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ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-2) LAUNCH

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16. ABSTRACT

This report presents a summary of selected atmospheric conditions observed near Space Shuttle STS-2 launch time on November 12, 1981, at Kennedy Space Center, Florida. Values of ambient pressure, temperature, moisture, ground winds, visual observations (cloud), and winds aloft are included. The sequence of prelaunch Jimsphere measured vertical wind profiles is given in this report. Also presented are the wind and thermodynamic parameters measured at the surface and aloft in the SRB descent/impact ocean area. Final meteorological tapes, which consist of wind and thermodynamic parameters versus altitude, for STS-2 vehicle ascent and SRB descent have been constructed. The STS-2 ascent meteorological data tape has been constructed by Marshall Space Flight Center in response to Shuttle task agreement No. 989-13-22-368 with Johnson Space Center.

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ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-2) LAUNCH

I. INTRODUCTION

This report presents an evaluation of the atmospheric environmental data taken during the launch of the Space Shuttle/STS-2 vehicle. This Space Shuttle vehicle was launched from Pad 39A at Kennedy Space Center (KSC), Florida, on a bearing of 60 degrees east of north at 1510 GMT (1010 EST) on November 12, 1981.

This report presents a summary of the atmospheric environment at launch time (L+0) of the STS-2, together with the sequence of prelaunch Jimsphere measured winds aloft profiles from L-13 h through liftoff. The general weather situation for the launch and flight area is described, and surface and upper level wind/thermodynamic observations near launch time are given. Surface and upper level wind/thermodynamic parameter measurements are also presented for the SRB descent/impact analyses.

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). A report summarizing only STS-1 launch conditions is presented in Reference 3.

II. SOURCES OF DATA

Atmospheric observational data used in this report were taken from weather maps made by the National Weather Service, plus all available surface observations and measurements from around the launch area. Upper air observations were taken from balloon-released instruments sent aloft from Cape Canaveral Air Force Station (CCAFS) and from the ship Gen. H. S. Vandenberg in the Atlantic Ocean off the Florida Coast. High-altitude winds and thermodynamic data were measured by the Super Loki rocketsonde launched from the CCAFS. Table 1 presents a listing of systems used to obtain the upper level wind profiles used in compiling the final ascent meteorological data tape. Only the ship-launched Omegasonde-Rawinsonde and Super Loki rocket data were used in the upper level atmospheric regions for the construction of the final SRB descent/impact meteorological data tape. Data cutoff altitudes are also given in Table 1.

III. GENERAL SYNOPTIC SITUATION AT LAUNCH TIME

A high pressure ridge located west of Florida, oriented north-south throughout the east-central United States, began influencing the weather throughout Florida prior to and including launch time. The low-pressure storm system which had passed through Florida the preceding day was located in the Atlantic Ocean, east and north of Florida by launch time. Surface winds were moderate (27 ft/s) from the north northwest, with warm temperatures (73°F) being experienced in the KSC area. Figure 1 gives the surface weather map 3 hr prior to launch. Figure 2 presents the wind flow aloft at the 500 mb level. North to northwesterly winds dominated the flow aloft over the KSC region.

Cloud bands were located in the ocean areas surrounding the Florida peninsula, as shown in Figure 3. Figure 3 presents the GOES east (SMS-II) visible satellite picture taken an hour before launch (1400Z). Only scattered, low-level clouds were present in the KSC area during launch. Figure 4 shows the contrail of the Shuttle at launch as recorded by the GOES east satellites visible photograph taken at 1510Z. The directional change of the contrail was attributed to wind shear in the upper levels of the atmosphere.

IV. SURFACE OBSERVATIONS AT LAUNCH TIME

Surface observations at launch time for selected KSC locations are given in Table 2. Included are pad 39A, Shuttle runway, and CCAFS balloon release station observations. Neither precipitation nor lightning was observed at launch time.

Table 3 presents Pad 39A wind data along with other standard hourly meteorological measurements and sky observations for the 6 hr prior to launch of STS-2. 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.

V. UPPER AIR MEASUREMENTS DURING LAUNCH

An estimated FPS-16 Jimsphere (L+0), GMD rawinsonde (1515Z), and Super-Loki rocketsonde (1710Z) systems were used to measure the upper level wind and thermodynamic parameters for STS-2 launch. At altitudes above the rocket-measured data, the Global Reference Atmosphere (GRA) [4] parameters for November KSC conditions were used. A tabulation of the STS-2 final meteorological data for ascent is presented in Table 4 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 27.0 ft/s (16.0 kn) at 60 ft and increasing to a maximum of 158 ft/s (94.0 kn) blowing from 286 degrees. This maximum occurred at an altitude of 36,300 ft (11,064 m). The winds decreased above this

level and then became stronger again at much higher levels, as shown in Figure 5. The overall maximum speed was 364.0 ft/s (216.0 kn) at 200,000 ft (60,960 m) altitude.

B. Wind Direction

At launch time, the 60 ft wind direction was from the north northwest (345 degrees) and slowly shifted from the north to become westerly at approximately 39,000 ft (11,887 m). Wind directions stayed westerly up to 340,000 ft (103,632 m). Figure 5 shows the complete wind direction versus altitude profile. As shown in Figure 5, wind directions became quite variable at altitudes with low wind speeds.

C. Prelaunch/Launch Wind Profiles

All wind data, except L+0 values, shown in Figures 6 through 9 were measured by the Jimsphere FPS-16 system. All L+0 data are estimated.

The most unusual aspects of the wind profiles measured during the latter part of the countdown were the strong northerly winds in the lower 3,000 ft – a feature that persisted throughout the period – and the rapid wind speed increase at about 36,000 ft from L-3.5 hr to L+48 min. Changes in the wind profiles from L-13 to L-3.5 hr were relatively small – a decrease of maximum wind speed and slight veering of wind direction. However, between L-3.5 hr and L+48 min there was a large increase in wind speed at about 36,000 ft. This caused a large increase in the left crosswind component (Fig. 9).

After evaluating these rapid changes, it was decided that the L+48-min profile was not representative of the STS-2 ascent winds, and that a new profile more descriptive of the wind encountered during ascent was needed. The estimated L+0 wind profile was developed to satisfy that need.

D. Thermodynamic Data

The thermodynamic data taken at STS-2 launch time, consisting of atmospheric temperature, dew-point temperature, pressure, and density have been compiled as the STS-2 ascent meteorological data and are presented in Table 4. The associated thermodynamic data taken in support of the SRB descent have also been assembled as the STS-2 SRB descent/impact meteorological data and are presented in Table 5. The vertical structure of temperature for the STS-2 ascent and for the SRB descent is shown graphically versus altitude in Figure 10.

E. SRB Upper Air and Surface Measurements

As has been mentioned in earlier paragraphs, an SRB descent meteorological data tape has also been constructed which consists of data taken from the Omega-sonde-Rawinsonde system (1728Z) aboard the USNS Vandenberg, which was stationed off the coast in the Atlantic Ocean. The CCAFS measured Super-Loki Rocketsonde data and the GRA model data were used at altitude levels above the measured

Omegasonde data. The tabular values for the SRB descent meteorological tape are presented in Table 5, with wind speed and direction profiles presented in Figure 11. Figure 10 gives the vertical temperature profile.

The surface-ship meteorological and oceanographical observations taken close to STS-2 SRB impact are presented in Table 6.

VI. ATMOSPHERIC SUMMARY CONDITIONS FOR STS LAUNCHES

Given in Table 7 are selected atmospheric T+0 launch conditions for all the Space Shuttle launches.

TABLE 1. SYSTEMS USED TO MEASURE UPPER AIR WIND DATA FOR STS-2 ASCENT.*

Type of Data	Release Time		Portion of Data Used			
			Start		End	
	Time (UT) (h:min)	Time After L+0 (min)	Altitude m (ft)	Time After L+0 (min)	Altitude m (ft)	Time After L+0 (min)
FPS-16 Jimsphere**	15:58	48	4 (14)	48	17 069 (56 000)	106
Rawinsonde	15:15	5	17 374 (57 000)	62	26 213 (86 000)	91
Super-Loki Rocketsonde	17:10	120	83 820 (275 000	120	27 432 (90 000)	110
Omegasonde-Rawinsonde*	17:28	138	18 (60)	138	29 870 (98 000)	236

* The Omegasonde-Rawinsonde was released from the USNS Gen. H. S. Vandenberg to measure the upper atmosphere for SRB descent/impact analyses.

** The T+17-min Jimsphere was unavailable. A second release at T+48 min provided Jimsphere wind data that was then used in the final meterological data tape, but was modified to reflect T+0 wind conditions.

TABLE 2. SURFACE OBSERVATIONS AT STS-2 LAUNCH TIME

Location[b]	Time After L+0 (min)	Pressure, [a*] N/cm² (psia)	Temperature, K (°F)	Dew Point K (°F)	Relative Humidity (%)	Visibility km (miles)	Sky Cover			Wind	
							Cloud Amount (Tenths)	Cloud Type	Height of Base Meters (ft)	Speed f/s (kn)	Direction (deg)
NASA Space Shuttle Runway Winds Measured at 10.4 m (34 ft)	0	10.169 (14.75)	295.9 (73.0)	288.7 (60.0)	63	13 (8)	1	Strato-Cumulus	671 (2200)	15.2 (9.0)	320
CCAFS[d] Surface Measurements	5	10.169 (14.75)	295.6 (72.0)	289.1 (61.0)	67	-	-	-	-	25.0 (14.8)	310
Pad 39A lightpole[e] NW 18.3 m (60.0 ft)	0	10.180 (14.77)	295.9 (73.0)	288.2 (59.0)	61	-	-	-	-	27.0[c] (16.0)	345[c]
Pad 39A FSS (Top-NW) 83.8 m (275 ft)	0	-	-	-	-	-	-	-	-	27.0[c] (16.0)	355[c]

a. Pad 39A Camera Site 3 barometric pressure instrument appeared to be reading too high. Therefore, the KSC Shuttle runway station pressure of 10.166 N/cm² would be more appropriate as the L+0 pad atmospheric pressure measurement, to be applied at 21 ft above MSL.

b. Altitudes of measurements are above natural grade, except where noted.

c. 1 min average prior to L+0.

d. Balloon release site.

e. Pad 39A thermodynamic measurements are taken at camera site #3, 6.4 m (21 ft) above MSL.

* Reduced to mean sea level, except PAD 39A observation.

TABLE 3. STS-2 PRE-LAUNCH THROUGH LAUNCH KSC PAD 39A METEOROLOGICAL MEASUREMENTS*

Hourly Atmospheric Measurements								Sky Condition			
12 November 1981 Time Z	Temp. (°F)	Dew Pt. (°F)	RH (%)	275' Level (NW)**		60' Level (NW)**		Clouds	Total Sky Cover	Vis. (mi.)	Other Remarks
				WS Kt	WD°	WS Kt	WD°				
0900	NA	51	NA	23	340	18	270	1/10 CU at 2,000 ft	1/10	10	
1000	70	63	78	21	350	12	280	1/10 CU at 2,000 ft	1/10	10	
1100	69	63	81	23	350	18	300	1/10 CU at 2,000 ft	1/10	10	
1200	69	60	73	21	350	17	320	1/10 CU at 1,800 ft	1/10	8	
1300	68	61	79	14	300	12	270	1/10 CU at 1,800 ft	1/10	8	
1400	70	61	72	12	290	13	280	1/10 CU at 2,000 ft	1/10	8	
1500	72	59	63	17	340	16	320	2/10 SC at 2,200 ft	2/10	8	
L-0***1510	73	59	61	16	355	16	345	1/10 SC at 2,200 ft	1/10	8	

* Hourly verbal observations from CCAFS

** 10 min mean from instrumentation on NW side of pad 39A. Hourly verbal estimates from CCAFS.

*** L-0 PAD Wind and thermodynamic parameters obtained from KSC strip charts (~ 1 min average before L-0). PAD 39A L-0 Atmospheric Pressure, at 21 ft (MSL) was 10.166 N cm^{-2}.

TABLE 4. STS-2 FINAL T+0 ASCENT METEOROLOGICAL DATA TAPE

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
000014	025	320	22.4	.1017+04	.1191+04	15.0
000100	027	347	22.1	.1014+04	.1189+04	14.9
000200	026	350	21.7	.1010+04	.1186+04	14.8
000300	027	355	21.3	.1007+04	.1184+04	14.7
000400	030	350	20.9	.1003+04	.1181+04	14.6
000500	032	346	20.5	.9996+03	.1179+04	14.5
000600	035	348	20.1	.9961+03	.1176+04	14.4
000700	037	346	19.7	.9926+03	.1174+04	14.3
000800	040	345	19.3	.9892+03	.1171+04	14.2
000900	037	001	18.9	.9857+03	.1169+04	14.1
001000	032	353	18.5	.9823+03	.1166+04	14.0
001100	035	351	18.2	.9788+03	.1163+04	13.9
001200	031	001	17.8	.9753+03	.1160+04	13.8
001300	033	359	17.5	.9718+03	.1158+04	13.7
001400	031	003	17.2	.9684+03	.1155+04	13.6
001500	033	007	16.9	.9649+03	.1152+04	13.5
001600	032	005	16.5	.9615+03	.1149+04	13.4
001700	034	003	16.2	.9581+03	.1147+04	13.3
001800	033	002	15.9	.9547+03	.1144+04	13.2
001900	029	005	15.5	.9513+03	.1141+04	13.1
002000	028	358	15.2	.9479+03	.1138+04	13.0
002100	030	000	15.0	.9445+03	.1135+04	12.9
002200	031	359	14.8	.9411+03	.1132+04	12.7
002300	033	003	14.6	.9378+03	.1129+04	12.6
002400	035	003	14.4	.9344+03	.1125+04	12.4
002500	035	005	14.2	.9310+03	.1122+04	12.3
002600	032	005	14.0	.9277+03	.1119+04	12.2
002700	033	000	13.8	.9244+03	.1116+04	12.0
002800	038	007	13.6	.9210+03	.1113+04	11.9
002900	038	013	13.4	.9177+03	.1109+04	11.7
003000	039	019	13.2	.9144+03	.1106+04	11
003100	033	023	13.1	.9111+03	.1103+04	10.
003200	030	025	13.0	.9078+03	.1100+04	8.8
003300	028	025	12.9	.9046+03	.1097+04	7.4
003400	029	027	12.8	.9013+03	.1094+04	6.0
003500	030	029	12.7	.8980+03	.1091+04	4.7
003600	029	035	12.6	.8948+03	.1087+04	3.3
003700	029	036	12.5	.8915+03	.1084+04	1.9
003800	026	031	12.4	.8883+03	.1081+04	.5
003900	027	029	12.3	.8851+03	.1078+04	-.9
004000	027	031	12.2	.8819+03	.1074+04	-2.3
004100	025	031	12.1	.8787+03	.1071+04	-2.4
004200	024	026	12.1	.8755+03	.1067+04	-2.5
004300	025	026	12.0	.8723+03	.1063+04	-2.6
004400	024	024	12.0	.8692+03	.1060+04	-2.7
004500	026	015	11.9	.8660+03	.1056+04	-2.8
004600	027	017	11.9	.8629+03	.1052+04	-3.0
004700	027	015	11.9	.8597+03	.1049+04	-3.1
004800	027	010	11.8	.8566+03	.1045+04	-3.2
004900	027	006	11.7	.8535+03	.1041+04	-3.3

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
005000	024	007	11.7	.8504+03	.1038+04	-3.4
005100	023	001	11.5	.8473+03	.1035+04	-3.4
005200	023	001	11.3	.8442+03	.1032+04	-3.3
005300	021	004	11.0	.8412+03	.1029+04	-3.3
005400	019	003	10.8	.8381+03	.1026+04	-3.3
005500	019	354	10.6	.8350+03	.1023+04	-3.2
005600	017	354	10.4	.8320+03	.1020+04	-3.2
005700	015	357	10.2	.8290+03	.1017+04	-3.2
005800	018	345	9.9	.8259+03	.1014+04	-3.2
005900	019	342	9.7	.8229+03	.1011+04	-3.1
006000	017	346	9.5	.8199+03	.1008+04	-3.1
006100	016	341	9.3	.8169+03	.1005+04	-3.4
006200	019	332	9.1	.8139+03	.1002+04	-3.7
006300	017	338	8.9	.8109+03	.9996+03	-4.0
006400	018	330	8.7	.8079+03	.9967+03	-4.3
006500	019	333	8.5	.8050+03	.9938+03	-4.6
006600	018	342	8.2	.8020+03	.9909+03	-4.9
006700	017	341	8.0	.7991+03	.9880+03	-5.2
006800	019	339	7.8	.7961+03	.9852+03	-5.5
006900	019	342	7.6	.7932+03	.9823+03	-5.8
007000	020	347	7.4	.7903+03	.9795+03	-6.1
007100	017	349	7.3	.7874+03	.9764+03	-6.3
007200	016	343	7.1	.7844+03	.9733+03	-6.5
007300	019	341	7.0	.7815+03	.9702+03	-6.7
007400	019	348	6.8	.7787+03	.9671+03	-6.9
007500	019	357	6.7	.7758+03	.9640+03	-7.1
007600	018	349	6.6	.7729+03	.9610+03	-7.4
007700	019	343	6.4	.7701+03	.9579+03	-7.6
007800	020	351	6.3	.7672+03	.9549+03	-7.8
007900	019	357	6.1	.7644+03	.9518+03	-8.0
008000	017	353	6.0	.7615+03	.9488+03	-8.2
008100	018	350	6.0	.7587+03	.9453+03	-9.1
008200	018	356	6.1	.7559+03	.9417+03	-9.9
008300	016	004	6.1	.7531+03	.9382+03	-10.8
008400	016	000	6.2	.7503+03	.9346+03	-11.7
008500	018	001	6.2	.7475+03	.9311+03	-12.5
008600	018	010	6.2	.7448+03	.9276+03	-13.4
008700	019	013	6.3	.7420+03	.9241+03	-14.3
008800	024	005	6.3	.7392+03	.9206+03	-15.2
008900	027	006	6.4	.7365+03	.9171+03	-16.0
009000	026	008	6.4	.7338+03	.9136+03	-16.9
009100	026	005	6.3	.7311+03	.9105+03	-17.0
009200	027	358	6.2	.7283+03	.9074+03	-17.1
009300	030	354	6.2	.7256+03	.9043+03	-17.2
009400	031	355	6.1	.7230+03	.9012+03	-17.3
009500	031	353	6.0	.7203+03	.8981+03	-17.3
009600	030	350	5.9	.7176+03	.8951+03	-17.4
009700	032	349	5.8	.7149+03	.8920+03	-17.5
009800	032	353	5.8	.7123+03	.8889+03	-17.6
009900	032	351	5.7	.7096+03	.8859+03	-17.7

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
010000	033	348	5.6	.7070+03	.8829+03	-17.8
010100	033	349	5.5	.7044+03	.8799+03	-17.9
010200	032	354	5.4	.7018+03	.8769+03	-17.9
010300	030	357	5.3	.6991+03	.8740+03	-18.0
010400	030	350	5.2	.6965+03	.8711+03	-18.1
010500	032	347	5.1	.6939+03	.8681+03	-18.1
010600	030	345	5.0	.6914+03	.8652+03	-18.2
010700	027	343	4.9	.6888+03	.8623+03	-18.3
010800	028	339	4.8	.6862+03	.8594+03	-18.4
010900	029	335	4.7	.6837+03	.8565+03	-18.4
011000	027	338	4.6	.6811+03	.8536+03	-18.5
011100	027	338	4.4	.6786+03	.8509+03	-18.6
011200	026	337	4.3	.6761+03	.8482+03	-18.7
011300	026	343	4.1	.6735+03	.8455+03	-18.8
011400	025	346	4.0	.6710+03	.8428+03	-18.9
011500	028	340	3.8	.6685+03	.8401+03	-19.0
011600	030	340	3.7	.6660+03	.8374+03	-19.1
011700	029	342	3.6	.6635+03	.8347+03	-19.2
011800	030	339	3.4	.6610+03	.8321+03	-19.3
011900	031	339	3.2	.6586+03	.8294+03	-19.4
012000	030	342	3.1	.6561+03	.8268+03	-19.5
012100	030	339	2.8	.6536+03	.8245+03	-19.7
012200	030	336	2.6	.6512+03	.8222+03	-19.8
012300	029	338	2.3	.6487+03	.8199+03	-20.0
012400	030	334	2.0	.6463+03	.8176+03	-20.2
012500	030	333	1.7	.6438+03	.8153+03	-20.3
012600	031	335	1.5	.6414+03	.8131+03	-20.5
012700	030	332	1.2	.6390+03	.8108+03	-20.7
012800	031	332	.9	.6366+03	.8086+03	-20.9
012900	033	329	.7	.6342+03	.8063+03	-21.0
013000	032	332	.4	.6318+03	.8041+03	-21.2
013100	031	332	.2	.6294+03	.8018+03	-21.4
013200	032	327	-.1	.6270+03	.7994+03	-21.6
013300	032	329	-.3	.6246+03	.7971+03	-21.8
013400	031	328	-.6	.6223+03	.7949+03	-22.0
013500	031	325	-.8	.6199+03	.7926+03	-22.2
013600	032	326	-1.1	.6175+03	.7903+03	-22.4
013700	031	330	-1.3	.6152+03	.7880+03	-22.6
013800	030	329	-1.6	.6129+03	.7858+03	-22.8
013900	034	330	-1.8	.6105+03	.7835+03	-23.0
014000	036	336	-2.1	.6082+03	.7812+03	-23.2
014100	035	338	-2.3	.6059+03	.7788+03	-23.4
014200	038	335	-2.5	.6036+03	.7763+03	-23.6
014300	040	336	-2.6	.6012+03	.7739+03	-23.8
014400	037	339	-2.8	.5989+03	.7714+03	-24.0
014500	038	336	-3.0	.5967+03	.7690+03	-24.2
014600	040	333	-3.2	.5944+03	.7666+03	-24.5
014700	036	334	-3.4	.5921+03	.7641+03	-24.7
014800	037	332	-3.5	.5898+03	.7617+03	-24.9
014900	038	332	-3.7	.5876+03	.7593+03	-25.1

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
015000	035	334	-3.9	.5853+03	.7569+03	-25.3
015100	038	330	-4.2	.5830+03	.7548+03	-25.5
015200	039	332	-4.5	.5808+03	.7527+03	-25.7
015300	037	332	-4.7	.5786+03	.7505+03	-25.8
015400	038	329	-5.0	.5763+03	.7484+03	-26.0
015500	038	330	-5.3	.5741+03	.7463+03	-26.2
015600	037	328	-5.6	.5719+03	.7442+03	-26.4
015700	039	328	-5.9	.5697+03	.7421+03	-26.6
015800	036	330	-6.1	.5675+03	.7400+03	-26.7
015900	037	328	-6.4	.5653+03	.7379+03	-26.9
016000	037	331	-6.7	.5631+03	.7359+03	-27.1
016100	037	331	-7.0	.5609+03	.7337+03	-27.3
016200	038	328	-7.2	.5587+03	.7316+03	-27.5
016300	038	328	-7.5	.5565+03	.7295+03	-27.8
016400	037	324	-7.8	.5543+03	.7274+03	-28.0
016500	037	326	-8.0	.5522+03	.7253+03	-28.2
016600	039	327	-8.3	.5500+03	.7232+03	-28.4
016700	033	329	-8.6	.5479+03	.7211+03	-28.6
016800	037	327	-8.9	.5457+03	.7190+03	-28.9
016900	039	326	-9.1	.5436+03	.7170+03	-29.1
017000	039	327	-9.4	.5415+03	.7149+03	-29.3
017100	039	324	-9.7	.5393+03	.7128+03	-29.5
017200	040	324	-9.9	.5372+03	.7107+03	-29.7
017300	039	324	-10.2	.5351+03	.7087+03	-29.8
017400	039	323	-10.5	.5330+03	.7066+03	-30.0
017500	038	325	-10.7	.5309+03	.7045+03	-30.2
017600	041	323	-11.0	.5288+03	.7025+03	-30.4
017700	040	323	-11.3	.5267+03	.7004+03	-30.6
017800	040	320	-11.6	.5246+03	.6984+03	-30.7
017900	042	318	-11.8	.5225+03	.6964+03	-30.9
018000	042	317	-12.1	.5205+03	.6943+03	-31.1
018100	041	313	-12.4	.5184+03	.6924+03	-31.3
018200	041	314	-12.7	.5163+03	.6904+03	-31.5
018300	039	317	-13.0	.5143+03	.6884+03	-31.7
018400	040	313	-13.3	.5122+03	.6865+03	-31.9
018500	041	312	-13.6	.5102+03	.6845+03	-32.1
018600	038	311	-13.9	.5081+03	.6826+03	-32.4
018700	040	308	-14.2	.5061+03	.6807+03	-32.6
018800	039	309	-14.5	.5041+03	.6788+03	-32.8
018900	037	305	-14.8	.5021+03	.6768+03	-33.0
019000	038	304	-15.1	.5001+03	.6749+03	-33.2
019100	038	306	-15.3	.4981+03	.6727+03	-33.4
019200	037	309	-15.5	.4961+03	.6705+03	-33.6
019300	040	302	-15.7	.4941+03	.6683+03	-33.8
019400	039	303	-15.9	.4921+03	.6661+03	-34.0
019500	040	299	-16.0	.4901+03	.6639+03	-34.1
019600	040	299	-16.2	.4881+03	.6617+03	-34.3
019700	041	300	-16.4	.4862+03	.6596+03	-34.5
019800	042	301	-16.6	.4842+03	.6574+03	-34.7
019900	045	304	-16.8	.4823+03	.6552+03	-34.9

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAMS/M3)	DEW POINT (DEG C)
020000	045	303	-17.0	.4803+03	.6531+03	-35.1
020100	048	303	-17.2	.4784+03	.6510+03	-35.2
020200	046	304	-17.4	.4764+03	.6489+03	-35.4
020300	048	305	-17.7	.4745+03	.6468+03	-35.5
020400	050	306	-17.9	.4726+03	.6448+03	-35.7
020500	048	309	-18.1	.4707+03	.6427+03	-35.8
020600	051	309	-18.3	.4687+03	.6407+03	-36.0
020700	052	311	-18.5	.4668+03	.6386+03	-36.1
020800	052	308	-18.8	.4650+03	.6366+03	-36.3
020900	055	308	-19.0	.4631+03	.6345+03	-36.4
021000	054	307	-19.2	.4612+03	.6325+03	-36.6
021100	056	305	-19.4	.4593+03	.6304+03	-36.8
021200	055	306	-19.5	.4574+03	.6282+03	-36.9
021300	053	307	-19.7	.4556+03	.6261+03	-37.1
021400	056	305	-19.9	.4537+03	.6239+03	-37.2
021500	057	306	-20.0	.4518+03	.6218+03	-37.4
021600	058	305	-20.2	.4500+03	.6197+03	-37.6
021700	060	304	-20.4	.4482+03	.6175+03	-37.7
021800	060	303	-20.6	.4463+03	.6154+03	-37.9
021900	062	301	-20.7	.4445+03	.6133+03	-38.0
022000	062	302	-20.9	.4427+03	.6112+03	-38.2
022100	060	300	-21.1	.4409+03	.6093+03	-38.4
022200	063	298	-21.4	.4390+03	.6074+03	-38.5
022300	062	298	-21.6	.4372+03	.6055+03	-38.7
022400	063	298	-21.9	.4354+03	.6036+03	-38.9
022500	065	299	-22.1	.4336+03	.6017+03	-39.0
022600	065	299	-22.4	.4318+03	.5999+03	-39.2
022700	067	298	-22.6	.4301+03	.5980+03	-39.4
022800	069	298	-22.9	.4283+03	.5961+03	-39.6
022900	069	298	-23.1	.4265+03	.5942+03	-39.7
023000	070	299	-23.4	.4248+03	.5924+03	-39.9
023100	068	300	-23.6	.4230+03	.5904+03	-40.1
023200	068	298	-23.8	.4212+03	.5885+03	-40.3
023300	069	299	-24.1	.4195+03	.5866+03	-40.4
023400	067	299	-24.3	.4177+03	.5847+03	-40.6
023500	069	299	-24.5	.4160+03	.5827+03	-40.8
023600	069	299	-24.7	.4143+03	.5808+03	-41.0
023700	071	297	-24.9	.4125+03	.5789+03	-41.2
023800	071	297	-25.2	.4108+03	.5770+03	-41.3
023900	070	297	-25.4	.4091+03	.5751+03	-41.5
024000	070	297	-25.6	.4074+03	.5733+03	-41.7
024100	069	299	-25.9	.4057+03	.5716+03	-41.9
024200	071	298	-26.2	.4040+03	.5699+03	-42.1
024300	070	301	-26.6	.4023+03	.5683+03	-42.3
024400	071	297	-26.9	.4006+03	.5666+03	-42.5
024500	074	298	-27.2	.3989+03	.5650+03	-42.7
024600	074	298	-27.5	.3972+03	.5633+03	-43.0
024700	076	297	-27.8	.3956+03	.5617+03	-43.2
024800	075	298	-28.2	.3939+03	.5600+03	-43.4
024900	076	297	-28.5	.3922+03	.5584+03	-43.6

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
025000	074	297	-28.8	.3906+03	.5568+03	-43.8
025100	073	297	-29.0	.3889+03	.5548+03	-44.0
025200	076	298	-29.2	.3873+03	.5529+03	-44.2
025300	076	300	-29.3	.3856+03	.5509+03	-44.3
025400	076	299	-29.5	.3840+03	.5490+03	-44.5
025500	079	298	-29.7	.3824+03	.5471+03	-44.7
025600	079	298	-29.9	.3807+03	.5452+03	-44.9
025700	079	297	-30.1	.3791+03	.5433+03	-45.1
025800	080	299	-30.2	.3775+03	.5413+03	-45.2
025900	080	298	-30.4	.3759+03	.5394+03	-45.4
026000	079	300	-30.6	.3743+03	.5376+03	-45.6
026100	079	300	-30.8	.3727+03	.5357+03	-45.7
026200	082	300	-31.0	.3711+03	.5339+03	-45.9
026300	081	301	-31.2	.3695+03	.5321+03	-46.0
026400	083	300	-31.4	.3679+03	.5302+03	-46.2
026500	081	299	-31.6	.3664+03	.5284+03	-46.3
026600	082	298	-31.9	.3648+03	.5266+03	-46.5
026700	082	299	-32.1	.3632+03	.5248+03	-46.6
026800	080	298	-32.3	.3617+03	.5230+03	-46.8
026900	083	298	-32.5	.3601+03	.5213+03	-46.9
027000	083	297	-32.7	.3586+03	.5195+03	-47.1
027100	085	296	-32.9	.3570+03	.5177+03	-47.3
027200	084	296	-33.1	.3555+03	.5159+03	-47.4
027300	085	294	-33.3	.3540+03	.5141+03	-47.6
027400	085	296	-33.5	.3524+03	.5124+03	-47.7
027500	086	295	-33.7	.3509+03	.5106+03	-47.9
027600	086	296	-34.0	.3494+03	.5088+03	-48.1
027700	086	295	-34.2	.3479+03	.5071+03	-48.2
027800	088	294	-34.4	.3464+03	.5053+03	-48.4
027900	087	295	-34.6	.3449+03	.5036+03	-48.5
028000	089	294	-34.8	.3434+03	.5019+03	-48.7
028100	088	294	-35.0	.3419+03	.5001+03	-48.9
028200	085	295	-35.2	.3404+03	.4983+03	-49.0
028300	086	294	-35.4	.3389+03	.4965+03	-49.2
028400	090	294	-35.6	.3375+03	.4948+03	-49.3
028500	091	295	-35.7	.3360+03	.4930+03	-49.5
028600	093	295	-35.9	.3345+03	.4912+03	-49.7
028700	094	295	-36.1	.3331+03	.4895+03	-49.8
028800	096	295	-36.3	.3316+03	.4878+03	-50.0
028900	098	294	-36.5	.3302+03	.4860+03	-50.1
029000	096	294	-36.7	.3287+03	.4843+03	-50.3
029100	097	294	-36.9	.3273+03	.4826+03	-50.5
029200	100	294	-37.1	.3258+03	.4809+03	-50.6
029300	100	293	-37.3	.3244+03	.4792+03	-50.8
029400	101	292	-37.5	.3230+03	.4775+03	-50.9
029500	102	292	-37.7	.3216+03	.4759+03	-51.1
029600	103	292	-38.0	.3202+03	.4742+03	-51.3
029700	104	293	-38.2	.3188+03	.4725+03	-51.4
029800	105	294	-38.4	.3174+03	.4709+03	-51.6
029900	108	291	-38.6	.3160+03	.4692+03	-51.7

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
030000	110	292	-38.8	.3146+03	.4676+03	-51.9
030100	108	291	-38.9	.3132+03	.4658+03	-52.0
030200	109	291	-39.1	.3118+03	.4640+03	-52.1
030300	107	291	-39.2	.3104+03	.4623+03	-52.2
030400	108	291	-39.4	.3091+03	.4605+03	-52.3
030500	109	292	-39.5	.3077+03	.4587+03	-52.4
030600	108	294	-39.6	.3063+03	.4570+03	-52.6
030700	112	293	-39.8	.3050+03	.4552+03	-52.7
030800	113	295	-39.9	.3036+03	.4535+03	-52.8
030900	115	294	-40.1	.3023+03	.4517+03	-52.9
031000	117	294	-40.2	.3009+03	.4500+03	-53.0
031100	116	295	-40.4	.2996+03	.4485+03	-53.2
031200	117	294	-40.7	.2983+03	.4470+03	-53.3
031300	117	295	-40.9	.2969+03	.4455+03	-53.5
031400	116	297	-41.2	.2956+03	.4439+03	-53.7
031500	116	296	-41.4	.2943+03	.4424+03	-53.8
031600	118	295	-41.7	.2930+03	.4409+03	-54.0
031700	121	294	-41.9	.2917+03	.4394+03	-54.2
031800	120	294	-42.2	.2904+03	.4380+03	-54.4
031900	119	294	-42.4	.2891+03	.4365+03	-54.5
032000	121	294	-42.7	.2878+03	.4350+03	-54.7
032100	120	295	-42.9	.2865+03	.4334+03	-54.9
032200	123	293	-43.1	.2852+03	.4318+03	-55.1
032300	121	293	-43.3	.2839+03	.4303+03	-55.2
032400	122	292	-43.5	.2826+03	.4287+03	-55.4
032500	123	291	-43.7	.2813+03	.4271+03	-55.6
032600	122	291	-43.9	.2801+03	.4256+03	-55.8
032700	121	291	-44.1	.2788+03	.4240+03	-56.0
032800	120	292	-44.3	.2776+03	.4225+03	-56.1
032900	119	290	-44.5	.2763+03	.4210+03	-56.3
033000	121	290	-44.7	.2751+03	.4194+03	-56.5
033100	122	290	-44.8	.2738+03	.4178+03	-56.6
033200	122	290	-45.0	.2726+03	.4161+03	-56.8
033300	123	289	-45.1	.2713+03	.4145+03	-56.9
033400	123	290	-45.3	.2701+03	.4129+03	-57.0
033500	127	287	-45.4	.2689+03	.4113+03	-57.1
033600	128	287	-45.5	.2677+03	.4096+03	-57.3
033700	130	286	-45.7	.2664+03	.4080+03	-57.4
033800	129	287	-45.8	.2652+03	.4064+03	-57.5
033900	130	287	-46.0	.2640+03	.4048+03	-57.7
034000	130	287	-46.1	.2628+03	.4033+03	-57.8
034100	133	287	-46.3	.2616+03	.4018+03	-57.9
034200	136	286	-46.6	.2604+03	.4004+03	-58.1
034300	139	285	-46.8	.2592+03	.3990+03	-58.2
034400	139	285	-47.1	.2581+03	.3976+03	-58.4
034500	139	285	-47.3	.2569+03	.3962+03	-58.5
034600	141	285	-47.5	.2557+03	.3948+03	-58.7
034700	141	285	-47.8	.2545+03	.3934+03	-58.8
034800	141	286	-48.0	.2534+03	.3920+03	-59.0
034900	143	285	-48.3	.2522+03	.3907+03	-59.1

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
035000	142	285	-48.5	.2510+03	.3893+03	-59.3
035100	143	285	-48.7	.2499+03	.3878+03	-59.5
035200	141	285	-48.8	.2487+03	.3863+03	-59.7
035300	143	285	-49.0	.2476+03	.3848+03	-59.9
035400	145	285	-49.2	.2464+03	.3833+03	-60.1
035500	147	285	-49.3	.2453+03	.3818+03	-60.2
035600	153	285	-49.5	.2442+03	.3804+03	-60.4
035700	153	285	-49.7	.2431+03	.3789+03	-60.6
035800	153	285	-49.9	.2419+03	.3774+03	-60.8
035900	157	284	-50.0	.2408+03	.3760+03	-61.0
036000	157	285	-50.2	.2397+03	.3745+03	-61.2
036100	156	286	-50.3	.2386+03	.3730+03	-61.3
036200	154	287	-50.4	.2375+03	.3715+03	-61.4
036300	158	286	-50.6	.2364+03	.3699+03	-61.5
036400	156	285	-50.7	.2353+03	.3684+03	-61.6
036500	154	286	-50.8	.2342+03	.3669+03	-61.7
036600	153	287	-50.9	.2331+03	.3654+03	-61.8
036700	152	287	-51.0	.2320+03	.3639+03	-61.9
036800	154	286	-51.2	.2309+03	.3624+03	-62.0
036900	153	284	-51.3	.2299+03	.3609+03	-62.1
037000	152	285	-51.4	.2288+03	.3594+03	-62.2
037100	151	286	-51.5	.2277+03	.3580+03	-62.3
037200	149	286	-51.7	.2267+03	.3565+03	-62.4
037300	147	287	-51.8	.2256+03	.3551+03	-62.5
037400	147	287	-52.0	.2245+03	.3536+03	-62.6
037500	147	286	-52.1	.2235+03	.3522+03	-62.6
037600	143	287	-52.2	.2224+03	.3508+03	-62.7
037700	144	286	-52.4	.2214+03	.3494+03	-62.8
037800	142	287	-52.5	.2204+03	.3480+03	-62.9
037900	143	286	-52.7	.2193+03	.3466+03	-63.0
038000	143	287	-52.8	.2183+03	.3452+03	-63.1
038100	143	286	-53.0	.2173+03	.3438+03	-63.2
038200	141	285	-53.1	.2163+03	.3424+03	-63.3
038300	140	285	-53.3	.2153+03	.3410+03	-63.4
038400	140	284	-53.4	.2142+03	.3397+03	-63.5
038500	139	283	-53.6	.2132+03	.3383+03	-63.7
038600	139	283	-53.8	.2122+03	.3370+03	-63.8
038700	138	282	-53.9	.2112+03	.3356+03	-63.9
038800	138	281	-54.1	.2102+03	.3343+03	-64.0
038900	138	281	-54.2	.2092+03	.3330+03	-64.1
039000	141	279	-54.4	.2083+03	.3317+03	-64.2
039100	141	279	-54.5	.2073+03	.3303+03	-64.4
039200	139	280	-54.7	.2063+03	.3290+03	-64.5
039300	136	280	-54.8	.2053+03	.3276+03	-64.7
039400	136	279	-55.0	.2043+03	.3263+03	-64.8
039500	134	280	-55.1	.2034+03	.3250+03	-65.0
039600	133	280	-55.3	.2024+03	.3237+03	-65.2
039700	131	280	-55.4	.2015+03	.3224+03	-65.3
039800	131	280	-55.6	.2005+03	.3211+03	-65.5
039900	131	279	-55.7	.1996+03	.3198+03	-65.6

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
040000	129	279	-55.9	.1986+03	.3185+03	-65.8
040100	129	277	-56.0	.1977+03	.3171+03	-65.9
040200	130	278	-56.1	.1967+03	.3157+03	-66.0
040300	129	278	-56.2	.1958+03	.3143+03	-66.1
040400	132	278	-56.3	.1949+03	.3130+03	-66.2
040500	131	278	-56.3	.1939+03	.3116+03	-66.3
040600	131	278	-56.4	.1930+03	.3103+03	-66.5
040700	131	277	-56.5	.1921+03	.3089+03	-66.6
040800	129	277	-56.6	.1912+03	.3076+03	-66.7
040900	130	275	-56.7	.1903+03	.3062+03	-66.8
041000	131	274	-56.8	.1893+03	.3049+03	-66.9
041100	129	273	-56.9	.1884+03	.3035+03	-67.0
041200	128	273	-56.9	.1875+03	.3022+03	-67.1
041300	129	271	-57.0	.1866+03	.3008+03	-67.1
041400	127	271	-57.1	.1858+03	.2995+03	-67.2
041500	128	270	-57.1	.1849+03	.2982+03	-67.3
041600	129	271	-57.2	.1840+03	.2968+03	-67.4
041700	132	272	-57.3	.1831+03	.2955+03	-67.5
041800	133	274	-57.4	.1822+03	.2942+03	-67.5
041900	135	274	-57.4	.1814+03	.2929+03	-67.6
042000	134	274	-57.5	.1805+03	.2916+03	-67.7
042100	137	274	-57.5	.1796+03	.2902+03	-67.8
042200	138	274	-57.6	.1788+03	.2889+03	-67.8
042300	139	275	-57.6	.1779+03	.2876+03	-67.9
042400	140	275	-57.7	.1771+03	.2863+03	-67.9
042500	141	275	-57.7	.1762+03	.2850+03	-68.0
042600	139	276	-57.8	.1754+03	.2837+03	-68.1
042700	138	277	-57.8	.1745+03	.2824+03	-68.1
042800	138	278	-57.9	.1737+03	.2811+03	-68.2
042900	137	278	-57.9	.1728+03	.2798+03	-68.2
043000	135	278	-58.0	.1720+03	.2785+03	-68.3
043100	135	277	-58.1	.1712+03	.2773+03	-68.3
043200	133	279	-58.1	.1704+03	.2760+03	-68.4
043300	132	279	-58.2	.1696+03	.2748+03	-68.4
043400	130	279	-58.3	.1687+03	.2736+03	-68.4
043500	129	278	-58.3	.1679+03	.2723+03	-68.4
043600	126	277	-58.4	.1671+03	.2711+03	-68.5
043700	126	275	-58.5	.1663+03	.2699+03	-68.5
043800	122	276	-58.6	.1655+03	.2687+03	-68.5
043900	120	277	-58.6	.1647+03	.2675+03	-68.6
044000	119	274	-58.7	.1639+03	.2663+03	-68.6
044100	116	277	-58.8	.1631+03	.2651+03	-9999.
044200	116	278	-58.9	.1624+03	.2640+03	-9999.
044300	114	278	-59.0	.1616+03	.2628+03	-9999.
044400	113	279	-59.1	.1608+03	.2616+03	-9999.
044500	114	277	-59.1	.1600+03	.2605+03	-9999.
044600	115	274	-59.2	.1592+03	.2593+03	-9999.
044700	110	275	-59.3	.1585+03	.2582+03	-9999.
044800	110	271	-59.4	.1577+03	.2571+03	-9999.
044900	108	271	-59.5	.1569+03	.2559+03	-9999.

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
045000	107	271	-59.6	.1562+03	.2548+03	-9999.
045100	108	270	-59.7	.1554+03	.2536+03	-9999.
045200	107	269	-59.7	.1547+03	.2525+03	-9999.
045300	107	268	-59.8	.1539+03	.2513+03	-9999.
045400	108	267	-59.8	.1532+03	.2502+03	-9999.
045500	109	266	-59.9	.1525+03	.2490+03	-9999.
045600	107	266	-60.0	.1517+03	.2479+03	-9999.
045700	108	265	-60.0	.1510+03	.2468+03	-9999.
045800	109	264	-60.1	.1502+03	.2457+03	-9999.
045900	112	262	-60.1	.1495+03	.2445+03	-9999.
046000	113	264	-60.2	.1488+03	.2434+03	-9999.
046100	112	265	-60.2	.1481+03	.2423+03	-9999.
046200	115	264	-60.3	.1474+03	.2412+03	-9999.
046300	116	263	-60.3	.1466+03	.2401+03	-9999.
046400	115	264	-60.4	.1459+03	.2390+03	-9999.
046500	118	262	-60.4	.1452+03	.2379+03	-9999.
046600	117	264	-60.5	.1445+03	.2368+03	-9999.
046700	121	262	-60.5	.1438+03	.2357+03	-9999.
046800	122	264	-60.6	.1431+03	.2346+03	-9999.
046900	123	261	-60.6	.1424+03	.2335+03	-9999.
047000	121	263	-60.7	.1417+03	.2324+03	-9999.
047100	120	264	-60.9	.1410+03	.2315+03	-9999.
047200	117	265	-61.1	.1404+03	.2306+03	-9999.
047300	118	264	-61.3	.1397+03	.2297+03	-9999.
047400	117	265	-61.5	.1390+03	.2288+03	-9999.
047500	116	266	-61.7	.1383+03	.2279+03	-9999.
047600	116	267	-61.9	.1376+03	.2270+03	-9999.
047700	116	268	-62.1	.1370+03	.2261+03	-9999.
047800	118	267	-62.3	.1363+03	.2252+03	-9999.
047900	121	265	-62.5	.1356+03	.2243+03	-9999.
048000	120	266	-62.7	.1350+03	.2234+03	-9999.
048100	119	267	-62.7	.1343+03	.2223+03	-9999.
048200	118	268	-62.7	.1336+03	.2213+03	-9999.
048300	116	270	-62.8	.1330+03	.2202+03	-9999.
048400	115	268	-62.8	.1323+03	.2192+03	-9999.
048500	115	267	-62.8	.1317+03	.2181+03	-9999.
048600	113	268	-62.8	.1310+03	.2170+03	-9999.
048700	113	268	-62.8	.1304+03	.2160+03	-9999.
048800	115	267	-62.9	.1298+03	.2150+03	-9999.
048900	115	266	-62.9	.1291+03	.2139+03	-9999.
049000	114	265	-62.9	.1285+03	.2129+03	-9999.
049100	114	266	-62.9	.1279+03	.2119+03	-9999.
049200	116	265	-62.9	.1272+03	.2108+03	-9999.
049300	114	264	-62.9	.1266+03	.2098+03	-9999.
049400	113	265	-62.9	.1260+03	.2088+03	-9999.
049500	112	265	-62.9	.1254+03	.2078+03	-9999.
049600	111	264	-63.0	.1248+03	.2068+03	-9999.
049700	111	263	-63.0	.1241+03	.2058+03	-9999.
049800	112	263	-63.0	.1235+03	.2048+03	-9999.
049900	112	262	-63.0	.1229+03	.2038+03	-9999.

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
050000	113	260	-63.0	.1223+03	.2028+03	-9999.
050100	115	259	-63.0	.1217+03	.2018+03	-9999.
050200	114	260	-63.0	.1211+03	.2008+03	-9999.
050300	111	261	-63.0	.1205+03	.1998+03	-9999.
050400	112	261	-63.0	.1199+03	.1989+03	-9999.
050500	112	261	-63.0	.1193+03	.1979+03	-9999.
050600	111	263	-63.1	.1188+03	.1969+03	-9999.
050700	112	263	-63.1	.1182+03	.1960+03	-9999.
050800	111	264	-63.1	.1176+03	.1950+03	-9999.
050900	110	265	-63.1	.1170+03	.1941+03	-9999.
051000	107	264	-63.1	.1164+03	.1931+03	-9999.
051100	103	266	-63.1	.1159+03	.1922+03	-9999.
051200	101	267	-63.2	.1153+03	.1913+03	-9999.
051300	100	267	-63.2	.1147+03	.1904+03	-9999.
051400	101	268	-63.3	.1142+03	.1895+03	-9999.
051500	102	270	-63.3	.1136+03	.1886+03	-9999.
051600	101	271	-63.3	.1130+03	.1877+03	-9999.
051700	096	270	-63.4	.1125+03	.1868+03	-9999.
051800	091	270	-63.4	.1119+03	.1859+03	-9999.
051900	087	269	-63.5	.1114+03	.1851+03	-9999.
052000	084	268	-63.5	.1108+03	.1842+03	-9999.
052100	085	265	-63.6	.1103+03	.1834+03	-9999.
052200	083	265	-63.7	.1098+03	.1825+03	-9999.
052300	081	265	-63.8	.1092+03	.1817+03	-9999.
052400	082	261	-63.9	.1087+03	.1809+03	-9999.
052500	083	259	-63.9	.1081+03	.1801+03	-9999.
052600	084	257	-64.0	.1076+03	.1793+03	-9999.
052700	084	255	-64.1	.1071+03	.1785+03	-9999.
052800	084	253	-64.2	.1065+03	.1777+03	-9999.
052900	085	255	-64.3	.1060+03	.1769+03	-9999.
053000	087	253	-64.4	.1055+03	.1761+03	-9999.
053100	086	255	-64.4	.1050+03	.1752+03	-9999.
053200	088	253	-64.4	.1045+03	.1743+03	-9999.
053300	089	254	-64.3	.1039+03	.1734+03	-9999.
053400	090	254	-64.3	.1034+03	.1725+03	-9999.
053500	092	255	-64.3	.1029+03	.1717+03	-9999.
053600	093	255	-64.3	.1024+03	.1708+03	-9999.
053700	095	256	-64.3	.1019+03	.1700+03	-9999.
053800	094	258	-64.2	.1014+03	.1691+03	-9999.
053900	093	260	-64.2	.1009+03	.1683+03	-9999.
054000	089	262	-64.2	.1004+03	.1674+03	-9999.
054100	084	265	-64.2	.9991+02	.1666+03	-9999.
054200	081	265	-64.3	.9942+02	.1658+03	-9999.
054300	077	266	-64.3	.9893+02	.1650+03	-9999.
054400	073	268	-64.3	.9844+02	.1642+03	-9999.
054500	070	269	-64.3	.9795+02	.1634+03	-9999.
054600	067	269	-64.4	.9747+02	.1626+03	-9999.
054700	065	269	-64.4	.9699+02	.1619+03	-9999.
054800	063	270	-64.4	.9651+02	.1611+03	-9999.
054900	060	271	-64.5	.9603+02	.1603+03	-9999.

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
055000	060	267	-64.5	.9556+02	.1595+03	-9999.
055100	059	266	-64.6	.9509+02	.1589+03	-9999.
055200	056	268	-64.8	.9461+02	.1582+03	-9999.
055300	056	264	-64.9	.9414+02	.1575+03	-9999.
055400	055	263	-65.1	.9368+02	.1568+03	-9999.
055500	054	263	-65.2	.9321+02	.1562+03	-9999.
055600	055	262	-65.3	.9275+02	.1555+03	-9999.
055700	054	261	-65.5	.9229+02	.1548+03	-9999.
055800	053	261	-65.6	.9183+02	.1541+03	-9999.
055900	053	263	-65.8	.9137+02	.1535+03	-9999.
056000	053	263	-65.9	.9092+02	.1528+03	-9999.
057000	043	259	-66.8	.8649+02	.1460+03	-9999.
058000	037	258	-67.9	.8225+02	.1396+03	-9999.
059000	034	257	-66.7	.7823+02	.1320+03	-9999.
060000	033	257	-63.7	.7443+02	.1238+03	-9999.
061000	032	255	-64.1	.7085+02	.1181+03	-9999.
062000	030	254	-62.5	.6744+02	.1115+03	-9999.
063000	028	256	-60.6	.6424+02	.1052+03	-9999.
064000	025	258	-59.7	.6120+02	.9988+02	-9999.
065000	021	257	-60.0	.5830+02	.9528+02	-9999.
066000	017	252	-60.1	.5555+02	.9083+02	-9999.
067000	014	246	-60.2	.5292+02	.8657+02	-9999.
068000	011	243	-58.6	.5042+02	.8187+02	-9999.
069000	006	249	-56.9	.4806+02	.7742+02	-9999.
070000	004	303	-56.1	.4583+02	.7356+02	-9999.
071000	004	334	-56.6	.4369+02	.7028+02	-9999.
072000	004	035	-57.2	.4166+02	.6721+02	-9999.
073000	007	077	-57.7	.3971+02	.6421+02	-9999.
074000	010	094	-57.9	.3786+02	.6127+02	-9999.
075000	011	106	-55.5	.3609+02	.5777+02	-9999.
076000	009	122	-54.2	.3443+02	.5478+02	-9999.
077000	007	149	-53.3	.3285+02	.5205+02	-9999.
078000	006	179	-52.3	.3135+02	.4945+02	-9999.
079000	001	193	-53.0	.2991+02	.4733+02	-9999.
080000	007	205	-53.7	.2854+02	.4531+02	-9999.
081000	007	223	-53.6	.2723+02	.4321+02	-9999.
082000	007	247	-53.6	.2598+02	.4122+02	-9999.
083000	009	255	-53.9	.2479+02	.3939+02	-9999.
084000	011	259	-53.9	.2365+02	.3758+02	-9999.
085000	014	258	-53.3	.2257+02	.3576+02	-9999.
086000	019	260	-53.5	.2153+02	.3415+02	-9999.
087000	025	260	-53.5	.2054+02	.3258+02	-9999.
088000	030	260	-53.0	.1960+02	.3102+02	-9999.
089000	035	260	-52.4	.1871+02	.2953+02	-9999.
090000	040	260	-52.3	.1779+02	.2806+02	-9999.
091000	045	259	-52.2	.1691+02	.2667+02	-9999.
092000	050	259	-52.2	.1608+02	.2535+02	-9999.
093000	055	259	-52.1	.1529+02	.2409+02	-9999.
094000	060	259	-52.0	.1454+02	.2290+02	-9999.
095000	067	258	-52.1	.1382+02	.2178+02	-9999.

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
096000	072	258	-52.2	.1314+02	.2072+02	-9999.
097000	079	258	-52.3	.1249+02	.1970+02	-9999.
098000	084	258	-52.4	.1188+02	.1875+02	-9999.
099000	089	258	-52.5	.1129+02	.1783+02	-9999.
100000	087	267	-52.3	.1079+02	.1702+02	-9999.
101000	082	260	-52.2	.1029+02	.1623+02	-9999.
102000	097	256	-52.3	.9830+01	.1548+02	-9999.
103000	106	261	-51.8	.9409+01	.1481+02	-9999.
104000	113	265	-51.7	.8965+01	.1410+02	-9999.
105000	116	261	-51.5	.8542+01	.1343+02	-9999.
106000	118	264	-50.2	.8163+01	.1275+02	-9999.
107000	10	259	-48.9	.7816+01	.1214+02	-9999.
108000	119	259	-47.6	.7457+01	.1152+02	-9999.
109000	133	266	-46.3	.7117+01	.1093+02	-9999.
110000	135	268	-45.0	.6800+01	.1038+02	-9999.
111000	121	264	-43.7	.6492+01	.9856+01	-9999.
112000	130	264	-42.4	.6203+01	.9364+01	-9999.
113000	140	264	-41.1	.5937+01	.8913+01	-9999.
114000	146	260	-39.8	.5683+01	.8485+01	-9999.
115000	158	264	-38.5	.5448+01	.8089+01	-9999.
116000	162	264	-37.2	.5213+01	.7697+01	-9999.
117000	157	265	-35.9	.4986+01	.7322+01	-9999.
118000	165	265	-34.6	.4774+01	.6972+01	-9999.
119000	172	264	-33.3	.4580+01	.6651+01	-9999.
120000	182	266	-32.0	.4392+01	.6344+01	-9999.
121000	179	266	-31.9	.4208+01	.6075+01	-9999.
122000	185	267	-31.7	.4026+01	.5810+01	-9999.
123000	199	271	-31.8	.3862+01	.5569+01	-9999.
124000	197	271	-31.4	.3706+01	.5340+01	-9999.
125000	185	269	-31.3	.3550+01	.5113+01	-9999.
126000	179	269	-31.1	.3403+01	.4898+01	-9999.
127000	175	263	-31.0	.3264+01	.4696+01	-9999.
128000	182	258	-30.9	.3129+01	.4499+01	-9999.
129000	197	255	-30.7	.3001+01	.4312+01	-9999.
130000	216	255	-30.6	.2878+01	.4134+01	-9999.
131000	224	257	-30.4	.2760+01	.3961+01	-9999.
132000	222	256	-30.3	.2644+01	.3792+01	-9999.
133000	229	253	-30.1	.2532+01	.3629+01	-9999.
134000	241	252	-30.0	.2427+01	.3477+01	-9999.
135000	239	254	-29.0	.2326+01	.3319+01	-9999.
136000	248	254	-28.0	.2229+01	.3167+01	-9999.
137000	249	254	-27.0	.2140+01	.3028+01	-9999.
138000	244	253	-26.0	.2053+01	.2894+01	-9999.
139000	238	254	-25.0	.1964+01	.2764+01	-9999.
140000	234	257	-24.0	.1880+01	.2640+01	-9999.
141000	229	258	-23.0	.1801+01	.2523+01	-9999.
142000	236	256	-22.0	.1726+01	.2410+01	-9999.
143000	248	253	-20.6	.1666+01	.2301+01	-9999.
144000	253	252	-19.1	.1604+01	.2199+01	-9999.
145000	243	253	-17.7	.1542+01	.2102+01	-9999.

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
146000	231	253	-16.2	.1481+01	.2008+01	-9999.
147000	228	251	-14.8	.1423+01	.1919+01	-9999.
148000	238	247	-13.3	.1370+01	.1837+01	-9999.
149000	253	246	-11.9	.1318+01	.1757+01	-9999.
150000	270	247	-10.4	.1266+01	.1679+01	-9999.
151000	282	248	-9.0	.1217+01	.1605+01	-9999.
152000	287	249	-9.1	.1172+01	.1547+01	-9999.
153000	280	250	-9.2	.1129+01	.1490+01	-9999.
154000	265	250	-9.4	.1085+01	.1434+01	-9999.
155000	253	249	-9.5	.1043+01	.1379+01	-9999.
156000	248	249	-9.6	.1003+01	.1326+01	-9999.
157000	255	248	-9.7	.9643+00	.1275+01	-9999.
158000	265	248	-9.9	.9278+00	.1228+01	-9999.
159000	271	248	-10.0	.8934+00	.1183+01	-9999.
160000	275	248	-10.6	.8597+00	.1141+01	-9999.
161000	278	246	-11.2	.8269+00	.1099+01	-9999.
162000	283	245	-11.7	.7937+00	.1058+01	-9999.
163000	290	244	-12.3	.7622+00	.1018+01	-9999.
164000	292	244	-12.9	.7328+00	.9809+00	-9999.
165000	288	245	-13.5	.7053+00	.9462+00	-9999.
166000	283	245	-14.0	.6787+00	.9125+00	-9999.
167000	275	246	-14.6	.6528+00	.8796+00	-9999.
168000	266	247	-15.2	.6276+00	.8476+00	-9999.
169000	261	247	-16.2	.6032+00	.8176+00	-9999.
170000	260	247	-16.2	.5797+00	.7858+00	-9999.
171000	263	247	-16.2	.5571+00	.7552+00	-9999.
172000	271	247	-17.5	.5354+00	.7295+00	-9999.
173000	280	247	-20.3	.5144+00	.7087+00	-9999.
174000	290	248	-22.2	.4939+00	.6655+00	-9999.
175000	298	249	-22.2	.4742+00	.6582+00	-9999.
176000	305	250	-20.2	.4555+00	.6272+00	-9999.
177000	309	251	-19.4	.4375+00	.6006+00	-9999.
178000	309	251	-18.2	.4203+00	.5742+00	-9999.
179000	307	252	-21.2	.4037+00	.5581+00	-9999.
180000	302	252	-25.1	.3876+00	.5444+00	9999.
181000	300	252	-28.9	.3719+00	.5304+00	-9999.
182000	298	252	-31.2	.3566+00	.5133+00	-9999.
183000	300	252	-32.2	.3419+00	.4942+00	-9999.
184000	305	252	-32.2	.3278+00	.4738+00	-9999.
185000	310	252	-31.2	.3142+00	.4523+00	-9999.
186000	317	252	-28.7	.3014+00	.4295+00	-9999.
187000	322	253	-27.2	.2891+00	.4094+00	-9999.
188000	327	253	-28.1	.2771+00	.3944+00	-9999.
189000	331	254	-29.1	.2660+00	.3797+00	-9999.
190000	334	255	-28.2	.2552+00	.3629+00	-9999.
191000	337	256	-28.2	.2448+00	.3481+00	-9999.
192000	339	257	-28.2	.2349+00	.3340+00	-9999.
193000	344	259	-28.2	.2253+00	.3204+00	-9999.
194000	347	260	-27.5	.2162+00	.3066+00	-9999.
195000	351	262	-24.6	.2075+00	.2908+00	-9999.

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
196000	356	264	-20.7	.1992+00	.2749+00	-9999.
197000	359	266	-17.7	.1917+00	.2614+00	-9999.
198000	363	267	-15.4	.1853+00	.2504+00	-9999.
199000	364	26	-16.4	.1781+00	.2417+00	-9999.
200000	364	270	-18.0	.1711+00	.2336+00	-9999.
201000	364	271	-19.2	.1644+00	.2255 00	-9999.
202000	363	272	-20.0	.1579+00	.2173+00	-9999.
203000	359	272	-21.9	.1517+00	.2104+00	-9999.
204000	354	272	-22.2	1456+00	.2021+00	-9999.
205000	349	272	-23.2	.1398+00	.1948+00	-9999.
206000	344	272	-24.1	.1342+00	.1877+00	-9999.
207000	339	271	-25.6	.1289+00	.1814+00	-9999.
208000	332	270	-27.1	.1237+00	.1752+00	-9999.
209000	325	269	-27.7	.1187+00	.1685+00	-9999.
210000	319	267	-28.2	.1138+00	.1618+00	-9999.
211000	310	264	-27.6	.1092+00	.1549+00	-9999.
212000	304	261	-27.1	.1048+00	.1484+00	-9999.
213000	297	258	-26.2	.1005+00	.1417+00	-9999.
214000	292	255	-25.2	.9650-01	.1356+00	-9999.
215000	288	251	-24.2	.9260-01	.1296+00	-9999.
216000	285	247	-24.2	.8890-01	.1244+00	-9999.
217000	283	243	-24.2	.8540-01	.1195+00	-9999.
218000	282	240	-24.9	.8200-01	.1151+00	-9999.
219000	282	237	-24.9	.7870-01	.1104+00	-9999.
220000	280	234	-25.4	.7550-01	.1062+00	-9999.
221000	280	233	-27.8	.7230-01	.1026+00	-9999.
222000	278	232	-29.7	.6930-01	.9915-01	-9999.
223000	276	231	-32.9	.6650-01	.9641-01	-9999.
224000	273	231	-33.9	.6380-01	.9290-01	-9999.
225000	270	232	-35.1	.6130-01	.8969-01	-9999.
226000	265	233	-35.2	.5890-01	.8621-01	-9999.
227000	260	234	-36.2	.5650-01	.8305-01	-9999.
228000	253	236	-38.2	.5410-01	.8020-01	-9999.
229000	246	237	-41.1	.5170-01	.7763-01	-9999.
230000	239	239	-42.7	.4940-01	.7467-01	-9999.
231000	233	242	-45.2	.4720-01	.7214-01	-9999.
232000	228	244	-46.7	.4510-01	.6939-01	-9999.
233000	221	247	-49.3	.4310-01	.6704-01	-9999.
234000	216	249	-52.4	.4120-01	.6501-01	-9999.
235000	211	251	-54.4	.3930-01	.6260-01	-9999.
236000	206	253	-57.5	.3750-01	.6057-01	-9999.
237000	202	255	-59.5	.3580-01	.5838-01	-9999.
238000	199	256	-61.9	.3410-01	.5622-01	-9999.
239000	194	258	-64.6	.3250-01	.5429-01	-9999.
240000	190	259	-67.7	.3090-01	.5239-01	-9999.
241000	187	259	-69.4	.2940-01	.5027-01	-9999.
242000	185	260	-71.8	.2800-01	.4844-01	-9999.
243000	182	260	-74.0	.2660-01	.4652-01	-9999.
244000	180	260	-76.0	.2530-01	.4471-01	-9999.
245000	179	261	-77.5	.2400-01	.4274-01	-9999.

TABLE 4. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
246000	175	261	-78.2	.2280-01	.4073-01	-9999.
247000	175	260	-80.0	.2160-01	.3896-01	-9999.
248000	172	260	-81.2	.2050-01	.3720-01	-9999.
249000	170	260	-82.6	.1940-01	.3547-01	-9999.
250000	170	259	-83.2	.1840-01	.3374-01	-9999.
251000	168	259	-83.2	.1750-01	.3209-01	-9999.
252000	167	258	-83.2	.1660-01	.3044-01	-9999.
253000	160	257	-82.6	.1590-01	.2915-01	-9999.
254000	152	257	-82.0	.1522-01	.2791-01	-9999.
255000	145	256	-81.4	.1458-01	.2673-01	-9999.
256000	138	256	-80.8	.1396-01	.2560-01	-9999.
257000	130	256	-80.2	.1337-01	.2452-01	-9999.
258000	123	255	-79.7	.1281-01	.2348-01	-9999.
259000	116	254	-79.1	.1226-01	.2249-01	-9999.
260000	108	254	-78.5	.1175-01	.2153-01	-9999.
261000	101	253	-77.9	.1125-01	.2062-01	-9999.
262000	094	252	-77.3	.1077-01	.1975-01	-9999.
263000	086	251	-76.8	.1032-01	.1891-01	-9999.
264000	079	250	-76.2	.9879-02	.1811-01	-9999.
265000	072	248	-75.6	.9461-02	.1735-01	-9999.
266000	065	247	-75.0	.9061-02	.1661-01	-9999.
267000	058	244	-74.4	.8677-02	.1591-01	-9999.
268000	051	241	-73.9	.8310-02	.1524-01	-9999.
271000	049	245	-74.4	.7130-02	.1250-01	-9999.
274000	046	249	-75.0	.6120-02	.1080-01	-9999.
277000	044	252	-75.5	.5250-02	.9250-02	-9999.
280000	038	256	-76.1	.4500-02	.7950-02	-9999.
283000	027	259	-76.7	.3860-02	.6840-02	-9999.
286000	016	265	-77.3	.3300-02	.5880-02	-9999.
289000	006	295	-77.9	.2830-02	.5060-02	-9999.
292000	008	034	-78.5	.2430-02	.4350-02	-9999.
295000	018	054	-79.1	.2080-02	.3750-02	-9999.
298000	028	289	-78.5	.1690-02	.3020-02	-9999.
301000	074	275	-77.3	.1450-02	.2570-02	-9999.
304000	117	272	-76.2	.1240-02	.2180-02	-9999.
307000	150	271	-75.0	.1060-02	.1850-02	-9999.
310000	164	270	-73.8	.9050-03	.1570-02	-9999.
313000	159	269	-72.2	.7770-03	.1330-02	-9999.
316000	158	269	-69.9	.6690-03	.1130-02	-9999.
319000	152	269	-67.7	.5760-03	.9600-03	-9999.
322000	137	269	-65.5	.4970-03	.8150-03	-9999.
325000	114	269	-63.3	.4280-03	.6920-03	-9999.
328000	077	269	-61.1	.3680-03	.5880-03	-9999.
331000	071	269	-57.4	.3190-03	.4990-03	-9999.
334000	062	268	-53.7	.2760-03	.4240-03	-9999.
337000	047	267	-49.9	.2390-03	.3590-03	-9999.
340000	025	262	-46.2	.2070-03	.3050-03	-9999.
343000	007	125	-42.5	.1790-03	.2590-03	-9999.
346000	027	096	-37.5	.1560-03	.2200-03	-9999.
349000	030	098	-31.2	.1370-03	.1890-03	-9999.

TABLE 4. (Concluded)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
352000	033	100	-24.5	.1210-03	.1610-03	-9999.
355000	037	102	-18.6	.1060-03	.1380-03	-9999.
358000	041	104	-12.4	.9300-04	.1180-03	-9999.
361000	043	099	-6.0	.8170-04	.1010-03	-9999.
364000	045	101	3.3	.7360-04	.8780-04	-9999.
367000	047	105	12.6	.6660-04	.7640-04	-9999.
370000	049	108	21.8	.6000-04	.6650-04	-9999.
373000	050	113	31.1	.5400-04	.5790-04	-9999.
376000	051	119	40.4	.4860-04	.5040-04	-9999.
379000	045	109	50.7	.4410-04	.4430-04	-9999.
382000	043	112	62.0	.4050-04	.3920-04	-9999.
385000	042	116	73.8	.3730-04	.3480-04	-9999.
388000	041	120	85.9	.3450-04	.3100-04	-9999.
391000	040	124	98.3	.3200-04	.2770-04	-9999.
394000	039	129	111.0	.2970-04	.2480-04	-9999.
397000	038	134	123.9	.2770-04	.2230-04	-9999.
400000	038	139	137.1	.2590-04	.2020-04	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.

TABLE 5. STS-2 FINAL SRB DESCENT METEOROLOGICAL DATA TAPE

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
000060	034	325	21.0	.1012+04	.1189+04	17.8
001000	028	006	20.4	.9780+03	.1152+04	16.9
002000	025	352	19.6	.9443+03	.1115+04	16.4
003000	026	343	16.5	.9114+03	.1088+04	16.2
004000	026	334	14.1	.8794+03	.1061+04	10.4
005000	030	331	12.6	.8482+03	.1029+04	8.4
006000	037	329	11.9	.8180+03	.9987+03	-13.2
007000	035	325	11.7	.7888+03	.9640+03	-18.1
008000	042	322	9.8	.7605+03	.9356+03	-18.7
009000	050	323	8.1	.7330+03	.9074+03	-22.0
010000	050	321	6.8	.7064+03	.8786+03	-24.1
011000	050	312	5.9	.6806+03	.8493+03	-24.4
012000	054	309	4.6	.6557+03	.8221+03	-24.6
013000	059	312	2.7	.6316+03	.7973+03	-24.7
014000	061	310	.8	.6082+03	.7731+03	-27.6
015000	062	309	-.9	.5855+03	.7490+03	-29.9
016000	064	308	-2.6	.5636+03	.7255+03	-31.6
017000	066	309	-4.4	.5423+03	.7028+03	-32.8
018000	067	308	-6.9	.5217+03	.6824+03	-34.9
019000	064	305	-9.2	.5017+03	.6620+03	-37.0
020000	062	304	-12.0	.4822+03	.6432+03	-39.4
021000	063	303	-14.4	.4634+03	.6238+03	-40.3
022000	060	301	-16.4	.4451+03	.6039+03	-42.3
023000	053	301	-18.5	.4274+03	.5847+03	-43.9
024000	075	305	-20.9	.4103+03	.5666+03	-45.6
025000	089	306	-22.9	.3937+03	.5480+03	-46.7
026000	095	304	-24.8	.3777+03	.5297+03	-47.6
027000	096	300	-27.7	.3621+03	.5140+03	-49.4
028000	088	287	-29.3	.3471+03	.4959+03	-50.7
029000	084	276	-31.4	.3326+03	.4793+03	-52.8
030000	085	280	-34.5	.3186+03	.4650+03	-55.4
031000	100	299	-36.6	.3050+03	.4491+03	-55.8
032000	111	307	-38.9	.2918+03	.4340+03	-56.2
033000	115	308	-41.1	.2792+03	.4191+03	-56.7
034000	120	308	-42.8	.2669+03	.4037+03	-57.9
035000	124	305	-42.6	.2552+03	.3856+03	-60.6
036000	114	294	-43.5	.2440+03	.3701+03	-61.2
037000	103	281	-44.9	.2332+03	.3559+03	-61.7
038000	098	271	-46.8	.2228+03	.3429+03	-63.2
039000	097	269	-47.8	.2128+03	.3290+03	-64.0
040000	097	271	-48.6	.2032+03	.3153+03	-64.5
041000	099	271	-49.9	.1941+03	.3028+03	-65.4
042000	100	270	-51.3	.1852+03	.2909+03	-66.5
043000	099	264	-52.4	.1768+03	.2790+03	-67.5
044000	100	260	-53.0	.1687+03	.2669+03	-67.9
045000	103	255	-53.5	.1609+03	.2552+03	-68.1
046000	103	252	-54.0	.1535+03	.2440+03	-68.6
047000	098	256	-54.8	.1464+03	.2336+03	-69.3
048000	095	265	-55.5	.1396+03	.2235+03	-70.2
049000	095	269	-56.1	.1331+03	.2137+03	-71.0

TABLE 5. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
050000	090	265	-56.7	.1269+03	.2043+03	-71.3
051000	083	258	-57.3	.1210+03	.1953+03	-71.6
052000	075	250	-57.9	.1153+03	.1867+03	-72.0
053000	067	242	-58.0	.1099+03	.1780+03	-72.1
054000	060	235	-58.1	.1048+03	.1697+03	-72
055000	055	231	-58.9	.9984+02	.1623+03	-73
056000	051	232	-60.0	.9513+02	.1555+03	-9999.
057000	045	241	-60.6	.9062+02	.1485+03	-9999.
058000	039	255	-59.8	.8632+02	.1409+03	-9999.
059000	036	264	-59.3	.8225+02	.1340+03	-9999.
060000	035	271	-58.7	.7837+02	.1273+03	-9999.
061000	033	272	-57.4	.7470+02	.1206+03	-9999.
062000	028	263	-56.7	.7121+02	.1146+03	-9999.
063000	018	238	-55.6	.6790+02	.1087+03	-9999.
064000	015	214	-54.9	.6476+02	.1034+03	-9999.
065000	014	205	-54.1	.6177+02	.9824+02	-9999.
066000	012	206	-53.1	.5893+02	.9329+02	-9999.
067000	009	214	-52.3	.5623+02	.8870+02	-9999.
068000	006	238	-52.1	.5367+02	.8458+02	-9999.
069000	006	264	-52.1	.5122+02	.8072+02	-9999.
070000	006	268	-51.2	.4888+02	.7672+02	-9999.
071000	008	279	-49.7	.4667+02	.7276+02	-9999.
072000	011	289	-48.4	.4457+02	.6908+02	-9999.
073000	012	286	-47.3	.4257+02	.6566+02	-9999.
074000	012	282	-47.2	.4067+02	.6270+02	-9999.
075000	012	282	-46.7	.3886+02	.5978+02	-9999.
076000	014	287	-46.1	.3713+02	.5697+02	-9999.
077000	017	295	-46.2	.3548+02	.5446+02	-9999.
078000	018	299	-46.3	.3390+02	.5206+02	-9999.
079000	017	294	-45.4	.3240+02	.4956+02	-9999.
080000	016	288	-44.7	.3097+02	.4723+02	-9999.
081000	015	283	-43.6	.2960+02	.4492+02	-9999.
082000	014	273	-42.5	.2831+02	.4276+02	-9999.
083000	015	272	-42.1	.2707+02	.4082+02	-9999.
084000	026	288	-41.8	.2589+02	.3898+02	-9999.
085000	047	297	-41.6	.2476+02	.3725+02	-9999.
086000	067	298	-41.2	.2369+02	.3558+02	-9999.
087000	082	298	-40.8	.2266+02	.3397+02	-9999.
088000	089	296	-40.5	.2167+02	.3245+02	-9999.
089000	088	293	-40.7	.2073+02	.3107+02	-9999.
090000	083	286	-40.5	.1984+02	.2971+02	-9999.
091000	080	277	-40.2	.1898+02	.2838+02	-9999.
092000	079	268	-39.4	.1816+02	.2706+02	-9999.
093000	079	262	-38.0	.1738+02	.2575+02	-9999.
094000	079	261	-36.6	.1663+02	.2449+02	-9999.
095000	079	263	-36.4	.1593+02	.2344+02	-9999.
096000	080	269	-36.2	.1525+02	.2242+02	-9999.
097000	082	274	-35.7	.1460+02	.2142+02	-9999.
098000	083	276	-35.0	.1398+02	.2045+02	-9999.
099000	089	258	-35.0	.1326+02	.1940+02	-9999.

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TABLE 5. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
100000	087	267	-34.8	.1258+02	.1839+02	-9999.
101000	082	260	-34.6	.1194+02	.1743+02	-9999.
102000	097	256	-34.4	.1133+02	.1653+02	-9999.
103000	106	261	-34.2	.1075+02	.1567+02	-9999.
104000	113	265	-34.2	.1019+02	.1486+02	-9999.
105000	116	261	-33.9	.9672+01	.1408+02	-9999.
106000	118	264	-33.8	.9176+01	.1336+02	-9999.
107000	109	259	-33.6	.8705+01	.1266+02	-9999.
108000	119	259	-33.4	.8259+01	.1200+02	-9999.
109000	133	266	-33.2	.7836+01	.1138+02	-9999.
110000	135	268	-33.2	.7434+01	.1079+02	-9999.
111000	121	264	-32.9	.7053+01	.1023+02	-9999.
112000	130	264	-32.8	.6691+01	.9698+01	-9999.
113000	140	264	-32.7	.6348+01	.9197+01	-9999.
114000	146	260	-32.6	.6023+01	.8722+01	-9999.
115000	158	264	-32.4	.5714+01	.8268+01	-9999.
116000	162	264	-32.3	.5421+01	.7841+01	-9999.
117000	157	265	-32.2	.5143+01	.7436+01	-9999.
118000	165	265	-32.1	.4879+01	.7052+01	-9999.
119000	172	264	-32.0	.4629+01	.6687+01	-9999.
120000	182	266	-32.0	.4392+01	.6344+01	-9999.
121000	179	266	-31.9	.4208+01	.6075+01	-9999.
122000	185	267	-31.7	.4026+01	.5810+01	-9999.
123000	199	271	-31.6	.3862+01	.5569+01	-9999.
124000	197	271	-31.4	.3706+01	.5340+01	-9999.
125000	185	269	-31.3	.3550+01	.5113+01	-9999.
126000	179	269	-31.1	.3403+01	.4898+01	-9999.
127000	175	263	-31.0	.3264+01	.4696+01	-9999.
128000	182	258	-30.9	.3129+01	.4499+01	-9999.
129000	197	255	-30.7	.3001+01	.4312+01	-9999.
130000	216	255	-30.6	.2878+01	.4134+01	-9999.
131000	224	257	-30.4	.2760+01	.3961+01	-9999.
132000	222	256	-30.3	.2644+01	.3792+01	-9999.
133000	229	253	-30.1	.2532+01	.3629+01	-9999.
134000	241	252	-30.0	.2427+01	.3477+01	-9999.
135000	244	254	-29.0	.2326+01	.3319+01	-9999.
136000	248	254	-28.0	.2229+01	.3167+01	-9999.
137000	249	254	-27.0	.2140+01	.3028+01	-9999.
138000	244	253	-26.0	.2053+01	.2894+01	-9999.
139000	238	254	-25.0	.1969+01	.2764+01	-9999.
140000	234	257	-24.0	.1888+01	.2640+01	-9999.
141000	229	258	-23.0	.1812+01	.2523+01	-9999.
142000	236	256	-22.0	.1738+01	.2410+01	-9999.
143000	248	253	-20.6	.1668+01	.2301+01	-9999.
144000	253	252	-19.1	.1604+01	.2199+01	-9999.
145000	243	253	-17.7	.1542+01	.2102+01	-9999.
146000	231	253	-16.2	.1481+01	.2008+01	-9999.
147000	228	251	-14.8	.1423+01	.1919+01	-9999.
148000	238	247	-13.3	.1370+01	.1837+01	-9999.
149000	253	246	-11.9	.1318+01	.1757+01	-9999.

TABLE 5. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
150000	270	247	-10.4	.1266+01	.1679+01	-9999.
151000	262	248	-9.0	.1217+01	.1605+01	-9999.
152000	287	249	-9.1	.1172+01	.1547+01	-9999.
153000	280	250	-9.2	.1129+01	.1490+01	-9999.
154000	265	250	-9.4	.1086+01	.1434+01	-9999.
155000	253	249	-9.5	.1043+01	.1379+01	-9999.
156000	248	249	-9.6	.1003+01	.1326+01	-9999.
157000	255	248	-9.7	.9643+00	.1275+01	-9999.
158000	265	248	-9.9	.9278+00	.1229+01	-9999.
159000	271	248	-10.0	.8934+00	.1183+01	-9999.
160000	275	248	-10.6	.8597+00	.1141+01	-9999.
161000	278	246	-11.2	.8264+00	.1099+01	-9999.
162000	283	245	-11.7	.7937+00	.1058+01	-9999.
163000	290	244	-12.3	.7622+00	.1018+01	-9999.
164000	292	244	-12.9	.7328+00	.9809+00	-9999.
165000	288	245	-13.5	.7053+00	.9462+00	-9999.
166000	283	245	-14.0	.6787+00	.9125+00	-9999.
167000	275	246	-14.6	.6528+00	.8796+00	-9999.
168000	266	247	-15.2	.6276+00	.8476+00	-9999.
169000	261	247	-16.2	.6032+00	.8176+00	-9999.
170000	260	247	-16.2	.5797+00	.7858+00	-9999.
171000	263	247	-16.2	.5571+00	.7552+00	-9999.
172000	271	247	-17.5	.5354+00	.7295+00	-9999.
173000	280	247	-20.3	.5144+00	.7087+00	-9999.
174000	290	248	-22.2	.4939+00	.6855+00	-9999.
175000	298	249	-22.2	.4742+00	.6582+00	-9999.
176000	305	250	-20.2	.4555+00	.6272+00	-9999.
177000	309	251	-19.4	.4375+00	.6006+00	-9999.
178000	309	251	-18.2	.4203+00	.5742+00	-9999.
179000	307	252	-21.2	.4037+00	.5581+00	-9999.
180000	302	252	-25.1	.3876+00	.5444+00	-9999.
181000	300	252	-28.9	.3719+00	.5304+00	-9999.
182000	298	252	-31.2	.3566+00	.5133+00	-9999.
183000	300	252	-32.2	.3419+00	.4942+00	-9999.
184000	305	252	-32.2	.3278+00	.4738+00	-9999.
185000	310	252	-31.2	.3142+00	.4523+00	-9999.
186000	317	252	-28.7	.3014+00	.4295+00	-9999.
187000	322	253	-27.2	.2891+00	.4094+00	-9999.
188000	327	253	-28.2	.2774+00	.3944+00	-9999.
189000	331	254	-29.1	.2660+00	.3797+00	-9999.
190000	334	255	-28.2	.2552+00	.3629+00	-9999.
191000	337	256	-28.2	.2448+00	.3481+00	-9999.
192000	339	257	-28.2	.2349+00	.3340+00	-9999.
193000	344	259	-28.2	.2253+00	.3204+00	-9999.
194000	347	260	-27.5	.2162+00	.3066+00	-9999.
195000	351	262	-24.6	.2075+00	.2908+00	-9999.
196000	356	264	-20.7	.1992+00	.2749+00	-9999.
197000	359	266	-17.7	.1917+00	.2614+00	-9999.
198000	363	267	-15.4	.1853+00	.2504+00	-9999.
199000	364	269	-16.4	.1781+00	.2417+00	-9999.

TABLE 5. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
200000	364	270	-18.0	.1711+00	.2336+00	-9999.
201000	364	271	-19.2	.1644+00	.2255+00	-9999.
202000	363	272	-20.0	.1579+00	.2173+00	-9999.
203000	359	272	-21.9	.1517+00	.2104+00	-9999.
204000	354	272	-22.2	.1456+00	.2021+00	-9999.
205000	349	272	-23.2	.1398+00	.1948+00	-9999.
206000	344	272	-24.1	.1342+00	.1877+00	-9999.
207000	339	271	-25.6	.1289+00	.1814+00	-9999.
208000	332	270	-27.1	.1237+00	.1752+00	-9999.
209000	325	269	-27.7	.1187+00	.1685+00	-9999.
210000	319	267	-28.2	.1138+00	.1618+00	-9999.
211000	310	264	-27.6	.1092+00	.1549+00	-9999.
212000	304	261	-27.1	.1048+00	.1484+00	-9999.
213000	297	258	-26.2	.1005+00	.1417+00	-9999.
214000	292	255	-25.2	.9650-01	.1356+00	-9999.
215000	288	251	-24.2	.9260-01	.1296+00	-9999.
216000	285	247	-24.2	.8890-01	.1244+00	-9999.
217000	283	243	-24.2	.8540-01	.1195+00	-9999.
218000	282	240	-24.9	.8200-01	.1151+00	-9999.
219000	282	237	-24.9	.7870-01	.1104+00	-9999.
220000	280	234	-25.4	.7550-01	.1062+00	-9999.
221000	280	233	-27.8	.7230-01	.1026+00	-9999.
222000	278	232	-29.7	.6930-01	.9915-01	-9999.
223000	276	231	-32.9	.6650-01	.9641-01	-9999.
224000	273	231	-33.9	.6380-01	.9290-01	-9999.
225000	270	232	-35.1	.6130-01	.8969-01	-9999.
226000	265	233	-35.2	.5890-01	.8621-01	-9999.
227000	260	234	-36.2	.5650-01	.8305-01	-9999.
228000	253	236	-38.2	.5410-01	.8020-01	-9999.
229000	246	237	-41.1	.5170-01	.7763-01	-9999.
230000	239	239	-42.7	.4940-01	.7467-01	-9999.
231000	233	242	-45.2	.4720-01	.7214-01	-9999.
232000	228	244	-46.7	.4510-01	.6939-01	-9999.
233000	221	247	-49.3	.4310-01	.6708-01	-9999.
234000	216	249	-52.4	.4120-01	.6501-01	-9999.
235000	211	251	-54.4	.3930-01	.6260-01	-9999.
236000	206	253	-57.5	.3750-01	.6057-01	-9999.
237000	202	255	-59.5	.3580-01	.5838-01	-9999.
238000	199	256	-61.9	.3410-01	.5622-01	-9999.
239000	194	258	-64.6	.3250-01	.5429-01	-9999.
240000	190	259	-67.7	.3090-01	.5239-01	-9999.
241000	187	259	-69.4	.2940-01	.5027-01	-9999.
242000	185	260	-71.8	.2800-01	.4844-01	-9999.
243000	182	260	-74.0	.2660-01	.4652-01	-9999.
244000	180	260	-76.0	.2530-01	.4471-01	-9999.
245000	179	261	-77.5	.2400-01	.4274-01	-9999.
246000	175	261	-78.2	.2280-01	.4073-01	-9999.
247000	175	260	-80.0	.2160-01	.3896-01	-9999.
248000	172	260	-81.2	.2050-01	.3720-01	-9999.
249000	170	260	-82.6	.1940-01	.3547-01	-9999.

TABLE 5. (Continued)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
250000	170	259	-83.2	.1840-01	.3374-01	-9999.
251000	168	259	-83.2	.1750-01	.3209-01	-9999.
252000	167	258	-83.2	.1660-01	.3044-01	-9999.
253000	160	257	-82.6	.1590-01	.2915-01	-9999.
254000	152	257	-82.0	.1522-01	.2791-01	-9999.
255000	145	256	-81.4	.1458-01	.2673-01	-9999.
256000	138	256	-80.8	.1396-01	.2560-01	-9999.
257000	130	256	-80.2	.1337-01	.2452-01	-9999.
258000	123	255	-79.7	.1281-01	.2348-01	-9999.
259000	116	254	-79.1	.1226-01	.2249-01	-9999.
260000	108	254	-78.5	.1175-01	.2153-01	-9999.
261000	101	253	-77.9	.1125-01	.2062-01	-9999.
262000	094	252	-77.3	.1077-01	.1975-01	-9999.
263000	086	251	-76.8	.1032-01	.1891-01	-9999.
264000	079	250	-76.2	.9879-02	.1811-01	-9999.
265000	072	248	-75.6	.9461-02	.1735-01	-9999.
266000	065	247	-75.0	.9061-02	.1661-01	-9999.
267000	058	244	-74.4	.8677-02	.1591-01	-9999.
268000	051	241	-73.9	.8310-02	.1524-01	-9999.
271000	049	245	-74.4	.7130-02	.1250-01	-9999.
274000	046	249	-75.0	.6120-02	.1080-01	-9999.
277000	044	252	-75.5	.5250-02	.9250-02	-9999.
280000	038	256	-76.1	.4500-02	.7950-02	-9999.
283000	027	259	-76.7	.3860-02	.6840-02	-9999.
286000	016	265	-77.3	.3300-02	.5880-02	-9999.
289000	006	295	-77.9	.2830-02	.5060-02	-9999.
292000	008	034	-78.5	.2430-02	.4350-02	-9999.
295000	018	054	-79.1	.2080-02	.3750-02	-9999.
298000	028	289	-78.5	.1690-02	.3020-02	-9999.
301000	074	275	-77.3	.1450-02	.2570-02	-9999.
304000	117	272	-76.2	.1240-02	.2180-02	-9999.
307000	150	271	-75.0	.1060-02	.1850-02	-9999.
310000	164	270	-73.8	.9050-03	.1570-02	-9999.
313000	159	269	-72.2	.7770-03	.1330-02	-9999.
316000	158	269	-69.9	.6690-03	.1130-02	-9999.
319000	152	269	-67.7	.5760-03	.9600-03	-9999.
322000	137	269	-65.5	.4970-03	.8150-03	-9999.
325000	114	269	-63.3	.4280-03	.6920-03	-9999.
328000	077	269	-61.1	.3680-03	.5880-03	-9999.
331000	071	269	-57.4	.3190-03	.4990-03	-9999.
334000	062	268	-53.7	.2760-03	.4240-03	-9999.
337000	047	267	-49.9	.2390-03	.3590-03	-9999.
340000	025	262	-46.2	.2070-03	.3050-03	-9999.
343000	007	125	-42.5	.1790-03	.2590-03	-9999.
346000	027	096	-37.5	.1560-03	.2200-03	-9999.
349000	030	098	-31.2	.1370-03	.1890-03	-9999.
352000	033	100	-24.9	.1210-03	.1610-03	-9999.
355000	037	102	-18.6	.1060-03	.1380-03	-9999.
358000	041	104	-12.4	.9300-04	.1180-03	-9999.
361000	043	099	-6.0	.8170-04	.1010-03	-9999.

TABLE 5. (Concluded)

METEOROLOGICAL DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
364000	045	101	3.3	.7380-04	.8780-04	-9999.
367000	047	105	12.6	.6660-04	.7640-04	-9999.
370000	049	108	21.8	.6000-04	.6650-04	-9999.
373000	050	113	31.1	.5400-04	.5790-04	-9999.
376000	051	119	40.4	.4860-04	.5040-04	-9999.
379000	045	109	50.7	.4410-04	.4430-04	-9999.
382000	043	112	62.0	.4050-04	.3920-04	-9999.
385000	042	116	73.8	.3730-04	.3480-04	-9999.
388000	041	120	85.9	.3450-04	.3100-04	-9999.
391000	040	124	98.3	.3200-04	.2770-04	-9999.
394000	039	129	111.0	.2970-04	.2480-04	-9999.
397000	038	134	123.9	.2770-04	.2230-04	-9999.
400000	038	139	137.1	.2590-04	.2020-04	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
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-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.
-9999.	-9999.	-9999.	-9999.	-9999.	-9999.	-9999.

TABLE 6. STS-2 SRB DESCENT-IMPACT SURFACE SHIP OBSERVATIONS

Site: USN Ship, Gen. H.S. Vandenberg

Location: 30°N Latitude
78°W Longitude

Date: November 12, 1981
Time: 1517Z

Surface Observation:

Air Temp. °F	Wet-Bulb °F	Dew Pt. °F	Pressure (MSL) mb	Wind Dir.	Wind Sp. Kt.
68.8	65.5	64	1013.4	325°	20

Sky Observation:

Clouds	Total Sky Cover	Total Opaque Sky	Visibility (miles)
7/10 Stratocumulus at 1,800 ft	7/10	7/10	7

Sea Observations:

Sea Condition:	Wind Waves: Freq. Sec.	Wind Waves: Ht. m.	Swell Conditions:
Sea Slight - Code 5 6/10 Breaking waves 4/10 Foam Surface Sea Water Temp = 83.5°F	6	2	Data Not Available

TABLE 7. SELECTED ATMOSPHERIC OBSERVATIONS FOR THE FLIGHT TESTS 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[c]					
Seq. No.	Vehicle No.	Launch Date	Time[b] (EST) Nearest Minute	Launch Pad	Press N/cm^2	Temp. (°C)	Rel. Hum. (%)	Speed (ft/sec)	Dir. (deg)	Alt. (ft)	Speed (ft/sec)	Dir. (deg)	
1	STS-1	4/12/81	0700	39A	10.234[d]	21	82	11.8 15.2	125 120	44 300	98	250	
2	STS-2	11/12/81	1010	39A	10.166[e]	23	61	27.0 27.0	345 355	36 300	158	286	

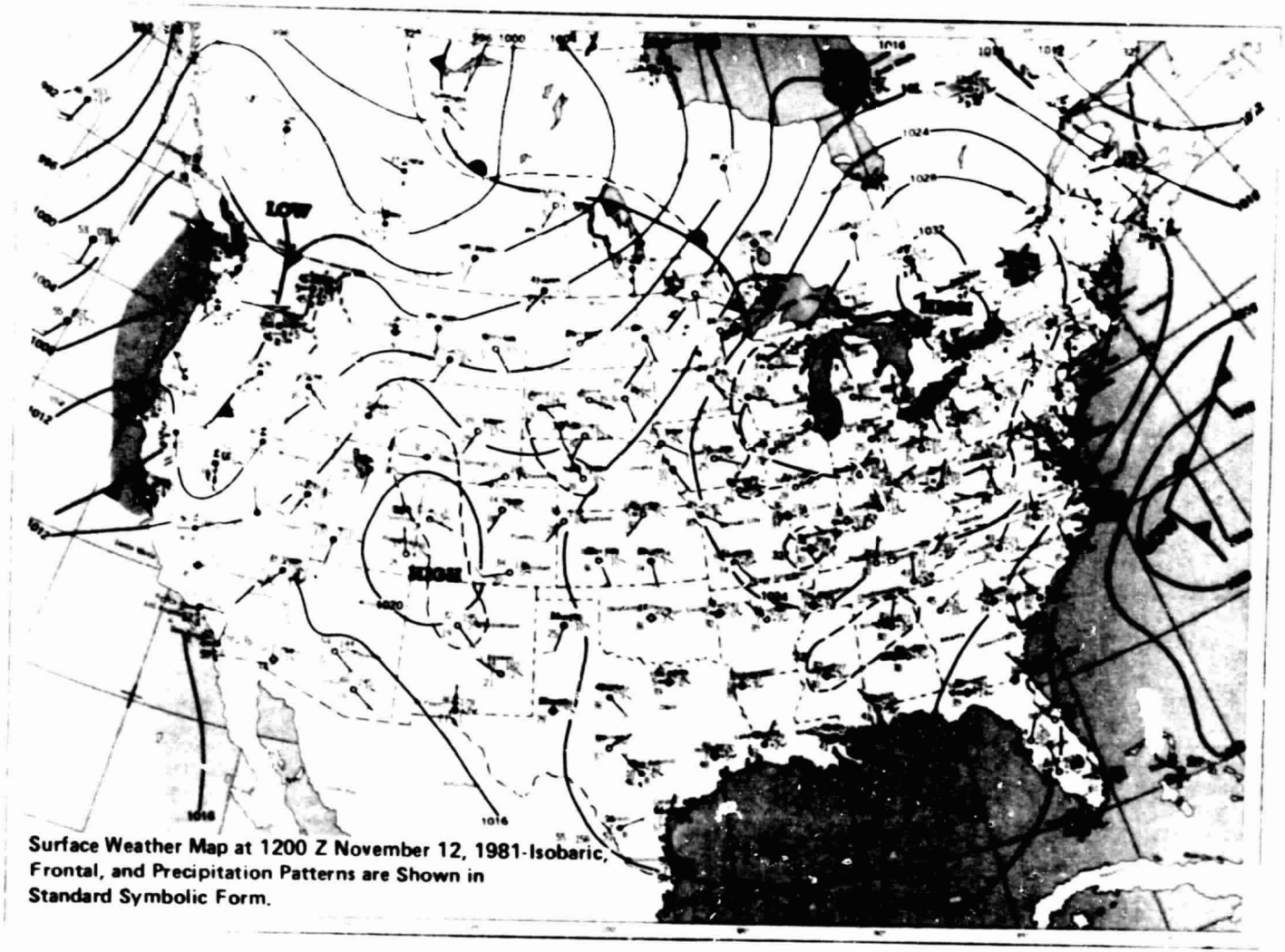
a. Pad 39A thermodynamic measurements taken at approximately 1.2 m (4 ft) above natural grade at camera site No. 3.

b. Eastern Standard Time unless otherwise noted.

c. 1 min average prior to T+0 of 60 ft PLP (listed first) and 275 ft FSS winds measured above natural grade.

d. Pressure measurement applicable to 14 ft above MSL.

e. Pressure measurement applicable to 21 ft above MSL.



Surface Weather Map at 1200 Z November 12, 1981-Isobaric, Frontal, and Precipitation Patterns are Shown in Standard Symbolic Form.

Figure 1. Surface weather map 3 hr, 10 min prior to launch of STS-2.

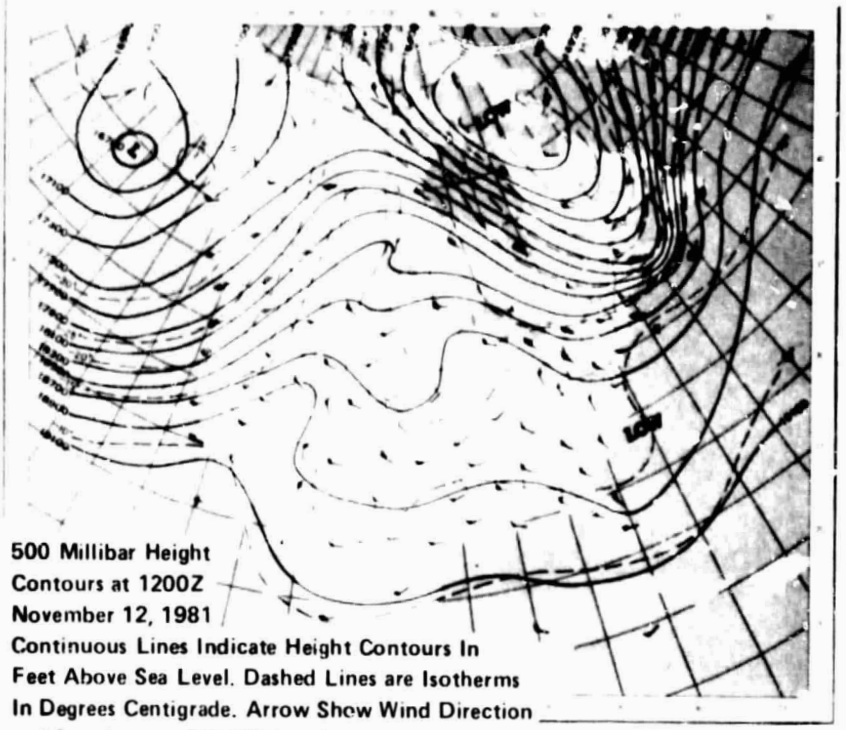


Figure 2. 500 mb map 3 hr, 10 min prior to launch of STS-2.

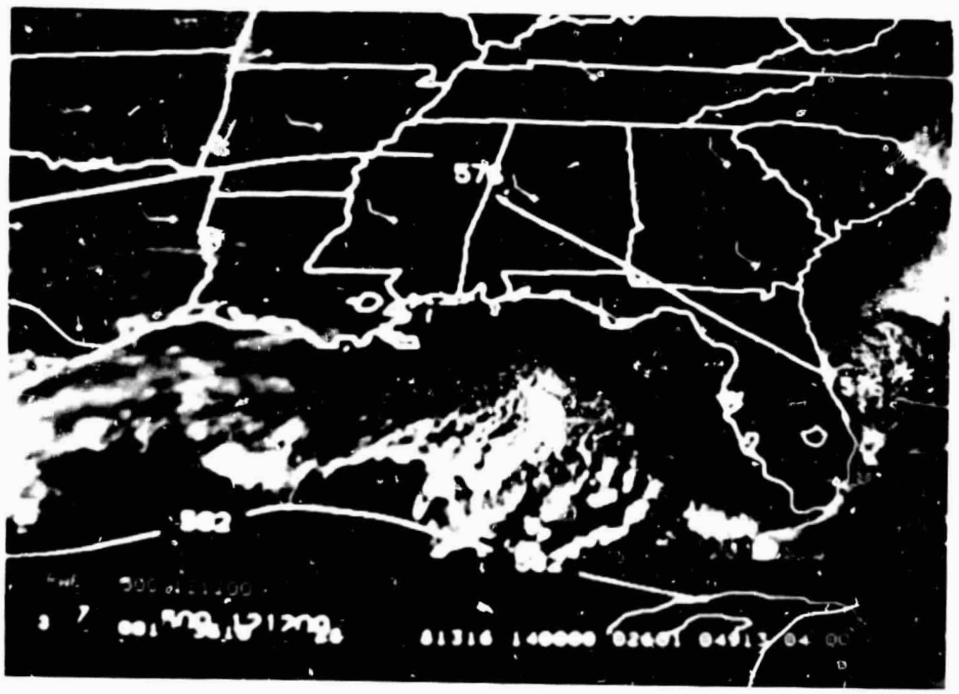


Figure 3. GOES SMS-II visible imagery of cloud cover 1 hr, 10 min prior to launch of STS-2 (1400Z, 12 November 1981).

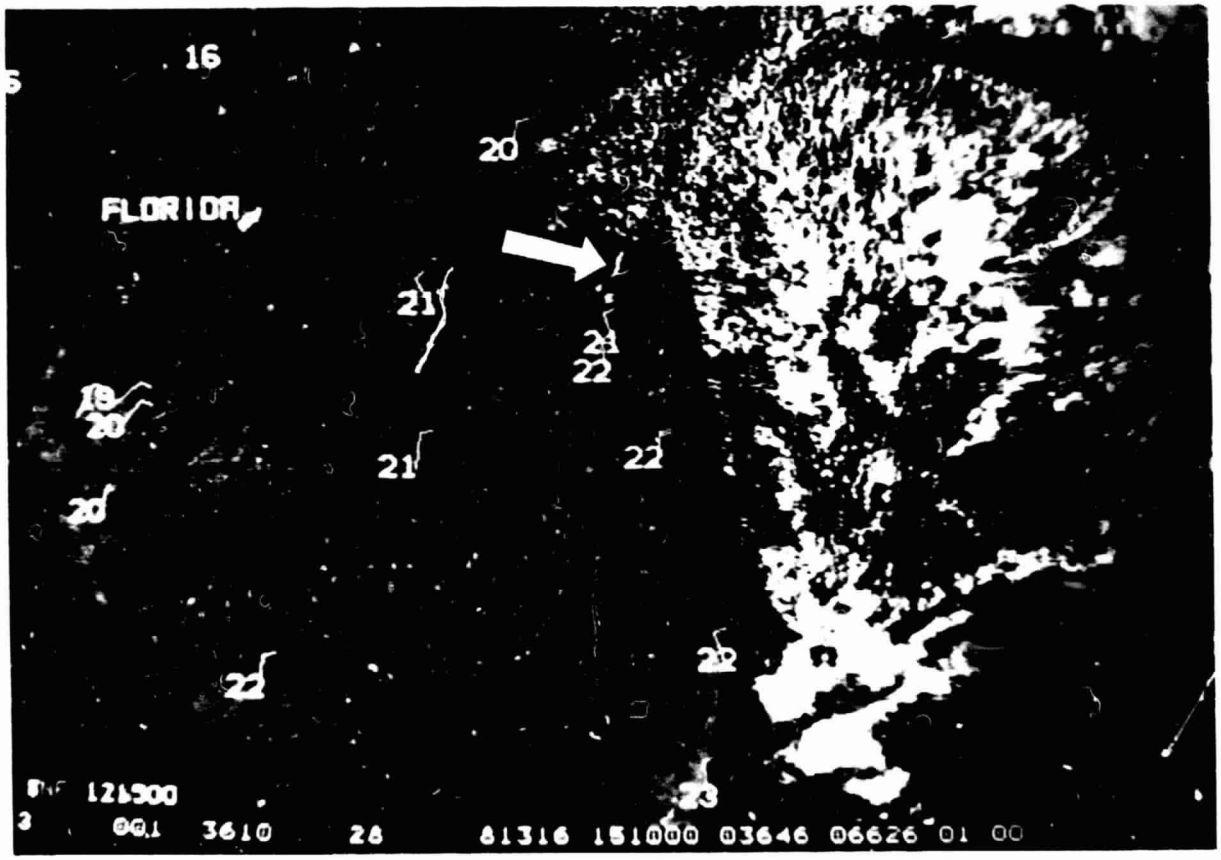


Figure 4. Enlarged view of GOES SMS II visible imagery of cloud cover with exhaust trail visible (indicated by arrow) during launch of STS-2 (1510Z, 12 November 1981). Figure includes 1500Z surface observations of temperature and winds for surrounding Florida sites.

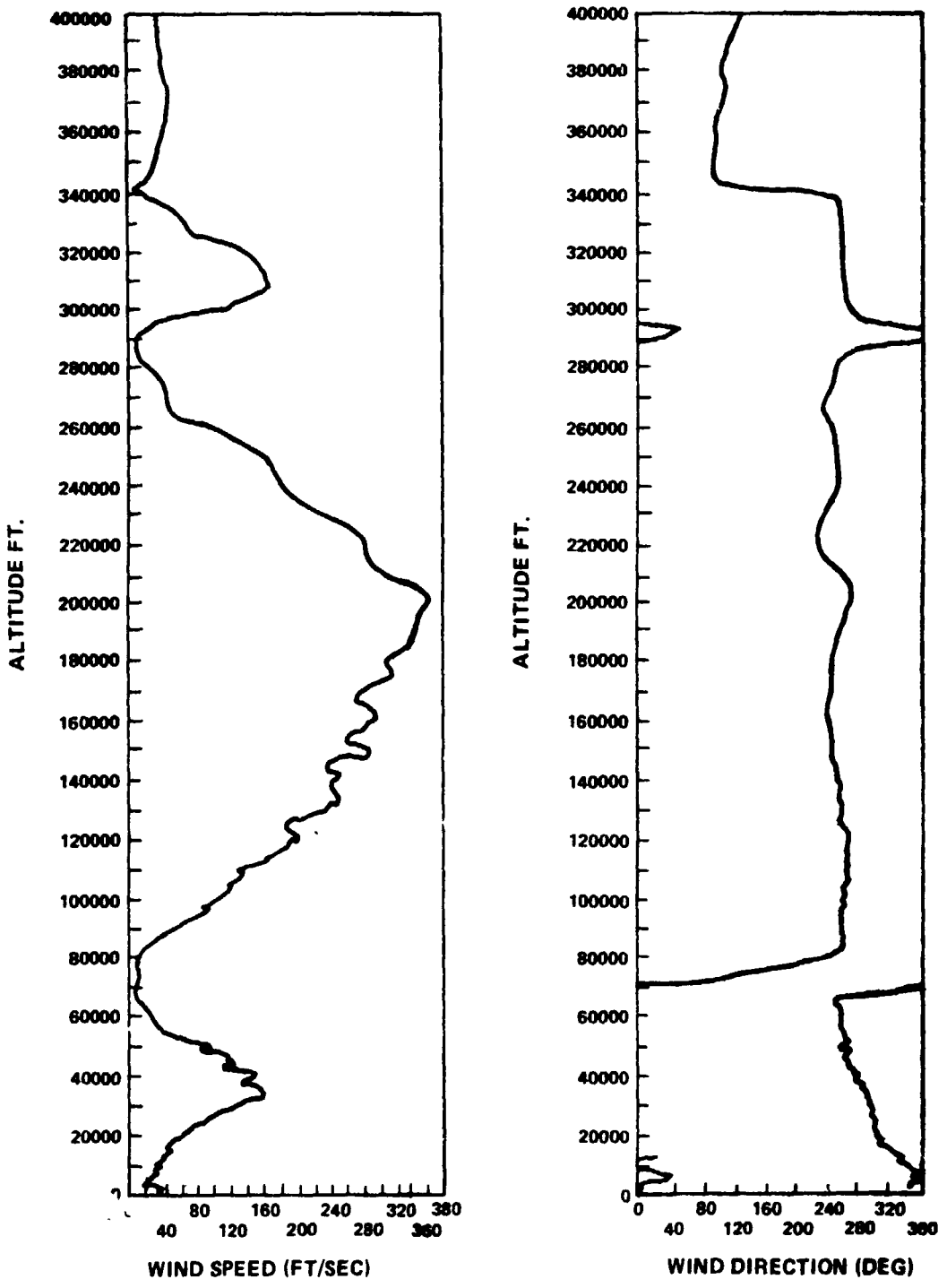


Figure 5. Scalar wind speed and direction at launch time of STS-2.

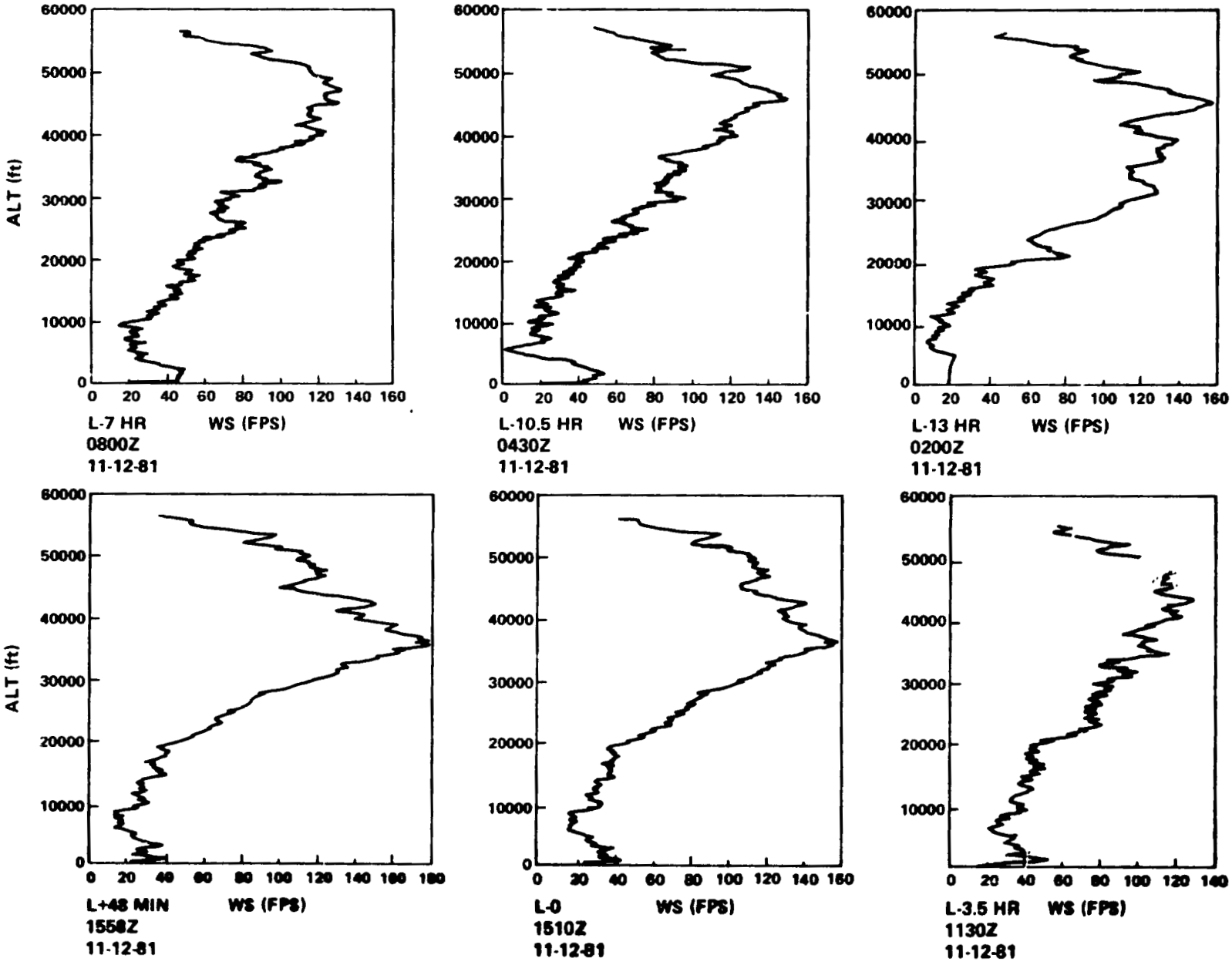


Figure 6. STS-2 prelaunch/launch Jimsphere-measured and estimated wind speeds (FPS).

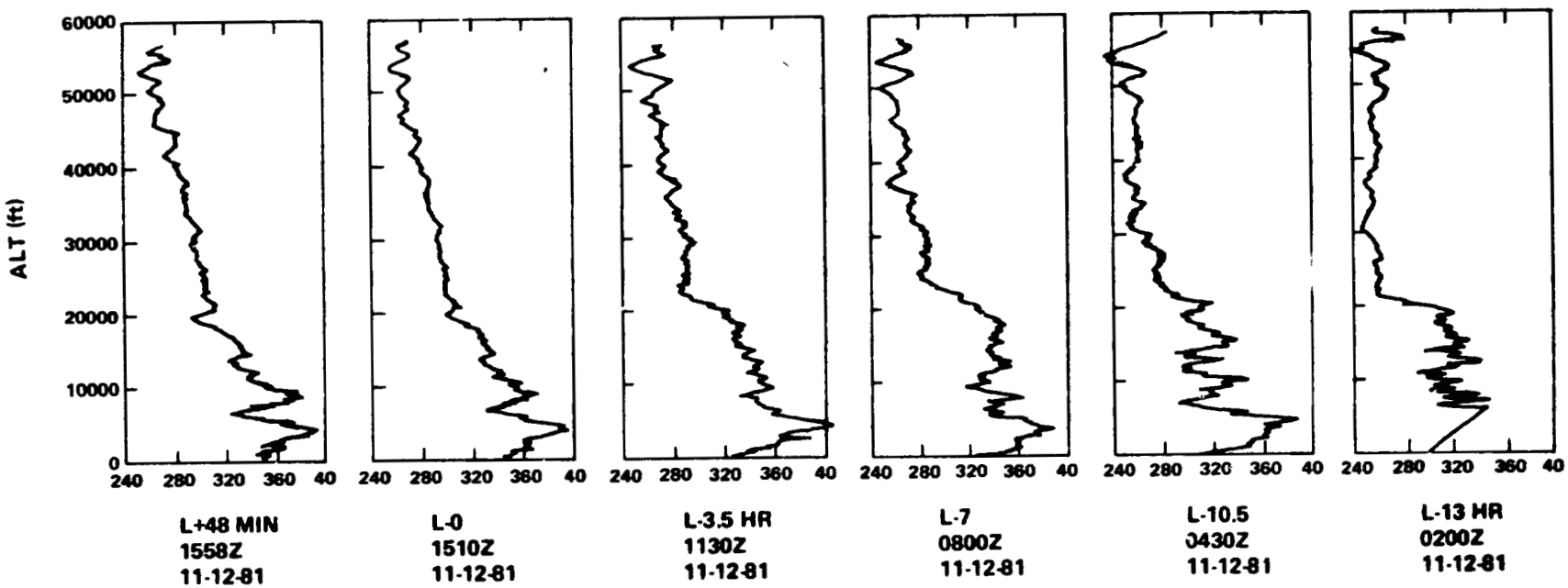


Figure 7. STS-2 prelaunch/launch Jimsphere-measured and estimated wind directions (degrees).

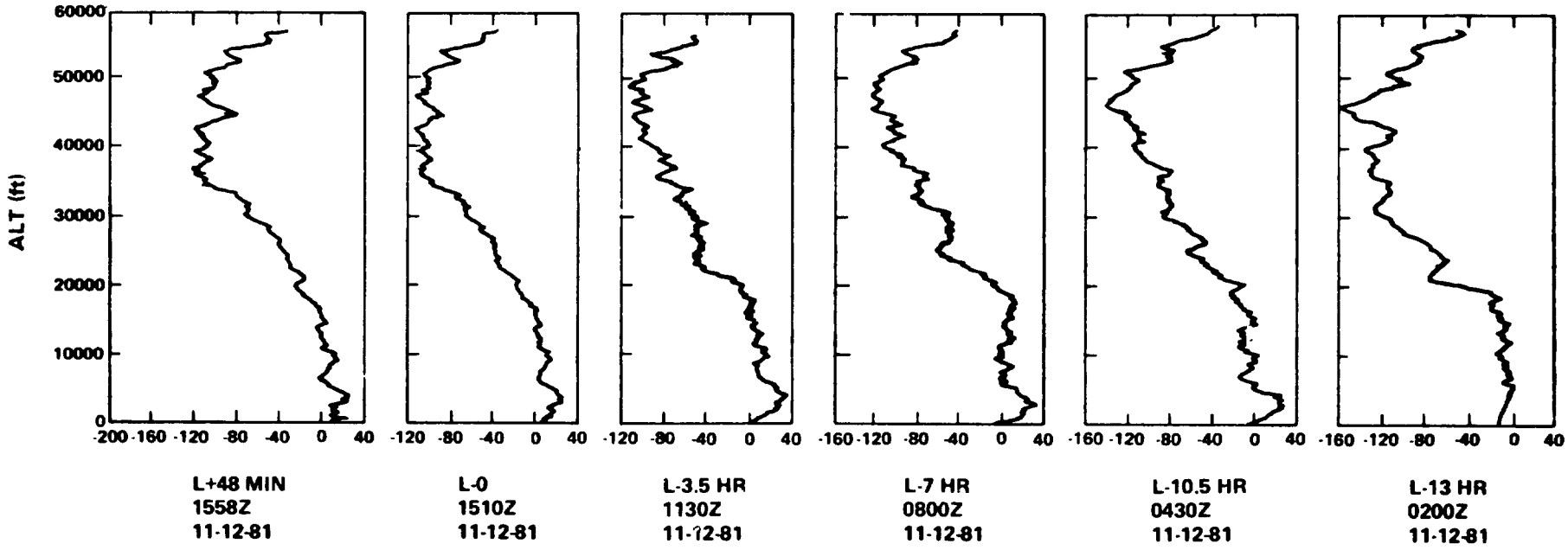


Figure 8. STS-2 prelaunch/launch Jimsphere measured and estimated in-plane component winds (FPS). Flight azimuth = 60 degrees.

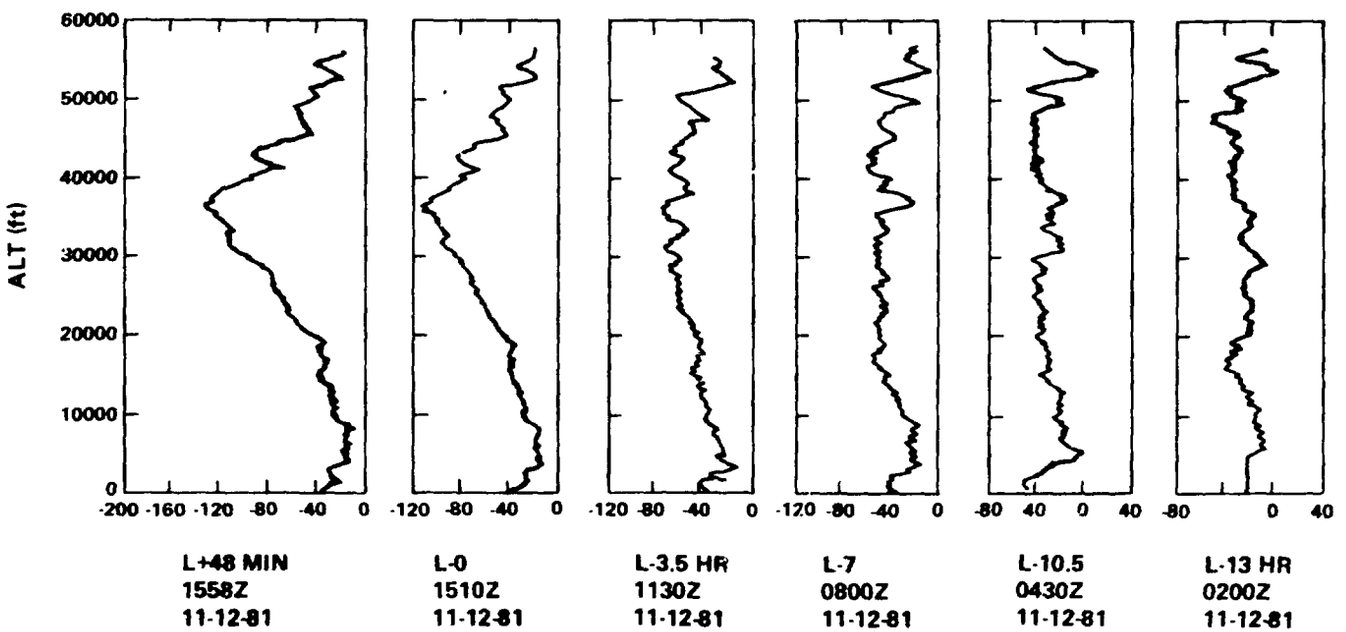
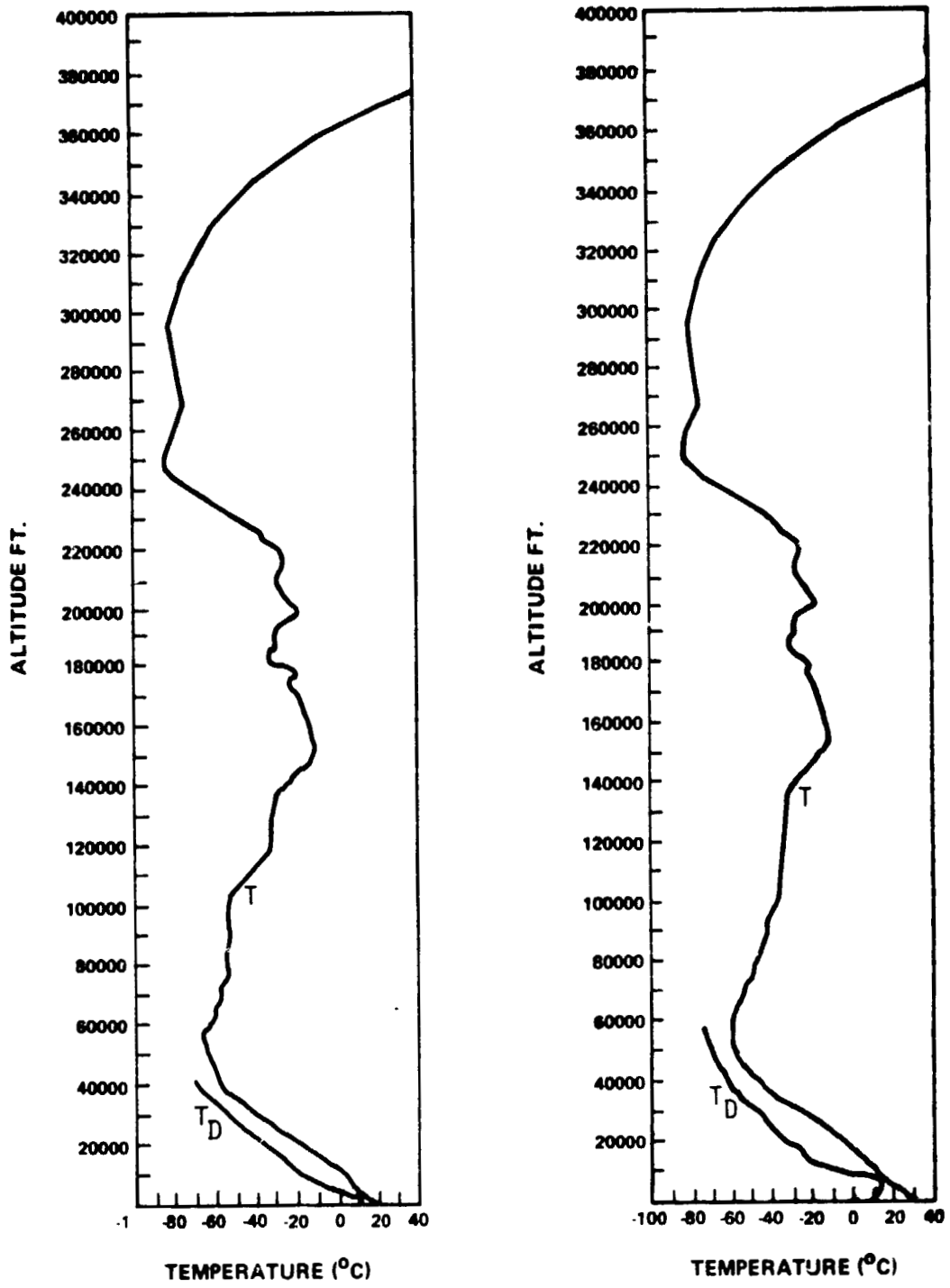


Figure 9. STS-2 prelaunch/launch Jimsphere measured and estimated out-of plane component winds (FPS). Flight azimuth = 60 degrees.



T_D - Dew point temperature

T - Temperature

Figure 10. STS-2 temperature profiles versus altitude for launch (left) and SRB descent (right).

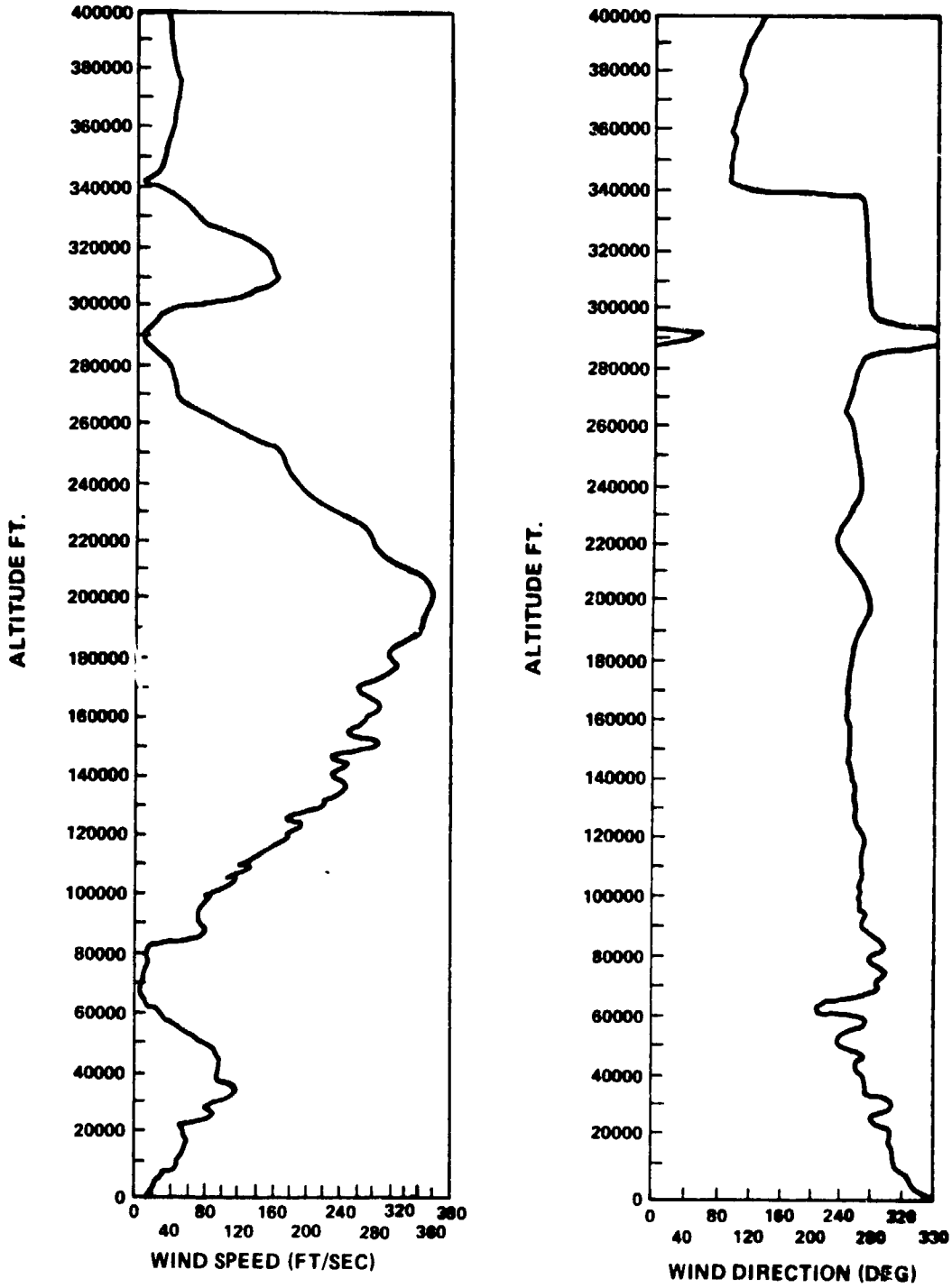


Figure 11. STS-2 scalar wind speed and direction for SRB descent.

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APPROVAL

ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-2) LAUNCH

By D. L. Johnson and S. C. Brown

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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