NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

TECHNICAL NOTE 4169

ATMOSPHERIC TEMPERATURE OBSERVATIONS TO 100,000 FEET FOR SEVERAL CLIMATOLOGICAL REGIONS OF THE NORTHERN HEMISPHERE

By H. B. Tolefson

Langley Aeronautical Laboratory
Langley Field, Va.

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SUMMARY

Radiosonde measurements of upper-air temperatures taken over a 5-year period at nine stations in the northern hemisphere are summarized in order to provide information on the temperatures likely to be encountered during airplane and missile operations up to 100,000 feet. The results are in general agreement with those from previous investigations of upper-air temperatures and indicate that the mean temperatures from the tropopause to 100,000 feet tend to increase fairly regularly and rapidly for southern locations, whereas a smaller increase occurs for more northerly locations. The scatter in the temperatures about the mean generally decreased with increasing altitude from the tropopause to 100,000 feet. Little, if any, effect of location upon the temperature was apparent for altitudes above about 90,000 feet.

INTRODUCTION

Data on the atmospheric temperatures at different altitudes have a number of applications during both the design phases and the actual operations of high-speed airplanes and missiles. Measurements of the upper-air temperatures were summarized some time ago by the United States Weather Bureau in reference 1 in order to provide information on the frequency with which given temperatures might be expected at different altitudes and locations. These data covered radiosonde observations made over a 5-year period from locations within the continental United States and in adjoining areas and, because of limitations of the sounding equipment, were restricted to altitudes of about 50,000 feet.

With the more recent design of airplanes and missiles having much greater altitude and range capabilities, temperature data are now needed for higher altitudes and for other areas throughout the world. A summary of radiosonde temperature measurements was accordingly undertaken by the National Advisory Committee for Aeronautics to extend the results in reference 1 to altitudes of about 100,000 feet and to several locations in the northern hemisphere. Although both the altitude and the area coverage of the results represented by this study are still limited, an effort was made through choice of station locations to obtain temperature data which could be considered representative of some of the wider climatological or geographical areas of the northern hemisphere.

Acknowledgment is made to the Office of Climatology of the United States Weather Bureau for their assistance in selecting the upper-air stations most suitable for the present study and to the National Weather Records Center for their services in processing the original observational data.

PRESENTATION OF DATA

Scope

Compilation of the available atmospheric temperature and pressure measurements to an altitude of 100,000 feet for a large portion of the earth would be a task of great magnitude. The compilation for continental United States, given in reference 1, and that for the North American continent, given in reference 2, suggest that the main temperature features, particularly at pressure levels corresponding to high altitudes, can be disclosed with significantly smaller effort by considering data for a few radiosonde stations selected to represent several broad climatological regions and geographic locations. Further, a survey of the available radiosonde data indicated that temperature and pressure measurements up to an altitude of about 100,000 feet and extending over a time interval of several years exist only for locations in the northern hemisphere. In view of these considerations, nine widely dispersed radiosonde stations in the northern hemisphere were selected to represent predominantly arctic, semitropical, maritime, and continental influences. Radiosonde observations covering a 5-year period were used for each station. The stations selected, their climatological regions, the time period covered by the observations, and the total number of radiosonde soundings from each station are listed in the following table:

Station	Influences represented	Period of observation	No. of soundings
Thule, Greenland	Arctic	Jan. 1951 - Dec. 1955	1,785
Barrow, Alaska	Arctic	Jan. 1951 - Dec. 1955	1,816
San Juan, P. R.	Semitropical	Jan. 1951 - Dec. 1955	1,823
Ocean station vessel Echo (lat. 35° N., long. 48° W.)	Maritime	Jan. 1951 - Dec. 1955	1,751
Ocean station vessel Victor (lat. 34° N., long. 164° E.)	Maritime	Sept. 1951 - Aug. 1956	1,767
International Falls, Minn.	Continental	Jan. 1951 - Dec. 1955	1,793
El Paso, Tex.	Continental	Jan. 1951 - Dec. 1955	1,820
Itazuki (Fukuoka), Japan	Continental	Jan. 1951 - Dec. 1955	1,772
Wiesbaden, Germany	Continental	Jan.-Apr., June-Aug., Oct.-Nov., 1950 Jan., Mar., May, Sept., Dec., 1951 Feb., Apr.-Dec., 1952 Jan. 1953 - Dec. 1955	1,752

The data for the stations in the table were confined to the daily radiosonde observation taken near 2300 e.s.t. (0300 Z). Because of differences in longitude of the stations, some of the data represent nighttime observations while others represent daytime observations. Temperature differences resulting from these differences in local time of the soundings are not considered significant for the higher altitudes which are of particular interest in this study. References 3 and 4, for example, indicate that diurnal temperature variations at the higher altitudes amount only to about 0.5° C. It may also be noted that with the exception of the data for Wiesbaden, Germany, each set of soundings covered about the same continuous 5-year period.

Results

The results are summarized in table I in terms of the frequencies f and the cumulative probability distributions cpd of the temperatures t observed at given altitudes for each of the nine stations. For the different stations, separate distributions are given for each month of the combined 5-years' sample of data and for the total 5-years' sample. The temperature data given in the table were obtained at the standard reporting pressure levels of 850, 700, 500, 300, 200, 100, 50, 30, 20, and 10 millibars. For convenience, these pressure levels are expressed as the corresponding geometric altitudes in the standard aeronautical atmosphere specified in references 2 and 5.

Each entry in table I refers to a temperature observation within a class interval of 2° C. A frequency value for a temperature of 10° C, for example, indicates the number of observations between 10° C and 11.9° C, and a frequency value for a temperature of -10° C indicates the number of observations between -10° C and -8.1° C. The cumulative probability distributions indicate the percentage of observations for which the temperatures exceeded the specified values. It was considered that tabular presentation would place the data in the form most suitable for a variety of uses, such as determining seasonal variations at a given location, the mean, or the standard deviation of the temperatures about the mean at different altitudes.

It might be noted from table I that the number of observations obtained decreases rapidly with altitude, particularly for altitudes above 67,500 feet, because of limitations in the performance of balloon sounding equipment. For Wiesbaden, Germany, only three observations were obtained at altitudes above 67,500 feet in January and February because of interrupted weather services during these months over parts of the 5-year period selected for study. For completeness, however, all observations were tabulated, regardless of how few were available. In addition, all singularities noted during the tabulation of the data by the National Weather Records Center were checked against data reported by previous or following soundings.

It might be pointed out that for each altitude table I approximates a graph in which temperature is the ordinate, time is the abscissa, and the curves are formed by lines running through constant values of the cumulative probability distributions. Thus, the variations in the temperature with season, altitude, and location may be readily observed from the table.

DISCUSSION

Table I indicates large monthly and seasonal temperature variations at all altitudes for the northern locations as compared with somewhat smaller variations for the southern locations. A few examples of the extreme variations in the temperature during summer months (June, July, and August) and winter months (December, January, and February) at altitudes above the tropopause are summarized in the following table for stations representing arctic, semitropical, and maritime regions.

Station		Temperature range, °C, at altitude of —					
		67,500 ft		78,500 ft		87,000 ft	
		Summer	Winter	Summer	Winter	Summer	Winter
Thule, Greenland (arctic)	t	-40 to -50	-42 to -82	-38 to -50	-44 to -82	-36 to -48	----------
	Δt	10	40	12	38	12	
San Juan, P. R. (semitropical)	t	-56 to -64	-60 to -80	-44 to -60	-50 to -70	-48 to -54	-46 to -64
	Δt	8	20	16	20	6	18
Ocean station vessel Victor (maritime)	t	-54 to -64	-52 to -70	-46 to -58	-46 to -64	-44 to -54	-42 to -60
	Δt	10	18	12	18	10	18

The primary indications of the preceding summary are the generally colder temperatures and the larger spread in the temperatures at all locations for the winter months than for the summer months. In similar investigations (ref. 6, for example) tendencies have been found for the temperatures at altitudes near 100,000 feet to be somewhat colder for northern locations than for more southerly locations. These latitude effects are not particularly apparent in the foregoing summary or in table I. The relatively few observations at 102,000 feet in the present summary, however, do not permit definite conclusions to be made in regard to such tendencies in the temperatures.

For a better illustration of the variations in temperature at the different altitudes, the mean temperature and the standard deviation of the temperatures about the mean are plotted against altitude in figure 1 for the 5-years' set of observations taken at Barrow, Alaska, ocean station vessel Victor, International Falls, Minnesota, and San Juan, Puerto Rico. The standard deviation σ is a useful measure of the scatter in the data about the mean and indicates the range that includes approximately 68 percent of the observations. The points in figure 1 are plotted slightly above or below the given altitudes for ease in distinguishing the average temperature and the values of σ. The variations in temperature with altitude for the standard atmosphere of references 2 and 5 are also shown by the curve in figure 1 for comparison with the observed data.

The much colder temperatures at tropopause levels and the wide departures from the temperatures for the standard atmosphere are evident for the southern locations from inspection of figure 1. Also, conditions in the stratosphere for the southern locations are characterized by a fairly large increase in the temperatures with altitude, while a small increase occurs for the more northerly locations. The mean temperatures for the high and low latitudes appear to converge at about 90,000 feet. Similar variations in the mean temperature with altitude above the tropopause for different latitudes are discussed in references 6 and 7.

The values of σ in figure 1 point out the very small variations in troposphere temperatures throughout the year for semitropical locations and the much larger variations for high-latitude stations. Above the tropopause, the temperature spreads generally decrease as altitude increases to 102,000 feet. The comparatively small amount of data obtained at the highest levels does not permit complete confidence to be placed in the values of σ at these altitudes, but in general it appears that the scatter in the temperatures about the mean values is represented by a value for σ of 10° C or more at low altitudes and less than 5° C at the higher altitudes.

CONCLUDING REMARKS

The preceding summary of the upper-air temperature measurements taken at nine radiosonde stations over a 5-year period provides basic temperature statistics for use in airplane and missile design studies. The stations were selected to represent given geographic or climatological influences, and the expected wide departures in the temperatures from those specified for standard atmospheric conditions were noted. The scatter in the temperatures at different altitudes agrees with the results from other investigations, and in terms of the standard deviations of the temperatures about the mean, frequently exceed 10° C in the troposphere and are less than 5° C for altitudes from the tropopause to 100,000 feet.

Langley Aeronautical Laboratory,
National Advisory Committee for Aeronautics,
Langley Field, Va., August 23, 1957.

REFERENCES

1. Ratner, Benjamin: Temperature Frequencies in the Upper Air. Weather Bur., U. S. Dept. Commerce, Jan. 1946.

2. Anon.: Standard Atmosphere - Tables and Data for Altitudes to 65,800 Feet. NACA Rep. 1235, 1955. (Supersedes NACA TN 3182.)

3. Kay, R. H.: The Apparent Diurnal Temperature Variation in the Lower Stratosphere. Quarterly Jour. Roy. Meteorological Soc., vol. 77, no. 333, July 1951, pp. 427-434.

4. Teweles, Sidney, Jr.: Tentative Normal Diurnal Height-Change Charts of the 500-Millibar Surface Over the United States. Bull. Am. Meteorological Soc., vol. 35, no. 6, June 1954, pp. 261-270.

5. Minzner, R. A., and Ripley, W. S.: The ARDC Model Atmosphere, 1956. Air Force Surveys in Geophysics No. 86 (AFCRC TN-56-204), Geophysics Res. Div., AF Cambridge Res. Center (Bedford, Mass.), Dec. 1956. (Available as ASTIA Doc. 110233.)

6. Anon.: Temperatures at the 10-mb (101,000-Foot) Level. AWS Tech. Rep. 105-108, Military Air Transport Service, U. S. Air Force, May 1953.

7. Kochanski, Adam B.: Wind, Temperature and Their Variabilities to 120,000 Feet. AWS Tech. Rep. 105-142, Military Air Transport Service, U. S. Air Force, May 1956.

TABLE I. - SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(a) Thule, Greenland																												
5,000	8											1	1	1	1	2	1									4		8
	6											3	3	6	5	2	3	2	1							13	1	6
	4											5	6	5	8	2	4									12	2	4
	2											7	11	18	20	21	18	1	2							47	4	2
	0									2	1	17	22	39	45	33	40	8	8							99	10	0
	-2							1	1	7	6	25	39	30	64	29	59	8	13	2	1	1	1	2	1	105	16	-2
	-4	2	1					1	1	7	11	24	55	27	82	29	78	12	22	3	3	1	1			106	22	-4
	-6	4	4	1	1			7	6	9	16	26	72	22	96	20	91	27	41	4	6	1	2	2	3	123	29	-6
	-8			2	2	3	2	8	12	16	27	13	81	6	100	12	99	18	54	9	12	3	4	1	3	91	34	-8
	-10	6	8	1	3			12	20	24	43	18	93			1	99	27	73	23	27	8	9	2	5	122	40	-10
	-12	5	11	1	4	4	5	14	29	27	61	7	97			1	100	25	90	25	44	5	11	3	7	115	47	-12
	-14	12	19	3	6	7	9	17	41	20	74	3	99					6	94	18	56	21	25	3	9	110	53	-14
	-16	9	25	3	8	7	14	12	49	20	87	1	100					7	99	19	69	16	36	8	14	102	59	-16
	-18	13	34	5	12	16	24	13	58	8	92							1	100	19	81	20	49	12	22	107	65	-18
	-20	14	43	14	22	15	34	16	69	5	95									11	89	21	63	19	35	115	71	-20
	-22	9	49	11	30	19	46	12	77	2	97									8	94	16	74	14	45	91	76	-22
	-24	8	54	12	39	9	52	6	81	3	99									5	97	18	86	16	55	77	81	-24
	-26	15	64	15	50	13	61	9	87	1	99									2	99	9	92	19	68	83	85	-26
	-28	14	73	21	66	17	72	4	90	1	100									2	100	4	95	17	80	80	90	-28
	-30	15	83	18	79	18	84	4	93													7	99	16	91	78	94	-30
	-32	16	93	5	83	11	91	3	95													1	100	11	98	47	97	-32
	-34	3	95	11	91	7	95	4	97															3	100	28	98	-34
	-36	5	99	5	95	5	99	4	100																	19	99	-36
	-38	2	100	2	96	2	100																			6	100	-38
	-40			5	100																					5	100	-40
10,000	0											2	1	1	1											3		0
	-2											1	2	7	5	2	1									10	1	-2
	-4											5	5	13	14	11	9	4	3							33	3	-4
	-6	1	1									17	17	32	35	28	27	4	6							82	7	-6
	-8	1	1							5	3	19	29	17	46	39	53	11	14	1	1					93	12	-8
	-10							1	1	6	7	19	42	27	63	33	74	11	21	1	1	1	1			99	18	-10
	-12	1	2	1	1			2	2	9	13	30	62	33	85	15	84	26	40	2	3					119	25	-12
	-14	2	3	1	2	1	1	5	5	16	24	22	77	18	97	13	93	18	53	8	8	1	1	3	2	108	31	-14
	-16	3	5	1	2	3	3	14	15	15	34	16	87	3	99	6	97	18	65	16	19	3	3	1	3	99	36	-16
	-18	9	11	1	3	5	6	18	27	27	51	8	93	2	100	4	99	17	77	17	30	11	11	4	5	123	43	-18
	-20	7	16	3	5	7	11	21	42	32	72	6	97			1	100	14	87	25	47	10	17	7	10	133	51	-20
	-22	16	26	4	8	8	16	15	52	21	86	2	98					11	95	18	59	14	27	5	14	114	57	-22
	-24	17	38	7	13	20	29	21	66	10	93	2	99					5	99	16	69	31	47	17	25	146	65	-24
	-26	17	49	12	22	22	43	18	78	6	97							1	99	19	82	21	61	23	41	139	73	-26
	-28	19	61	18	35	18	55	9	84	2	98	1	100					1	100	12	90	22	76	17	52	119	80	-28
	-30	18	73	17	48	19	68	5	88	2	99									8	95	11	83	21	66	101	85	-30
	-32	12	81	24	65	16	78	3	90											4	98	12	91	22	81	93	91	-32
	-34	12	89	15	77	11	86	5	93	1	100									1	99	7	96	13	90	65	94	-34
	-36	10	95	12	85	14	95	3	95											2	100	5	99	10	97	56	97	-36
	-38	3	97	8	91	2	96	3	97													1	100	3	99	20	98	-38
	-40	2	99	4	94	6	100	2	99															2	100	16	99	-40
	-42	2	100	2	96			1	99																	5	100	-42
	-44			6	100																					6	100	-44
	-46							1	100																	1	100	-46
18,000	-16											1	1	3	2	1	1									5		-16
	-18											1	1	10	9	5	4									16	1	-18
	-20											8	7	19	22	12	12	2	1							41	4	-20
	-22									4	3	15	17	21	36	29	32	5	5	2	1					76	8	-22
	-24	1	1							4	5	19	30	24	52	36	57	13	15							97	14	-24
	-26	2	2			1	1	3	2	7	10	33	53	30	72	31	78	17	27	4	4					128	21	-26
	-28	1	3	2	2	1	1	8	8	11	17	23	69	24	88	13	86	22	43	6	8	2	1			113	28	-28
	-30	1	3			4	4	7	12	18	30	22	84	11	95	11	94	23	59	8	14	3	3	1	1	109	34	-30
	-32	4	6	1	2	4	7	13	21	31	50	14	93	4	98	5	97	19	73	15	24	8	9	4	3	122	41	-32
	-34	9	12	1	3	9	13	17	33	26	68	5	97	2	99	2	99	15	84	22	39	10	16	6	8	124	48	-34
	-36	14	22	4	6	12	22	22	48	24	84	4	99	1	100	2	100	8	90	20	53	10	23	10	14	151	56	-36
	-38	19	35	7	12	18	34	25	65	18	96							7	95	21	67	31	44	15	25	161	65	-38
	-40	24	51	15	24	20	48	18	77	4	99	1	100					4	98	20	81	25	61	21	39	152	74	-40
	-42	24	67	22	41	27	67	14	87									2	99	16	92	24	78	35	63	164	83	-42
	-44	18	79	25	61	15	77	5	90	2	100							1	100	4	95	12	86	21	77	103	89	-44
	-46	17	91	29	84	18	90	6	95											6	99	10	93	21	92	107	95	-46
	-48	7	95	11	92	11	97	2	96											1	99	5	97	8	97	45	98	-48
	-50	3	97	8	98	4	100	2	97											1	100	5	100	4	100	27	99	-50
	-52	4	100	2	100			4	100																	10	100	-52
30,000	-38									1	1	1	1	1	1											3		-38
	-40			1	1					2	2	4	4	5	4	2	2									14	1	-40
	-42			2	3	1	1	1	1	6	6	6	8	4	7	1	2									21	2	-42
	-44			5	7	4	4	3	3	15	17	5	11	11	15	6	7	1	1	1	1	1	1			52	6	-44
	-46			4	10	7	9	11	11	19	30	9	18	27	34	11	15	5	5	3	3	1	1	1	1	98	12	-46
	-48			4	14	13	19	6	16	24	47	40	46	31	56	31	39	12	14	9	9	3	4	1	2	174	22	-48
	-50	9	7	7	20	13	29	17	28	22	62	36	72	36	81	44	73	20	30	9	16	8	9	3	4	224	36	-50
	-52	9	14	12	30	24	48	29	50	22	78	28	92	23	97	24	92	29	52	30	37	13	19	4	7	247	52	-52
	-54	16	26	11	39	10	55	24	67	19	91	11	99	4	100	8	98	31	77	28	56	21	34	16	18	199	64	-54
	-56	12	35	19	55	22	72	19	82	11	99	1	100			3	100	21	93	33	80	26	53	24	36	191	76	-56
	-58	20	51	16	69	19	87	17	94	1	99							9	100	18	92	35	78	33	60	168	86	-58
	-60	21	67	15	81	11	95	8	100											8	98	23	95	27	80	113	93	-60
	-62	24	85	14	93	6	100			1	100									3	100	7	100	16	91	71	98	-62
	-64	16	98	6	98																			10	99	32	100	-64
	-66	3	100	1	99																			2	100	6	100	-66
	-68			1	100																					1	100	-68

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(a) Thule, Greenland - Continued																												
38,500	-36													1	1											1		-36
	-38			3	3							5	4	3	3											11	1	-38
	-40			6	8	1	1			8	6	13	14	16	15	4	3	1	1							49	4	-40
	-42			2	10	9	9			21	22	37	43	35	41	11	13	2	3							117	12	-42
	-44					10	18	11	9	46	56	22	60	29	63	19	29	8	9			1	1	3	2	149	22	-44
	-46	5	4	8	18	7	24	21	25	31	79	30	84	23	80	26	51	20	26	7	5	6	5	3	5	187	34	-46
	-48	6	9	8	25	14	36	31	50	18	92	13	94	10	87	23	71	29	51	21	20	4	9	2	6	179	46	-48
	-50	15	22	11	35	18	52	23	68	3	94	6	98	10	95	14	83	31	77	38	48	8	15	9	13	186	59	-50
	-52	18	37	19	53	22	71	24	87	3	96	2	100	2	96	7	89	12	87	36	74	22	32	12	23	179	71	-52
	-54	14	49	7	59	10	80	6	92	3	99			2	98	5	93	7	93	17	86	33	57	23	41	127	79	-54
	-56	5	53	5	64	8	87	7	98	1	99					3	96	3	96	9	93	29	80	21	58	91	86	-56
	-58	5	57	15	78	3	90	1	98					2	99	2	97			7	98	18	94	15	69	68	90	-58
	-60	7	63	12	89			2	100							1	98	4	99	3	100	4	97	8	76	41	93	-60
	-62	11	72	7	95	4	95			1	100			1	100	1	99					3	99	11	84	39	95	-62
	-64	15	85	2	97	3	96									1	100	1	100			1	100	6	89	29	97	-64
	-66	13	96	1	98	2	97																	6	94	22	99	-66
	-68	2	98	1	99	1	98																	2	95	6	99	-68
	-70	2	99			2	100																	2	97	6	100	-70
	-72	1	100																					1	98	2	100	-72
	-74			1	100																			3	100	4	100	-74
53,000	-38			2	3																					2		-38
	-40			6	11	3	3					3	3	7	6											19	2	-40
	-42			1	13	8	13			2	2	18	19	41	44	6	6									76	9	-42
	-44					6	19	5	5	20	20	38	54	41	82	42	48	1	1					1	1	154	22	-44
	-46	2	3			5	25	12	18	40	56	33	84	16	96	32	79	15	18					1	3	156	36	-46
	-48	9	16	3	17	6	32	15	34	29	82	16	99	4	100	17	96	21	41			1	1	3	7	124	47	-48
	-50	13	34	12	33	5	38	22	57	13	94					3	99	32	76	10	9	5	6	1	8	116	57	-50
	-52	3	38	5	40	8	47	17	76	6	99	1	100			1	100	18	96	37	40	6	12	6	16	108	66	-52
	-54	1	39	8	51	19	68	18	95	1	100							3	99	30	66	9	20	3	20	92	74	-54
	-56	2	42	5	58	10	80	5	100											20	83	9	29	6	28	57	79	-56
	-58	3	47	6	67	5	85											1	100	13	94	16	44	6	36	50	84	-58
	-60	3	51	1	68	3	89													5	98	25	68	6	44	43	87	-60
	-62	4	56	7	78	1	90													2	100	23	90	11	59	48	92	-62
	-64	5	63	6	86	1	91															9	99	8	69	29	94	-64
	-66	6	72	4	92	2	93															1	100	6	77	19	96	-66
	-68	6	80	5	99	3	97																	5	84	19	97	-68
	-70	10	94			3	100																	5	91	18	99	-70
	-72	2	97	1	100																			4	96	7	100	-72
	-74	2	100																					2	99	4	100	-74
	-76																							1	100	1	100	-76
67,500	-40					2	5					8	9	15	19											25	4	-40
	-42			4	24	3	13			1	1	30	45	46	76	8	10									92	19	-42
	-44					1	15	4	6	19	25	29	79	19	100	36	56									108	36	-44
	-46			1	29	5	28	11	23	21	51	16	98			27	91	1	2							82	49	-46
	-48					1	31	10	39	20	76	2	100			4	96	14	28					1	4	52	58	-48
	-50	3	21					5	46	14	94					3	100	9	44							34	63	-50
	-52			1	35	1	33	4	52	4	99							12	67	1	2			1	9	24	67	-52
	-54	4	50			1	36	7	63	1	100							14	93	4	8			1	13	32	72	-54
	-56	3	71	4	59	4	46	7	74									4	100	6	18	1	3	3	26	32	77	-56
	-58			1	65	3	54	6	83											18	48			2	35	30	82	-58
	-60			3	82	1	56	8	95											17	77	4	17	4	52	37	88	-60
	-62	2	86	3	100	11	85	5	100											10	93	6	38	2	61	37	94	-62
	-64					2	90													3	98	4	52	1	65	10	95	-64
	-66					4	100													1	100	8	79	3	78	16	98	-66
	-68																					4	93			4	99	-68
	-72																					1	97			1	99	-72
	-74	1	93																			1	100			2	99	-74
	-76	1	100																					1	83	2	99	-76
	-78																							2	91	2	100	-78
	-80																							1	96	1	100	-80
	-82																							1	100	1	100	-82
78,500	-38													1	2											1		-38
	-40											19	33	24	41											43	14	-40
	-42									3	8	26	79	28	87	15	26									72	38	-42
	-44			1	33	1	20	1	3	12	41	10	97	8	100	22	69									55	56	-44
	-46							5	19	11	70	2	100			14	94									32	67	-46
	-48					2	60	7	41	8	92					2	98	5	15							24	74	-48
	-50							1	44	2	97					1	100	9	42							13	79	-50
	-52	1	50					1	47	1	100							3	52							6	81	-52
	-54	1	100	1	67			3	56									11	85							16	86	-54
	-56							1	59									4	97	1	5					6	88	-56
	-58							5	75									1	100	3	21					9	91	-58
	-60							5	91											5	47					10	94	-60
	-62							1	94											5	74					6	96	-62
	-64							2	100											4	95					6	98	-64
	-66			1	100	2	100															1	100			4	99	-66
	-68																			1	100					1	100	-68
	-82																							1	100	1	100	-82

TABLE I. - SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan. f	Jan. cpd %	Feb. f	Feb. cpd %	March f	March cpd %	April f	April cpd %	May f	May cpd %	June f	June cpd %	July f	July cpd %	Aug. f	Aug. cpd %	Sept. f	Sept. cpd %	Oct. f	Oct. cpd %	Nov. f	Nov. cpd %	Dec. f	Dec. cpd %	Total f	Total cpd %	t, °C
(a) Thule, Greenland - Concluded																												
87,000	-36											1	3	1	3											2	1	-36
	-38											14	48	8	26	1	3									23	17	-38
	-40									1	5	9	77	19	80	2	10									31	37	-40
	-42									6	35	3	87	7	100	14	57									30	57	-42
	-44									9	80	4	100			11	93									24	73	-44
	-46							3	25	1	85					1	97	2	11							7	78	-46
	-48							3	50	2	95					1	100	3	28							9	84	-48
	-50																	3	44							3	86	-50
	-52			1	50			2	67	1	100							4	67							8	91	-52
	-54							1	75									4	89							5	95	-54
	-56							1	83									1	94							2	96	-56
	-58							2	100																	2	97	-58
	-60																	1	100							1	98	-60
	-62																			2	100					2	99	-62
	-70			1	100																					1	100	-70
102,000	-30											1	33													1	8	-30
	-32													2	100											2	25	-32
	-34											2	100			2	33									4	58	-34
	-38															1	50									1	67	-38
	-40															2	83									2	83	-40
	-44															1	100									1	92	-44
	-52																	1	100							1	100	-52
(b) Barrow, Alaska																												
5,000	14													1	1											1		14
	12													2	2											2		12
	10													8	7	2	1									10	1	10
	8											4	3	8	12	9	7									21	2	8
	6											14	12	18	24	18	19									50	5	6
	4											17	24	33	45	15	29	1	1	1	1					67	8	4
	2					1	1			4	3	32	45	29	64	22	43	10	7	3	3					101	14	2
	0	2	1					1	1	12	10	34	68	20	77	25	60	16	18	4	5					114	20	0
	-2							4	3	14	19	24	85	19	89	29	79	18	30	4	8	2	1			114	26	-2
	-4	1	2			3	3	7	8	21	33	8	90	9	95	15	89	32	52	9	14	3	3			108	32	-4
	-6	2	3					12	16	23	48	7	95	7	99	11	96	25	69	12	21	5	7	1	1	105	38	-6
	-8	12	11	1	1	2	4	8	21	16	58	6	99	1	100	6	100	21	83	17	33	10	13	2	2	102	44	-8
	-10	11	18	6	5	3	6	21	35	25	74	2	100					9	89	17	44	12	22	3	4	109	50	-10
	-12	16	28	2	6	8	11	18	47	14	83							13	98	30	63	25	38	8	9	134	57	-12
	-14	5	32	8	12	19	23	19	60	13	92							3	100	23	78	19	51	15	19	124	64	-14
	-16	7	36	14	22	17	34	20	73	6	96									22	92	20	64	13	27	119	71	-16
	-18	18	48	11	30	20	47	14	83	7	100									8	97	11	72	15	37	104	76	-18
	-20	13	56	16	41	22	61	9	89											4	100	9	78	24	53	97	82	-20
	-22	9	62	16	53	24	77	8	94													13	87	19	65	89	87	-22
	-24	10	60	14	62	19	89	6	98													11	94	13	73	73	91	-24
	-26	11	76	20	77	8	94	3	100													8	99	19	86	69	94	-26
	-28	12	83	10	84	3	96															1	100	10	92	36	96	-28
	-30	13	92	5	87	4	99																	7	97	29	98	-30
	-32	8	97	7	92																			2	98	17	99	-32
	-34	2	98	3	94	2	100																	2	99	9	99	-34
	-36	1	99	3	97																			1	100	5	100	-36
	-38	1	99	2	98																					3	100	-38
	-40	1	100	3	100																					4	100	-40
10,000	2													6	4	3	2									9	1	2
	0											2	1	11	11	4	5									17	1	0
	-2											6	5	26	28	19	17			1	1					52	4	-2
	-4	1	1			1	1					20	19	29	47	21	31	4	3	3	3					79	9	-4
	-6							1	1	1	1	35	43	37	70	29	50	5	6	5	6					113	15	-6
	-8	2	2			2	2	1	1	8	6	37	68	28	88	30	70	18	18	3	8	1	1			130	22	-8
	-10	3	4			1	3	3	3	29	25	28	87	10	95	20	83	36	43	3	10	1	1	1	1	135	30	-10
	-12	1	5	1	1	2	4	9	9	26	41	14	96	8	100	16	93	21	57	13	18	6	5			117	36	-12
	-14	6	8			5	7	7	14	34	63	4	99			8	99	27	76	15	28	8	11	2	2	116	42	-14
	-16	7	13	3	3	3	9	20	27	21	77	2	100			2	100	20	89	22	42	16	22	4	5	120	49	-16
	-18	12	21	5	6	8	14	27	45	18	88							10	96	36	65	27	40	17	16	160	58	-18
	-20	15	31	12	15	12	22	20	59	14	97							2	97	24	81	24	56	11	23	134	65	-20
	-22	13	39	9	21	31	42	25	75	3	99							4	100	11	88	17	67	14	32	127	72	-22
	-24	12	47	20	36	24	57	20	89	1	100									9	94	9	73	25	48	120	79	-24
	-26	21	60	23	52	26	74	6	93											7	98	18	85	22	63	123	86	-26
	-28	13	69	24	69	18	86	9	99											3	100	13	94	22	77	102	91	-28
	-30	12	77	14	79	15	96	2	100													8	99	16	88	67	95	-30
	-32	14	86	10	86	2	97															1	100	13	96	40	97	-32
	-34	10	92	10	93	3	99																	1	97	24	98	-34
	-36	9	98			1	99																	2	98	12	99	-36
	-38	2	99	4	96	1	100																	2	99	9	100	-38
	-40	1	100	4	99																			1	100	6	100	-40
	-42			2	100																					2	100	-42

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(b) Barrow, Alaska - Continued																												
18,000	-12											1	1	1	1											2		-12
	-14											2	2	6	5	6	4									14	1	-14
	-16											1	3	12	12	7	9									20	2	-16
	-18											6	7	27	30	21	23									54	5	-18
	-20	1	1					1	1			15	17	37	54	26	40	4	3	3	2	1	1			88	10	-20
	-22	3	3			2	1	3	3	3	2	31	39	39	80	32	61	8	8	4	5					125	17	-22
	-24	1	3			1	2	3	5	16	12	28	58	16	90	23	77	22	24	8	10			1	1	119	24	-24
	-26	2	5			3	4	9	11	26	29	36	83	8	95	16	87	35	48	12	18	2	2	1	1	150	32	-26
	-28	6	9	1	1	7	8	4	13	28	47	14	93	7	100	12	95	21	63	10	24	3	4			113	38	-28
	-30	5	12	2	2	10	15	12	21	32	68	10	100			6	99	28	82	17	36	12	12	6	5	140	46	-30
	-32	8	17	3	4	5	18	16	32	19	81					1	100	15	92	28	54	17	24	5	9	117	53	-32
	-34	11	24	9	11	14	27	17	43	19	93							6	97	24	70	25	41	22	23	147	61	-34
	-36	13	33	18	24	13	36	33	65	10	99							4	99	28	88	29	61	20	36	168	70	-36
	-38	20	46	20	38	32	56	26	83	1	100							1	100	7	93	21	75	14	45	142	78	-38
	-40	23	61	23	54	33	77	18	95											10	99	21	89	25	61	153	87	-40
	-42	19	74	27	74	16	88	6	99											1	100	10	96	30	81	109	93	-42
	-44	16	84	16	85	13	96	2	100													3	98	22	95	72	97	-44
	-46	16	95	12	94	4	99															3	100	5	99	40	99	-46
	-48	6	99	7	99	1	99																	2	100	16	100	-48
	-50	2	100	2	100	1	100																			5	100	-50
30,000	-38													3	2											3		-38
	-40											1	1	2	3	2	1									5	1	-40
	-42									2	1	2	2	12	11	5	5									21	2	-42
	-44	1	1	2	2	1	1	1	1	2	3	8	8	21	25	16	16	2	1							54	5	-44
	-46	2	2	3	4			2	2	10	9	14	18	34	47	29	36	2	3	4	3					100	10	-46
	-48	3	4	3	6	10	7	6	6	14	18	26	37	40	73	40	64	8	9	12	11	1	1	1	1	164	20	-48
	-50	10	11	7	11	7	12	12	14	21	32	34	62	31	94	28	83	26	28	19	20	3	3	4	3	196	31	-50
	-52	10	18	19	25	18	24	23	30	36	56	33	86	8	99	17	95	37	54	17	31	17	15	5	7	240	45	-52
	-54	33	40	19	39	30	43	25	46	41	82	14	96	2	100	6	99	42	85	9	37	33	38	19	19	273	60	-54
	-56	32	62	19	53	32	64	39	73	21	96	6	100			1	100	15	96	24	53	37	64	30	38	256	75	-56
	-58	24	79	29	74	23	79	24	89	6	100							4	99	35	77	29	84	33	60	207	87	-58
	-60	14	88	22	90	22	94	14	98									2	100	30	97	18	97	28	78	150	95	-60
	-62	13	97	8	96	9	99	3	100											3	99	5	100	28	96	69	99	-62
	-64	3	99	2	98															1	100			4	99	10	100	-64
	-66	1	100	2	99	1	100																	2	100	6	100	-66
	-68			1	100																					1	100	-68
38,500	-40					2	1					1	1	5	3	2	1									10	1	-40
	-42			8	6	3	3			3	2	5	4	17	15	8	7									44	3	-42
	-44	2	2	4	9	3	5	5	4	12	10	25	23	20	28	23	22	3	2	2	1					99	9	-44
	-46	10	9	8	15	8	11	10	10	28	29	27	43	30	48	22	37	15	13	5	5			1	1	164	19	-46
	-48	7	14	15	27	16	22	27	29	54	64	35	68	20	61	34	61	26	32	7	10	6	4	3	3	250	33	-48
	-50	19	29	22	44	24	38	40	57	24	80	17	81	21	75	20	74	29	53	19	24	18	17	8	8	261	49	-50
	-52	20	44	15	55	30	58	22	72	14	89	10	88	11	82	12	82	30	74	27	43	39	45	25	25	255	64	-52
	-54	24	62	23	73	16	69	21	87	7	94	5	92	7	87	5	86	15	85	24	60	28	65	28	44	203	76	-54
	-56	22	79	18	87	24	85	9	93	4	97	8	98	5	90	8	91	11	93	16	72	26	84	22	59	173	86	-56
	-58	6	83	11	95	9	91	3	95	4	99	2	99	5	93	7	96	5	96	16	84	13	93	17	71	98	91	-58
	-60	7	89	2	97	6	95	1	96	1	100	1	100	6	97	2	97	4	99	6	88	3	95	10	78	49	94	-60
	-62	5	92	1	98			3	98					4	100	4	100	1	100	2	89	2	96	7	82	29	96	-62
	-64	1	93	2	99	3	97	2	99											4	92	3	99	9	88	24	97	-64
	-66	1	94	1	100	2	99	1	100											6	96	2	100	8	94	21	99	-66
	-68	3	96			2	100													3	99			4	97	12	99	-68
	-70	5	100																	1	99			4	99	10	100	-70
	-72																			1	100			1	100	2	100	-72
53,000	-38			1	1	1	1																			2		-38
	-40			1	2	2	2																			3		-40
	-42	3	3	3	5	7	8							1	1							1	1	1	1	16	1	-42
	-44	2	4	6	11	6	12	4	3	7	5	11	8	39	27	12	9					1	2	1	2	89	7	-44
	-46	7	10	8	18	8	19	13	13	21	19	67	59	57	66	59	51	11	8	4	4	4	5	4	5	263	24	-46
	-48	24	31	12	30	9	25	26	32	52	54	40	89	38	91	45	83	30	31	4	7	18	18	8	12	306	44	-48
	-50	18	47	16	45	16	38	30	54	56	92	12	98	12	99	21	98	63	78	12	18	22	35	13	23	291	63	-50
	-52	19	64	18	63	27	59	32	78	12	100	3	100	1	100	3	100	26	98	30	45	35	62	12	33	218	77	-52
	-54	12	74	14	76	28	80	20	93									3	100	21	63	16	74	21	51	135	86	-54
	-56	11	84	20	95	11	89	10	100											20	81	14	85	13	62	99	92	-56
	-58	10	92			7	94													11	91	9	92	11	72	48	95	-58
	-60	5	97	2	97	2	95													7	97	10	99	6	77	52	97	-60
	-62	1	97	2	99	1	96													1	98	1	100	12	87	18	98	-62
	-64	3	100	1	100	5	100													1	99			7	93	17	99	-64
	-66																			1	100			4	97	5	100	-66
	-68																							2	98	2	100	-68
	-70																							1	99	1	100	-70
	-72																							1	100	1	100	-72

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(b) Barrow, Alaska - Concluded																												
67,500	-36					1	1																			1		-36
	-38					3	5																			3		-38
	-40					2	8																	2	4	4	1	-40
	-42	3	5	2	6	4	13					3	.3	8	6							1	1	3	10	24	3	-42
	-44	1	6	2	11	2	15			3	2	44	42	73	61	16	12					3	6	1	13	145	17	-44
	-46	4	13	1	14	5	22	3	3	27	24	50	87	44	94	38	41	5	5			2	9	3	19	182	33	-46
	-48	10	29	4	25	5	28	24	24	40	57	13	99	8	100	59	86	4	8	1	2			5	29	173	50	-48
	-50	4	35	1	28	8	39	23	44	33	84	1	100			16	99	23	29			6	17	8	46	123	61	-50
	-52	14	57	5	42	4	44	21	62	16	97					2	100	46	70	1	4	13	36	9	65	131	73	-52
	-54	12	76	8	64	6	51	25	84	4	100							25	92	11	24	12	54	7	79	110	83	-54
	-56	7	87	7	83	17	73	16	97									8	99	10	42	7	64	1	81	73	90	-56
	-58	3	92	4	94	13	90	5	100									1	100	15	69	7	74	1	83	47	95	-58
	-60	1	94	1	97	5	96													8	84	9	87	3	90	27	97	-60
	-62	2	97	1	100															6	95	7	97	2	94	18	99	-62
	-64	2	100																	3	100	2	100	1	96	8	100	-64
	-66					2	99																	1	98	3	100	-66
	-68					1	100																			1	100	-68
	-70																							1	100	1	100	-70
78,500	-40											1	2	1	1									1	14	3	1	-40
	-42											6	12	18	25	4	5							2	43	30	8	-42
	-44			1	9	1	6			6	12	29	60	37	75	10	16									84	27	-44
	-46	1	11	3	36	1	13	3	5	11	35	22	97	17	97	29	48	1	2					1	57	89	47	-46
	-48							7	18	6	47	1	98	2	100	30	82							2	86	48	58	-48
	-50	1	22	2	55	2	25	14	43	14	76	1	100			12	96	9	22							55	70	-50
	-52	1	33	2	73	1	31	6	54	9	94					4	100	20	67	1	10	1	8			45	81	-52
	-54	2	56			1	38	8	68	3	100							8	84	2	30	1	17			25	86	-54
	-56	1	67	1	82	1	44	6	79									6	98	2	50	4	50	1	100	22	91	-56
	-58	1	78			6	81	10	96									1	100	3	80					21	96	-58
	-60					1	88	2	100											1	90	4	83			8	98	-60
	-62	1	89	2	100	2	100													1	100					4	99	-62
	-64	1	100																			2	100			3	100	-64
87,000	-40													3	15											3	4	-40
	-42									2	14	5	46	9	60	3	21									19	26	-42
	-44									2	29	3	73	7	95	2	36									14	42	-44
	-46									3	50	2	91	1	100	4	64									10	54	-46
	-48			1	50			2	13	1	57					2	79									6	61	-48
	-50					1	50			2	71	1	100			2	93	3	60							9	72	-50
	-52			1	100			4	38	4	100					1	100	2	100							12	86	-52
	-56							2	50																	2	88	-54
	-58							5	81																	5	94	-58
	-60					1	100	3	100													1	100			5	100	-60
102,000	-48															1	50									1	25	-48
	-52									2	100					1	100									3	100	-52
(c) San Juan, Puerto Rico																												
5,000	22																			1	1					1		22
	20											1	1							1	1					2		20
	18					3	2	5	3	15	10	19	13	25	16	52	34	55	37	36	25	6	4			216	12	18
	16	3	2	6	4	6	6	40	30	88	67	97	78	13	89	92	93	92	98	3	92	86	61	22	14	748	53	16
	14	49	34	42	34	47	36	64	73	50	99	33	100	17	100	11	100	3	100	13	100	52	96	87	71	468	79	14
	12	88	90	63	79	71	82	33	95	1	100											6	100	43	99	305	95	12
	10	15	100	25	97	26	99	8	100															2	100	76	100	10
	8			5	100	2	100																			7	100	8
10,000	12	1	1	6	4	4	3			1	1	1	1			1	1	2	1	1	1	3	2	4	3	24	1	12
	10	26	18	22	20	25	19	6	4	12	9	12	9	24	16	27	18	31	22	41	27	16	13	23	18	265	16	10
	8	41	44	41	49	57	56	58	43	77	59	97	73	99	79	10	89	3	91	72	74	76	63	47	48	878	64	8
	6	65	86	46	82	49	87	59	82	52	93	38	99	29	98	16	99	13	100	39	99	49	96	64	90	519	93	6
	4	13	95	22	98	18	99	25	99	10	99	2	100	2	99	1	100			1	100	4	99	11	97	109	99	4
	2	8	100			2	100	2	100	1	100			1	100							2	100	5	100	21	100	2
	0			3	100																					3	100	0
18,000	-2																			1	1					1		-2
	-4			1	1	5	3	2	1	2	1			1	1	9	6	5	3	4	3	10	7	1	1	40	2	-4
	-6	22	14	26	19	31	24	48	34	32	23	29	20	34	23	54	42	47	35	57	41	51	41	50	33	481	29	-6
	-8	74	63	52	57	77	74	49	66	74	72	90	80	89	80	79	94	79	88	71	87	54	77	62	74	850	76	-8
	-10	42	90	48	91	31	94	41	94	38	97	30	100	30	99	9	100	16	99	20	100	31	98	33	95	369	97	-10
	-12	12	98	10	99	7	99	9	100	5	100			1	100			2	100			3	100	7	100	56	100	-12
	-14	2	99	1	99	2	100																			5	100	-14
	-16	1	100	1	100																					2	100	-16
30,000	-30			1	1					1	1					6	4	5	3			1	1			14	1	-30
	-32	9	6	6	5	10	7	12	8	19	14	8	6	8	5	17	15	33	26	27	18	14	10	7	5	170	10	-32
	-34	33	28	35	30	21	21	58	47	67	61	60	47	46	35	77	66	58	65	78	69	70	58	49	37	652	47	-34
	-36	69	74	60	74	58	59	61	89	46	93	65	92	83	90	46	97	46	96	41	96	49	91	72	84	696	86	-36
	-38	31	95	31	96	45	89	15	99	9	99	12	100	15	99	5	100	6	100	6	100	12	99	23	99	210	98	-38
	-40	6	99	5	100	17	100	2	100	1	100			1	100							1	100	1	100	34	100	-40
	-42	2	100																							2	100	-42

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan. f	Jan. cpd %	Feb. f	Feb. cpd %	March f	March cpd %	April f	April cpd %	May f	May cpd %	June f	June cpd %	July f	July cpd %	Aug. f	Aug. cpd %	Sept. f	Sept. cpd %	Oct. f	Oct. cpd %	Nov. f	Nov. cpd %	Dec. f	Dec. cpd %	Total f	Total cpd %	t, °C
(c) San Juan, Puerto Rico - Concluded																												
38,500	-50	1	1	1	1	6	4																			8	1	-50
	-52	21	15	7	6	23	19	6	4	3	2					2	1	5	3			1	1	3	2	71	5	-52
	-54	42	44	56	47	45	49	39	31	23	18	2	1	6	4	21	15	19	17	24	16	23	16	31	23	331	24	-54
	-56	55	83	38	75	49	82	67	77	65	64	52	39	39	30	80	69	79	71	78	68	99	84	62	64	763	67	-56
	-58	22	98	29	96	24	98	33	100	47	97	70	89	87	89	43	98	35	95	47	99	23	100	52	99	512	97	-58
	-60	2	99	6	100	2	99			3	99	13	99	16	99	3	100	7	100	2	100			1	100	55	100	-60
	-62	1	100			1	100			2	100	2	100													6	100	-62
	-66													1	100											1	100	-66
53,000	-68													1	1			3	3							4		-68
	-70											10	9	14	11	5	4	8	9	1	1					38	3	-70
	-72	2	2					5	4	7	6	24	30	40	41	26	23	26	31	6	6			3	2	139	12	-72
	-74	10	9	7	5	7	5	14	15	14	19	44	69	52	81	62	68	26	53	25	25	9	7	5	6	275	30	-74
	-76	25	28	22	23	38	32	41	49	37	52	19	86	24	99	35	93	43	89	35	53	25	27	25	24	369	54	-76
	-78	46	63	60	69	55	72	45	85	35	83	8	93	2	100	8	99	12	99	30	76	53	68	47	58	401	80	-78
	-80	35	89	28	91	32	95	13	96	15	96	5	97			1	100	1	100	22	94	33	94	31	80	216	94	-80
	-82	14	100	12	100	6	99	5	100	4	100	2	99							4	98	6	98	28	100	83	100	-82
	-84					1	100					1	100							2	100	1	99			5	100	-84
	-86																					1	100			1	·100	-86
67,500	-54					1	1			1	1															2		-54
	-56									1	3	2	3	2	2											5	1	-56
	-58					1	2	2	2	4	8	5	9	6	9	11	10	2	3	2	2					33	4	-58
	-60	3	4	2	2	2	4	9	13	19	33	18	32	32	43	35	42	16	24	6	9	5	6	2	2	149	18	-60
	-62	3	8	2	5	3	7	11	26	16	53	30	70	39	84	44	83	32	66	32	47	23	31	8	12	243	41	-62
	-64	5	14	11	18	15	21	25	55	16	74	24	100	15	100	19	100	19	91	30	82	26	60	18	33	223	63	-64
	-66	16	35	23	46	28	48	23	81	12	90							7	100	11	95	23	86	27	66	170	79	-66
	-68	18	58	17	66	27	74	14	98	8	100									4	100	13	100	18	87	119	90	-68
	-70	25	90	16	86	18	91	1	99															7	95	67	97	-70
	-72	5	96	9	96	7	98	1	100															2	98	24	99	-72
	-74	1	97	3	100	2	100																	2	100	8	100	-74
	-76	1	99																							1	100	-76
	-80	1	100																							1	100	-80
78,500	-44											1	2													1		-44
	-46											1	5													1		-46
	-48																					1	2			1	1	-48
	-50			1	2	1	1	3	6	2	4	3	11			1	2	2	5			2	5			15	3	-50
	-52			1	4	8	12	1	8	5	15	2	16	6	12	7	13	1	8			4	12	1	2	36	9	-52
	-54			4	13	7	22	11	30	13	42	15	50	15	42	17	40	6	23	3	6	16	40	12	23	119	28	-54
	-56	8	17	9	31	24	55	23	76	20	83	18	91	25	92	22	76	18	69	14	31	12	60	16	52	209	61	-56
	-58	12	44	13	58	19	81	9	94	8	100	5	98	4	100	13	97	11	97	24	75	12	81	14	77	142	83	-58
	-60	18	83	13	85	10	95	3	100			1	100			2	100	1	100	11	95	9	97	10	95	78	96	-60
	-62	6	96	5	96	3	99													3	100	2	100	2	98	21	99	-62
	-64	1	98	2	100	1	100																	1	100	5	100	-64
	-70	1	100																							1	100	-70
87,000	-44									1	8															1		-44
	-46					1	3							1	5			1	7					1	6	4	2	-46
	-48			3	13	4	17	6	30	3	31	3	27	3	21	2	12	1	13	1	4	5	18			31	15	-48
	-50	2	8	3	25	13	60	4	50	7	85	6	82	5	47	6	47	1	20	3	16	17	79	5	35	72	44	-50
	-52	6	33	4	42	5	77	4	70	1	92	1	91	8	90	7	88	4	47	10	56	3	89	3	53	56	68	-52
	-54	4	50	7	71	3	87	5	95	1	100	1	100	2	100	2	100	7	93	11	100	3	100	4	77	50	88	-54
	-56	5	71	4	88	2	93	1	100									1	100					2	88	15	94	-56
	-58	6	96	2	96	2	100																	2	100	12	99	-58
	-62			1	100																					1	100	-62
	-64	1	100																							1	100	-64
102,000	-42					1	17	1	50																	2	15	-42
	-44					1	33																			1	23	-44
	-46					3	83							1	100											4	54	-46
	-48	1	33			1	100											1	100							3	77	-48
	-50							1	100																	1	85	-50
	-54	1	67																							1	92	-54
	-62	1	100																							1	100	-62
(d) Ocean station vessel Echo																												
5,000	20																	1	1							1		20
	18													1	1	4	3	2	2							7	1	18
	16											2	1	14	10	38	28	25	19	9	7					88	6	16
	14							1	1	6	4	41	29	79	61	89	88	69	67	41	36					335	25	14
	12	8	6	3	2	3	2	5	4	32	25	64	71	52	94	15	98	36	92	41	66	8	6	1	1	309	42	12
	10	22	21	16	14	11	9	34	27	52	60	30	91	9	100	3	100	8	97	17	78	34	31	16	12	264	57	10
	8	34	44	37	40	28	28	43	55	29	79	9	97					4	100	12	87	33	55	29	33	269	73	8
	6	36	69	30	62	36	51	36	79	16	90	4	100							13	96	33	79	40	61	204	84	6
	4	25	86	19	76	35	74	11	87	10	97									5	100	13	89	20	75	135	92	4
	2	15	96	14	86	25	91	5	90	5	100											12	98	18	88	78	97	2
	0	5	99	12	94	9	97	12	98													3	100	11	96	44	99	0
	-2	1	100	8	100	4	99	3	100															6	100	16	100	-2
	-4					1	100																			1	100	-4

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(d) Ocean station vessel Echo - Continued																												
10,000	10													1	1	4	3	7	5	3	2					15	1	10
	8	1	1									4	3	13	9	35	26	38	31	16	14	3	2	2	1	112	7	8
	6							3	2	5	3	37	28	66	52	90	87	62	74	41	44	16	14	9	8	329	26	6
	4	12	9	3	2	7	5	10	9	38	29	76	79	66	95	19	99	34	97	48	78	47	49	16	19	376	48	4
	2	29	29	13	12	10	11	35	32	61	69	30	99	7	99	1	100	4	100	17	91	39	77	34	43	280	64	2
	0	37	55	38	39	37	35	45	62	30	89	2	100	1	100					7	96	23	94	30	65	250	78	0
	-2	31	76	35	64	29	54	33	84	7	94									2	97	3	96	26	83	166	87	-2
	-4	26	94	25	82	37	78	17	95	4	97									3	99	5	100	16	94	133	95	-4
	-6	5	97	12	91	17	90	2	97	4	99									1	100			6	99	47	98	-6
	-8	3	99	5	94	11	97	2	98	1	100													1	99	23	99	-8
	-10	1	100	7	99	4	99	1	99															1	100	14	100	-10
	-12			1	100			2	100																	3	100	-12
	-14					1	100																			1	100	-14
18,000	-6													1	1	16	11	13	9	4	3					34	2	-6
	-8											4	3	24	16	40	39	39	37	27	24	1	1			135	10	-8
	-10					2	1	3	2	7	5	57	42	54	52	58	80	47	70	26	43	11	9	6	4	271	26	-10
	-12	8	6	2	2	2	3	14	12	49	38	61	84	60	91	27	99	37	96	38	72	43	43	12	13	353	47	-12
	-14	21	20	13	11	12	12	28	32	47	71	21	99	12	99	1	100	6	100	23	89	32	67	22	29	238	61	-14
	-16	29	41	38	39	29	33	37	57	32	93	2	100	2	100					9	96	25	87	44	61	247	76	-16
	-18	41	70	24	56	28	53	25	75	3	95									2	98	13	97	26	80	162	85	-18
	-20	18	82	32	80	28	73	24	92	3	97									2	99	4	100	14	91	125	93	-20
	-22	19	96	7	85	19	87	8	97	4	99									1	100			7	96	65	97	-22
	-24	5	99	11	93	8	93	2	99															5	99	31	99	-24
	-26			5	96	6	97			1	100													1	100	13	99	-26
	-28	1	100	3	99	3	99																			7	100	-28
	-30			2	100			2	100																	4	100	-30
	-34					1	100																			1	100	-34
30,000	-32															2	1	3	2	2	2					7		-32
	-34											2	1	12	8	21	16	27	22	14	12					76	5	-34
	-36					2	2	1	1	5	4	18	14	30	29	60	59	41	51	24	31	3	2			184	16	-36
	-38	1	1			3	4	6	5	13	13	58	56	56	67	45	90	43	83	37	60	12	12	11	8	285	34	-38
	-40	11	9	5	4	6	8	22	21	41	44	48	90	39	93	14	100	17	95	26	80	35	40	16	20	280	51	-40
	-42	25	27	19	18	12	17	18	34	41	75	10	97	8	99			7	100	18	94	40	73	29	41	227	65	-42
	-44	25	45	26	37	27	37	32	57	23	92	3	99	2	100					7	99	19	88	28	61	192	77	-44
	-46	43	76	32	61	32	61	28	78	10	99	1	100							1	100	12	98	26	80	185	88	-46
	-48	19	90	29	83	25	79	20	92	1	100											3	100	12	89	109	94	-48
	-50	10	97	17	96	22	96	10	99															14	99	73	99	-50
	-52	4	100	3	98	5	99	1	100																	13	100	-52
	-54			2	99	1	100																	1	100	4	100	-54
	-56			1	100																					1	100	-56
38,500	-46	2	2			1	1	2	2																	5		-46
	-48	2	3	6	5	3	3							2	1					1	1	1	1	3	2	18	2	-48
	-50	6	8	5	9	4	7			4	3					2	1			2	3			2	4	25	3	-50
	-52	8	14	4	12	5	11	5	5	1	4	1	1	7	6	10	9	1	1			3	3	4	7	49	6	-52
	-54	6	19	10	20	6	15	1	6	3	6			10	13	23	25	10	8	7	8	2	5	10	14	88	12	-54
	-56	9	26	15	32	11	24	6	11	3	9	7	6	37	39	51	62	33	32	30	33	9	12	11	23	222	26	-56
	-58	10	34	19	47	13	35	4	14	18	23	37	33	47	72	46	95	56	74	38	64	17	26	15	34	320	47	-58
	-60	15	46	11	56	8	41	25	33	28	45	68	84	35	97	6	99	25	92	26	85	40	60	19	49	306	66	-60
	-62	24	66	15	68	19	57	33	59	50	84	21	99	5	100	1	100	10	99	14	97	25	80	31	72	248	82	-62
	-64	18	80	18	82	25	77	33	84	18	98	1	100					1	100	4	100	17	94	26	92	161	92	-64
	-66	17	94	15	94	19	92	16	96	3	100											5	98	9	99	84	98	-66
	-68	6	98	7	100	8	98	4	99													2	100	2	100	29	100	-68
	-70	2	100			2	100	1	100																	5	100	-70
53,000	-56			1	1	4	4	1	1																	6	1	-56
	-58	4	4	4	6	7	12	1	2	7	7	3	3	2	2			1	1					1	1	30	3	-58
	-60	6	10	15	22	14	28	12	14	7	14	15	15											6	7	75	9	-60
	-62	3	13	12	36	19	49	21	34	23	36	26	37	23	19	8	7	2	3	4	4	2	2	14	21	157	22	-62
	-64	21	34	16	53	15	66	25	58	28	63	30	62	49	57	18	23	15	16	5	10	10	14	13	34	245	41	-64
	-66	24	57	12	67	14	81	24	82	23	85	31	88	35	84	34	52	25	38	12	22	13	29	23	58	270	63	-66
	-68	20	77	15	83	10	92	12	93	11	95	10	96	16	96	36	84	35	68	18	41	23	56	16	74	222	81	-68
	-70	10	87	11	96	5	98	6	99	4	99	3	98	5	100	18	99	26	91	15	57	11	69	13	87	127	91	-70
	-72	6	93	3	99	2	100	1	100	1	100	2	100			1	100	7	97	16	74	18	90	8	95	65	96	-72
	-74	5	98	1	100													3	100	14	88	3	93	5	100	31	99	-74
	-76	2	100																	8	97	4	98			14	100	-76
	-78																			3	100	1	99			4	100	-78
	-82																					1	100			1	100	-82
67,500	-50									1	1															1		-50
	-52							1	2							1	1									2		-52
	-54			1	3			4	10	4	7	3	4	2	2	2	3					1	2	3	3	20	3	-54
	-56					3	7	4	18	16	28	23	31	31	36	32	39	8	9	3	5	2	6			122	18	-56
	-58	7	15	4	13	4	17	15	47	35	75	40	78	47	86	43	87	39	54	15	28	6	16	4	12	259	51	-58
	-60	6	27	6	29	14	50	15	77	16	96	17	98	11	98	11	99	31	90	16	53	14	42	8	25	165	72	-60
	-62	12	52	6	45	7	67	10	96	2	99	2	100	2	100	1	100	8	99	19	83	12	64	19	58	100	85	-62
	-64	10	73	12	76	9	88	2	100	1	100									10	98	8	78	11	76	63	93	-64
	-66	5	89	8	97	2	93											1	100	1	100	6	89	9	92	32	97	-66
	-68	6	96			2	98															6	100	3	97	17	99	-68
	-70	2	100	1	100	1	100																	2	100	6	100	-70

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(d) Ocean station vessel Echo - Concluded																												
78,500	-40																							1	3	1		-40
	-46	1	3							1	2															2	1	-46
	-48	2	10	1	5							2	3	1	2	1	1									7	2	-48
	-50	3	20			1	5	2	8	2	7	12	21	9	16	10	16							1	6	40	10	-50
	-52	1	23	1	11			10	48	22	54	34	73	35	73	32	61	15	28	6	15	1	4	3	15	160	43	-52
	-54	2	30			2	14	6	72	17	91	16	97	16	98	27	100	24	72	7	33	2	11			119	67	-54
	-56	5	47	3	26	7	46	6	96	3	98	2	100					13	96	16	74	6	33	7	36	68	81	-56
	-58	8	73			7	77	1	100	1	100			1	100			1	98	9	97	8	63	7	58	43	89	-58
	-60	3	83	9	74	5	100											1	100	1	100	8	93	4	70	31	96	-60
	-62	4	97	5	100																	2	100	6	88	17	99	-62
	-64	1	100																					3	97	4	100	-64
	-66																							1	100	1	100	-66
87,000	-40							1	10																	1	1	-40
	-42	1	11																							1	1	-42
	-44																							1	11	1	2	-44
	-46	1	22							1	8	8	22	3	12	4	11									17	10	-46
	-48	1	33					1	20	5	50	17	68	8	42	14	50	2	11			1	11	2	33	51	36	-48
	-50	1	44	1	14	3	21	4	60	2	67	7	87	11	85	12	83	7	47	3	38					51	62	-50
	-52					1	29	2	80	3	92	4	97	3	96	6	100	7	84	2	63	1	22	1	44	30	78	-52
	-54	1	56	1	29	6	71			1	100	1	100	1	100			2	95	2	88	1	33	1	56	17	86	-54
	-56	2	78	3	71	1	79	2	100									1	100	1	100	6	100	1	67	17	95	-56
	-58			1	86	1	86																	3	100	5	97	-58
	-60	2	100	1	100	1	93																			4	100	-60
	-62					1	100																			1	100	-62
102,000	-44											1	33													1	11	-44
	-46									1	100	2	100			1	100									4	56	-46
	-52					1	100											1	50							2	78	-52
	-54																	1	100							1	89	-54
	-56	1	100																							1	100	-56
(e) Ocean station vessel Victor																												
5,000	20											2	1	1	1	1	1	2	2							6		20
	18									1	1	13	10	15	10	22	15	27	24	20	13	3	2	1	1	102	6	18
	16					1	1	1	1	12	9	44	40	87	67	85	70	45	61	49	45	17	14	3	3	344	26	16
	14	4	3			6	5	7	5	48	41	43	69	46	97	44	98	39	93	45	74	32	35	12	11	326	44	14
	12	5	6	10	7	10	12	31	27	39	67	24	85	3	99	3	100			20	87	24	51	17	22	186	55	12
	10	16	17	19	21	28	31	37	52	32	88	16	95	2	100			8	100	17	97	20	65	22	36	217	67	10
	8	24	33	14	31	26	48	18	64	7	93	4	98							3	99	19	78	25	52	140	75	8
	6	23	49	12	39	21	63	21	78	7	97	3	100							1	100	17	89	23	67	128	82	6
	4	26	66	21	54	18	75	15	88	2	99											11	97	28	86	121	89	4
	2	24	82	34	79	18	87	7	93													5	100	15	95	103	95	2
	0	19	95	19	92	11	95	6	97	2	100													7	100	64	98	0
	-2	7	100	10	99	8	100	4	100																	29	100	-2
	-4			1	100																					1	100	-4
10,000	12									3	2	4	3	2	1	1	1	7	6	7	5					24	1	12
	10									6	6	26	20	19	14	58	25	43	42	21	18	7	5	2	1	162	11	10
	8					1	1	4	3	38	31	56	57	78	64	82	78	54	87	72	65	31	26	3	3	419	34	8
	6	7	5	3	2	3	3	29	22	36	55	45	87	51	97	53	99	13	98	39	90	41	53	21	17	321	52	6
	4	14	14	8	8	35	26	30	42	46	85	11	95	4	100	1	100	2	99	12	97	31	74	31	38	225	65	4
	2	24	31	29	28	39	53	33	64	15	95									3	99	16	85	25	55	184	76	2
	0	30	51	26	47	30	73	27	82	5	99	8	100					1	100			13	94	21	69	161	85	0
	-2	17	63	20	61	20	87	15	92	2	100											5	97	15	79	94	90	-2
	-4	14	72	18	73	6	91	7	97											1	100	2	99	15	89	63	93	-4
	-6	20	86	16	85	7	95	2	98													2	100	11	97	58	97	-6
	-8	13	95	11	92	5	99	3	100															4	99	34	99	-8
	-10	4	97	9	99	2	100																	1	100	16	100	-10
	-12	2	99	2	100																					4	100	-12
	-14	2	100																							2	100	-14
18,000	-2									1	1													1	1	2		-2
	-4									3	3	11	8	4	3	7	5	13	11	7	5	2	1			47	3	-4
	-6	1	1					1	1	15	13	47	40	48	34	52	39	53	56	30	25	9	8	6	5	262	18	-6
	-8	4	4	1	1	1	1	13	10	50	48	50	74	66	78	57	77	43	93	64	67	45	38	12	13	406	41	-8
	-10	3	6	7	6	4	4	25	26	34	71	27	93	26	95	33	99	5	97	43	96	32	60	22	27	261	56	-10
	-12	16	17	15	16	19	17	44	56	32	93	8	98	8	100	2	100	2	99	4	99	21	74	29	47	200	68	-12
	-14	35	41	32	39	43	47	38	82	8	99	2	99							1	99	21	88	25	63	205	80	-14
	-16	19	55	21	54	47	79	13	91	2	100	1	100					1	100			9	95	20	77	133	87	-16
	-18	19	68	27	73	20	93	7	95											1	100	3	97	13	85	90	93	-18
	-20	22	83	11	80	5	97	2	97													4	99	10	92	54	96	-20
	-22	12	92	9	87	4	99	3	99													1	100	8	97	37	98	-22
	-24	6	96	9	93	1	100	2	100															4	100	22	99	-24
	-26	3	98	6	97																					9	100	-26
	-28			3	99																					3	100	-28
	-30	1	99	1	100																					2	100	-30
	-32	1	99																							1	100	-32
	-34	1	100																							1	100	-34

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(e) Ocean station vessel Victor - Concluded																												
30,000	-26																							1	1	1		-26
	-28			1	1											1	1							1	1	3		-28
	-30	6	4	4	4							12	8	4	3	8	6	2	2	6	4	1	1	6	6	49	3	-30
	-32	16	16	14	14					14	10	50	43	42	31	30	27	20	20	19	17	14	11	8	11	227	17	-32
	-34	17	29	11	21	3	2	5	4	36	35	41	72	62	74	58	67	48	62	40	44	35	35	26	29	382	39	-34
	-36	18	42	13	31	5	6	19	17	36	60	25	90	24	90	34	90	34	92	43	73	40	63	26	47	317	58	-36
	-38	22	58	11	38	13	15	29	37	41	89	9	96	12	98	9	97	7	98	34	96	20	77	23	63	230	72	-38
	-40	14	68	22	54	22	30	36	62	9	95	4	99	2	99	5	100	2	100	3	98	16	88	23	79	158	81	-40
	-42	12	77	20	68	32	53	32	84	5	99	2	100	1	100					2	99	10	95	8	85	124	88	-42
	-44	15	88	13	77	38	80	13	93	2	100									1	100	3	97	7	90	92	94	-44
	-46	7	93	15	88	23	96	7	98													2	99	7	94	61	97	-46
	-48	4	96	7	93	6	100	3	100													1	99	8	100	29	99	-48
	-50	4	99	6	97																	1	100			11	100	-50
	-52			3	99																					3	100	-52
	-54	2	100																							2	100	-54
	-56			1	100																					1	100	-56
38,500	-44	3	2	2	2			1	1															1	1	7		-44
	-46	4	5	1	2			1	1															4	4	10	1	-46
	-48	8	11	8	8	6	4					1	1							1	1	3	2	6	8	33	3	-48
	-50	20	27	10	15	7	10	1	2									2	2	1	1	1	3	14	19	56	6	-50
	-52	42	58	41	46	15	21	11	10			4	4	4	3	5	4	9	10	11	9	12	11	29	40	183	18	-52
	-54	20	74	29	67	20	36	9	17	8	6	29	25	31	24	31	25	17	25	28	28	43	42	41	71	306	36	-54
	-56	17	86	21	82	18	49	13	26	22	21	65	72	66	69	64	70	49	68	48	61	46	75	22	87	451	64	-56
	-58	9	93	16	94	19	63	22	42	49	56	27	91	36	93	32	92	34	97	42	90	17	87	9	94	312	83	-58
	-60	3	96	4	97	14	73	22	58	37	83	9	98	9	99	11	100	3	100	11	97	12	95	5	98	140	91	-60
	-62	6	100	2	99	10	81	37	84	16	94	3	100	1	100					3	99	7	100	1	99	86	96	-62
	-64			2	100	18	94	16	96	8	100									1	100			2	100	47	99	-64
	-66					7	99	5	99																	12	100	-66
	-68					1	100	1	100																	2	100	-68
53,000	-54	2	2																							2		-54
	-56	2	4																							2		-56
	-58	1	4	1	1	1	1																			3	1	-58
	-60	2	6	2	3	2	3	2	2			1	1													9	1	-60
	-62	6	12	6	8	10	11	7	8			1	2	4	3	2	2					1	1	5	4	42	4	-62
	-64	4	15	16	21	14	22	11	17	4	3	1	2	19	17	15	13	2	2			5	5	5	9	96	11	-64
	-66	16	29	18	37	23	41	27	40	8	10	9	10	26	37	29	36	5	7	2	2	9	13	15	22	187	24	-66
	-68	14	42	13	48	21	58	20	56	33	36	20	26	44	69	30	59	5	12	7	7	7	19	7	28	221	39	-68
	-70	9	50	13	59	24	78	23	76	30	60	10	34	21	85	25	78	16	27	5	11	11	28	15	41	202	53	-70
	-72	18	66	17	74	19	93	15	88	19	75	35	63	17	98	14	89	34	60	12	20	16	42	14	54	230	69	-72
	-74	24	87	20	91	7	99	11	98	19	90	28	85	3	100	11	98	15	75	30	43	18	57	27	77	213	83	-74
	-76	9	95	9	98	1	100	2	99	12	99	12	95			1	98	17	91	34	69	22	75	16	91	135	93	-76
	-78	4	98	2	100			1	100	1	100	4	98			2	100	6	97	32	94	18	91	6	97	76	98	-78
	-80	1	99									2	100					2	99	6	99	11	100	3	99	25	100	-80
	-82	1	100															1	100	2	100			1	100	5	100	-82
67,500	-52	1	1					1	1	1	1															3		-52
	-54	1	2	3	3			1	2	3	4	2	2	4	3	4	4	1	1							19	2	-54
	-56	4	7	5	9	4	4	3	7	8	10	14	15	25	25	18	19	6	8	2	2	2	2	3	4	96	10	-56
	-58	10	19	9	20	14	20	17	26	33	39	49	63	56	72	47	61	27	37	9	10	1	3	7	13	279	33	-58
	-60	15	37	20	43	18	40	28	55	46	79	30	91	31	98	40	96	41	82	24	31	21	24	8	23	322	60	-60
	-62	15	55	9	53	36	79	26	83	22	98	8	99	2	100	4	99	15	99	40	67	26	49	19	46	222	79	-62
	-64	14	72	29	86	5	85	12	96	2	100	1	100			1	100	1	100	23	88	24	73	23	75	135	90	-64
	-66	13	88	9	97	10	96	3	99											10	96	22	94	12	90	79	97	-66
	-68	9	99	2	99	3	99	1	100											4	100	6	100	6	98	31	100	-68
	-70	1	100	1	100	1	100																	2	100	5	100	-70
78,500	-46									1	1			1	1	1	1							1	2	4	1	-46
	-48	2	4					1	1	4	6	3	4	4	6	4	5	1	1	1	1	1	1	1	4	22	3	-48
	-50	2	8			2	3	6	10	12	19	10	18	20	28	8	13	8	13	5	8	1	3	4	11	78	12	-50
	-52	5	17	8	15	4	9	10	24	34	57	31	62	36	67	36	51	17	38	13	25	3	7	3	16	200	35	-52
	-54	8	32	10	33	18	35	23	56	26	86	22	93	26	96	44	96	31	83	17	47	18	39	11	36	254	64	-54
	-56	11	53	14	58	19	63	24	89	12	99	4	99	4	100	4	100	11	99	23	77	9	46	19	71	154	82	-56
	-58	11	74	13	82	16	87	8	100	1	100	1	100					1	100	14	95	22	77	8	86	95	93	-58
	-60	7	87	2	86	9	100													4	100	10	91	4	93	36	97	-60
	-62	4	94	4	93																	5	99	2	96	15	99	-62
	-64	3	100	4	100																	1	100	2	100	10	100	-64
87,000	-42																							1	4	1		-42
	-44							1	6	1	4			2	6	1	2	1	4	1	4			2	13	9	4	-44
	-46	1	5	2	13			2	17	3	17	3	14	9	33	4	12	1	8					1	17	26	13	-46
	-48	1	11	3	31	1	5	2	28	13	74	10	59	11	67	16	51	5	28	2	12			5	38	69	37	-48
	-50	3	26	3	50	3	18	5	56	4	91	5	82	9	94	15	88	10	68	4	28	2	11	4	54	67	60	-50
	-52	6	58	2	63	8	55	6	89	1	96	3	96	1	97	3	95	7	96	11	72	7	47	3	67	58	80	-52
	-54	4	79	3	81	4	73	2	100			1	100	1	100	2	100			6	96	4	68	6	92	33	92	-54
	-56	2	90			6	100			1	100									1	100	4	90			14	97	-56
	-58	1	95	2	94													1	100			2	100	2	100	8	99	-58
	-60	1	100	1	100																					2	100	-60
102,000	-44											1	50	2	100			2	100							5	29	-44
	-46					1	50			1	100									1	50			1	33	4	53	-46
	-48	1	100									1	100			1	100			1	100			1	67	5	82	-48
	-50					1	100	1	100															1	100	3	100	-50

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

(f) International Falls, Minn.

Alt., ft	t, °C	Jan. f	Jan. cpd %	Feb. f	Feb. cpd %	March f	March cpd %	April f	April cpd %	May f	May cpd %	June f	June cpd %	July f	July cpd %	Aug. f	Aug. cpd %	Sept. f	Sept. cpd %	Oct. f	Oct. cpd %	Nov. f	Nov. cpd %	Dec. f	Dec. cpd %	Total f	Total cpd %	t, °C
5,000	22															2	1	2	1							4		22
	20							1	1			1	1	6	4	9	7	4	4	1	1					22	2	20
	18							3	3	2	1	6	5	21	18	5	10	1	5	2	2					40	4	18
	16									7	6	17	16	17	29	15	20	9	11	2	3					67	7	16
	14									9	12	16	27	25	45	25	36	8	15	7	8					88	12	14
	12							5	6	12	20	21	41	35	68	22	50	8	21	5	11	1	1			109	18	12
	10	1	1					7	11	15	30	28	60	25	85	33	72	14	30	9	17	2	2			134	26	10
	8							6	15	10	36	23	75	8	90	28	90	14	40	13	25	1	3	1	1	104	32	8
	6					3	2	7	19	16	47	16	86	7	95	13	98	20	54	21	39	9	9			112	38	6
	4			4	3			13	28	23	62	8	91	6	99	3	100	21	68	10	46	5	13	1	1	94	43	4
	2	1	1	7	8	5	5	14	37	12	70	9	97					13	77	14	55	9	19	5	5	89	48	2
	0	2	3	5	12	3	7	13	46	13	79	2	99					17	89	9	60	8	25	7	9	79	53	0
	-2	5	6	4	15	4	10	14	55	16	89	1	99					10	96	14	70	12	34	8	14	88	58	-2
	-4	9	12	6	19	14	19	15	65	7	94	1	100	2	100			3	98	15	79	12	42	10	21	94	63	-4
	-6	12	20	7	24	7	23	22	80	4	97							3	100	10	86	13	51	18	33	96	68	-6
	-8	16	30	19	39	17	34	11	87	1	97									11	93	17	64	15	42	107	74	-8
	-10	12	38	14	49	23	49	2	89	2	99									4	96	11	71	20	55	88	79	-10
	-12	17	49	17	62	21	63	8	94	2	100									4	98	15	82	20	68	104	85	-12
	-14	22	63	18	75	16	73	4	97											2	99	7	87	12	76	81	89	-14
	-16	13	72	9	82	10	80	3	99											1	100	7	92	9	82	52	92	-16
	-18	6	76	6	86	12	88															4	95	4	84	32	94	-18
	-20	11	83	6	90	9	94															3	97	7	89	36	96	-20
	-22	9	89	3	93	6	97															3	99	6	93	27	98	-22
	-24	7	94	5	96	2	99	2	100													1	100	5	96	22	99	-24
	-26	5	97	3	99																			3	98	11	99	-26
	-28	3	99			2	100																	2	99	7	100	-28
	-30	1	99	1	99																			1	100	3	100	-30
	-32			1	100																					1	100	-32
	-36	1	100																							1	100	-36
10,000	14															1	1									1		14
	12													4	3	1	1									5		12
	10											3	2	6	7	5	5	4	3							18	1	10
	8											3	4	25	23	13	13	6	7	2	1					49	4	8
	6									2	1	17	16	34	45	28	31	8	13	2	3					91	9	6
	4							3	2	6	5	28	35	30	65	32	52	12	21	5	6					116	14	4
	2									13	14	21	49	19	78	28	70	11	29	17	17	2	1			111	22	2
	0							11	9	27	32	21	63	13	86	25	86	23	45	22	31	3	4	1	1	146	30	0
	-2	1	1	2	1			12	17	20	45	25	80	8	91	15	96	21	59	17	42	5	7	2	2	128	37	-2
	-4	1	1	3	4	5	3	20	31	20	58	20	94	10	98	5	99	21	74	16	55	12	15	6	6	139	45	-4
	-6	3	3	8	9	9	9	22	46	19	71	6	98	3	100	1	100	13	83	12	60	13	25	10	12	119	52	-6
	-8	6	7	8	15	7	14	8	51	14	80	2	99					10	90	14	70	16	36	12	20	97	57	-8
	-10	14	16	12	24	13	22	18	63	10	87	1	100					11	98	17	81	13	45	15	30	124	64	-10
	-12	16	27	9	30	13	30	17	75	12	95							1	99	7	85	21	59	15	40	111	70	-12
	-14	17	38	19	44	17	41	7	79	3	97							2	100	8	90	18	72	22	54	113	76	-14
	-16	22	52	19	58	28	59	13	88	4	99									5	94	11	80	13	63	115	83	-16
	-18	18	64	22	73	18	71	12	96	1	100									6	97	10	87	16	73	103	89	-18
	-20	18	76	10	81	19	83	3	98											3	99	7	92	9	79	69	92	-20
	-22	11	83	10	88	4	86															4	94	12	87	41	95	-22
	-24	12	91	8	94	9	92	1	99											1	100	3	97	5	90	39	97	-24
	-26	5	94	5	97	6	96	1	99													2	98	11	97	30	98	-26
	-28	7	99	3	99	4	98															1	99	1	98	16	99	-28
	-30	1	99	1	100	3	100	1	100													1	99			7	100	-30
	-32																					1	100	2	99	3	100	-32
	-34	1	100																					1	100	2	100	-34
18,000	-4													1	1											1		-4
	-6													7	5	3	2									10	1	-6
	-8											6	4	11	13	8	7									25	2	-8
	-10									1	1	12	12	35	37	26	25	8	6							82	7	-10
	-12									5	4	27	31	42	65	37	50	17	18	3	2					131	14	-12
	-14							2	1	15	14	30	52	21	79	29	69	16	29	11	9					124	21	-14
	-16							8	7	24	30	25	69	12	87	26	87	32	51	24	25	4	3			155	30	-16
	-18					1	1	14	16	27	48	21	83	10	94	13	95	24	68	24	41	9	9	5	3	148	38	-18
	-20	1	1	5	4	3	3	16	27	15	58	14	93	5	97	6	99	22	84	28	60	11	17	3	5	129	46	-20
	-22	3	3	10	11	6	7	28	45	17	70	7	98	4	100	1	100	9	90	18	72	20	31	12	13	135	53	-22
	-24	13	11	8	17	19	19	15	55	21	84	2	99					6	94	14	81	18	44	15	23	131	61	-24
	-26	14	21	13	26	23	34	20	69	11	91	1	100					6	99	4	84	18	57	19	36	129	68	-26
	-28	17	32	18	39	9	40	14	78	8	97							2	100	7	89	22	73	18	47	115	75	-28
	-30	23	47	22	55	29	59	11	85	5	100									7	93	10	80	22	62	129	82	-30
	-32	22	62	17	67	21	73	10	92											6	97	10	87	16	72	102	88	-32
	-34	19	75	21	83	18	85	5	95											2	99	10	94	18	84	93	93	-34
	-36	18	87	10	90	7	90	3	97											1	99	1	95	6	88	46	96	-36
	-38	9	93	6	94	4	92	2	99											1	100	2	96	7	93	31	97	-38
	-40	7	97	4	97	7	97	2	100													2	98	6	97	28	99	-40
	-42	3	99	3	99	3	99															3	100	2	98	14	100	-42
	-44	1	100	1	100	2	100																	2	99	6	100	-44
	-48																							1	100	1	100	-48

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan. f	Jan. cpd %	Feb. f	Feb. cpd %	March f	March cpd %	April f	April cpd %	May f	May cpd %	June f	June cpd %	July f	July cpd %	Aug. f	Aug. cpd %	Sept. f	Sept. cpd %	Oct. f	Oct. cpd %	Nov. f	Nov. cpd %	Dec. f	Dec. cpd %	Total f	Total cpd %	t, °C
(f) International Falls, Minn. - Continued																												
30,000	-32													4	3			2	1							6		-32
	-34											5	4	13	12	13	9	2	3							33	2	-34
	-36											6	8	23	28	15	19	2	4							46	5	-36
	-38									1	1	17	20	29	48	18	32	7	9	1	1	1	1			74	9	-38
	-40			1	1			1	1	11	8	27	40	32	70	30	52	16	21	1	1	1	2			120	16	-40
	-42	1	1					2	2	12	16	26	58	23	86	34	76	21	36	17	13	1	2			137	24	-42
	-44	1	1	3	3			9	8	28	35	31	81	10	92	23	92	34	60	35	37	4	5	6	4	184	35	-44
	-46	3	4	2	5	3	2	17	20	30	55	9	87	6	97	10	99	29	81	31	58	16	17	1	5	157	44	-46
	-48	14	13	8	10	8	7	30	40	34	78	12	96	4	99	1	99	20	95	31	80	29	39	14	14	205	56	-48
	-50	18	26	20	25	32	28	27	58	13	87	5	99	1	100	1	100	4	98	13	88	26	59	22	29	182	67	-50
	-52	26	44	25	44	41	55	29	78	16	98							3	100	8	94	31	82	27	48	206	79	-52
	-54	36	70	31	67	38	80	15	88	3	100	1	100							5	97	14	93	42	76	185	89	-54
	-56	25	87	35	93	17	91	13	97											3	99	7	98	21	91	121	96	-56
	-58	15	98	6	98	9	97	1	97											1	100	2	99	9	97	43	99	-58
	-60	1	99	3	100	3	99	3	99													1	100	4	99	15	100	-60
	-62	2	100			1	100	1	100															1	100	5	100	-62
38,500	-40											1	1													1		-40
	-42							1	1							2	1					2	2	1	1	6		-42
	-44	3	2	4	3	1	1			5	4	4	4	2	1			5	4	1	1	1	2	1	2	27	2	-44
	-46	10	10	8	9	7	6	1	2	6	8	5	7	4	4	2	3	5	7	4	4	2	4	7	7	61	6	-46
	-48	20	26	11	18	11	13	15	12	11	15	9	14	9	10	9	9	9	14	7	9	6	9	12	15	129	14	-48
	-50	21	42	17	31	28	35	13	22	13	24	11	22	18	23	18	22	15	25	14	18	18	23	13	25	199	26	-50
	-52	20	57	16	43	30	54	16	34	15	35	16	34	23	39	17	33	18	38	14	28	19	38	18	38	222	39	-52
	-54	15	69	17	56	11	62	16	45	13	44	10	42	33	62	41	62	24	55	23	44	17	51	22	54	242	54	-54
	-56	11	78	19	71	17	74	12	54	13	55	28	62	25	79	31	83	21	70	17	56	19	66	21	69	234	68	-56
	-58	13	88	10	79	11	82	10	61	14	63	19	76	20	93	12	92	20	85	19	70	13	76	13	79	174	79	-58
	-60	7	93	11	87	18	94	12	70	13	72	22	93	8	99	8	97	9	91	20	84	11	85	11	87	150	88	-60
	-62	3	95	5	91	3	97	16	82	24	88	8	99	2	100	4	100	10	99	8	89	7	91	7	92	97	94	-62
	-64	4	98	6	95	3	99	15	93	9	94	2	100					2	100	10	97	7	96	3	94	61	97	-64
	-66			4	99	2	99	8	99	6	99									4	99	3	98	8	100	34	99	-66
	-68	1	99	2	100	1	100	2	100	2	100									1	100	1	99			10	100	-68
	-70	1	100																			1	100			2	100	-70
53,000	-46									1	1									1	1			2	2	4		-46
	-48			3	3	1	1	4	4													1	1	5	6	14	1	-48
	-50	4	4	6	9	9	8	6	9	1	2							3	3	1	2	3	4	11	15	44	5	-50
	-52	20	25	13	22	24	28	14	21	11	11	13	11	5	4	6	5	9	10	4	5	11	14	14	26	144	15	-52
	-54	24	50	12	35	27	51	20	39	29	35	18	27	15	16	17	18	16	23	10	13	21	34	30	51	239	32	-54
	-56	28	68	22	57	25	72	24	60	23	55	21	45	23	33	23	37	27	46	20	29	23	56	20	68	269	51	-56
	-58	17	86	19	77	24	92	25	82	29	79	34	75	24	52	24	56	26	67	28	51	17	72	21	85	288	72	-58
	-60	13	99	15	92	6	97	16	97	18	94	15	88	29	74	26	76	21	84	28	74	13	85	11	94	211	87	-60
	-62			5	97	4	100	4	100	3	97	10	97	22	92	22	94	13	95	18	88	13	97	2	96	116	96	-62
	-64			2	99					4	100	3	99	11	100	7	99	5	99	11	97	3	100	3	98	49	99	-64
	-66	1	100	1	100							1	100			1	100	1	100	4	100			1	99	10	100	-66
	-72																							1	100	1	100	-72
67,500	-48			3	6					1	1	1	1	2	2									2	3	9	1	-48
	-50			2	10							1	3	5	7	9	10	3	4	1	1			4	8	25	4	-50
	-52	1	3	5	20			5	8	5	8	9	14	31	40	29	40	4	9	1	2	1	2	6	16	97	15	-52
	-54	2	8	8	36	17	22	18	34	27	44	33	56	32	74	30	72	16	30	5	8	1	4	13	33	202	38	-54
	-56	7	26	2	40	21	49	22	67	25	77	33	98	21	96	21	94	26	64	16	27	12	25	18	57	224	64	-56
	-58	14	62	6	52	23	79	13	87	11	92	2	100	4	100	6	100	22	92	25	57	23	65	14	75	163	83	-58
	-60	10	87	10	72	12	95	7	97	4	97							6	100	28	89	10	83	9	87	96	94	-60
	-62	4	97	8	88	4	100	2	100	2	100									9	100	8	97	7	96	44	99	-62
	-64			3	94																	2	100	2	99	7	99	-64
	-66	1	100	3	100																			1	100	5	100	-66
78,500	-44											2	4	1	2											3	1	-44
	-46									1	2	4	12	4	9	1	2									10	3	-46
	-48									1	5	6	25	21	45	18	31	2	4	1	3	1	5			50	16	-48
	-50							1	7	5	16	14	53	21	81	24	69	5	14	1	7			1	4	72	34	-50
	-52	1	6			2	11			13	47	19	92	11	100	15	94	19	52	6	27			3	17	89	57	-52
	-54	1	12	3	30	6	42	6	50	14	79	4	100			4	100	10	72					4	35	52	70	-54
	-56	4	35			4	63	3	71	6	93							12	96	6	47	2	16	6	61	43	81	-56
	-58	6	71	2	50	4	84	4	100	2	98							2	100	10	80	6	47	3	74	39	91	-58
	-60	5	100	1	60	2	95			1	100									6	100	4	68	4	91	23	97	-60
	-62			2	80	1	100															4	90			7	99	-62
	-64			2	100																	1	95	2	100	5	100	-64
	-66																					1	100			1	100	-66
87,000	-40											1	4													1	1	-40
	-42											1	8													1	1	-42
	-44									1	13	3	20	8	29	3	13									15	12	-44
	-46											5	40	9	61	5	33	1	5			1	20			21	27	-46
	-48									3	50	7	68	8	89	13	88	3	20	1	8					35	53	-48
	-50									1	63	5	88	2	96	2	96	9	65	3	33					22	68	-50
	-52									1	75	2	96	1	100	1	100	4	85					2	67	11	76	-52
	-54					2	67	3	75	1	88	1	100					3	100	2	50					12	85	-54
	-56									1	100									3	75	1	40			5	89	-56
	-58	3	60					1	100											2	92	1	60	1	100	8	94	-58
	-60	2	100	2	100															1	100	1	80			6	99	-60
	-62					1	100															1	100			2	100	-62

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan. f	Jan. cpd %	Feb. f	Feb. cpd %	March f	March cpd %	April f	April cpd %	May f	May cpd %	June f	June cpd %	July f	July cpd %	Aug. f	Aug. cpd %	Sept. f	Sept. cpd %	Oct. f	Oct. cpd %	Nov. f	Nov. cpd %	Dec. f	Dec. cpd %	Total f	Total cpd %	t, °C
(f) International Falls, Minn. - Concluded																												
102,000	-44													1	33											1	13	-44
	-46													1	67											1	25	-46
	-48																	2	100							2	50	-48
	-50									1	100			1	100									1	100	3	88	-50
	-56							1	100																	1	100	-56
(g) El Paso, Texas																												
5,000	36											1	1													1		36
	34									1	1	5	4	1	1											7		34
	32									1	1	17	15	8	6	7	5	1	1							34	2	32
	30									4	4	29	35	28	24	20	18	8	6							89	7	30
	28									11	11	40	62	42	51	36	41	30	26							159	16	28
	26							1	1	25	28	31	83	29	70	44	70	41	54	5	3					176	26	26
	24					1	1	8	6	30	47	14	92	20	83	23	84	34	77	24	19					154	34	24
	22							25	23	24	63	4	95	17	94	17	96	18	89	36	42					141	42	22
	20			2	2	6	5	31	44	15	73	5	98	6	97	5	99	9	95	26	59	4	3			109	48	20
	18			4	4	26	22	27	62	18	84			2	99	1	99	5	98	26	76	15	13	5	3	129	55	18
	16	18	12	15	15	29	41	19	75	6	88	3	100	2	100	1	100	3	100	19	88	27	31	11	10	153	64	16
	14	16	22	24	33	21	55	14	85	7	93									9	94	34	54	12	18	137	71	14
	12	32	43	18	46	13	63	17	96	5	96									4	97	14	63	22	33	125	78	12
	10	17	55	22	62	17	74	3	98	4	99									4	99	20	77	23	47	110	84	10
	8	18	66	13	72	14	84	1	99	1	99											11	84	17	58	75	89	8
	6	19	79	10	79	6	88	1	99											1	100	5	87	23	73	65	92	6
	4	11	86	9	85	9	93	1	100													12	95	19	86	61	96	4
	2	14	95	10	93	9	99			1	100											4	98	10	92	48	98	2
	0	6	99	5	96																	3	100	4	95	18	99	0
	-2	1	100	1	97																			3	97	5	99	-2
	-4			1	98	1	100																	3	99	5	100	-4
	-8			2	99																			2	100	4	100	-8
	-10			1	100																					1	100	-10
10,000	20											1	1													1		20
	18											6	5	4	3											10	1	18
	16									3	2	25	21	14	12	9	6	4	3							55	4	16
	14									6	6	42	49	47	42	36	29	18	15							149	12	14
	12									22	20	41	77	59	80	65	71	53	50	4	3					244	25	12
	10							4	3	25	36	25	93	22	94	38	96	53	86	32	23					199	36	10
	8	3	2	2	1	2	1	26	20	41	63	7	98	8	99	6	100	14	95	60	62	9	6	4	3	182	46	8
	6	9	8	3	4	14	10	41	47	18	74	2	99					7	100	37	86	30	26	14	12	175	56	6
	4	25	24	19	17	29	29	25	64	19	87	1	100	1	100					13	95	49	59	22	26	203	67	4
	2	38	49	33	41	34	51	26	81	9	92									5	98	25	75	24	41	194	78	2
	0	27	66	26	60	35	74	21	95	7	97									2	99	14	85	37	65	169	87	0
	-2	22	81	20	74	16	84	5	99	1	97									1	100	8	90	14	74	87	92	-2
	-4	13	89	11	82	9	90	1	99	3	99											10	97	20	87	67	95	-4
	-6	5	92	5	86	4	92	1	100													3	99	7	92	25	97	-6
	-8	2	94	9	92	4	95			1	100											1	99	4	94	21	98	-8
	-10	6	97	4	95	7	99															1	100	5	97	23	99	-10
	-12	3	99	6	99																			1	98	10	100	-12
	-14			1	100	1	100																	2	99	4	100	-14
	-16	1	100																					1	100	2	100	-16
18,000	-2											1	1													1		-2
	-4											3	3	5	3	3	2	4	3							15	1	-4
	-6									1	1	22	18	50	37	55	38	29	22	6	4					163	10	-6
	-8									8	6	45	48	78	89	74	86	65	67	22	18	1	1	2	1	295	26	-8
	-10	5	3			1	1	1	1	23	21	55	85	17	100	20	99	33	89	44	47	21	15	6	5	226	39	-10
	-12	17	15	3	2	10	7	17	12	31	41	15	95			1	100	13	98	48	78	39	41	25	21	219	51	-12
	-14	27	33	20	17	18	19	48	45	51	74	7	100					5	100	29	97	44	71	24	37	271	66	-14
	-16	36	56	28	37	41	47	41	72	21	88									2	98	25	87	29	56	223	79	-16
	-18	23	72	37	64	42	75	25	89	13	96									3	100	5	91	26	73	174	88	-18
	-20	18	83	20	79	20	88	10	96	3	98											6	95	21	86	98	94	-20
	-22	12	91	9	85	10	95	5	99	1	99											5	98	13	95	55	97	-22
	-24	5	95	9	92	3	97	1	100													2	99	3	97	23	98	-24
	-26	2	96	7	97	2	98			1	99													2	98	14	99	-26
	-28	3	98	3	99	3	100			1	100													1	99	11	100	-28
	-30	2	99																			1	100	1	99	4	100	-30
	-32			1	100																			1	100	2	100	-32
	-36	1	100																							1	100	-36
30,000	-30	1	1											6	4	11	8	3	2							21	1	-30
	-32											8	6	74	54	59	48	27	21	3	2					171	11	-32
	-34	2	2					1	1			36	32	50	88	60	89	50	56	14	11					213	23	-34
	-36	4	5			4	3			2	1	35	57	16	99	15	99	44	87	19	24	10	7	3	2	152	32	-36
	-38	11	12	1	1	5	6	3	3	27	19	33	81	2	100	1	100	12	95	32	45	19	20	13	11	159	41	-38
	-40	17	24	6	5	19	19	15	13	48	51	19	94					6	99	48	76	41	48	21	25	240	55	-40
	-42	30	45	22	22	31	41	42	43	47	82	8	100					1	100	28	95	37	74	29	44	275	71	-42
	-44	33	.67	30	44	35	65	51	78	19	94									6	99	28	93	36	68	238	84	-44
	-46	34	90	44	77	28	84	22	94	7	99									2	100	9	99	26	85	172	94	-46
	-48	14	100	20	92	21	99	4	97	2	100											1	100	14	94	76	99	-48
	-50			9	99	2	100	5	100															8	99	24	100	-50
	-52			2	100																			1	100	3	100	-52

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(g) El Paso, Texas - Concluded																												
38,500	-42									1	1															1		-42
	-46					1	1	1	1															1	1	3		-46
	-48	6	5	3	2	1	2	3	3	1	1													2	2	16	1	-48
	-50	8	10	12	12	8	8	6	8									2	1	1	1	1	1	4	5	42	4	-50
	-52	11	19	14	22	7	13	3	10	9	7	3	2	11	8	16	12	20	16	6	5	5	4	10	12	115	11	-52
	-54	14	29	13	32	11	22	5	13	7	12	21	17	66	54	69	61	66	64	26	22	15	15	17	23	330	30	-54
	-56	15	40	16	45	18	36	12	22	20	26	60	61	57	94	43	92	38	91	50	56	20	30	19	36	368	53	-56
	-58	14	51	16	57	11	44	19	37	42	54	43	92	9	100	11	100	9	98	33	78	42	60	26	54	275	69	-58
	-60	20	66	18	71	20	60	23	54	37	79	8	98					3	100	24	95	32	83	22	69	207	81	-60
	-62	25	84	14	82	22	77	32	78	25	95	2	99							8	100	14	94	29	88	171	92	-62
	-64	9	91	12	91	23	95	21	93	6	99	1	100									9	100	15	99	96	97	-64
	-66	10	99	10	99	5	98	9	100	1	100													2	100	37	100	-66
	-68	2	100	2	100	2	100																			6	100	-68
53,000	-56			2	2																					2		-56
	-58	1	1	3	5	1	1			2	2							1	1			2	2			10	1	-58
	-60	1	2	7	12	2	3	2	2	6	6													4	3	22	3	-60
	-62	6	8	12	24	8	12	12	13	16	18									1	1	2	3	11	12	68	7	-62
	-64	6	14	14	38	14	27	24	36	25	37	3	3	1	1					2	2	4	7	12	22	105	15	-64
	-66	13	27	18	55	20	48	29	63	27	58	12	12	1	2			1	2	7	8	20	23	19	38	167	27	-66
	-68	17	43	17	72	24	73	20	82	15	69	18	27	13	13	4	3	5	6	10	15	23	43	27	60	193	41	-68
	-70	31	74	10	82	15	89	14	95	24	87	24	47	22	32	35	33	24	25	37	44	20	59	22	78	278	61	-70
	-72	13	86	13	95	9	99	5	100	4	90	31	72	36	64	44	70	27	47	34	70	30	84	16	91	262	80	-72
	-74	9	95	4	99	1	100			9	97	26	93	24	84	30	95	44	83	21	86	10	93	5	95	183	93	-74
	-76	2	97	1	100					4	100	7	99	12	95	6	100	16	96	11	95	7	98	5	99	71	98	-76
	-78	3	100											5	99			5	100	7	100	2	100	1	100	23	100	-78
	-80											1	100	1	100											2	100	-80
67,500	-50													1	1											1		-50
	-54			1	2					1	1			1	2											3		-54
	-56			1	4	2	4	2	3	14	16	8	10	9	13	8	9	4	4	3	3	1	1	2	2	54	6	-56
	-58	1	3	4	12	9	23	5	10	22	40	39	59	35	55	43	55	34	39	17	20			4	7	213	29	-58
	-60	3	10	8	28	5	33	25	46	30	73	26	91	30	91	32	90	47	87	32	51	16	19	11	20	265	58	-60
	-62	2	15	8	44	9	52	18	71	19	94	7	100	7	99	9	100	12	99	26	77	25	46	20	44	162	75	-62
	-64	14	50	9	62	11	75	14	91	5	99			1	100			1	100	21	97	24	73	29	78	129	89	-64
	-66	10	75	10	82	4	83	5	99	1	100									3	100	22	97	16	97	71	96	-66
	-68	6	90	5	92	4	92	1	100													2	99	3	100	21	99	-68
	-70	1	93	1	94	2	96															1	100			5	99	-70
	-72	3	100	3	100	1	98																			7	100	-72
	-74					1	100																			1	100	-74
78,500	-46											1	3													1		-46
	-48									1	2			3	6											4	1	-48
	-50			1	7	1	6			6	14	7	22	10	25	7	15	5	7	1	1	1	2			39	9	-50
	-52			1	13			4	17	21	54	13	58	25	72	23	63	21	38	11	17	5	11			124	34	-52
	-54					6	39	8	50	16	85	14	97	10	91	16	96	35	88	23	50	9	27	7	19	144	64	-54
	-56	1	9	2	27	5	67	10	92	5	94	1	100	5	100	2	100	7	99	24	84	13	50	8	42	83	81	-56
	-58	1	18	6	67	6	100	2	100	3	100							1	100	10	99	17	80	6	58	52	92	-58
	-60	4	55	4	93															1	100	6	91	10	86	25	97	-60
	-62	5	100	1	100																	3	96	4	97	13	99	-62
	-64																					2	100	1	100	3	100	-64
87,000	-44									2	13	1	6			1	5									4	3	-44
	-46							1	13	2	25	4	31	2	18							1	8			10	9	-46
	-48							2	38	3	44	7	75	6	73	4	25	6	27	2	8					30	29	-48
	-50					1	17	1	50	5	75	4	100	2	91	10	75	10	73	5	28	1	15	1	11	40	55	-50
	-52					2	50	2	75	4	100			1	100	5	100	5	96	10	68	1	23	2	33	32	76	-52
	-54					2	83	2	100											7	96	5	62	2	56	18	88	-54
	-56	1	100	2	33	1	100											1	100			4	92	3	89	12	95	-56
	-58			2	67															1	100			1	100	4	98	-58
	-60			2	100																	1	100			3	100	-60
102,000	-44									1	100															1	20	-44
	-46											1	100													1	40	-46
	-48															1	100									1	60	-48
	-50																					1	100			1	80	-50
	-54																			1	100					1	100	-54

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(h) Itazuki (Fukuoka), Japan																												
5,000	22													2	1	6	4									8	1	22
	20													15	11	43	33	1	1							59	4	20
	18											5	4	69	56	63	75	22	16							159	13	18
	16							1	1	6	4	43	33	44	85	30	95	35	41	5	3					164	22	16
	14							3	3	21	18	36	58	14	94	6	99	39	68	9	9	1	1			129	29	14
	12			1	1			10	10	42	45	32	81	8	99	1	100	25	86	23	25	3	3			145	38	12
	10			1	2	3	2	17	21	38	70	19	94					14	96	26	42	9	9	1	1	128	45	10
	8			4	4	5	5	23	37	25	86	8	99	1	100			4	99	31	63	21	24	5	4	127	52	8
	6	2	1	8	10	11	13	30	57	14	95	1	100					1	99	28	81	32	46	12	12	139	60	6
	4	3	3	7	15	24	29	20	70	5	99							1	100	17	93	25	63	12	20	114	66	4
	2	8	9	15	27	22	44	15	80	2	100									7	97	20	77	15	30	104	72	2
	0	12	16	13	36	15	54	17	92											3	99	11	85	20	43	91	77	0
	-2	25	33	14	46	21	68	7	97											1	100	10	92	31	64	109	83	-2
	-4	18	45	15	57	17	79	5	100													7	97	17	75	79	88	-4
	-6	26	62	15	68	17	91															4	99	24	91	86	93	-6
	-8	23	77	19	82	9	97															1	100	8	96	60	96	-8
	-10	20	90	13	92	3	99																	6	100	42	98	-10
	-12	8	95	6	96	1	99																			15	99	-12
	-14	6	99	5	100	1	100																			12	100	-14
	-16	1	100																							1	100	-16
10,000	14													2	1	8	5	1	1							11	1	14
	12											2	1	11	9	38	31	10	8							61	4	12
	10									1	1	11	9	63	50	59	71	28	28	1	1					163	13	10
	8									5	4	40	37	55	86	37	95	43	58	7	5	1	1			188	24	8
	6					1	1	4	3	30	24	39	63	17	97	7	100	36	84	29	25	3	3			166	33	6
	4					2	2	16	14	40	50	26	81	5	100			19	97	21	38	13	12			142	41	4
	2			3	2	5	5	23	29	34	72	18	94					3	99	33	60	18	24	3	2	140	49	2
	0			9	9	15	15	28	48	17	84	6	98					1	100	29	80	20	38	6	6	131	57	0
	-2	5	3	15	20	24	31	23	64	17	95	3	100							24	95	33	61	20	19	164	66	-2
	-4	8	9	16	31	28	50	22	78	2	96									6	99	24	78	25	36	131	73	-4
	-6	22	23	8	37	21	64	12	87	5	99									1	100	15	88	29	55	113	80	-6
	-8	19	36	21	53	20	77	9	93	1	100											6	92	31	76	107	86	-8
	-10	25	52	19	66	11	84	6	97													4	95	15	86	80	90	-10
	-12	18	64	17	79	9	90	4	99													2	97	9	92	59	94	-12
	-14	23	80	13	88	7	95															4	99	5	95	52	96	-14
	-16	15	89	4	91	5	98	1	100													1	100	4	98	30	98	-16
	-18	9	95	7	96	3	100																	2	99	21	99	-18
	-20	3	97	2	98																			1	100	6	100	-20
	-22	4	100																							4	100	-22
	-24			1	99																					1	100	-24
	-26			2	100																					2	100	-26
18,000	0													2	1			1	1							3		0
	-2											2	1	10	8	17	12	9	7							38	2	-2
	-4									2	1	8	7	51	42	62	55	25	25	2	1					150	11	-4
	-6									4	4	34	31	45	72	45	86	34	49	4	4					166	20	-6
	-8							3	2	24	20	37	57	35	95	20	99	45	81	21	18	2	1			187	31	-8
	-10							9	8	28	39	30	78	8	100	1	100	19	94	20	32	7	6			122	38	-10
	-12			1	1	2	1	21	22	31	59	20	92					6	99	30	52	9	13	2	1	122	45	-12
	-14			5	4	20	15	30	43	26	77	11	100					2	100	21	66	21	27	4	4	140	53	-14
	-16	1	1	12	13	23	30	31	64	14	86									21	80	29	48	10	11	141	61	-16
	-18	9	7	13	23	25	47	21	78	13	95									22	95	26	66	29	30	158	70	-18
	-20	20	20	24	40	32	69	14	87	4	97									7	100	23	82	29	50	153	79	-20
	-22	35	43	24	58	21	83	9	93	4	100											17	94	28	69	138	87	-22
	-24	20	57	20	73	11	90	6	97													5	97	24	85	86	92	-24
	-26	30	77	19	87	8	95	4	100													3	99	14	94	78	96	-26
	-28	16	87	7	92	4	98															1	100	4	97	32	98	-28
	-30	14	97	7	97																			4	99	25	99	-30
	-32	2	98	2	99	3	100																	1	100	8	100	-32
	-34	1	99	1	99																					2	100	-34
	-36	1	99	1	100																					2	100	-36
	-38	1	100																							1	100	-38
30,000	-22																	1	1							1		-22
	-24											2	1	1	1	2	1									5		-24
	-26											1	2	11	8	11	9	5	4	1	1					29	2	-26
	-28											10	9	30	29	33	33	11	12							84	7	-28
	-30									7	5	24	27	47	61	40	62	28	33	3	3	4	3	2	1	155	16	-30
	-32	4	3	2	2			1	1	13	14	38	54	40	88	40	91	47	67	13	12	7	8	2	3	207	28	-32
	-34	3	5	2	3			7	5	17	26	27	73	14	98	11	99	26	86	25	29	15	19	6	7	153	37	-34
	-36	5	8	3	5	2	1	9	12	31	47	15	84	2	99	2	100	11	94	22	44	20	33	11	15	133	45	-36
	-38	8	14	5	9	4	4	22	27	28	66	14	94	1	100			7	99	24	61	19	47	11	22	143	54	-38
	-40	20	28	5	13	8	10	25	44	14	76	2	96					1	100	26	79	11	55	28	42	140	62	-40
	-42	14	38	21	29	28	29	31	65	16	87	3	98							20	92	25	73	31	63	189	73	-42
	-44	22	53	22	46	37	55	22	80	11	95	2	99							10	99	18	86	12	72	156	82	-44
	-46	18	66	33	71	29	75	15	90	6	99	1	100							1	100	11	94	25	89	139	90	-46
	-48	16	77	15	82	26	92	12	98	2	100											8	100	12	97	91	96	-48
	-50	21	92	16	94	7	97	3	100															4	100	51	99	-50
	-52	11	99	6	99	4	100																			21	100	-52
	-54	1	100	2	100																					3	100	-54

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(h) Itazuki (Fukuoka), Japan - Concluded																												
38,500	-42	1	1																							1		-42
	-44					1	1	1	1																	2		-44
	-46	6	6	4	3	3	3	3	3	1	1	3	2	2	1	6	4	6	5			1	1	1	1	36	3	-46
	-48	19	21	13	14	6	8	6	8	5	4	6	7	10	9	12	13	5	9	4	3	7	6	13	10	106	9	-48
	-50	24	41	22	33	9	15	12	17	11	12	9	14	29	29	35	38	11	17	11	11	10	14	19	25	202	22	-50
	-52	24	61	32	59	17	28	16	29	15	22	39	43	59	70	49	74	45	52	40	40	23	32	30	47	389	46	-52
	-54	20	77	23	78	14	39	14	39	30	43	32	67	31	92	28	94	41	84	39	69	46	69	34	72	352	69	-54
	-56	14	89	11	88	26	59	11	47	30	64	28	88	10	99	8	100	18	98	29	90	27	90	26	92	238	83	-56
	-58	3	91	5	92	14	69	16	59	25	81	11	96	1	100			3	100	8	96	9	97	6	96	101	90	-58
	-60	7	97	5	96	16	82	16	71	12	90	4	99							6	100	3	99	4	99	73	94	-60
	-62	1	98	2	98	11	90	24	90	12	98	1	100											1	100	52	98	-62
	-64	3	100	2	99	9	97	12	99	3	100											1	100			30	100	-64
	-66			1	100	3	99	2	100																	6	100	-66
	-68					1	100																			1	100	-68
53,000	-54	1	1			1	1																			2		-54
	-56	1	3			1	2	1	1													2	2			5	1	-56
	-58	4	8	2	3	2	5	2	3			1	1									1	3	1	1	13	2	-58
	-60	4	13	4	8	2	7	6	9	5	4	2	3							4	4	1	4	3	4	31	4	-60
	-62	11	27	11	23	17	27	18	27	6	9	3	6							3	7	4	8	9	14	82	11	-62
	-64	10	39	10	37	24	55	23	50	18	24	12	17							7	14	10	18	15	30	129	22	-64
	-66	17	61	12	53	15	72	19	68	26	46	17	33	8	7	7	6	3	3	26	40	18	36	17	48	185	38	-66
	-68	15	80	9	66	15	90	14	82	35	74	20	51	38	40	19	22	6	9	10	50	17	54	16	66	214	56	-68
	-70	9	91	12	82	7	98	13	95	17	88	32	81	28	64	31	48	27	37	22	72	14	68	15	82	227	75	-70
	-72	5	98	8	93	2	100	3	98	9	96	9	90	18	80	33	76	23	60	9	81	15	83	10	93	144	87	-72
	-74	1	99	4	99			2	100	5	100	10	99	15	93	21	93	25	86	15	96	8	91	3	96	109	96	-74
	-76	1	100	1	100							1	100	7	99	6	98	13	99	3	99	9	100	1	97	42	99	-76
	-78													1	100	2	100	1	100	1	100			1	98	6	100	-78
	-80																							2	100	2	100	-80
67,500	-48	1	2																							1		-48
	-50																	1	1							1		-50
	-52					1	2					2	2	1	1	1	1					1	1			6	1	-52
	-54	2	6			1	3	5	7	4	4	8	11	3	4	3	4	2	4	1	1	4	7	2	3	35	5	-54
	-56	9	25	1	3	8	16	8	17	17	21	23	36	17	21	22	24	15	21	9	12	9	19	16	25	154	21	-56
	-58	4	33	7	22	10	33	20	43	35	56	39	77	48	68	50	70	27	54	25	42	22	49	12	42	299	53	-58
	-60	12	57	6	39	12	53	25	76	24	80	20	99	29	97	25	94	25	83	34	82	17	72	17	66	246	79	-60
	-62	4	65	9	64	11	71	10	90	14	94	1	100	3	100	6	99	12	98	14	99	11	87	11	82	106	91	-62
	-64	14	94	4	75	11	89	6	97	4	98							2	100	1	100	5	93	8	93	55	96	-64
	-66	2	98	5	89	3	93	2	100	2	100					1	100					4	99	4	99	23	99	-66
	-68	1	100	3	97	4	100															1	100	1	100	10	100	-68
	-70			1	100																					1	100	-70
78,500	-44															1	1							2	4	3		-44
	-46	1	3					3	6	5	7	2	3	2	3	1	2							3	10	17	3	-46
	-48			1	4	3	7	2	9	9	19	10	16	9	14	10	12	5	7	2	3	6	10	8	27	65	11	-48
	-50	2	9	1	8	6	20	11	29	19	45	25	49	25	44	33	46	13	24	6	11	4	16	9	46	154	32	-50
	-52	5	25	4	24	13	48	21	67	31	87	27	85	36	89	34	81	31	65	25	43	20	48	13	73	260	67	-52
	-54	6	44	4	40	18	87	14	93	8	97	10	99	9	100	15	97	20	91	23	74	17	75	6	85	150	87	-54
	-56	10	75	9	76	5	98	3	98	1	99	1	100			1	98	7	100	15	93	10	91	4	94	66	96	-56
	-58	5	91	3	88	1	100	1	100							2	100			3	97	5	98			20	98	-58
	-60	2	97	1	92					1	100									2	100	1	100	2	98	9	100	-60
	-62	1	100																					1	100	2	100	-62
	-64			1	96																					1	100	-64
	-66			1	100																					1	100	-66
87,000	-38									1	3											1	2			2		-38
	-40									1	5	2	4											4	11	7	2	-40
	-42									3	13	4	11			3	5					1	4	5	24	16	5	-42
	-44			1	6	2	8	1	3	1	16	7	25	4	10	10	19	3	5	1	2	2	9	6	40	38	13	-44
	-46	1	5	1	13	4	23	5	19	14	93	17	57	19	55	19	48	11	22	6	11	6	22	14	76	117	36	-46
	-48	1	10	4	38	9	58	14	65	13	87	17	89	16	95	22	81	23	58	16	37	11	47	3	84	149	66	-48
	-50	5	35	4	63	9	92	9	94	4	97	5	98	3	100	10	96	17	84	21	71	10	69	3	92	100	86	-50
	-52	7	70	4	88	1	96	2	100			1	100			1	97	8	97	14	94	8	87	1	95	47	95	-52
	-54	5	95	1	94	1	100									1	99	2	100	4	100	4	96	1	97	19	99	-54
	-56			1	100					1	100					1	100					2	100			5	100	-56
	-58	1	100																					1	100	2	100	-58
102,000	-30									1	11															1	1	-30
	-32											1	10	1	8									1	20	3	4	-32
	-34																					1	17			1	5	-34
	-36	1	17			1	13					1	20					1	6							4	9	-36
	-38	1	33			1	25	1	13	2	33	1	30	2	25	2	20									10	18	-38
	-40											3	60	1	33	2	40	2	18	1	13			1	40	10	28	-40
	-42			3	50	1	38	2	38	1	44	2	80	4	67	1	50	3	35	1	25			2	80	20	47	-42
	-44					3	75	4	88	2	67	1	90	3	92	1	60	6	71			1	33			21	67	-44
	-46	2	67	2	83	1	88	1	100	2	89			1	100	2	80	3	88	3	63	2	67	1	100	20	86	-46
	-48	1	83							1	100	1	100			1	90	2	100	3	100					9	94	-48
	-50	1	100	1	100	1	100									1	100					2	100			6	100	-50

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(l) Wiesbaden, Germany																												
5,000	20													3	2											3		20
	18													3	4											3		18
	16									1	1			3	6	11	7									15	1	16
	14					1	1	1	1	5	4	6	4	9	12	10	14	9	6	1	1					42	4	14
	12							3	3	2	5	12	13	19	24	12	21	12	14	2	2					62	7	12
	10							6	7	14	14	21	28	24	40	25	38	19	27	10	9					119	14	10
	8	1	1	1	1			7	12	10	21	25	46	28	58	42	65	21	41	13	17	14	9	6	4	168	24	8
	6	1	1	2	2	5	5	5	16	24	36	30	68	39	84	25	81	19	54	27	35	6	13	11	11	194	35	6
	4	10	8	5	6	16	17	15	27	23	51	21	83	14	93	23	96	24	70	18	47	14	23	11	18	194	46	4
	2			9	13	17	30	19	41	24	67	14	94	8	98	6	100	25	87	18	59	26	40	15	28	181	56	2
	0	19	21	16	24	18	43	18	54	19	79	8	99	3	100			12	95	28	78	15	50	23	43	179	66	0
	-2	20	35	16	36	12	52	15	65	19	92							6	99	11	85	21	64	25	59	145	75	-2
	-4	20	49	24	54	20	67	30	87	9	97	1	100					2	100	13	94	20	78	25	75	164	84	-4
	-6	23	65	13	63	17	80	8	93	3	99									7	99	21	92	25	91	117	91	-6
	-8	24	81	21	79	13	90	8	99	1	100									1	99	7	97	12	99	87	96	-8
	-10	13	90	16	90	8	96	2	100											1	100	3	99			43	98	-10
	-12	8	96	8	96	5	100															2	100	2	100	25	99	-12
	-14	5	99	2	98																					7	100	-14
	-16			3	100																					3	100	-16
	-18	1	100																							1	100	-18
10,000	10													1	1											1		10
	8													2	2			1	1							3		8
	6											1	1	7	7	5	3	2	2							15	1	6
	4							1	1	1	1	8	7	11	14	22	18	12	10	2	1					57	4	4
	2					2	2			5	4	12	15	32	35	23	33	17	22	15	11			1	1	107	11	2
	0			1	1	1	2	4	4	9	10	36	41	37	59	30	52	38	47	26	29	9	6	4	3	195	22	0
	-2	4	3	2	2	3	5	8	10	15	20	24	59	28	78	35	75	20	61	25	45	21	20	8	8	193	33	-2
	-4	4	6	7	7	10	12	13	19	34	42	23	75	17	89	18	87	19	74	17	57	16	31	14	17	192	44	-4
	-6	22	21	15	18	11	21	21	35	32	62	14	86	12	97	15	97	11	81	15	67	19	44	26	34	213	56	-6
	-8	14	31	12	27	25	39	20	49	21	76	12	94	3	99	3	99	14	91	19	79	20	57	28	52	191	67	-8
	-10	20	44	14	38	27	60	28	70	11	83	6	99	2	100	2	100	9	97	17	91	20	71	20	65	176	77	-10
	-12	21	59	17	50	14	71	16	82	16	94	2	100					4	99	6	95	14	80	20	78	130	84	-12
	-14	23	75	24	68	14	81	13	91	5	97							1	100	3	97	12	88	14	87	109	91	-14
	-16	18	88	10	75	6	86	6	96	4	99									5	100	11	95	14	96	74	95	-16
	-18	13	97	16	87	5	89	5	99	1	100											4	98	2	97	46	97	-18
	-20	3	99	12	96	11	98	1	100													3	100	3	99	33	99	-20
	-22	1	99	5	99	3	100																	1	100	10	100	-22
	-26	1	100	1	100																					2	100	-26
18,000	-8											1	1			1	1	1	1							3		-8
	-10													3	2	6	5	2	2							11	1	-10
	-12											5	5	21	16	11	12	16	13	1	1					54	4	-12
	-14									2	1	16	17	45	46	44	41	26	30	13	9					146	12	-14
	-16							2	2	12	9	29	39	36	70	22	55	24	47	24	25	5	3	1	1	155	21	-16
	-18	1	1	3	2	1	1	3	4	12	17	31	63	21	83	36	78	29	66	31	46	17	15	6	5	191	32	-18
	-20	4	4	1	3	6	6	14	14	29	36	18	76	15	93	20	92	14	76	25	63	17	26	17	16	180	43	-20
	-22	10	11	11	11	11	14	20	29	39	61	13	86	1	94	7	96	15	86	16	73	21	40	23	30	187	54	-22
	-24	25	28	18	25	18	28	23	47	20	74	8	92	7	99	4	99	5	89	13	82	26	58	31	50	198	65	-24
	-26	26	47	17	37	27	49	26	66	19	86	6	97	2	100	2	100	5	93	9	88	26	75	20	63	185	76	-26
	-28	16	58	10	45	24	68	23	84	9	92	1	98					9	99	9	94	10	82	12	71	123	83	-28
	-30	20	72	18	58	12	77	10	91	3	94	2	99					2	100	2	95	8	87	15	81	92	88	-30
	-32	19	85	16	70	6	82	7	96	5	97	1	100							5	99	7	92	11	88	77	93	-32
	-34	12	94	15	81	10	90	5	100	4	100									1	99	6	96	13	96	66	97	-34
	-36	4	97	13	91	4	93													1	100	4	99	4	99	30	98	-36
	-38	3	99	8	97	4	96															1	99	1	99	17	99	-38
	-40	2	100	3	99	4	99															1	100			10	100	-40
	-42			1	100	1	100																			2	100	-42
	-44																							1	100	1	100	-44
30,000	-34													1	1											1		-34
	-36													1	1	1	1									2		-36
	-38											1	1	11	9	9	7	3	2							24	2	-38
	-40											3	3	20	22	23	22	17	14	5	3					68	6	-40
	-42									2	1	14	15	57	60	31	42	29	34	17	15	2	1			152	15	-42
	-44	1	1					1	1	10	8	28	38	28	78	28	61	29	54	21	29	8	7	5	2	157	25	-44
	-46			1	1	1	1	3	3	20	21	38	69	18	90	29	80	29	74	37	53	16	18	2	3	194	36	-46
	-48	5	5	7	7	7	7	12	14	30	41	19	85	9	96	22	95	17	86	33	75	23	33	22	18	206	49	-48
	-50	20	22	17	22	18	21	26	36	55	77	10	93	5	99	6	99	11	94	22	90	33	56	33	40	256	65	-50
	-52	17	36	13	34	34	49	35	65	22	91	8	100	1	100	2	100	4	97	12	98	36	80	41	66	225	78	-52
	-54	27	58	19	50	31	74	26	87	11	99							5	100	3	100	21	95	20	80	163	88	-54
	-56	27	81	37	83	20	90	15	100	2	100											8	100	17	91	126	96	-56
	-58	15	93	13	95	9	98																	8	96	45	99	-58
	-60	7	99	5	99	2	99																	3	98	17	100	-60
	-62	1	100	1	100	1	100																	3	100	6	100	-62

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Continued

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(i) Wiesbaden, Germany - Continued																												
38,500	-42											1	1			1	1									2		-42
	-44			2	2					1	1	2	3			2	2	1	1							8	1	-44
	-46			1	3					4	4	1	4	8	6	7	7	1	2					1	1	23	2	-46
	-48	2	2	3	6					12	12	2	5	19	19	12	15	13	12	4	3	1	1	2	2	70	7	-48
	-50	2	4	8	14	1	1	4	4	5	16	13	17	12	28	17	27	7	18	10	10	5	4	4	5	88	13	-50
	-52	2	7	7	21	13	13	6	10	16	27	17	31	20	42	16	39	8	25	4	13	14	15	6	10	129	22	-52
	-54	10	18	13	35	15	27	11	21	15	37	16	45	19	56	19	52	9	32	11	22	13	24	15	21	166	33	-54
	-56	14	33	15	50	18	44	17	37	11	45	15	58	14	66	22	67	19	48	17	34	14	35	13	30	189	46	-56
	-58	12	47	11	61	7	51	10	47	15	56	14	70	23	82	19	80	16	61	13	44	13	44	13	40	166	58	-58
	-60	12	60	12	74	11	61	16	63	16	67	9	78	17	94	13	90	26	82	18	58	12	53	16	52	178	70	-60
	-62	10	71	7	81	14	75	7	70	31	89	19	95	8	100	15	100	16	95	29	79	10	61	20	66	184	82	-62
	-64	6	78	6	87	9	83	11	80	10	96	6	100					6	100	22	96	18	74	16	78	110	90	-64
	-66	7	86	3	90	9	92	15	95	6	100									6	100	17	87	17	90	80	95	-66
	-68	5	91	8	98	7	98	4	99													14	97	7	96	45	98	-68
	-70	6	98	2	100	2	100	1	100													4	100	4	99	19	100	-70
	-72	2	100																					2	100	4	100	-72
53,000	-44															1	1									1		-44
	-48													5	5	1	2	1	1							7	1	-48
	-50									3	3	5	5	11	16	8	9	2	3							29	4	-50
	-52			2	5			2	3	19	21	16	22	20	35	32	39	7	11					1	1	99	14	-52
	-54	3	8	2	10	2	4	11	17	29	48	26	50	30	65	24	61	6	18	3	4			3	4	139	29	-54
	-56	5	22	6	25	10	24	15	37	30	76	34	85	21	85	24	83	17	58	5	11			7	12	174	47	-56
	-58	3	31	10	50	19	62	20	63	20	94	12	98	8	93	12	94	27	68	12	28	5	6	7	20	155	63	-58
	-60	8	53	6	65	9	80	22	92	5	99	2	100	6	99	4	97	18	89	20	56	18	26	10	31	128	77	-60
	-62	5	67	6	80	7	94	6	100					1	100	2	99	9	99	17	79	29	60	24	58	106	88	-62
	-64	6	83	6	95					1	100					1	100	1	100	11	94	16	78	22	82	64	95	-64
	-66	4	94	2	100	3	100													2	97	14	94	9	92	34	98	-66
	-68	2	100																	2	100	5	100	3	96	12	100	-68
	-70																							1	97	1	100	-70
	-72																							2	99	2	100	-72
	-74																							1	100	1	100	-74
67,500	-46									1	1					1	1									2		-46
	-48									1	3	1	1	4	6	1	3									7	2	-48
	-50							1	2	5	9	10	15	5	14	7	12	1	2							29	7	-50
	-52							7	17	13	26	28	54	26	55	30	51	3	7							107	26	-52
	-54							3	23	27	61	26	90	24	92	20	77	13	28	1	2					114	46	-54
	-56							6	36	18	84	7	100	5	100	13	94	24	68					2	7	75	60	-56
	-58	1	33					12	62	12	100					4	99	16	95	7	20			2	13	54	69	-58
	-60	1	67	1	6	13	68	10	83							1	100	3	100	11	46	10	19	5	30	55	79	-60
	-62	1	100	7	50	4	90	7	98											20	95	5	28	6	50	50	88	-62
	-64			4	75	2	100	1	100													11	49	3	60	21	92	-64
	-66			3	94															2	100	15	77	7	83	27	97	-66
	-68			1	100																	8	93	3	93	12	99	-68
	-70																					3	98	2	100	5	100	-70
	-72																					1	100			1	100	-72
78,500	-44									1	2	1	2	1	2	1	2									4	1	-44
	-46							1	3	1	3	10	18	6	14	1	4									19	6	-46
	-48									3	8	6	28	14	41	11	23									34	15	-48
	-50									10	24	22	65	18	77	19	56	4	9					1	7	74	35	-50
	-52							2	10	28	68	17	93	12	100	15	83	8	27							82	57	-52
	-54							5	28	9	83	4	100			8	97	13	56					1	13	40	68	-54
	-56							6	48	10	98					2	100	11	80	4	17					33	76	-56
	-58					4	57	7	72	1	100							8	98	6	44			1	20	27	84	-58
	-60					2	86	8	100									1	100	9	83	2	9	1	27	23	90	-60
	-62	1	100	2	100															3	96	3	23	3	47	12	93	-62
	-64					1	100													1	100	5	46	3	67	10	96	-64
	-66																					9	86	1	73	10	98	-66
	-68																					2	96	2	87	4	99	-68
	-70																							1	93	1	100	-70
	-72																					1	100	1	100	2	100	-72
87,000	-38											1	2	1	3											2	1	-38
	-40									1	2			1	6	2	7									4	3	-40
	-42											4	12	2	13											6	6	-42
	-44									1	5	10	35	4	25	3	17									18	15	-44
	-46							1	9	9	27	8	54	11	59	7	40									36	32	-46
	-48									9	49	14	86	12	97	13	83	1	3							49	56	-48
	-50									12	78	3	93			4	97	7	28							26	69	-50
	-52							2	27	6	93	3	100	1	100	1	100	9	59	1	17					23	80	-52
	-54							2	46	3	100							4	72							9	85	-54
	-56							1	55									6	93					2	40	9	89	-56
	-58							2	73									2	100	4	83					8	93	-58
	-60							2	91																	2	94	-60
	-62							1	100											1	100	2	29	1	60	5	97	-62
	-64																					4	86			4	99	-64
	-66																					1	100	1	80	2	100	-66
	-72																							1	100	1	100	-72

TABLE I.- SUMMARY OF RADIOSONDE MEASUREMENTS OF UPPER-AIR TEMPERATURES - Concluded

Alt., ft	t, °C	Jan.		Feb.		March		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		Total		t, °C
		f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	f	cpd %	
(f) Wiesbaden, Germany - Concluded																												
102,000	-26													1	13											1	3	-26
	-34									1	13															1	6	-34
	-36									1	25	1	20	1	25	1	20									4	18	-36
	-38											1	40	1	38	1	40									3	27	-38
	-40									1	38			3	75											4	38	-40
	-42									1	50	1	60	2	100	1	60									5	53	-42
	-44							1	33	3	88	1	80			2	100									7	74	-44
	-46									1	100							1	20							2	79	-46
	-48											1	100					1	40							2	85	-48
	-50																	2	80							2	91	-50
	-52																	1	100							1	94	-52
	-54							2	100																	2	100	-54

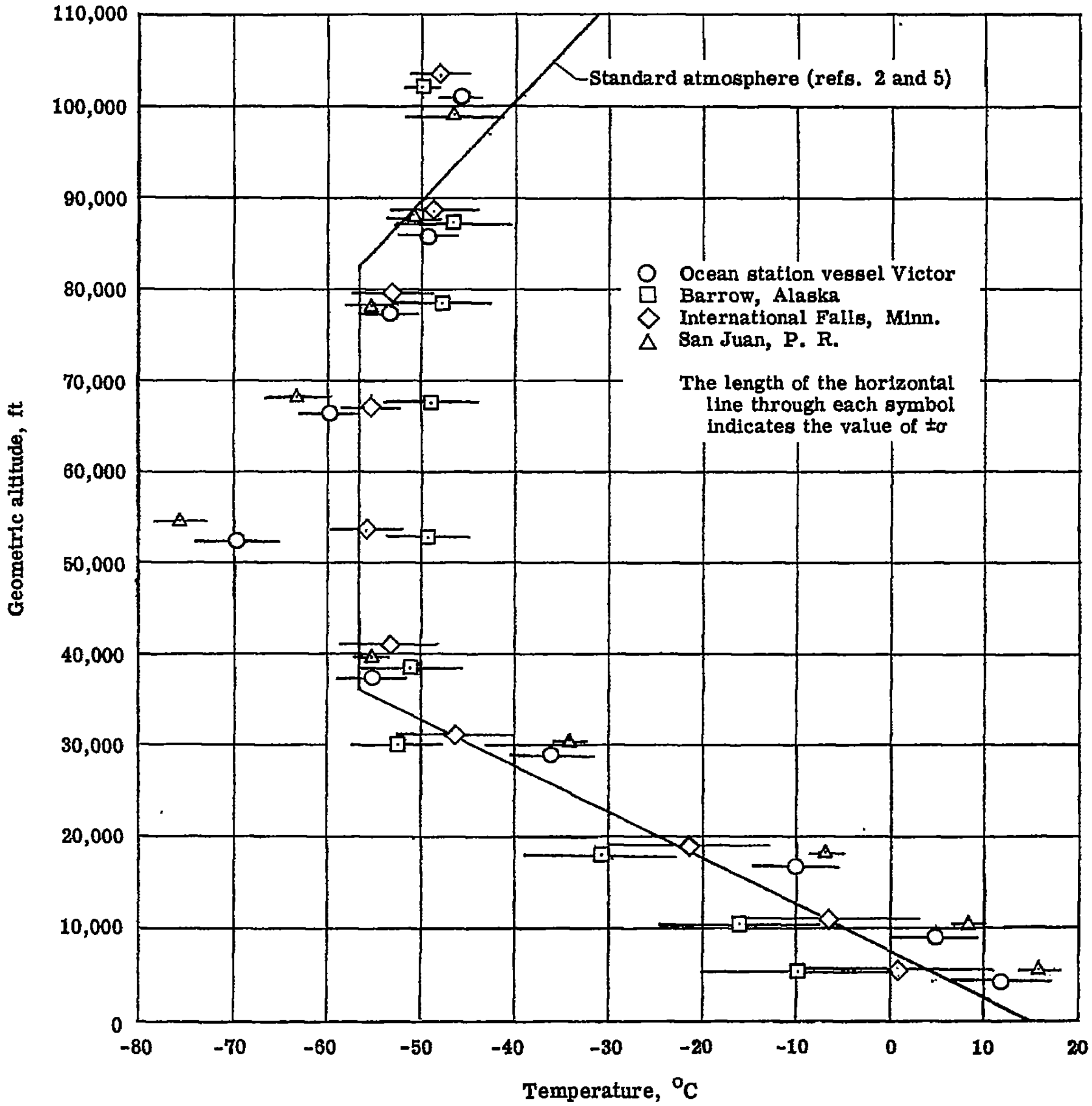

Figure 1.- Comparison of upper-air temperature measurements for several geographic locations with temperatures for standard atmosphere.