.57	10.55	16.39	23.37	12.25	.00	4.944	2.432	00015
1976	01821	4.67	8.84	6.92	7.63	9.56	11.70	16.42	25.48	8.73	.05	4.895	2.361	00013
1977	01788	5.03	10.79	6.82	8.33	10.07	11.59	16.55	22.82	7.89	.00	4.703	2.395	00024
1978	01900	3.42	7.89	6.26	8.42	8.16	14.53	18.89	23.47	8.89	.05	5.003	2.245	00016
1979	01860	1.24	6.18	4.78	7.31	7.74	11.88	19.28	28.92	13.66	.00	5.495	2.104	00011
TOTALS FOR 09 YEARS														
09	15288	4.47	8.03	6.61	7.20	8.30	11.30	17.51	24.99	11.53	.07			00262

TABLE A-29. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR MANAGUA/SANDINO, NICARAGUA, WMO STATION 787410.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1970	00779	0735	0001	0000	0043	0000	0779
1971	00869	0804	0005	0000	0060	0000	0865
1972	00640	0623	0002	0000	0012	0003	0614
1973	01381	1363	0010	0000	0005	0003	1316
1974	01874	1841	0028	0000	0000	0005	1809
1975	01698	1645	0038	0000	0000	0015	1565
1976	02275	2203	0049	0000	0000	0023	2035
1977	02385	2290	0068	0000	0000	0027	2098
1978	02273	2200	0065	0000	0000	0008	1954
1979	02102	2024	0070	0000	0000	0008	1742
		TOTALS FOR 10 YEARS					
10	16276	15728	0336	0000	0120	0092	14777

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1970	00779	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1971	00869	99.65	.00	.12	.00	.23	.00	.00	.00	.00	.00	.012	.203	00000
1972	00640	96.09	.00	3.91	.00	.00	.00	.00	.00	.00	.00	.078	.388	00000
1973	01381	73.06	.00	4.63	.00	22.30	.00	.00	.00	.00	.00	.985	1.669	00000
1974	01874	83.62	.00	3.36	.05	12.91	.00	.00	.00	.05	.00	.590	1.376	00000
1975	01698	70.44	.00	7.54	.00	21.38	.00	.00	.00	.65	.00	1.058	1.738	00000
1976	02275	43.78	.00	10.51	.00	45.71	.00	.00	.00	.00	.00	2.039	1.892	00000
1977	02385	31.07	.00	11.74	.00	57.19	.00	.00	.00	.00	.00	2.522	1.805	00000
1978	02273	21.82	.00	14.17	.00	64.01	.00	.00	.00	.00	.00	2.844	1.650	00000
1979	02102	18.17	.00	17.08	.00	64.75	.00	.00	.00	.00	.00	2.931	1.565	00000
		TOTALS FOR 10 YEARS												
10	16276	53.13	.00	7.10	.01	37.69	.00	.00	.00	.07	.00			00000

TABLE A-29. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1970	00779	.64	6.03	7.19	6.42	7.70	10.53	11.55	15.79	34.15	.00	5.761	2.314	00000
1971	00865	1.16	4.28	5.32	7.51	5.43	7.40	12.14	14.91	41.73	.12	6.083	2.265	00004
1972	00614	2.61	5.37	10.26	6.51	8.31	8.14	10.75	11.73	36.32	.00	5.565	2.513	00026
1973	01316	6.69	4.86	6.61	5.70	6.00	6.91	9.12	10.64	43.47	.00	5.707	2.696	00065
1974	01809	16.69	8.13	9.67	9.84	7.30	7.30	9.78	10.56	20.73	.00	4.211	2.929	00065
1975	01565	10.29	7.73	6.65	7.41	7.22	7.80	7.67	10.03	35.14	.06	5.091	2.902	00133
1976	02035	15.23	9.63	6.73	7.67	6.44	6.83	7.17	8.16	31.99	.15	4.634	3.082	00240
1977	02098	14.25	8.67	7.39	6.01	7.29	6.05	8.20	8.63	33.46	.05	4.786	3.055	00287
1978	01954	12.49	8.65	7.01	7.52	7.78	6.70	8.65	9.21	31.99	.00	4.821	2.970	00319
1979	01742	11.19	7.23	6.95	6.31	6.83	7.69	7.63	8.55	37.54	.06	5.124	2.949	00360
						TOTALS FOR 10 YEARS								
10	14777	11.03	7.59	7.32	7.19	7.02	7.25	8.78	10.07	33.69	.05			01499

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1970	00735	.68	7.07	7.35	6.94	7.76	11.16	12.38	16.46	30.07	.14	5.607	2.338	00044
1971	00804	.62	6.22	5.85	9.08	6.59	7.46	11.69	15.17	36.69	.62	5.843	2.351	00065
1972	00623	2.57	8.03	10.59	7.70	10.11	7.70	9.95	12.04	30.82	.48	5.262	2.581	00017
1973	01363	6.53	6.46	6.97	7.34	5.65	7.41	9.68	10.64	39.25	.07	5.493	2.733	00018
1974	01841	16.35	9.18	10.27	9.89	7.93	7.12	9.45	10.21	19.61	.00	4.117	2.907	00033
1975	01645	10.03	9.54	7.54	7.54	6.69	7.54	8.09	9.97	33.01	.06	4.946	2.923	00053
1976	02203	14.34	10.35	6.95	7.72	6.85	7.13	7.58	9.40	29.64	.05	4.592	3.035	00072
1977	02290	13.23	9.87	7.82	6.77	7.42	6.99	7.99	9.00	30.92	.00	4.687	3.011	00095
1978	02200	11.55	11.95	7.59	7.82	7.41	7.59	8.77	10.36	26.95	.00	4.590	2.938	00073
1979	02024	10.03	9.88	6.67	6.37	7.11	8.65	8.20	10.03	33.00	.05	4.979	2.912	00078
						TOTALS FOR 10 YEARS								
10	15728	10.54	9.43	7.69	7.66	7.21	7.66	8.87	10.55	30.32	.08			00548

TABLE A-30. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR SAN JOSE, COSTA RICA, WMO STATION 787620.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1974	02077	2031	0033	0000	0000	0013	1870
1975	02173	2140	0017	0000	0000	0016	1981
1976	02031	1852	0161	0000	0000	0018	1647
1977	02307	2094	0196	0000	0002	0015	1917
1978	02143	1947	0188	0000	0001	0007	1767
1979	02005	1865	0133	0000	0001	0006	1722
		TOTALS FOR 06 YEARS					
06	12736	11929	0728	0000	0004	0075	10904

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1974	02077	43.72	.00	9.82	.00	46.46	.00	.00	.00	.00	.00	2.055	1.899	00000
1975	02173	39.48	.00	8.65	.00	51.82	.00	.00	.00	.05	.00	2.249	1.900	00000
1976	02031	24.08	.00	18.91	.00	57.02	.00	.00	.00	.00	.00	2.659	1.677	00000
1977	02307	19.72	.00	16.91	.00	63.37	.00	.00	.00	.00	.00	2.873	1.601	00000
1978	02143	18.43	.00	17.73	.09	63.74	.00	.00	.00	.00	.00	2.907	1.570	00000
1979	02005	11.52	.00	14.31	.00	74.16	.00	.00	.00	.00	.00	3.253	1.363	00000
		TOTALS FOR 06 YEARS												
06	12736	26.19	.00	14.39	.02	59.39	.00	.00	.00	.01	.00			00000

TABLE A-30. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1974	01870	16.31	8.77	6.15	5.72	6.26	5.99	8.34	10.53	31.93	.00	4.724	3.104	00207
1975	01981	15.65	8.28	6.11	5.00	5.00	5.50	8.68	12.12	33.01	.66	4.899	3.111	00192
1976	01647	24.65	9.41	6.25	5.04	4.86	5.71	6.44	12.26	25.26	.12	4.126	3.251	00384
1977	01917	22.85	7.62	5.69	6.68	4.59	6.00	7.98	11.32	26.81	.47	4.332	3.215	00390
1978	01767	22.18	4.24	4.07	5.60	4.02	6.40	7.07	11.83	34.30	.28	4.794	3.240	00376
1979	01722	17.13	4.12	2.61	4.53	4.12	5.28	8.77	14.52	38.15	.75	5.321	3.086	00283
TOTALS FOR 06 YEARS														
06	10904	19.68	7.11	5.18	5.45	4.82	5.81	7.91	12.06	31.58	.39			01832

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1974	02031	15.07	11.28	5.76	4.43	5.81	6.35	8.22	11.57	31.51	.00	4.735	3.105	00046
1975	02140	14.49	10.89	5.23	4.77	4.35	5.98	9.02	12.66	31.96	.65	4.873	3.104	00033
1976	01852	21.81	11.34	6.26	4.81	4.27	6.05	6.86	12.96	25.54	.11	4.227	3.221	00179
1977	02094	21.06	9.26	6.16	6.26	4.11	6.02	7.69	12.27	26.70	.48	4.368	3.201	00213
1978	01947	20.18	6.01	4.57	6.16	4.31	6.32	6.73	12.74	32.72	.26	4.761	3.197	00196
1979	01865	15.92	5.68	2.95	5.09	4.13	5.20	8.20	14.42	37.64	.75	5.275	3.082	00140
TOTALS FOR 06 YEARS														
06	11929	18.03	9.13	5.18	5.26	4.50	5.99	7.81	12.74	30.97	.38			00807

TABLE A-31. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR TOCUMEN, PANAMA, WMO STATION 787920.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1973	02298	2160	0129	0000	0000	0009	0596
1974	02247	2209	0032	0000	0000	0006	1215
1975	02403	2321	0073	0000	0000	0009	0010
1976	02727	2601	0122	0000	0000	0004	0000
1977	02638	2523	0109	0000	0000	0006	0000
1978	02674	2541	0133	0000	0000	0000	0055
1979	02784	2721	0059	0000	0000	0004	0002
		TOTALS FOR 07 YEARS					
07	17771	17076	0657	0000	0000	0038	1878

(b)

YEAR	VALID OBS	% OF OBSERVATIONS OF EACH TYPE **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1973	02298	2.22	.00	74.06	.00	23.72	.00	.00	.00	.00	.00	2.430	.924	00000
1974	02247	5.25	.00	45.84	.00	48.91	.00	.00	.00	.00	.00	2.873	1.185	00000
1975	02403	.00	.00	99.58	.00	.42	.00	.00	.00	.00	.00	2.008	.129	00000
1976	02727	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1977	02638	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1978	02674	.04	.00	97.91	.00	2.06	.00	.00	.00	.00	.00	2.040	.287	00000
1979	02784	.00	.00	99.93	.00	.07	.00	.00	.00	.00	.00	2.001	.054	00000
		TOTALS FOR 07 YEARS												
07	17771	.96	.00	89.42	.00	9.63	.00	.00	.00	.00	.00			00000

TABLE A-31. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** SKY *** AVG	SDV	INVALID SKY
1973	00596	.50	5.87	5.54	3.19	5.70	4.87	4.19	4.70	65.44	.00	6.552	2.338	01702
1974	01215	1.23	12.59	7.98	6.67	9.88	7.08	9.30	8.40	36.79	.08	5.331	2.656	01032
1975	00010	.00	10.00	.00	10.00	.00	10.00	.00	.00	70.00	.00	6.500	2.593	02393
1976	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02727
1977	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02638
1978	00055	1.82	20.00	3.64	3.64	9.09	14.55	9.09	12.73	25.45	.00	4.945	2.690	02619
1979	00002	.00	.00	50.00	.00	50.00	.00	.00	.00	.00	.00	3.000	1.414	02782
						TOTALS FOR 07 YEARS								
07	01878	1.01	10.65	7.08	5.48	8.52	6.60	7.61	7.29	45.69	.05			15893

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** TCC *** AVG	SDV	INVALID TCC
1973	02160	.14	7.36	4.21	3.19	8.70	11.57	10.09	19.58	35.14	.00	5.968	2.218	00138
1974	02209	.72	13.54	7.11	4.66	9.64	9.82	9.60	13.72	31.19	.00	5.325	2.573	00038
1975	02321	.00	16.03	6.85	3.06	9.05	12.97	8.83	20.77	22.40	.04	5.179	2.511	00082
1976	02601	.08	28.49	9.30	3.65	9.30	13.07	8.23	12.30	15.57	.00	4.207	2.646	00126
1977	02523	.16	27.86	7.33	3.84	11.26	11.77	8.56	13.24	15.89	.08	4.298	2.644	00115
1978	02541	.08	23.53	10.78	3.86	10.04	12.55	7.56	15.35	16.25	.00	4.424	2.614	00133
1979	02721	.04	15.55	13.34	6.87	7.98	10.88	9.22	17.57	18.56	.00	4.759	2.542	00063
						TOTALS FOR 07 YEARS								
07	17076	.16	19.30	8.61	4.22	9.42	11.83	8.83	15.99	21.62	.02			00695

TABLE A- 32. DIAGNOSTIC STATISTICS PERFORMED ON THE DATA FOR HOWARD AFB, PANAMA, WMO STATION 788060.

(a)

YEAR	#DATA RECORDS	********** CLOUD LAYERS ********** VALID	ERR#1	ERR#2	ERR#3	ERR4	SKY VALID
1962	02920	2121	0016	0781	0001	0001	2920
1963	02920	2117	0028	0772	0002	0001	2920
1964	02928	0287	2468	0001	0172	0000	2927
1965	01473	0275	1109	0000	0089	0000	1472
1966	00107	0107	0000	0000	0000	0000	0107
1967	00205	0205	0000	0000	0000	0000	0205
1968	02927	2689	0235	0000	0003	0000	0002
1969	02920	2790	0130	0000	0000	0000	0000
1970	02920	2857	0063	0000	0000	0000	0000
1973	02918	2876	0041	0000	0000	0001	1691
1974	02916	2913	0000	0000	0000	0003	1594
1975	02919	2916	0001	0000	0000	0002	1535
1976	02928	2928	0000	0000	0000	0000	1453
1977	02919	2915	0000	0000	0000	0004	1464
1978	02920	2920	0000	0000	0000	0000	1468
1979	02905	2887	0018	0000	0000	0000	1626
1980	02899	2840	0059	0000	0000	0000	1577
1981	02878	2853	0023	0000	0000	0002	1503
				TOTALS FOR 18 YEARS			
18	45522	39496	4191	1554	0267	0014	24464

(b)

YEAR	VALID OBS	********** % OF OBSERVATIONS OF EACH TYPE ********** **0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	*** OBS *** AVG	SDV	INVALID OBS
1962	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1963	02920	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1964	02928	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1965	01473	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1966	00107	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1967	00205	.00	100.00	.00	.00	.00	.00	.00	.00	.00	.00	1.000	.000	00000
1968	02927	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1969	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1970	02920	.00	.00	100.00	.00	.00	.00	.00	.00	.00	.00	2.000	.000	00000
1973	02918	.00	.00	76.01	.00	23.99	.00	.00	.00	.00	.00	2.480	.854	00000
1974	02916	.00	.00	55.28	.00	44.72	.00	.00	.00	.00	.00	2.894	.995	00000
1975	02919	.00	.00	55.91	.00	44.09	.00	.00	.00	.00	.00	2.882	.993	00000
1976	02928	.00	.00	54.82	.00	45.18	.00	.00	.00	.00	.00	2.904	.996	00000
1977	02919	.00	.00	53.65	.00	46.35	.00	.00	.00	.00	.00	2.927	.998	00000
1978	02920	.00	.00	53.42	.00	46.58	.00	.00	.00	.00	.00	2.932	.998	00000
1979	02905	.00	.00	56.56	.00	43.44	.00	.00	.00	.00	.00	2.869	.992	00000
1980	02899	.00	.00	79.54	.00	20.46	.00	.00	.00	.00	.00	2.409	.807	00000
1981	02878	.00	.00	59.28	.00	40.72	.00	.00	.00	.00	.00	2.814	.983	00000
						TOTALS FOR 18 YEARS								
18	45522	.00	23.18	54.07	.00	22.75	.00	.00	.00	.00	.00			00000

TABLE A-32. (continued)

(c)

YEAR	VALID SKY	% OCCURRENCES IN EACH OCTA FOR SKY										*** SKY *** AVG	SDV	INVALID SKY
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**			
1962	02920	11.51	.00	22.19	.00	.00	.00	.00	25.10	41.10	.10	5.498	3.058	00000
1963	02920	9.90	.00	23.01	.00	.00	.00	.00	27.19	39.73	.17	5.557	2.988	00000
1964	02927	9.12	.00	22.14	.00	.00	.00	.00	25.18	43.56	.00	5.690	2.954	00001
1965	01472	18.48	.00	29.82	.00	.00	.00	.00	17.93	33.76	.00	4.553	3.297	00001
1966	00107	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00205	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	00002	50.00	50.00	.00	.00	.00	.00	.00	.00	.00	.00	.500	.707	02925
1969	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02920
1970	00000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	02920
1973	01691	2.25	3.90	8.22	8.69	10.41	9.11	12.95	14.73	29.75	.00	5.523	2.346	01227
1974	01594	6.65	7.21	9.28	8.91	8.41	9.79	10.85	12.92	25.97	.00	4.984	2.657	01322
1975	01535	10.88	6.91	6.91	6.71	7.10	5.73	9.58	7.82	38.24	.13	5.172	2.938	01384
1976	01453	10.94	10.94	8.74	7.50	8.47	5.51	8.47	5.92	33.52	.00	4.727	2.988	01475
1977	01464	6.69	5.87	7.45	6.76	6.56	5.12	8.27	6.35	46.93	.00	5.624	2.792	01455
1978	01468	4.09	4.50	6.20	8.11	6.06	6.95	9.74	9.81	44.55	.00	5.837	2.547	01452
1979	01626	4.49	5.41	6.52	6.15	6.70	8.00	11.19	9.16	42.37	.00	5.740	2.576	01279
1980	01577	9.26	7.42	10.15	8.81	6.40	6.34	11.10	6.79	33.73	.00	4.954	2.873	01322
1981	01503	3.06	3.66	6.65	8.32	8.72	9.38	13.77	16.03	30.41	.00	5.618	2.347	01375
						TOTALS FOR 18 YEARS								
18	24464	9.69	3.51	14.28	4.43	4.37	4.19	6.09	16.04	37.37	.04			21058

(d)

YEAR	VALID TCC	% OCCURRENCES IN EACH OCTA FOR TCC										*** TCC *** AVG	SDV	INVALID TCC
		0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**			
1962	02121	15.89	4.76	17.07	9.10	8.63	6.41	8.68	1.23	27.68	.57	4.199	2.966	00799
1963	02117	14.08	5.15	18.89	10.68	6.75	5.76	10.11	1.79	26.55	.24	4.185	2.912	00803
1964	00287	99.65	.00	.35	.00	.00	.00	.00	.00	.00	.00	.007	.118	02641
1965	00275	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	01198
1966	00107	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1967	00205	100.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.000	.000	00000
1968	02689	.04	5.58	5.28	4.61	5.54	8.22	7.88	12.90	49.94	.00	6.304	2.238	00238
1969	02790	.00	3.87	4.05	4.62	6.09	7.92	8.49	14.19	50.68	.07	6.462	2.078	00130
1970	02857	.00	3.26	4.27	4.31	5.99	8.37	8.89	15.96	48.90	.07	6.474	2.026	00063
1973	02876	1.70	4.14	8.87	7.89	8.94	10.29	12.10	14.60	31.47	.00	5.593	2.341	00042
1974	02913	7.76	6.14	8.20	7.76	8.86	10.23	11.71	13.08	26.26	.00	5.043	2.658	00003
1975	02916	10.94	7.00	6.07	6.34	7.48	6.82	9.57	9.71	36.04	.03	5.162	2.905	00003
1976	02928	12.84	9.39	8.57	6.90	8.57	6.35	8.13	7.72	31.52	.00	4.683	2.996	00000
1977	02915	8.30	5.63	6.14	6.35	7.31	6.07	8.16	9.02	42.98	.03	5.529	2.810	00004
1978	02920	4.28	4.59	5.68	6.95	7.29	7.88	9.73	11.27	42.33	.00	5.812	2.523	00000
1979	02887	5.44	5.75	6.65	6.58	6.06	8.73	10.63	11.57	38.59	.00	5.602	2.624	00018
1980	02840	7.43	5.85	7.64	6.76	6.34	7.43	11.20	11.97	35.39	.00	5.380	2.729	00059
1981	02853	3.47	3.72	6.13	7.26	8.24	9.29	12.06	18.44	31.41	.00	5.698	2.363	00025
						TOTALS FOR 18 YEARS								
18	39496	8.39	5.25	7.57	6.61	7.13	7.73	9.62	11.05	36.59	.06			06026

TABLE A-33. KEY TO THE OBSERVATION TYPE CODES USED IN TABLES A-1 (b) TO A-29 (b).

Code	Type of Observation
0	Synoptic
1	Airways
2	METAR
3	Merged Synoptic-Airways
4	Merged Synoptic-METAR
5	Reserved
6	Aero
7	SMARS
8	Merged Synoptic-Aero

APPENDIX B
CORRECTIONS TO VERTICAL LINE-OF-SIGHT CALCULATIONS

During editing of the report, it was pointed out by Major Albert Boehm of AFGL that the formula for $P(c=1|x)$ in Equation 4. is in error. $P(c=1|x)$ is the probability of encountering a cloud along a randomly chosen vertical line-of-sight given that the fractional cloud cover for the whole sky is x. Since the line-of-sight is vertical, $P(c=1|x)$ equals the fractional cloud cover projected onto a horizontal plane. Equation 4. states that $P(c=1|x) = x/8$. However the fractional cloud cover x includes the effect of the "packing" of clouds near the horizon (see section 2.2.2) and tends to be larger than the cloud cover projected onto a horizontal plane.

An empirical correction for the packing effect has been developed by [B-1]. According to this work, Equation 4 should be replaced by:

$$P(c=1|x) = (x/8)*(1+3x/8)/4 \qquad \text{B-1}$$

Similarly, Equation 6 should be replaced by:

$$P(c=0|x) = (1-x/8)*(1+3x/8)/4 \qquad \text{B-2}$$

The difference between the two forms is shown in table B-1. Clearly the difference between the two forms can be substantial, particularly for x between 1 and 4.

TABLE B-1. DIFFERENCE BETWEEN PROBABILITIES CALCULATED USING EQUATION 4 AND B-1.

CLOUD COVER x	EQ.4	EQ. B-1
0	0	0.0
1	1	0.3
2	2	0.9
3	3	1.6
4	4	2.5
5	5	3.6
6	6	4.9
7	7	6.3
8	8	8.0

TABLE B-2. DIFFERENCE IN PROBABILITIES CALCULATED USING EQUATION 4 FROM THIS REPORT AND EQUATION B-1 FROM REFERENCE [B-1]. DATA ARE FOR SEOUL, KOREA AND FOR THE ALTITUDE RANGE 0 TO 100,000 FEET.

x	P(x) (%)	P(c=1|x) (%)		P(c=0|x) (%)	
		Eq. 4	Eq. B-1	Eq. 6	Eq. B-2
0	25	0	0	51	45
1	8	2	1	14	14
2	6	3	1	9	10
3	6	4	3	8	9
4	5	6	3	5	6
5	5	6	5	4	5
6	6	9	8	3	4
7	10	17	17	3	4
8	29	55	62	0	0

The effect of these differences on a representative case is shown in table B-2. The data used are the unconditional probabilities (frequency-of-occurrence) P(x) of cloud cover from 0 to 1000,000 ft. for Seoul, Korea. The conditional probabilities $P(c|x)$ are calculated using both Equation 4 and 6 and Equation B-1 and B-2.

As can be seen from this table, the difference in probabilities between the two techniques is small but significant: the largest differences are small enough however that the general results of this report are still valid. Future calculations of conditional cloud cover should include the correction for the packing effect.

REFERENCE

1. John D. Malick, John H. Allen and Stephen Zakanycz Calibrated Analytical Modeling of Cloud Free Intervals, SPIE Vol. 195, pp. 142-147, 1979.

END

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