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ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-51L) LAUNCH

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16. ABSTRACT

This report presents a summary of selected atmospheric conditions observed near Space Shuttle STS-51L launch time on January 28, 1986, at Kennedy Space Center Florida. Values of ambient pressure, temperature, moisture, ground winds, visual observations (cloud), and winds aloft are included. The sequence of pre-launch Jimsphere measured vertical wind profiles is given in this report. The final atmospheric tape, which consists of wind and thermodynamic parameters versus altitude, for STS-51L vehicle ascent has been constructed. The STS-51L ascent atmospheric data tape has been constructed by Marshall Space Flight Center's Atmospheric Sciences Division to provide an internally consistent data set for use in post flight performance assessments.

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ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-51L) LAUNCH

I. INTRODUCTION

This report represents an evaluation of the atmospheric environmental data taken during the launch of the Space Shuttle/STS-51L vehicle. This Space Shuttle vehicle was launched from Pad 39B at Kennedy Space Center (KSC), Florida, on a bearing of 85 deg east of north on January 28, 1986, at 11:30 a.m. EST (1638 UT).

This report presents a summary of the atmospheric environment at launch time (L+0) of the STS-51L, together with the sequence of prelaunch Jimsphere measured winds aloft profiles from L-4.5 hr through liftoff. The general atmospheric situation for the launch and flight area is described, and surface and upper level wind/thermodynamic observations near launch time are given. Since the ship Redstone was unavailable for STS-51L duty, the SRB descent/impact atmospheric data were not taken.

Previous MSFC-related launch vehicle atmospheric environmental conditions have been published as Appendix A of individual MSFC Saturn Flight Evaluation Working Group reports [1]. Office memorandums have been issued for previous flights giving launch pad wind information. A report has also been published [2] which summarizes most launch atmospheric conditions observed for the past 155 MSFC/ABMA-related vehicle launches through SA-208 (Skylab 4). Reports summarizing ASTP, STS-1 through STS-51B launch conditions are presented in References 3 through 20, respectively. Table 1 gives the atmospheric L+0 launch conditions for all Space Shuttle missions.

The Appendices of this document contain Solar Radiation data, Shortwave Solar Irradiance (Insolation) data and plots of the Wind Uncertainty Data with plus and minus three sigma (standard deviation) limits.

II. SOURCES OF DATA

Atmospheric observational data used in this report were taken from synoptic maps made by the National Weather Service, plus all available surface observations and measurements from around the launch area. This includes the USAF WINDS (Weather Information Network Display System) tower data. Upper air observations were taken from balloon-released instruments sent aloft from Cape Canaveral Air Force Station (CCAFS). Table 2 presents a listing of systems used to obtain the upper level wind profiles used in compiling the final ascent atmospheric data tape. Data cutoff altitudes are also given in Table 2. MSFC used the KSC measured L+9 min MSFC Rawinsonde's 12 sec averaged range, elevation and azimuth data, and reduced it for each 60 sec vertical displacement; resulting in 1000 ft increment winds of finer resolution.

III. GENERAL SYNOPTIC SITUATION AT LAUNCH TIME

High pressure was centered over the Gulf Coast just west of northern Florida during the launch of STS-51L. A weak frontal system stretched southeastward from a low over northeastern Montana through the Plain States to another low over eastern Nebraska and ended over eastern Arkansas. Surface temperatures were in the 30's around launch of STS-51L. Eastern Florida surface winds were relatively light and north-northwest to north-westerly. Figure 1 shows the surface weather map about 4.5 hr before launch of STS-51L.

The wind flow aloft was dominated by westerly winds over the KSC Florida area. Figure 2 depicts the wind aloft condition about 4.5 hr before launch. Skies were clear over the KSC launch area around the launch of STS-51L. Figure 3 exhibits the GOES-6 visible picture taken at 1644 UT (6 min after liftoff). Figure 4 presents an up-close visible picture of the Florida peninsula as recorded by GOES-6, taken also at 1644 UT. Easily visible in the picture is the bank of clouds off shore. This absence of clouds over the launch site area enabled the satellite to photograph the STS-51L exhaust and explosion cloud.

IV. SURFACE OBSERVATIONS AT LAUNCH TIME

Surface observations at launch time for selected KSC locations are given in Table 3. Included are pad 39B, pad 39A, shuttle runway, and many of the wind tower system observations. Neither precipitation nor lightning was observed at launch time.

Table 4 presents Pad 39B wind data along with other standard hourly atmospheric measurements and sky observations for the 6-hr period prior to launch of STS-51L. Values for wind speed and direction are given for the 84 m (275 ft) FSS reference level and 18 m (60 ft) pad light pole level. A continuous record of the wind speed and direction from the 60 ft NW Pad 39B light pole is presented in Figures 5 and 6, respectively, for the 11 sec prior to and including L-0.

Figures 7, 8, and 9 provide a detailed description of the variations in the temperature, wind direction and wind speed over the 24-hr time period prior to L-0 and for various sites in the area of pad 39B. One will note in Figure 7 that the temperature difference between the sites varied from three to four degrees depending on location of the site with a minimum of about 21°F being observed about 2.5 miles to the west of pad 39B. The CS3 site at pad 39B recorded a minimum of 26°F at 16 ft above natural grade for site CS3 which is 1250 ft from the center point of vehicle. Figures 8 and 9 illustrate for a reference height of approximately 60 ft the variation in the wind field during the 24-hr period prior to L-0. The rather significant deviation of the wind direction at pad 39B in the 4-hr period prior to L-0 from that shown by the other nearby sites was due to measurement errors which produced a bias of about 60 degrees.

Figure 10 shows the maximum and minimum temperatures, the associated relative humidities, and precipitation totals for the period from October 11, 1985, through January 24, 1986. Figure 11 gives the hourly temperature, relative humidity, and the 3-hr precipitation total beginning with January 25 and ending at January 28, 1986 (Day of Launch). The data in Figures 10 and 11 were obtained from the KSC X68 Shuttle Runway site. Figure 12 shows the temperature versus altitude for ascent of STS-51L. A map of John F. Kennedy Space Center and Cape Canaveral Air Force Station is given in Figure 13.

V. UPPER AIR MEASUREMENTS DURING LAUNCH

The MSS Rawinsonde (1647 UT) system was used to measure the upper level wind and thermodynamic parameters for STS-51L launch. This sounding data was reduced to a finer scale at MSFC and used as the wind profile most representative of L-0 atmospheric conditions. Since there were no rocket measurements for STS-51L, the Global Reference Atmosphere (GRA) [21] parameters for January KSC conditions were used. A tabulation of the STS-51L final atmospheric data for ascent is presented in Table 5 which lists the wind and thermodynamic parameters versus altitude. A brief summary of parameters is given in the following paragraphs.

A. Wind Speed

At launch time, wind speeds were 20.1 ft/sec (11.9 kts) at 60 ft and increased to a maximum of 174 ft/sec (103 kts) flowing from 264 deg. This measured maximum occurred at an altitude of 42,000 ft (12,802 m). The winds decreased above this level as shown in Figure 14. The maximum speed of 185 ft/sec (109 kts) at 214,000 ft (65,227 m) altitude, was not measured, but derived from the GRA model. The L-0 maximum dynamic pressure altitude region wind profile developed essentially as expected from the observed trend, based on Radar/Jimsphere measurements during the prelaunch wind loads monitoring period, relative to decreasing total wind speed, with veering contributing to out of plane increases in wind relative to total vector magnitude, and increasing of height for peak wind level. Wind shears were well within (less than about 70 percent of magnitude) those indicated by previous statistical analyses at the 1 percent risk level (Ref. 22, Tables 2.4.8 and 2.4.9).

B. Wind Direction

At launch time, the 60-ft wind direction was from north-northwest (334 deg). Winds were from the west to northwest above this level and continued throughout 74,000 ft as shown in Figure 14. At this level winds shifted to north and shifted from northeast to east up to the 86,700 ft level. Winds returned to west to northwest above this level and continued throughout 108,000 ft. It should be noted that above the 60,000 ft level, all wind calculations were derived from the GRAM model (calculated winds based on climatology).

C. Prelaunch/Launch Wind Profiles

1. Wind Speed

Winds aloft were strong during the countdown of the STS-51L. Polar and subtropical jet stream winds between 30 and 50,000 ft altitude extended over and near the state of Florida. By 1200Z on Saturday, January 25, 1986, jet-stream magnitude winds >70 knots at 200 mb (∿39,000 ft) were initially establishing themselves over Florida, appearing to be influenced by the subtropical jet at this level. By 1200Z Sunday January 26, with help from the polar jet influence, jet winds >70 knots at 300 mb (∿30,000 ft) were established over Florida. These converging jet-stream wind conditions at 300 mb and higher levels persisted from these listed times up through liftoff. However, jet-stream winds peaked around 0700Z on Monday, January 27, 1986, with a peak magnitude just less than 240 ft/sec between 30 and 40,000 ft altitude. From this point in time onward, the maximum wind speed aloft over KSC decreased as the central jet core was slowly moving off into the Atlantic Ocean in conjunction with an upper-level trough, which was also slowly moving eastward beyond KSC and its influence over the southeastern U.S. was lessening. Figure 15 indicates the levels of jet-stream winds between 30 and 50,000 ft. The magnitude of the jet-stream winds decreased from the L-15 hr to the L-3.75 hr Jimsphere balloon measurement; from ∿225 ft/sec to ∿200 ft/sec, respectively. By liftoff, winds between 40 and 50,000 ft had decreased to a peak of 174 ft/sec (at 42,000 ft).

2. Wind Direction

Throughout the countdown period, as the upper-level trough was slowly moving through the eastern U.S., wind directions aloft over KSC and central Florida were generally westerly. Between the surface and ∿25,000 ft winds were from the northwest and shifted westerly with altitude. Above 30,000 ft to beyond 60,000 ft, the winds generally shifted to a westerly component being just south of due west (270 deg). Since wind direction versus altitude did not change much during the countdown period, Figure 16 gives wind directional plots, for comparison, in time.

Figures 17 and 18 present the in-plane and out-of-plane Jimsphere measured wind components for L-4.5 hr, L-3.25 hr, and L+3.5 hr. The L+9 min profile is a rawinsonde profile. Generally westerly to northwesterly flow aloft produced in-plane tail winds along with out-of-plane winds from the left, at most altitudes and times. Component magnitudes were generally greater than the January mean component, with both components well within the 99th percentile. The wind flow produced a predominantly east-west (inplane) wind component for the STS-51L flight in the maximum dynamic pressure region reaching about 170 ft/sec from the west at 42,000 ft altitude. The north-south (out-of-plane) wind component of about 50 ft/sec from the north at approximately 33,000 ft reversed to a southerly component during the next 5000 ft and then remained near 20 ft/sec from the south to about 50,000 ft. The largest shear layer (0.012 sec^{-1}) occurred in the 35,000 ft (about 61 sec flight time) altitude region.

D. Thermodynamic Data

The cold air mass which had moved into central and southern Florida produced higher than average pressure (+0.9 percent) and density (+9.4 percent) values, and a lower (-7.0 percent), or colder, than average temperature value at the surface as shown in Figure 19. Values are expressed as a percentage of change from the Patrick

Reference Atmosphere 1963 (PRA-63) [23]. The most negative temperature deviation, -7.9 percent, occurred between 1000 and 2000 ft altitude. Negative temperature deviations decreased to -2.3 percent at 10,000 ft and then increased to -5.3 percent by 32,000 ft. Temperatures then increased with altitude becoming equal to the PRA-63 value by 40,300 ft. Temperature deviations remained greater than the PRA-63 above this level up through 70,000 ft, with the maximum positive deviation of +2.2 percent occurring at 45,000 ft. Pressure deviations became negative at 3000 ft altitude and remained so with increasing altitude, peaking negatively at 39,800 ft with a value of -5.1 percent. Density decreased to close to nominal PRA-63 values by 9000 ft, until becoming lower than the PRA-63 at 34,400 ft and higher altitudes with peak negative density deviation of -6.8 percent at 45,000 ft.

E. Wind Uncertainty Analysis

The independent measurement of a wind profile along the ascent trajectory with any acceptable accuracy and resolution for STS applications is not possible with current technology. For the STS-51L ascent flight the MSS/Rawinsonde using a balloon-borne instrument package was utilized by the Air Force. An analysis was made to estimate the uncertainties of the MSS/Rawinsonde wind profile due to lack of high frequency content normally obtained from the Radar/Jimsphere System and the normal MSS/Rawinsonde system inaccuracies. In order to provide a conservative measure for the wind profile uncertainties plus and minus three sigma (standard deviation) limits were developed for the STS-51L Final Ascent Atmospheric Data Tape wind profile. Graphs for the results of this analysis are given in Appendix C Figure C-1 (Total Wind Speed), Figure C-2 (Total Wind Direction), Figure C-3 (Zonal (U) Wind Component), and Figure C-4 (Meridional (V) Wind Component). The combination used produced a wide range of uncertainties at the three sigma level in all parameters. This was done to permit a liberal error base for comparison with wind profiles estimated from on board vehicle response data and aerodynamic information relative to STS-51L so as not to eliminate any potential characteristic that might warrant further analysis.

The data on uncertainties do not include any adjustments for the fact that the MSS/Rawinsonde balloon-borne instrument package was released 9 min after the lift-off of STS-51L which resulted in the balloon reaching 48,000 ft approximately 50 min after L-0. From the variability of the wind profiles between the L-3.75 hr and L+3.5 hr Radar/Jimsphere measurements, it is estimated that any adjustment made to correct the MSS/Rawinsonde wind profile data for the time differential would result in decreases in the north-south wind component and a reduction of about 300 ft in the peak wind speed altitude level.

Table 6 is the STS-51L systematic uncertainties for the final ascent atmospheric data tape and uncertainties due to not having a Jimsphere run. Wind speed, direction and component uncertainties are presented graphically in Appendix C Figures C-1, C-2, C-3, and C-4, respectively.

TABLE 1. SELECTED ATMOSPHERIC OBSERVATIONS FOR THE FLIGHTS OF THE SPACE SHUTTLE VEHICLES

Vehicle Data				Surface Observations					Inflight Conditions Max. Wind Below 60,000 ft			Count Down and Launch Comments of Meteorological Significance
				Thermodynamic[a]			Wind[b]					
Seq. No.	Vehicle No.	Launch Date	Time (EST) Nearest Minute	Press.[c] N/cm^2	Temp. (°C)	Rel. Hum. (%)	Speed (ft/sec)	Dir. (deg)	Alt. (ft)	Speed (ft/sec)	Dir. (deg)	
1	STS-1 Columbia	4/12/81	0700	10.234[d]	21	82	11.8 15.2	125 120	44,300	98	250	
2	STS-2 Columbia	11/12/81	1010	10.166	23	61	27.0 27.0	345 355	36,300	158	286	
3	STS-3 Columbia	3/22/82	1100	10.160	24	71	7.0[e] 8.0[e]	50[e] 145[e]	45,000	119	250	Wind directional change observed at Pad just prior to L+0. Onset of sea breeze.
4	STS-4 Columbia	6/27/82	1100[f]	10.200	29	70	5.8[g] 4.9[g]	133[g] 141[g]	47,900	37	329	
5	STS-5 Columbia	11/11/82	0719	10.227	22	68	22.0 35.0	90 90	40,600	146	336	
6	STS-6 Challenger	4/4/83	1330	10.183	23	55	12.7 16.4	63 55	46,100	155	277	
7	STS-7 Challenger	6/18/83	0733[f]	10.146	25	80	5.9[e] 10.3[e]	10[e] 350[e]	45,900	76	278	
8	STS-8 Challenger	8/30/83	0232[f]	10.111	24	97	8.8 14.0	269 268	45,100	30	349	17 min countdown delay due to adverse weather conditions.
9	STS-9 (SL-1) Columbia	11/28/83	1100	10.153	24	83	19.1 32.0	183 190	47,100	117	252	
10	STS-11 (41-B) Challenger	2/3/84	0800	10.173	17	75	0.0 NA	0 NA	38,200	143	288	
11	STS-13 (41-C) Challenger	4/6/84	0858	10.149	16	56	21.5 18.6	320 275	37,700	176	289	
12	STS-41D Discovery	8/30/84	0842[f]	10.172	26	81	3.0 3.6	106 39	40,300	44	270	
13	STS-41G Challenger	10/5/84	0703[f]	10.210	23	60	16.5 14.8	73 58	40,600	78	303	
14	STS-51A Discovery	11/8/84	0715	10.227	20	59	23.0 31.1	24 10	33,100	131	272	1 day delay due to excessive wind loads, calculated at high altitudes.

TABLE 1. (Concluded)

Vehicle Data[h]				Surface Observations					Inflight Conditions Max. Wind Below 60,000 ft			Count Down and Launch Comments of Meteorological Significance
				Thermodynamic[a]			Wind[b]					
Seq. No.	Vehicle No.	Launch Date	Time (EST) Nearest Minute	Press.[c] N/cm^2	Temp. (°C)	Rel. Hum. (%)	Speed (ft/sec)	Dir. (deg)	Alt. (ft)	Speed (ft/sec)	Dir. (deg)	
15	STS-51C Discovery	1/24/85	1450	10.173	18	46	17.1 15.5	228 253	42,900	199	265	1 day delay due to extreme cold surface temperatures.
16	STS-51D Discovery	4/12/85	1359	10.257	21	55	19.9 22.3	82 82	42,600	134	265	55-min delay due to a ship in the SRB impact area, and concerns over potential weather related impacts (cloud cover).
17	STS-51B Challenger	4/29/85	1202[f]	10.128	27	65	11.5 18.4	005 337	32,900 40,700	68 68	320 297	
18	STS-51G Discovery	6/17/85	0733[f]	10.201	23	91	2.9 11.8	201 206	40,100 46,700	55 55	298 302	
19	STS-51F Challenger	7/29/85	1700[f]	10.174	28	72	14.9 13.4	101 113	48,000	53	035	(2) 8/24 launch scrub due to unexceptable weather in launch area. Rain during countdown.
20	STS-51I Discovery	8/27/85	0658[f]	10.225	24	86	14.2 16.6	073 070	41,000	43	123	
21	STS-51J Atlantis	10/3/85	1115[f]	10.185	28	79	17.0 13.7	213 171	48,000	48	283	(24) 1/7 launch scrub due to unexceptable weather at TAW sites. 1/10 launch scrub due to heavy rain in launch area.
22	STS-61A Challenger	10/30/85	1200	10.059	28	72	12.7 14.1	217 174	43,000	81	218	
23	STS-61B Atlantis	11/26/85	1929	10.202	23	81	10.1 10.4	165 112	49,300	75	270	(25) 1/26 launch scrub due in-part to potential bad weather associated with frontal passage. 1/27 launch scrub due in-part to strong cross winds at X68. 1/28 2-hr delay due in-part to cold early morning temperatures.
24	STS-61C Columbia	1/12/86	0655	10.206	12	84	15.4 18.6	323 342	40,000	221	263	
25	STS-51L[i] Challenger	1/28/86	1138	10.253	3	27	20.1 15.3	331 262	42,000	174	264	

a. Pad 39A thermodynamic measurements taken at approximately 1.2 m (4 ft) above natural grade at camera site No. 3.
b. 1 min average prior to L+0 of 60 ft PLP (listed first) and 275 FSS winds measured above natural grade. 275 ft FSS wind measurement can possibly be influenced by surrounding pad structures and thermal balance. 60 ft PLP wind data should not have this potential problem.
c. Pressure measurement applicable to 21 ft above MSL unless otherwise indicated.
d. Pressure measurement applicable to 14 ft above MSL.
e. 10 sec average prior to L+0.
f. Eastern Daylight Time.
g. 30 sec average prior to L+0.
h. All vehicles launched from LC39B except where noted.
i. Shuttle exploded in flight.

TABLE 2. SYSTEMS USED TO MEASURE UPPER AIR WIND DATA FOR STS-51L ASCENT

Type of Data	Date: January 28, 1986		Portion of Data Used			
	Release Time		Start		End	
	Time (UT) (hr/min)	Time After L+0 (min)	Altitude m (ft)	Time After L+0 (min)	Altitude m (ft)	Time After L+0 (min)
MSS Rawinsonde[a]	16:47	9	6 (21)	9	32,918 (108,000)	42

a. MSFC used the KSC measured L+9 min MSS Rawinde's 12 sec averaged range, elevation, and azimuth data and reduced it for each 60 sec vertical displacement; resulting in 1000 ft increment winds of finer resolution.

TABLE 3. SURFACE OBSERVATIONS AT STS-51L LAUNCH TIME[f]

Location[a]	Time After L+0 (min)	Pressure (MSL) (N/cm^2)	Temperature[b] (°F)	Dew Point[b] (°F)	Relative[b] Humidity (%)	Wind		Visibility (miles)	Sky Cover		
						Speed (ft/sec)	Direction (deg)		Cloud Amount	Cloud Type	Height of Base Meters (ft)
KSC Shuttle Runway[b] X68, No. 512 So. 30 ft.	0	1026.1	38	4	26	15.2	290	10	0/10	Clear	–
Pad 39A[c]	0										
NW Lightpole 60 ft		10.327[g]	34.0	-1.7	21.3	17.6	329				
NW FSS 275 ft						17.7	303				
Pad 39B[c]	0										
NW Lightpole 60 ft		10.188[e]	36.7	6.1	27.3	20.1	331				
NW FSS 275 ft						15.3	262				
Wind Tower No. 313[b]	2[d]	10.250[b]	35.7	3.5	25.4	–	–				
12 ft			–	–	–	11.8	265				
54 ft			32.2	1.7	27.1	16.9	271				
162 ft			30.9	–	–	23.6	277				
204 ft			30.4	1.1	28.1	23.6	280				
295 ft			–	–	–	23.6	285				
Wind Tower No. 112[b]	2[d]	–	35.8	–	–	–	–				
12 ft			–			13.5	282				
54 ft			33.9			16.9	284				
Wind Tower No. 110[b]	2[d]	–	33.0	12.0	41.1	–	–				
12 ft			–	–	–	13.5	288				
54 ft			32.0	6.0	32.7	18.6	279				
162 ft			31.0	–	–	18.6	283				
204 ft.			–	–	–	18.6	283				
Ascent Atmospheric Data Tape[f]	0	1026.1	36.7	6.1	27.3	20.1[f]	331[f]				
						15.3[f]	262[f]				

a. Altitudes of measurements are above natural grade (NG) except where noted.
b. X68 and towers 313, 110 and 112 thermodynamic measurements are taken approximately 6 ft above NG.
c. Pad 39A and B thermodynamic measurements are taken at camera site No. 3, approximately 21 ft above MSL. Pad wind and thermodynamic values given are 1-min averaged just prior to liftoff.
d. Wind tower thermodynamic and wind measurements were averaged over a 5-min integration period ending at 1640 UT.
e. The L-0 1-min averaged pressure value of 10.188 N/cm^2 at 21 ft above MSL for Pad 39B appears inaccurately too low.
f. Official L-0 surface observations as used on the STS-51L ascent atmospheric data tape. Thermodynamic measurements apply to ∿21 ft above MSL, and wind values apply to the 60 ft (top value) above NG, and the 275 ft (bottom value) above MSL.
g. The L-0 1-min averaged pressure value of 10.327 N/cm^2 at 21 ft above MSL for Pad 39A appears inaccurately too low.

TABLE 4. STS-51L PRE-LAUNCH THROUGH LAUNCH KSC PAD 39B ATMOSPHERIC MEASUREMENTS[a]

Hourly Atmospheric Measurements								Sky Condition[b]		
28 January 1986 Time UT	Temp. (°F)	Dew Point (°F)	RH (%)	275' Level (NW)		60' Level (NW)		Clouds	Total Sky Cover	Vis. (mi.)
				WS Kt	WD°	WS Kt	WD°			
1000	26	12	55	10	260	9	306	Clear skys	0/10	10
1100	24	12	58	10	259	9	301	Clear skys	0/10	10
1200	24	13	65	11	246	9	297	Scattered at 3,000 ft	1/10	10
1300	27	11	49	10	262	12	308	Scattered at 3,000 ft	1/10	10
1400	29	10	44	12	266	14	318	Clear skys	0/10	10
1500	31	9	39	9	232	9	308	Clear skys	0/10	10
1600	34	9	34	9	210	9	307	Clear skys	0/10	10
L+0[c] 1638	37	6	27	9	262	12	331	Clear skys	0/10	10

a. Hourly pad observations (obtained via MSFC/HOSC) averaged over 2 min, centered on the hour.

b. Sky observations taken at the Shuttle runway site X68.

c. L+0 PAD Wind and thermodynamic parameters obtained from HOSC data bank. NW Anemometers used at 60 and 275 ft levels for L+0 wind conditions (approximately 1 min average prior to L+0). Pad 39A L+0 atmospheric pressure, at 21 ft (MSL), was 10.253 N/cm^2. Sea level pressure was 10.261 N/cm^2.

TABLE 5. STS-51L ASCENT ATMOSPHERIC DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
000021	017	300	2.6	.1025+04	.1294+04	-14.4
000100	017	299	2.3	.1022+04	.1292+04	-14.7
000200	017	298	1.8	.1018+04	.1289+04	-15.1
000300	017	297	1.4	.1014+04	.1286+04	-15.6
000400	017	296	1.0	.1011+04	.1283+04	-16.0
000500	016	295	.5	.1007+04	.1281+04	-16.4
000600	016	294	.1	.1003+04	.1278+04	-16.8
000700	016	293	-.3	.9991+03	.1275+04	-17.2
000800	016	292	-.7	.9953+03	.1272+04	-17.7
000900	016	291	-1.2	.9916+03	.1269+04	-18.1
001000	016	290	-1.6	.9878+03	.1267+04	-18.5
001100	017	294	-1.8	.9840+03	.1263+04	-19.1
001200	019	297	-1.9	.9802+03	.1258+04	-19.7
001300	020	300	-2.1	.9765+03	.1254+04	-20.3
001400	022	303	-2.3	.9728+03	.1251+04	-20.9
001500	024	305	-2.4	.9690+03	.1247+04	-21.4
001600	025	307	-2.6	.9653+03	.1243+04	-22.0
001700	027	308	-2.8	.9616+03	.1239+04	-22.6
001800	029	310	-3.0	.9579+03	.1235+04	-23.2
001900	030	311	-3.1	.9543+03	.1231+04	-23.8
002000	032	312	-3.3	.9506+03	.1227+04	-24.4
002100	032	312	-3.2	.9470+03	.1221+04	-24.4
002200	033	312	-3.0	.9434+03	.1216+04	-24.5
002300	033	311	-2.8	.9398+03	.1211+04	-24.5
002400	033	311	-2.7	.9362+03	.1205+04	-24.6
002500	033	311	-2.5	.9326+03	.1200+04	-24.6
002600	034	311	-2.4	.9290+03	.1195+04	-24.7
002700	034	311	-2.3	.9254+03	.1190+04	-24.7
002800	034	310	-2.1	.9219+03	.1184+04	-24.8
002900	035	310	-1.9	.9184+03	.1179+04	-24.8
003000	035	310	-1.8	.9148+03	.1174+04	-24.9
003100	036	312	-1.5	.9114+03	.1169+04	-24.7
003200	036	314	-1.3	.9079+03	.1163+04	-24.5
003300	037	315	-1.0	.9045+03	.1157+04	-24.2
003400	038	317	-.8	.9010+03	.1152+04	-24.0
003500	039	318	-.5	.8976+03	.1146+04	-23.8
003600	039	320	-.2	.8942+03	.1141+04	-23.6
003700	040	321	.0	.8908+03	.1136+04	-23.4
003800	041	322	.3	.8874+03	.1130+04	-23.1
003900	042	324	.5	.8840+03	.1125+04	-22.9
004000	043	325	.8	.8807+03	.1119+04	-22.7
004100	044	325	1.0	.8773+03	.1114+04	-21.1
004200	045	325	1.2	.8740+03	.1109+04	-19.4
004300	046	324	1.3	.8707+03	.1104+04	-17.8
004400	047	324	1.5	.8674+03	.1099+04	-16.1
004500	048	324	1.7	.8642+03	.1094+04	-14.5
004600	050	324	1.9	.8609+03	.1089+04	-12.9
004700	051	324	2.1	.8577+03	.1084+04	-11.2
004800	052	323	2.2	.8544+03	.1079+04	-9.6
004900	053	323	2.4	.8512+03	.1074+04	-7.9

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
005000	054	323	2.6	.8480+03	.1069+04	-6.3
005100	055	322	2.7	.8448+03	.1065+04	-6.3
005200	056	321	2.7	.8416+03	.1061+04	-6.4
005300	057	320	2.8	.8385+03	.1057+04	-6.4
005400	058	319	2.8	.8353+03	.1053+04	-6.5
005500	059	319	2.9	.8322+03	.1048+04	-6.5
005600	060	318	3.0	.8291+03	.1044+04	-6.6
005700	062	317	3.0	.8260+03	.1040+04	-6.6
005800	063	316	3.1	.8229+03	.1036+04	-6.7
005900	064	316	3.1	.8198+03	.1032+04	-6.7
006000	065	315	3.2	.8167+03	.1028+04	-6.8
006100	065	315	3.1	.8137+03	.1024+04	-6.9
006200	066	315	2.9	.8106+03	.1021+04	-7.0
006300	066	314	2.8	.8076+03	.1018+04	-7.1
006400	067	314	2.6	.8045+03	.1015+04	-7.2
006500	067	314	2.5	.8015+03	.1011+04	-7.3
006600	067	314	2.4	.7985+03	.1008+04	-7.4
006700	068	314	2.2	.7955+03	.1005+04	-7.5
006800	068	313	2.1	.7925+03	.1001+04	-7.6
006900	069	313	1.9	.7895+03	.9982+03	-7.7
007000	069	313	1.8	.7866+03	.9950+03	-7.8
007100	069	312	1.8	.7836+03	.9912+03	-7.9
007200	069	310	1.8	.7806+03	.9874+03	-8.0
007300	069	309	1.8	.7777+03	.9837+03	-8.1
007400	069	308	1.8	.7748+03	.9799+03	-8.2
007500	069	306	1.8	.7718+03	.9762+03	-8.3
007600	069	305	1.9	.7689+03	.9725+03	-8.5
007700	069	304	1.9	.7660+03	.9688+03	-8.6
007800	070	303	1.9	.7631+03	.9651+03	-8.7
007900	070	301	1.9	.7603+03	.9615+03	-8.8
008000	070	300	1.9	.7574+03	.9578+03	-8.9
008100	070	299	1.9	.7546+03	.9543+03	-9.0
008200	070	299	1.8	.7517+03	.9508+03	-9.1
008300	070	298	1.8	.7489+03	.9474+03	-9.1
008400	070	298	1.8	.7461+03	.9439+03	-9.2
008500	070	297	1.8	.7433+03	.9405+03	-9.3
008600	071	296	1.7	.7405+03	.9370+03	-9.4
008700	071	296	1.7	.7377+03	.9336+03	-9.5
008800	071	295	1.7	.7349+03	.9302+03	-9.5
008900	071	295	1.6	.7322+03	.9268+03	-9.6
009000	071	294	1.6	.7294+03	.9235+03	-9.7
009100	071	294	1.5	.7267+03	.9204+03	-9.9
009200	071	293	1.3	.7239+03	.9174+03	-10.0
009300	071	293	1.2	.7212+03	.9144+03	-10.2
009400	071	292	1.1	.7185+03	.9114+03	-10.3
009500	071	292	1.0	.7158+03	.9084+03	-10.5
009600	072	292	.8	.7130+03	.9054+03	-10.7
009700	072	291	.7	.7104+03	.9024+03	-10.8
009800	072	291	.6	.7077+03	.8994+03	-11.0
009900	072	290	.4	.7050+03	.8965+03	-11.1

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
010000	072	290	.3	.7023+03	.8935+03	-11.3
010100	072	290	.1	.6997+03	.8909+03	-11.4
010200	073	291	-.2	.6970+03	.8883+03	-11.5
010300	073	291	-.4	.6944+03	.8857+03	-11.6
010400	073	292	-.7	.6917+03	.8831+03	-11.7
010500	073	292	-.9	.6891+03	.8806+03	-11.8
010600	074	292	-1.1	.6865+03	.8780+03	-12.0
010700	074	293	-1.4	.6839+03	.8754+03	-12.1
010800	074	293	-1.6	.6813+03	.8729+03	-12.2
010900	075	294	-1.9	.6787+03	.8704+03	-12.3
011000	075	294	-2.1	.6761+03	.8678+03	-12.4
011100	075	295	-2.3	.6735+03	.8652+03	-12.5
011200	076	295	-2.6	.6709+03	.8627+03	-12.6
011300	076	296	-2.8	.6684+03	.8601+03	-12.8
011400	076	296	-3.0	.6658+03	.8575+03	-12.9
011500	076	297	-3.2	.6633+03	.8550+03	-13.0
011600	077	297	-3.5	.6607+03	.8524+03	-13.1
011700	077	298	-3.7	.6582+03	.8499+03	-13.2
011800	077	298	-3.9	.6557+03	.8474+03	-13.4
011900	078	299	-4.2	.6531+03	.8449+03	-13.5
012000	078	299	-4.4	.6506+03	.8423+03	-13.6
012100	078	299	-4.6	.6481+03	.8396+03	-13.8
012200	078	298	-4.7	.6456+03	.8369+03	-13.9
012300	079	298	-4.9	.6431+03	.8342+03	-14.1
012400	079	298	-5.1	.6406+03	.8315+03	-14.3
012500	079	297	-5.2	.6382+03	.8289+03	-14.4
012600	079	297	-5.4	.6357+03	.8262+03	-14.6
012700	079	297	-5.6	.6332+03	.8235+03	-14.8
012800	080	297	-5.8	.6308+03	.8209+03	-15.0
012900	080	296	-5.9	.6284+03	.8183+03	-15.1
013000	080	296	-6.1	.6259+03	.8156+03	-15.3
013100	080	296	-6.3	.6235+03	.8132+03	-15.5
013200	080	296	-6.6	.6211+03	.8107+03	-15.8
013300	081	295	-6.8	.6187+03	.8083+03	-16.0
013400	081	295	-7.0	.6163+03	.8058+03	-16.2
013500	081	295	-7.2	.6139+03	.8034+03	-16.4
013600	081	295	-7.5	.6115+03	.8010+03	-16.7
013700	081	295	-7.7	.6091+03	.7986+03	-16.9
013800	082	294	-7.9	.6067+03	.7962+03	-17.1
013900	082	294	-8.2	.6044+03	.7938+03	-17.4
014000	082	294	-8.4	.6020+03	.7914+03	-17.6
014100	082	294	-8.6	.5997+03	.7888+03	-17.7
014200	082	293	-8.7	.5973+03	.7861+03	-17.8
014300	082	293	-8.9	.5950+03	.7835+03	-17.9
014400	082	292	-9.0	.5926+03	.7809+03	-18.0
014500	081	292	-9.2	.5903+03	.7784+03	-18.0
014600	081	292	-9.4	.5880+03	.7758+03	-18.1
014700	081	291	-9.5	.5857+03	.7732+03	-18.2
014800	081	291	-9.7	.5834+03	.7707+03	-18.3
014900	081	290	-9.8	.5811+03	.7681+03	-18.4

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
015000	081	290	-10.0	.5788+03	.7656+03	-18.5
015100	081	289	-10.2	.5765+03	.7630+03	-18.8
015200	081	288	-10.3	.5743+03	.7605+03	-19.0
015300	081	288	-10.5	.5720+03	.7580+03	-19.3
015400	082	287	-10.6	.5698+03	.7554+03	-19.6
015500	082	286	-10.8	.5675+03	.7529+03	-19.8
015600	082	285	-11.0	.5653+03	.7504+03	-20.1
015700	082	284	-11.1	.5630+03	.7479+03	-20.4
015800	082	284	-11.3	.5608+03	.7455+03	-20.7
015900	083	283	-11.4	.5586+03	.7430+03	-20.9
016000	083	282	-11.6	.5564+03	.7405+03	-21.2
016100	084	282	-11.7	.5542+03	.7378+03	-21.6
016200	084	282	-11.7	.5520+03	.7351+03	-21.9
016300	085	282	-11.8	.5498+03	.7324+03	-22.3
016400	085	282	-11.9	.5476+03	.7297+03	-22.6
016500	086	283	-11.9	.5455+03	.7270+03	-23.0
016600	087	283	-12.0	.5433+03	.7243+03	-23.4
016700	087	283	-12.1	.5411+03	.7217+03	-23.7
016800	088	283	-12.2	.5390+03	.7190+03	-24.1
016900	088	283	-12.2	.5369+03	.7164+03	-24.4
017000	089	283	-12.3	.5347+03	.7137+03	-24.8
017100	089	284	-12.6	.5326+03	.7117+03	-24.8
017200	089	284	-12.9	.5305+03	.7097+03	-24.7
017300	089	285	-13.2	.5284+03	.7077+03	-24.7
017400	089	285	-13.5	.5263+03	.7056+03	-24.6
017500	089	286	-13.8	.5242+03	.7036+03	-24.5
017600	089	287	-14.1	.5221+03	.7016+03	-24.5
017700	090	287	-14.4	.5200+03	.6996+03	-24.5
017800	090	288	-14.7	.5179+03	.6977+03	-24.4
017900	090	288	-15.0	.5158+03	.6957+03	-24.4
018000	090	289	-15.3	.5138+03	.6937+03	-24.3
018100	090	289	-15.5	.5117+03	.6914+03	-24.6
018200	091	289	-15.6	.5097+03	.6890+03	-24.8
018300	091	289	-15.8	.5076+03	.6867+03	-25.1
018400	091	289	-15.9	.5056+03	.6843+03	-25.4
018500	091	290	-16.1	.5035+03	.6820+03	-25.6
018600	092	290	-16.3	.5015+03	.6797+03	-25.9
018700	092	290	-16.4	.4995+03	.6774+03	-26.2
018800	092	290	-16.6	.4975+03	.6751+03	-26.5
018900	093	290	-16.7	.4955+03	.6728+03	-26.7
019000	093	290	-16.9	.4935+03	.6705+03	-27.0
019100	093	290	-17.1	.4915+03	.6683+03	-27.4
019200	094	290	-17.3	.4895+03	.6661+03	-27.7
019300	094	290	-17.4	.4875+03	.6638+03	-28.1
019400	095	290	-17.6	.4855+03	.6616+03	-28.4
019500	095	290	-17.8	.4836+03	.6594+03	-28.8
019600	095	290	-18.0	.4816+03	.6572+03	-29.2
019700	096	290	-18.2	.4796+03	.6550+03	-29.5
019800	096	290	-18.3	.4777+03	.6528+03	-29.9
019900	097	290	-18.5	.4758+03	.6507+03	-30.2

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
015000	081	290	-10.0	.5788+03	.7656+03	-18.5
015100	081	289	-10.2	.5765+03	.7630+03	-18.8
015200	081	288	-10.3	.5743+03	.7605+03	-19.0
015300	081	288	-10.5	.5720+03	.7580+03	-19.3
015400	082	287	-10.6	.5698+03	.7554+03	-19.6
015500	082	286	-10.8	.5675+03	.7529+03	-19.8
015600	082	285	-11.0	.5653+03	.7504+03	-20.1
015700	082	284	-11.1	.5630+03	.7479+03	-20.4
015800	082	284	-11.3	.5608+03	.7455+03	-20.7
015900	083	283	-11.4	.5586+03	.7430+03	-20.9
016000	083	282	-11.6	.5564+03	.7405+03	-21.2
016100	084	282	-11.7	.5542+03	.7378+03	-21.6
016200	084	282	-11.7	.5520+03	.7351+03	-21.9
016300	085	282	-11.8	.5498+03	.7324+03	-22.3
016400	085	282	-11.9	.5476+03	.7297+03	-22.6
016500	086	283	-11.9	.5455+03	.7270+03	-23.0
016600	087	283	-12.0	.5433+03	.7243+03	-23.4
016700	087	283	-12.1	.5411+03	.7217+03	-23.7
016800	088	283	-12.2	.5390+03	.7190+03	-24.1
016900	088	283	-12.2	.5369+03	.7164+03	-24.4
017000	089	283	-12.3	.5347+03	.7137+03	-24.8
017100	089	284	-12.6	.5326+03	.7117+03	-24.8
017200	089	284	-12.9	.5305+03	.7097+03	-24.7
017300	089	285	-13.2	.5284+03	.7077+03	-24.7
017400	089	285	-13.5	.5263+03	.7056+03	-24.6
017500	089	286	-13.8	.5242+03	.7036+03	-24.5
017600	089	287	-14.1	.5221+03	.7016+03	-24.5
017700	090	287	-14.4	.5200+03	.6996+03	-24.5
017800	090	288	-14.7	.5179+03	.6977+03	-24.4
017900	090	288	-15.0	.5158+03	.6957+03	-24.4
018000	090	289	-15.3	.5138+03	.6937+03	-24.3
018100	090	289	-15.5	.5117+03	.6914+03	-24.6
018200	091	289	-15.6	.5097+03	.6890+03	-24.8
018300	091	289	-15.8	.5076+03	.6867+03	-25.1
018400	091	289	-15.9	.5056+03	.6843+03	-25.4
018500	091	290	-16.1	.5035+03	.6820+03	-25.6
018600	092	290	-16.3	.5015+03	.6797+03	-25.9
018700	092	290	-16.4	.4995+03	.6774+03	-26.2
018800	092	290	-16.6	.4975+03	.6751+03	-26.5
018900	093	290	-16.7	.4955+03	.6728+03	-26.7
019000	093	290	-16.9	.4935+03	.6705+03	-27.0
019100	093	290	-17.1	.4915+03	.6683+03	-27.4
019200	094	290	-17.3	.4895+03	.6661+03	-27.7
019300	094	290	-17.4	.4875+03	.6638+03	-28.1
019400	095	290	-17.6	.4855+03	.6616+03	-28.4
019500	095	290	-17.8	.4836+03	.6594+03	-28.8
019600	095	290	-18.0	.4816+03	.6572+03	-29.2
019700	096	290	-18.2	.4796+03	.6550+03	-29.5
019800	096	290	-18.3	.4777+03	.6528+03	-29.9
019900	097	290	-18.5	.4758+03	.6507+03	-30.2

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
020000	097	290	-18.7	.4738+03	.6485+03	-30.6
020100	097	290	-19.0	.4719+03	.6465+03	-30.7
020200	098	291	-19.2	.4700+03	.6445+03	-30.8
020300	098	291	-19.5	.4681+03	.6425+03	-31.0
020400	099	292	-19.7	.4661+03	.6406+03	-31.1
020500	099	292	-20.0	.4642+03	.6386+03	-31.2
020600	100	292	-20.3	.4623+03	.6367+03	-31.3
020700	100	293	-20.5	.4605+03	.6347+03	-31.4
020800	101	293	-20.8	.4586+03	.6328+03	-31.6
020900	101	294	-21.0	.4567+03	.6308+03	-31.7
021000	102	294	-21.3	.4548+03	.6289+03	-31.8
021100	102	294	-21.5	.4530+03	.6269+03	-31.9
021200	103	294	-21.8	.4511+03	.6250+03	-32.0
021300	103	294	-22.0	.4492+03	.6230+03	-32.2
021400	104	294	-22.3	.4474+03	.6211+03	-32.3
021500	104	295	-22.5	.4455+03	.6191+03	-32.4
021600	104	295	-22.8	.4437+03	.6172+03	-32.5
021700	105	295	-23.0	.4418+03	.6153+03	-32.6
021800	105	295	-23.3	.4400+03	.6133+03	-32.8
021900	106	295	-23.5	.4382+03	.6114+03	-32.9
022000	106	295	-23.8	.4364+03	.6095+03	-33.0
022100	106	295	-24.0	.4346+03	.6075+03	-33.3
022200	106	294	-24.2	.4328+03	.6055+03	-33.6
022300	106	294	-24.5	.4310+03	.6035+03	-33.9
022400	106	294	-24.7	.4292+03	.6015+03	-34.2
022500	106	293	-24.9	.4274+03	.5996+03	-34.5
022600	106	293	-25.1	.4256+03	.5976+03	-34.9
022700	106	293	-25.3	.4238+03	.5957+03	-35.2
022800	106	293	-25.6	.4221+03	.5937+03	-35.5
022900	106	292	-25.8	.4203+03	.5918+03	-35.8
023000	106	292	-26.0	.4186+03	.5898+03	-36.1
023100	106	292	-26.3	.4168+03	.5880+03	-36.4
023200	107	292	-26.5	.4150+03	.5861+03	-36.6
023300	107	292	-26.8	.4133+03	.5843+03	-36.9
023400	108	292	-27.0	.4116+03	.5824+03	-37.1
023500	108	291	-27.3	.4098+03	.5806+03	-37.4
023600	109	291	-27.6	.4081+03	.5788+03	-37.7
023700	109	291	-27.8	.4064+03	.5769+03	-37.9
023800	110	291	-28.1	.4047+03	.5751+03	-38.2
023900	110	291	-28.3	.4030+03	.5733+03	-38.4
024000	111	291	-28.6	.4013+03	.5715+03	-38.7
024100	111	291	-28.9	.3996+03	.5697+03	-38.9
024200	111	291	-29.1	.3979+03	.5679+03	-39.2
024300	112	291	-29.4	.3962+03	.5661+03	-39.4
024400	112	291	-29.7	.3945+03	.5643+03	-39.7
024500	112	291	-29.9	.3928+03	.5626+03	-39.9
024600	112	291	-30.2	.3911+03	.5608+03	-40.2
024700	112	291	-30.5	.3895+03	.5590+03	-40.4
024800	113	291	-30.8	.3878+03	.5573+03	-40.7
024900	113	291	-31.0	.3862+03	.5555+03	-40.9

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
025000	113	291	-31.3	.3845+03	.5538+03	-41.2
025100	113	291	-31.6	.3829+03	.5521+03	-41.4
025200	114	290	-31.9	.3812+03	.5504+03	-41.6
025300	114	290	-32.2	.3796+03	.5486+03	-41.9
025400	115	290	-32.5	.3779+03	.5470+03	-42.1
025500	115	289	-32.7	.3763+03	.5453+03	-42.3
025600	115	289	-33.0	.3747+03	.5436+03	-42.5
025700	116	289	-33.3	.3731+03	.5419+03	-42.7
025800	116	289	-33.6	.3715+03	.5402+03	-43.0
025900	117	288	-33.9	.3699+03	.5385+03	-43.2
026000	117	288	-34.2	.3683+03	.5369+03	-43.4
026100	118	288	-34.4	.3667+03	.5351+03	-43.8
026200	118	287	-34.7	.3651+03	.5333+03	-44.3
026300	119	287	-34.9	.3635+03	.5315+03	-44.7
026400	119	287	-35.2	.3619+03	.5297+03	-45.1
026500	120	286	-35.4	.3604+03	.5280+03	-45.5
026600	121	286	-35.6	.3588+03	.5262+03	-46.0
026700	121	286	-35.9	.3572+03	.5244+03	-46.4
026800	122	286	-36.1	.3557+03	.5227+03	-46.8
026900	122	285	-36.4	.3541+03	.5209+03	-47.3
027000	123	285	-36.6	.3526+03	.5192+03	-47.7
027100	123	285	-36.9	.3510+03	.5176+03	-48.0
027200	123	285	-37.2	.3495+03	.5160+03	-48.3
027300	123	284	-37.5	.3479+03	.5143+03	-48.7
027400	123	284	-37.8	.3464+03	.5127+03	-49.0
027500	122	284	-38.1	.3449+03	.5111+03	-49.3
027600	122	284	-38.4	.3434+03	.5095+03	-49.6
027700	122	284	-38.7	.3419+03	.5079+03	-49.9
027800	122	283	-39.0	.3404+03	.5063+03	-50.3
027900	122	283	-39.3	.3389+03	.5048+03	-50.6
028000	122	283	-39.6	.3374+03	.5032+03	-50.9
028100	121	283	-39.9	.3359+03	.5016+03	-51.2
028200	121	283	-40.2	.3344+03	.5000+03	-51.4
028300	120	283	-40.5	.3329+03	.4983+03	-51.7
028400	119	283	-40.8	.3314+03	.4967+03	-51.9
028500	119	283	-41.0	.3299+03	.4952+03	-52.2
028600	118	283	-41.3	.3284+03	.4936+03	-52.5
028700	117	283	-41.6	.3270+03	.4920+03	-52.7
028800	116	283	-41.9	.3255+03	.4904+03	-53.0
028900	116	283	-42.2	.3241+03	.4888+03	-53.2
029000	115	283	-42.5	.3226+03	.4873+03	-53.5
029100	114	283	-42.8	.3212+03	.4856+03	-53.6
029200	114	284	-43.0	.3197+03	.4839+03	-53.8
029300	113	284	-43.3	.3183+03	.4823+03	-53.9
029400	113	284	-43.5	.3169+03	.4806+03	-54.0
029500	112	284	-43.8	.3154+03	.4790+03	-54.1
029600	112	285	-44.0	.3140+03	.4774+03	-54.3
029700	111	285	-44.3	.3126+03	.4757+03	-54.4
029800	111	285	-44.5	.3112+03	.4741+03	-54.5
029900	110	286	-44.8	.3098+03	.4725+03	-54.7

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
030000	110	286	-45.0	.3084+03	.4709+03	-54.8
030100	110	287	-45.3	.3070+03	.4694+03	-55.1
030200	109	287	-45.6	.3056+03	.4679+03	-55.4
030300	109	288	-46.0	.3042+03	.4664+03	-55.6
030400	108	288	-46.3	.3028+03	.4650+03	-55.9
030500	108	289	-46.6	.3014+03	.4635+03	-56.2
030600	107	290	-46.9	.3000+03	.4620+03	-56.5
030700	107	290	-47.2	.2987+03	.4606+03	-56.8
030800	107	291	-47.6	.2973+03	.4591+03	-57.0
030900	106	291	-47.9	.2960+03	.4577+03	-57.3
031000	106	292	-48.2	.2946+03	.4562+03	-57.6
031100	106	293	-48.4	.2932+03	.4546+03	-57.8
031200	105	293	-48.7	.2919+03	.4529+03	-58.0
031300	105	294	-48.9	.2905+03	.4513+03	-58.2
031400	105	295	-49.1	.2892+03	.4497+03	-58.4
031500	104	295	-49.3	.2879+03	.4481+03	-58.5
031600	104	296	-49.6	.2865+03	.4465+03	-58.7
031700	104	297	-49.8	.2852+03	.4449+03	-58.9
031800	103	298	-50.0	.2839+03	.4433+03	-59.1
031900	103	298	-50.3	.2826+03	.4417+03	-59.3
032000	103	299	-50.5	.2813+03	.4401+03	-59.5
032100	103	299	-50.7	.2800+03	.4384+03	-59.7
032200	103	300	-50.8	.2787+03	.4366+03	-59.9
032300	103	300	-51.0	.2774+03	.4349+03	-60.0
032400	103	301	-51.1	.2761+03	.4332+03	-60.2
032500	103	301	-51.3	.2748+03	.4315+03	-60.4
032600	104	301	-51.5	.2735+03	.4298+03	-60.6
032700	104	302	-51.6	.2722+03	.4281+03	-60.8
032800	104	302	-51.8	.2710+03	.4264+03	-60.9
032900	104	303	-51.9	.2697+03	.4247+03	-61.1
033000	104	303	-52.1	.2684+03	.4231+03	-61.3
033100	104	303	-52.2	.2672+03	.4214+03	-61.4
033200	104	302	-52.4	.2659+03	.4197+03	-61.5
033300	104	302	-52.5	.2647+03	.4180+03	-61.6
033400	104	301	-52.7	.2634+03	.4163+03	-61.7
033500	104	301	-52.8	.2622+03	.4146+03	-61.8
033600	104	301	-53.0	.2610+03	.4130+03	-62.0
033700	104	300	-53.1	.2598+03	.4113+03	-62.1
033800	104	300	-53.3	.2585+03	.4097+03	-62.2
033900	104	299	-53.4	.2573+03	.4080+03	-62.3
034000	104	298	-53.6	.2561+03	.4064+03	-62.4
034100	104	298	-53.7	.2549+03	.4047+03	-62.5
034200	103	296	-53.8	.2537+03	.4029+03	-62.7
034300	103	295	-53.9	.2525+03	.4012+03	-62.8
034400	103	294	-54.0	.2513+03	.3996+03	-62.9
034500	102	293	-54.1	.2501+03	.3979+03	-63.0
034600	102	291	-54.3	.2489+03	.3962+03	-63.2
034700	102	290	-54.4	.2478+03	.3945+03	-63.3
034800	102	289	-54.5	.2466+03	.3929+03	-63.4
034900	102	287	-54.6	.2454+03	.3912+03	-63.6

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
035000	102	286	-54.7	.2443+03	.3896+03	-63.7
035100	103	285	-54.6	.2431+03	.3875+03	-63.7
035200	104	284	-54.5	.2420+03	.3855+03	-63.7
035300	106	284	-54.4	.2408+03	.3835+03	-63.7
035400	107	283	-54.3	.2397+03	.3816+03	-63.7
035500	108	282	-54.2	.2386+03	.3796+03	-63.7
035600	110	282	-54.1	.2375+03	.3776+03	-63.7
035700	111	281	-54.0	.2363+03	.3757+03	-63.7
035800	112	280	-53.9	.2352+03	.3737+03	-63.7
035900	114	280	-53.8	.2341+03	.3718+03	-63.7
036000	115	279	-53.7	.2330+03	.3699+03	-63.7
036100	116	278	-53.7	.2319+03	.3681+03	-63.7
036200	118	277	-53.6	.2308+03	.3662+03	-63.6
036300	119	275	-53.6	.2297+03	.3644+03	-63.6
036400	120	274	-53.5	.2287+03	.3626+03	-63.5
036500	122	273	-53.4	.2276+03	.3609+03	-63.5
036600	123	272	-53.4	.2265+03	.3591+03	-63.5
036700	125	271	-53.3	.2254+03	.3573+03	-63.4
036800	127	270	-53.3	.2244+03	.3555+03	-63.4
036900	128	269	-53.3	.2233+03	.3538+03	-63.3
037000	130	268	-53.2	.2223+03	.3520+03	-63.3
037100	131	268	-53.4	.2212+03	.3508+03	-63.4
037200	132	267	-53.7	.2202+03	.3495+03	-63.5
037300	134	267	-53.9	.2191+03	.3482+03	-63.6
037400	135	266	-54.2	.2181+03	.3470+03	-63.7
037500	136	266	-54.4	.2171+03	.3457+03	-63.8
037600	137	266	-54.6	.2160+03	.3444+03	-63.9
037700	138	265	-54.9	.2150+03	.3432+03	-64.0
037800	140	265	-55.1	.2140+03	.3419+03	-64.1
037900	141	264	-55.4	.2130+03	.3407+03	-64.2
038000	142	264	-55.6	.2120+03	.3395+03	-64.3
038100	143	264	-55.7	.2110+03	.3381+03	-64.6
038200	143	264	-55.9	.2100+03	.3367+03	-64.8
038300	144	264	-56.0	.2090+03	.3353+03	-65.1
038400	144	264	-56.2	.2080+03	.3339+03	-65.4
038500	145	264	-56.3	.2070+03	.3325+03	-65.6
038600	146	264	-56.4	.2060+03	.3312+03	-65.9
038700	146	264	-56.6	.2050+03	.3298+03	-66.2
038800	147	264	-56.7	.2041+03	.3284+03	-66.5
038900	147	264	-56.9	.2031+03	.3271+03	-66.7
039000	148	264	-57.0	.2021+03	.3258+03	-67.0
039100	148	264	-56.9	.2012+03	.3241+03	-66.9
039200	149	264	-56.8	.2002+03	.3224+03	-66.8
039300	149	264	-56.7	.1992+03	.3207+03	-66.7
039400	150	264	-56.6	.1983+03	.3190+03	-66.6
039500	150	265	-56.6	.1973+03	.3174+03	-66.5
039600	151	265	-56.5	.1964+03	.3157+03	-66.4
039700	151	265	-56.4	.1955+03	.3141+03	-66.3
039800	152	265	-56.3	.1945+03	.3125+03	-66.2
039900	152	265	-56.2	.1936+03	.3109+03	-66.1

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
040000	153	265	-56.1	.1927+03	.3092+03	-66.0
040100	154	265	-56.1	.1918+03	.3077+03	-66.0
040200	155	265	-56.0	.1909+03	.3062+03	-66.0
040300	156	265	-56.0	.1899+03	.3047+03	-66.0
040400	157	265	-55.9	.1890+03	.3031+03	-66.0
040500	158	265	-55.8	.1881+03	.3016+03	-65.9
040600	160	265	-55.8	.1873+03	.3001+03	-65.9
040700	161	265	-55.8	.1864+03	.2986+03	-65.9
040800	162	265	-55.7	.1855+03	.2971+03	-65.9
040900	163	265	-55.7	.1846+03	.2957+03	-65.9
041000	164	265	-55.6	.1837+03	.2942+03	-65.9
041100	165	265	-55.6	.1828+03	.2929+03	-65.9
041200	166	265	-55.7	.1820+03	.2915+03	-65.9
041300	167	265	-55.7	.1811+03	.2902+03	-65.9
041400	168	265	-55.8	.1803+03	.2889+03	-65.9
041500	169	264	-55.8	.1794+03	.2876+03	-65.8
041600	170	264	-55.9	.1785+03	.2863+03	-65.8
041700	171	264	-55.9	.1777+03	.2850+03	-65.8
041800	172	264	-56.0	.1769+03	.2837+03	-65.8
041900	173	264	-56.0	.1760+03	.2824+03	-65.8
042000	174	264	-56.1	.1752+03	.2812+03	-65.8
042100	172	264	-56.2	.1743+03	.2800+03	-65.9
042200	171	264	-56.4	.1735+03	.2788+03	-66.0
042300	169	265	-56.5	.1727+03	.2777+03	-66.2
042400	168	265	-56.7	.1719+03	.2765+03	-66.3
042500	166	265	-56.8	.1710+03	.2754+03	-66.4
042600	164	265	-56.9	.1702+03	.2743+03	-66.5
042700	163	265	-57.1	.1694+03	.2731+03	-66.6
042800	161	266	-57.2	.1686+03	.2720+03	-66.8
042900	160	266	-57.4	.1678+03	.2709+03	-66.9
043000	158	266	-57.5	.1670+03	.2698+03	-67.0
043100	158	266	-57.6	.1662+03	.2686+03	-67.1
043200	158	266	-57.7	.1654+03	.2674+03	-67.2
043300	158	266	-57.8	.1646+03	.2662+03	-67.3
043400	158	266	-57.9	.1638+03	.2651+03	-67.4
043500	158	266	-57.9	.1630+03	.2639+03	-67.5
043600	158	266	-58.0	.1622+03	.2627+03	-67.6
043700	158	266	-58.1	.1615+03	.2616+03	-67.7
043800	158	266	-58.2	.1607+03	.2604+03	-67.8
043900	158	266	-58.3	.1599+03	.2593+03	-67.9
044000	158	266	-58.4	.1592+03	.2582+03	-68.0
044100	158	266	-58.5	.1584+03	.2570+03	-68.1
044200	159	266	-58.5	.1576+03	.2559+03	-68.1
044300	159	265	-58.6	.1569+03	.2547+03	-68.2
044400	160	265	-58.7	.1561+03	.2536+03	-68.2
044500	160	265	-58.7	.1554+03	.2524+03	-68.3
044600	161	265	-58.8	.1546+03	.2513+03	-68.4
044700	161	265	-58.9	.1539+03	.2502+03	-68.4
044800	162	264	-59.0	.1531+03	.2490+03	-68.5
044900	162	264	-59.0	.1524+03	.2479+03	-68.5

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
045000	163	264	-59.1	.1516+03	.2468+03	-68.6
045100	164	264	-59.2	.1509+03	.2458+03	-9999.
045200	164	264	-59.4	.1502+03	.2448+03	-9999.
045300	165	264	-59.5	.1495+03	.2437+03	-9999.
045400	165	264	-59.7	.1487+03	.2427+03	-9999.
045500	166	263	-59.8	.1480+03	.2417+03	-9999.
045600	167	263	-59.9	.1473+03	.2407+03	-9999.
045700	167	263	-60.1	.1466+03	.2397+03	-9999.
045800	168	263	-60.2	.1459+03	.2387+03	-9999.
045900	168	263	-60.4	.1452+03	.2377+03	-9999.
046000	169	263	-60.5	.1445+03	.2367+03	-9999.
046100	169	263	-60.7	.1438+03	.2358+03	-9999.
046200	169	263	-60.9	.1431+03	.2349+03	-9999.
046300	168	264	-61.2	.1424+03	.2340+03	-9999.
046400	168	264	-61.4	.1417+03	.2331+03	-9999.
046500	168	264	-61.6	.1410+03	.2322+03	-9999.
046600	168	264	-61.8	.1403+03	.2313+03	-9999.
046700	168	264	-62.0	.1396+03	.2304+03	-9999.
046800	167	265	-62.3	.1389+03	.2295+03	-9999.
046900	167	265	-62.5	.1383+03	.2286+03	-9999.
047000	167	265	-62.7	.1376+03	.2277+03	-9999.
047100	166	265	-62.8	.1369+03	.2267+03	-9999.
047200	165	265	-62.9	.1362+03	.2257+03	-9999.
047300	164	265	-63.0	.1356+03	.2247+03	-9999.
047400	163	265	-63.1	.1349+03	.2237+03	-9999.
047500	161	265	-63.1	.1342+03	.2227+03	-9999.
047600	160	264	-63.2	.1336+03	.2217+03	-9999.
047700	159	264	-63.3	.1329+03	.2207+03	-9999.
047800	158	264	-63.4	.1323+03	.2197+03	-9999.
047900	157	264	-63.5	.1316+03	.2187+03	-9999.
048000	156	264	-63.6	.1310+03	.2177+03	-9999.
048100	155	265	-63.7	.1303+03	.2167+03	-9999.
048200	154	265	-63.8	.1297+03	.2158+03	-9999.
048300	153	266	-63.9	.1290+03	.2148+03	-9999.
048400	152	267	-64.0	.1284+03	.2138+03	-9999.
048500	151	267	-64.1	.1278+03	.2129+03	-9999.
048600	150	268	-64.1	.1271+03	.2119+03	-9999.
048700	149	269	-64.2	.1265+03	.2109+03	-9999.
048800	148	270	-64.3	.1259+03	.2100+03	-9999.
048900	147	270	-64.4	.1253+03	.2090+03	-9999.
049000	146	271	-64.5	.1246+03	.2081+03	-9999.
049100	145	271	-64.5	.1240+03	.2071+03	-9999.
049200	144	272	-64.6	.1234+03	.2061+03	-9999.
049300	143	272	-64.6	.1228+03	.2052+03	-9999.
049400	142	272	-64.7	.1222+03	.2042+03	-9999.
049500	141	272	-64.8	.1216+03	.2032+03	-9999.
049600	140	273	-64.8	.1210+03	.2023+03	-9999.
049700	139	273	-64.8	.1204+03	.2013+03	-9999.
049800	138	273	-64.9	.1198+03	.2004+03	-9999.
049900	137	274	-64.9	.1192+03	.1994+03	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
050000	136	274	-65.0	.1186+03	.1985+03	-9999.
050100	135	273	-65.1	.1180+03	.1977+03	-9999.
050200	134	271	-65.3	.1174+03	.1968+03	-9999.
050300	134	270	-65.4	.1168+03	.1960+03	-9999.
050400	133	268	-65.6	.1163+03	.1951+03	-9999.
050500	133	267	-65.7	.1157+03	.1943+03	-9999.
050600	132	265	-65.8	.1151+03	.1934+03	-9999.
050700	132	264	-66.0	.1145+03	.1926+03	-9999.
050800	132	262	-66.1	.1140+03	.1918+03	-9999.
050900	132	261	-66.3	.1134+03	.1909+03	-9999.
051000	132	259	-66.4	.1128+03	.1901+03	-9999.
051100	132	259	-66.5	.1123+03	.1893+03	-9999.
051200	132	258	-66.6	.1117+03	.1884+03	-9999.
051300	132	258	-66.7	.1111+03	.1876+03	-9999.
051400	132	258	-66.8	.1106+03	.1867+03	-9999.
051500	132	257	-66.9	.1100+03	.1859+03	-9999.
051600	132	257	-67.1	.1095+03	.1851+03	-9999.
051700	132	257	-67.2	.1089+03	.1843+03	-9999.
051800	132	257	-67.3	.1084+03	.1834+03	-9999.
051900	132	256	-67.4	.1079+03	.1826+03	-9999.
052000	132	256	-67.5	.1073+03	.1818+03	-9999.
052100	131	257	-67.4	.1068+03	.1808+03	-9999.
052200	130	258	-67.2	.1062+03	.1797+03	-9999.
052300	130	259	-67.1	.1057+03	.1787+03	-9999.
052400	129	261	-66.9	.1052+03	.1777+03	-9999.
052500	128	262	-66.8	.1047+03	.1767+03	-9999.
052600	128	263	-66.7	.1041+03	.1757+03	-9999.
052700	127	264	-66.5	.1036+03	.1747+03	-9999.
052800	127	266	-66.4	.1031+03	.1737+03	-9999.
052900	126	267	-66.2	.1026+03	.1727+03	-9999.
053000	126	268	-66.1	.1021+03	.1717+03	-9999.
053100	125	269	-66.1	.1016+03	.1709+03	-9999.
053200	124	270	-66.2	.1011+03	.1701+03	-9999.
053300	123	271	-66.2	.1005+03	.1693+03	-9999.
053400	122	272	-66.3	.1000+03	.1685+03	-9999.
053500	121	273	-66.3	.9955+02	.1677+03	-9999.
053600	121	274	-66.4	.9905+02	.1669+03	-9999.
053700	120	276	-66.4	.9856+02	.1661+03	-9999.
053800	119	277	-66.5	.9807+02	.1653+03	-9999.
053900	119	278	-66.5	.9758+02	.1645+03	-9999.
054000	118	279	-66.6	.9709+02	.1638+03	-9999.
054100	117	279	-66.6	.9661+02	.1630+03	-9999.
054200	116	278	-66.7	.9612+02	.1622+03	-9999.
054300	115	278	-66.7	.9564+02	.1614+03	-9999.
054400	114	277	-66.8	.9517+02	.1606+03	-9999.
054500	113	277	-66.8	.9469+02	.1599+03	-9999.
054600	112	277	-66.8	.9422+02	.1591+03	-9999.
054700	111	276	-66.9	.9375+02	.1583+03	-9999.
054800	110	276	-66.9	.9328+02	.1576+03	-9999.
054900	109	275	-67.0	.9281+02	.1568+03	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
055000	108	275	-67.0	.9235+02	.1561+03	-9999.
055100	107	275	-67.2	.9189+02	.1554+03	-9999.
055200	106	274	-67.3	.9142+02	.1547+03	-9999.
055300	105	274	-67.5	.9096+02	.1541+03	-9999.
055400	104	274	-67.6	.9051+02	.1534+03	-9999.
055500	102	273	-67.8	.9005+02	.1528+03	-9999.
055600	101	273	-68.0	.8960+02	.1521+03	-9999.
055700	100	272	-68.1	.8915+02	.1515+03	-9999.
055800	099	272	-68.3	.8870+02	.1508+03	-9999.
055900	098	271	-68.4	.8825+02	.1502+03	-9999.
056000	097	271	-68.6	.8781+02	.1495+03	-9999.
056100	096	271	-68.6	.8737+02	.1488+03	-9999.
056200	096	270	-68.7	.8693+02	.1481+03	-9999.
056300	095	270	-68.7	.8649+02	.1474+03	-9999.
056400	094	270	-68.7	.8606+02	.1466+03	-9999.
056500	093	270	-68.7	.8562+02	.1459+03	-9999.
056600	093	269	-68.8	.8519+02	.1452+03	-9999.
056700	092	269	-68.8	.8476+02	.1445+03	-9999.
056800	091	269	-68.8	.8434+02	.1438+03	-9999.
056900	091	268	-68.9	.8391+02	.1431+03	-9999.
057000	090	268	-68.9	.8349+02	.1424+03	-9999.
057100	090	267	-68.9	.8307+02	.1417+03	-9999.
057200	090	266	-68.9	.8265+02	.1410+03	-9999.
057300	089	265	-68.9	.8223+02	.1403+03	-9999.
057400	089	264	-68.9	.8182+02	.1395+03	-9999.
057500	089	264	-68.9	.8140+02	.1388+03	-9999.
057600	089	263	-68.9	.8099+02	.1381+03	-9999.
057700	089	262	-68.9	.8058+02	.1374+03	-9999.
057800	089	261	-68.9	.8018+02	.1368+03	-9999.
057900	089	260	-68.9	.7977+02	.1361+03	-9999.
058000	089	259	-68.9	.7937+02	.1354+03	-9999.
058100	089	258	-68.9	.7897+02	.1347+03	-9999.
058200	090	257	-68.8	.7857+02	.1339+03	-9999.
058300	090	257	-68.8	.7818+02	.1332+03	-9999.
058400	090	256	-68.7	.7778+02	.1325+03	-9999.
058500	091	255	-68.6	.7739+02	.1318+03	-9999.
058600	091	254	-68.6	.7700+02	.1311+03	-9999.
058700	092	253	-68.6	.7661+02	.1304+03	-9999.
058800	092	253	-68.5	.7623+02	.1298+03	-9999.
058900	093	252	-68.4	.7584+02	.1291+03	-9999.
059000	093	251	-68.4	.7546+02	.1284+03	-9999.
059100	093	252	-67.9	.7508+02	.1274+03	-9999.
059200	092	253	-67.4	.7471+02	.1265+03	-9999.
059300	092	254	-66.9	.7434+02	.1256+03	-9999.
059400	092	255	-66.4	.7397+02	.1247+03	-9999.
059500	092	255	-66.0	.7360+02	.1237+03	-9999.
059600	092	256	-65.5	.7323+02	.1228+03	-9999.
059700	091	257	-65.0	.7286+02	.1219+03	-9999.
059800	091	258	-64.5	.7250+02	.1210+03	-9999.
059900	091	259	-64.0	.7214+02	.1202+03	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
060000	091	260	-63.5	.7178+02	.1193+03	-9999.
060100	090	262	-63.6	.7143+02	.1187+03	-9999.
060200	089	263	-63.6	.7107+02	.1182+03	-9999.
060300	088	265	-63.7	.7072+02	.1176+03	-9999.
060400	087	267	-63.8	.7038+02	.1171+03	-9999.
060500	086	269	-63.8	.7003+02	.1166+03	-9999.
060600	085	270	-63.9	.6968+02	.1160+03	-9999.
060700	084	272	-64.0	.6934+02	.1155+03	-9999.
060800	084	274	-64.1	.6900+02	.1150+03	-9999.
060900	083	276	-64.1	.6866+02	.1144+03	-9999.
061000	083	278	-64.2	.6832+02	.1139+03	-9999.
061100	081	278	-64.1	.6798+02	.1133+03	-9999.
061200	080	279	-64.1	.6765+02	.1127+03	-9999.
061300	078	279	-64.0	.6732+02	.1121+03	-9999.
061400	077	280	-64.0	.6698+02	.1116+03	-9999.
061500	075	280	-63.9	.6665+02	.1110+03	-9999.
061600	073	281	-63.8	.6633+02	.1104+03	-9999.
061700	072	281	-63.8	.6600+02	.1098+03	-9999.
061800	070	282	-63.7	.6568+02	.1092+03	-9999.
061900	069	282	-63.7	.6535+02	.1087+03	-9999.
062000	067	283	-63.6	.6503+02	.1081+03	-9999.
062100	065	283	-63.5	.6471+02	.1075+03	-9999.
062200	064	283	-63.4	.6439+02	.1069+03	-9999.
062300	062	283	-63.3	.6408+02	.1064+03	-9999.
062400	061	283	-63.2	.6376+02	.1058+03	-9999.
062500	060	283	-63.1	.6345+02	.1052+03	-9999.
062600	058	283	-62.9	.6314+02	.1046+03	-9999.
062700	056	283	-62.8	.6283+02	.1041+03	-9999.
062800	055	283	-62.7	.6252+02	.1035+03	-9999.
062900	054	283	-62.6	.6222+02	.1029+03	-9999.
063000	052	283	-62.5	.6191+02	.1024+03	-9999.
063100	051	282	-62.5	.6161+02	.1019+03	-9999.
063200	050	281	-62.4	.6131+02	.1013+03	-9999.
063300	050	280	-62.4	.6101+02	.1008+03	-9999.
063400	049	279	-62.3	.6071+02	.1003+03	-9999.
063500	048	278	-62.3	.6041+02	.9979+02	-9999.
063600	048	277	-62.2	.6012+02	.9928+02	-9999.
063700	047	276	-62.2	.5982+02	.9877+02	-9999.
063800	046	274	-62.1	.5953+02	.9826+02	-9999.
063900	046	273	-62.1	.5924+02	.9776+02	-9999.
064000	045	272	-62.0	.5895+02	.9726+02	-9999.
064100	044	271	-62.0	.5866+02	.9678+02	-9999.
064200	044	271	-62.0	.5838+02	.9630+02	-9999.
064300	043	270	-61.9	.5809+02	.9582+02	-9999.
064400	043	270	-61.9	.5781+02	.9534+02	-9999.
064500	042	269	-61.9	.5753+02	.9487+02	-9999.
064600	041	269	-61.9	.5725+02	.9440+02	-9999.
064700	041	268	-61.9	.5697+02	.9393+02	-9999.
064800	040	267	-61.8	.5669+02	.9346+02	-9999.
064900	040	267	-61.8	.5641+02	.9300+02	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
065000	039	266	-61.8	.5614+02	.9254+02	-9999.
065100	039	266	-61.8	.5587+02	.9208+02	-9999.
065200	038	266	-61.8	.5559+02	.9162+02	-9999.
065300	038	266	-61.7	.5532+02	.9116+02	-9999.
065400	037	266	-61.7	.5505+02	.9071+02	-9999.
065500	037	266	-61.7	.5478+02	.9026+02	-9999.
065600	037	265	-61.7	.5452+02	.8981+02	-9999.
065700	036	265	-61.7	.5425+02	.8936+02	-9999.
065800	036	265	-61.6	.5399+02	.8892+02	-9999.
065900	035	265	-61.6	.5372+02	.8847+02	-9999.
066000	035	265	-61.6	.5346+02	.8803+02	-9999.
066100	035	266	-61.6	.5320+02	.8760+02	-9999.
066200	035	266	-61.6	.5294+02	.8717+02	-9999.
066300	035	267	-61.5	.5268+02	.8673+02	-9999.
066400	035	267	-61.5	.5243+02	.8630+02	-9999.
066500	035	268	-61.5	.5217+02	.8588+02	-9999.
066600	035	269	-61.5	.5192+02	.8545+02	-9999.
066700	035	269	-61.5	.5167+02	.8503+02	-9999.
066800	035	270	-61.4	.5142+02	.8461+02	-9999.
066900	035	270	-61.4	.5117+02	.8419+02	-9999.
067000	035	271	-61.4	.5092+02	.8377+02	-9999.
067100	035	272	-61.3	.5067+02	.8331+02	-9999.
067200	035	272	-61.1	.5043+02	.8286+02	-9999.
067300	035	273	-61.0	.5018+02	.8241+02	-9999.
067400	035	273	-60.9	.4994+02	.8196+02	-9999.
067500	035	274	-60.8	.4970+02	.8151+02	-9999.
067600	036	275	-60.6	.4945+02	.8106+02	-9999.
067700	036	275	-60.5	.4921+02	.8062+02	-9999.
067800	036	276	-60.4	.4897+02	.8018+02	-9999.
067900	036	276	-60.2	.4874+02	.7974+02	-9999.
068000	036	277	-60.1	.4850+02	.7930+02	-9999.
068100	035	279	-60.0	.4827+02	.7888+02	-9999.
068200	034	282	-59.9	.4804+02	.7846+02	-9999.
068300	033	285	-59.7	.4780+02	.7804+02	-9999.
068400	032	287	-59.6	.4757+02	.7762+02	-9999.
068500	031	291	-59.5	.4735+02	.7720+02	-9999.
068600	030	294	-59.4	.4712+02	.7679+02	-9999.
068700	029	297	-59.3	.4689+02	.7637+02	-9999.
068800	029	301	-59.1	.4667+02	.7597+02	-9999.
068900	028	304	-59.0	.4644+02	.7556+02	-9999.
069000	028	308	-58.9	.4622+02	.7515+02	-9999.
069100	027	309	-58.9	.4600+02	.7481+02	-9999.
069200	026	311	-59.0	.4578+02	.7447+02	-9999.
069300	025	312	-59.0	.4555+02	.7412+02	-9999.
069400	024	314	-59.1	.4534+02	.7378+02	-9999.
069500	023	316	-59.1	.4512+02	.7345+02	-9999.
069600	022	318	-59.2	.4490+02	.7311+02	-9999.
069700	021	321	-59.2	.4468+02	.7277+02	-9999.
069800	020	323	-59.3	.4447+02	.7244+02	-9999.
069900	019	326	-59.3	.4425+02	.7211+02	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
070000	018	329	-59.4	.4404+02	.7178+02	-9999.
070100	016	326	-59.5	.4383+02	.7145+02	-9999.
070200	015	322	-59.5	.4362+02	.7113+02	-9999.
070300	014	318	-59.6	.4341+02	.7081+02	-9999.
070400	012	313	-59.7	.4320+02	.7049+02	-9999.
070500	011	306	-59.7	.4299+02	.7018+02	-9999.
070600	010	298	-59.8	.4278+02	.6986+02	-9999.
070700	009	289	-59.9	.4257+02	.6955+02	-9999.
070800	009	278	-60.0	.4237+02	.6923+02	-9999.
070900	009	266	-60.0	.4216+02	.6892+02	-9999.
071000	009	255	-60.1	.4196+02	.6861+02	-9999.
071100	009	259	-59.9	.4176+02	.6821+02	-9999.
071200	009	263	-59.7	.4156+02	.6782+02	-9999.
071300	009	267	-59.5	.4136+02	.6742+02	-9999.
071400	009	271	-59.3	.4116+02	.6703+02	-9999.
071500	010	274	-59.1	.4096+02	.6664+02	-9999.
071600	010	278	-58.8	.4076+02	.6626+02	-9999.
071700	010	281	-58.6	.4056+02	.6587+02	-9999.
071800	010	284	-58.4	.4037+02	.6549+02	-9999.
071900	011	287	-58.2	.4017+02	.6511+02	-9999.
072000	011	290	-58.0	.3998+02	.6474+02	-9999.
072100	011	295	-58.1	.3979+02	.6446+02	-9999.
072200	010	301	-58.2	.3960+02	.6419+02	-9999.
072300	010	307	-58.4	.3941+02	.6392+02	-9999.
072400	010	313	-58.5	.3922+02	.6365+02	-9999.
072500	010	319	-58.6	.3903+02	.6338+02	-9999.
072600	010	325	-58.7	.3885+02	.6311+02	-9999.
072700	011	331	-58.8	.3866+02	.6285+02	-9999.
072800	011	336	-59.0	.3848+02	.6258+02	-9999.
072900	011	341	-59.1	.3829+02	.6232+02	-9999.
073000	012	346	-59.2	.3811+02	.6205+02	-9999.
073100	013	346	-59.2	.3793+02	.6179+02	-9999.
073200	014	346	-59.1	.3775+02	.6144+02	-9999.
073300	015	346	-59.1	.3756+02	.6113+02	-9999.
073400	016	346	-59.0	.3738+02	.6083+02	-9999.
073500	016	346	-59.0	.3720+02	.6052+02	-9999.
073600	017	346	-59.0	.3703+02	.6022+02	-9999.
073700	018	346	-58.9	.3685+02	.5992+02	-9999.
073800	019	346	-58.9	.3667+02	.5962+02	-9999.
073900	020	346	-58.8	.3650+02	.5932+02	-9999.
074000	021	346	-58.8	.3632+02	.5903+02	-9999.
074100	020	349	-58.7	.3615+02	.5873+02	-9999.
074200	018	352	-58.7	.3597+02	.5843+02	-9999.
074300	017	356	-58.6	.3580+02	.5813+02	-9999.
074400	016	001	-58.6	.3563+02	.5784+02	-9999.
074500	015	006	-58.5	.3545+02	.5754+02	-9999.
074600	015	011	-58.4	.3528+02	.5725+02	-9999.
074700	014	018	-58.4	.3511+02	.5696+02	-9999.
074800	013	024	-58.3	.3495+02	.5667+02	-9999.
074900	013	032	-58.3	.3478+02	.5638+02	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
075000	013	039	-58.2	.3461+02	.5609+02	-9999.
075100	013	042	-58.1	.3444+02	.5581+02	-9999.
075200	013	044	-58.1	.3428+02	.5553+02	-9999.
075300	013	047	-58.0	.3412+02	.5524+02	-9999.
075400	013	049	-58.0	.3395+02	.5497+02	-9999.
075500	013	052	-57.9	.3379+02	.5469+02	-9999.
075600	013	054	-57.8	.3363+02	.5441+02	-9999.
075700	013	057	-57.8	.3347+02	.5414+02	-9999.
075800	014	059	-57.7	.3331+02	.5386+02	-9999.
075900	014	062	-57.7	.3315+02	.5359+02	-9999.
076000	014	064	-57.6	.3299+02	.5332+02	-9999.
076100	014	064	-57.5	.3283+02	.5305+02	-9999.
076200	014	063	-57.5	.3268+02	.5278+02	-9999.
076300	014	063	-57.4	.3252+02	.5251+02	-9999.
076400	014	063	-57.3	.3237+02	.5224+02	-9999.
076500	013	063	-57.3	.3221+02	.5197+02	-9999.
076600	013	062	-57.2	.3206+02	.5171+02	-9999.
076700	013	062	-57.1	.3190+02	.5145+02	-9999.
076800	013	062	-57.0	.3175+02	.5118+02	-9999.
076900	013	061	-57.0	.3160+02	.5092+02	-9999.
077000	013	061	-56.9	.3145+02	.5066+02	-9999.
077100	014	061	-56.8	.3130+02	.5039+02	-9999.
077200	014	061	-56.6	.3115+02	.5012+02	-9999.
077300	015	061	-56.5	.3100+02	.4986+02	-9999.
077400	015	061	-56.4	.3086+02	.4959+02	-9999.
077500	016	061	-56.3	.3071+02	.4933+02	-9999.
077600	017	061	-56.1	.3057+02	.4906+02	-9999.
077700	017	061	-56.0	.3042+02	.4880+02	-9999.
077800	018	061	-55.9	.3028+02	.4854+02	-9999.
077900	018	061	-55.7	.3013+02	.4828+02	-9999.
078000	019	061	-55.6	.2999+02	.4802+02	-9999.
078100	020	062	-55.5	.2985+02	.4778+02	-9999.
078200	020	062	-55.4	.2971+02	.4754+02	-9999.
078300	021	063	-55.4	.2957+02	.4730+02	-9999.
078400	021	063	-55.3	.2943+02	.4706+02	-9999.
078500	022	064	-55.2	.2929+02	.4682+02	-9999.
078600	023	064	-55.1	.2915+02	.4658+02	-9999.
078700	023	065	-55.0	.2902+02	.4635+02	-9999.
078800	024	065	-55.0	.2888+02	.4611+02	-9999.
078900	024	066	-54.9	.2875+02	.4588+02	-9999.
079000	025	066	-54.8	.2861+02	.4565+02	-9999.
079100	025	066	-54.7	.2848+02	.4542+02	-9999.
079200	024	066	-54.7	.2834+02	.4519+02	-9999.
079300	024	066	-54.6	.2821+02	.4496+02	-9999.
079400	024	066	-54.5	.2807+02	.4473+02	-9999.
079500	023	066	-54.4	.2794+02	.4451+02	-9999.
079600	023	065	-54.4	.2781+02	.4429+02	-9999.
079700	023	065	-54.3	.2768+02	.4406+02	-9999.
079800	023	065	-54.2	.2755+02	.4384+02	-9999.
079900	022	065	-54.2	.2742+02	.4362+02	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
080000	022	065	-54.1	.2729+02	.4340+02	-9999.
080100	021	064	-54.0	.2716+02	.4317+02	-9999.
080200	020	063	-53.8	.2704+02	.4294+02	-9999.
080300	019	063	-53.7	.2691+02	.4271+02	-9999.
080400	018	062	-53.5	.2678+02	.4248+02	-9999.
080500	016	060	-53.3	.2666+02	.4225+02	-9999.
080600	015	059	-53.2	.2653+02	.4202+02	-9999.
080700	014	057	-53.1	.2641+02	.4180+02	-9999.
080800	013	056	-52.9	.2629+02	.4158+02	-9999.
080900	012	054	-52.8	.2616+02	.4135+02	-9999.
081000	011	051	-52.6	.2604+02	.4113+02	-9999.
081100	011	053	-52.6	.2592+02	.4095+02	-9999.
081200	011	055	-52.7	.2580+02	.4076+02	-9999.
081300	011	057	-52.7	.2568+02	.4058+02	-9999.
081400	011	059	-52.8	.2556+02	.4040+02	-9999.
081500	011	060	-52.8	.2544+02	.4022+02	-9999.
081600	011	062	-52.8	.2532+02	.4004+02	-9999.
081700	012	064	-52.9	.2520+02	.3986+02	-9999.
081800	012	066	-52.9	.2508+02	.3968+02	-9999.
081900	012	067	-53.0	.2497+02	.3950+02	-9999.
082000	012	069	-53.0	.2485+02	.3932+02	-9999.
082100	012	070	-53.1	.2473+02	.3916+02	-9999.
082200	013	072	-53.3	.2462+02	.3900+02	-9999.
082300	013	073	-53.4	.2450+02	.3884+02	-9999.
082400	013	074	-53.5	.2439+02	.3868+02	-9999.
082500	013	075	-53.6	.2427+02	.3852+02	-9999.
082600	014	076	-53.8	.2416+02	.3837+02	-9999.
082700	014	077	-53.9	.2405+02	.3821+02	-9999.
082800	014	078	-54.0	.2393+02	.3805+02	-9999.
082900	015	079	-54.2	.2382+02	.3790+02	-9999.
083000	015	080	-54.3	.2371+02	.3774+02	-9999.
083100	015	083	-54.2	.2360+02	.3754+02	-9999.
083200	015	086	-54.0	.2349+02	.3734+02	-9999.
083300	015	089	-53.9	.2338+02	.3714+02	-9999.
083400	015	092	-53.7	.2327+02	.3694+02	-9999.
083500	014	095	-53.6	.2316+02	.3675+02	-9999.
083600	015	098	-53.5	.2305+02	.3655+02	-9999.
083700	015	101	-53.3	.2294+02	.3636+02	-9999.
083800	015	104	-53.2	.2283+02	.3616+02	-9999.
083900	015	107	-53.0	.2273+02	.3597+02	-9999.
084000	015	110	-52.9	.2262+02	.3578+02	-9999.
084100	014	108	-52.9	.2251+02	.3561+02	-9999.
084200	013	107	-52.8	.2241+02	.3543+02	-9999.
084300	012	104	-52.8	.2231+02	.3526+02	-9999.
084400	011	102	-52.7	.2220+02	.3509+02	-9999.
084500	010	099	-52.7	.2210+02	.3492+02	-9999.
084600	009	095	-52.7	.2200+02	.3475+02	-9999.
084700	008	090	-52.6	.2189+02	.3459+02	-9999.
084800	007	085	-52.6	.2179+02	.3442+02	-9999.
084900	007	078	-52.5	.2169+02	.3425+02	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
085000	006	069	-52.5	.2159+02	.3409+02	-9999.
085100	006	068	-52.5	.2149+02	.3392+02	-9999.
085200	006	066	-52.5	.2139+02	.3376+02	-9999.
085300	006	065	-52.4	.2129+02	.3360+02	-9999.
085400	006	064	-52.4	.2119+02	.3344+02	-9999.
085500	006	063	-52.4	.2109+02	.3328+02	-9999.
085600	007	061	-52.4	.2099+02	.3312+02	-9999.
085700	007	060	-52.4	.2089+02	.3296+02	-9999.
085800	007	059	-52.3	.2079+02	.3281+02	-9999.
085900	007	058	-52.3	.2070+02	.3265+02	-9999.
086000	007	057	-52.3	.2060+02	.3249+02	-9999.
086100	006	056	-52.3	.2050+02	.3234+02	-9999.
086200	005	054	-52.3	.2041+02	.3220+02	-9999.
086300	004	052	-52.3	.2031+02	.3205+02	-9999.
086400	003	049	-52.3	.2022+02	.3190+02	-9999.
086500	002	042	-52.3	.2012+02	.3175+02	-9999.
086600	001	026	-52.4	.2003+02	.3160+02	-9999.
086700	001	338	-52.4	.1994+02	.3146+02	-9999.
086800	001	284	-52.4	.1984+02	.3131+02	-9999.
086900	002	266	-52.4	.1975+02	.3117+02	-9999.
087000	003	259	-52.4	.1966+02	.3103+02	-9999.
087100	003	265	-52.2	.1957+02	.3085+02	-9999.
087200	003	271	-51.9	.1948+02	.3068+02	-9999.
087300	003	278	-51.7	.1939+02	.3050+02	-9999.
087400	003	285	-51.5	.1930+02	.3033+02	-9999.
087500	003	292	-51.3	.1921+02	.3016+02	-9999.
087600	003	300	-51.0	.1912+02	.2999+02	-9999.
087700	003	307	-50.8	.1903+02	.2982+02	-9999.
087800	003	314	-50.6	.1894+02	.2965+02	-9999.
087900	003	320	-50.3	.1886+02	.2948+02	-9999.
088000	003	326	-50.1	.1877+02	.2932+02	-9999.
088100	004	329	-50.2	.1868+02	.2919+02	-9999.
088200	004	331	-50.3	.1860+02	.2907+02	-9999.
088300	005	333	-50.3	.1851+02	.2894+02	-9999.
088400	005	334	-50.4	.1843+02	.2882+02	-9999.
088500	006	335	-50.5	.1834+02	.2870+02	-9999.
088600	007	336	-50.6	.1826+02	.2857+02	-9999.
088700	007	337	-50.7	.1817+02	.2845+02	-9999.
088800	008	337	-50.7	.1809+02	.2833+02	-9999.
088900	008	338	-50.8	.1800+02	.2821+02	-9999.
089000	009	338	-50.9	.1792+02	.2809+02	-9999.
089100	009	337	-51.1	.1784+02	.2798+02	-9999.
089200	009	335	-51.3	.1775+02	.2788+02	-9999.
089300	008	333	-51.5	.1767+02	.2777+02	-9999.
089400	008	332	-51.7	.1759+02	.2767+02	-9999.
089500	008	330	-51.8	.1751+02	.2756+02	-9999.
089600	008	328	-52.0	.1743+02	.2746+02	-9999.
089700	008	326	-52.2	.1735+02	.2736+02	-9999.
089800	007	324	-52.4	.1727+02	.2725+02	-9999.
089900	007	321	-52.6	.1719+02	.2715+02	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
090000	007	319	-52.8	.1711+02	.2705+02	-9999.
090100	007	312	-52.5	.1703+02	.2689+02	-9999.
090200	008	307	-52.2	.1695+02	.2673+02	-9999.
090300	008	301	-52.0	.1687+02	.2657+02	-9999.
090400	009	297	-51.7	.1679+02	.2642+02	-9999.
090500	009	293	-51.4	.1672+02	.2626+02	-9999.
090600	010	289	-51.1	.1664+02	.2610+02	-9999.
090700	011	286	-50.8	.1656+02	.2595+02	-9999.
090800	012	283	-50.6	.1648+02	.2580+02	-9999.
090900	012	281	-50.3	.1641+02	.2564+02	-9999.
091000	013	279	-50.0	.1633+02	.2549+02	-9999.
091100	013	277	-49.9	.1626+02	.2537+02	-9999.
091200	014	276	-49.8	.1618+02	.2524+02	-9999.
091300	014	274	-49.7	.1611+02	.2511+02	-9999.
091400	015	273	-49.6	.1603+02	.2499+02	-9999.
091500	015	272	-49.5	.1596+02	.2486+02	-9999.
091600	015	270	-49.4	.1589+02	.2474+02	-9999.
091700	016	269	-49.3	.1582+02	.2461+02	-9999.
091800	016	268	-49.2	.1574+02	.2449+02	-9999.
091900	017	267	-49.1	.1567+02	.2437+02	-9999.
092000	017	266	-49.0	.1560+02	.2425+02	-9999.
092100	017	267	-49.0	.1553+02	.2413+02	-9999.
092200	018	267	-49.0	.1546+02	.2402+02	-9999.
092300	018	268	-49.0	.1539+02	.2391+02	-9999.
092400	018	269	-49.0	.1532+02	.2380+02	-9999.
092500	018	269	-49.0	.1525+02	.2369+02	-9999.
092600	019	270	-49.0	.1518+02	.2359+02	-9999.
092700	019	270	-49.0	.1511+02	.2348+02	-9999.
092800	019	271	-49.0	.1504+02	.2337+02	-9999.
092900	020	271	-49.0	.1497+02	.2326+02	-9999.
093000	020	272	-49.0	.1490+02	.2316+02	-9999.
093100	020	274	-49.0	.1483+02	.2305+02	-9999.
093200	021	276	-48.9	.1476+02	.2294+02	-9999.
093300	021	278	-48.9	.1470+02	.2283+02	-9999.
093400	021	280	-48.8	.1463+02	.2272+02	-9999.
093500	022	282	-48.8	.1456+02	.2261+02	-9999.
093600	022	284	-48.8	.1449+02	.2250+02	-9999.
093700	023	285	-48.7	.1443+02	.2240+02	-9999.
093800	023	287	-48.7	.1436+02	.2229+02	-9999.
093900	024	288	-48.6	.1430+02	.2218+02	-9999.
094000	024	290	-48.6	.1423+02	.2208+02	-9999.
094100	024	289	-48.5	.1416+02	.2197+02	-9999.
094200	024	288	-48.5	.1410+02	.2186+02	-9999.
094300	024	288	-48.4	.1403+02	.2176+02	-9999.
094400	024	287	-48.4	.1397+02	.2165+02	-9999.
094500	024	286	-48.3	.1391+02	.2155+02	-9999.
094600	025	285	-48.2	.1384+02	.2144+02	-9999.
094700	025	284	-48.2	.1378+02	.2134+02	-9999.
094800	025	284	-48.1	.1372+02	.2123+02	-9999.
094900	025	283	-48.1	.1365+02	.2113+02	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
095000	025	282	-48.0	.1359+02	.2103+02	-9999.
095100	025	283	-47.9	.1353+02	.2093+02	-9999.
095200	025	283	-47.9	.1347+02	.2082+02	-9999.
095300	026	284	-47.8	.1340+02	.2072+02	-9999.
095400	026	285	-47.8	.1334+02	.2062+02	-9999.
095500	026	285	-47.7	.1328+02	.2052+02	-9999.
095600	026	286	-47.6	.1322+02	.2042+02	-9999.
095700	026	286	-47.6	.1316+02	.2032+02	-9999.
095800	027	287	-47.5	.1310+02	.2023+02	-9999.
095900	027	287	-47.5	.1304+02	.2013+02	-9999.
096000	027	288	-47.4	.1298+02	.2003+02	-9999.
096100	028	291	-47.3	.1292+02	.1994+02	-9999.
096200	029	294	-47.3	.1286+02	.1984+02	-9999.
096300	029	296	-47.2	.1281+02	.1975+02	-9999.
096400	030	298	-47.2	.1275+02	.1965+02	-9999.
096500	031	301	-47.1	.1269+02	.1956+02	-9999.
096600	032	303	-47.0	.1263+02	.1947+02	-9999.
096700	034	305	-47.0	.1258+02	.1937+02	-9999.
096800	035	307	-46.9	.1252+02	.1928+02	-9999.
096900	036	308	-46.9	.1247+02	.1919+02	-9999.
097900	035	307	-46.1	.1190+02	.1832+02	-9999.
098900	034	306	-45.3	.1135+02	.1748+02	-9999.
099900	034	306	-44.5	.1084+02	.1668+02	-9999.
100900	033	305	-43.7	.1034+02	.1592+02	-9999.
101900	032	305	-42.9	.9871+01	.1520+02	-9999.
102900	031	304	-42.1	.9421+01	.1450+02	-9999.
103900	030	303	-41.3	.8991+01	.1384+02	-9999.
104900	030	303	-40.5	.8581+01	.1321+02	-9999.
105900	029	302	-39.7	.8189+01	.1261+02	-9999.
106900	028	301	-38.9	.7816+01	.1203+02	-9999.
107900	027	300	-38.1	.7459+01	.1148+02	-9999.
108900	026	300	-37.3	.7119+01	.1096+02	-9999.
109900	026	299	-36.6	.6794+01	.1046+02	-9999.
110900	025	298	-35.8	.6485+01	.9983+01	-9999.
111900	024	297	-35.0	.6189+01	.9528+01	-9999.
112900	023	295	-34.2	.5907+01	.9093+01	-9999.
115000	026	295	-32.7	.5420+01	.7850+01	-9999.
118000	024	293	-29.2	.4790+01	.6840+01	-9999.
121000	022	291	-25.6	.4240+01	.5960+01	-9999.
124000	021	288	-22.0	.3750+01	.5200+01	-9999.
127000	019	285	-18.4	.3320+01	.4530+01	-9999.
130000	018	281	-14.8	.2930+01	.3950+01	-9999.
133000	018	276	-12.1	.2610+01	.3470+01	-9999.
136000	018	269	-10.1	.2330+01	.3080+01	-9999.
139000	019	263	-8.0	.2080+01	.2720+01	-9999.
142000	020	257	-5.9	.1860+01	.2410+01	-9999.
145000	022	252	-3.3	.1640+01	.2110+01	-9999.
148000	023	248	-1.5	.1470+01	.1870+01	-9999.
151000	025	245	-.9	.1310+01	.1670+01	-9999.
154000	027	243	-.4	.1180+01	.1500+01	-9999.

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OF POOR QUALITY

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
157000	029	241	.2	.1050+01	.1340+01	-9999.
160000	031	240	.7	.9420+00	.1200+01	-9999.
163000	033	238	1.3	.8430+00	.1070+01	-9999.
166000	038	241	.4	.7560+00	.9650+00	-9999.
169000	044	246	-1.2	.6780+00	.8710+00	-9999.
172000	051	249	-2.8	.6070+00	.7840+00	-9999.
175000	057	251	-4.5	.5430+00	.7050+00	-9999.
176000	064	253	-6.1	.4850+00	.6330+00	-9999.
181000	071	255	-8.0	.4330+00	.5690+00	-9999.
184000	078	256	-10.7	.3840+00	.5100+00	-9999.
187000	086	257	-13.4	.3410+00	.4570+00	-9999.
190000	094	257	-16.0	.3020+00	.4100+00	-9999.
193000	101	258	-18.7	.2680+00	.3680+00	-9999.
196000	109	259	-21.4	.2380+00	.3300+00	-9999.
199000	121	261	-24.4	.2100+00	.2950+00	-9999.
202000	134	265	-27.6	.1860+00	.2640+00	-9999.
205000	148	267	-30.8	.1640+00	.2360+00	-9999.
208000	162	269	-33.9	.1450+00	.2110+00	-9999.
211000	176	271	-37.1	.1280+00	.1890+00	-9999.
214000	185	272	-40.3	.1120+00	.1680+00	-9999.
217000	176	274	-43.8	.9800-01	.1490+00	-9999.
220000	168	275	-47.2	.8550-01	.1320+00	-9999.
223000	160	277	-50.6	.7450-01	.1170+00	-9999.
226000	152	278	-53.6	.6500-01	.1030+00	-9999.
229000	144	280	-56.6	.5660-01	.9110-01	-9999.
232000	139	279	-58.6	.4910-01	.7980-01	-9999.
235000	135	277	-60.3	.4260-01	.6970-01	-9999.
238000	131	275	-62.1	.3690-01	.6080-01	-9999.
241000	127	273	-63.8	.3190-01	.5310-01	-9999.
244000	124	271	-65.6	.2760-01	.4640-01	-9999.
247000	118	269	-67.1	.2390-01	.4040-01	-9999.
250000	109	266	-67.9	.2050-01	.3480-01	-9999.
253000	100	264	-69.1	.1760-01	.3010-01	-9999.
256000	091	260	-70.3	.1510-01	.2600-01	-9999.
259000	083	256	-71.5	.1300-01	.2250-01	-9999.
262000	075	251	-72.8	.1120-01	.1950-01	-9999.
265000	072	249	-73.7	.9590-02	.1680-01	-9999.
268000	070	247	-74.6	.8240-02	.1450-01	-9999.
271000	068	244	-75.4	.7070-02	.1250-01	-9999.
274000	067	242	-76.3	.6070-02	.1080-01	-9999.
277000	065	240	-77.2	.5210-02	.9280-02	-9999.
280000	060	237	-78.3	.4460-02	.7990-02	-9999.
283000	050	235	-79.5	.3810-02	.6860-02	-9999.
286000	040	231	-80.7	.3250-02	.5890-02	-9999.
289000	030	225	-81.9	.2770-02	.5050-02	-9999.
292000	021	212	-83.1	.2370-02	.4340-02	-9999.
295000	014	185	-84.3	.2020-02	.3720-02	-9999.
298000	012	207	-83.7	.1600-02	.2930-02	-9999.
301000	012	226	-82.8	.1360-02	.2490-02	-9999.
304000	010	232	-81.8	.1160-02	.2110-02	-9999.

TABLE 5. (Concluded)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
307000	004	184	-80.9	.9930-03	.1790-02	-9999.
310000	018	094	-79.9	.8480-03	.1520-02	-9999.
313000	037	090	-78.7	.7260-03	.1290-02	-9999.
316000	041	090	-77.2	.6240-03	.1090-02	-9999.
319000	045	090	-75.7	.5360-03	.9290-03	-9999.
322000	049	090	-74.2	.4600-03	.7890-03	-9999.
325000	053	091	-72.7	.3960-03	.6700-03	-9999.
328000	057	091	-71.1	.3400-03	.5690-03	-9999.
331000	060	091	-68.1	.2940-03	.4840-03	-9999.
334000	063	091	-64.9	.2550-03	.4120-03	-9999.
337000	065	092	-61.8	.2210-03	.3510-03	-9999.
340000	066	093	-58.7	.1910-03	.2980-03	-9999.
343000	065	095	-55.5	.1650-03	.2540-03	-9999.
346000	064	093	-51.3	.1440-03	.2170-03	-9999.
349000	065	095	-46.1	.1270-03	.1850-03	-9999.
352000	064	096	-40.8	.1110-03	.1590-03	-9999.
355000	061	099	-35.5	.9770-04	.1360-03	-9999.
358000	056	103	-30.3	.8570-04	.1160-03	-9999.
361000	046	101	-25.0	.7520-04	.9980-04	-9999.
364000	048	104	-17.9	.6750-04	.8680-04	-9999.
367000	048	108	-10.8	.6050-04	.7550-04	-9999.
370000	049	114	-3.7	.5420-04	.6570-04	-9999.
373000	049	121	3.4	.4850-04	.5710-04	-9999.
376000	049	130	10.5	.4340-04	.4970-04	-9999.
379000	038	121	18.4	.3910-04	.4350-04	-9999.
382000	036	127	27.2	.3560-04	.3830-04	-9999.
385000	035	133	36.2	.3250-04	.3380-04	-9999.
388000	035	140	45.6	.2980-04	.3000-04	-9999.
391000	035	147	55.1	.2730-04	.2670-04	-9999.
394000	036	154	64.9	.2520-04	.2380-04	-9999.
397000	037	161	74.9	.2320-04	.2130-04	-9999.
400000	039	168	85.1	.2150-04	.1910-04	-9999.

TABLE 6. STS-51L ASCENT ATMOSPHERIC SYSTEMATIC UNCERTAINTIES DATA TAPE

ALT(FT)	WS-E(FPS)	WD-E(DEG)	WS+E(FPS)	WD+E(DEG)	U-E(FPS)	V-E(FPS)	U+E(FPS)	V+E(FPS)
	Wind Speed - 3 Sigma	Wind Direction - 3 Sigma	Wind Speed + 3 Sigma	Wind Direction + 3 Sigma	East-West Speed - 3 Sigma (+ to the east)	North-South Speed - 3 Sigma (+ to the north)	East-West Speed + 3 Sigma (+ to the east)	North-South Speed + 3 Sigma (+ to the north)

Uncertainty data below 2100 FT are not available due to a lack of Jimsphere data used in their computation.

2100	1.85	280.62	48.16	331.22	1.82	-.34	23.18	-42.21
2200	4.24	279.65	48.81	328.90	4.18	-.71	25.21	-41.79
2300	4.26	292.24	48.59	326.42	3.94	-1.61	26.88	-40.48
2400	8.33	286.95	47.31	327.36	7.97	-2.43	25.52	-39.83
2500	9.16	288.63	47.00	327.17	8.68	-2.93	25.48	-39.50
2600	13.49	292.55	46.85	326.68	12.46	-5.17	25.73	-39.15
2700	17.41	295.40	45.53	326.14	15.73	-7.47	25.36	-37.81
2800	18.14	286.35	45.41	327.14	17.41	-5.11	24.64	-38.15
2900	21.80	286.98	45.53	327.25	20.85	-6.37	24.63	-38.29
3000	21.41	291.32	45.56	326.02	19.95	-7.79	25.46	-37.78
3100	22.85	297.71	46.39	326.80	20.23	-10.62	25.40	-38.81
3200	21.85	295.32	46.74	330.00	19.75	-9.35	23.37	-40.48
3300	23.75	300.26	47.42	329.93	20.51	-11.97	23.76	-41.03
3400	25.61	305.80	48.16	330.88	20.77	-14.98	23.44	-42.08
3500	26.32	308.48	49.30	331.40	20.60	-16.38	23.60	-43.28
3600	22.89	309.11	50.40	333.94	17.76	-14.44	22.14	-45.28
3700	24.30	308.56	51.25	335.33	19.00	-15.15	21.39	-46.57
3800	26.86	311.22	51.72	333.66	20.20	-17.70	22.95	-46.35
3900	27.87	313.81	52.72	335.49	20.11	-19.30	21.87	-47.97
4000	28.62	317.77	53.85	335.67	19.23	-21.19	22.19	-49.07
4100	30.01	318.99	54.75	335.30	19.69	-22.65	22.88	-49.74
4200	28.33	314.64	56.56	336.57	20.16	-19.91	22.49	-51.90
4300	30.50	312.03	57.17	335.99	22.66	-20.42	23.26	-52.22
4400	31.17	314.97	58.30	335.19	22.05	-22.03	24.46	-52.92
4500	30.88	317.80	59.79	334.48	20.74	-22.88	25.76	-53.96
4600	32.63	315.62	61.83	335.05	22.82	-23.32	26.08	-56.06
4700	36.68	319.19	61.93	333.94	23.97	-27.76	27.21	-55.63
4800	35.33	319.23	63.75	332.79	23.07	-26.76	29.15	-56.69
4900	35.74	315.95	64.82	333.68	24.85	-25.69	28.74	-58.10

TABLE 6. (Continued)

ALT(FT)	WS-E(FPS)	WD-E(DEG)	WS+E(FPS)	WD+E(DEG)	U-E(FPS)	V-E(FPS)	U+E(FPS)	V+E(FPS)
5000	38.88	312.81	65.05	334.49	28.53	-26.42	28.02	-58.71
5100	41.31	315.00	65.58	330.41	29.22	-29.21	32.38	-57.02
5200	40.71	311.43	67.10	330.16	30.52	-26.94	33.39	-58.20
5300	43.18	312.48	67.61	328.56	31.85	-29.16	35.27	-57.69
5400	44.22	312.14	68.61	327.36	32.79	-29.67	37.00	-57.78
5500	45.49	311.30	69.51	327.61	34.18	-30.03	37.23	-58.69
5600	46.26	312.46	70.62	325.97	34.12	-31.23	39.53	-58.53
5700	47.76	309.73	72.76	325.49	36.73	-30.53	41.22	-59.95
5800	50.20	307.19	73.27	324.94	39.99	-30.34	42.09	-59.97
5900	53.18	308.67	73.62	324.46	41.52	-33.23	42.79	-59.91
6000	49.27	308.55	76.27	323.26	38.53	-30.71	45.62	-61.12
6100	50.69	305.78	75.77	324.07	41.13	-29.64	44.47	-61.35
6200	53.25	304.32	76.26	324.52	43.98	-30.02	44.27	-62.10
6300	47.99	305.73	78.01	322.80	38.96	-28.02	47.16	-62.13
6400	48.51	306.27	79.17	322.65	39.11	-28.70	48.03	-62.94
6500	46.73	309.71	79.84	321.77	35.95	-29.86	49.41	-62.71
6600	42.06	308.96	81.36	322.07	32.70	-26.44	50.02	-64.18
6700	41.48	310.43	82.93	321.77	31.57	-26.90	51.33	-65.14
6800	45.19	307.44	81.64	321.15	35.88	-27.47	51.22	-63.58
6900	48.13	307.83	82.01	321.00	38.01	-29.52	51.61	-63.74
7000	46.14	304.29	82.62	321.93	38.12	-26.00	50.95	-65.04
7100	49.84	303.14	81.39	320.96	41.74	-27.25	51.26	-63.22
7200	53.47	302.09	80.18	318.68	45.30	-28.41	52.94	-60.22
7300	57.26	300.00	78.91	318.00	49.59	-28.63	52.80	-58.64
7400	53.55	295.79	80.19	317.94	48.22	-23.30	53.72	-59.54
7500	54.94	295.54	79.70	315.44	49.57	-23.69	55.92	-56.78
7600	54.15	295.82	79.95	314.05	48.75	-23.58	57.46	-55.59
7700	51.62	295.48	80.80	312.86	46.60	-22.20	59.22	-54.96
7800	51.07	293.07	82.31	312.25	46.99	-20.01	60.93	-55.35
7900	52.45	288.76	81.89	310.91	49.66	-16.87	61.89	-53.63
8000	52.78	287.32	81.79	310.04	50.39	-15.71	62.62	-52.62
8100	55.70	286.35	80.82	309.09	53.45	-15.68	62.73	-50.97
8200	54.98	286.20	81.07	309.12	52.79	-15.34	62.89	-51.15
8300	56.05	285.97	80.69	307.92	53.88	-15.42	63.66	-49.59
8400	56.45	287.42	80.53	307.48	53.86	-16.90	63.90	-49.00
8500	55.06	287.93	80.98	306.02	52.38	-16.95	65.50	-47.62
8600	53.25	289.85	82.95	304.20	50.09	-18.08	68.60	-46.63
8700	54.87	284.79	82.40	305.64	53.05	-14.00	66.96	-48.01
8800	56.05	282.49	82.04	305.04	54.72	-12.12	67.17	-47.10
8900	57.21	285.08	81.60	304.28	55.24	-14.88	67.42	-45.96
9000	56.05	285.52	81.99	302.84	54.00	-15.00	68.88	-44.47
9100	56.10	284.91	81.97	303.03	54.21	-14.44	68.72	-44.67
9200	54.21	282.00	82.61	302.57	53.03	-11.27	69.62	-44.47
9300	55.15	281.46	82.31	302.74	54.05	-10.95	69.23	-44.52
9400	55.35	280.59	82.24	301.71	54.40	-10.17	69.97	-43.22
9500	55.75	281.79	82.09	301.36	54.58	-11.39	70.10	-42.72
9600	56.46	280.95	83.20	301.60	55.43	-10.72	70.86	-43.60
9700	57.95	280.64	82.69	300.41	56.95	-10.70	71.31	-41.86
9800	58.19	281.00	82.61	300.30	57.12	-11.11	71.32	-41.68
9900	56.76	281.33	83.08	298.90	55.65	-11.15	72.73	-40.15

TABLE 6. (Continued)

ALT(FT)	WS-E(FPS)	WD-E(DEG)	WS+E(FPS)	WD+E(DEG)	U-E(FPS)	V-E(FPS)	U+E(FPS)	V+E(FPS)
10000	57.95	281.00	82.68	299.00	56.89	-11.06	72.32	-40.09
10100	61.45	279.43	81.53	299.51	60.62	-10.07	70.95	-40.16
10200	58.64	276.38	83.93	301.69	58.28	-6.51	71.41	-44.09
10300	57.74	279.74	84.11	300.67	56.91	-9.77	72.34	-42.90
10400	61.15	279.56	83.01	302.09	60.30	-10.16	70.33	-44.09
10500	57.55	280.06	84.19	301.87	56.67	-10.05	71.50	-44.45
10600	59.97	281.85	84.68	301.35	58.69	-12.31	72.32	-44.06
10700	59.74	281.78	84.78	302.67	58.48	-12.19	71.36	-45.76
10800	57.66	278.83	85.56	303.50	56.98	-8.85	71.35	-47.22
10900	61.20	279.51	85.74	304.67	60.36	-10.11	70.52	-48.77
11000	58.90	280.52	86.46	304.31	57.91	-10.76	71.42	-48.73
11100	60.30	284.93	85.90	304.32	58.27	-15.54	70.95	-48.44
11200	62.77	284.84	86.42	304.36	60.68	-16.07	71.34	-48.77
11300	63.48	286.59	86.17	305.13	60.84	-18.12	70.48	-49.59
11400	60.36	286.75	87.21	305.07	57.80	-17.39	71.38	-50.12
11500	59.25	287.04	87.59	306.28	56.65	-17.37	70.61	-51.82
11600	62.36	286.93	87.88	306.32	59.66	-18.16	70.81	-52.06
11700	60.21	287.87	88.60	307.33	57.31	-18.47	70.45	-53.73
11800	60.56	286.40	88.51	307.76	58.09	-17.10	69.98	-54.20
11900	62.88	291.53	89.05	307.54	58.49	-23.07	70.61	-54.26
12000	62.72	287.60	89.12	308.71	59.79	-18.97	69.54	-55.74
12100	61.38	288.36	89.55	308.48	58.25	-19.33	70.11	-55.72
12200	59.79	283.28	90.22	308.61	58.19	-13.73	70.49	-56.30
12300	61.01	283.14	91.15	308.66	59.41	-13.87	71.18	-56.94
12400	62.24	283.96	90.70	308.46	60.41	-15.02	71.02	-56.42
12500	62.58	282.61	90.61	307.57	61.07	-13.66	71.82	-55.25
12600	62.64	281.53	90.65	307.89	61.38	-12.52	71.54	-55.67
12700	64.73	282.40	89.91	307.70	63.22	-13.90	71.14	-54.98
12800	66.83	284.25	90.46	307.16	64.78	-16.45	72.09	-54.65
12900	63.62	282.74	91.55	306.25	62.05	-14.03	73.83	-54.13
13000	64.15	284.02	91.33	305.88	62.24	-15.54	73.99	-53.53
13100	63.32	279.97	91.79	307.04	62.37	-10.96	73.27	-55.30
13200	64.68	281.90	91.23	306.52	63.29	-13.33	73.32	-54.30
13300	64.79	282.39	92.47	305.06	63.28	-13.90	75.69	-53.12
13400	65.01	283.28	92.37	304.80	63.27	-14.94	75.84	-52.72
13500	63.92	284.70	92.70	304.38	61.83	-16.22	76.51	-52.34
13600	64.78	283.44	92.44	304.75	63.01	-15.06	75.95	-52.70
13700	64.57	284.77	92.48	304.36	62.44	-16.47	76.35	-52.20
13800	66.78	285.30	93.07	302.91	64.41	-17.62	78.14	-50.57
13900	68.27	281.34	92.64	304.13	66.94	-13.43	76.69	-51.97
14000	68.17	280.98	92.69	304.24	66.93	-12.98	76.63	-52.15
14100	67.77	281.04	92.82	304.21	66.51	-12.97	76.77	-52.19
14200	67.83	276.57	93.00	304.26	67.38	-7.76	76.87	-52.36
14300	65.44	280.04	93.60	303.16	64.44	-11.40	78.35	-51.20
14400	64.56	281.83	93.82	301.34	63.18	-13.24	80.13	-48.79
14500	63.70	280.93	92.79	301.60	62.54	-12.08	79.03	-48.62
14600	64.12	282.21	92.63	301.23	62.67	-13.56	79.21	-48.03
14700	62.89	284.04	93.06	299.42	61.01	-15.26	81.06	-45.71
14800	63.73	283.79	92.77	299.48	61.89	-15.19	80.76	-45.66
14900	64.72	280.27	92.43	299.22	63.68	-11.53	80.67	-45.12

TABLE 6. (Continued)

ALT(FT)	WS-E(FPS)	WD-E(DEG)	WS+E(FPS)	WD+E(DEG)	U-E(FPS)	V-E(FPS)	U+E(FPS)	V+E(FPS)
15000	63.68	280.22	92.78	299.23	62.67	-11.29	80.97	-45.30
15100	66.80	280.00	91.73	298.00	65.79	-11.60	80.99	-43.07
15200	69.37	277.37	90.89	297.52	68.80	-8.90	80.61	-42.00
15300	69.55	277.04	90.84	297.63	69.02	-8.52	80.48	-42.12
15400	70.24	276.27	91.94	296.55	69.82	-7.67	82.24	-41.09
15500	69.85	274.94	92.07	295.65	69.60	-6.02	83.00	-39.86
15600	69.21	274.33	92.28	294.52	69.02	-5.23	83.95	-38.30
15700	69.23	273.32	92.27	293.53	69.11	-4.01	84.60	-36.83
15800	65.84	272.92	93.41	293.62	65.76	-3.35	85.58	-37.42
15900	68.96	272.31	93.69	292.52	68.91	-2.78	86.55	-35.88
16000	70.11	269.17	93.37	292.19	70.10	1.01	86.46	-35.27
16100	71.03	274.01	94.34	288.62	70.86	-4.97	89.40	-30.13
16200	69.92	272.97	94.74	288.93	69.83	-3.62	89.62	-30.73
16300	73.59	271.19	94.93	289.54	73.58	-1.53	89.46	-31.75
16400	72.62	272.70	95.18	289.04	72.54	-3.42	89.98	-31.05
16500	73.24	275.37	96.27	289.51	72.92	-6.86	90.74	-32.15
16600	75.45	274.65	96.88	289.75	75.20	-6.12	91.18	-32.74
16700	75.86	274.82	96.74	289.70	75.59	-6.37	91.08	-32.62
16800	75.17	273.45	98.35	290.12	75.04	-4.52	92.35	-33.82
16900	75.73	276.57	98.09	289.14	75.23	-8.67	92.67	-32.16
17000	76.15	275.70	99.29	289.41	75.77	-7.56	93.65	-33.00
17100	75.76	277.46	99.42	290.17	75.12	-9.83	93.32	-34.28
17200	77.59	276.71	98.81	290.41	77.06	-9.07	92.61	-34.47
17300	77.53	276.20	98.87	291.90	77.08	-8.38	91.73	-36.87
17400	76.89	274.90	99.13	292.30	76.61	-6.57	91.72	-37.62
17500	77.02	277.86	99.02	292.68	76.29	-10.54	91.36	-38.18
17600	77.55	279.77	98.82	293.40	76.43	-13.16	90.70	-39.24
17700	76.94	279.92	100.36	293.34	75.79	-13.25	92.15	-39.76
17800	76.10	280.76	100.64	294.38	74.77	-14.21	91.66	-41.55
17900	77.33	282.00	100.22	294.00	75.64	-16.08	91.56	-40.77
18000	75.53	281.07	100.84	295.59	74.12	-14.50	90.95	-43.56
18100	75.53	281.07	100.84	295.59	74.12	-14.50	90.95	-43.56
18200	75.84	279.93	102.11	295.93	74.70	-13.08	91.83	-44.65
18300	77.64	279.79	101.51	296.00	76.51	-13.20	91.24	-44.50
18400	80.14	282.14	100.62	295.28	78.35	-16.85	90.99	-42.97
18500	76.37	281.02	101.93	296.91	74.96	-14.60	90.89	-46.14
18600	78.99	281.31	102.38	296.84	77.45	-15.49	91.35	-46.23
18700	78.29	283.49	102.57	296.16	76.13	-18.26	92.06	-45.22
18800	78.43	283.01	102.53	296.31	76.42	-17.65	91.91	-45.44
18900	81.32	282.78	102.90	296.39	79.31	-17.99	92.18	-45.74
19000	81.26	284.00	102.91	296.00	78.85	-19.66	92.50	-45.11
19100	82.06	282.88	102.66	296.36	79.99	-18.30	91.98	-45.58
19200	79.31	279.38	105.02	297.42	78.25	-12.92	93.23	-48.36
19300	80.85	281.17	104.43	296.89	79.31	-15.66	93.14	-47.23
19400	82.58	282.20	105.16	296.57	80.72	-17.46	94.05	-47.04
19500	81.05	281.93	105.68	296.64	79.30	-16.76	94.46	-47.39
19600	83.35	281.27	104.93	296.88	81.74	-16.29	93.60	-47.44
19700	81.69	280.39	106.85	297.11	80.35	-14.74	95.11	-48.70
19800	82.83	283.17	106.40	296.26	80.65	-18.88	95.42	-47.07
19900	81.20	283.84	108.27	296.05	78.84	-19.42	97.27	-47.54

TABLE 6. (Continued)

ALT(FT)	WS-E(FPS)	WD-E(DEG)	WS+E(FPS)	WD+E(DEG)	U-E(FPS)	V-E(FPS)	U+E(FPS)	V+E(FPS)
20000	80.87	284.07	108.38	295.98	78.44	-19.65	97.43	-47.48
20100	79.97	283.02	108.68	296.29	77.92	-18.02	97.44	-48.14
20200	79.93	282.36	110.07	297.77	78.07	-17.11	97.39	-51.29
20300	82.78	282.88	109.10	297.65	80.69	-18.45	96.64	-50.63
20400	85.94	284.37	109.37	298.51	83.25	-21.33	96.10	-52.21
20500	83.41	282.74	110.26	298.99	81.36	-18.39	96.45	-53.44
20600	85.43	282.49	110.94	299.08	83.40	-18.47	96.95	-53.92
20700	84.93	286.32	111.03	299.21	81.51	-23.86	96.91	-54.18
20800	85.16	285.43	112.29	299.48	82.09	-22.66	97.76	-55.26
20900	85.85	286.72	112.06	300.39	82.22	-24.70	96.66	-56.69
21000	90.55	288.00	111.82	300.00	86.12	-27.98	96.84	-55.91
21100	87.87	286.43	112.73	300.49	84.28	-24.86	97.14	-57.19
21200	90.86	287.12	113.05	300.28	86.84	-26.74	97.63	-57.01
21300	89.05	287.63	113.65	300.11	84.87	-26.97	98.31	-57.02
21400	90.80	287.48	114.40	300.16	86.61	-27.28	98.91	-57.48
21500	89.67	288.07	114.78	301.29	85.25	-27.82	98.09	-59.61
21600	90.79	288.51	114.40	301.15	86.10	-28.83	97.90	-59.19
21700	92.89	288.23	115.04	301.25	88.22	-29.06	98.35	-59.67
21800	90.63	288.07	115.80	301.29	86.16	-28.11	98.95	-60.14
21900	94.19	287.80	115.95	301.39	89.68	-28.79	98.98	-60.39
22000	93.43	288.59	116.19	301.13	88.56	-29.79	99.46	-60.07
22100	92.04	287.91	116.66	301.34	87.58	-28.30	99.64	-60.68
22200	92.61	286.88	116.47	300.35	88.62	-26.89	100.51	-58.85
22300	92.58	288.00	116.47	300.00	88.05	-28.61	100.87	-58.24
22400	92.99	287.31	116.34	300.22	88.78	-27.67	100.53	-58.55
22500	93.47	287.12	116.18	298.96	89.32	-27.51	101.65	-56.26
22600	93.02	286.26	116.33	299.23	89.30	-26.04	101.51	-56.81
22700	93.52	285.27	116.18	299.55	90.22	-24.63	101.07	-57.30
22800	93.55	284.48	116.19	299.80	90.57	-23.40	100.83	-57.75
22900	93.50	285.67	116.17	298.11	90.03	-25.26	102.47	-54.72
23000	94.26	286.00	115.91	298.00	90.61	-25.98	102.35	-54.42
23100	94.96	284.92	115.69	298.35	91.76	-24.45	101.81	-54.94
23200	95.95	284.92	116.69	298.35	92.72	-24.71	102.69	-55.41
23300	95.23	285.58	116.92	298.14	91.73	-25.57	103.11	-55.14
23400	97.78	284.77	117.42	298.40	94.55	-24.93	103.28	-55.85
23500	97.78	285.00	117.41	297.00	94.44	-25.31	104.61	-53.30
23600	97.23	284.56	118.93	297.14	94.11	-24.43	105.83	-54.26
23700	96.33	285.00	119.22	297.00	93.04	-24.93	106.23	-54.13
23800	98.55	285.00	119.82	297.00	95.19	-25.51	106.76	-54.40
23900	98.26	285.00	119.91	297.00	94.91	-25.43	106.84	-54.44
24000	99.55	285.00	120.82	297.00	96.16	-25.77	107.65	-54.85
24100	99.55	285.00	120.82	297.00	96.16	-25.77	107.65	-54.85
24200	99.86	284.16	120.72	297.27	96.83	-24.44	107.30	-55.31
24300	101.27	285.00	121.58	297.00	97.82	-26.21	108.33	-55.19
24400	100.49	284.51	121.84	297.16	97.28	-25.18	108.41	-55.61
24500	99.59	284.95	122.14	297.02	96.22	-25.69	108.81	-55.48
24600	100.19	284.51	121.94	297.16	96.99	-25.11	108.50	-55.66
24700	99.46	284.28	122.19	297.23	96.38	-24.54	108.65	-55.91
24800	101.86	284.15	122.72	297.28	98.77	-24.90	109.07	-56.24
24900	102.78	285.00	122.41	297.00	99.27	-26.60	109.07	-55.57

TABLE 6. (Continued)

ALT(FT)	WS-E(FPS)	WD-E(DEG)	WS+E(FPS)	WD+E(DEG)	U-E(FPS)	V-E(FPS)	U+E(FPS)	V+E(FPS)
25000	101.95	283.89	122.69	297.36	98.96	-24.48	108.97	-56.39
25100	102.27	285.00	122.58	297.00	98.78	-26.47	109.22	-55.65
25200	100.89	282.07	124.40	296.61	98.66	-21.09	111.22	-55.73
25300	103.35	282.23	123.57	296.58	101.01	-21.89	110.51	-55.29
25400	103.96	282.88	124.69	296.36	101.34	-23.18	111.72	-55.37
25500	102.56	280.19	125.21	295.90	100.94	-18.14	112.63	-54.69
25600	102.08	281.25	125.33	295.56	100.12	-19.91	113.07	-54.07
25700	103.87	282.01	126.05	295.32	101.60	-21.61	113.94	-53.91
25800	102.65	281.18	126.48	295.58	100.70	-19.90	114.08	-54.60
25900	105.26	280.23	126.94	294.57	103.59	-18.70	115.44	-52.78
26000	104.37	280.87	127.22	294.36	102.50	-19.68	115.89	-52.48
26100	107.55	280.99	127.49	294.33	105.58	-20.50	116.17	-52.53
26200	107.78	281.00	127.41	293.00	105.80	-20.56	117.28	-49.78
26300	106.10	279.79	129.31	293.39	104.55	-18.04	118.69	-51.33
26400	106.35	278.54	129.26	293.79	105.17	-15.79	118.28	-52.14
26500	107.04	278.40	130.34	292.51	105.89	-15.64	120.41	-49.90
26600	105.10	278.79	134.31	292.39	103.87	-16.06	124.19	-51.15
26700	106.56	278.77	133.83	292.40	105.31	-16.25	123.73	-50.99
26800	107.22	278.27	134.95	292.56	106.10	-15.43	124.63	-51.77
26900	108.04	277.85	134.67	291.37	107.02	-14.76	125.40	-49.08
27000	108.56	277.77	135.83	291.40	107.56	-14.68	126.46	-49.56
27100	109.03	277.85	135.67	291.37	108.01	-14.89	126.34	-49.45
27200	108.24	277.57	135.94	291.46	107.30	-14.26	126.51	-49.74
27300	109.78	278.00	135.41	290.00	108.71	-15.28	127.24	-46.31
27400	107.54	278.00	136.15	290.00	106.49	-14.97	127.94	-46.57
27500	107.55	278.00	134.82	290.00	106.50	-14.97	126.69	-46.11
27600	107.01	277.07	135.01	290.30	106.19	-13.17	126.62	-46.84
27700	106.28	276.84	135.25	290.37	105.52	-12.67	126.79	-47.08
27800	108.09	275.82	134.65	289.39	107.54	-10.96	127.01	-44.69
27900	108.86	275.89	134.39	289.36	108.28	-11.18	126.79	-44.56
28000	110.00	277.00	134.00	289.00	109.18	-13.41	126.70	-43.63
28100	107.78	275.77	133.42	289.40	107.23	-10.84	125.84	-44.32
28200	105.98	275.93	134.02	289.35	105.41	-10.95	126.45	-44.39
28300	107.07	275.28	130.33	289.55	106.62	-9.85	122.82	-43.61
28400	108.21	274.26	128.66	289.90	107.91	-8.03	120.98	-43.78
28500	107.25	275.26	128.94	289.56	106.80	-9.83	121.50	-43.18
28600	106.21	275.80	127.94	289.39	105.67	-10.73	120.69	-42.47
28700	105.30	275.35	126.92	289.53	104.85	-9.81	119.61	-42.44
28800	105.41	275.34	125.55	289.54	104.95	-9.80	118.32	-42.00
28900	104.31	275.35	125.92	289.53	103.85	-9.72	118.67	-42.10
29000	104.09	275.84	124.65	289.38	103.55	-10.59	117.58	-41.36
29100	102.25	275.76	123.93	289.40	101.73	-10.26	116.89	-41.17
29200	102.26	278.00	123.91	290.00	101.27	-14.23	116.44	-42.38
29300	100.38	276.70	123.22	290.41	99.69	-11.71	115.48	-42.98
29400	100.36	275.18	123.27	290.90	99.95	-9.05	115.16	-43.98
29500	99.62	276.18	122.15	290.58	99.04	-10.73	114.35	-42.94
29600	99.50	276.77	122.20	291.71	98.80	-11.73	113.53	-45.21
29700	98.62	277.18	121.15	291.58	97.85	-12.33	112.66	-44.56
29800	99.29	277.22	120.93	291.57	98.50	-12.49	112.46	-44.46
29900	96.79	278.75	120.41	292.40	95.67	-14.72	111.33	-45.88

TABLE 6. (Continued)

ALT(FT)	WS-E(FPS)	WD-E(DEG)	WS+E(FPS)	WD+E(DEG)	U-E(FPS)	V-E(FPS)	U+E(FPS)	V+E(FPS)
30000	97.25	278.85	120.26	292.36	96.09	-14.97	111.21	-45.76
30100	98.27	279.80	119.92	293.39	96.84	-16.73	110.07	-47.60
30200	97.29	279.80	118.91	293.39	95.87	-16.57	109.15	-47.20
30300	100.00	282.00	118.00	294.00	97.81	-20.79	107.80	-47.99
30400	97.02	281.09	117.67	294.30	95.21	-18.66	107.24	-48.42
30500	97.61	282.02	117.47	295.32	95.47	-20.32	106.18	-50.24
30600	96.56	283.04	116.49	296.31	94.07	-21.79	104.42	-51.64
30700	96.78	284.00	116.41	296.00	93.90	-23.41	104.63	-51.03
30800	96.27	285.00	116.58	297.00	92.99	-24.92	103.87	-52.92
30900	95.78	285.00	115.41	297.00	92.51	-24.79	102.83	-52.39
31000	93.50	285.67	116.17	298.11	90.03	-25.26	102.47	-54.72
31100	92.49	285.88	116.51	299.35	88.96	-25.30	101.55	-57.11
31200	88.98	285.48	116.35	299.46	85.75	-23.75	101.31	-57.23
31300	88.42	286.09	116.55	300.58	84.95	-24.51	100.35	-59.29
31400	90.29	286.27	115.95	301.84	86.68	-25.29	98.50	-61.18
31500	89.34	286.27	114.94	301.84	85.76	-25.03	97.64	-60.64
31600	90.24	287.37	114.63	302.82	86.12	-26.94	96.33	-62.14
31700	88.67	288.87	115.14	303.65	83.91	-28.68	95.84	-63.80
31800	88.33	289.65	113.92	304.73	83.19	-29.70	93.63	-64.90
31900	87.92	290.09	114.05	304.59	82.57	-30.20	93.89	-64.74
32000	89.19	290.74	113.64	305.71	83.41	-31.58	92.28	-66.32
32100	91.26	293.00	112.91	305.00	84.01	-35.66	92.49	-64.76
32200	94.00	294.00	112.00	306.00	85.87	-38.23	90.61	-65.83
32300	90.30	292.98	113.24	306.32	83.13	-35.26	91.24	-67.08
32400	88.46	295.66	113.85	306.80	79.74	-38.31	91.17	-68.19
32500	87.90	294.05	114.04	307.29	80.26	-35.82	90.73	-69.09
32600	90.15	293.67	114.63	307.42	82.57	-36.19	91.04	-69.65
32700	88.07	296.59	115.31	307.82	78.76	-39.43	91.09	-70.71
32800	85.37	293.50	116.25	308.73	78.29	-34.04	90.68	-72.74
32900	83.21	296.49	116.93	309.15	74.48	-37.11	90.69	-73.82
33000	82.21	295.12	117.28	309.53	74.44	-34.90	90.46	-74.65
33100	83.38	295.13	116.89	309.53	75.49	-35.41	90.15	-74.41
33200	85.32	292.85	116.29	308.92	78.62	-33.13	90.47	-73.06
33300	88.91	293.60	115.07	308.74	81.48	-35.60	89.75	-72.00
33400	86.18	293.38	115.96	307.48	79.10	-34.20	92.02	-70.56
33500	87.37	297.29	115.58	306.31	77.65	-40.06	93.13	-68.44
33600	82.75	295.00	117.08	307.00	75.00	-34.97	93.51	-70.46
33700	81.60	292.76	117.47	306.35	75.25	-31.57	94.62	-69.62
33800	82.38	292.46	117.22	306.43	76.13	-31.47	94.31	-69.62
33900	84.06	289.20	116.73	306.09	79.39	-27.64	94.33	-68.77
34000	85.66	289.17	116.20	306.13	80.91	-28.13	93.86	-68.51
34100	85.55	286.26	116.35	305.68	82.13	-23.96	94.51	-67.87
34200	85.25	286.96	114.97	302.90	81.54	-24.87	96.53	-62.45
34300	86.68	286.83	114.47	301.66	82.97	-25.10	97.44	-60.07
34400	85.98	285.03	114.73	300.89	83.04	-22.29	98.46	-58.90
34500	82.76	283.67	114.48	299.96	80.41	-19.56	99.18	-57.18
34600	86.38	282.03	113.26	297.91	84.49	-18.00	100.09	-53.01
34700	85.58	282.29	113.49	296.51	83.62	-18.22	101.55	-50.66
34800	87.88	280.95	112.73	295.64	86.28	-16.69	101.63	-48.78
34900	89.11	279.79	112.31	293.38	87.81	-15.15	103.08	-44.57

TABLE 6. (Continued)

ALT(FT)	WS-E(FPS)	WD-E(DEG)	WS+E(FPS)	WD+E(DEG)	U-E(FPS)	V-E(FPS)	U+E(FPS)	V+E(FPS)
35000	87.49	278.82	112.85	292.37	86.45	-13.41	104.36	-42.94
35100	88.12	278.75	113.96	291.08	87.09	-13.41	106.34	-40.98
35200	88.59	278.60	115.14	289.82	87.59	-13.24	108.32	-39.03
35300	87.96	275.66	118.05	290.69	87.53	-8.68	110.43	-41.71
35400	88.86	275.61	119.06	289.41	88.43	-8.69	112.29	-39.57
35500	90.07	273.62	120.01	288.71	89.89	-5.69	113.67	-38.49
35600	95.77	272.09	120.85	289.22	95.71	-3.49	114.11	-39.79
35700	96.79	268.76	122.01	288.94	96.76	2.10	115.40	-39.61
35800	96.57	266.46	123.54	288.31	96.39	5.96	117.28	-38.81
35900	99.55	266.19	125.26	288.43	99.32	6.62	118.84	-39.59
36000	99.73	264.31	126.63	287.67	99.24	9.89	120.66	-38.43
36100	101.24	268.01	127.04	285.24	101.18	3.51	122.57	-33.39
36200	104.45	269.68	128.53	283.42	104.45	.58	125.02	-29.82
36300	106.18	267.20	129.30	281.58	106.05	5.19	126.67	-25.94
36400	107.33	266.23	130.25	280.57	107.10	7.06	128.04	-23.89
36500	105.42	263.06	135.65	280.25	104.65	12.74	133.49	-24.13
36600	105.38	260.46	137.11	279.73	103.93	17.47	135.14	-23.17
36700	108.69	256.67	139.00	279.63	105.76	25.07	137.04	-23.26
36800	113.35	273.00	140.25	273.05	113.18	-6.13	140.05	-7.45
36900	114.58	271.38	141.07	272.27	114.55	-2.75	140.96	-5.59
37000	114.24	267.23	143.48	272.33	114.11	5.51	143.37	-5.83
37100	115.10	265.83	144.42	272.78	114.80	8.38	144.25	-7.00
37200	117.23	262.65	144.95	272.47	116.27	15.00	144.81	-6.23
37300	119.25	262.23	146.93	272.60	118.16	16.13	146.78	-6.67
37400	121.22	261.22	147.61	271.60	119.80	18.51	147.55	-4.13
37500	121.75	262.81	148.82	271.09	120.80	15.24	148.79	-2.82
37600	123.80	263.49	149.51	270.85	123.00	14.04	149.50	-2.22
37700	123.10	261.39	151.02	270.23	121.71	18.43	151.02	-.60
37800	124.12	262.94	153.44	269.74	123.18	15.25	153.43	.71
37900	123.87	260.73	154.78	269.14	122.25	19.96	154.76	2.33
38000	125.78	260.34	155.46	269.25	123.99	21.11	155.45	2.03
38100	126.30	260.45	156.62	269.22	124.55	20.95	156.61	2.14
38200	126.00	260.49	156.73	269.21	124.27	20.81	156.71	2.17
38300	128.17	260.56	157.34	269.18	126.44	21.02	157.32	2.26
38400	126.82	259.38	157.74	269.56	124.65	23.38	157.74	1.20
38500	127.43	259.39	158.87	269.56	125.26	23.45	158.87	1.22
38600	128.35	259.43	159.90	269.55	126.17	23.55	159.90	1.26
38700	129.76	258.90	159.42	269.71	127.33	24.99	159.42	.80
38800	130.62	259.47	160.48	269.53	128.42	23.86	160.47	1.32
38900	132.25	259.14	159.93	269.63	129.88	24.93	159.93	1.03
39000	134.61	259.72	160.49	269.43	132.45	24.03	160.48	1.58
39100	131.10	261.34	161.74	268.93	129.61	19.73	161.71	3.01
39200	130.17	259.41	163.30	269.56	127.95	23.91	163.29	1.26
39300	132.10	260.23	162.68	269.29	130.19	22.43	162.67	2.01
39400	134.24	260.29	163.30	269.26	132.32	22.64	163.29	2.10
39500	133.86	260.02	163.39	270.67	131.84	23.21	163.38	-1.92
39600	134.68	260.01	164.45	270.67	132.64	23.36	164.44	-1.94
39700	135.81	260.08	164.07	270.65	133.78	23.40	164.06	-1.86
39800	136.13	260.06	165.30	270.66	134.09	23.49	165.29	-1.90
39900	138.27	259.00	164.58	271.00	135.73	26.38	164.55	-2.87

TABLE 6. (Continued)

ALT(FT)	WS-E(FPS)	WD-E(DEG)	WS+E(FPS)	WD+E(DEG)	U-E(FPS)	V-E(FPS)	U+E(FPS)	V+E(FPS)
40000	139.67	260.73	165.47	270.43	137.84	22.51	165.47	-1.25
40100	141.49	260.21	166.18	270.60	139.43	24.05	166.18	-1.73
40200	142.21	260.71	167.29	270.43	140.35	22.95	167.29	-1.27
40300	142.70	260.74	168.46	270.43	140.84	22.98	168.46	-1.26
40400	143.38	260.76	169.57	270.42	141.52	23.02	169.57	-1.25
40500	143.34	261.78	170.97	270.09	141.87	20.49	170.97	-.28
40600	146.64	260.72	172.48	270.43	144.72	23.64	172.48	-1.30
40700	147.22	260.23	173.61	270.60	145.09	24.99	173.60	-1.81
40800	148.12	261.44	174.69	270.20	146.47	22.04	174.69	-.61
40900	148.84	261.39	175.78	270.22	147.16	22.28	175.78	-.67
41000	146.04	261.26	178.04	270.28	144.34	22.19	178.04	-.88
41100	145.23	262.53	179.72	269.90	144.00	18.88	179.72	.32
41200	148.05	259.96	179.99	270.69	145.79	25.80	179.98	-2.18
41300	150.58	259.00	180.47	271.00	147.82	28.73	180.44	-3.15
41400	152.37	261.54	181.28	270.18	150.71	22.41	181.28	-.56
41500	156.32	259.21	181.24	269.60	153.55	29.28	181.24	1.26
41600	154.85	259.03	183.06	269.67	152.02	29.47	183.06	1.07
41700	155.02	260.55	184.40	269.18	152.92	25.46	184.38	2.64
41800	152.96	261.29	186.46	268.96	151.20	23.17	186.43	3.37
41900	152.45	264.46	187.98	265.92	151.74	14.72	187.50	13.37
42000	153.88	262.31	188.73	266.59	152.49	20.58	188.39	11.23
42100	156.60	259.02	185.15	269.67	153.73	29.81	185.14	1.07
42200	157.29	260.75	183.66	269.10	155.24	25.29	183.63	2.89
42300	154.82	261.71	181.81	270.11	153.21	22.31	181.81	-.35
42400	150.13	261.64	182.03	270.16	148.53	21.84	182.03	-.51
42500	146.91	262.79	180.52	269.81	145.74	18.43	180.52	.60
42600	146.04	261.26	178.04	270.28	144.34	22.19	178.04	-.88
42700	148.03	260.09	176.00	270.64	145.83	25.47	175.99	-1.98
42800	145.57	262.83	174.23	271.08	144.44	18.17	174.20	-3.30
42900	146.78	260.00	172.41	272.00	144.55	25.49	172.30	-6.02
43000	142.69	261.61	171.13	271.48	141.16	20.82	171.07	-4.42
43100	140.89	262.60	171.77	271.17	139.72	18.15	171.74	-3.51
43200	138.73	263.42	172.54	270.93	137.82	15.90	172.52	-2.80
43300	136.59	263.29	173.25	270.99	135.65	15.95	173.22	-2.99
43400	138.17	262.51	172.67	271.22	136.99	18.01	172.63	-3.67
43500	141.40	261.69	171.56	271.46	139.92	20.42	171.51	-4.36
43600	142.18	261.27	171.29	271.59	140.54	21.57	171.22	-4.75
43700	142.86	262.71	171.12	271.12	141.71	18.14	171.09	-3.35
43800	143.12	262.73	171.04	271.11	141.97	18.11	171.01	-3.32
43900	142.27	261.73	171.28	271.44	140.79	20.47	171.22	-4.31
44000	143.68	262.41	170.83	271.21	142.42	18.98	170.80	-3.62
44100	144.76	261.74	170.45	271.43	143.26	20.80	170.39	-4.24
44200	146.40	261.72	171.23	271.43	144.87	21.08	171.18	-4.27
44300	143.59	261.37	172.20	270.23	141.96	21.54	172.20	-.70
44400	146.14	260.67	172.65	270.45	144.21	23.69	172.64	-1.36
44500	145.29	260.25	172.92	270.59	143.19	24.60	172.91	-1.79
44600	143.37	259.95	174.89	270.70	141.17	25.02	174.87	-2.13
44700	141.17	261.09	175.65	270.35	139.47	21.86	175.65	-1.06
44800	143.40	259.53	176.22	269.52	141.02	26.06	176.22	1.48
44900	143.87	259.26	176.06	269.60	141.35	26.81	176.06	1.23

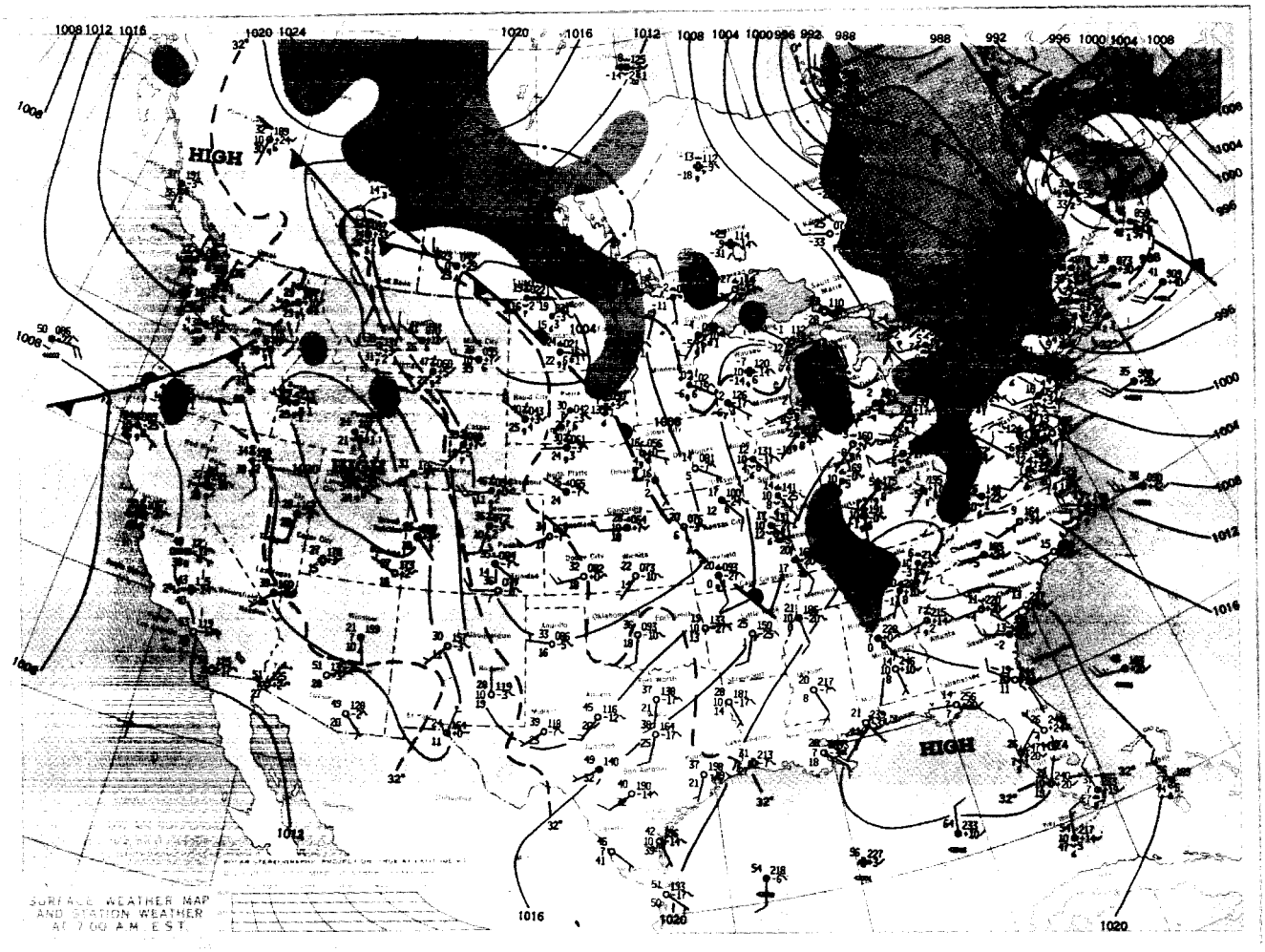
TABLE 6. (Continued)

ALT(FT)	WS-E(FPS)	WD-E(DEG)	WS+E(FPS)	WD+E(DEG)	U-E(FPS)	V-E(FPS)	U+E(FPS)	V+E(FPS)
45000	146.59	259.25	176.49	269.60	144.02	27.33	176.48	1.24
45100	147.98	259.00	177.35	269.68	145.26	28.24	177.35	1.00
45200	149.71	259.12	176.78	269.63	147.02	28.26	176.77	1.13
45300	150.22	259.15	177.94	269.63	147.53	28.29	177.94	1.16
45400	150.96	259.65	177.71	269.46	148.50	27.12	177.70	1.68
45500	151.12	259.72	179.04	268.12	148.69	26.98	178.94	5.88
45600	152.97	259.43	179.74	268.20	150.38	28.06	179.65	5.63
45700	150.12	259.55	180.70	268.18	147.63	27.23	180.61	5.73
45800	151.87	258.13	181.39	268.63	148.62	31.23	181.34	4.32
45900	149.10	257.75	182.31	268.76	145.70	31.64	182.26	3.93
46000	150.32	257.82	183.24	268.74	146.93	31.71	183.19	4.03
46100	148.45	258.86	183.89	268.42	145.65	28.69	183.82	5.06
46200	149.44	258.21	183.54	268.62	146.28	30.54	183.48	4.42
46300	151.44	259.54	181.55	269.50	148.92	27.49	181.54	1.57
46400	153.55	258.00	180.82	270.00	150.20	31.92	180.82	.00
46500	154.16	259.21	180.63	269.60	151.43	28.86	180.63	1.25
46600	154.16	259.21	180.63	269.60	151.43	28.86	180.63	1.25
46700	152.57	259.75	181.18	269.43	150.13	27.16	181.17	1.79
46800	153.05	260.66	179.68	270.46	151.02	24.84	179.68	-1.43
46900	151.50	260.23	180.18	270.60	149.31	25.70	180.17	-1.89
47000	149.95	259.00	180.68	271.00	147.20	28.61	180.66	-3.15
47100	145.77	259.75	180.75	270.77	143.45	25.94	180.73	-2.42
47200	144.33	259.74	179.90	270.77	142.02	25.71	179.88	-2.42
47300	144.65	259.87	178.46	270.73	142.39	25.44	178.44	-2.27
47400	146.66	261.69	176.52	270.14	145.12	21.21	176.52	-.42
47500	144.08	260.76	174.67	270.44	142.21	23.13	174.67	-1.33
47600	143.33	259.49	173.58	269.52	140.92	26.14	173.58	1.45
47700	144.73	259.12	171.77	269.63	142.13	27.33	171.77	1.09
47800	143.23	259.14	170.94	269.63	140.67	26.98	170.93	1.11
47900	142.73	260.70	169.83	269.12	140.85	23.07	169.81	2.61
48000	141.09	259.18	168.98	269.62	138.58	26.49	168.98	1.13
48100	139.13	259.00	168.29	271.00	136.57	26.55	168.27	-2.94
48200	138.91	260.12	167.04	270.64	136.85	23.84	167.03	-1.86
48300	137.00	261.18	166.35	271.62	135.38	21.01	166.28	-4.70
48400	134.24	262.02	165.93	272.68	132.94	18.63	165.75	-7.75
48500	129.91	261.91	166.04	272.72	128.62	18.29	165.85	-7.88
48600	128.99	263.02	165.01	273.69	128.03	15.68	164.67	-10.61
48700	132.46	264.69	162.54	274.46	131.89	12.25	162.05	-12.63
48800	133.32	266.76	160.97	275.10	133.11	7.54	160.33	-14.32
48900	135.01	265.22	159.01	275.59	134.54	11.24	158.26	-15.49
49000	132.78	265.00	158.41	277.00	132.27	11.57	157.23	-19.31
49100	131.85	263.25	157.41	277.58	130.93	15.50	156.04	-20.76
49200	130.07	264.28	156.67	278.56	129.42	12.95	154.93	-23.32
49300	127.10	264.77	156.32	278.40	126.57	11.58	154.64	-22.82
49400	124.52	266.00	155.83	278.00	124.22	8.69	154.31	-21.69
49500	122.88	266.00	155.04	278.00	122.58	8.57	153.53	-21.58
49600	122.95	267.00	153.68	279.00	122.78	6.43	151.79	-24.04
49700	121.63	265.40	152.81	279.51	121.24	9.76	150.71	-25.24
49800	121.37	265.91	151.55	279.35	121.06	8.66	149.54	-24.62
49900	121.13	268.00	150.29	280.00	121.05	4.23	148.01	-26.10

TABLE 6. (Concluded)

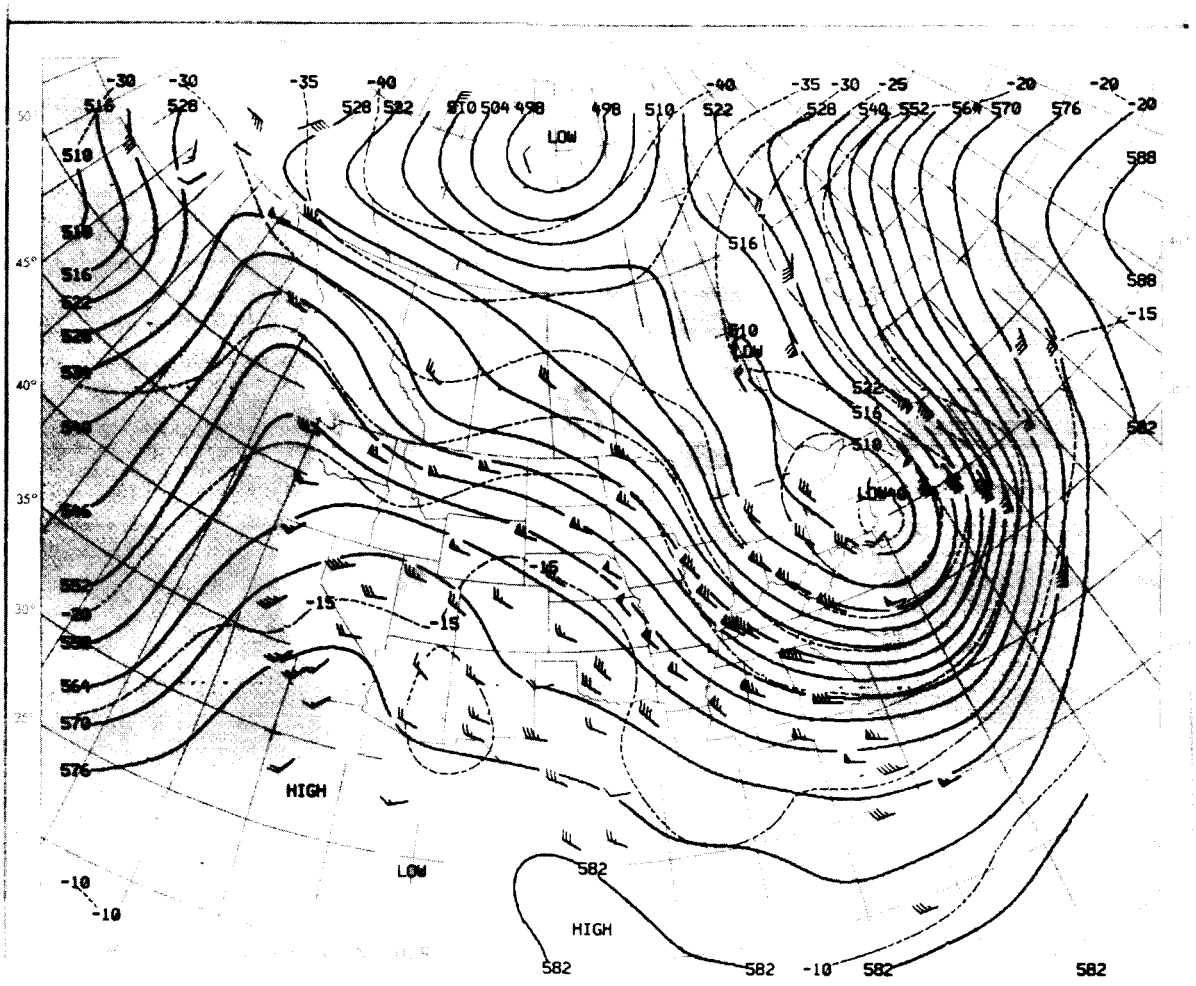
ALT(FT)	WS-E(FPS)	WD-E(DEG)	WS+E(FPS)	WD+E(DEG)	U-E(FPS)	V-E(FPS)	U+E(FPS)	V+E(FPS)
50000	120.13	266.26	149.32	280.56	119.87	7.84	146.79	-27.36
50100	118.62	264.23	148.53	279.88	118.02	11.93	146.32	-25.49
50200	119.53	263.77	146.84	277.40	118.83	12.97	145.61	-18.91
50300	118.33	264.00	147.22	276.00	117.68	12.37	146.42	-15.39
50400	116.11	263.23	146.64	273.61	115.30	13.68	146.35	-9.23
50500	114.77	263.81	147.14	272.12	114.10	12.38	147.04	-5.45
50600	113.40	260.22	146.21	270.62	111.75	19.25	146.21	-1.58
50700	112.86	258.00	146.38	270.00	110.39	23.46	146.38	.00
50800	112.62	256.51	146.46	267.84	109.52	26.26	146.36	5.52
50900	112.90	257.29	146.41	266.29	110.14	24.83	146.10	9.48
51000	113.88	253.00	146.04	265.00	108.90	33.29	145.49	12.73
51100	114.13	255.46	146.01	264.23	110.47	28.64	145.27	14.69
51200	115.37	254.24	145.59	263.29	111.03	31.34	144.59	17.01
51300	116.15	253.27	145.30	263.59	111.24	33.43	144.39	16.22
51400	112.35	253.63	146.57	263.50	107.80	31.67	145.63	16.60
51500	109.54	251.00	147.49	263.00	103.57	35.66	146.39	17.97
51600	110.68	250.53	147.11	263.14	104.35	36.89	146.05	17.57
51700	112.84	252.27	146.40	262.61	107.48	34.37	145.18	18.84
51800	111.88	253.39	146.75	262.27	107.21	31.98	145.42	19.74
51900	112.24	251.21	146.60	261.63	106.26	36.15	145.04	21.35
52000	112.45	251.59	146.54	261.51	106.70	35.52	144.93	21.63
52100	111.44	252.66	145.54	262.49	106.38	33.21	144.29	19.03
52200	112.20	254.14	143.97	263.33	107.93	30.66	143.00	16.72
52300	111.54	255.30	144.20	264.28	107.88	28.30	143.48	14.36
52400	112.67	255.88	142.45	266.72	109.27	27.49	142.22	8.15
52500	113.23	258.52	140.98	267.18	110.96	22.54	140.81	6.92
52600	114.58	259.68	140.53	268.12	112.73	20.53	140.46	4.61
52700	110.76	260.69	140.47	269.14	109.30	17.92	140.46	2.10
52800	107.74	262.98	141.49	271.08	106.93	13.17	141.47	-2.67
52900	104.15	262.86	141.31	272.44	103.34	12.94	141.18	-6.02
53000	105.04	263.19	141.00	273.64	104.30	12.45	140.71	-8.95
53100	106.46	264.34	139.20	274.58	105.94	10.50	138.75	-11.12
53200	107.80	266.88	137.47	275.08	107.64	5.86	136.93	-12.18
53300	108.12	262.58	136.01	277.78	107.21	13.97	134.76	-18.42
53400	107.22	263.32	134.99	278.87	106.49	12.47	133.37	-20.80
53500	107.22	263.57	133.69	280.12	106.54	12.00	131.61	-23.49
53600	106.13	263.69	134.10	281.39	105.49	11.67	131.46	-26.48
53700	108.39	267.72	129.91	282.74	108.30	4.31	126.72	-28.64
53800	107.26	269.26	128.94	283.56	107.25	1.39	125.34	-30.24
53900	107.26	270.26	128.94	284.56	107.26	-.49	124.80	-32.42
54000	106.57	270.54	127.86	285.80	106.57	-1.01	123.03	-34.81
54100	105.00	269.13	127.11	286.24	104.99	1.59	122.04	-35.55
54200	104.47	270.27	125.87	284.56	104.47	-.49	121.82	-31.64
54300	104.66	270.28	124.47	284.57	104.66	-.50	120.47	-31.30
54400	102.58	268.45	123.86	283.82	102.54	2.77	120.27	-29.59
54500	100.91	270.00	123.04	283.32	100.91	.01	119.73	-28.35
54600	99.91	270.00	122.04	283.32	99.91	.00	118.75	-28.12
54700	97.77	267.88	121.44	282.67	97.70	3.62	118.48	-26.64
54800	96.02	268.71	120.67	282.40	96.00	2.16	117.85	-25.92
54900	96.73	266.72	119.13	281.73	96.57	5.54	116.64	-24.22

TUESDAY, JANUARY 28, 1986



Surface Synoptic Map at 1200 UT January 28, 1986 – Isobaric, Frontal, and Precipitation Patterns are Shown in Standard Symbolic Form.

Figure 1. Surface synoptic chart 4 hr 38 min prior to launch of STS-51L.



500 Millibar Height
Contours at 1200 UT
January 28, 1986.
Continuous Lines Indicate Height Contours in Feet Above Sea Level.
Dashed Lines are Isotherms In Degrees Centigrade. Arrows Show
Wind Direction and Speed at the 500 MB Level.

Figure 2. 500 mb map 4 hr 38 min prior to launch of STS-51L.

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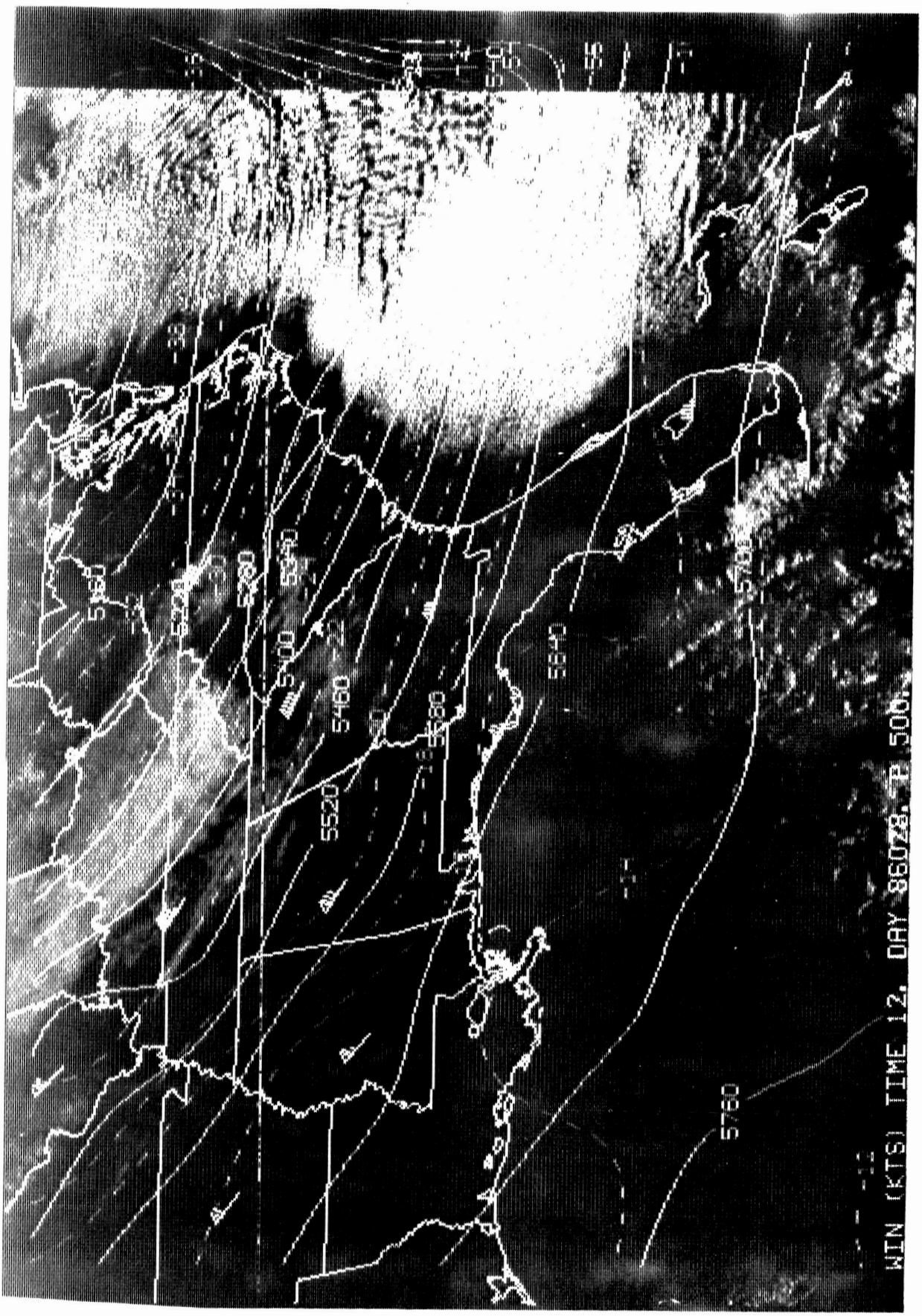


Figure 3. GOES-6 visible imagery of cloud cover 6 min after launch of STS-51L (1644 UT, January 28, 1986). 500-mb contours and wind barbs are included for 1200 UT.

Figure 4. Enlarged view of GOES-6 visible imagery of cloud cover taken 6 min after launch of STS-51L (1644 UT, January 28, 1986). Surface temperatures and wind barbs for 1700 UT are also included. The cloud from the explosion can be seen just east of KSC.

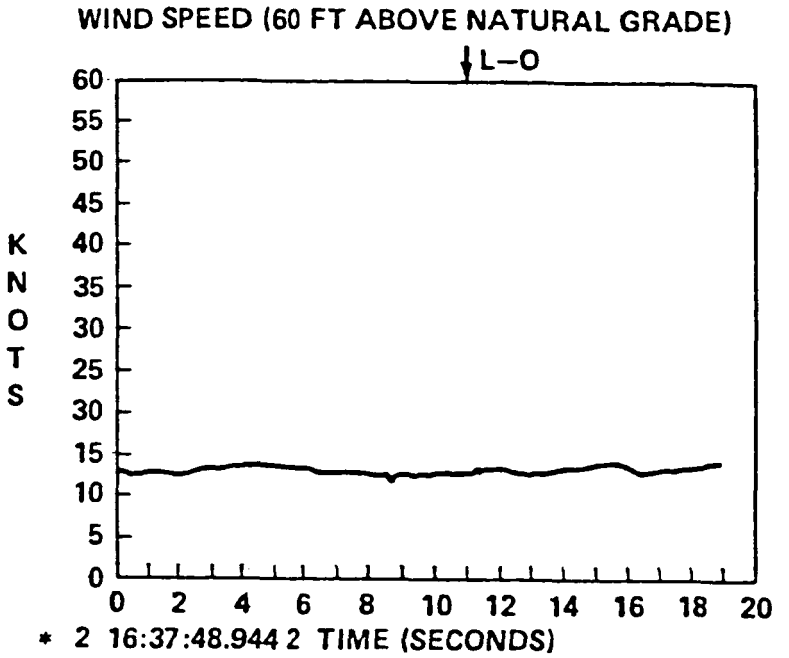


Figure 5. Wind Speed Pad 39B.

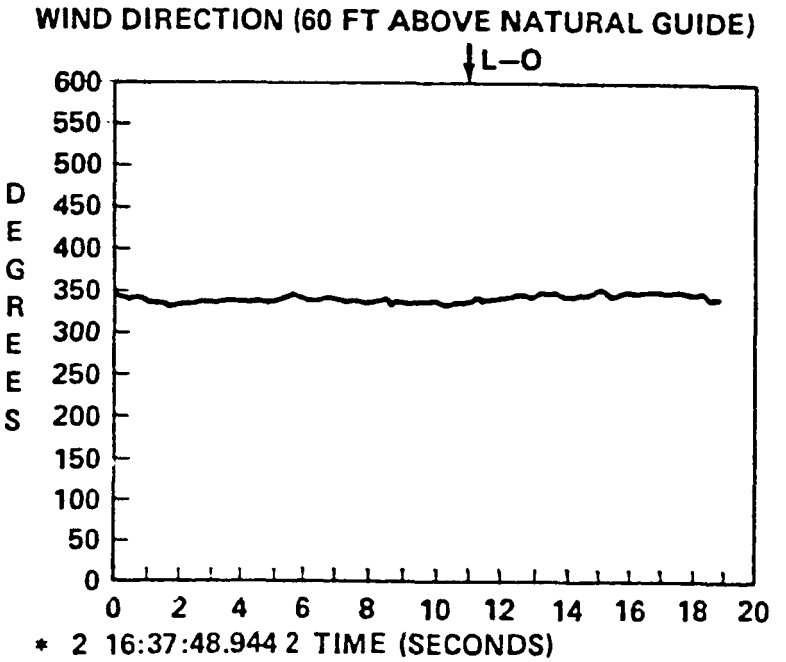


Figure 6. Wind Direction Pad 39B.

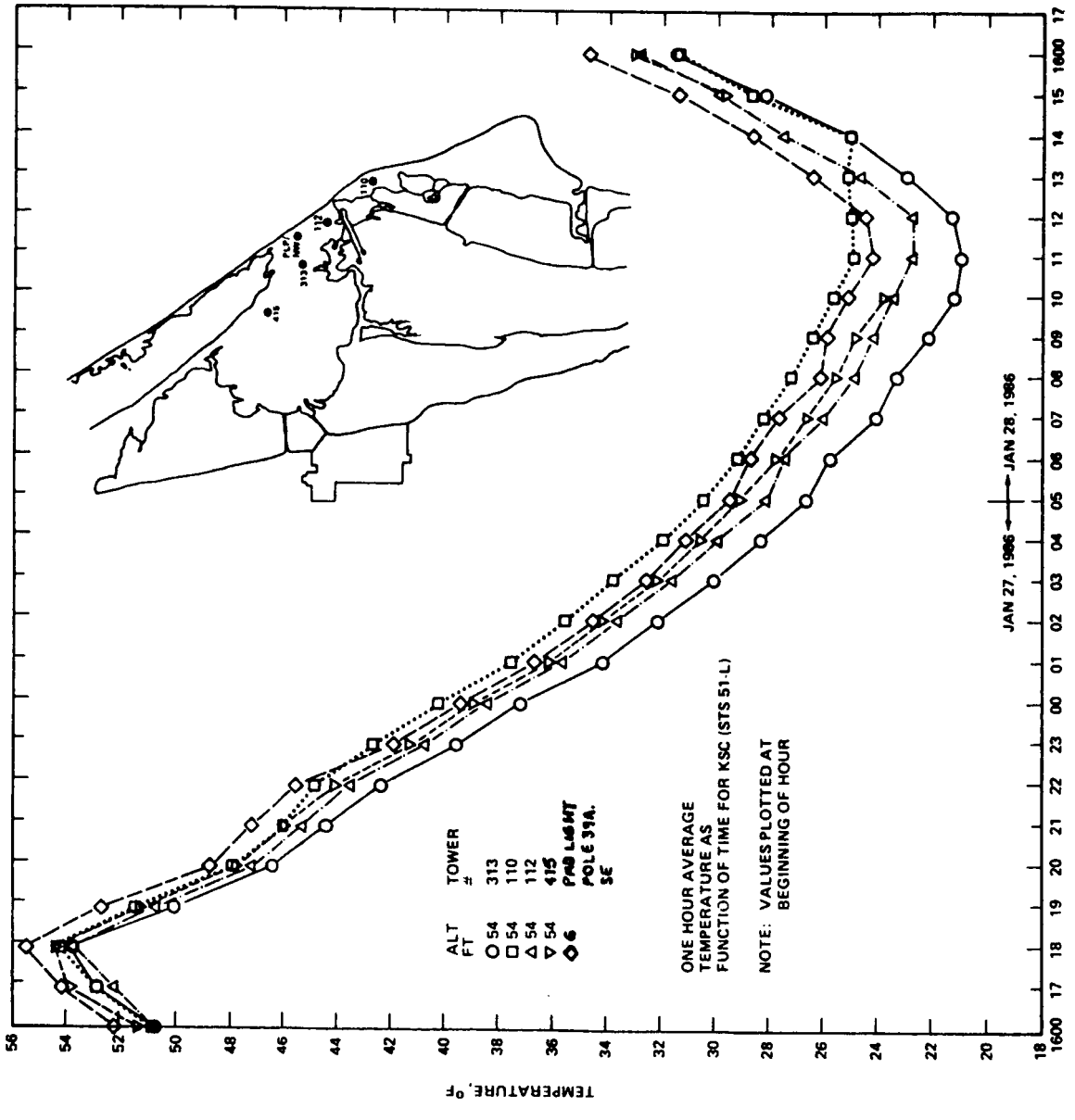


Figure 7. STS-51L 1-hr average temperature as a function of time.

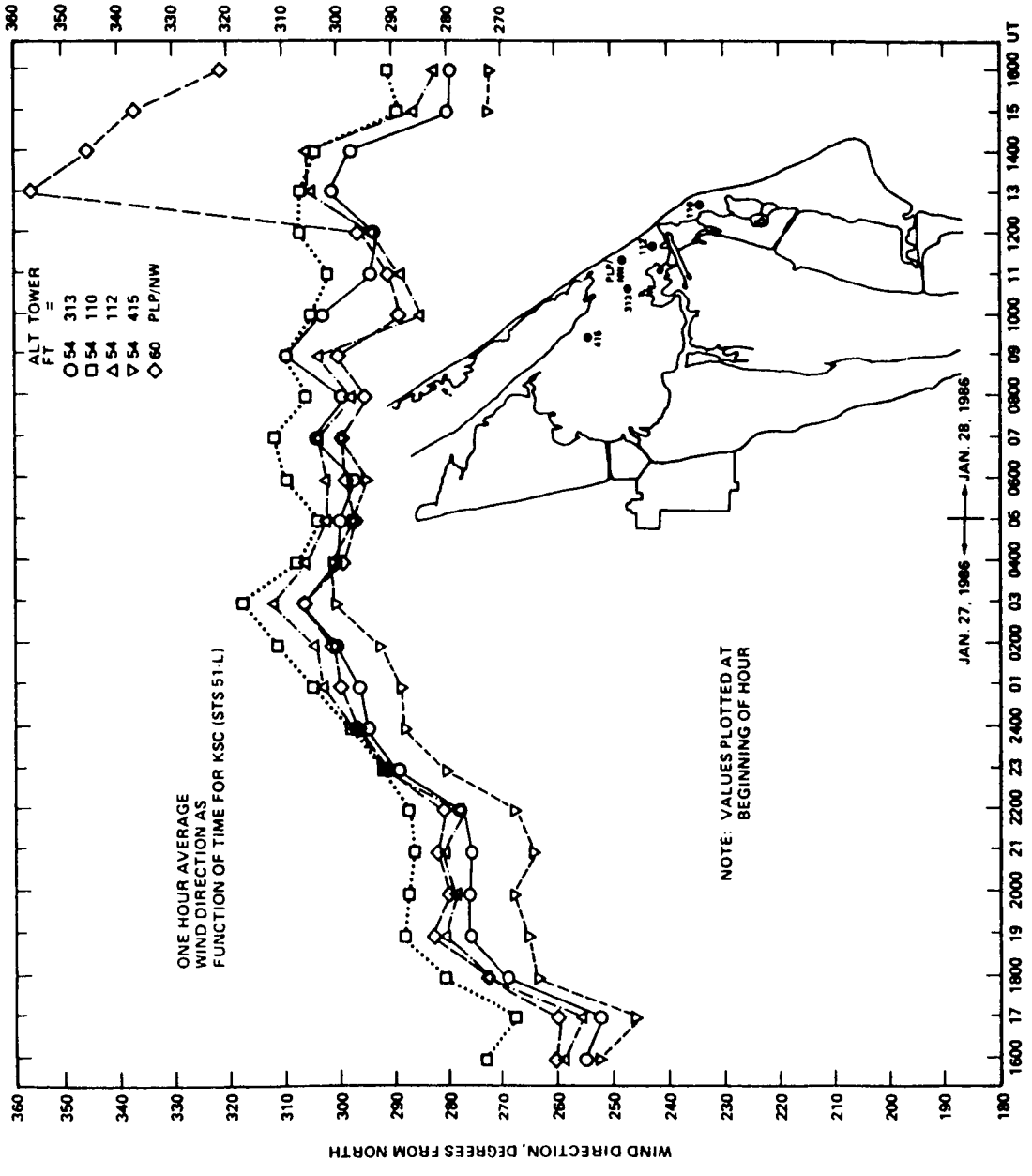


Figure 8. STS-51L 1-hr average wind direction as a function of time.

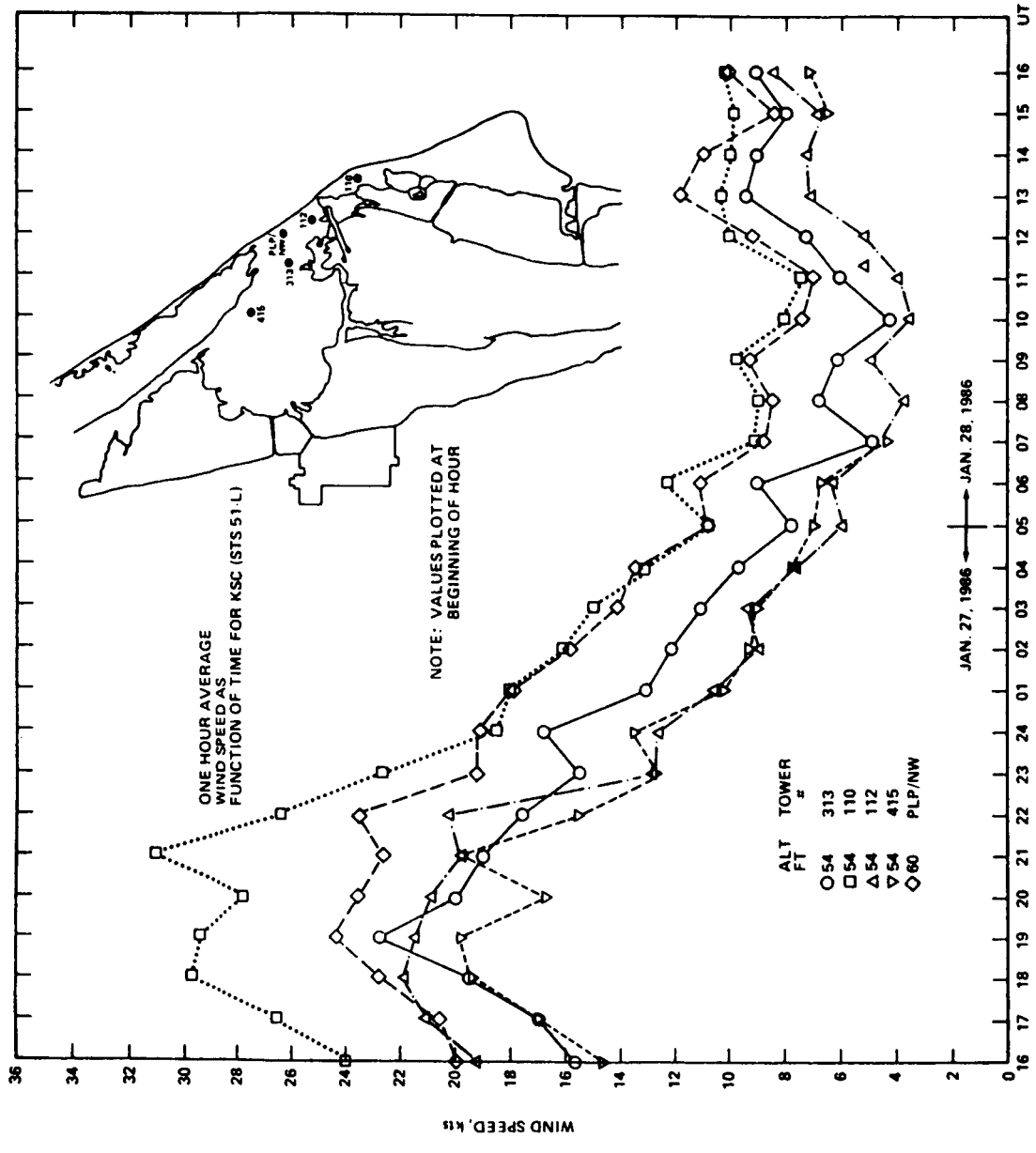
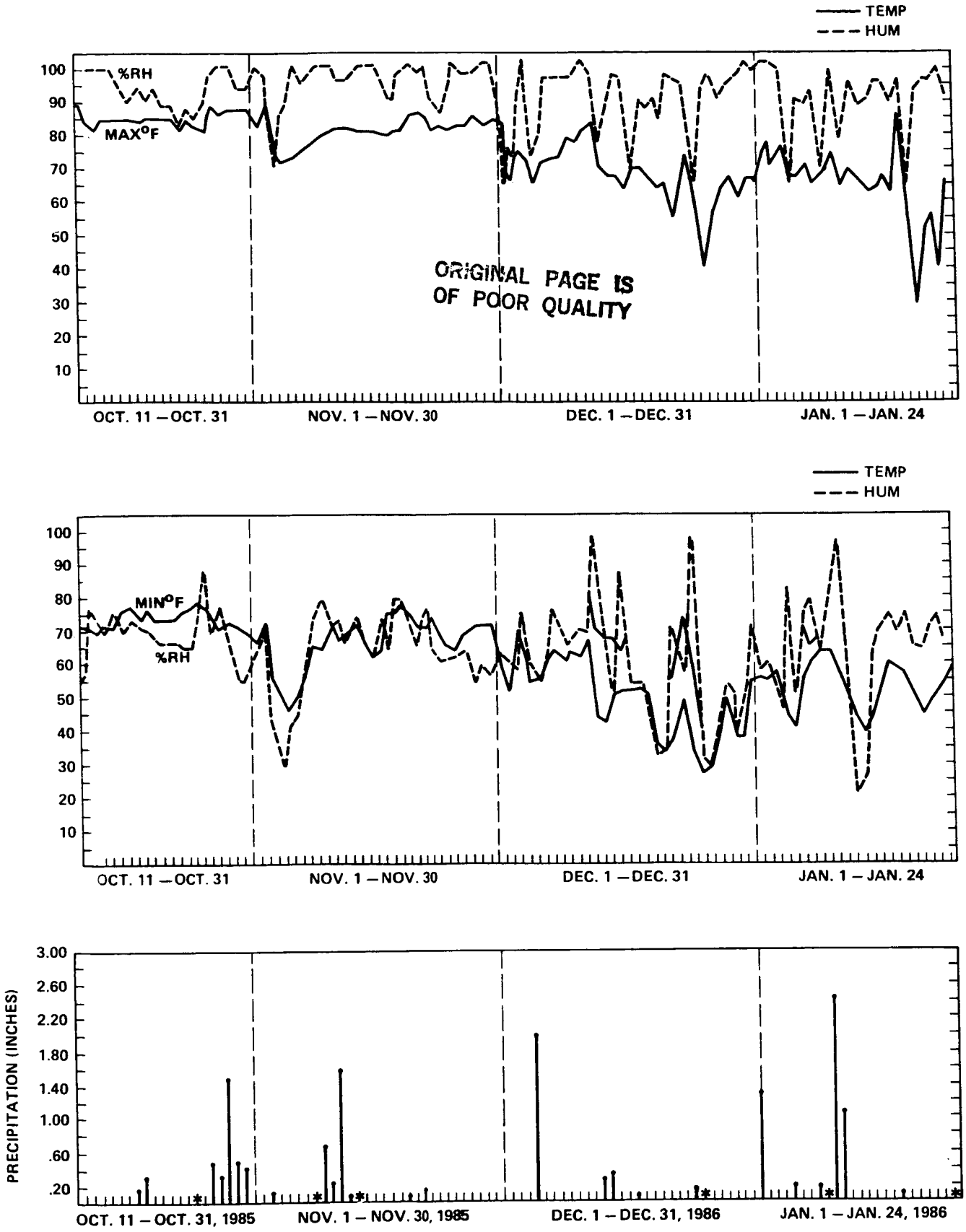


Figure 9. STS-51L 1-hr average wind speed as a function of time.



* – PRECIPITATION LESS THAN .01 OF AN INCH

Figure 10. Daily maximum, minimum temperatures with corresponding maximum, minimum relative humidities; also daily precipitation totals. All data obtained from X68 Shuttle Runway site (October 11, 1985 to January 24, 1986).

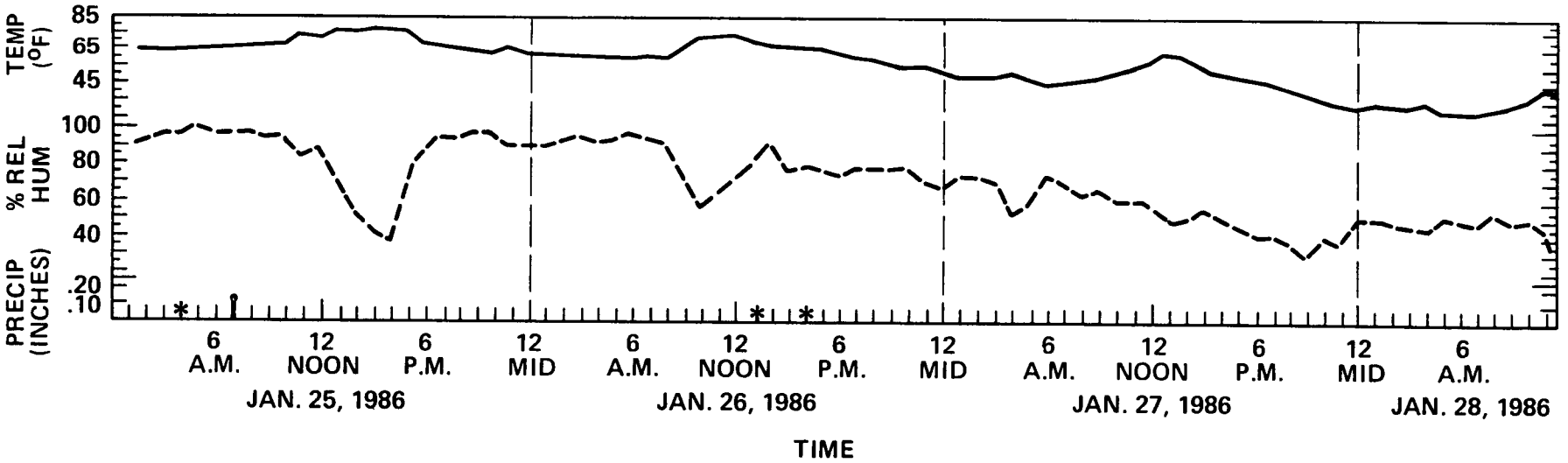


Figure 11. Hourly temperature, relative humidity and 3-hr precipitation totals from X68 Shuttle Runway site (January 25, 1986 to January 28, 1986).

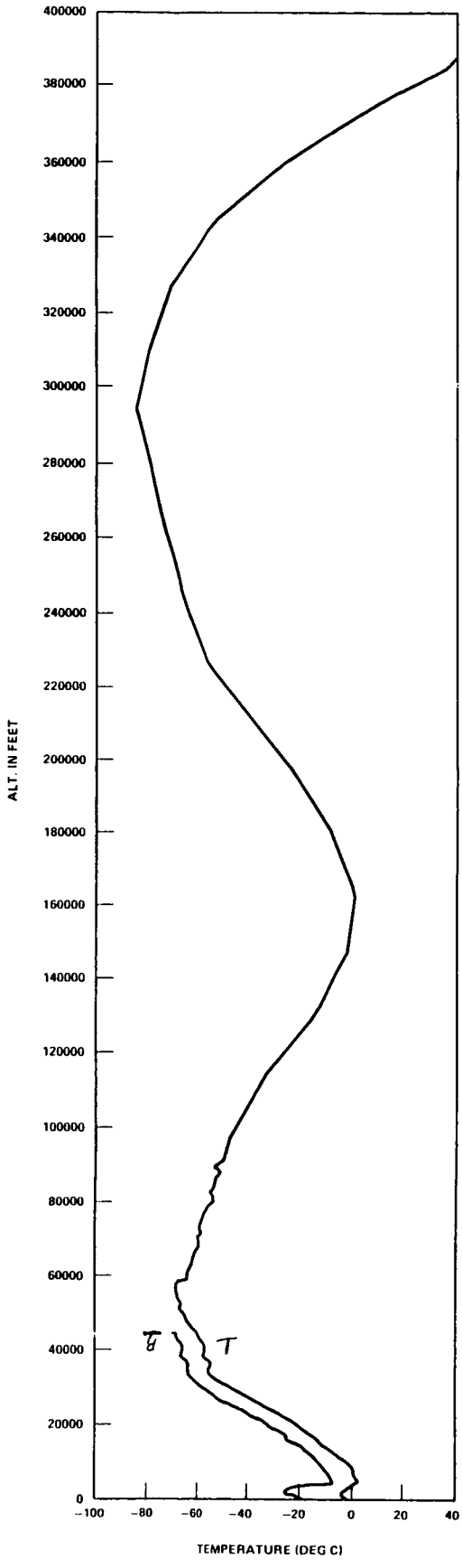


Figure 12. STS-51L temperature profiles versus altitude for launch (ascent).

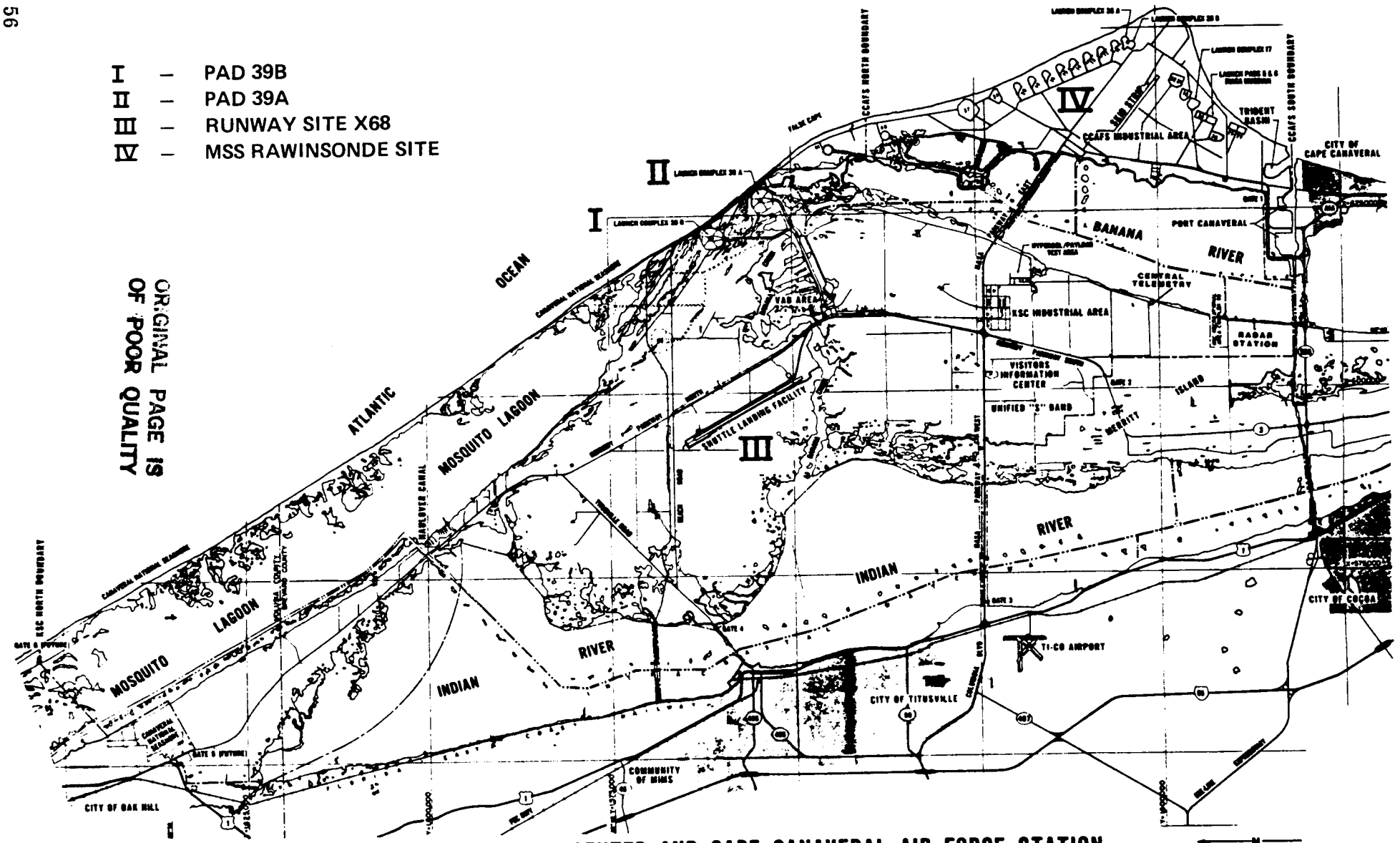


Figure 13. Map of John F. Kennedy Space Center and Cape Canaveral Air Force Station.

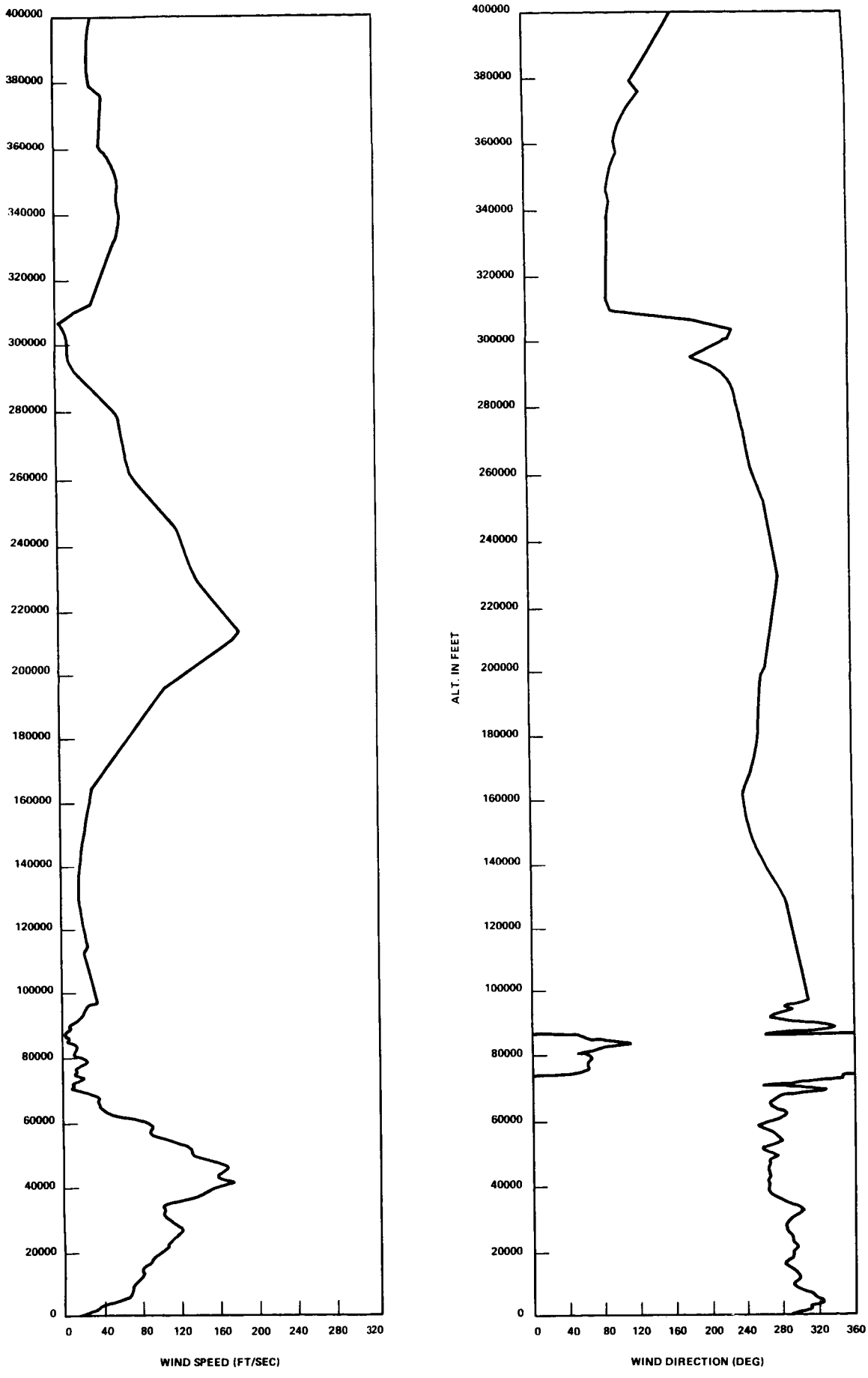


Figure 14. Scalar wind speed and direction at launch time of STS-51L.

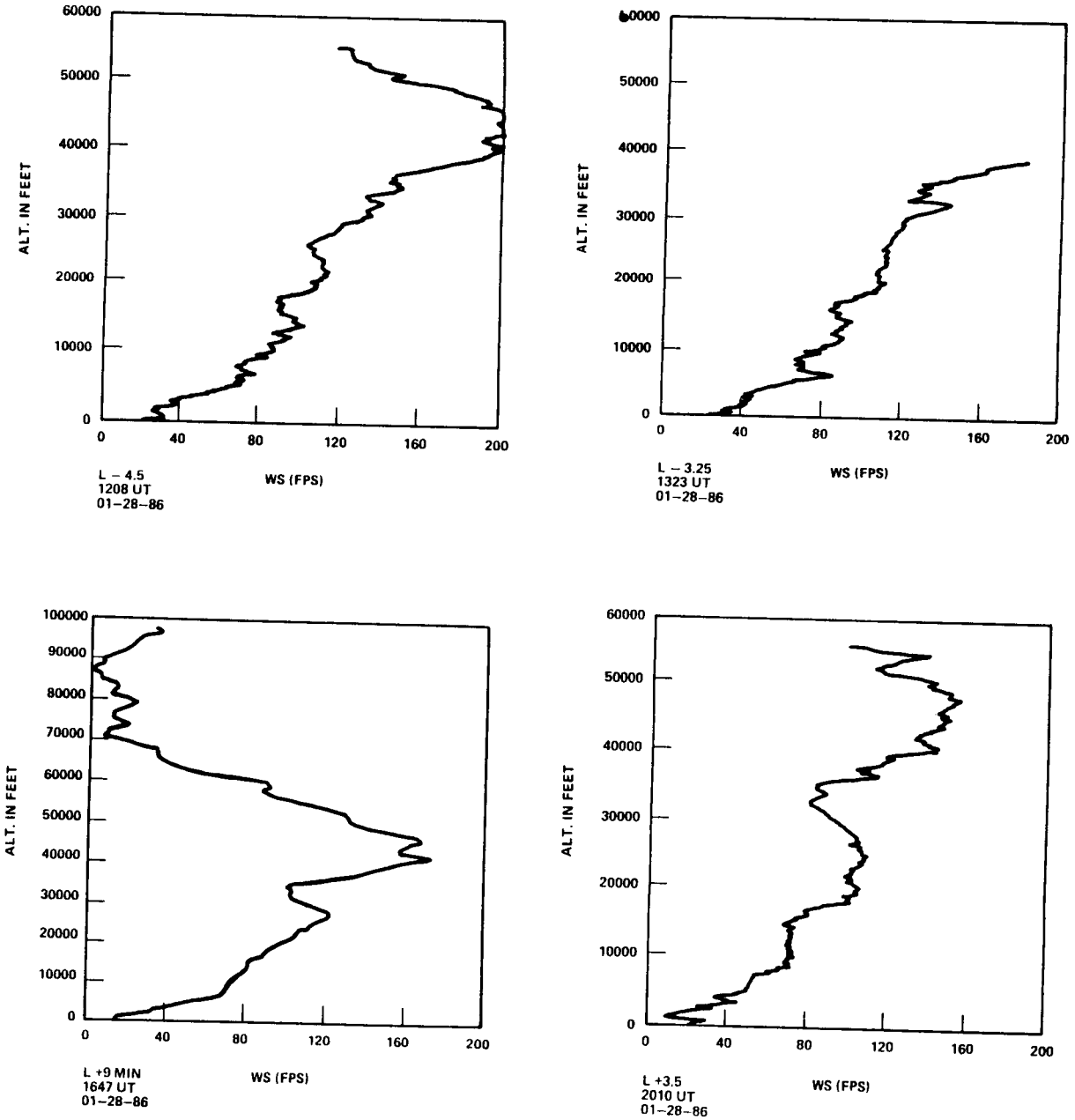


Figure 15. STS-51L prelaunch/launch Jimsphere-measured wind speeds (FPS). (L+9 is a rawinsonde profile)

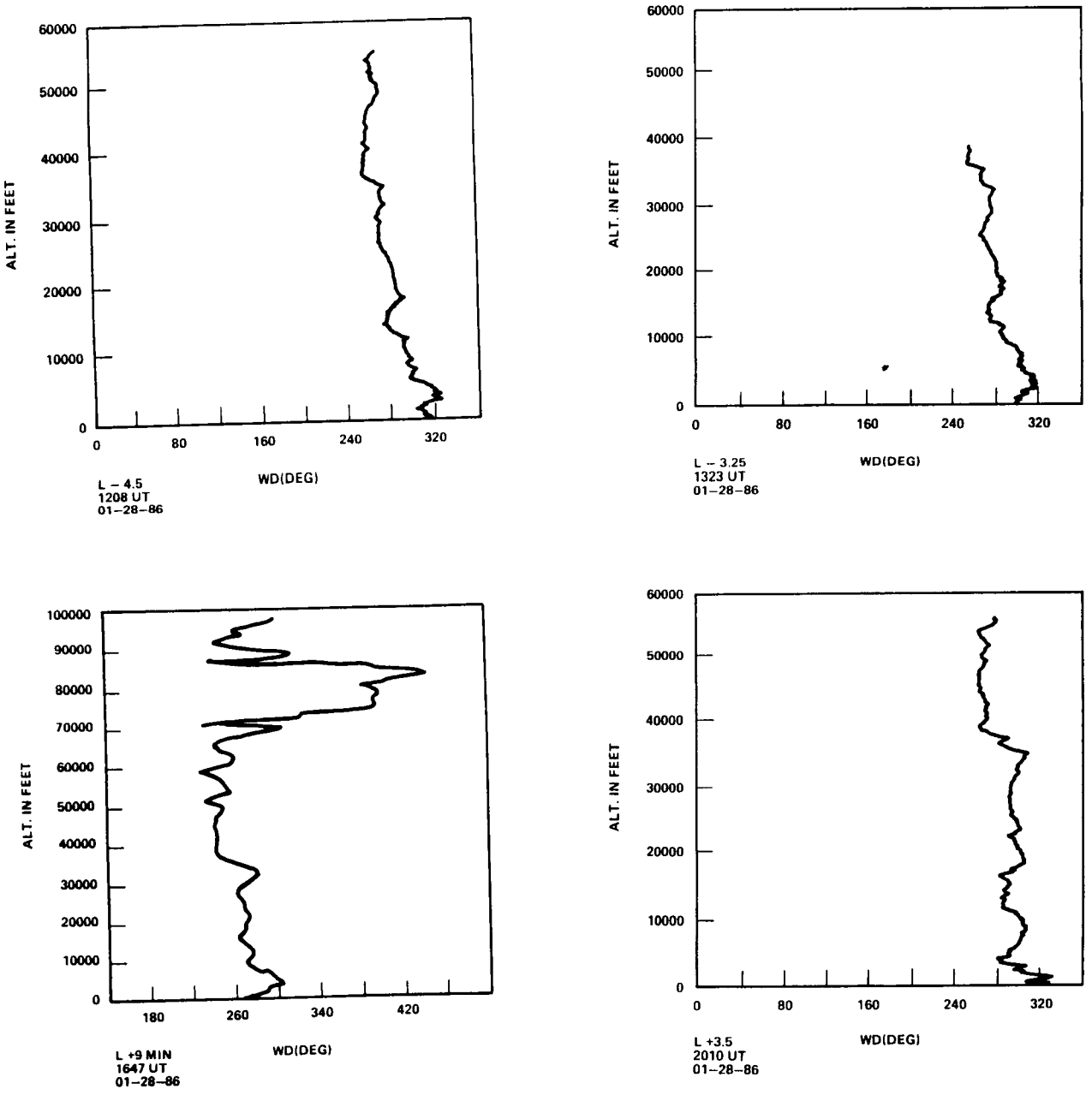


Figure 16. STS-51L prelaunch/launch Jimsphere-measured wind directions (degrees). (L+9 is a rawinsonde profile)

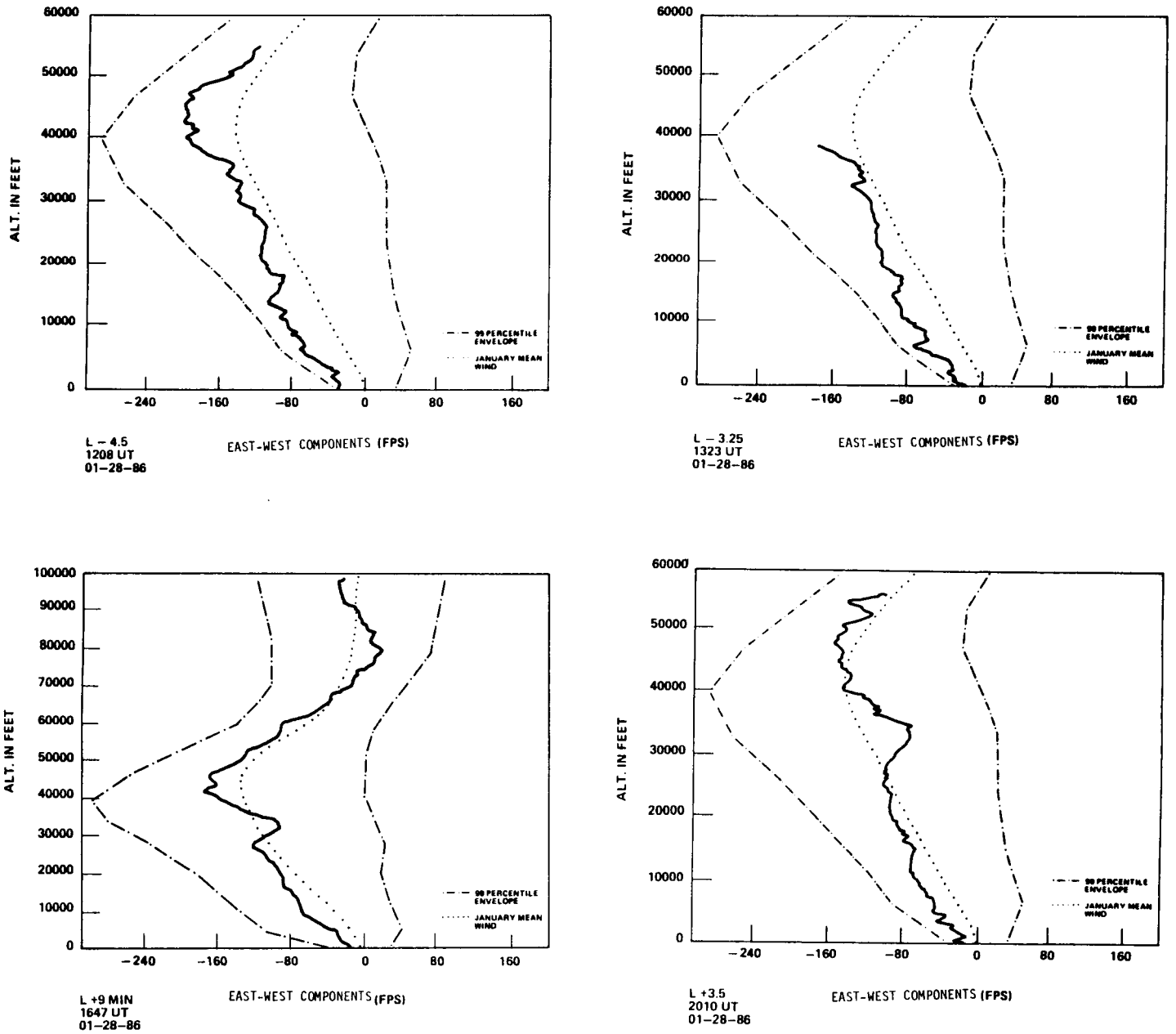


Figure 17. STS-51L prelaunch/launch Jimsphere-measured in-plane component winds (FPS). Flight azimuth = 85 degrees.
(L+9 is a rawinsonde profile)

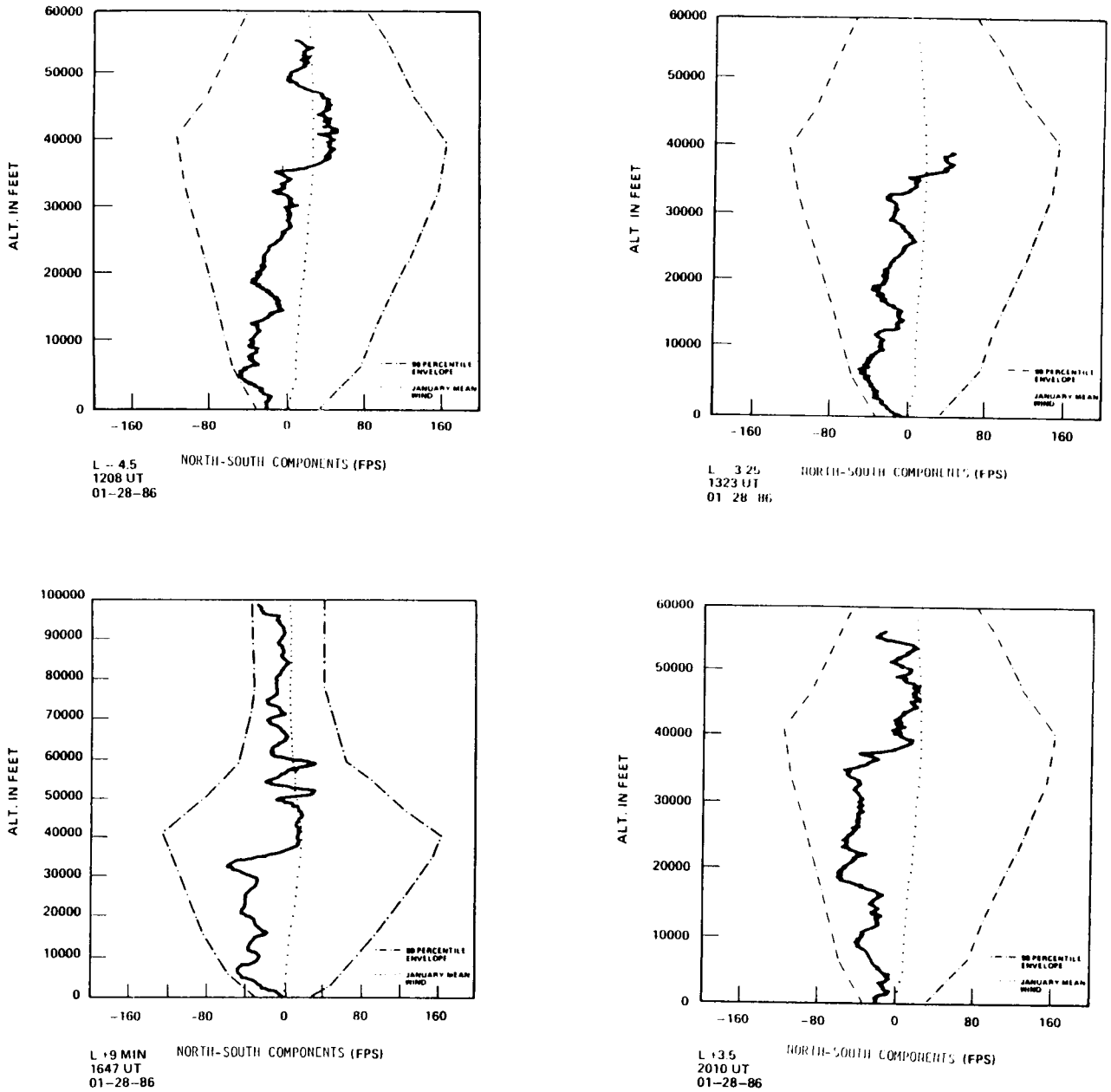
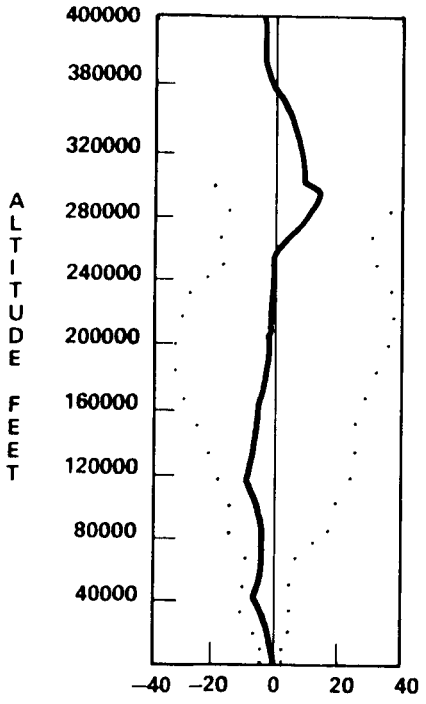
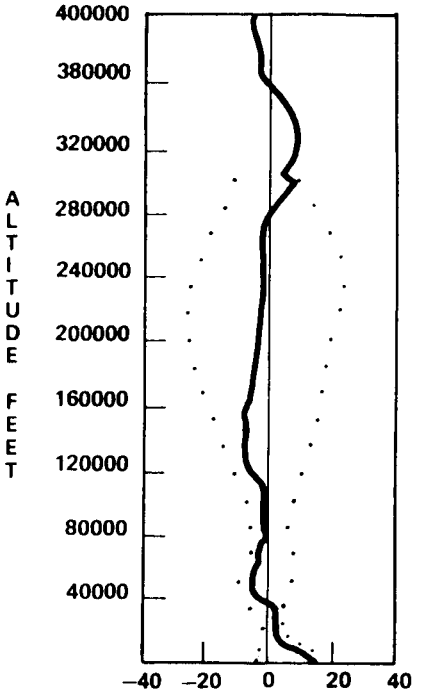


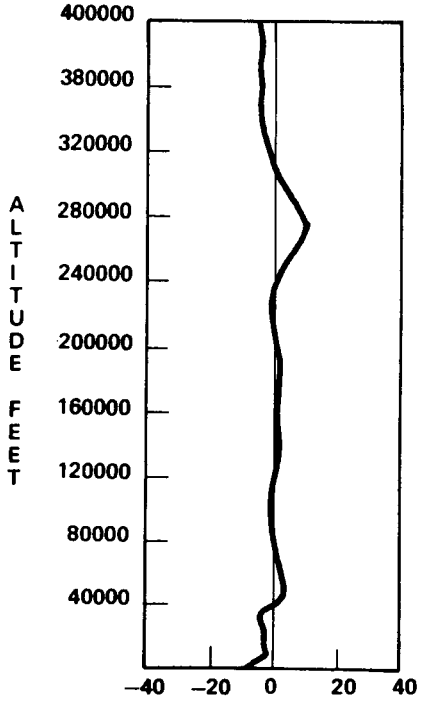
Figure 18. STS-51L prelaunch/launch Jimsphere-measured out-of-plane component winds (FPS). Flight azimuth = 85 degrees. (L+9 is a rawinsonde profile)



PERCENT DEV. FROM PRA 63 FOR PRESSURE
WITH MAX. AND MIN. ENVELOPE



PERCENT DEV. FROM PRA 63 FOR DENSITY
WITH MAX. AND MIN. ENVELOPE



PERCENT DEV. FROM PRA 63 FOR TEMPERATURE

Figure 19. Percent deviation of thermodynamic parameters from PRA 63 values.

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APPENDIX A

FSEC (FLORIDA SOLAR ENERGY CENTER) SOLAR RADIATION

The data is listed as integrated average half hour values in Watts/square meter multiplied by ten. For example, the average insolation from 11:00 to 12:00 a.m. Eastern Standard time on 1 February 1979 (day 32) was (3415 + 3663) ÷ 10 = 707.8 W/m^2. Note that the data printed is for the half hour preceding the printed time.

All data was measured with Eppley PSP pyranometers and NIP pyrheliometers, and was integrated and recorded with a Monitor Labs model 5130 electronic integrator. The data was collected in Cape Canaveral, Florida.

The columns are labeled as follows:

HORIZ Insolation on a horizontal surface.

TILT Insolation on a tilted surface. Before day 240 of 1977 the tilt was 28.5 deg, the same as the local latitude. Since then the tilt was adjusted according to this table so that the incident angle at solar noon was never more than four degrees.

DATES	TILT
3 November through 9 February	48 deg
10 February through 4 March and 11 October through 2 November	40 deg
5 March through 24 March and 21 September through 10 October	32 deg
25 March through 13 April and 31 August through 20 September	24 deg
14 April through 7 May and 8 August through 30 August	16 deg
8 May through 7 August	8 deg

DIRECT Direct normal insolation.

1986 Day 1 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	22	3	0
800	113	69	0
830	320	256	54
900	560	469	45
930	719	684	33
1000	1294	1411	333
1030	1868	2650	1491
1100	1836	2128	423
1130	1810	1820	233
1200	1367	1322	115
1230	2137	2758	924
1300	1603	2017	372
1400	1097	1817	132
1430	1351	1810	175
1500	1293	1430	258
1530	1322	1319	439
1600	815	938	193
1630	461	368	1
1700	203	189	27
1730	77	37	0
1800	0	0	0
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 Day 2 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
720	47	28	8
800	293	557	841
830	652	1366	1638
900	1037	1870	2299
930	1506	2568	2846
1000	2062	3366	3418
1030	2388	3648	3065
1100	3045	4409	3562
1130	2708	3702	2253
1300	3084	4339	2793
1230	2535	3537	1980
1300	2397	3533	2100
1400	2569	4054	3157
1430	2610	1228	3678
1500	2287	3955	3452
1530	2018	3475	3384
1600	1058	1577	1065
1630	942	1572	1718
1700	432	627	453
1730	200	414	509
1800	10	0	0
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 3 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	0	0	0
800	0	0	0
830	0	0	0
900	501	378	1
930	733	594	3
1000	805	617	5
1030	1018	843	9
1100	1725	1641	69
1130	2224	2786	509
1200	3272	5008	3549
1230	3198	4985	4100
1300	3212	5015	4265
1330	3071	4872	1167
1400	2809	4578	3964
1430	2546	4273	3591
1500	2256	3289	3374
1530	1955	3433	3179
1600	1503	2843	2917
1630	1023	2165	2513
1700	550	1358	1839
1730	175	519	823
1800	14	7	18
1830	3	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 4 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	41	23	4
800	231	310	213
830	441	560	295
900	721	767	103
930	1237	2186	2167
1000	1811	3197	3373
1030	2385	3874	3638
1100	2669	4230	3819
1130	2908	4528	3888
1200	3090	4746	3995
1230	2164	4860	4034
1300	3189	4907	4023
1330	3134	4791	3308
1400	2985	4004	3613
1430	2639	4329	3282
1500	2241	3735	2857
1530	1726	2936	2256
1600	1281	2198	1728
1630	839	1519	1253
1700	520	995	897
1730	181	320	256
1800	22	12	7
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 5 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	43	26	0
800	151	122	14
830	197	132	0
900	408	303	1
930	461	334	1
1000	693	509	4
1030	697	506	10
1100	176	105	0
1130	350	227	0
1200	383	273	0
1230	497	365	0
1300	494	375	0
1330	295	210	0
1400	334	239	0
1430	388	271	0
1500	395	278	0
1530	587	424	8
1600	556	414	3
1630	559	484	2
1700	257	188	2
1730	210	504	580
1800	26	26	29
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 6 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	33	22	25
800	265	335	1181
830	716	1616	2536
900	1224	2424	3257
930	1719	3103	3702
1000	2156	3689	3991
1030	2559	4196	4222
1100	2890	4616	4342
1130	3111	4893	4397
1200	3331	5168	4451
1230	2932	4132	2643
1300	2693	3462	1362
1330	1772	1752	121
1400	1992	2356	528
1430	1988	2567	1000
1500	1513	1803	571
1530	1572	2017	883
1600	1675	2983	3123
1630	1153	2444	3055
1700	641	1605	2295
1730	214	670	1088
1800	12	18	11
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 7 HOUR	HORIZ	TILT	DIRECT
30	0		
100	0		
130	0		
200	0		
230	0		
300	0		
330	0		
400	0		
430	0		
500	0		
530	0		
600	0		
630	0		
700	0		
730	18		
800	39		
830	157		
900	281		
930	405		
1000	661		
1030	998		
1100	1505		
1130	2151		
1200	2447		
1230	1680		
1300	1778		
1330	1067		
1400	2183		
1430	1630		
1500	1397		
1530	838		
1600	925		
1630	786		
1700	285		
1730	90		
1800	11		
1830	0		
1900	0		
1930	0		
2000	0		
2030	0		
2100	0		
2130	0		
2200	0		
2230	0		
2300	0		
2330	0		
2400	0		

1986 DAY 8 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
400	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	15	0	0
800	37	12	0
830	76	41	0
900	170	104	1
930	367	263	1
1000	290	218	0
1030	369	266	0
1100	454	320	0
1130	552	377	0
1200	725	489	0
1230	283	210	0
1300	627	437	4
1330	612	450	2
1400	185	116	0
1430	155	100	0
1500	225	158	0
1530	256	180	0
1600	116	70	191
1630	89	53	0
1700	112	71	1
1730	77	40	2
1800	17	0	4
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 9 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	26	4	0
800	76	37	0
830	175	124	0
900	388	298	0
930	681	510	0
1000	569	401	0
1030	972	851	5
1100	1483	1451	24
1130	1240	1084	10
1200	1605	1333	6
1230	1235	877	0
1300	426	288	0
1330	704	556	1
1400	1189	915	1
1430	1160	850	0
1500	776	566	0
1530	568	414	0
1600	604	451	0
1630	174	112	0
1700	175	109	0
1730	62	32	0
1800	17	0	0
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 10 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	0	0	0
800	28	4	0
830	69	38	0
900	65	31	0
930	65	33	0
1000	61	29	0
1030	443	292	2
1100	806	687	5
1130	1821	1690	151
1200	1189	1089	20
1230	1891	1918	292
1300	2078	2399	662
1330	2213	2570	471
1400	2488	3328	1729
1430	829	767	12
1500	590	491	0
1530	247	190	0
1600	166	113	0
1630	59	28	0
1700	27	12	0
1730	26	16	0
1800	18	0	0
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 11 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	21	5	0
800	29	9	0
830	182	122	0
900	160	106	0
930	277	186	0
1000	888	702	7
1030	547	461	2
1100	932	777	10
1130	1171	972	19
1200	843	669	0
1230	526	386	0
1300	683	504	0
1330	880	663	0
1400	1400	1188	12
1430	2087	2773	885
1500	2422	3868	2537
1530	1992	3219	2070
1600	1503	2298	1188
1630	928	1298	603
1700	359	377	71
1730	264	403	232
1800	39	24	0
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 12 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	31	16	12
800	266	500	1094
830	707	1536	2276
900	1214	2339	3022
930	1722	3016	3467
1000	2148	3604	3739
1030	2551	4096	3926
1100	2890	4500	4046
1130	3145	4833	4145
1200	3341	5073	4225
1230	3434	5189	4267
1300	3441	5209	4273
1330	3364	5129	1241
1400	3188	4940	4153
1430	2924	4643	3431
1500	2562	4245	3121
1530	2185	3750	2920
1600	1731	3155	2694
1630	1223	2467	2319
1700	724	1682	1777
1730	282	779	914
1800	32	45	41
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 13 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	22	11	0
800	282	601	1676
830	757	1722	2858
900	1276	2485	3490
930	1920	3159	3877
1000	2225	3703	4049
1030	2549	4134	4175
1100	2907	4560	4323
1130	3171	4878	4388
1200	3401	5135	4497
1230	3562	5331	4647
1300	3604	5399	4710
1330	3542	5348	4748
1400	3369	5172	4702
1430	3092	4864	4621
1500	2739	4461	4465
1530	2327	3969	4207
1600	1801	3361	3698
1630	1322	2689	3631
1700	791	9090	3073
1730	305	1034	2037
1800	23	129	330
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 14 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	25	17	54
800	286	630	2181
830	784	1817	3330
900	1321	2603	3868
930	1854	3276	4337
1000	2316	3854	4188
1030	2723	4373	4758
1100	3053	4803	4884
1130	3324	5132	4956
1200	3519	5326	4983
1230	3606	5413	4977
1300	3627	5442	4986
1330	3538	5348	4954
1400	3347	5145	4890
1430	3081	4044	4774
1500	3708	4400	4556
1530	2294	3902	4340
1600	1842	3338	4087
1630	1314	2662	3673
1700	805	1927	3094
1730	326	1060	2073
1800	26	95	350
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 15 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	31	20	11
800	258	456	793
830	683	1475	1582
900	1222	2341	3623
930	1724	3003	3017
1000	2179	3584	3373
1030	2609	4128	3583
1100	2975	4582	4339
1130	3261	4935	4624
1200	3440	5146	4652
1230	3511	5225	4627
1300	3496	5318	4597
1330	3407	5132	4567
1400	3218	4938	4496
1430	2954	4624	4343
1500	2606	4177	4086
1530	2193	3651	3810
1600	1751	3079	3531
1630	1245	2416	3120
1700	754	1688	2560
1730	253	654	1128
1800	22	27	41
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 16 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	20	0	0
800	46	20	0
830	150	113	0
900	240	186	1
930	495	402	44
1000	225	165	1
1030	953	730	9
1100	1029	754	21
1130	538	364	1
1200	338	209	0
1230	549	387	1
1300	1054	836	10
1330	1587	1494	93
1400	2090	2403	651
1430	2744	3836	2224
1500	2489	3900	2890
1530	1916	3009	1990
1600	1644	2788	2287
1630	1123	1998	1816
1700	613	1130	1044
1730	229	377	331
1800	36	14	0
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 17 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	23	3	0
800	94	51	1
830	296	194	1
900	508	411	3
930	635	572	7
1000	1363	1192	32
1030	1149	950	7
1100	578	455	0
1130	1164	1032	6
1200	1470	1303	46
1230	2257	2350	380
1300	2495	2872	788
1330	3077	4373	2346
1400	3219	4804	3148
1430	2019	4329	2770
1500	2143	3256	1842
1530	2132	3438	2535
1600	1738	2396	2310
1630	1325	2188	1661
1700	686	1275	1474
1730	224	268	136
1800	32	16	0
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 18 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	21	1	0
800	115	66	1
830	250	172	1
900	489	337	2
930	782	569	8
1000	658	486	6
1030	585	423	0
1100	491	350	1
1130	713	531	3
1200	867	664	1
1230	734	533	0
1300	746	573	0
1330	1058	809	3
1400	720	530	1
1430	599	410	0
1500	512	395	0
1530	936	871	204
1600	1145	1117	265
1630	952	1072	482
1700	450	425	86
1730	98	48	0
1800	18	1	0
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 19 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	24	3	0
800	89	46	7
830	371	527	597
900	735	930	790
930	1229	2074	1936
1000	1743	2342	1448
1030	1688	1861	751
1100	2666	3906	3329
1130	3213	4761	4192
1200	1904	2247	1000
1230	2611	3641	2603
1300	1871	2381	1120
1330	2948	4081	2627
1400	3486	4853	3913
1430	3640	3590	2398
1500	2696	4229	3892
1530	2282	3664	3582
1600	1780	2794	2912
1630	1477	2549	2129
1700	760	1556	2204
1730	315	691	1134
1800	62	85	139
1830	1	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 20 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	37	21	113
800	311	746	1828
830	783	1649	3015
900	1312	2464	3740
930	1839	3133	4099
1000	2297	3713	4812
1030	2708	4213	4428
1100	3000	4483	4460
1130	3284	4878	4495
1200	3487	5115	4569
1230	3606	5257	4640
1300	3607	5262	4620
1330	3535	5194	4632
1400	3366	5028	4616
1430	3135	4790	1575
1500	2795	4398	4354
1530	2365	3890	4109
1600	1912	3317	3857
1630	1401	2676	3535
1700	888	1964	3024
1730	418	1140	2112
1800	80	220	512
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 21 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	38	22	151
800	314	745	2064
830	794	1879	3095
900	1309	2143	3692
930	1827	3000	4054
1000	2230	3529	4200
1030	2706	4187	4478
1100	3055	4597	4587
1130	3330	4926	4666
1200	3531	5164	4727
1230	3643	5305	4770
1300	3649	5315	4755
1330	3552	5213	4699
1400	3378	4439	4654
1430	3118	4753	4539
1500	2777	4855	4279
1530	2366	3871	4057
1600	1917	3297	3771
1630	1403	2648	3377
1700	891	1948	2888
1730	395	1119	1984
1800	50	206	427
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 22 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	32	16	7
800	222	338	557
830	623	1257	2388
900	1259	2237	3211
930	1656	2721	3341
1000	2156	3414	3777
1030	2635	4042	4154
1100	2972	4448	4240
1130	3284	4818	4358
1200	3501	5083	4452
1230	3629	5234	4484
1300	3564	5122	4282
1330	2820	4013	3110
1400	3550	5029	4412
1430	3325	4778	4183
1500	2720	4241	3881
1530	2326	3767	3799
1600	1880	3178	3463
1630	1326	2438	2911
1700	667	1285	1624
1730	251	407	448
1800	45	30	13
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 23 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	25	4	4
800	177	117	1
830	373	295	5
900	420	347	21
930	766	1033	930
1000	1950	3067	3033
1030	2633	4008	3845
1100	2627	3911	3098
1130	3004	3892	2169
1200	3954	6100	3120
1230	1942	1948	140
1300	2816	3152	817
1330	2612	3213	1078
1400	3050	4312	2033
1430	2210	4376	3848
1500	2617	3271	3846
1530	1746	2718	2604
1600	1176	1823	1726
1630	962	1598	1720
1700	579	1029	1233
1730	307	621	894
1800	46	44	52
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 24 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	37	19	7
800	266	425	591
830	688	1222	1578
900	1193	2009	2298
930	1720	2772	2959
1000	2185	3387	3360
1030	2607	3927	3606
1100	2900	4391	3866
1130	3261	4725	3962
1200	3461	4964	4023
1230	3579	5111	4083
1300	3578	5105	4002
1330	3392	4864	3578
1400	3074	4089	2503
1430	2417	2832	1061
1500	2477	3918	1113
1530	2366	3588	2879
1600	1548	2126	994
1630	1193	1607	859
1700	563	621	276
1730	169	128	9
1800	54	44	33
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 25 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	35	11	0
800	162	124	0
830	342	241	0
900	328	215	0
930	450	307	0
1000	927	693	6
1030	1330	1120	18
1100	1902	2062	227
1130	1986	1993	207
1200	2298	2686	701
1230	3107	4039	1980
1300	2619	3241	1229
1330	3135	4271	2557
1400	3193	4105	2205
1430	2442	3183	1526
1500	2640	3890	2898
1530	1905	2828	1947
1600	1358	1978	1289
1630	899	1125	577
1700	543	530	103
1730	245	216	9
1800	51	26	6
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 26 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	27	13	0
800	217	286	342
830	735	1197	1610
900	1272	2043	2571
930	1779	2819	3267
1000	2280	3323	3149
1030	1676	1779	489
1100	773	584	0
1130	1349	1230	9
1200	1117	887	39
1230	635	471	1
1300	858	605	1
1330	255	727	4
1400	217	601	0
1430	806	619	1
1500	528	358	2
1530	418	302	0
1600	553	435	0
1630	1060	1315	782
1700	442	481	311
1730	612	1223	1587
1800	110	287	415
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 27 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	48	35	190
800	251	394	963
830	306	217	0
900	436	334	20
930	848	999	684
1000	2384	3712	4134
1030	2845	4272	4413
1100	3232	4733	4347
1130	3369	4811	4165
1200	2778	3674	2172
1230	3159	4183	2916
1300	3272	4293	3112
1330	2910	3711	2209
1400	3022	4106	2769
1430	2533	3415	1963
1500	2529	3549	2198
1530	2126	3069	1977
1600	1511	2032	1045
1630	1293	1760	909
1700	721	1158	588
1730	471	993	592
1800	106	197	75
1830	3	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

1986 DAY 28 HOUR	HORIZ	TILT	DIRECT
30	0	0	0
100	0	0	0
130	0	0	0
200	0	0	0
230	0	0	0
300	0	0	0
330	0	0	0
400	0	0	0
430	0	0	0
500	0	0	0
530	0	0	0
600	0	0	0
630	0	0	0
700	0	0	0
730	48	32	334
800	367	883	2285
830	872	1820	3308
900	1424	2551	3841
930	1971	3220	4338
1000	2457	3924	1578
1030	2887	4329	4727
1100	3242	4741	4820
1130	3540	5094	4802
1200	3740	5301	4931
1230	3849	5420	4947
1300	3869	5448	4951
1330	3781	5369	4918
1400	3577	5171	4843
1430	3317	4811	4753
1500	2961	4519	4470
1530	2510	4001	4191
1600	2045	3420	3915
1630	1524	2764	3563
1700	969	2076	3099
1730	473	1302	2300
1800	98	384	707
1830	0	0	0
1900	0	0	0
1930	0	0	0
2000	0	0	0
2030	0	0	0
2100	0	0	0
2130	0	0	0
2200	0	0	0
2230	0	0	0
2300	0	0	0
2330	0	0	0
2400	0	0	0

APPENDIX B

SHORTWAVE SOLAR IRRADIANCE (INSOLATION) STATISTICS

1. These insolation computations were produced by the USAFETAC Shortwave Solar Radiation Estimating Model (SWSLR). This model is based on the subroutine INSOL of the Infrared Tactical Decision Aid, reference Air Force Geophysics Laboratory Technical Report AFGL/TR/82-0274. It accounts for elevation, latitude, time of day and year, current weather conditions, and an appropriate albedo for the location.

a. The concrete environment at this location dictates an albedo of 0.30.

b. The current weather is read from the USAFETAC historical surface weather database by the SWSLR program, which checks the data for correct format and rejects unusable data. Less than two percent of data for this location was rejected.

c. The SWSLR model does not consider any influences on solar irradiance attributable to the spacecraft in its pre-launch configuration.

d. The SWSLR model does not consider thermal radiation from the atmosphere (sky radiation), since it is negligible in comparison to the solar component in the range from 0.3 to 2.5 microns.

2. Model output for each shuttle mission includes daily shortwave solar irradiance for 0000 GMT, 0600 GMT, 1200 GMT, 1800 GMT. Units for the shortware solar irradiance statistics are Wm^{-2}. To convert to Btu ft^{-2} h^{-1}, multiply by 0.317. No shortwave solar irradiance is present at 0600 GMT, very limited shortwave solar irradiance occurs at 0000 GMT and 1200 GMT (late evening and early morning) and the greatest amount occurs at 1800 GMT. The maximum solar irradiance occurs at solar noon which for the Kennedy Space Center is 1800 GMT. The mean irradiance for each shuttle mission is given by hour below the tabulation of the daily irradiances.

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-1	00Z	06Z	12Z	18Z
80 DEC 29	0.0	0.0	0.0	251.9
80 DEC 30	0.0	0.0	0.0	621.3
80 DEC 31	0.0	0.0	0.0	655.0
81 JAN 1	0.0	0.0	0.0	684.8
81 JAN 2	0.0	0.0	0.0	657.1
81 JAN 3	0.0	0.0	0.0	688.3
81 JAN 4	0.0	0.0	0.0	688.7
81 JAN 5	0.0	0.0	0.0	607.7
81 JAN 6	0.0	0.0	0.0	600.7
81 JAN 7	0.0	0.0	0.0	257.7
81 JAN 8	0.0	0.0	0.0	697.6
81 JAN 9	0.0	0.0	0.0	641.5
81 JAN 10	0.0	0.0	0.0	704.2
81 JAN 11	0.0	0.0	0.0	515.1
81 JAN 12	0.0	0.0	0.0	680.2
81 JAN 13	0.0	0.0	0.0	712.6
81 JAN 14	0.0	0.0	0.0	645.8
81 JAN 15	0.0	0.0	0.0	647.7
81 JAN 16	0.0	0.0	0.0	526.7
81 JAN 17	0.0	0.0	0.0	694.1
81 JAN 18	0.0	0.0	0.0	726.9
81 JAN 19	0.0	0.0	0.0	730.3
81 JAN 20	0.0	0.0	0.0	452.2
81 JAN 21	0.0	0.0	0.0	575.5
81 JAN 22	0.0	0.0	0.0	713.4
81 JAN 23	0.0	0.0	0.0	675.0
81 JAN 24	0.0	0.0	0.0	719.1
81 JAN 25	0.0	0.0	0.0	724.5
81 JAN 26	0.0	0.0	0.0	756.2
81 JAN 27	0.0	0.0	0.0	760.1
81 JAN 28	0.0	0.0	0.0	516.5
81 JAN 29	0.0	0.0	0.0	769.9
81 JAN 30	0.0	0.0	0.0	743.6
81 JAN 31	0.0	0.0	0.0	592.1
81 FEB 1	0.0	0.0	0.0	684.0
81 FEB 2	0.0	0.0	0.0	296.9
81 FEB 3	0.0	0.0	0.0	759.7
81 FEB 4	0.0	0.0	0.0	750.1
81 FEB 5	0.0	0.0	0.0	799.4
81 FEB 6	0.0	0.0	0.0	574.5
81 FEB 7	0.0	0.0	0.0	578.8
81 FEB 8	0.0	0.0	0.0	159.1
81 FEB 9	0.0	0.0	0.0	785.5
81 FEB 10	0.0	0.0	0.0	643.4
81 FEB 11	0.0	0.0	0.0	162.5
81 FEB 12	0.0	0.0	0.0	320.4
81 FEB 13	0.0	0.0	0.0	164.9
81 FEB 14	0.0	0.0	0.0	372.4
81 FEB 15	0.0	0.0	0.0	741.3
81 FEB 16	0.0	0.0	0.0	772.9
81 FEB 17	0.0	0.0	0.0	326.5

81 FEB 18	0.0	0.0	0.0	601.8
81 FEB 19	0.0	0.0	0.0	806.1
81 FEB 20	0.0	0.0	0.0	810.7
81 FEB 21	0.0	0.0	0.0	868.6
81 FEB 22	0.0	0.0	0.3	870.0
81 FEB 23	0.0	0.0	1.4	400.1
81 FEB 24	0.0	0.0	4.6	881.1
81 FEB 25	0.0	0.0	6.6	882.2
81 FEB 26	0.0	0.0	3.8	662.9
81 FEB 27	0.0	0.0	11.5	893.3
81 FEB 28	0.0	0.0	13.5	869.0
81 MAR 1	0.0	0.0	15.9	863.1
81 MAR 2	0.0	0.0	11.7	658.3
81 MAR 3	0.0	0.0	21.0	905.6
81 MAR 4	0.0	0.0	17.4	806.8
81 MAR 5	0.0	0.0	7.5	850.8
81 MAR 6	0.0	0.0	30.0	920.2
81 MAR 7	0.0	0.0	19.7	690.4
81 MAR 8	0.0	0.0	24.7	716.5
81 MAR 9	0.0	0.0	12.6	363.9
81 MAR 10	0.0	0.0	28.7	903.0
81 MAR 11	0.0	0.0	27.8	600.0
81 MAR 12	0.0	0.0	47.2	937.1
81 MAR 13	0.0	0.0	20.3	419.3
81 MAR 14	0.0	0.0	45.9	904.7
81 MAR 15	0.0	0.0	39.8	901.3
81 MAR 16	0.0	0.0	7.4	905.1
81 MAR 17	0.0	0.0	53.3	952.5
81 MAR 18	0.0	0.0	8.4	743.4
81 MAR 19	0.0	0.0	59.2	765.5
81 MAR 20	0.0	0.0	69.6	961.0
81 MAR 21	0.0	0.0	80.6	963.7
81 MAR 22	0.0	0.0	10.4	202.5
81 MAR 23	0.0	0.0	80.1	723.9
81 MAR 24	0.0	0.0	11.4	934.8
81 MAR 25	0.0	0.0	80.0	952.3
81 MAR 26	0.0	0.0	68.8	940.6
81 MAR 27	0.0	0.0	72.0	943.4
81 MAR 28	0.0	0.0	74.9	900.4
81 MAR 29	0.0	0.0	92.0	708.3
81 MAR 30	0.0	0.0	85.5	700.0
81 MAR 31	0.0	0.0	78.2	906.9
81 APR 1	0.0	0.0	97.5	844.9
81 APR 2	0.0	0.0	47.4	946.5
81 APR 3	0.0	0.0	118.6	766.7
81 APR 4	0.0	0.0	110.8	914.6
81 APR 5	0.0	0.0	116.0	770.0
81 APR 6	0.0	0.0	47.6	622.3
81 APR 7	0.0	0.0	125.1	811.1
81 APR 8	0.0	0.0	107.5	812.8
81 APR 9	0.0	0.0	131.1	959.9
81 APR 10	0.0	0.0	135.6	975.2
81 APR 11	0.0	0.0	151.1	667.1
81 APR 12	0.0	0.0	165.7	972.5

MISSION SUMMARY FOR STS-1

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 27.0 18Z: 700.8

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-2	00Z	06Z	12Z	18Z
81 AUG 31	0.0	0.0	53.8	880.2
81 SEP 1	0.0	0.0	135.0	916.6
81 SEP 2	0.0	0.0	142.0	914.9
81 SEP 3	0.0	0.0	142.8	921.9
81 SEP 4	0.0	0.0	139.3	955.3
81 SEP 5	0.0	0.0	137.9	909.5
81 SEP 6	0.0	0.0	127.4	729.4
81 SEP 7	0.0	0.0	94.5	867.4
81 SEP 8	0.0	0.0	133.8	946.0
81 SEP 9	0.0	0.0	134.6	621.2
81 SEP 10	0.0	0.0	102.1	904.8
81 SEP 11	0.0	0.0	117.5	902.1
81 SEP 12	0.0	0.0	128.3	935.7
81 SEP 13	0.0	0.0	150.3	933.0
81 SEP 14	0.0	0.0	115.4	889.9
81 SEP 15	0.0	0.0	112.3	927.3
81 SEP 16	0.0	0.0	111.0	924.4
81 SEP 17	0.0	0.0	109.7	606.7
81 SEP 18	0.0	0.0	55.3	558.3
81 SEP 19	0.0	0.0	123.9	857.8
81 SEP 20	0.0	0.0	127.2	927.0
81 SEP 21	0.0	0.0	97.4	871.0
81 SEP 22	0.0	0.0	79.0	829.5
81 SEP 23	0.0	0.0	103.4	906.3
81 SEP 24	0.0	0.0	96.8	861.9
81 SEP 25	0.0	0.0	80.9	678.1
81 SEP 26	0.0	0.0	97.5	891.5
81 SEP 27	0.0	0.0	106.5	891.8
81 SEP 28	0.0	0.0	61.7	682.4
81 SEP 29	0.0	0.0	105.3	884.3
81 SEP 30	0.0	0.0	103.7	663.8
81 OCT 1	0.0	0.0	90.3	872.9
81 OCT 2	0.0	0.0	98.5	869.0
81 OCT 3	0.0	0.0	117.9	792.9
81 OCT 4	0.0	0.0	103.7	678.3
81 OCT 5	0.0	0.0	101.9	880.7
81 OCT 6	0.0	0.0	93.8	856.2
81 OCT 7	0.0	0.0	98.8	848.9
81 OCT 8	0.0	0.0	75.1	752.7
81 OCT 9	0.0	0.0	63.2	799.6
81 OCT 10	0.0	0.0	73.5	839.2
81 OCT 11	0.0	0.0	46.3	628.5
81 OCT 12	0.0	0.0	81.5	827.7
81 OCT 13	0.0	0.0	81.5	792.7
81 OCT 14	0.0	0.0	78.0	821.7
81 OCT 15	0.0	0.0	77.8	817.2
81 OCT 16	0.0	0.0	82.9	836.6
81 OCT 17	0.0	0.0	77.2	805.8
81 OCT 18	0.0	0.0	59.7	801.4
81 OCT 19	0.0	0.0	24.7	849.7
81 OCT 20	0.0	0.0	73.1	794.8

81 OCT 21	0.0	0.0	72.8	790.2
81 OCT 22	0.0	0.0	63.3	745.1
81 OCT 23	0.0	0.0	61.4	779.0
81 OCT 24	0.0	0.0	50.1	708.6
81 OCT 25	0.0	0.0	40.8	600.3
81 OCT 26	0.0	0.0	51.0	700.1
81 OCT 27	0.0	0.0	48.4	588.3
81 OCT 28	0.0	0.0	44.9	626.3
81 OCT 29	0.0	0.0	40.8	712.1
81 OCT 30	0.0	0.0	7.1	707.8
81 OCT 31	0.0	0.0	41.5	573.7
81 NOV 1	0.0	0.0	32.7	738.9
81 NOV 2	0.0	0.0	6.3	764.2
81 NOV 3	0.0	0.0	34.1	582.4
81 NOV 4	0.0	0.0	39.1	152.4
81 NOV 5	0.0	0.0	5.4	294.9
81 NOV 6	0.0	0.0	12.4	719.1
81 NOV 7	0.0	0.0	41.8	772.6
81 NOV 8	0.0	0.0	34.8	739.5
81 NOV 9	0.0	0.0	20.5	459.7
81 NOV 10	0.0	0.0	27.3	688.1
81 NOV 11	0.0	0.0	9.2	537.5
81 NOV 12	0.0	0.0	25.3	751.4

MISSION SUMMARY FOR STS-2

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 127: 78.0 18Z: 769.6

SOLAR IRRANDIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-3	00Z	06Z	12Z	18Z
82 FEB 16	0.0	0.0	0.0	792.1
82 FEB 17	0.0	0.0	0.0	378.8
82 FEB 18	0.0	0.0	0.0	801.3
82 FEB 19	0.0	0.0	0.0	859.9
82 FEB 20	0.0	0.0	0.0	861.5
82 FEB 21	0.0	0.0	0.0	832.8
82 FEB 22	0.0	0.0	0.3	872.6
82 FEB 23	0.0	0.0	2.4	876.8
82 FEB 24	0.0	0.0	4.1	779.3
82 FEB 25	0.0	0.0	6.5	882.0
82 FEB 26	0.0	0.0	2.4	344.0
82 FEB 27	0.0	0.0	7.3	807.6
82 FEB 28	0.0	0.0	4.2	439.0
82 MAR 1	0.0	0.0	5.7	441.5
82 MAR 2	0.0	0.0	10.8	901.6
82 MAR 3	0.0	0.0	17.7	858.9
82 MAR 4	0.0	0.0	18.3	670.7
82 MAR 5	0.0	0.0	8.0	560.0
82 MAR 6	0.0	0.0	13.9	686.7
82 MAR 7	0.0	0.0	14.5	189.2
82 MAR 8	0.0	0.0	29.4	899.4
82 MAR 9	0.0	0.0	34.1	863.9
82 MAR 10	0.0	0.0	26.5	848.8
82 MAR 11	0.0	0.0	31.9	790.4
82 MAR 12	0.0	0.0	34.6	894.0
82 MAR 13	0.0	0.0	32.0	894.4
82 MAR 14	0.0	0.0	37.3	898.0
82 MAR 15	0.0	0.0	50.5	905.5
82 MAR 16	0.0	0.0	53.6	909.0
82 MAR 17	0.0	0.0	64.1	912.4
82 MAR 18	0.0	0.0	69.4	915.8
82 MAR 19	0.0	0.0	49.9	919.1
81 MAR 20	0.0	0.0	53.7	922.4
82 MAR 21	0.0	0.0	55.1	941.4
82 MAR 22	0.0	0.0	57.8	944.2

MISSION SUMMARY FOR STS-3

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 23.2 18Z: 778.7

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-4	00Z	06Z	12Z	18Z
82 MAY 26	10.4	0.0	156.6	540.9
82 MAY 27	9.7	0.0	186.1	762.4
82 MAY 28	9.7	0.0	224.8	805.1
82 MAY 29	15.8	0.0	246.0	1012.6
82 MAY 30	10.9	0.0	169.0	757.0
82 MAY 31	3.1	0.0	135.7	468.6
82 JUN 1	9.8	0.0	215.2	950.1
82 JUN 2	3.4	0.0	159.3	757.7
82 JUN 3	10.9	0.0	99.2	655.1
82 JUN 4	12.8	0.0	247.1	853.0
82 JUN 5	16.2	0.0	225.8	762.4
82 JUN 6	23.0	0.0	268.0	1004.6
82 JUN 7	23.9	0.0	248.5	1039.7
82 JUN 8	27.0	0.0	284.9	1015.5
82 JUN 9	31.0	0.0	287.4	1013.4
82 JUN 10	28.4	0.0	287.3	792.1
82 JUN 11	23.2	0.0	251.1	923.2
82 JUN 12	18.4	0.0	267.9	950.0
82 JUN 13	14.3	0.0	213.6	1004.8
82 JUN 14	24.5	0.0	244.8	1013.6
82 JUN 15	26.7	0.0	282.8	1013.6
82 JUN 16	24.6	0.0	232.9	949.9
82 JUN 17	20.4	0.0	134.8	757.8
82 JUN 18	4.6	0.0	42.3	804.9
82 JUN 19	20.7	0.0	160.5	853.8
82 JUN 20	32.8	0.0	203.9	757.8
82 JUN 21	16.7	0.0	226.5	762.1
82 JUN 23	30.5	0.0	202.9	757.7
82 JUN 24	24.5	0.0	139.3	762.0
82 JUN 25	24.5	0.0	221.2	949.7
82 JUN 26	23.0	0.0	235.3	949.7
82 JUN 27	14.8	0.0	275.4	1013.7

MISSION SUMMARY FOR STS-4

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 18.9 06Z: 0.0 12Z: 213.3 18Z: 856.7

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-5	00Z	06Z	12Z	18Z
82 OCT 21	0.0	0.0	65.1	759.3
82 OCT 22	0.0	0.0	63.3	626.6
82 OCT 23	0.0	0.0	28.0	512.9
82 OCT 24	0.0	0.0	50.1	321.8
82 OCT 25	0.0	0.0	71.2	826.9
82 OCT 26	0.0	0.0	54.5	722.9
82 OCT 27	0.0	0.0	49.3	733.7
82 OCT 28	0.0	0.0	62.7	604.6
82 OCT 29	0.0	0.0	53.5	752.1
82 OCT 30	0.0	0.0	38.7	683.3
82 OCT 31	0.0	0.0	21.0	550.4
82 NOV 1	0.0	0.0	32.7	675.0
82 NOV 2	0.0	0.0	16.9	466.8
82 NOV 3	0.0	0.0	31.7	563.3
82 NOV 4	0.0	0.0	25.9	461.5
82 NOV 5	0.0	0.0	19.9	486.5
82 NOV 6	0.0	0.0	39.7	591.4
82 NOV 7	0.0	0.0	28.1	714.8
82 NOV 8	0.0	0.0	28.3	669.8
82 NOV 9	0.0	0.0	24.9	484.4
82 NOV 10	0.0	0.0	30.7	593.9
82 NOV 11	0.0	0.0	27.1	672.3

MISSION SUMMARY FOR STS-5

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 38.3 18Z: 613.3

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-6	00Z	06Z	12Z	18Z
82 NOV 30	0.0	0.0	0.0	524.5
82 DEC 1	0.0	0.0	0.0	634.7
82 DEC 2	0.0	0.0	0.0	632.6
82 DEC 3	0.0	0.0	0.0	630.5
82 DEC 4	0.0	0.0	0.0	627.2
82 DEC 5	0.0	0.0	0.0	625.4
82 DEC 6	0.0	0.0	0.0	601.2
82 DEC 7	0.0	0.0	0.0	476.5
82 DEC 8	0.0	0.0	0.0	388.3
82 DEC 9	0.0	0.0	0.0	527.2
82 DEC 10	0.0	0.0	0.0	250.4
82 DEC 11	0.0	0.0	0.0	454.8
82 DEC 12	0.0	0.0	0.0	309.4
82 DEC 13	0.0	0.0	0.0	409.1
82 DEC 14	0.0	0.0	0.0	254.0
82 DEC 15	0.0	0.0	0.0	469.6
82 DEC 16	0.0	0.0	0.0	420.8
82 DEC 17	0.0	0.0	0.0	655.6
82 DEC 18	0.0	0.0	0.0	644.6
82 DEC 19	0.0	0.0	0.0	672.3
82 DEC 20	0.0	0.0	0.0	672.3
82 DEC 21	0.0	0.0	0.0	672.4
82 DEC 22	0.0	0.0	0.0	674.2
82 DEC 23	0.0	0.0	0.0	555.9
82 DEC 24	0.0	0.0	0.0	576.4
82 DEC 25	0.0	0.0	0.0	615.7
82 DEC 26	0.0	0.0	0.0	249.2
82 DEC 27	0.0	0.0	0.0	249.2
82 DEC 28	0.0	0.0	0.0	443.5
82 DEC 29	0.0	0.0	0.0	568.7
82 DEC 30	0.0	0.0	0.0	517.3
82 DEC 31	0.0	0.0	0.0	408.4
83 JAN 1	0.0	0.0	0.0	126.5
83 JAN 2	0.0	0.0	0.0	521.8
83 JAN 3	0.0	0.0	0.0	254.9
83 JAN 4	0.0	0.0	0.0	662.3
83 JAN 5	0.0	0.0	0.0	128.3
83 JAN 6	0.0	0.0	0.0	575.7
83 JAN 7	0.0	0.0	0.0	575.9
83 JAN 8	0.0	0.0	0.0	411.6
83 JAN 9	0.0	0.0	0.0	455.7
83 JAN 10	0.0	0.0	0.0	494.1
83 JAN 11	0.0	0.0	0.0	307.4
83 JAN 12	0.0	0.0	0.0	707.9
83 JAN 13	0.0	0.0	0.0	652.3
83 JAN 14	0.0	0.0	0.0	713.7
83 JAN 15	0.0	0.0	0.0	658.5
83 JAN 16	0.0	0.0	0.0	693.0
83 JAN 17	0.0	0.0	0.0	680.4
83 JAN 18	0.0	0.0	0.0	728.2
83 JAN 19	0.0	0.0	0.0	610.1

83 JAN 20	0.0	0.0	0.0	139.1
83 JAN 21	0.0	0.0	0.0	569.1
83 JAN 22	0.0	0.0	0.0	468.2
83 JAN 23	0.0	0.0	0.0	281.0
82 JAN 24	0.0	0.0	0.0	720.3
83 JAN 25	0.0	0.0	0.0	627.5
83 JAN 26	0.0	0.0	0.0	555.8
83 JAN 27	0.0	0.0	0.0	649.3
83 JAN 28	0.0	0.0	0.0	597.5
83 JAN 29	0.0	0.0	0.0	711.0
83 JAN 30	0.0	0.0	0.0	701.9
83 JAN 31	0.0	0.0	0.0	554.2
83 FEB 1	0.0	0.0	0.0	696.5
83 FEB 2	0.0	0.0	0.0	152.2
83 FEB 3	0.0	0.0	0.0	730.9
83 FEB 4	0.0	0.0	0.0	736.1
83 FEB 5	0.0	0.0	0.0	769.9
83 FEB 6	0.0	0.0	0.0	156.7
83 FEB 7	0.0	0.0	0.0	309.7
83 FEB 8	0.0	0.0	0.0	810.0
83 FEB 9	0.0	0.0	0.0	816.5
83 FEB 10	0.0	0.0	0.0	161.3
83 FEB 11	0.0	0.0	0.0	767.0
83 FEB 12	0.0	0.0	0.0	163.6
83 FEB 13	0.0	0.0	0.0	164.8
83 FEB 14	0.0	0.0	0.0	634.5
83 FEB 15	0.0	0.0	0.0	842.7
83 FEB 16	0.0	0.0	0.0	204.6
83 FEB 17	0.0	0.0	0.0	796.7
83 FEB 18	0.0	0.0	0.0	855.6
83 FEB 19	0.0	0.0	0.0	681.7
83 FEB 20	0.0	0.0	0.0	808.0
83 FEB 21	0.0	0.0	0.0	628.1
83 FEB 22	0.0	0.0	0.1	769.3
83 FEB 23	0.0	0.0	1.4	612.6
83 FEB 24	0.0	0.0	3.0	828.5
82 FEB 25	0.0	0.0	6.8	833.0
83 FEB 26	0.0	0.0	5.7	671.2
83 FEB 27	0.0	0.0	4.9	180.8
83 FEB 28	0.0	0.0	8.0	220.9
83 MAR 1	0.0	0.0	4.5	355.0
83 MAR 2	0.0	0.0	19.0	904.9
83 MAR 3	0.0	0.0	14.7	858.9
83 MAR 4	0.0	0.0	23.6	827.1
83 MAR 5	0.0	0.0	21.6	850.6
83 MAR 6	0.0	0.0	19.4	668.9
83 MAR 7	0.0	0.0	12.1	189.2
83 MAR 8	0.0	0.0	14.0	895.8
83 MAR 9	0.0	0.0	35.4	930.7
83 MAR 10	0.0	0.0	27.6	708.6
83 MAR 11	0.0	0.0	37.4	890.8
83 MAR 12	0.0	0.0	43.8	941.0
83 MAR 13	0.0	0.0	50.5	707.3
83 MAR 14	0.0	0.0	37.3	862.1
83 MAR 15	0.0	0.0	18.8	352.8

83 MAR 16	0.0	0.0	43.2	904.9
83 MAR 17	0.0	0.0	47.4	590.7
83 MAR 18	0.0	0.0	22.2	757.3
83 MAR 19	0.0	0.0	71.2	919.1
83 MAR 20	0.0	0.0	45.7	934.0
83 MAR 21	0.0	0.0	23.4	941.4
83 MAR 22	0.0	0.0	68.6	966.2
83 MAR 23	0.0	0.0	86.1	733.2
83 MAR 24	0.0	0.0	14.1	779.4
83 MAR 25	0.0	0.0	28.3	937.6
83 MAR 26	0.0	0.0	90.9	954.7
83 MAR 27	0.0	0.0	66.1	206.0
83 MAR 28	0.0	0.0	74.7	935.9
83 MAR 29	0.0	0.0	111.9	988.3
83 MAR 30	0.0	0.0	115.9	951.2
83 APR 1	0.0	0.0	104.0	956.1
83 APR 2	0.0	0.0	103.8	626.5
83 APR 3	0.0	0.0	109.0	998.8
83 APR 4	0.0	0.0	136.2	957.4

MISSION SUMMARY FOR STS-6

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z; 0.0 12Z: 15.4 18Z: 611.5

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-7	00Z	06Z	12Z	18Z
83 MAY 26	11.6	0.0	280.0	1003.7
83 MAY 27	14.3	0.0	280.8	1012.3
83 MAY 28	14.8	0.0	265.5	962.9
83 MAY 29	15.8	0.0	256.5	912.7
83 MAY 30	10.9	0.0	42.6	468.6
83 MAY 31	8.8	0.0	93.7	755.0
83 JUN 1	15.1	0.0	286.5	950.1
83 JUN 2	20.1	0.0	234.6	971.4
83 JUN 3	18.5	0.0	251.2	1004.4
83 JUN 4	14.1	0.0	248.3	1013.1
83 JUN 5	18.0	0.0	179.9	906.5
83 JUN 6	15.2	0.0	201.4	886.5
83 JUN 7	4.2	0.0	245.3	269.5
83 JUN 8	16.1	0.0	43.0	232.0
83 JUN 9	13.6	0.0	94.3	804.8
83 JUN 10	26.8	0.0	248.2	805.6
83 JUN 11	27.9	0.0	247.9	1004.8
83 JUN 12	24.8	0.0	187.5	950.0
82 JUN 13	17.2	0.0	219.7	906.7
83 JUN 14	22.9	0.0	187.0	912.7
83 JUN 15	29.9	0.0	246.5	1004.0
83 JUN 16	27.7	0.0	217.7	964.0
83 JUN 17	31.1	0.0	245.5	693.8
83 JUN 18	32.6	0.0	205.0	949.9

MISSION SUMMARY FOR STS-7

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 19.2 06Z: 0.0 12Z: 209.3 18Z: 851.4

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-8	00Z	06Z	12Z	18Z
83 AUG 2	17.6	0.0	175.0	907.4
83 AUG 3	14.3	0.0	184.6	956.2
83 AUG 4	13.2	0.0	157.4	906.6
83 AUG 5	10.0	0.0	170.7	906.1
83 AUG 6	10.8	0.0	180.1	266.9
83 AUG 7	5.2	0.0	153.4	219.8
83 AUG 8	4.6	0.0	187.1	266.5
83 AUG 9	5.6	0.0	150.7	903.9
83 AUG 10	4.8	0.0	204.2	940.8
83 AUG 11	4.1	0.0	157.2	902.6
83 AUG 12	0.5	0.0	155.8	990.4
83 AUG 13	1.4	0.0	145.5	753.7
83 AUG 14	0.3	0.0	145.8	265.0
83 AUG 15	0.0	0.0	62.5	839.9
83 AUG 16	0.0	0.0	175.0	986.3
83 AUG 17	0.0	0.0	164.1	897.7
83 AUG 18	0.0	0.0	149.7	896.8
83 AUG 19	0.0	0.0	146.6	895.8
83 AUG 20	0.0	0.0	162.1	988.7
83 AUG 21	0.0	0.0	189.1	980.1
83 AUG 22	0.0	0.0	159.3	978.7
83 AUG 24	0.0	0.0	154.3	934.6
83 AUG 25	0.0	0.0	124.6	634.6
83 AUG 26	0.0	0.0	141.7	972.6
83 AUG 27	0.0	0.0	152.4	970.9
83 AUG 28	0.0	0.0	97.4	922.8
83 AUG 29	0.0	0.0	125.5	712.8
83 AUG 30	0.0	0.0	154.7	924.3

MISSION SUMMARY FOR STS-8

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 3.1 06Z: 0.0 12Z: 154.7 18Z: 819.4

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-9	00Z	06Z	12Z	18Z
83 NOV 11	0.0	0.0	11.7	712.3
83 NOV 12	0.0	0.0	25.3	723.9
83 NOV 13	0.0	0.0	28.7	749.4
83 NOV 14	0.0	0.0	26.6	745.7
83 NOV 15	0.0	0.0	16.7	711.2
83 NOV 16	0.0	0.0	19.5	738.5
83 NOV 17	0.0	0.0	20.4	735.0
83 NOV 18	0.0	0.0	17.8	729.9
83 NOV 19	0.0	0.0	8.6	643.8
83 NOV 20	0.0	0.0	6.1	270.1
83 NOV 21	0.0	0.0	8.5	662.3
83 NOV 22	0.0	0.0	7.0	659.1
83 NOV 23	0.0	0.0	5.8	654.7
83 NOV 24	0.0	0.0	5.7	618.2
83 NOV 25	0.0	0.0	4.0	708.2
83 NOV 26	0.0	0.0	2.7	622.8
83 NOV 27	0.0	0.0	1.4	584.4
83 NOV 28	0.0	0.0	0.0	507.9

MISSION SUMMARY FOR STS-9

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 11.4 18Z: 633.8

C-2

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-41B	00Z	06Z	12Z	18Z
84 JAN 12	0.0	0.0	0.0	514.0
84 JAN 13	0.0	0.0	0.0	265.7
84 JAN 14	0.0	0.0	0.0	494.8
84 JAN 15	0.0	0.0	0.0	479.2
84 JAN 16	0.0	0.0	0.0	269.9
84 JAN 17	0.0	0.0	0.0	324.9
84 JAN 18	0.0	0.0	0.0	591.4
84 JAN 19	0.0	0.0	0.0	138.2
84 JAN 20	0.0	0.0	0.0	139.1
84 JAN 21	0.0	0.0	0.0	277.6
84 JAN 22	0.0	0.0	0.0	685.4
84 JAN 23	0.0	0.0	0.0	674.8
84 JAN 24	0.0	0.0	0.0	689.1
84 JAN 25	0.0	0.0	0.0	694.5
84 JAN 26	0.0	0.0	0.0	510.3
84 JAN 27	0.0	0.0	0.0	639.0
84 JAN 28	0.0	0.0	0.0	705.2
84 JAN 29	0.0	0.0	0.0	769.7
84 JAN 30	0.0	0.0	0.0	771.9
84 JAN 31	0.0	0.0	0.0	591.3
84 FEB 1	0.0	0.0	0.0	780.2
84 FEB 2	0.0	0.0	0.0	686.6
84 FEB 3	0.0	0.0	0.0	704.9

MISSION SUMMARY FOR STS-41B

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 0.0 18Z: 541.9

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-41C	00Z	06Z	12Z	18Z
84 MAR 19	0.0	0.0	53.7	922.4
84 MAR 20	0.0	0.0	80.5	728.3
84 MAR 21	0.0	0.0	57.8	971.1
84 MAR 22	0.0	0.0	88.2	968.7
84 MAR 23	0.0	0.0	38.4	440.4
84 MAR 24	0.0	0.0	69.1	748.8
84 MAR 25	0.0	0.0	81.6	856.7
84 MAR 26	0.0	0.0	78.3	978.4
84 MAR 27	0.0	0.0	79.4	619.5
84 MAR 28	0.0	0.0	89.5	746.2
84 MAR 29	0.0	0.0	83.5	951.2
84 MAR 30	0.0	0.0	90.5	992.7
84 MAR 31	0.0	0.0	108.4	989.0
84 APR 1	0.0	0.0	128.1	996.8
84 APR 2	0.0	0.0	129.5	923.5
84 APR 3	0.0	0.0	102.3	735.0
84 APR 4	0.0	0.0	22.6	817.8
84 APR 5	0.0	0.0	144.4	967.4
84 APR 6	0.0	0.0	148.4	1006.0

MISSION SUMMARY FOR STS-41C

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 90.6 18Z: 868.1

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-41D	00Z	06Z	12Z	18Z
84 MAY 1	0.0	0.0	220.4	880.3
84 MAY 2	0.0	0.0	150.0	935.8
84 MAY 3	0.0	0.0	240.7	1004.0
84 MAY 4	0.0	0.0	205.2	1004.7
84 MAY 5	0.0	0.0	209.6	1005.3
84 MAY 6	0.0	0.0	251.2	1005.9
84 MAY 7	0.0	0.0	250.8	1006.4
84 MAY 8	0.0	0.0	217.7	999.0
84 MAY 9	0.0	0.0	37.6	715.7
84 MAY 10	0.0	0.0	260.3	1007.9
84 MAY 11	0.0	0.0	225.7	1008.4
84 MAY 12	0.1	0.0	245.7	1008.8
84 MAY 13	1.4	0.0	266.3	1009.1
84 MAY 14	2.5	0.0	268.1	1009.5
84 MAY 15	3.4	0.0	269.9	1009.8
84 MAY 16	4.4	0.0	195.9	949.2
84 MAY 17	5.5	0.0	237.4	790.7
84 MAY 18	4.0	0.0	238.8	1005.7
84 MAY 19	8.8	0.0	276.0	1011.0
84 MAY 20	10.1	0.0	261.2	949.6
84 MAY 21	10.9	0.0	172.2	961.9
84 MAY 22	9.9	0.0	228.3	762.3
84 MAY 23	6.5	0.0	132.7	269.1
84 MAY 24	5.4	0.0	160.6	221.8
84 MAY 25	11.6	0.0	142.3	567.0
84 MAY 26	8.0	0.0	109.4	221.8
84 MAY 27	9.7	0.0	162.2	962.9
84 MAY 28	9.5	0.0	135.1	717.7
84 MAY 29	8.3	0.0	110.2	622.5
84 MAY 30	7.5	0.0	179.9	429.7
84 MAY 31	6.5	0.0	216.7	1004.3
84 JUN 1	20.1	0.0	286.9	1013.0
84 JUN 2	25.6	0.0	287.2	1039.7
84 JUN 3	26.7	0.0	287.4	1039.7
84 JUN 4	27.0	0.0	284.9	1030.7
84 JUN 5	28.0	0.0	285.0	1004.6
84 JUN 6	30.0	0.0	285.0	1003.7
84 JUN 7	22.4	0.0	159.8	886.5
84 JUN 8	23.1	0.0	235.2	1004.7
84 JUN 9	26.3	0.0	233.1	950.0
84 JUN 10	27.9	0.0	287.0	1004.8
84 JUN 11	24.8	0.0	245.6	853.2
84 JUN 12	23.9	0.0	211.1	853.2
84 JUN 13	24.5	0.0	213.2	717.6
84 JUN 14	22.6	0.0	212.8	912.7
84 JUN 15	27.7	0.0	282.2	1004.9
84 JUN 16	28.3	0.0	134.8	764.2
84 JUN 17	15.9	0.0	161.9	650.0
84 JUN 18	16.2	0.0	280.2	964.0
84 JUN 19	27.5	0.0	279.5	1004.9
84 JUN 20	33.3	0.0	281.3	1013.7

84 JUN 21	27.6	0.0	252.4	1004.2
84 JUN 22	31.1	0.0	147.5	468.7
84 JUN 23	24.9	0.0	171.7	649.9
84 JUN 24	21.1	0.0	210.0	1013.7
84 JUN 25	35.2	0.0	180.3	649.9
84 JUN 26	6.4	0.0	206.6	1013.7

MISSION SUMMARY FOR STS-41D

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 14.0 06Z: 0.0 12Z: 216.7 18Z: 867.1

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-41DD	00Z	06Z	12Z	18Z
84 AUG 8	8.6	0.0	178.5	991.1
84 AUG 9	5.8	0.0	184.1	1000.1
84 AUG 10	5.5	0.0	202.5	991.3
84 AUG 11	8.5	0.0	171.3	930.7
84 AUG 12	1.8	0.0	188.5	938.7
84 AUG 13	0.3	0.0	178.0	988.4
84 AUG 14	0.0	0.0	182.8	937.2
84 AUG 15	0.0	0.0	136.4	936.3
84 AUG 16	0.0	0.0	154.5	985.2
84 AUG 17	0.0	0.0	191.1	984.0
84 AUG 18	0.0	0.0	133.7	895.8
84 AUG 19	0.0	0.0	164.9	981.4
84 AUG 20	0.0	0.0	186.3	741.1
84 AUG 21	0.0	0.0	118.2	262.2
84 AUG 22	0.0	0.0	147.8	831.8
84 AUG 23	0.0	0.0	167.4	1007.4
84 AUG 24	0.0	0.0	143.1	933.0
84 AUG 25	0.0	0.0	121.8	743.5
84 AUG 26	0.0	0.0	136.3	886.2
84 AUG 27	0.0	0.0	159.8	969.2
84 AUG 28	0.0	0.0	162.5	732.1
84 AUG 29	0.0	0.0	124.3	924.3
84 AUG 30	0.0	0.0	131.3	212.5

MISSION SUMMARY FOR STS-41DD

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 1.1 06Z: 0.0 12Z: 159.0 18Z: 865.2

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-41G	00Z	06Z	12Z	18Z
84 SEP 13	0.0	0.0	151.4	930.2
84 SEP 14	0.0	0.0	108.5	927.3
84 SEP 15	0.0	0.0	145.4	924.4
84 SEP 16	0.0	0.0	108.0	882.2
84 SEP 17	0.0	0.0	97.2	879.5
84 SEP 18	0.0	0.0	96.0	693.5
84 SEP 19	0.0	0.0	52.9	593.5
84 SEP 20	0.0	0.0	115.5	908.7
84 SEP 21	0.0	0.0	121.0	905.4
84 SEP 22	0.0	0.0	106.3	197.3
84 SEP 23	0.0	0.0	111.0	898.6
84 SEP 24	0.0	0.0	111.5	895.1
84 SEP 25	0.0	0.0	110.0	895.5
84 SEP 26	0.0	0.0	108.5	891.8
84 SEP 27	0.0	0.0	16.5	192.8
84 SEP 28	0.0	0.0	103.8	880.5
84 SEP 29	0.0	0.0	56.2	876.7
84 SEP 30	0.0	0.0	59.2	190.0
84 OCT 1	0.0	0.0	85.5	872.5
84 OCT 2	0.0	0.0	107.6	868.5
84 OCT 3	0.0	0.0	97.1	861.1
84 OCT 4	0.0	0.0	79.2	860.3
84 OCT 5	0.0	0.0	92.2	760.1

MISSION SUMMARY FOR STS-41G

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 97.1 18Z: 776.4

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-51A	00Z	06Z	12Z	18Z
84 OCT 23	0.0	0.0	61.0	776.6
84 OCT 24	0.0	0.0	64.5	772.1
84 OCT 25	0.0	0.0	57.2	767.6
84 OCT 26	0.0	0.0	8.0	587.8
84 OCT 27	0.0	0.0	53.3	626.3
84 OCT 28	0.0	0.0	41.3	725.2
84 OCT 29	0.0	0.0	44.2	747.7
84 OCT 30	0.0	0.0	41.6	743.3
84 OCT 31	0.0	0.0	44.5	687.6
84 NOV 1	0.0	0.0	43.8	736.3
84 NOV 2	0.0	0.0	6.0	477.0
84 NOV 3	0.0	0.0	7.0	562.9
84 NOV 4	0.0	0.0	33.2	576.2
84 NOV 5	0.0	0.0	30.3	654.7
84 NOV 6	0.0	0.0	34.4	714.9
84 NOV 7	0.0	0.0	34.6	710.7
84 NOV 8	0.0	0.0	30.7	706.6

MISSION SUMMARY FOR STS-51A

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 37.1 18Z: 633.6

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-51C	00Z	06Z	12Z	18Z
85 JAN 5	0.0	0.0	0.0	630.5
85 JAN 6	0.0	0.0	0.0	634.0
85 JAN 7	0.0	0.0	0.0	667.0
85 JAN 8	0.0	0.0	0.0	0.0
84 JAN 9	0.0	0.0	0.0	641.2
84 JAN 10	0.0	0.0	0.0	642.5
85 JAN 11	0.0	0.0	0.0	608.2
85 JAN 12	0.0	0.0	0.0	534.9
85 JAN 13	0.0	0.0	0.0	591.6
85 JAN 14	0.0	0.0	0.0	521.3
85 JAN 15	0.0	0.0	0.0	718.4
85 JAN 16	0.0	0.0	0.0	661.7
85 JAN 17	0.0	0.0	0.0	664.3
85 JAN 18	0.0	0.0	0.0	276.4
85 JAN 19	0.0	0.0	0.0	731.6
85 JAN 20	0.0	0.0	0.0	674.1
85 JAN 21	0.0	0.0	0.0	709.2
85 JAN 22	0.0	0.0	0.0	724.8
85 JAN 23	0.0	0.0	0.0	744.4
85 JAN 24	0.0	0.0	0.0	689.1

MISSION SUMMARY FOR STS-51C

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 0.0 18Z: 638.7

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-51D	00Z	06Z	12Z	18Z
85 FEB 15	0.0	0.0	0.0	516.9
85 FEB 16	0.0	0.0	0.0	792.1
85 FEB 17	0.0	0.0	0.0	820.1
85 FEB 18	0.0	0.0	0.0	824.4
85 FEB 19	0.0	0.0	0.0	803.5
85 FEB 20	0.0	0.0	0.0	604.7
85 FEB 21	0.0	0.0	0.0	538.1
85 FEB 22	0.0	0.0	0.2	609.1
85 FEB 23	0.0	0.0	1.5	791.2
85 FEB 24	0.0	0.0	3.9	795.3
85 FEB 25	0.0	0.0	5.8	664.7
85 FEB 26	0.0	0.0	2.4	837.4
85 FEB 27	0.0	0.0	7.5	841.8
85 FEB 28	0.0	0.0	9.4	801.8
85 MAR 1	0.0	0.0	5.4	720.8
85 MAR 2	0.0	0.0	17.0	682.2
85 MAR 3	0.0	0.0	18.8	823.3
85 MAR 4	0.0	0.0	21.2	859.9
85 MAR 5	0.0	0.0	16.7	822.4

MISSION SUMMARY FOR STS-51D

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 6.4 18Z: 752.1

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-51B	00Z	06Z	12Z	18Z
85 APR 15	0.0	0.0	106.1	635.4
85 APR 16	0.0	0.0	134.0	985.2
85 APR 17	0.0	0.0	184.9	980.0
85 APR 18	0.0	0.0	160.5	934.2
85 APR 19	0.0	0.0	166.0	947.3
85 APR 20	0.0	0.0	126.0	942.2
85 APR 21	0.0	0.0	186.9	992.0
85 APR 22	0.0	0.0	173.2	938.0
85 APR 23	0.0	0.0	193.0	938.8
85 APR 24	0.0	0.0	121.9	995.4
85 APR 25	0.0	0.0	185.2	996.5
85 APR 26	0.0	0.0	127.1	718.3
85 APR 27	0.0	0.0	164.8	1022.0
84 APR 28	0.0	0.0	226.0	1022.7
85 APR 29	0.0	0.0	199.0	990.0

MISSION SUMMARY FOR STS-51B

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 166.4 18Z: 927.2

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-51DD	00Z	06Z	12Z	18Z
85 MAR 26	0.0	0.0	83.4	940.5
85 MAR 27	0.0	0.0	94.6	938.2
85 MAR 28	0.0	0.0	63.5	802.1
85 MAR 29	0.0	0.0	71.4	843.4
85 MAR 30	0.0	0.0	100.1	840.9
85 MAR 31	0.0	0.0	83.4	953.7
85 APR 1	0.0	0.0	111.1	798.8
85 APR 2	0.0	0.0	50.4	620.4
85 APR 3	0.0	0.0	132.1	998.8
85 APR 4	0.0	0.0	136.2	1000.7
85 APR 5	0.0	0.0	140.3	976.4
85 APR 6	0.0	0.0	130.9	732.3
85 APR 7	0.0	0.0	58.6	733.9
85 APR 8	0.0	0.0	123.7	965.4
85 APR 9	0.0	0.0	122.6	851.9
85 APR 10	0.0	0.0	88.9	860.0
85 APR 11	0.0	0.0	148.6	861.4
85 APR 12	0.0	0.0	66.8	458.1

MISSION SUMMARY FOR STS-51DD

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 96.3 18Z: 817.8

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-51G	00Z	06Z	12Z	18Z
85 JUN 4	21.3	0.0	249.2	1039.7
85 JUN 5	25.2	0.0	267.9	1013.2
85 JUN 6	28.9	0.0	220.7	1029.6
85 JUN 7	27.1	0.0	164.4	963.7
85 JUN 8	24.0	0.0	152.3	943.5
85 JUN 9	16.9	0.0	231.7	943.5
85 JUN 10	17.4	0.0	284.6	886.5
85 JUN 11	21.0	0.0	284.4	886.5
85 JUN 12	22.7	0.0	191.0	650.1
85 JUN 13	4.1	0.0	52.4	650.0
85 JUN 14	23.8	0.0	98.1	222.1
85 JUN 15	14.6	0.0	110.2	468.7
85 JUN 16	16.4	0.0	142.9	791.9
85 JUN 17	13.1	0.0	265.6	1004.1

MISSION SUMMARY FOR STS-51G

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 20.2 06Z: 0.0 12Z: 199.8 18Z: 825.3

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-51F	00Z	06Z	12Z	18Z
85 JUN 29	25.5	0.0	247.8	912.5
85 JUN 30	24.0	0.0	246.7	764.1
85 JUL 1	22.4	0.0	179.5	963.3
85 JUL 2	29.7	0.0	202.9	764.1
85 JUL 3	27.5	0.0	227.7	886.1
85 JUL 4	35.3	0.0	178.9	764.1
85 JUL 5	29.7	0.0	238.4	949.5
85 JUL 6	27.4	0.0	224.0	1004.6
85 JUL 7	18.1	0.0	105.9	1004.5
85 JUL 8	35.8	0.0	261.2	1013.3
85 JUL 9	32.4	0.0	257.0	885.9
85 JUL 10	32.2	0.0	258.2	1004.3
85 JUL 11	35.0	0.0	238.8	885.7
85 JUL 12	28.2	0.0	237.3	963.2
85 JUL 13	6.1	0.0	214.5	911.8
85 JUL 14	33.3	0.0	195.9	221.8
85 JUL 15	27.2	0.0	212.9	761.3
85 JUL 16	21.7	0.0	231.1	885.3
85 JUL 17	16.1	0.0	239.6	1002.5
85 JUL 18	19.0	0.0	149.7	911.3
85 JUL 19	24.8	0.0	164.6	716.4
85 JUL 20	15.1	0.0	126.6	911.0
85 JUL 21	16.3	0.0	176.3	961.6
85 JUL 22	17.6	0.0	202.6	961.3
85 JUL 23	22.6	0.0	34.1	850.9
85 JUL 24	23.9	0.0	33.8	715.7
85 JUL 25	3.7	0.0	126.4	883.7
85 JUL 26	20.9	0.0	175.6	883.5
85 JUL 27	20.0	0.0	168.2	959.6
85 JUL 28	20.4	0.0	172.9	998.9
85 JUL 29	19.5	0.0	176.9	882.6

MISSION SUMMARY FOR STS-51F

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 23.5 06Z: 0.0 12Z: 189.2 18Z: 877.6

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-51I	00Z	06Z	12Z	18Z
85 AUG 6	10.0	0.0	164.0	757.6
85 AUG 7	8.0	0.0	116.9	953.5
85 AUG 8	1.3	0.0	207.5	878.2
85 AUG 9	6.3	0.0	124.6	643.8
85 AUG 10	4.6	0.0	184.1	903.2
85 AUG 11	2.2	0.0	140.1	989.2
85 AUG 12	3.0	0.0	171.3	901.9
85 AUG 13	1.2	0.0	169.8	901.1
85 AUG 14	0.1	0.0	144.3	265.0
85 AUG 15	0.0	0.0	142.8	643.6
85 AUG 16	0.0	0.0	117.1	898.7
85 AUG 17	0.0	0.0	140.4	897.8
85 AUG 18	0.0	0.0	161.1	870.8
85 AUG 19	0.0	0.0	151.1	836.2
85 AUG 20	0.0	0.0	158.3	927.6
85 AUG 21	0.0	0.0	113.6	746.6
85 AUG 22	0.0	0.0	184.6	746.8
85 AUG 22	0.0	0.0	184.7	866.7
85 AUG 23	0.0	0.0	183.2	974.0
85 AUG 24	0.0	0.0	146.8	745.5
85 AUG 25	0.0	0.0	91.9	974.2
85 AUG 26	0.0	0.0	129.4	979.3
85 AUG 27	0.0	0.0	24.5	697.7

MISSION SUMMARY FOR STS-51I

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 1.7 06Z: 0.0 12Z: 142.1 18Z: 824.3

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-51J	00Z	06Z	12Z	18Z
85 AUG 29	0.0	0.0	131.3	737.0
85 AUG 30	0.0	0.0	91.4	735.6
85 AUG 31	0.0	0.0	86.7	399.3
85 SEP 1	0.0	0.0	28.6	257.3
85 SEP 2	0.0	0.0	107.6	914.9
85 SEP 3	0.0	0.0	140.7	957.5
85 SEP 4	0.0	0.0	139.3	873.2
85 SEP 5	0.0	0.0	125.0	871.3
85 SEP 6	0.0	0.0	123.8	869.4
85 SEP 7	0.0	0.0	127.8	905.6
85 SEP 8	0.0	0.0	121.3	946.0
85 SEP 9	0.0	0.0	134.6	949.1
85 SEP 10	0.0	0.0	155.0	935.5
85 SEP 11	0.0	0.0	90.5	858.7
85 SEP 12	0.0	0.0	126.7	929.9
85 SEP 13	0.0	0.0	98.4	854.0
85 SEP 14	0.0	0.0	59.8	893.6
85 SEP 15	0.0	0.0	112.3	887.4
85 SEP 16	0.0	0.0	114.2	929.3
85 SEP 17	0.0	0.0	49.3	202.2
85 SEP 18	0.0	0.0	80.3	698.2
85 SEP 19	0.0	0.0	18.8	243.5
85 SEP 20	0.0	0.0	18.6	481.9
85 SEP 21	0.0	0.0	47.0	908.7
85 SEP 22	0.0	0.0	105.9	905.4
85 SEP 23	0.0	0.0	123.5	902.0
85 SEP 24	0.0	0.0	131.9	898.6
85 SEP 25	0.0	0.0	101.6	841.2
85 SEP 26	0.0	0.0	66.7	871.7
85 SEP 27	0.0	0.0	94.4	852.3
85 SEP 28	0.0	0.0	94.7	464.8
85 SEP 29	0.0	0.0	86.8	679.6
85 SEP 30	0.0	0.0	101.7	0.0
85 OCT 1	0.0	0.0	100.1	838.6
85 OCT 2	0.0	0.0	91.2	740.2
85 OCT 3	0.0	0.0	87.4	792.9

MISSION SUMMARY FOR STS-51J

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 97.3 18Z: 771.1

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-61A	00Z	06Z	12Z	18Z
85 OCT 16	0.0	0.0	68.4	721.9
85 OCT 17	0.0	0.0	66.7	765.2
85 OCT 18	0.0	0.0	70.7	760.8
85 OCT 19	0.0	0.0	10.4	785.7
85 OCT 20	0.0	0.0	45.3	672.3
85 OCT 21	0.0	0.0	66.7	788.0
85 OCT 22	0.0	0.0	63.3	697.8
85 OCT 23	0.0	0.0	62.9	767.3
85 OCT 24	0.0	0.0	56.0	689.6
85 OCT 25	0.0	0.0	51.7	758.1
85 OCT 26	0.0	0.0	51.0	678.9
85 OCT 27	0.0	0.0	32.7	565.6
85 OCT 28	0.0	0.0	42.8	705.4
85 OCT 29	0.0	0.0	41.3	580.7
85 OCT 30	0.0	0.0	58.2	747.7

MISSION SUMMARY FOR STS-61A

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 52.4 18Z: 711.1

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-61B	00Z	06Z	12Z	18Z
85 NOV 12	0.0	0.0	20.0	583.2
85 NOV 13	0.0	0.0	23.6	664.8
85 NOV 14	0.0	0.0	21.8	671.8
85 NOV 15	0.0	0.0	19.5	681.7
85 NOV 16	0.0	0.0	16.1	678.1
85 NOV 17	0.0	0.0	16.7	675.9
85 NOV 18	0.0	0.0	15.1	553.9
85 NOV 19	0.0	0.0	9.1	493.3
85 NOV 20	0.0	0.0	6.9	474.5
85 NOV 21	0.0	0.0	1.4	637.4
85 NOV 22	0.0	0.0	7.6	542.8
85 NOV 23	0.0	0.0	3.0	540.3
85 NOV 24	0.0	0.0	5.7	653.0
85 NOV 25	0.0	0.0	4.1	648.8
85 NOV 26	0.0	0.0	2.8	647.3
85 NOV 27	0.0	0.0	1.2	644.6

MISSION SUMMARY FOR STS-61B

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 10.3 18Z: 613.7

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-61C	00Z	06Z	12Z	18Z
85 DEC 1	0.0	0.0	0.0	450.9
85 DEC 2	0.0	0.0	0.0	527.8
85 DEC 3	0.0	0.0	0.0	630.5
85 DEC 4	0.0	0.0	0.0	496.9
85 DEC 5	0.0	0.0	0.0	127.2
85 DEC 6	0.0	0.0	0.0	684.9
85 DEC 7	0.0	0.0	0.0	623.3
85 DEC 8	0.0	0.0	0.0	252.3
85 DEC 9	0.0	0.0	0.0	311.2
85 DEC 10	0.0	0.0	0.0	603.3
85 DEC 11	0.0	0.0	0.0	467.4
85 DEC 12	0.0	0.0	0.0	593.5
85 DEC 13	0.0	0.0	0.0	564.3
85 DEC 14	0.0	0.0	0.0	591.9
85 DEC 15	0.0	0.0	0.0	591.3
85 DEC 16	0.0	0.0	0.0	565.5
85 DEC 17	0.0	0.0	0.0	307.6
85 DEC 18	0.0	0.0	0.0	503.4
85 DEC 19	0.0	0.0	0.0	613.7
85 DEC 20	0.0	0.0	0.0	672.3
85 DEC 21	0.0	0.0	0.0	646.8
85 DEC 22	0.0	0.0	0.0	612.8
85 DEC 23	0.0	0.0	0.0	470.0
85 DEC 24	0.0	0.0	0.0	556.4
85 DEC 25	0.0	0.0	0.0	604.7
85 DEC 26	0.0	0.0	0.0	647.3
85 DEC 27	0.0	0.0	0.0	676.1
85 DEC 28	0.0	0.0	0.0	507.2
85 DEC 29	0.0	0.0	0.0	619.6
85 DEC 30	0.0	0.0	0.0	681.1
85 DEC 31	0.0	0.0	0.0	622.3
86 JAN 1	0.0	0.0	0.0	497.1
86 JAN 2	0.0	0.0	0.0	521.8
86 JAN 3	0.0	0.0	0.0	658.6
86 JAN 4	0.0	0.0	0.0	577.5
86 JAN 5	0.0	0.0	0.0	128.3
86 JAN 6	0.0	0.0	0.0	538.4
86 JAN 7	0.0	0.0	0.0	469.7
86 JAN 8	0.0	0.0	0.0	263.8
86 JAN 9	0.0	0.0	0.0	264.9
86 JAN 10	0.0	0.0	0.0	351.7
86 JAN 11	0.0	0.0	0.0	263.1
86 JAN 12	0.0	0.0	0.0	648.0

MISSION SUMMARY FOR STS-61C

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 0.0 18Z: 516.3

SOLAR IRRADIANCE UNITS ARE IN WATTS/METER**2

MISSION STS-51L	00Z	06Z	12Z	18Z
85 DEC 22	0.0	0.0	0.0	612.8
85 DEC 23	0.0	0.0	0.0	470.0
85 DEC 24	0.0	0.0	0.0	556.4
85 DEC 25	0.0	0.0	0.0	604.7
85 DEC 26	0.0	0.0	0.0	647.3
85 DEC 27	0.0	0.0	0.0	676.1
85 DEC 28	0.0	0.0	0.0	507.2
85 DEC 29	0.0	0.0	0.0	619.6
85 DEC 30	0.0	0.0	0.0	681.1
85 DEC 31	0.0	0.0	0.0	622.3
86 JAN 1	0.0	0.0	0.0	497.1
86 JAN 2	0.0	0.0	0.0	521.8
86 JAN 3	0.0	0.0	0.0	658.6
86 JAN 4	0.0	0.0	0.0	577.5
86 JAN 5	0.0	0.0	0.0	128.6
86 JAN 6	0.0	0.0	0.0	538.4
86 JAN 7	0.0	0.0	0.0	469.7
86 JAN 8	0.0	0.0	0.0	263.8
86 JAN 9	0.0	0.0	0.0	264.9
86 JAN 10	0.0	0.0	0.0	351.7
86 JAN 11	0.0	0.0	0.0	263.1
86 JAN 12	0.0	0.0	0.0	648.0
86 JAN 13	0.0	0.0	0.0	712.8
86 JAN 14	0.0	0.0	0.0	715.3
86 JAN 15	0.0	0.0	0.0	718.4
86 JAN 16	0.0	0.0	0.0	561.1
86 JAN 17	0.0	0.0	0.0	430.4
86 JAN 18	0.0	0.0	0.0	0.0
86 JAN 19	0.0	0.0	0.0	671.9
86 JAN 20	0.0	0.0	0.0	704.1
86 JAN 21	0.0	0.0	0.0	738.7
86 JAN 22	0.0	0.0	0.0	682.9
86 JAN 23	0.0	0.0	0.0	575.8
86 JAN 24	0.0	0.0	0.0	720.4
86 JAN 25	0.0	0.0	0.0	615.2
86 JAN 26	0.0	0.0	0.0	144.8
86 JAN 27	0.0	0.0	0.0	579.1
86 JAN 28	0.0	0.0	0.0	763.8

MISSION SUMMARY FOR STS-51L

MEAN SOLAR IRRADIANCE BY HOUR 00Z: 0.0 06Z: 0.0 12Z: 0.0 18Z: 559.3

APPENDIX C

PLOTS: WIND SPEED, WIND DIRECTION, WIND COMPONENT SPEEDS WITH PLUS AND MINUS THREE SIGMA (STANDARD DEVIATION) UNCERTAINTIES

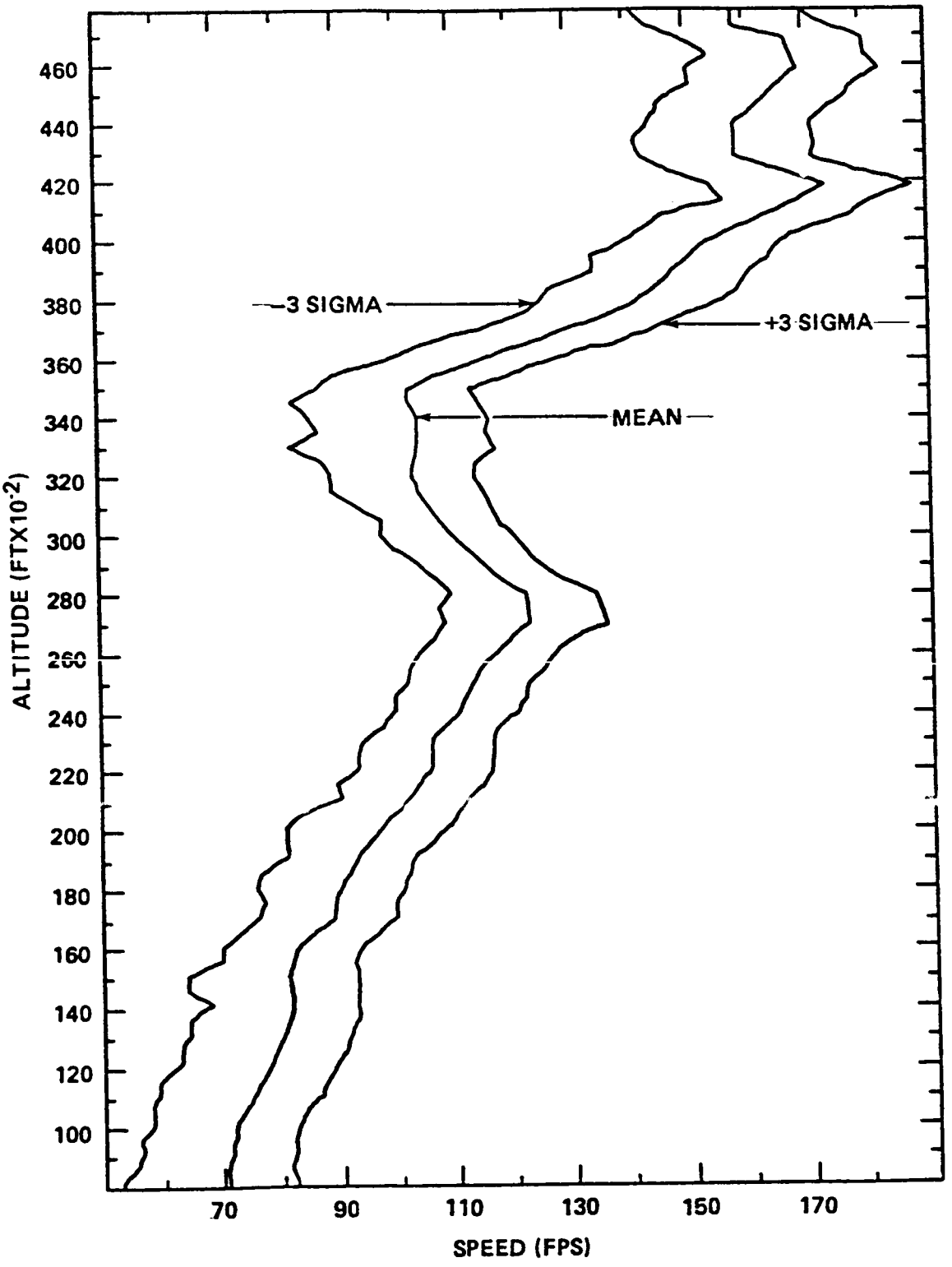

Figure C-1. Total wind speed (FPS).

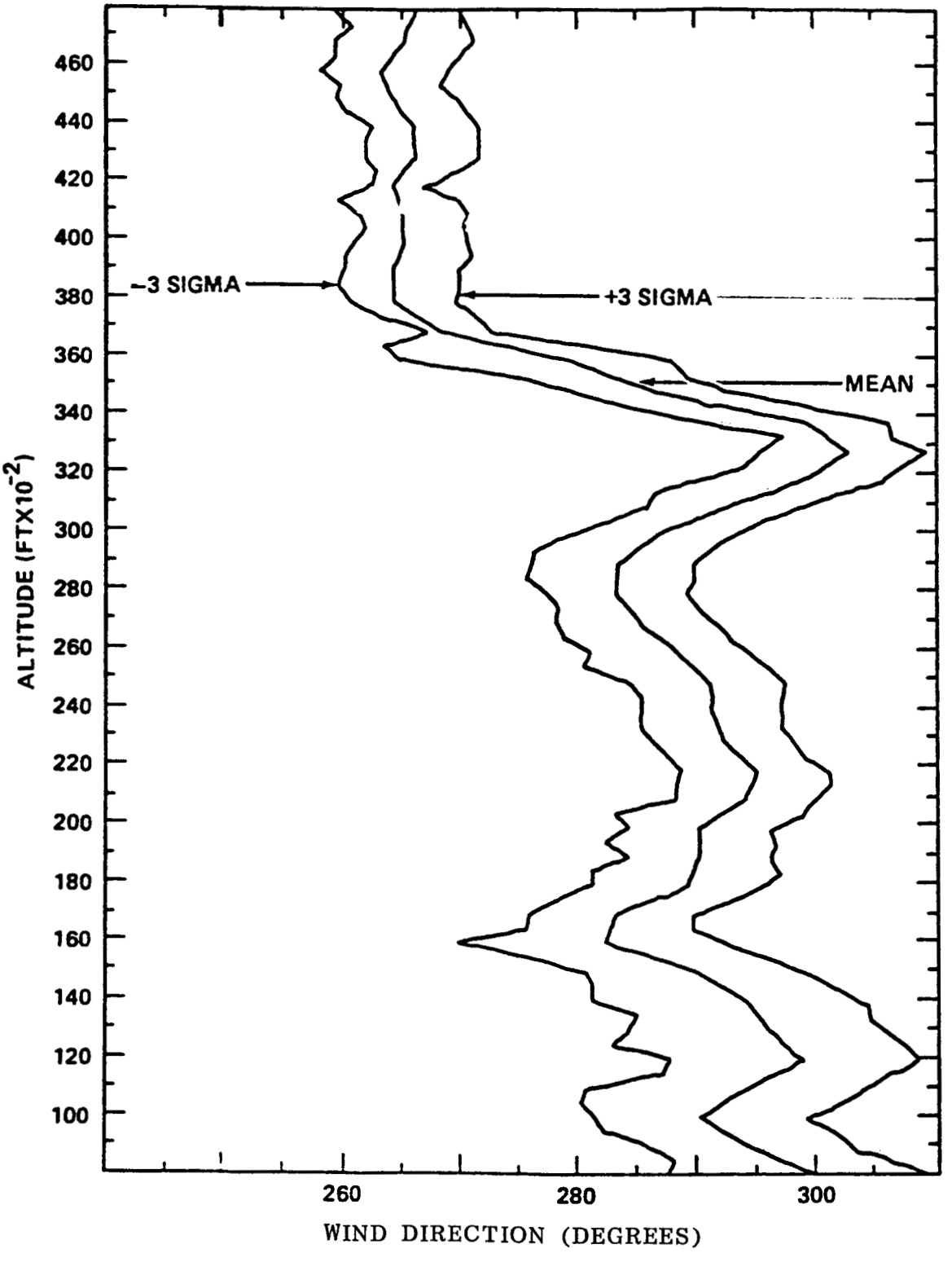

Figure C-2. Total wind direction (degrees).

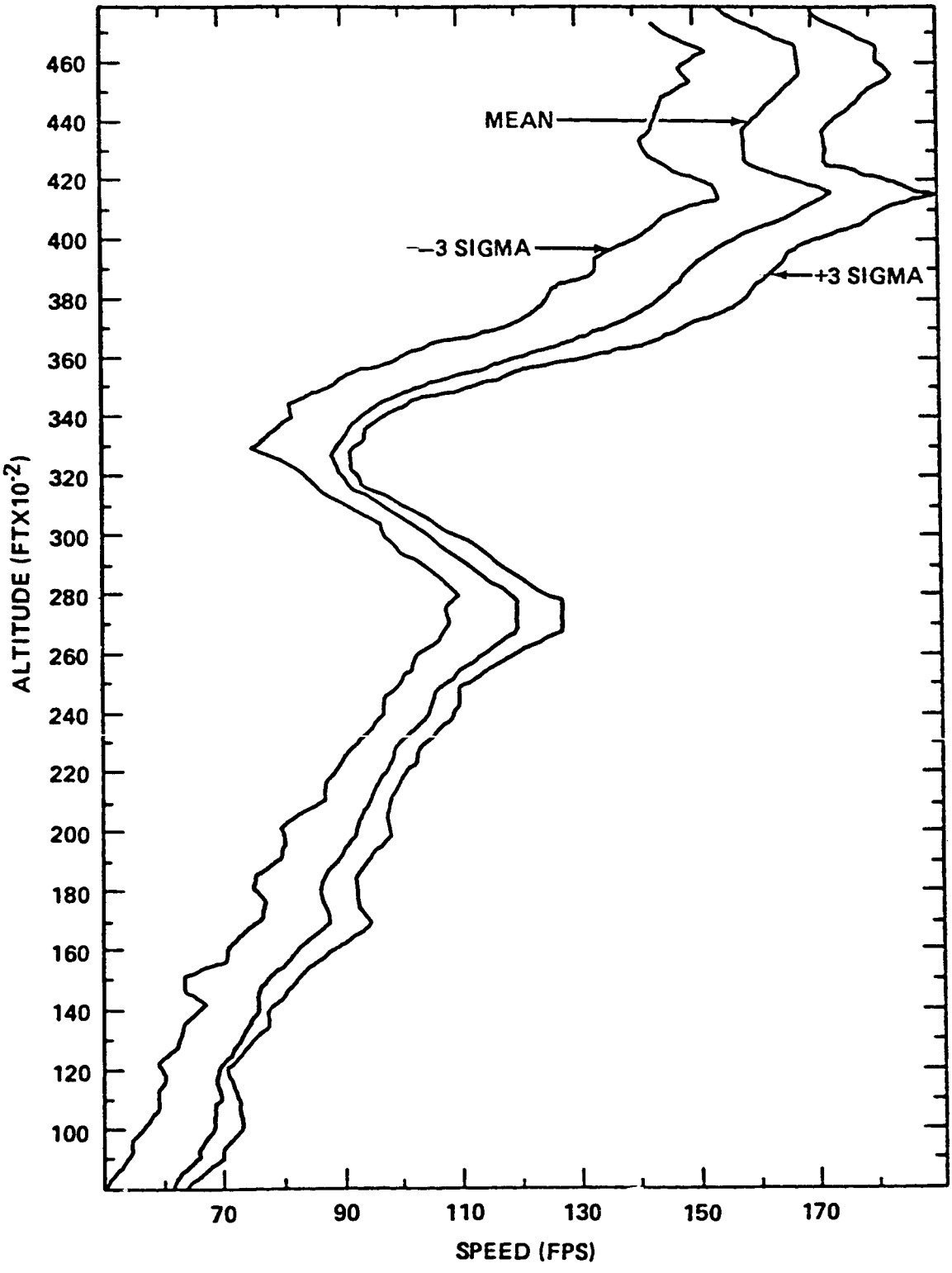

Figure C-3. Zonal (U) wind component.

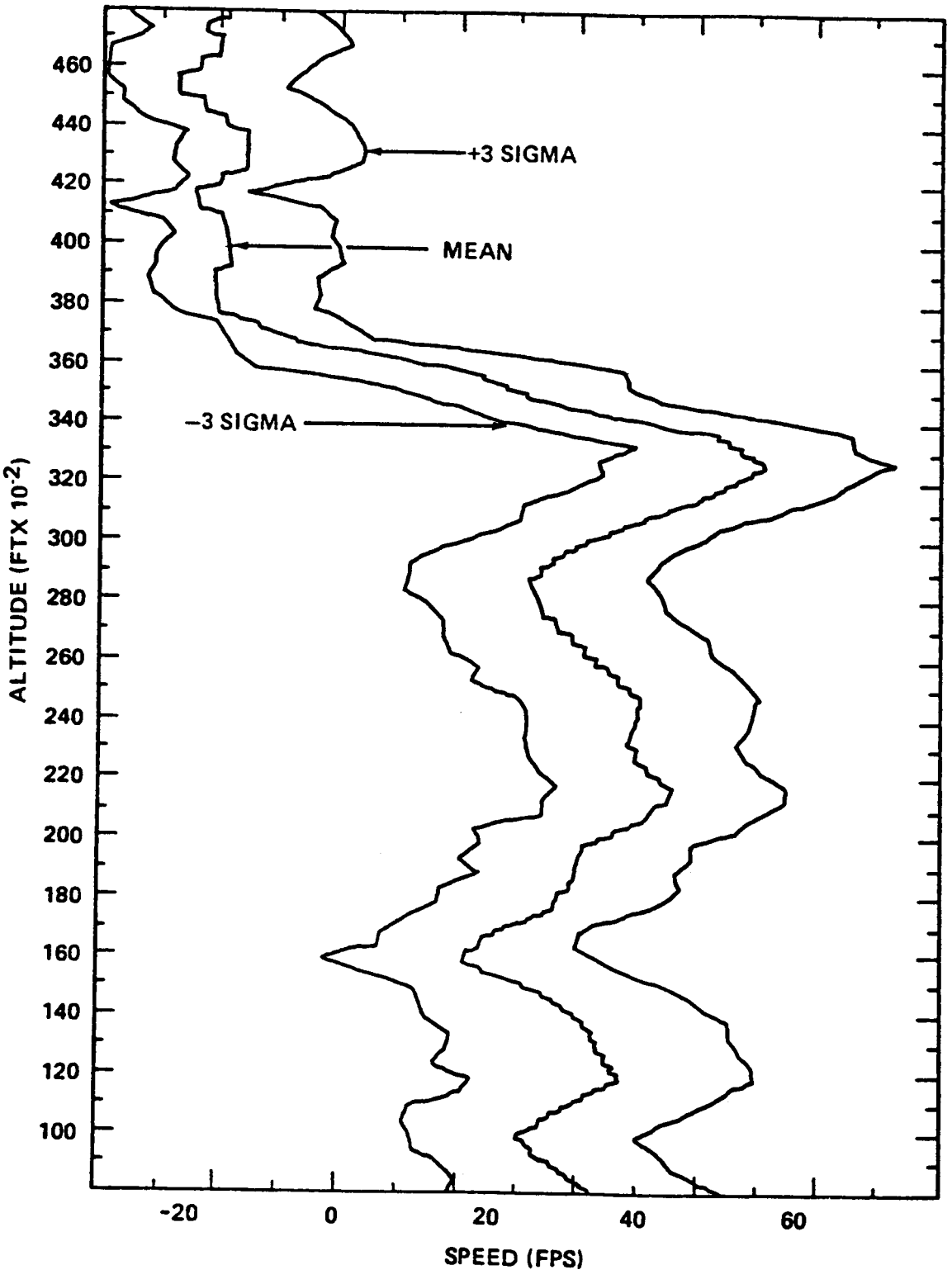

Figure C-4. Meridional (V) wind component.

APPROVAL

ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-51L) LAUNCH

By G. Jasper, D. L. Johnson, M. Alexander,
G. H. Fichtl, and G. W. Batts

The information in this report has been reviewed for technical content. Review of any information concerning Department of Defense or nuclear energy activities or programs has been made by the MSFC Security Classification Officer. This report, in its entirety, has been determined to be unclassified.

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