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DFW (Dallas-Ft. Worth) Microburst on August 2, 1985

Chicago Univ., IL

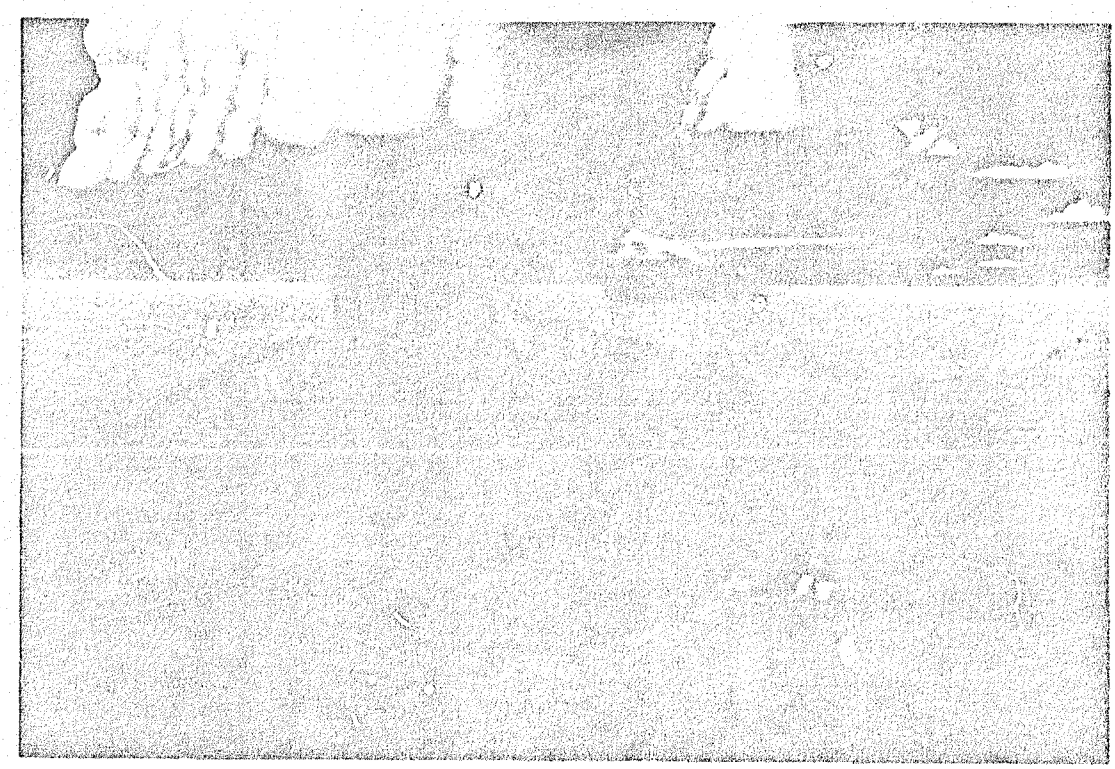
Prepared for

National Aeronautics and Space Administration
Washington, DC

1986

DFW MICROBURST

On August 2, 1985



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DFW Microburst

Published by Satellite and Mesometeorology Research Project (SMRP)
Department of the Geophysical Sciences
The University of Chicago

SMRP Research Paper Number 217

Library of Congress Catalog Card Number 85-52386

National Technical Information Service PB 86-131638

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PREFACE

This book describes the features of the microburst on August 2, 1985, related to the Delta 191 accident during the approach to Runway 17L of the Dallas-Ft. Worth Airport. Both radar and satellite data, along with ground-based measurements, were used in determining the characteristics of the parent cloud which spawned the most complicated microburst winds ever analyzed by the author.

The detailed reconstruction of the airflow and the aircraft's maneuver were made possible by a series of computer analyses of the Digital Flight Data Recorder (DFDR) readout. Analysis of the DFDR readout and aircraft performance were assisted by Captain Douglas Twinam, Messrs. Charles Bautz, Jr. and Roy Maxwell of Delta Air Lines, Inc.

The purpose of this book is to present both measured and computed values in color diagrams that can be evaluated readily by meteorologists, pilots, structural engineers, and other interested persons in preventing microburst-related accidents in future years. The staff members of the Satellite and Mesometeorology Research Project (SMRP) of the Department of the Geophysical Sciences, the University of Chicago, played a major role in completing this book. The author wishes to extend his thanks to the staff members, Jaime Tecson and Brian Smith for computing aircraft and meteorological parameters, Jim Partacz and Duane Stiegler for photographic work, and Eric Petersen for satellite radiation analysis.

Appreciation is due to Mr. Charles Stern of the University of Chicago Printing Department for his dedicated effort toward the completion of this book, and to Mr. Robert Arsenault of Unique Printers and Lithographers for color printing under strict requirements and tight schedule. The author wishes to express his sincere appreciation to Mrs. Toshiko Arai, wife of the Consul General of Japan for her volunteer art work and to Mrs. Akiko Sugano for drafting and layout. Finally, special appreciation is due to my wife, Susie Fujita, for her hidden efforts in assisting with plotting charts and typing the manuscript while sharing sleepless nights with the author.

The meteorological research on radar, satellite, and conventional data was sponsored by the National Aeronautics and Space Administration (NASA) under Grant NGR 14-001-008 and the National Environmental Satellite, Data, and Information Service (NESDIS) under Grant NA85RAD00064. The computation and reconstruction of microburst winds and the laboratory model experiment of microbursts were sponsored by the National Science Foundation (NSF) under Grant ATM8109828.

January 31, 1986

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Introduction

August 2, 1985 was a very hot summer day at the Dallas-Ft. Worth (DFW) Airport with midafternoon surface temperature of 101°F (38.3°C). The upper-air temperature below 700 mb was dry-adiabatic. Although large thunderstorms were located along the warm front far to the northeast, there were scattered, relatively small thunderstorms to the north of the airport.

At 1804 CDT, Delta 191 (L-1011) passed over the outer marker and descended toward Runway 17L. At 1803 CDT, Delta 191 had already entered the localized rainshower. While traversing through severe and unusual microburst winds, the aircraft lost its altitude and contacted the ground in a plowed field to the north of Texas Highway 114 at the location of the red dot in Fig. I.1. (For airport coordinate, see Fig. I.2).

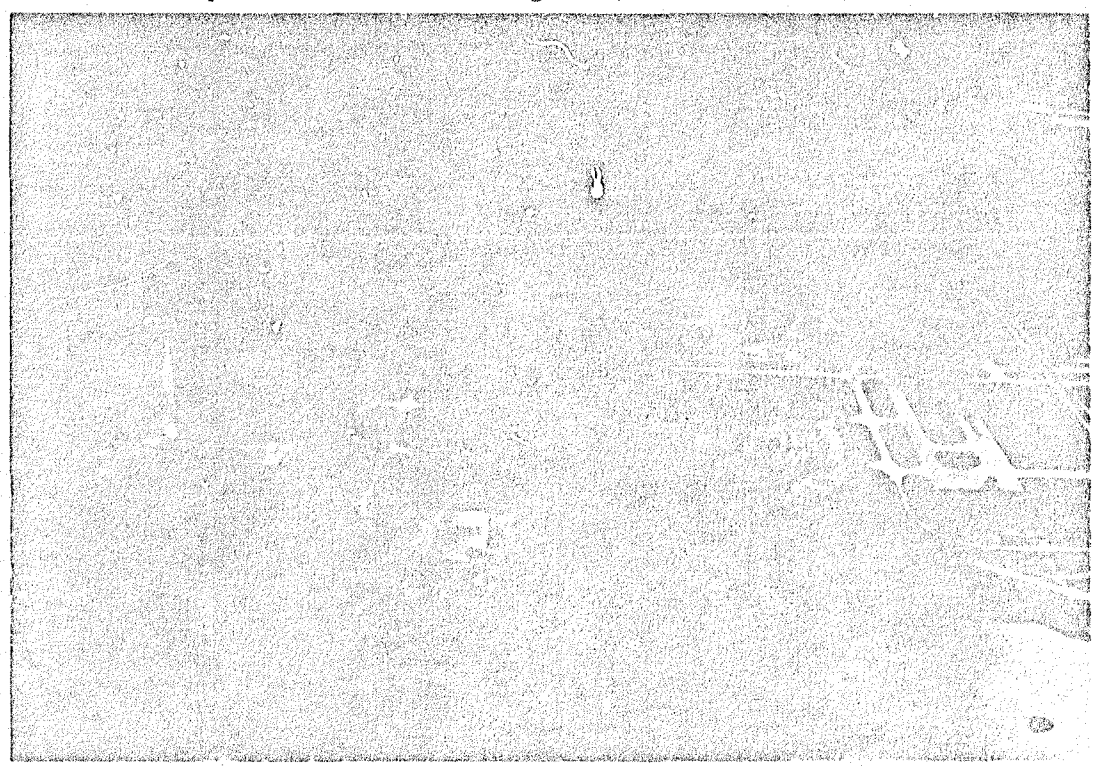

Fig. I.1 An aerial photo of DFW Airport, looking north. Photo by the author on September 4, 1985.

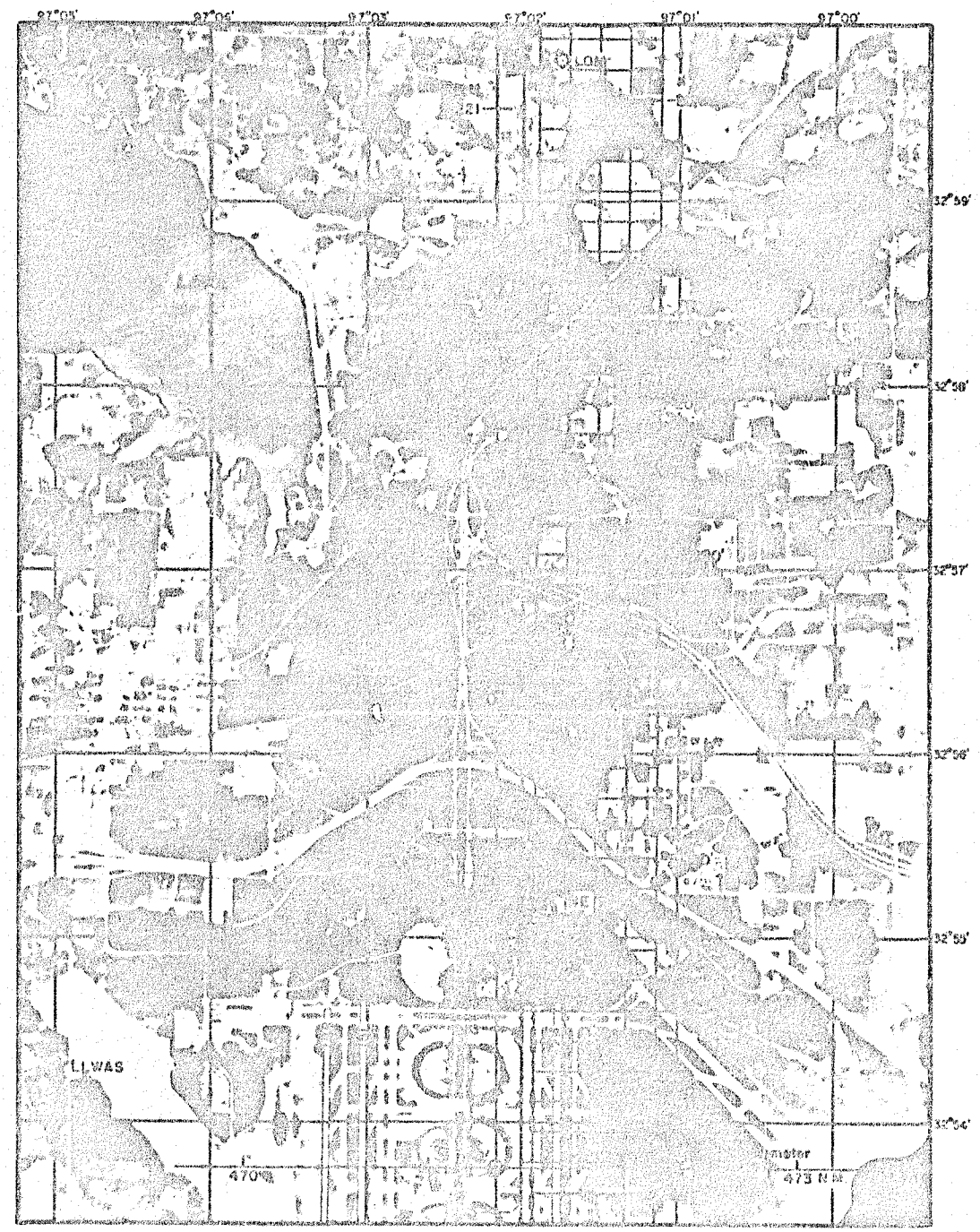

Fig. I.2 ATC radar coordinates (blue) and Runway 17L coordinates (red) superimposed upon a vertical photo.

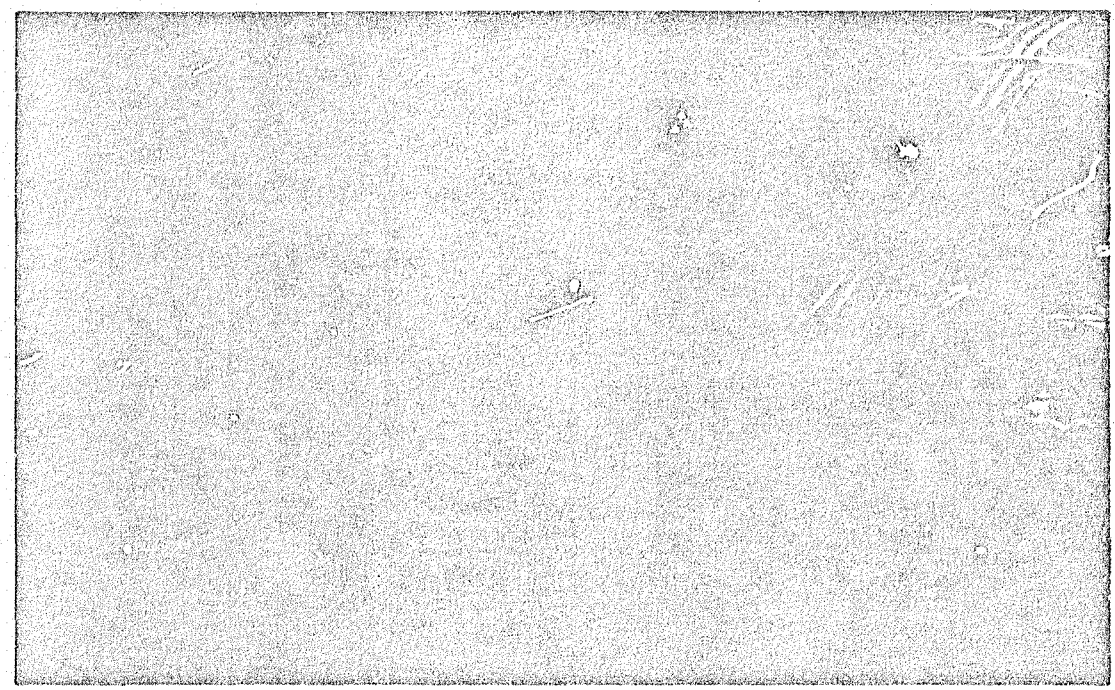

Fig. I.3 17L coordinates made visible by x - y lines in blue. Line interval is 1,000 ft. A red line extending from left to right across the photo denotes the path of the aircraft which made the first contact in the plowed field. Photo by the author on September 4, 1985.

The x-axis of Runway 17L coordinates is the centerline of the runway, with positive direction toward the south. The y-axis is perpendicular to the x-axis, with its positive direction toward the west. The origin of the coordinates is located at the approach end on the runway (See Fig. I.2).

The locations of the four ground contacts are shown in Fig. I.3, along with the 17L coordinates at 1,000 ft interval of both x and y lines. Five-foot contour lines in Fig. I.4 reveal that the ground at the first contact slopes slightly upward toward the south.

After making the second contact in a short grass field, the aircraft's landing gear contacted the pavement of the highway. The time between the first and third (highway) contacts was approximately 3.6 seconds. Between the third and fourth contacts, the aircraft was airborne only for about 1 second. Then the fourth contact occurred on the south side of the service road. Thereafter, the aircraft skidded toward the water tanks seen in Fig. I.3.

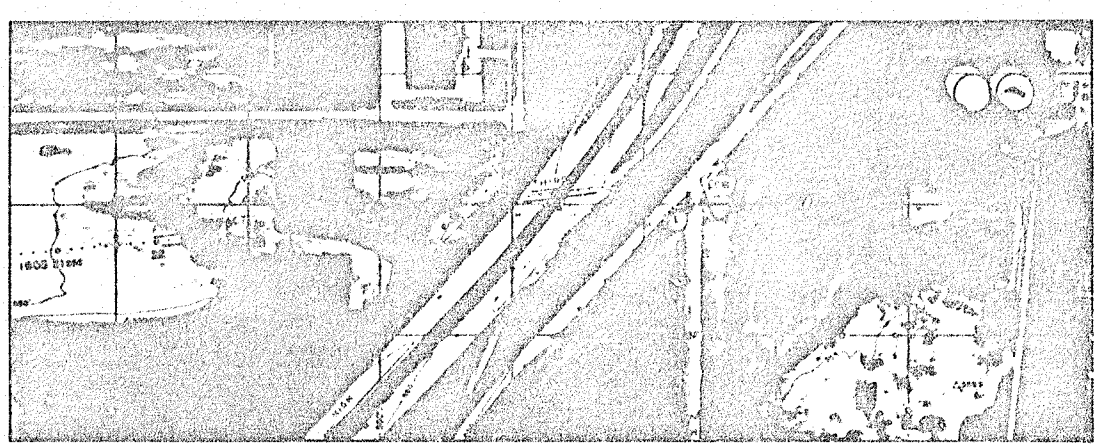

Fig. I.4 Position of the aircraft accelerometer at 1/8 second interval (small, black dots). The first and the second contacts are those of the main landing gear. The third contact left the tire tracks of both main and nose gear. Contour interval is 5 ft.

Chapter One

Weather Situations

1.1 Weather at DFW Airport

The National Weather Service (NWS) anemometer and the Low Level Wind Shear Alert System (LLWAS) centerfield anemometers are co-located 1,100' to the east of 17L centerline (See Fig. I.2). As shown in Fig. 1.1, the distance between them is no more than 150 feet.

The NWS Airport Office is located at the Delta hangar, 4,500' (3/4 n.m.) south of the anemometer. At 1553 CDT, NWS observed scattered towering cumuli with their bases at 6,000' AGL and scattered cirrus at 21,000' AGL. The 1751 CDT observation in Table 1.1 indicates little change in the cloud-base heights of both cumuli and cirrus clouds. However, shortly thereafter, a thunderstorm developed to the northeast of the approach end of 17L and moved slowly across the field toward the south, inducing gusty winds which were measured at the centerfield location beginning at 1811 CDT and peaking at 1824:30 CDT (See Fig. 1.2).

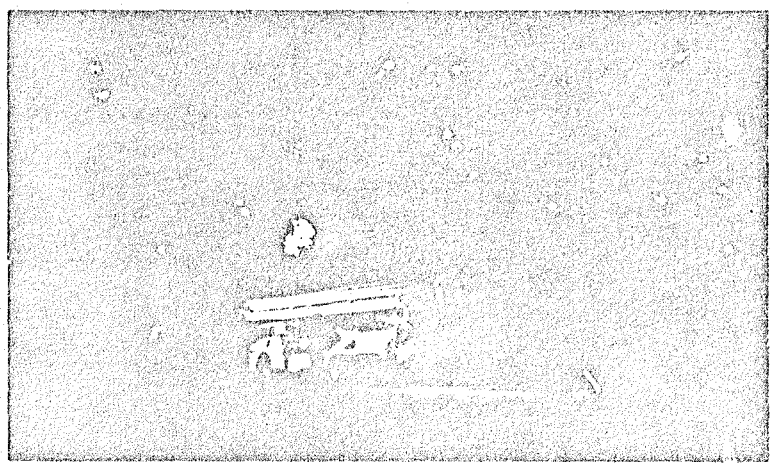

Fig. 1.1 NWS (left) and LLWAS centerfield (right) towers photographed by the author on September 4, 1985 prior to his ride on the cherry picker parked between the two anemometer towers.

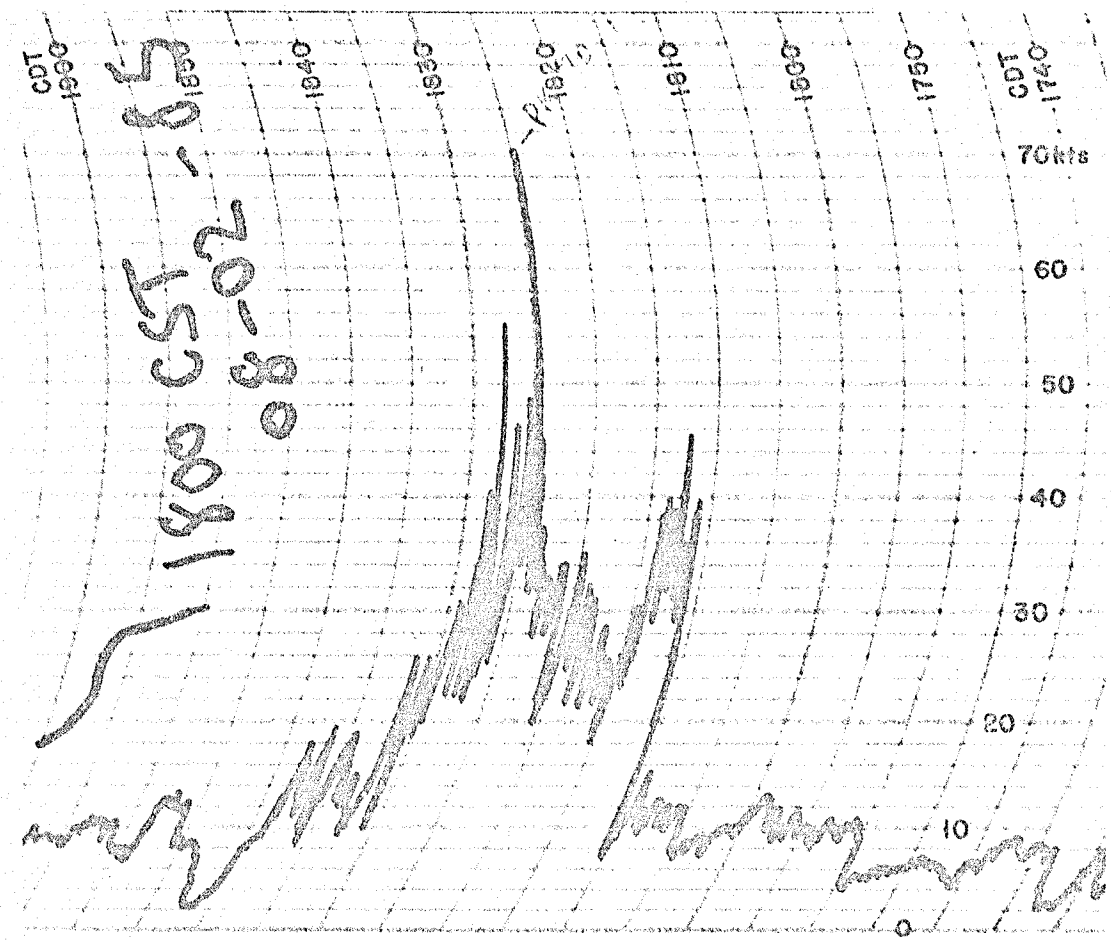

Fig. 1.2 The trace of the gusty winds measured by the National Weather Service anemometer seen in Fig. 1.1.

Table 1.1 Weather observations from the National Weather Service Airport Office located at the Delta hangar.

CDT	CLOUDS	VIS	T / Td	ddff	REMARKS
1751	60SCT E210BKN	11	101 / 65	1208	CB N-NE TCU NE-S-W-N
1805	E60SCT 210BKN	10		0708	T N-NE AND OVHD MOVG SLOWLY S OCNL LTGCC RWU N-NE TCU NE-SE W
1814	4SCT E60BKN 210BKN	11		3637	T N-NE AND OVHD MOVG SLOWLY S OCNL LTGCC RWU N-NE
1826	-X E60BKN	1/2		3050	T N-NE AND OVHD MOVG SLOWLY S OCNL LTGCC
1837	60BKN	2 1/2		1217	T OVHD MOVG SLOWLY S OCNL LTGCC OVHD
1853	E60BKN 210BKN	7	88 / 68	0210	T N-NE AND OVHD STNRY OCNL LTGCC N-NE

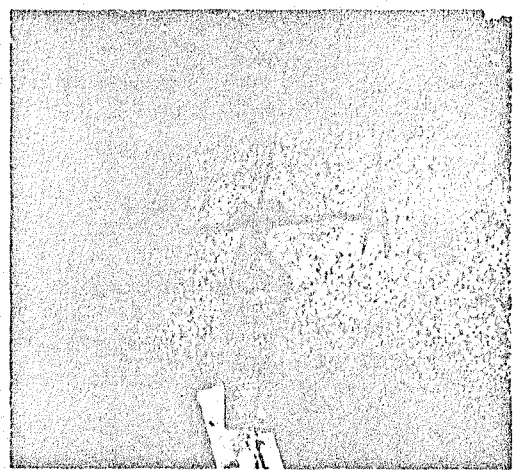

Fig. 1.3 A three-cup anemometer of the NWS seen from the cherry picker.

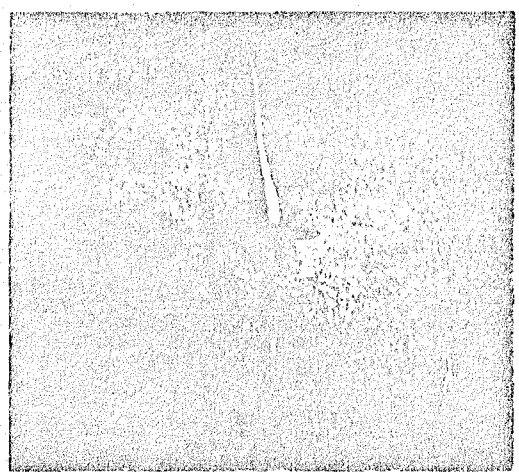

Fig. 1.4 The propeller-type LLWAS centerfield anemometer.

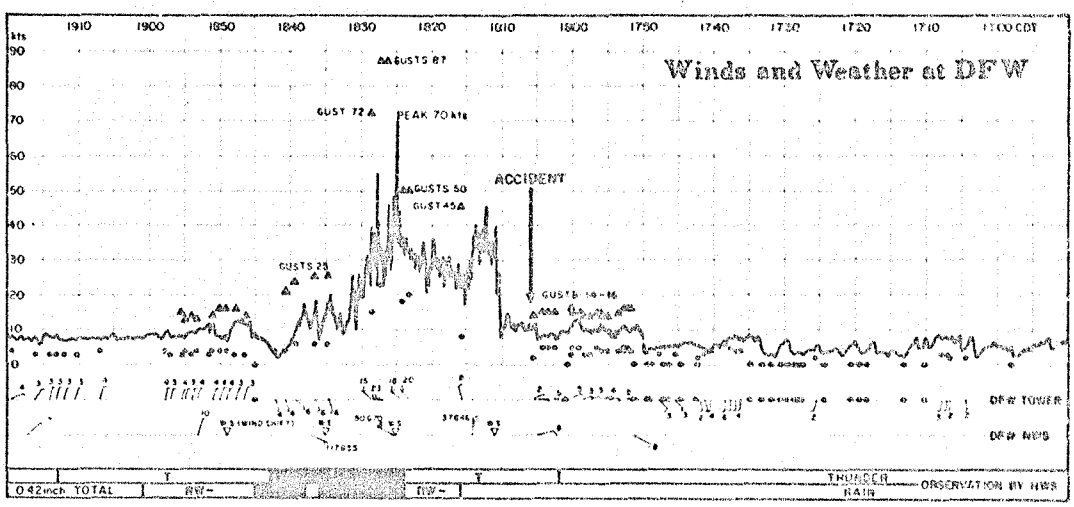

Fig. 1.5 Winds and weather at DFW Airport on August 2, 1985 between 1650 and 1920 CDT. Winds reported by DFW CT-E and CT-W are shown in blue, while those by NWS are in red.

Presented in Figs. 1.3 and 1.4 are the NWS and the centerfield anemometers, respectively. Reported winds by NWS and CT-E and CT-W are shown in Fig. 1.5. Note that the centerfield winds reported by ATC to pilots are unusually lower, on the average, than NWS winds, while gusts from LLWAS are higher than those from the NWS wind trace.

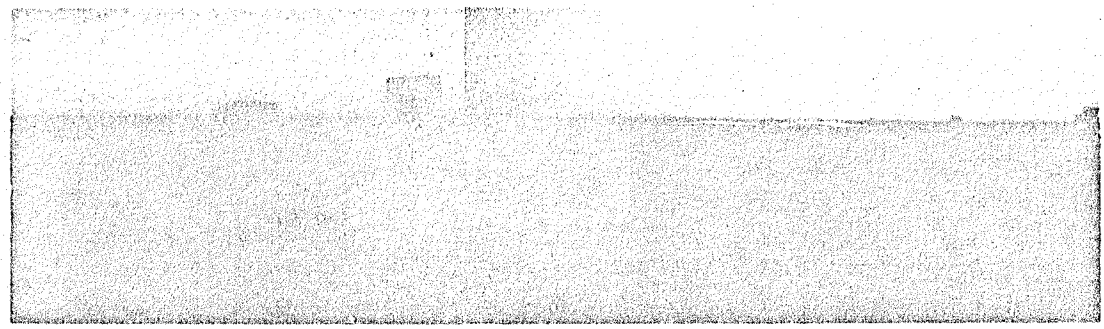

Fig. 1.6 A view from the cherry picker bucket placed above the LLWAS NE anemometer. Two water tanks and the entire area of the third and fourth contacts are visible. Photo by the author on September 4, 1985.

The LLWAS NE located 400' east of the 17L centerline and 3,000' north of the 17L threshold is the anemometer closest to the accident site. Since the exposure of this anemometer is excellent, it should have detected the microburst wind as early as 1806 CDT (See Fig. 1.6 for exposure and Fig. 5.9 for microburst boundary).

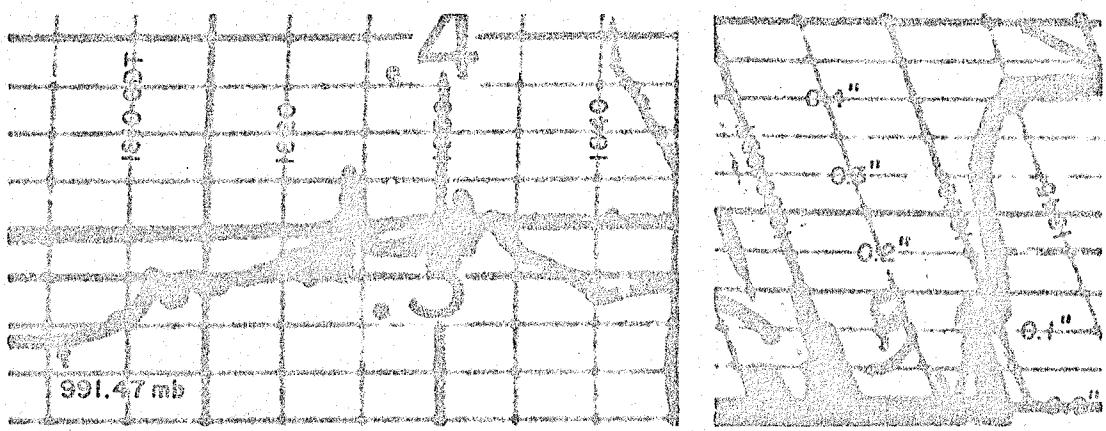

Fig. 1.7 Barograph and raingauge traces from the National Weather Service DFW Airport Office at the Delta hangar.

The NWS station pressure (elevation 574.83') at 1806 CDT was computed to be 991.47 mb. This value was used in correcting the DFDR pressure obtained from the ALTF pressure altitude fine data and the Standard Atmosphere equation. Pressure variations and cumulative rainfalls recorded at the NWS are presented in Fig. 1.7. A total of 0.42" rainfall was received during the thunderstorm which induced both the DL 191 and the 70-kt peak gust microbursts.

1.2 Radar Pictures of the Microburst Cloud

Thunderstorm activity in and around the DFW Airport was depicted by the NWS Stephenville, Texas (SEP) radar. A sequence of Kavouras system photos did not include the color imagery at the accident time. Two photos in Fig. 1.8 show storm echoes at 1743 (23 minutes before the accident) and 1819 CDT (13 minutes after the accident).

A 16-mm radar film (B & W) from SEP, 75 n.m. southwest of DFW includes a sequence of images taken every 4 to 5 minutes. Figure 1.9 presents a sequence of 16 pictures taken between 1737 and 1843 CDT. The parent echo of the DL 191 microburst, identified as Echo "2" appeared at 1752 CDT just to the east of the 17L glideslope (See Fig. 1.9). It was a video integrator and processor (VIP) level 2 echo, 3 n.m. in diameter. In 4 minutes, at 1756 CDT, it grew to 6 n.m. in diameter. At 1800 CDT, Echo "2" was observed by the SEP radar specialist to have received a VIP level 4 (See NTSB Exhibit 5, black and white photograph, and NTSB Transcript, P55). The core at 1804 CDT was located on the 17L glideslope. Thereafter, the core increased in diameter until 1813 CDT, while moving slowly toward the south.

The core of Echo "2" was located directly above the NWS anemometer when it measured the 70-kt peak gust at 1825 CDT. Echo "2" began decreasing in diameter and in intensity. This evidence shows that the parent echo of the DL 191 microburst appeared on the SEP radar scope 14 minutes in advance of the accident. Six minutes before the accident, Echo "2" intensity increased to a VIP level 4. The peak gust of the microburst measured by the NWS anemometer, located 16,000' (2.7 n.m.) south of the microburst center, was 46 kts.

Apparently, the 70-kt peak gust at 1825 CDT was induced by the second microburst, spawned by the same parent Echo "2" as it passed directly over the runway area. Figure 1.5 shows two wind shifts, the one caused by the first microburst (DL 191 microburst) at 1811 CDT and the other by the second microburst (with a 70-kt peak gust) at 1825 CDT.

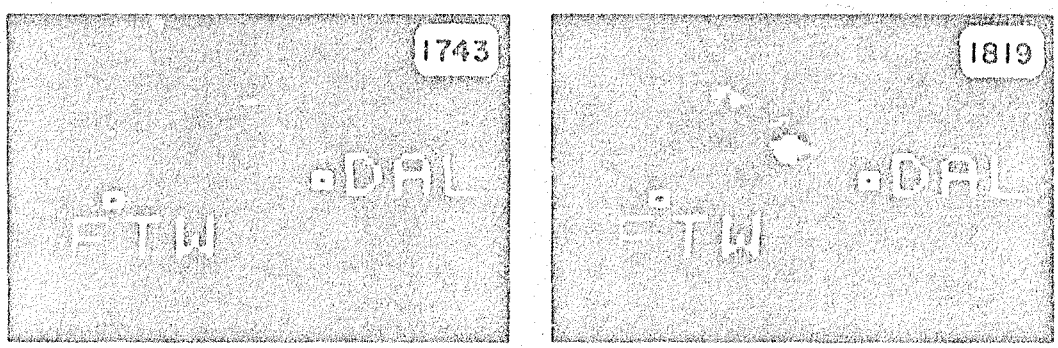

Fig. 1.8 Two photos showing the thunderstorm echoes 23 minutes prior to (left) and 13 minutes after (right) the accident. Video taped by American Airlines at DFW out of the Kavouras system at the SEP radar.

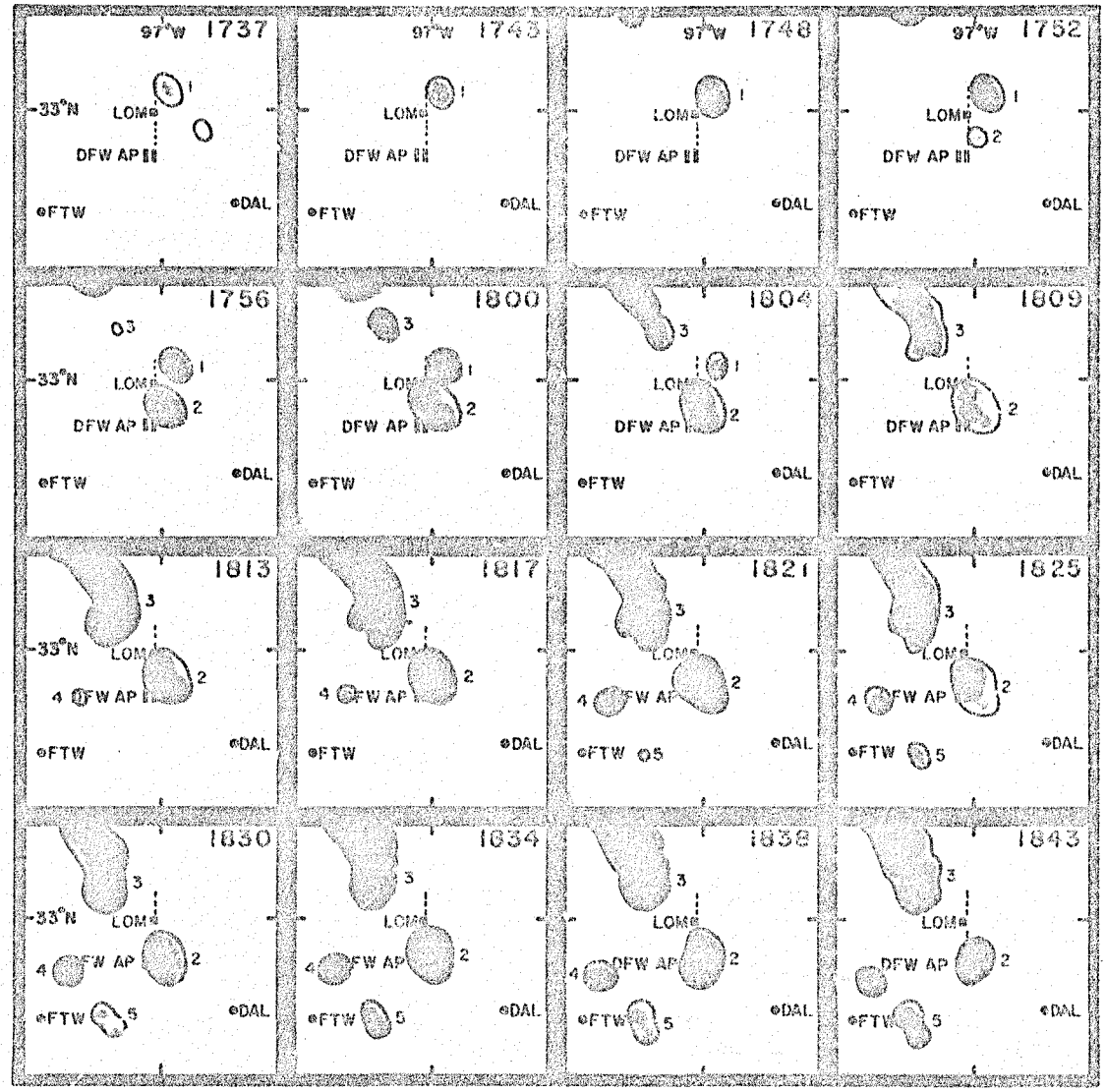

Fig. 1.9 A sequence of radar photos from the SEF radar, 75 n.m. southwest of DFW Airport. Of the five numbered echoes, Echo "2" induced two microbursts which are the DL 191 microburst and the 70-kt peak-gust microburst.

Echo "1" which formed earlier than Echo "2" was located to the north-northeast of the outer marker. During its mature stage, Echo "1" apparently obstructed the view of Echo "2", according to the testimony of the flight crews of a number of aircraft approaching runway 17L from the north.

1.3 Satellite Pictures and Infrared Temperature

During the past several years, it has been known that relatively small thunderstorms could produce severe wind shear which endangers aircraft operations at low altitudes. Because the DFW thunderstorm belongs to this category, it is necessary to understand the nature of this type of storm on or near the glideslope of the approaching runway.

At 1735 CDT, 30 minutes before the accident, there were large thunderstorms along a warm front extending from the Texas-Oklahoma border toward the southeast. Towering cumuli were observed all around the DFW Airport and a cumulonimbus cloud began developing to the northeast of the Airport (See Fig. 1.13 and Table 1.1).

By 1805 CDT, a line of relatively small thunderstorms formed along a very weak gust front of the cold air outflow from a large thunderstorm complex along the warm front. Note that the 101°F temperature decreases to 93°F near the warm-front thunderstorms (See Fig. 1.14).

The 1835 CDT photo in Fig. 1.15 reveals the growth of small thunderstorms along the NW-SE line through DFW. The shadow length of the DFW thunderstorm was 110,000', indicating that the height of the cloud top was 26,000' at this time.

Fig. 1.13 GOES photo at 1735 CDT when a thunderstorm began developing at 97°W and 33°N, to the northeast of DFW Airport.

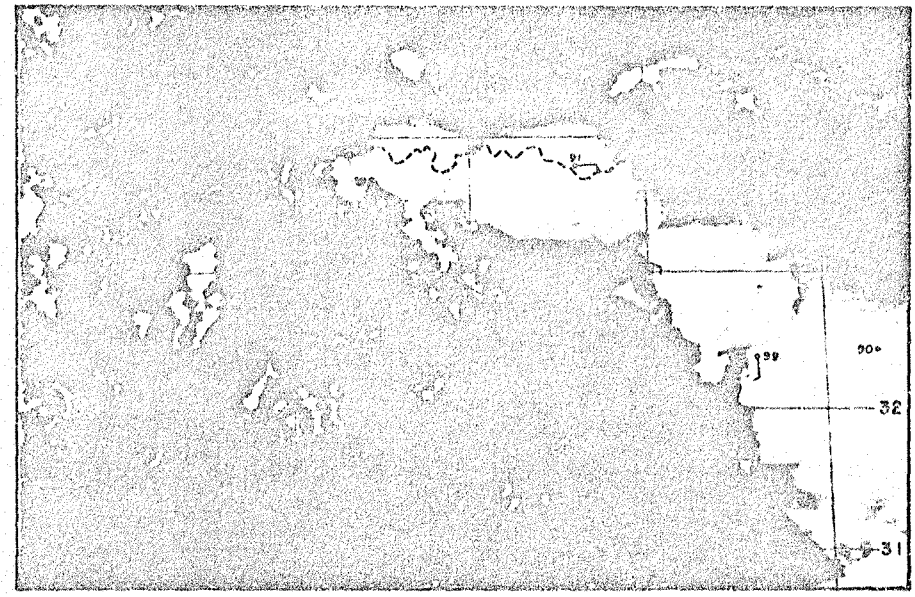

Fig. 1.14 GOES photo at 1805 CDT, the time of the accident. A line of relatively small thunderstorms formed along the leading edge of a cool outflow from the east.

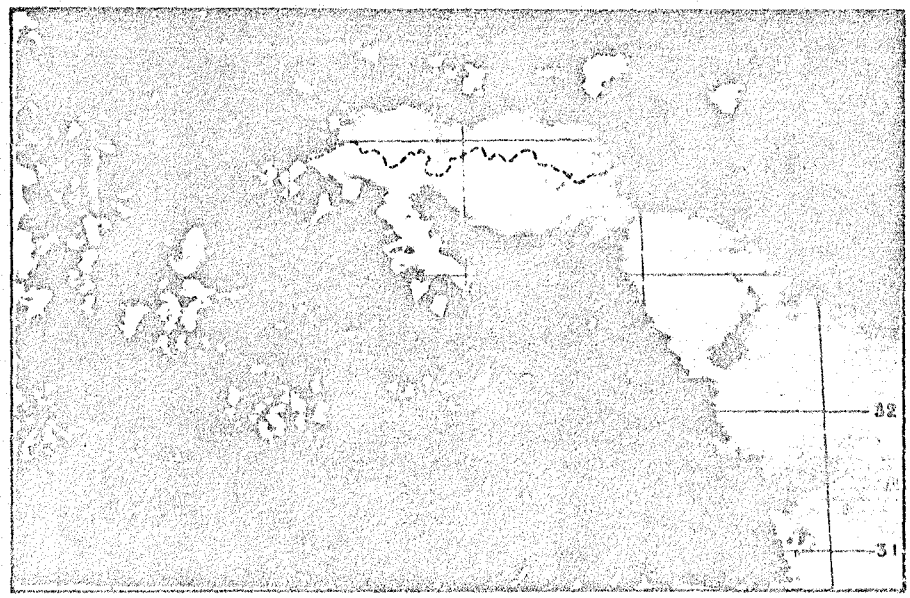

Fig. 1.15 GOES photo at 1835 CDT, showing the growth of thunderstorms oriented in the NW-SE direction through DFW.

Fig. 1.16 An enlargement of the GOES photo at 1805 CDT when the Blue Ridge VOR was beneath the anvil cloud of a large storm.

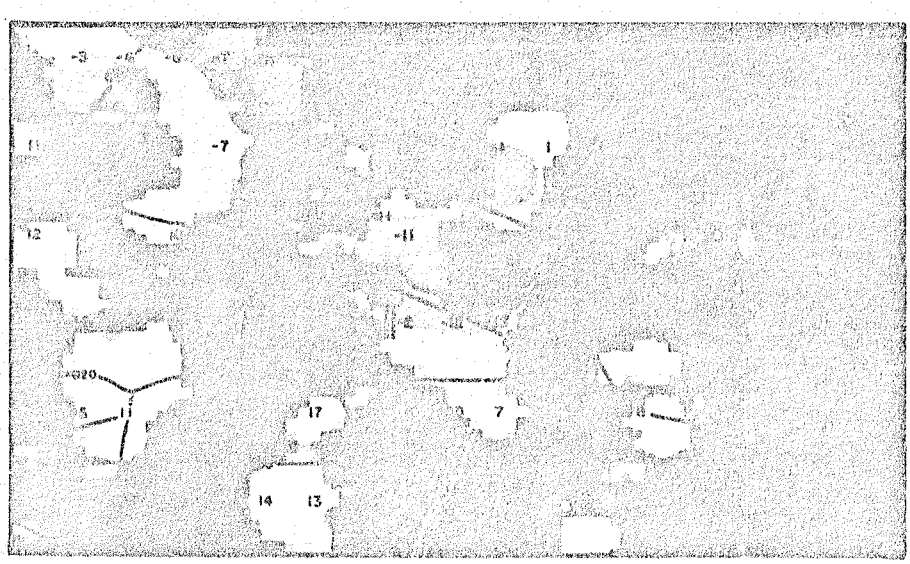

Fig. 1.17 A further enlargement of the GOES photo at 1805 CDT superimposed upon the echoes from the SEP radar (blue) and infrared, cloud-top temperatures (red) in °C. The coldest cloud-top temperature of the DFW thunderstorm was -14°C.

Fig. 1.18 Isotherms of infrared temperatures superimposed upon the GOES photo at 1805 CDT. Isotherms of 0°C or colder temperature are drawn in blue and those warmer than 0°C are in red.

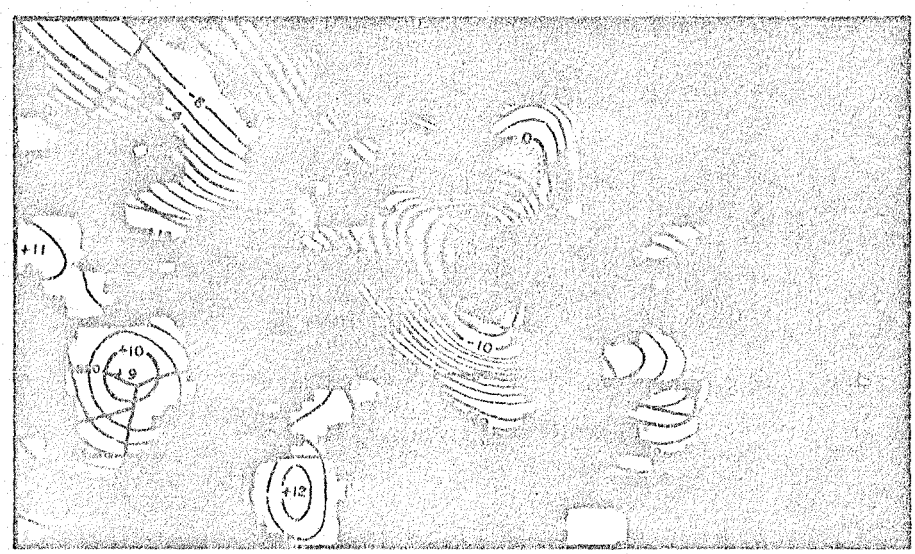

Fig. 1.19 An enlargement of the 1805 CDT photo superimposed upon isotherms at 2°C interval and SEP radar echoes. The location of the DL 191 microburst is shown by the black circle on the glideslope of Runway 17L.

Figures 1.16 and 1.18 present enlarged views of the GOES photo at 1805 CDT in Fig. 1.14. The cloud-top temperature of the large thunderstorm north of the Blue Ridge VOR was -69°C, while that of a relatively small thunderstorm northeast of DFW was -14°C. These GOES photos were enlarged further in Figs. 1.17 and 1.19, which are superimposed upon SEP radar echoes and infrared temperatures and their isotherms.

A schematic view of these large (N of Blue Ridge) and relatively small (NE of DFW) thunderstorms in Fig. 1.20 shows their differences in both size and height. The former was 50,000' tall, while the latter was only 23,000' tall according to two independent estimates based on the shadow length in Table 1.2 and on the infrared temperatures in Fig. 1.17.

Table 1.2 Computation of cloud-top heights based on the shadow length (S.L.) measured on satellite pictures.

Local Time	1735 CDT	1805 CDT	1835 CDT
S.L. of cumulus cloud base	12,000'	18,000'	26,000'
AGL height of cumulus cloud base	6,000'	6,000'	6,000'
Ratio of above	2.0	3.0	4.3
S.L of the DFW thunderstorm	---	68,000'	110,000'
AGL height of the cloud top	---	23,000'	26,000'

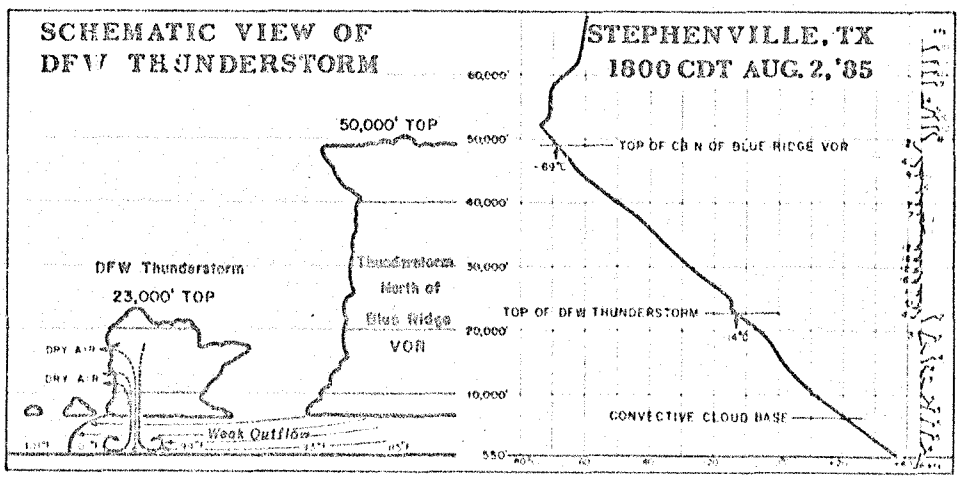

Fig.1.20 A view of the DFW thunderstorm which is dwarfed by a giant thunderstorm north of Blue Ridge VOR. The Stephenville sounding was made by the NWS 75 n.m. southwest of DFW Airport.

Fig. 1.21 A stretching vortex of a microburst made visible by a swirling dust cloud at Provo, Utah. Note that the dust cloud in the right photo, taken 12 seconds later, was descending rapidly toward the ground. Photos were taken from I-55 at 1915 MDT on July 6, 1985 looking northeast by Mr. Duane Stiegler, SMRP, The University of Chicago.

Microburst-inducing small thunderstorms are not as rare as people suspected years ago. They are reported just about everywhere. Four weeks before the DL 191 accident, a swirling dust cloud was photographed 2 miles east of Provo, Utah Airport (Fig. 1.21). On May 11, 1985 a microburst-inducing, small thunderstorm was photographed at Idaho Falls, Idaho (Fig. 1.22).

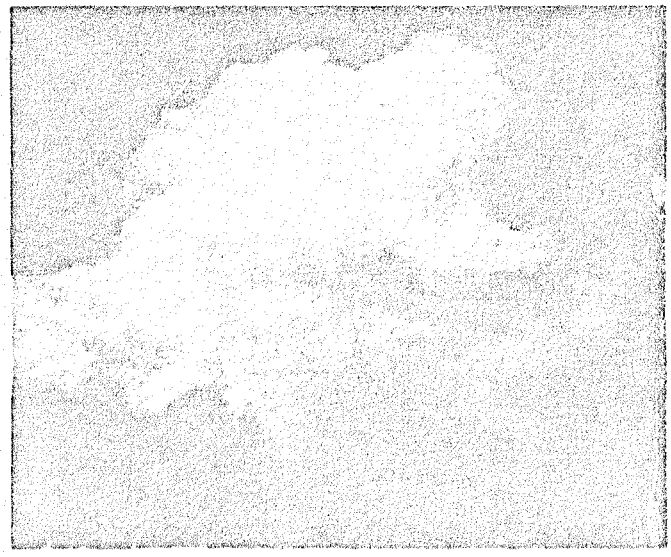

Fig. 1.22 An entire view of a small thunderstorm which induced a 59-mph peak wind at KIFI TV, Idaho Falls, Idaho. Photo looking ENE at 1832 MDT by Mr. Dave Miller, KIFI TV, Idaho Falls, Idaho.

Chapter Two

Analysis of Delta 191 DFDR Readout

The purpose of analyzing the Digital Flight Data Recorder (DFDR) readout is to reconstruct the Delta 191 positions and attitudes in conjunction with the environmental winds penetrated by the aircraft. A major problem in achieving this task is to match the resolutions of the various readout parameters, some of which were measured four times a second, while others were measured once every two seconds.

2.1 Plots of the DFDR Readout

DFDR readout values from Delta 191 were measured at 64 data gates each second. Since it is not practicable to perform integrations at 1/64 second time steps, eight data gates were grouped together in the order of their recording sequence into one of the eight time groups in each second. Table 2.1 presents the data gates including each time group.

Table 2.1 Time-group assignments of the DL 191 DFDR readout values. The longitudinal acceleration, for example, measured at 0/8, 2/8, 4/8, and 6/8 second past each second.

TIME LAG	DATA GATE		SYMBOLS		PARAMETERS
0	1	L	LONG	4	LONGITUDINAL ACCELERATION (g)
	2		HEAD	1	TRUNCTIC HEADING (deg)
	3		.....	...	.....
	4	H	ALTP	1	PRESSURE ALTITUDE FINE (ft)
	5		.....	...	.....
	6		.....	...	.....
	7		.....	...	.....
	8		CPPL	1	PITCH CONTROL COLUMN POSITION CAPTAIN (deg)
1	9		SPO LS	1	SPOILER POSITION LEFT NO 6 (deg)
	10		.....	...	.....
	11	Q,	AOA L	2	ANGLE OF ATTACK LEFT (deg)
	12		SPO1,8 LEF	1	SPOILER POSITION LEFT NO 8 (deg)
	13	N	VER G	4	VERTICAL ACCELERATION (g)
	14		.....	...	.....
	15	M	LAT G	4	LATERAL ACCELERATION (g)
	16		CWPL	1	WHEL CONTROL WHEEL CAPTAIN (deg)
2	17	Φ	ROLL	1	ANGLE OF ROLL, LEFT WING UP POSITIVE (deg)
	18	L	LON G	4	LONGITUDINAL ACCELERATION (g)
	19		IAS	1	INDICATED AIRSPEED (kts)
	20		AIL LO	1	AILERON POSITION LEFT OUTBOARD (deg)
	21		FLA 1	0.5	FLAP POSITION LEFT NO 1 (deg)
	22		.....	...	.....
	23		ALT G	0.25	ALTITUDE COARSE (ft)
	24		RPP	2	RUDDER PEDAL POSITION (inches)
3	25	Q,	AOA R	2	ANGLE OF ATTACK RIGHT (deg)
	26		.....	...	.....
	27		RUD	1	RUDDER POSITION (deg)
	28		.....	...	.....
	29	N	VER G	4	VERTICAL ACCELERATION (g)
	30		.....	...	.....
	31	M	LAT G	4	LATERAL ACCELERATION (g)
	32		AIL LI	1	AILERON POSITION LEFT INBOARD (deg)

TIME LAG	DATA GATE		SYMBOLS		PARAMETERS
4	33	L	EPR	0.25	ENGINE PRESS RE RATIO, NO 1 OF 3
	34		LON G	4	LONGITUDINAL ACCELERATION (g)
	35		.....	...	.....
	36		SPO RR	0.5	SPOILER POSITION RIGHT NO 6 (deg)
	37		.....	...	.....
	38		.....	...	.....
	39		FLA R1	0.5	FLAP POSITION LEFT NO 1 (deg)
	40		SLAT	0.5	SLAT POSITION RIGHT (deg)
	41		STAB	1	STABILIZER POSITION (deg)
5	42		.....	...	.....
	43		PITCH	1	PITCH CONTROL COLUMN POSITION (deg)
	44		.....	...	.....
	45	Q,	AOA R	2	ANGLE OF ATTACK (deg)
	46	N	VER G	4	VERTICAL ACCELERATION (g)
	47		CWPO	1	WHEL CONTROL WHEEL FIRST OFFICER (deg)
	48	M	LAT G	4	LATERAL ACCELERATION (g)
	49		AIL WO	1	AILERON POSITION LEFT OUTBOARD (deg)
6	50		.....	...	.....
	51	L	LON G	4	LONGITUDINAL ACCELERATION (g)
	52	P	PITCH	1	PITCH ATTITUDE (deg)
	53		THPM L	0.5	THRUST RATING POSITION LEFT ENGINE (deg)
	54		.....	...	.....
	55		.....	...	.....
	56		THPM R	0.5	THRUST RATING POSITION RIGHT ENGINE (deg)
	57		IAS	1	STATIC AIR TEMPERATURE (°)
	58		SPO1	1	SPOILER POSITION (deg)
7	59	Q,	AOA R	2	ANGLE OF ATTACK (deg)
	60		.....	...	.....
	61		RUD	1	RUDDER POSITION (deg)
	62		.....	...	.....
	63	N	VER G	4	VERTICAL ACCELERATION (g)
	64		.....	...	.....
	1	M	LAT G	4	LATERAL ACCELERATION (g)
	2		AIL R	1	AILERON POSITION RIGHT INBOARD (deg)

Figure 2.1 presents an example of the DFDR parameters plotted with the time group shown in Table 2.1. Of a large number of parameters, only ALTF, SAT, PITCH, AOA, ROLL, and IAS were chosen to be presented in this figure. The drop in the static air temperature indicates a cold-air penetration; indicated airspeed drops suggest tailwind encounters; etc.

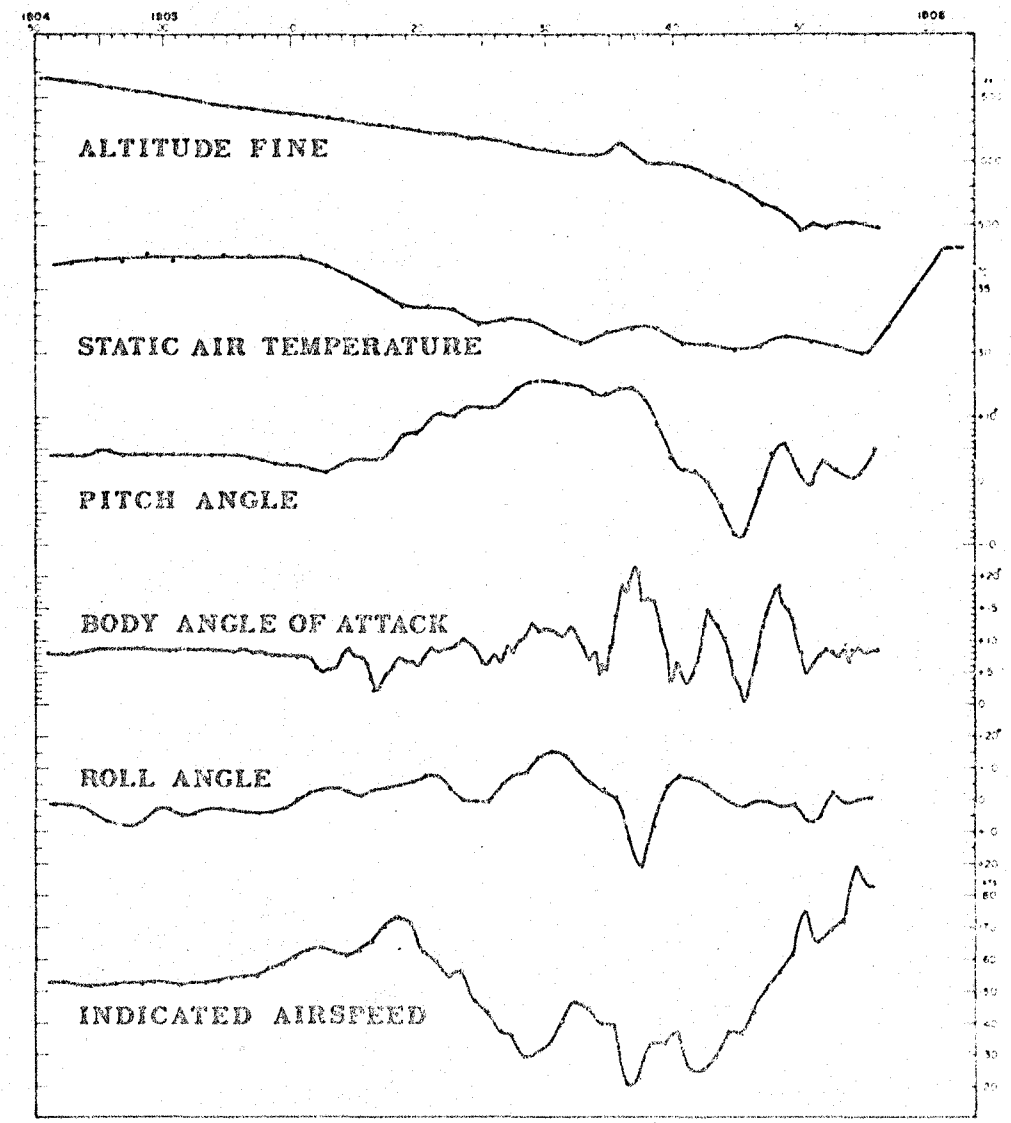

Fig. 2.1 Plots of selected DFDR parameters shifted with proper time lags.

2.2 Aircraft, Earth, and 17L Coordinates

The three axes of the aircraft coordinates in Fig. 2.2 change their orientations when an aircraft pitches, rolls, and changes its heading. Consequently, the vertical acceleration in the DFDR readout does not always point toward the local vertical.

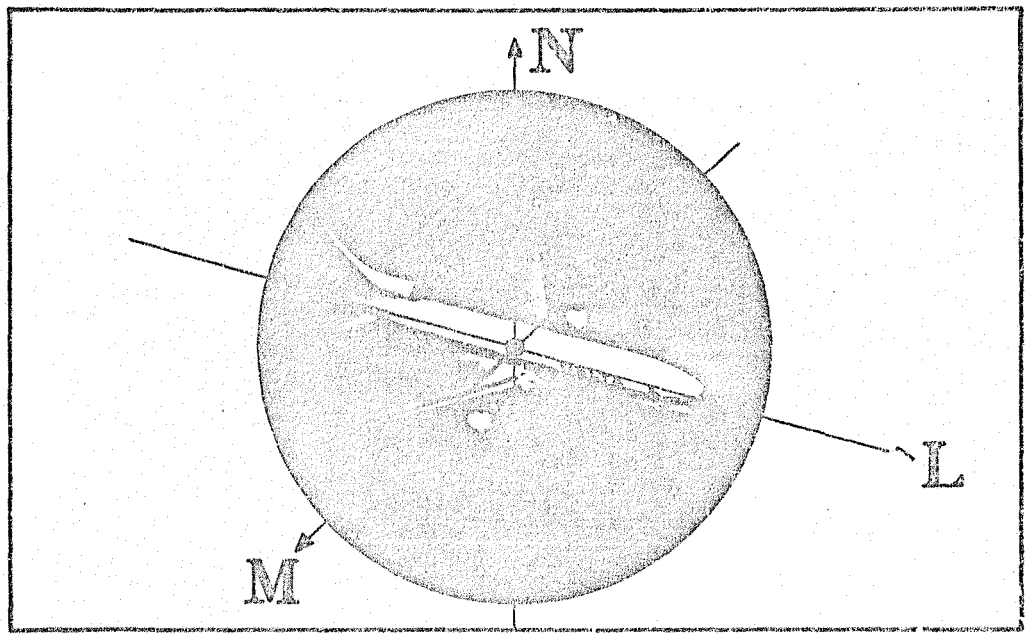

Fig. 2.2 Aircraft coordinates consisting of L (longitudinal), M (lateral), and N (normal) axes. These axes are superimposed upon a model of the Delta Air Lines L-1011 aircraft. This model was built by Mr. Brian Smith of the University of Chicago.

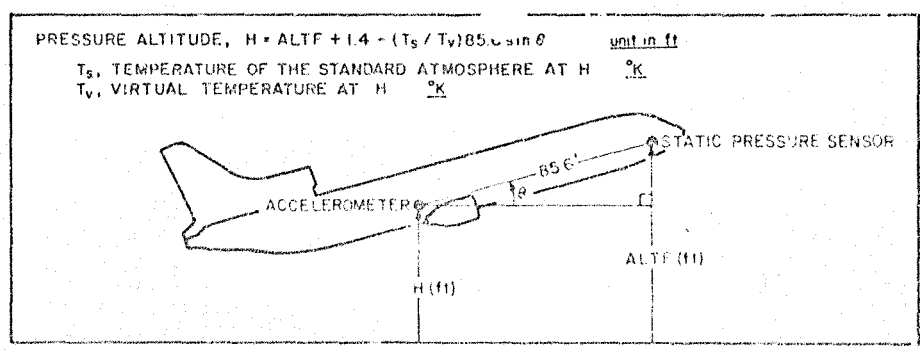

Fig. 2.3 Computation of the pressure altitude, H by correcting the difference in the locations of the pressure sensor and the accelerometer.

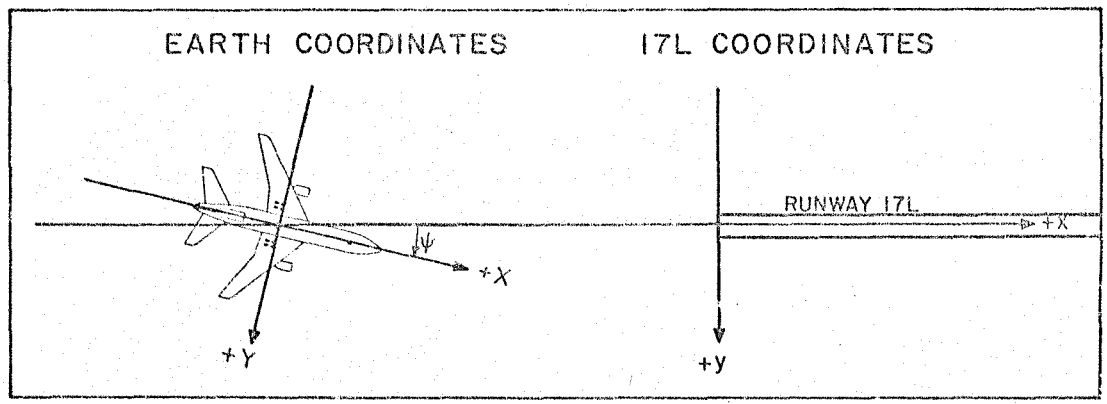

Fig. 2.4 Earth coordinates and 17L coordinates.

The "earth coordinates" consists of the Z-axis pointing toward the local zenith at the accelerometer, the X-axis points toward the aircraft heading, and the Y-axis is perpendicular to the X-axis. Both X- and Y-axes are included in the horizontal plane through the accelerometer.

The "17L coordinates" consists of the z-axis pointing toward the local zenith at the Runway 17L threshold (See Fig. 2.4), the x-axis pointing toward the south along the runway center line with its true heading of 180.26°, and the y-axis, perpendicular to the x-axis. Both x- and y-axes are included in the horizontal plane. The origin of the 17L coordinates may be chosen at any height on the z-axis.

2.3 Acceleration, Velocity, and Distance Traveled

In order to compute the velocity and the distance traveled by the aircraft, the three accelerations on the aircraft coordinates (L,M,N) were transformed into those on the earth coordinates (X,Y,Z). The equations of transformation derived by solving the spherical triangles in Fig. 2.5 are

$$\ddot{X} = \ddot{L}\cos\theta + \ddot{M}\sin\theta\sin\phi - \ddot{N}\sin\theta\cos\phi \qquad (2.1)$$

$$\ddot{Y} = \ddot{M}\cos\phi + \ddot{N}\sin\phi \qquad (2.2)$$

$$\ddot{Z} = \ddot{L}\sin\theta - \ddot{M}\cos\theta\sin\phi + \ddot{N}\cos\theta\cos\phi - 1 \qquad (2.3)$$

where double dots denote acceleration along the coordinate axis. The unit in these equations is "g", the gravitational acceleration.

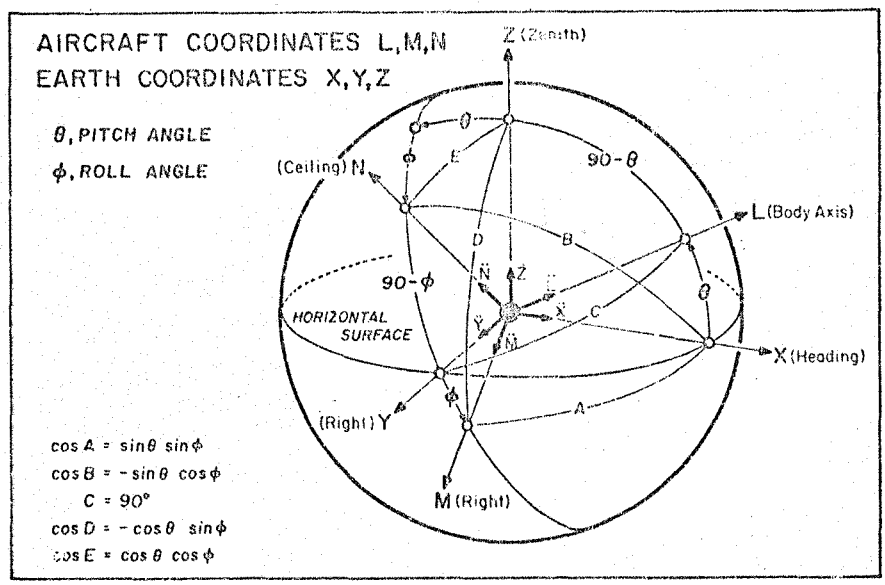

Fig. 2.5 The aircraft coordinates (L,M,N) in red and the earth coordinates (X,Y,Z) in blue.

For computing aircraft positions relative to Runway 17L, the three accelerations on the earth coordinates were transformed into the 17L coordinates by

$$\ddot{x} = \ddot{X}\cos\psi - \ddot{Y}\sin\psi \tag{2.4}$$

$$\ddot{y} = \ddot{X}\sin\psi + \ddot{Y}\cos\psi \tag{2.5}$$

$$\ddot{z} = \ddot{Z} \tag{2.6}$$

where ψ is the aircraft heading measured clockwise from the 17L heading. (180.26° true). The magnetic deviation at DFW on August 2 1985 was 7.02°.

Three-component velocities and positions of the aircraft were computed from

$$\dot{x} = \dot{x}_0 + \int_0^t \ddot{x}\,dt \quad \text{and} \quad x = x_0 + \int_0^t \dot{x}\,dt \tag{2.7}$$

$$\dot{y} = \dot{y}_0 + \int_0^t \ddot{y}\,dt \quad \text{and} \quad y = y_0 + \int_0^t \dot{y}\,dt \tag{2.8}$$

$$\dot{z} = \dot{z}_0 + \int_0^t \ddot{z}\,dt \quad \text{and} \quad z = z_0 + \int_0^t \dot{z}\,dt \tag{2.9}$$

where a single dot denotes the velocity along a specific axis. $\dot{x}_0, \dot{y}_0, \dot{z}_0$ are initial velocities and x_0, y_0, z_0 are initial positions determined by ATC radar positions along with input biases.

2.4 Computation of Three-dimensional Winds

Three-dimensional winds were computed by solving the following equations

$$u = \dot{\hat{x}} - TAS \cos\gamma \cos(\psi + \delta) \tag{2.10}$$

$$v = \dot{\hat{y}} - TAS \cos\gamma \sin(\psi + \delta) \tag{2.11}$$

$$w = \dot{\hat{z}} - TAS \sin\gamma \tag{2.12}$$

where u,v,w are component winds in the x,y,z directions, $\dot{\hat{x}},\dot{\hat{y}},\dot{\hat{z}}$ are ground-relative velocity components, TAS is true airspeed, and γ and δ are the angles computed as functions of pitch angle(θ), roll angle(ϕ), and angle of attack(α), and sideslip angle(β) (See Fig. 2.6).

A number of spherical triangles in succession were solved in computing γ and δ required in determining u,v,w from Eqs. (2.10), (2.11), and (2.12).

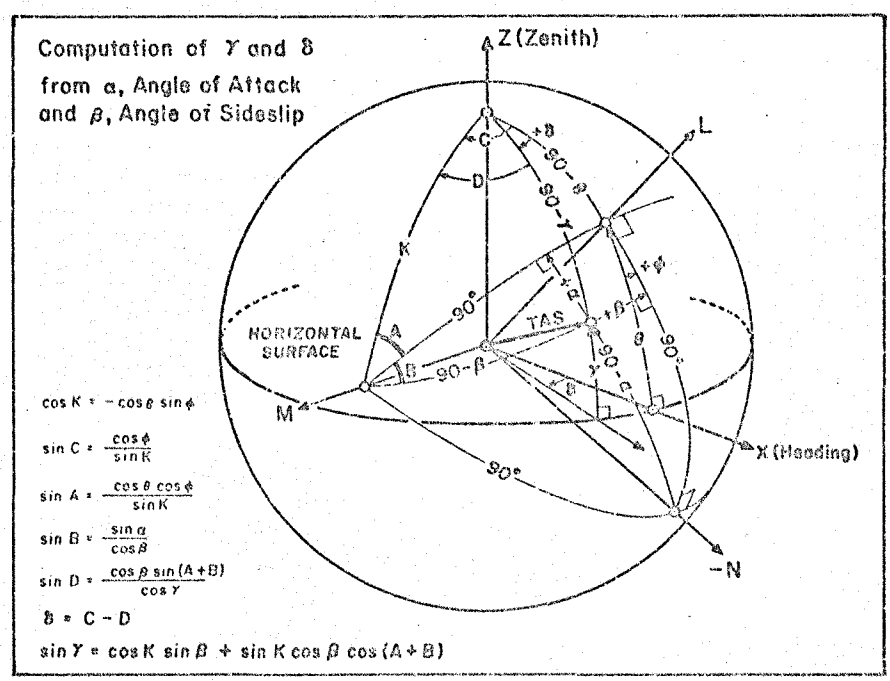

Fig. 2.6 Spherical triangles for computing γ and δ. When sideslip of an aircraft does not exist, as in the case of a straight flight in calm air, γ is obtained by simply subtracting α from θ. While flying through a wind shear, an aircraft receives lateral acceleration which sideslips the aircraft.

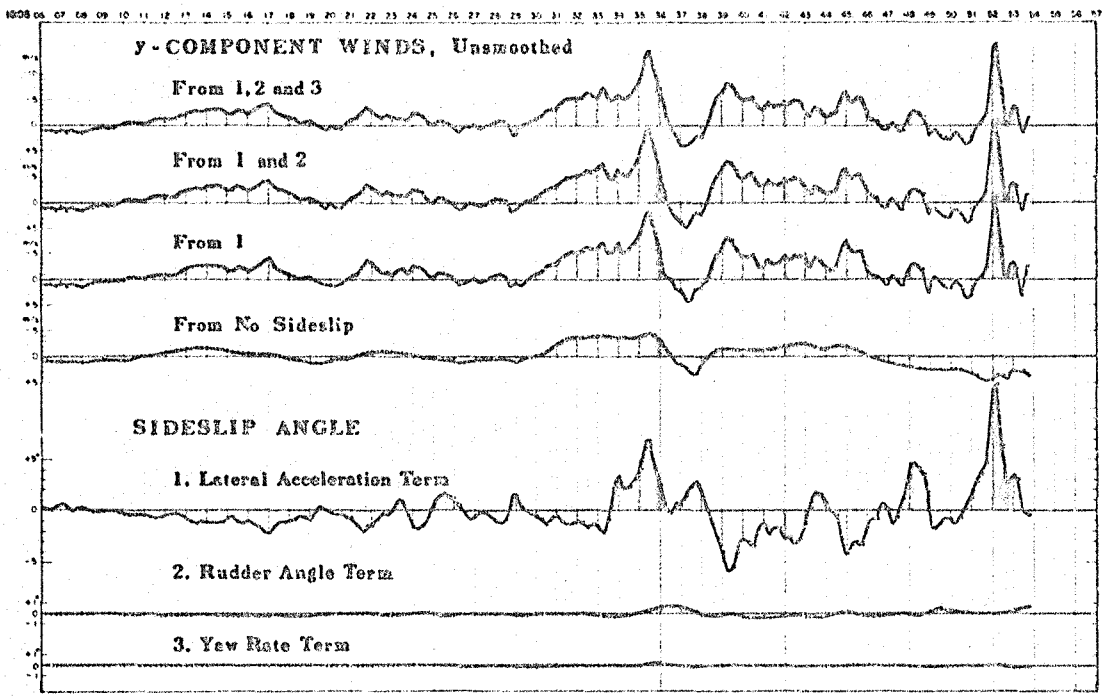

Fig. 2.7 y-component winds computed from β using Term 1, Terms 1 and 2, and Terms 1, 2, and 3. It should be noted that Term 1 is the most important term in computing v-component winds. Effects of Terms 2 and 3 are insignificant.

The sideslip angle β mainly influences δ. Eqs. (2.10), (2.11), and (2.12) indicate that δ influences most significantly the component wind v when γ and ψ are relatively small. Although β includes a number of terms, it can be expressed by the following three terms.

$$\beta = \left[\frac{\ddot{M}\,W}{C_y A \frac{1}{2}\rho_0 CAS^2}\right] + \left[-\frac{C_{RD} RD}{C_y}\right] + \left[-\frac{C_{YR} YR\, b}{C_y 2 TAS}\right] \qquad (2.13)$$

(Term 1) (Term 2) (Term 3)

where parameters are: $\ddot{M}$, lateral acceleration; W, weight of aircraft; A, area of wings; ρ_0, the density of the standard atmosphere at sea level; CAS, corrected airspeed; RD and $C_{RD} = -0.0039\ deg^{-1}$ rudder angle and its coefficient; YR and $C_{YR} = 0.0066\ deg^{-1}$, yaw rate and its coefficient; b, wing span, and TAS, true airspeed. Sideslip coefficient C_y varies between -0.0220 and -0.0265 as the angle of attack increases from 0° to 20°. However, a constant value, $C_y = -0.0220$ used by NASA was adopted in this computation.

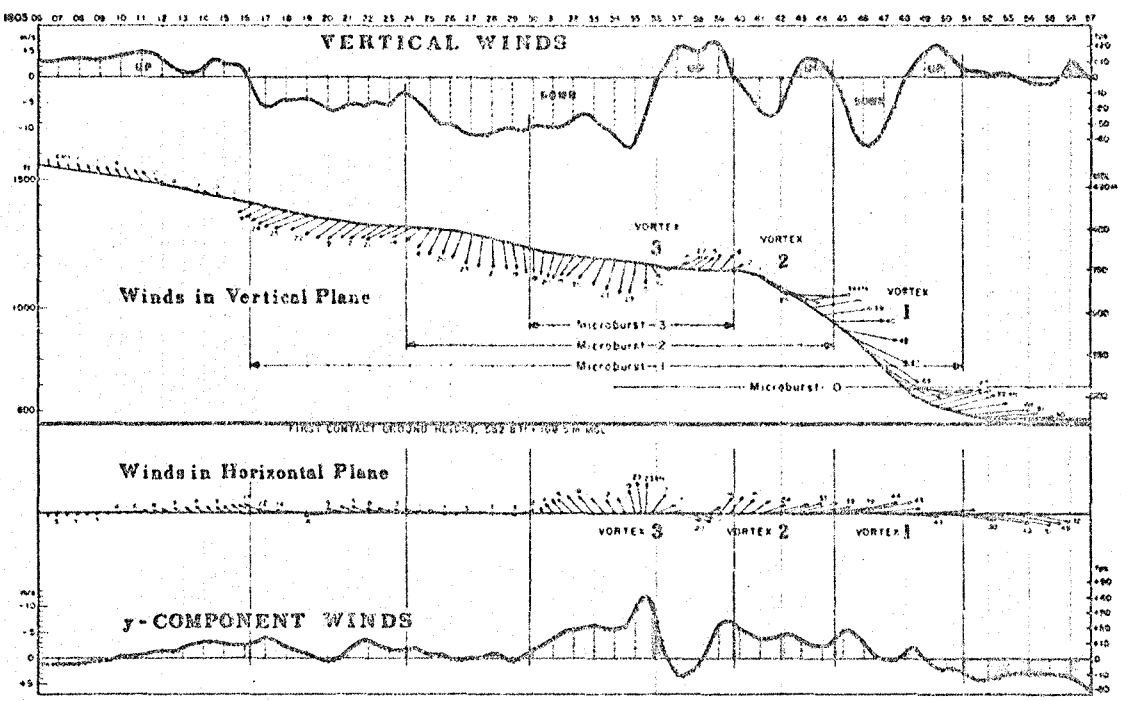

Fig. 2.8 Winds in vertical and horizontal planes plotted as functions of time. The top curve denotes the w-component (vertical) winds and the bottom curve, the y-component winds. Red numbers next to each arrow are total windspeeds in each plane.

The time-domain plots of the computed winds in both vertical and horizontal planes show convincingly that DL 191 encountered severe wind shear systems. According to the author's interpretation, Microburst 3 was the youngest, being located near the center of the overall downflow. Microbursts 2 and 1 are progressively older with Microburst 0, being the oldest, probably several minutes older than Microburst 3.

Each of Microbursts 1, 2, and 3 was accompanied by a roll vortex on the south side, while the parent cloud was moving toward the south rather slowly. Apparently, the aircraft flew through the east side of Microburst 3 across Vortex 3. The aircraft was pushed from right to left. In Vortices 2 and 1, it encountered in succession rapidly changing up- and downflows.

Shortly before the first ground contact, the aircraft entered Microburst 0, the oldest one with very strong outflow winds. It encountered a 51-kt tailwind and the main landing gear contacted the plowed field at 552.8' MSL.

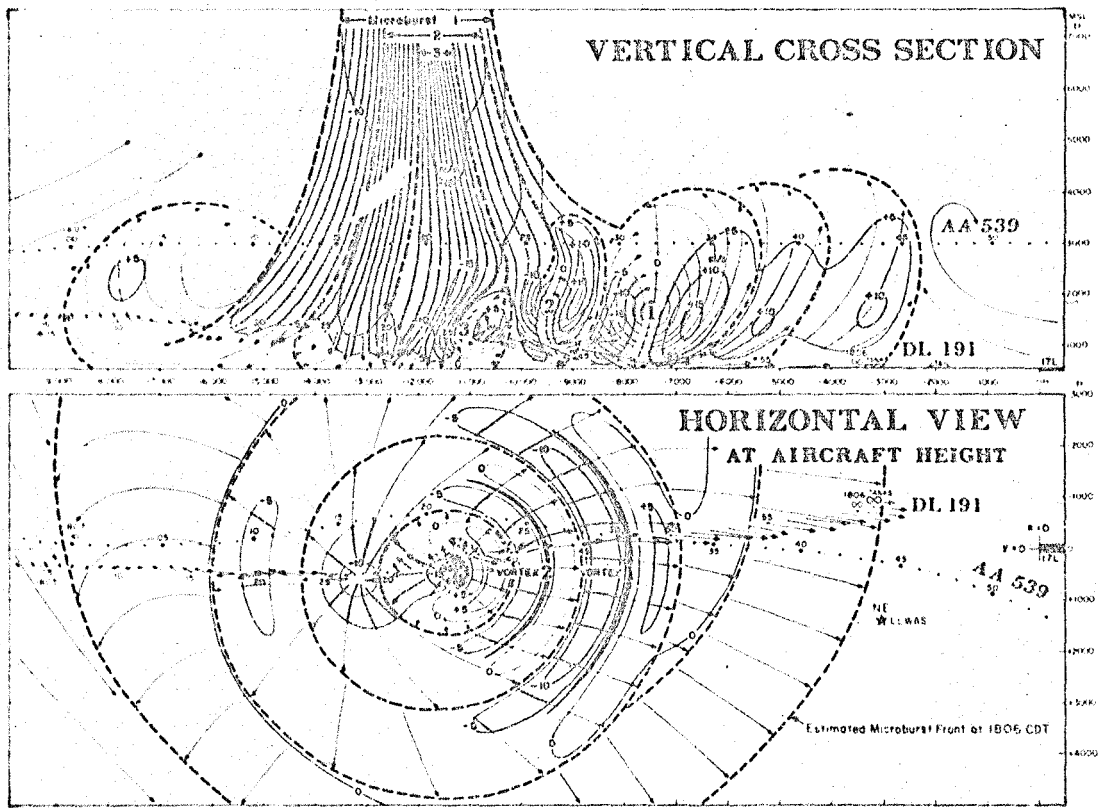

Fig. 2.9 A vertical cross section and a horizontal view of the DL 191 microburst at 1806 CDT on August 2, 1985. This microburst, approximately 16,000' (3.5 km or 1.9 n.m.) in diameter, is characterized by three major Vortices 1, 2, and 3, which are surrounded by an older vortex encircling the overall microburst.

The spatial distribution of the computed winds strongly suggests the existence of semi-ring vortices encircling the downflow region. Vortex 3, being too close to the downflow center, is suspected to have descended along with the downflow shaft. This type of the vortex is called the "descending vortex" in this book. In contrast, Vortices 1 and 2 are called the "stretching vortices" because they form near the ground inside the boundary layer and spin up as they stretch into larger ring vortices.

DL 191 flew 200' to 300' to the east of the center of Microburst 3 (See Figs. 2.8 and 2.9). Approximately one minute later, AA 539 penetrated the microburst at 3,000' MSL during a go-around after the accident. The

Fig. 2.10 A bird's-eye view of the DL 191 microburst at its mature stage. This painting was completed by a number of artists and non-artists based on the author's pencil sketch of the parent cloud and induced microburst winds.

ATC radar track revealed that the aircraft made a slight left turn and progressed through an area almost entirely outside of Microburst 3. During its fly over, AA 539 experienced an upflow above Vortex 2, but its go-around flight was uneventful.

The age of this microburst has not been estimated accurately. However, it will take only 2.5 minutes for a 20 m/s (66 fps or 39 kts) downflow at the center of Microburst 3 to descend from 10,000' AGL to near the ground. To detect microbursts during their descending stages, ground-based anemometers are not adequate, necessitating the development of a terminal Doppler radar capable of detecting automatically this type of wind shear before it reaches the glideslope.

Chapter Three

Energy, Curvature, and Command

Three-dimensional motions of an aircraft can be characterized by its energy. An attempt was made in this chapter to evaluate the variation of the total energy as functions of the engine power, environmental winds, etc.

Other important parameters related to flight path are radius of curvature in both horizontal and vertical planes. Two additional curvatures, curvature of pitch and curvature of heading were defined and computed.

3.1 Kinetic, Potential, and Total Energy

Both kinetic energy and potential energy per unit mass of aircraft were computed from

$$\text{Kinetic energy} = \frac{1}{2}(\dot{x}^2 + \dot{y}^2 + \dot{z}^2) \tag{3.1}$$

$$\text{Potential energy} = g\,(z - z_{lat}) \tag{3.2}$$

where $\dot{x}$, $\dot{y}$, and $\dot{z}$ are three-component velocities of the aircraft and z and z_{lat} are the geometric altitudes (MSL) of the aircraft accelerometer. In this computation, z_{lat} = 567.1' MSL was used.

As expected, the total energy (kinetic energy + potential energy) increases when the engine power (Engine Pressure Ratio in Fig. 3.1) was applied. The rate of increase was overshadowed by other parameters such as upflow and tailwind.

Like a soaring bird gains its potential energy while circling in an updraft, the rate of energy change peaks at A, F, H, and J, where the vertical winds in Fig. 3.2 are positive and maxima. Although the responses are slow, peaks in the tailwind at D, E, and G resulted in small peaks in the rate of the total energy change.

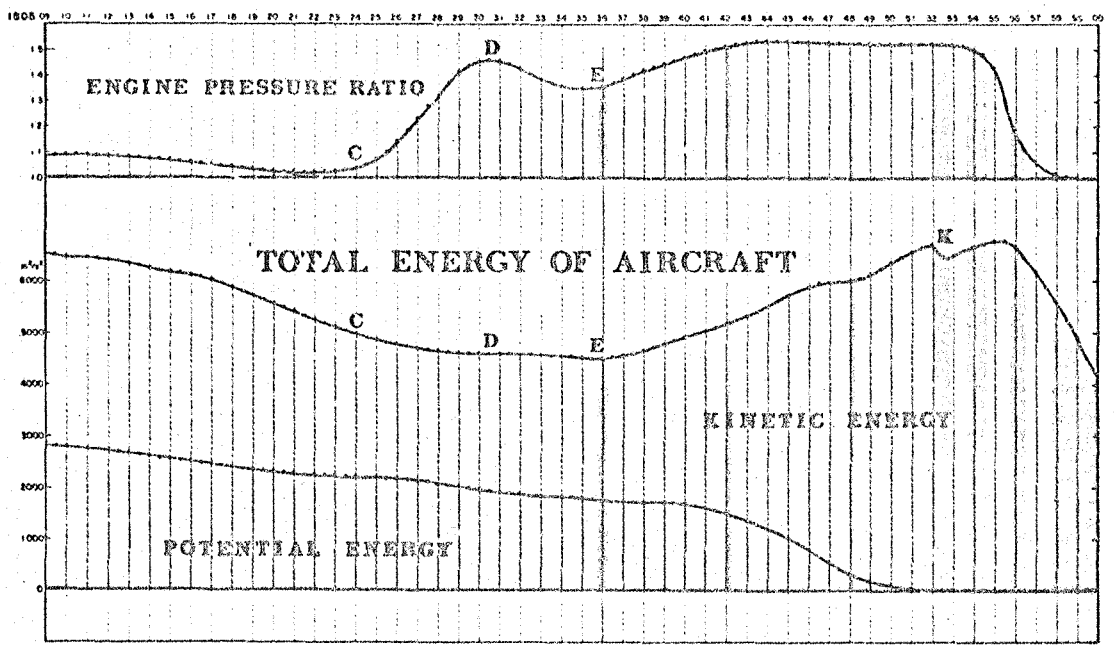

Fig. 3.1 Total energy per unit mass of the DL 191 aircraft.

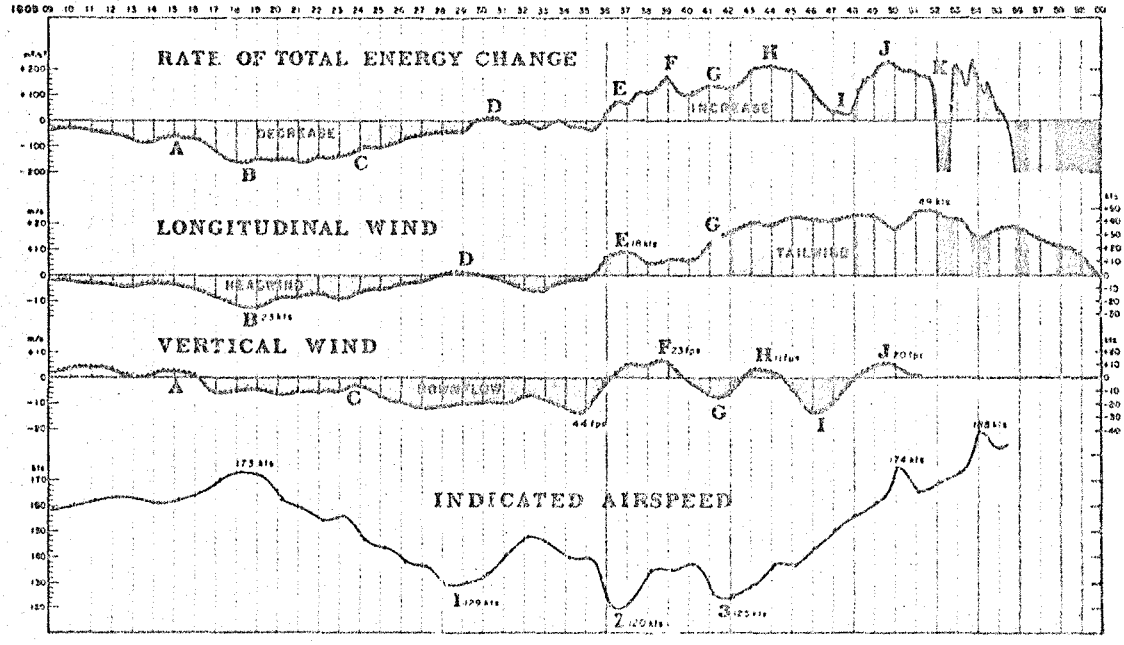

Fig. 3.2 Rate of change in the total energy in relation to longitudinal and vertical winds.

Three minima 1, 2, and 3 of indicated airspeed are associated with the respective tailwind peaks at 1805 CDT 29 sec, 37 sec, and 43 sec. Further investigations of these seven curves presented in Figs. 3.1 and 3.2 will be useful in understanding the nature of the changes in the total energy of an aircraft in a microburst wind shear.

3.2 Roll of Aircraft and Aileron Position

During the microburst traverse, the roll angle of the aircraft varied between -15° and +20°. The +20° roll (right wing "down") occurred when the ALTF (Pressure Altitude Fine) reached a small peak at 1805:36 sec. This increase in ALTF does not imply an increase in the geometric altitude. Instead, the disturbed pressure in Fig. 3.3 shows a significant drop. Evidently, the aircraft flew through an extremely localized low-pressure area.

Under normal circumstances, the static temperature increases during a descent toward the runway. This time, however, the static temperature began falling at 1805:11 sec when the aircraft entered the microburst.

An examination of Fig. 3.4 suggests that the rolling motions of the aircraft were caused by (1) the differential lift forces on the left and right wings induced by an aircraft-sized airflow and (2) the command by the roll control wheel. Numbers 1 through 12 in the figure indicate the turning of the wheel, which caused the changes in the aileron position. There was appproximately 1/4 second time lag between the positions of the control wheel and the ailerons.

The response of the aircraft's roll angle occurred approximately 1 second after the onset of each change in the aileron position. To assist in an easy follow up of the cause and effect relationships of control wheel-aileron-roll angle, command and response angles are shaded with light blue.

A significant change in roll angle at 1805:36 sec from near 0° to +20° was caused by the environmental winds, because the signs of the aileron position and that of the roll angle are opposite from each other. Apparently, the control wheel was rotated in an attempt to reduce the excessive roll of the aircraft caused by the wind. This subject will be discussed in detail in Chapter Four.

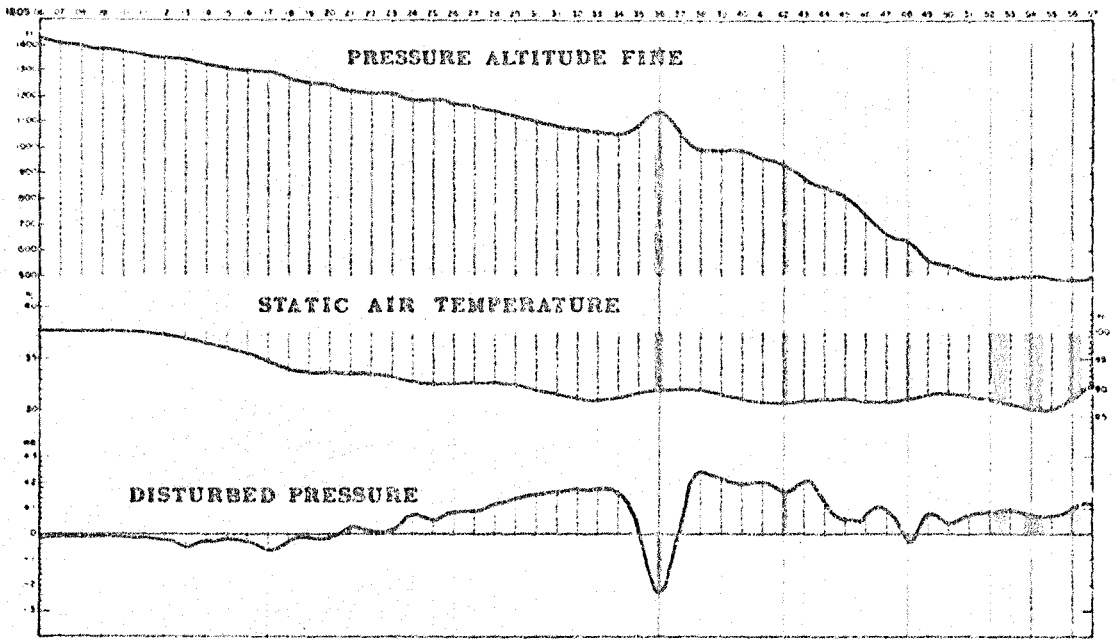

Fig. 3.3 Pressure altitude and pressure disturbances caused by the microburst. Disturbed pressure was computed along the flight path.

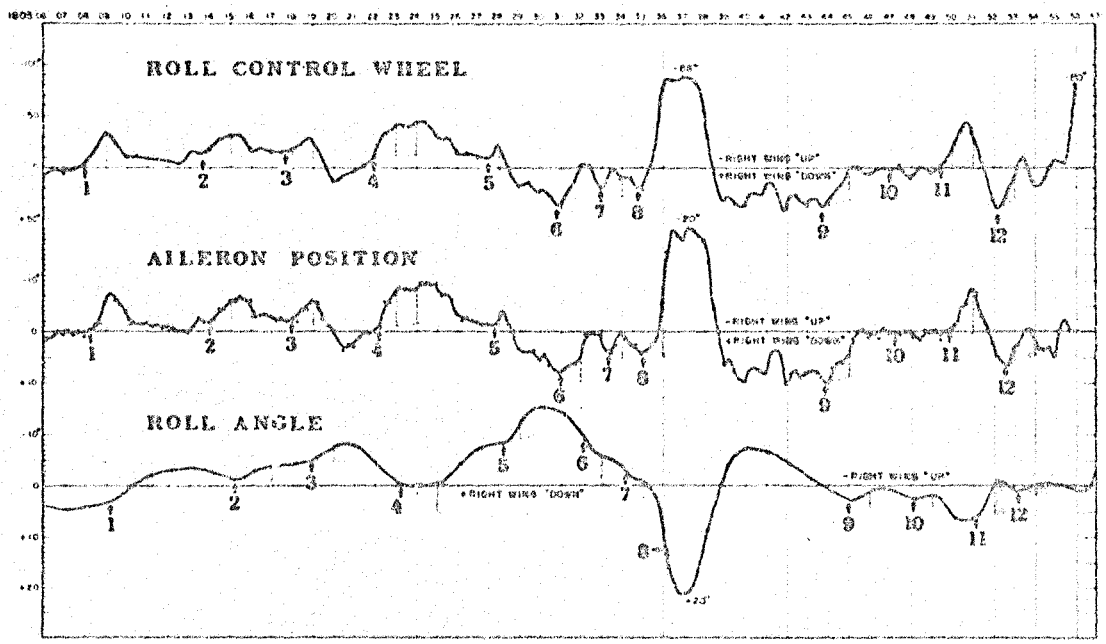

Fig. 3.4 Roll control achieved by the DL 191 pilots during the microburst penetration.

3.3 Vertical Curvature and Curvature of Pitch

A curved flight path in a vertical plane is characterized by the vertical curvature,

$$C_{VER} = \frac{d\eta}{dS} \quad \text{and} \quad R_{VER} = 1 / C_{VER} \tag{3.1}$$

where C_{VER} denotes the curvature in vertical plane, R_{VER} its radius of curvature, η the vertical path angle shown in Fig. 3.5, and S the length along the path.

Replacing η in Eq. (3.1) by θ, we define the "curvature of pitch" by

$$C_{PCH} = \frac{d\theta}{dS} \tag{3.2}$$

The vertical curvature of path is closely related to the variation of vertical winds (See 1, 2, 3, ..., 9 in Figs. 3.6 and 3.7). On the other hand, the curvature of pitch is controlled by the pitch control column which alters the stabilizer position and ultimately, the pitch angle.

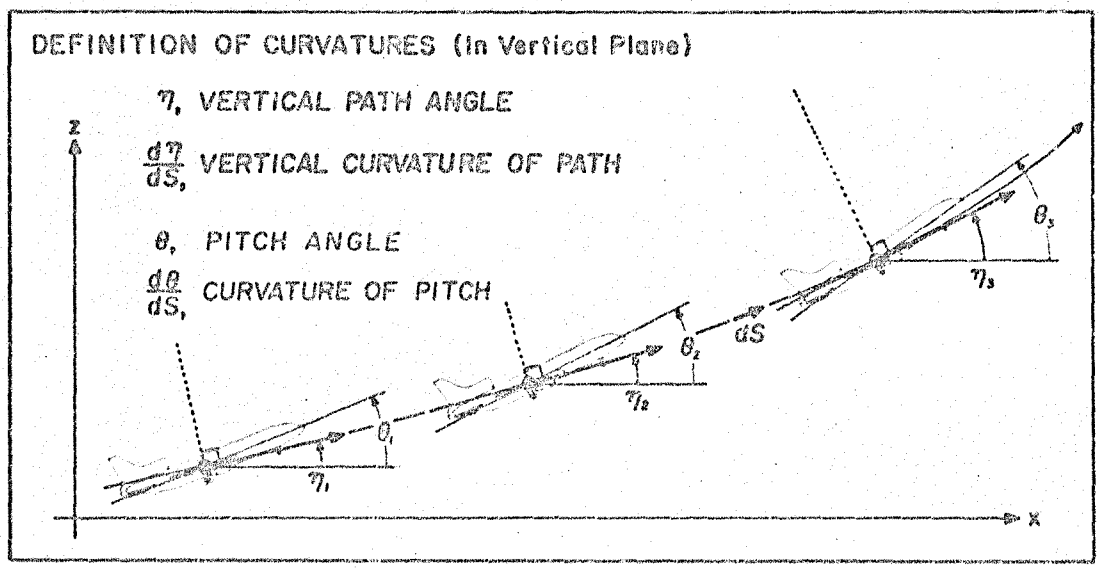

Fig. 3.5 Definition of vertical curvature and curvature of pitch. Both pilots and passengers will sense vertical curvature while in their seats.

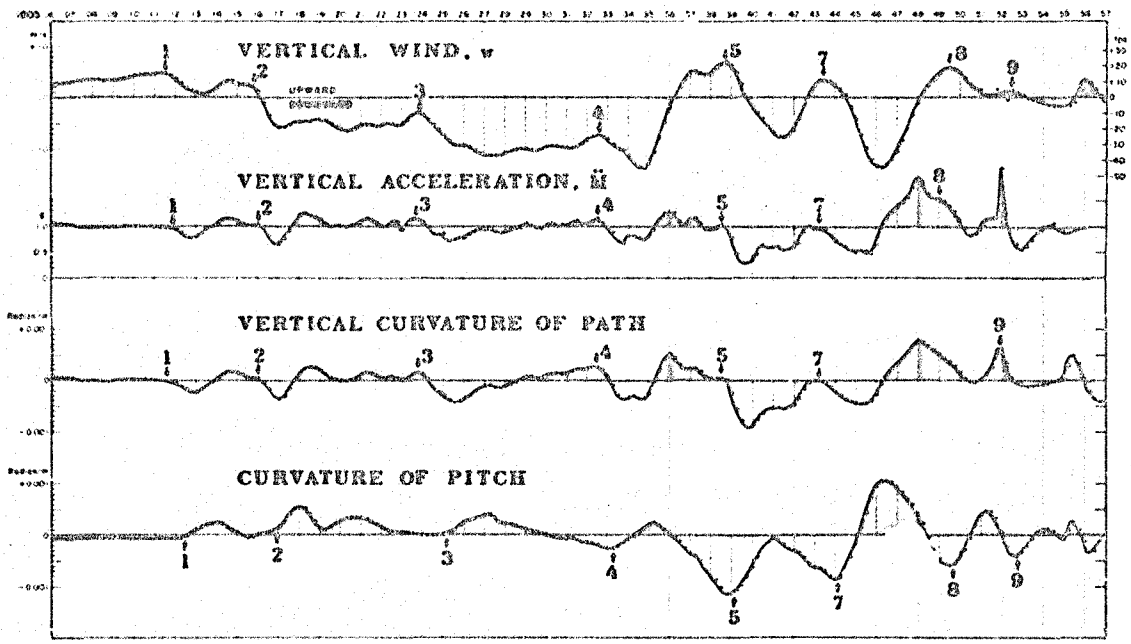

Fig. 3.6 Vertical curvature of path caused predominantly by the environmental vertical winds.

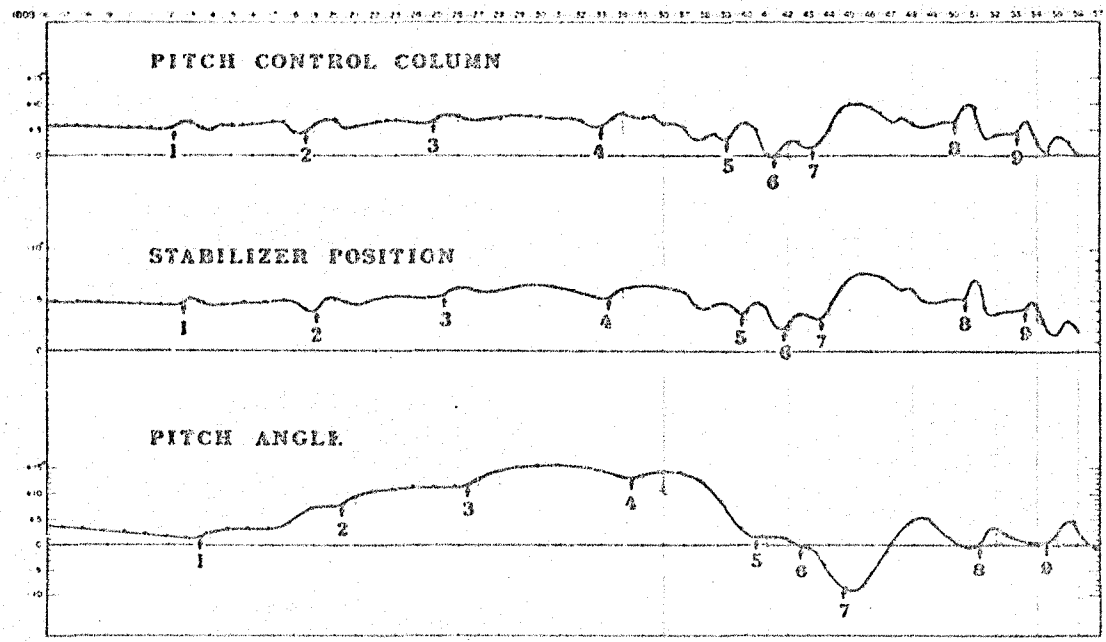

Fig. 3.7 Pitch control achieved by DC 191 pilots during the microburst penetration.

3.4 Horizontal Curvature and Command of Heading

A curved flight path in a horizontal plane is characterized by the horizontal curvature expressed by

$$C_{HOR} = \frac{d\zeta}{dS} \quad \text{and} \quad R_{HOR} = 1 / C_{HOR} \tag{3.3}$$

where C_{HOR} and R_{HOR} are, respectively, the horizontal curvature of path and the radius of curvature (turning radius).

Replacing ζ by ψ, we define the curvature of the heading as

$$C_{HDG} = \frac{d\psi}{dS} . \tag{3.4}$$

In spite of an attempt to relate the horizontal curvature with crosswind, curvature of heading, rudder pedal position, and rudder position, no conclusive relationship is seen in Figs. 3.9 and 3.10.

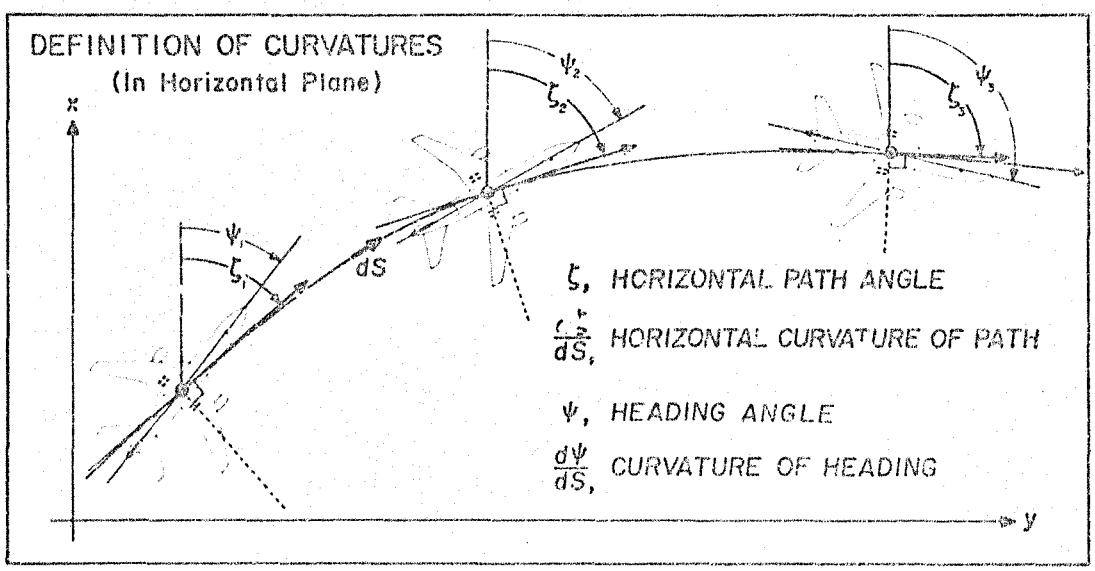

Fig. 3.8 Definition of horizontal curvature of path and curvature of heading. It is expected that pilots sense the horizontal curvature of path and attempt to command heading changes whenever necessary. Crosswinds will induce sideslip and horizontal curvature.

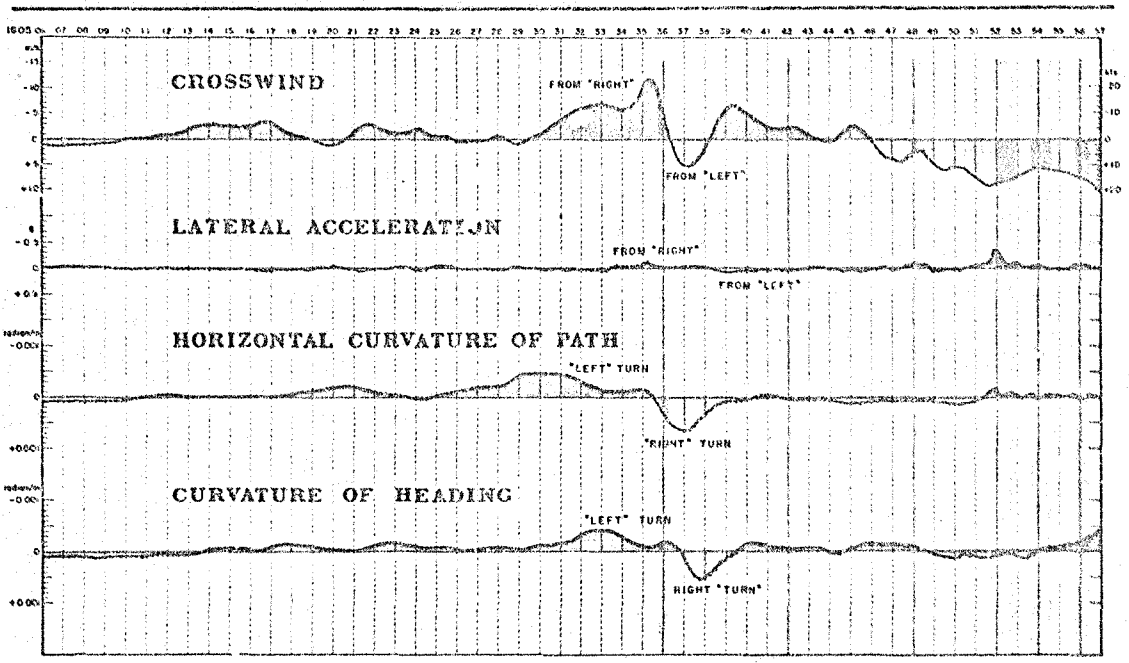

Fig. 3.9 Crosswind and horizontal curvature of path. Detailed study of this diagram by pilots is recommended.

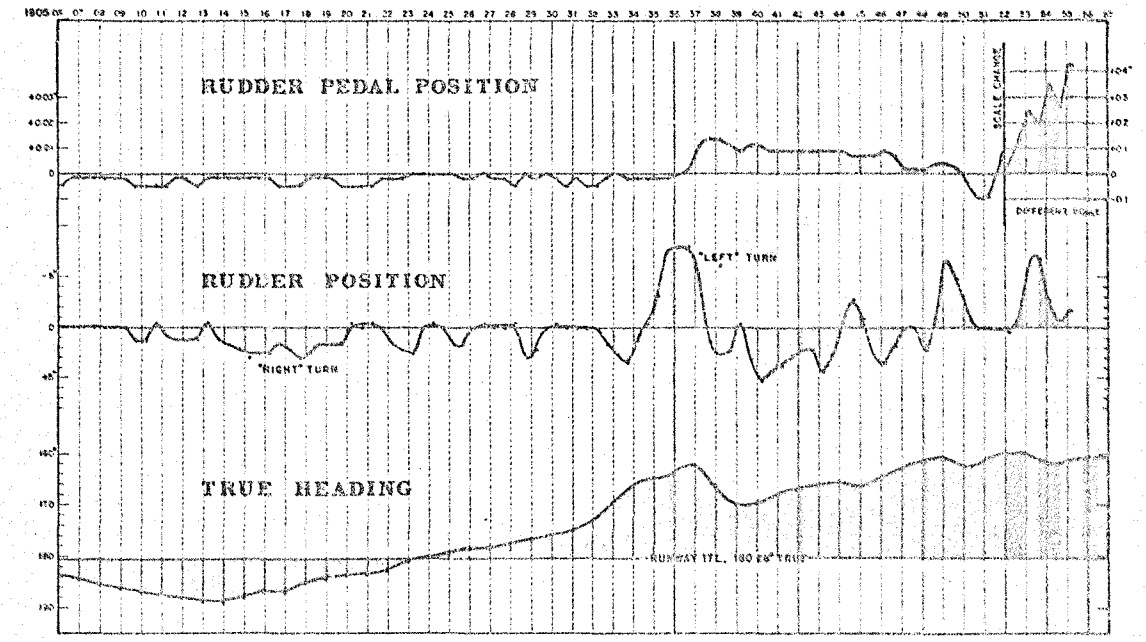

Fig. 3.10 Rudder pedal and rudder positions from DFDR readout. This diagram, along with Fig. 3.9 should be studied by performance analysts.

Chapter Four

Specific Events Experienced

4.1 Penetration of a Descending Vortex

When Delta 191 approached the central region of the microburst, the downflow speed kept increasing (See Fig. 2.8) until the maximum value of 13.9 m/s (26 kts or 44 fps) was reached at 1805:34.7 CDT. 1.5 sec later, the aircraft traversed through a ring vortex which was descending on the south side of the microburst shaft.

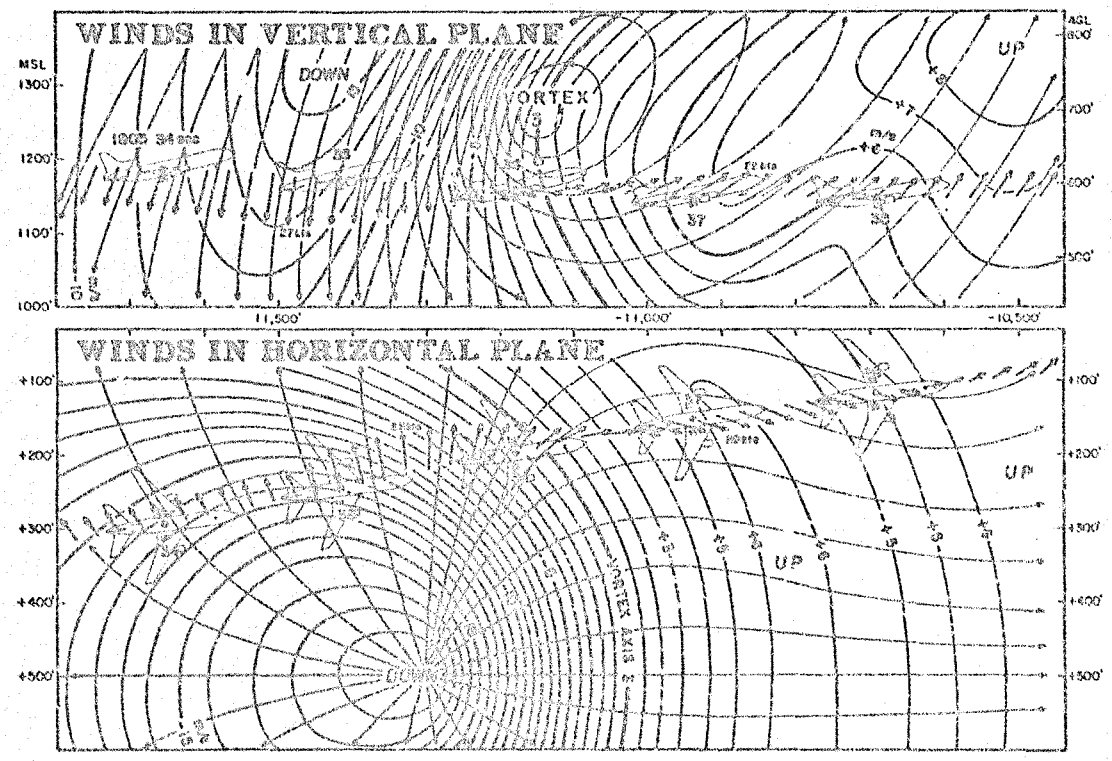

Fig. 4.1 Winds in the vertical and horizontal planes in relation to the path of Delta 191. The aircraft penetrated Vortex 3 (a descending vortex) in an oblique angle.

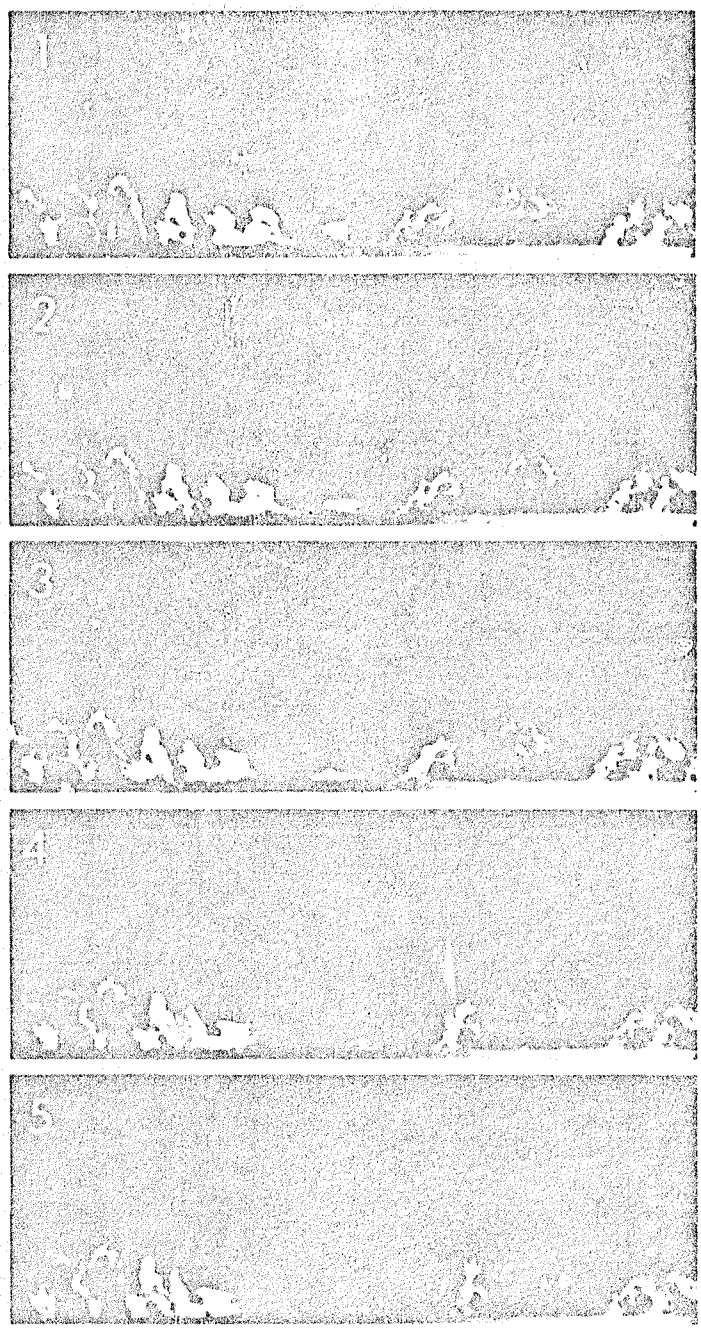

Fig. 4.2 A descending vortex similar to that penetrated by Delta 191. Enlargement of movie frames taken at 64 frames per second at the University of Chicago Laboratory.

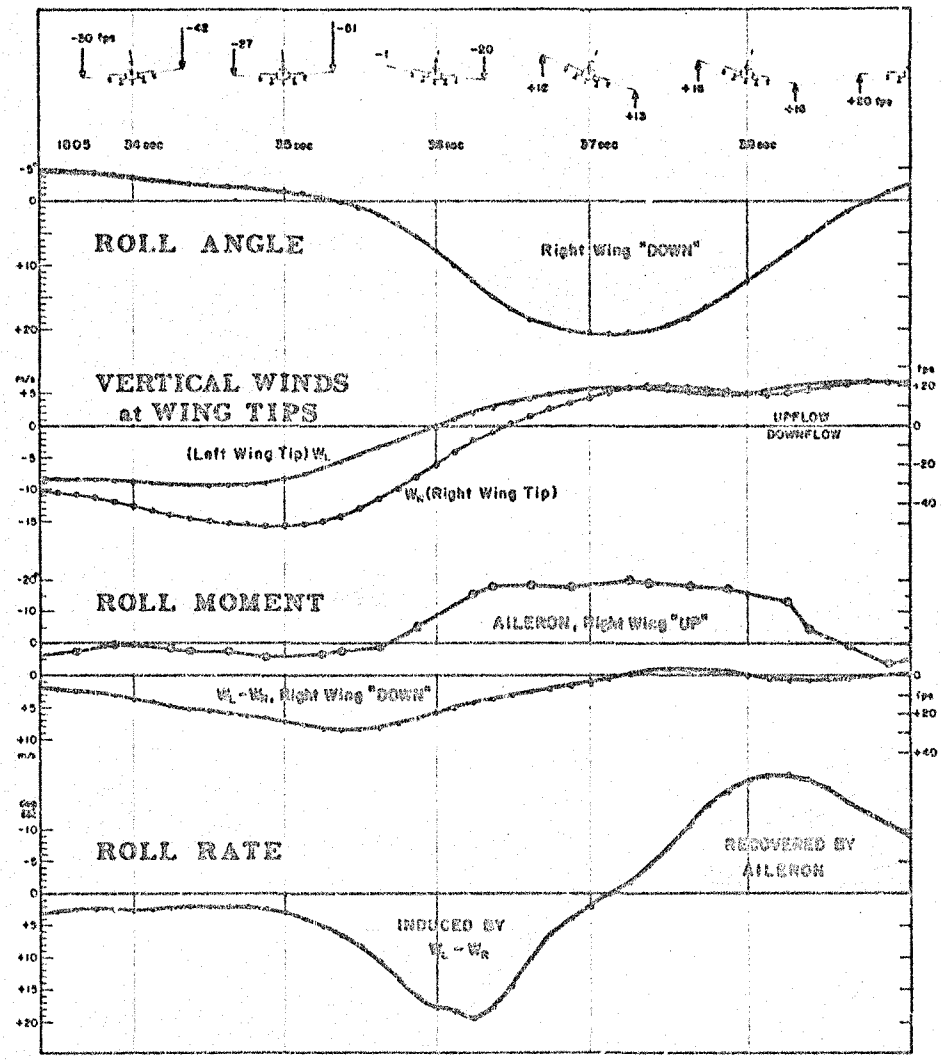

Fig. 4.3 A time sequence of the events which took place during an oblique traverse of a descending vortex by the Delta 191 aircraft.

During the traverse, approximately 100' below the vortex center, the disturbed pressure fell 4.09 mb (+1.78 to -2.31 mb) first, then rose 4.75 mb (-2.31 to +2.44) in about 3 sec. Estimated diameter of the vortex is 500' (150 m) approximately 3 times the wing span of the aircraft.

Figure 4.2 shows vertical views of a descending vortex. It is seen that the vortex is very close to the downflow center and is not symmetric, characterized by a large vortex on the right side, while little or no vortices existed on the left side of the descending microburst shaft.

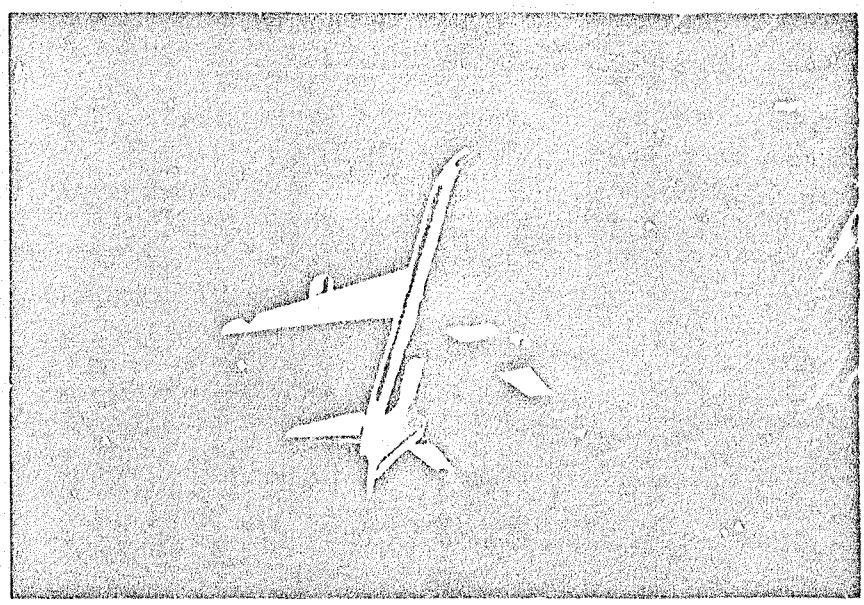

Fig. 4.4 A schematic painting of an aircraft flying near the center of a descending vortex. An oblique traverse of a vortex could result in large differential downflow speeds between the tips of the left and right wings. This illustration was painted by Mrs. Toshiko Arai.

During the traverse of the vortex in an oblique angle, the right wing was in a downflow stronger than that of the left wing, resulting in a positive roll moment which lasted about 4 sec (1805:33 to 37). The roll angle increased by 26° (-6° to + 20°) which was corrected by a command of the aileron. Thus the positive roll rate caused by the vortex winds was counteracted by the control wheel (See Fig. 4.3).

A schematic painting in Fig. 4.4 shows an aircraft flying through a descending vortex. The size of the vortex is approximately three times the wing span of the penetrating aircraft. Depending upon the angle of traverse, an aircraft will receive a large roll moment as well as a lateral acceleration.

4.2 Penetration of Two Stretching Vortices

After completing the traverse through the descending vortex, two more vortices were waiting ahead of the Delta 191 aircraft. Figures 4.5 and 4.6 present the flight paths projected on both horizontal and vertical planes. Apparently, these are the stretching vortices, encircling the overall center of the microburst flow.

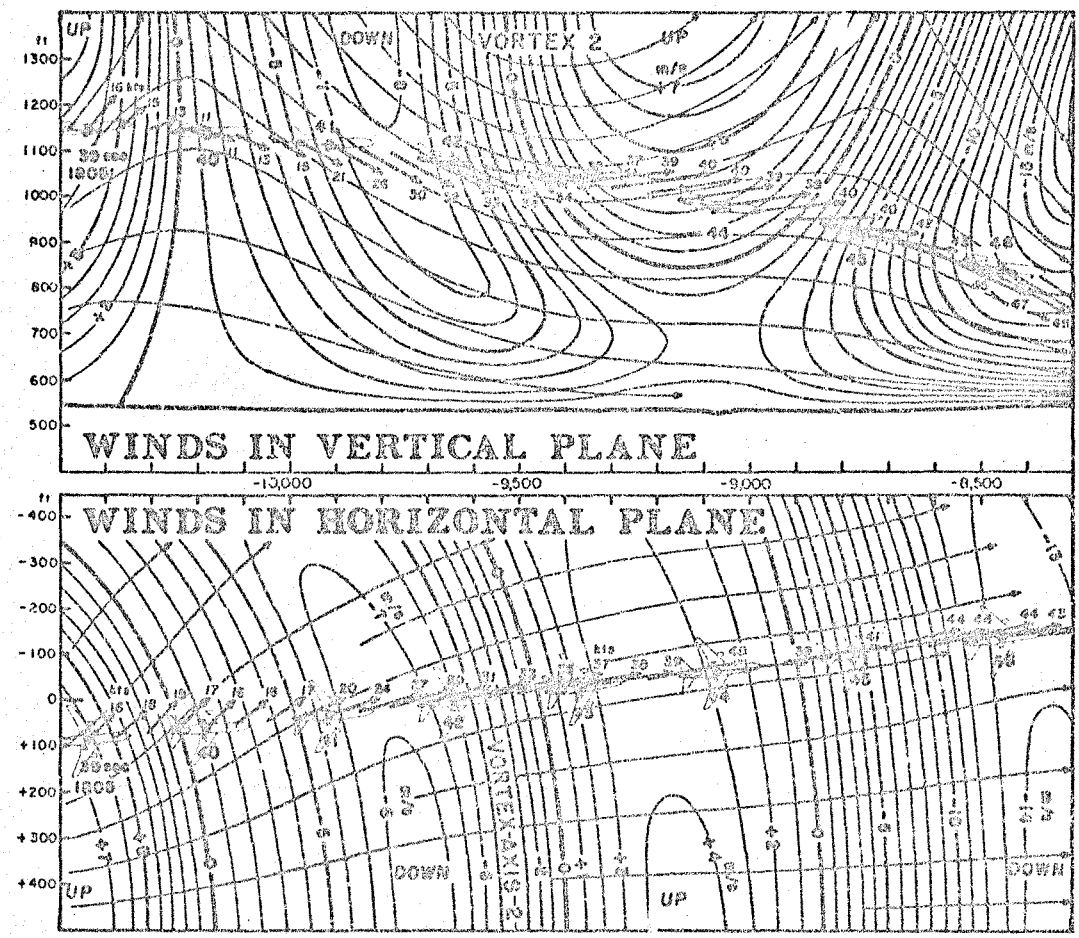

Fig. 4.5 Windfields of Vortex 2 when Delta 191 penetrated between 39 and 46 sec past 1805 CDT. This figure continues to the right-hand page.

The aircraft penetrated Vortex 2 at a right angle (See Fig. 4.5), experiencing a 34-kt downflow/tailwind first, followed by a 40-kt upflow/tailwind. Unlike the Vortex 3 penetration, the aircraft altitude was way below the vortex center, thus showing a very small disturbed pressure.

Unlike the oblique-angle traverse of Vortex 3, both wing tips were not affected by differential downflow speeds. The roll angle of the aircraft remained practically unchanged and the roll control wheel position did not change much during the penetration of Vortex 2 (See Fig. 3.4).

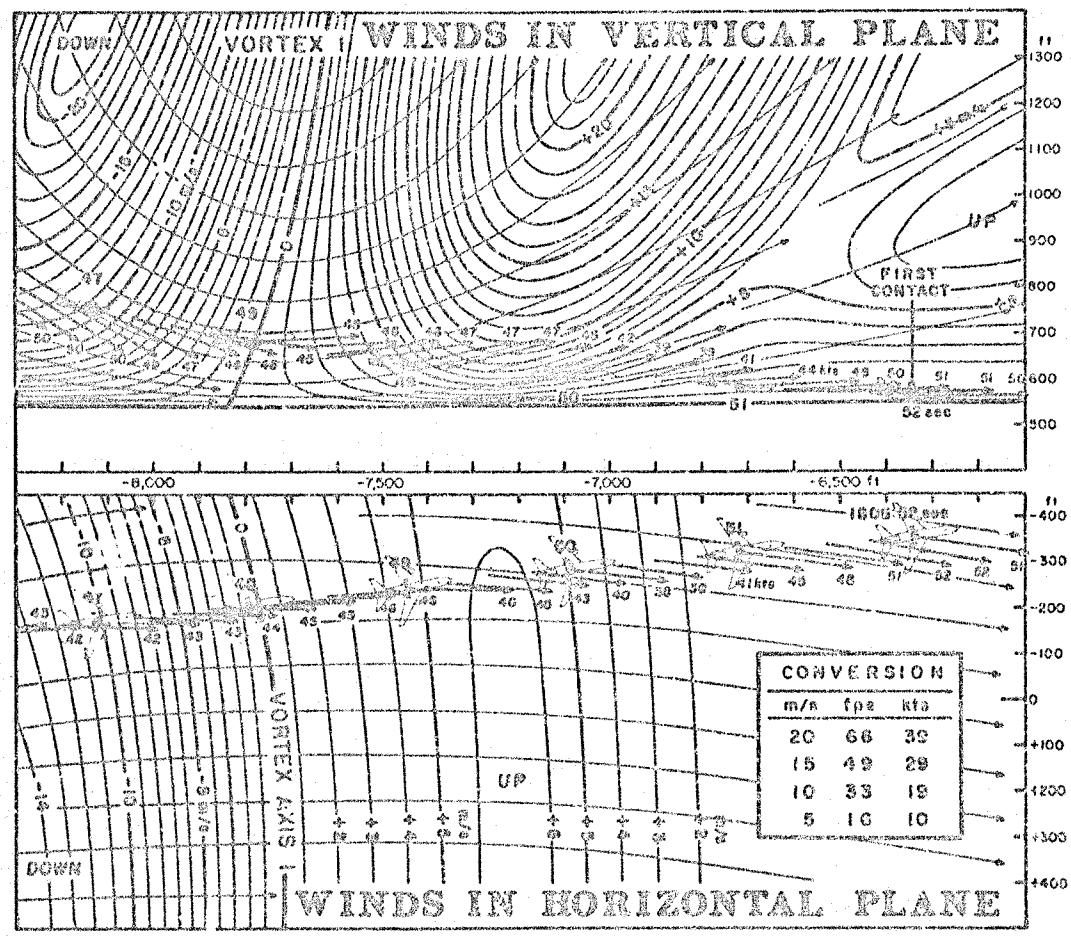

Fig. 4.6 Windfields of Vortex 1 when Delta 191 penetrated between 47 and 52 sec past 1605 CDT. The first contact occurred at 1605:52.

The second stretching vortex, Vortex 1 was penetrated at a right angle (See Fig. 4.6). During the approach phase, the aircraft encountered a downflow/tailwind of 50 kts. On the other side of the vortex center, the upflow/tailwind was as strong as 47 kts. The disturbed pressure at the flight level fell only 1.43 (+1.04 to -0.39 mb) and rose 1.20 mb (-0.39 to +0.81 mb), because the aircraft altitude was approximately 700' below the center of the vortex (See Fig. 3.3). Had the penetration altitude been much closer to that of the vortex center, the drop and rise would have been significantly larger.

At 1805:50, the aircraft flew out of roll Vortex 1 and entered the region of a very strong tailwind, reaching as high as 50 kts.

4.3 First and Second Contacts

The tailwind decreased somewhat after penetrating Vortex 1 (See Fig. 4.6). Thereafter, the tailwind increased again reaching its peak speed of 52 kts at 1805:51.7 sec. A few tenths of a second later at 1805:52, the aircraft made the first contact on a dirt field with the landing gear (See Fig. 4.8).

Figure 4.7 reveals that the elevation of the first contact is 552.8' MSL at the location where the ground surface slopes up toward the south. At 1805:52.6, the landing gear left the ground in a 44-kt tailwind. From 1805:53.5 to 54.6 sec, the main landing gear made contact with tall grass in the field (See Fig. 4.9).

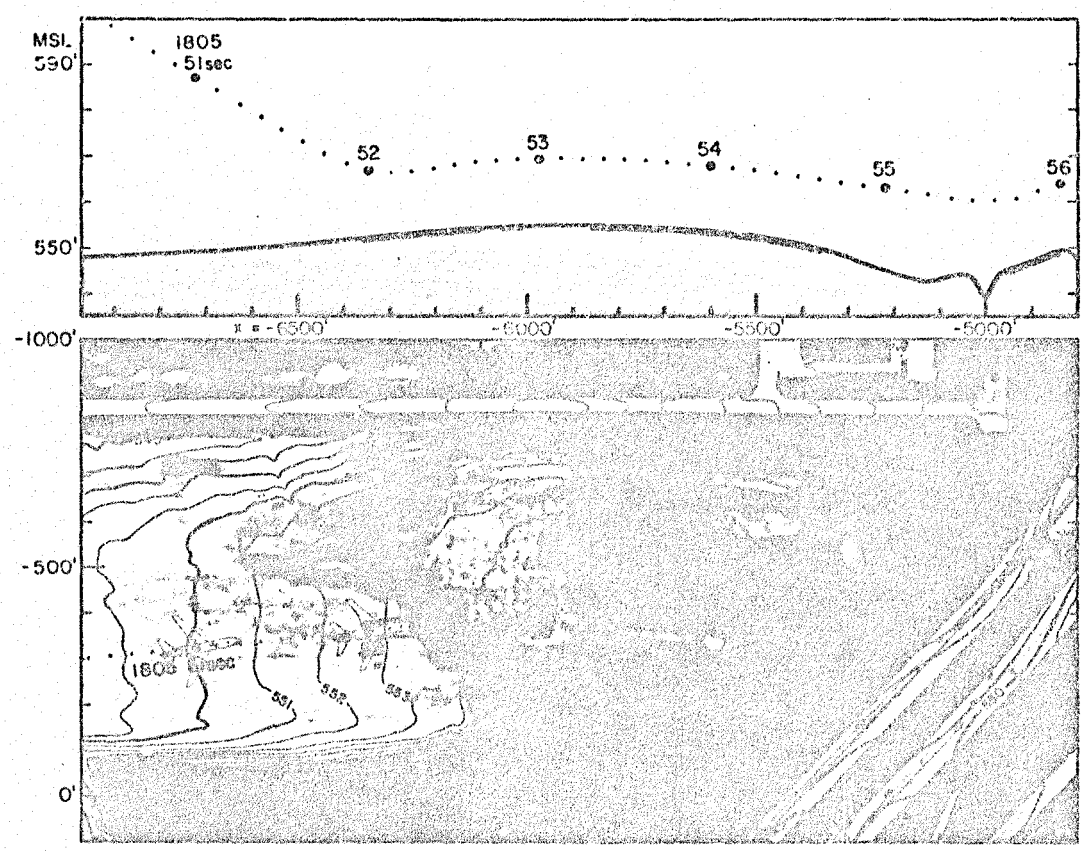

Fig. 4.7 The tire tracks of the first and second contacts superimposed upon an aerial photograph and contour lines at one foot interval. Both x and y scales in the plan view are at 100 ft interval, however, the vertical scale of the top diagram is exaggerated 10 times.

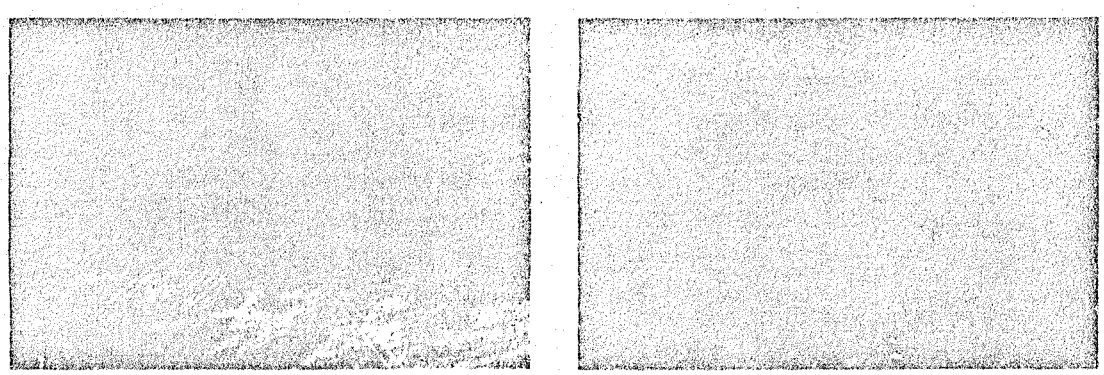

Fig. 4.8 The tire tracks of the first contact, photographed looking southeast from a low-flying helicopter (left). The right-hand photograph is a ground view of the tracks of the left-side main gear. Pictures in Figs. 4.8 through 4.12 were taken by the Delta Airlines on August 3, 1985 during the post-accident investigation.

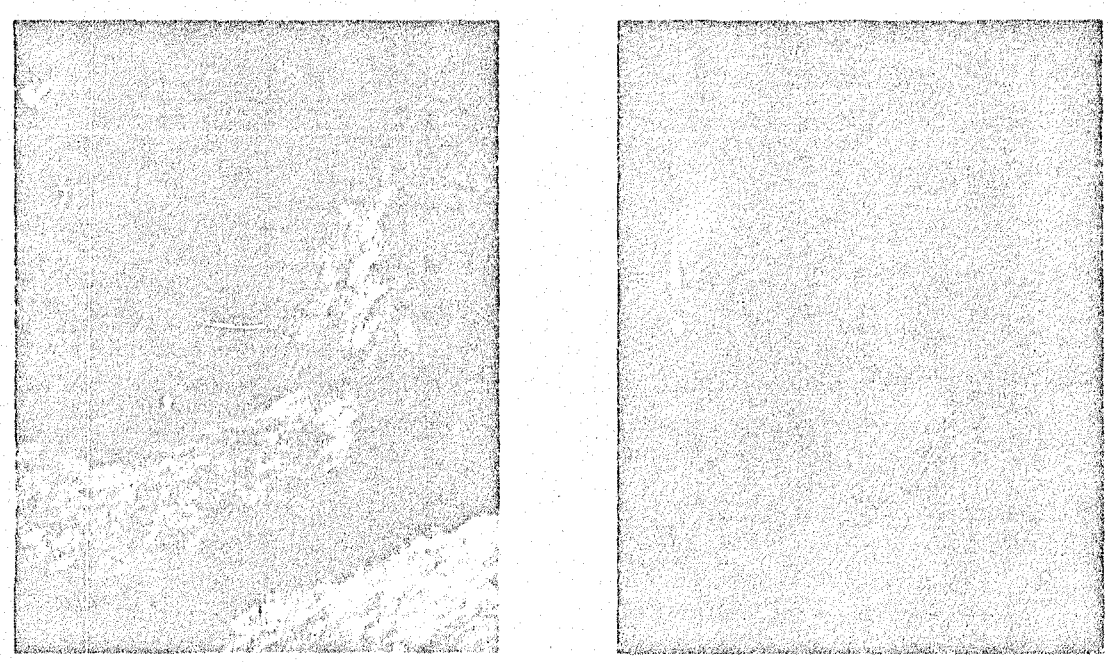

Fig. 4.9 A semi-vertical view of the first and the second contact areas (left) and an enlarged, oblique view of the second contact tire tracks. Highway 114 is seen near the top (right).

4.4 Third and Fourth Contacts

The aircraft reached Highway 114 approximately 3.6 sec after the first contact. Two tire tracks of the main landing gear and one track of the nose gear were left on the pavement (See Fig. 4.11). While on the pavement, the aircraft's yaw angle was 4° toward the left. A car on the highway was hit by the left engine and five (5) light poles along the highway and the service road were downed. However, one light pole along the service road was not damaged because the right wing passed over the pole. The left engine cut a large gouge on the south side of the service road. From that point on, the aircraft moved into a grass field and skidded toward the two water tanks.

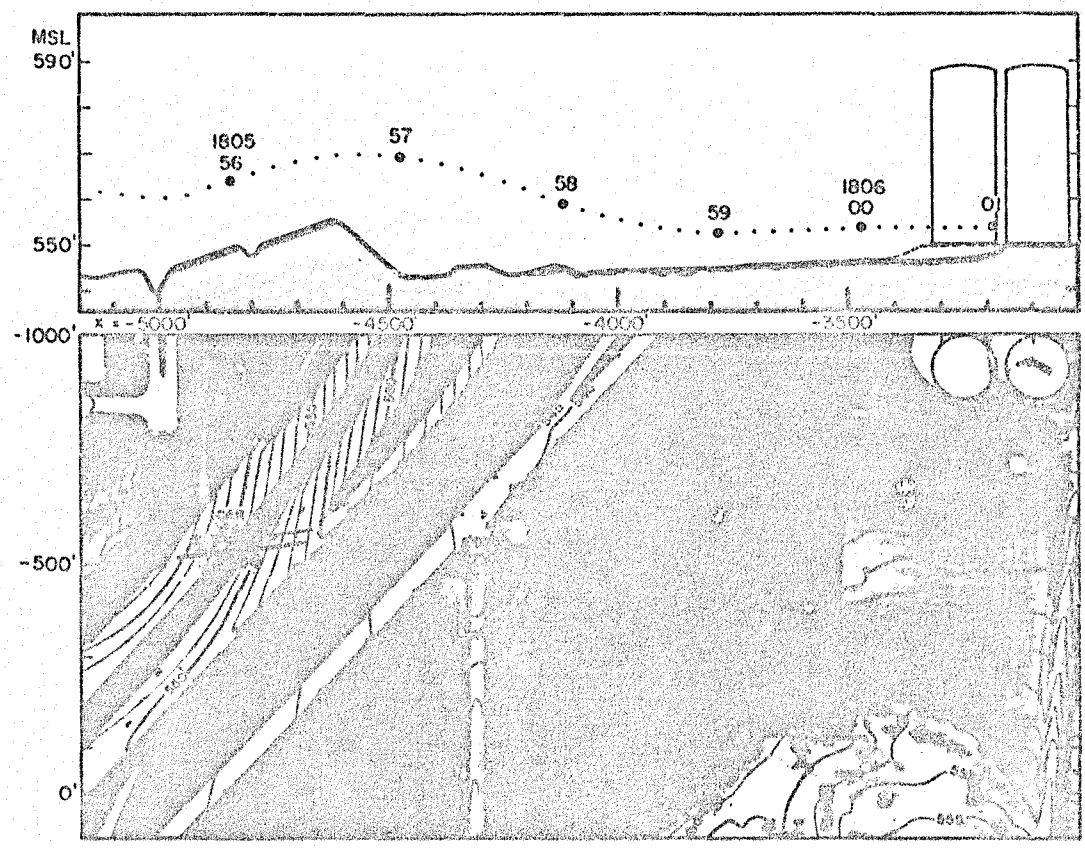

Fig. 4.10 Tire tracks of the third contact and the ground marks of the fourth contact. Painted squares along the highway are light poles damaged by the aircraft. Undamaged poles are shown by small open squares. The vertical scale of the top diagram is exaggerated 10 times.

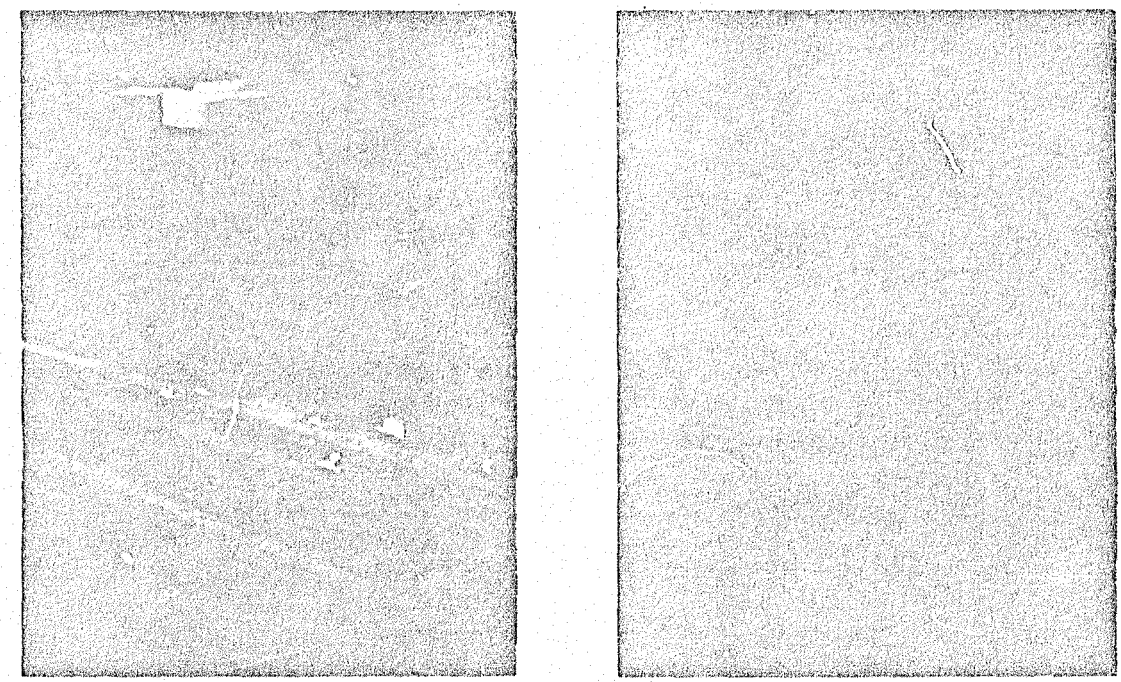

Fig. 4.11 An aerial view of the third and the fourth contact area photographed looking toward the direction of the aircraft motion (left). An enlargement of the left photograph, showing the tire tracks of both main and nose gear (right).

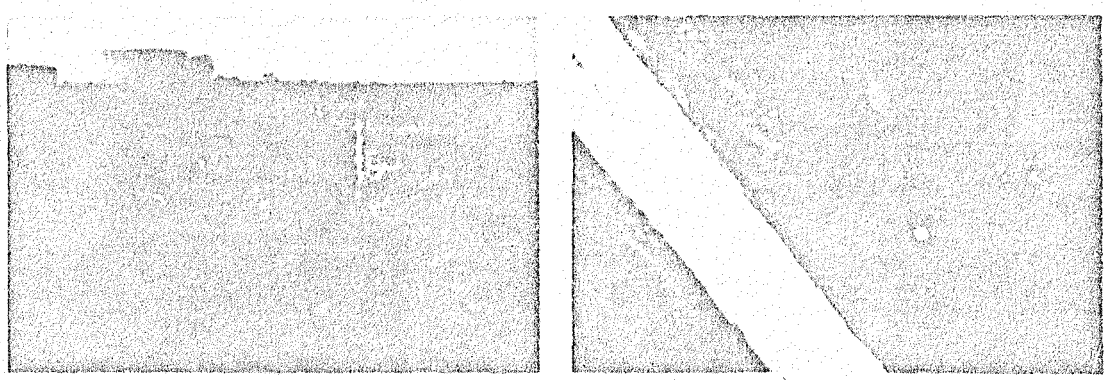

Fig. 4.12 A ground view of the gouge caused by the left engine as it contacted the ground (left). An aerial view of the gouge area in the left photograph. A narrow, deep gouge is the track of the left main landing gear, and a small gouge just to the right of the engine gouge was made by the nose gear.

Chapter Five

Data from Other Aircraft

The accident aircraft was in the microburst area for only one to two minutes. In order to determine the variation of the microburst wind shear for a much longer period of time, it is necessary to analyze the data from other aircraft that either landed or attempted to land before and after DL 191.

ATC radar positions of the seven aircraft listed in Table 5.1 were obtained from the FAA. The radar data include the depiction time to the nearest second for 10 or 11 sec intervals, radar ordinate ($\bar{Y}$) and abscissa ($\bar{X}$) of aircraft to the nearest 1/16 nautical mile, and pressure altitudes to the nearest 100 feet. An x-t diagram in Fig. 5.1 was constructed from these radar data.

By using the 17L coordinates (x,y) and the ATC radar coordinates ($\bar{X}$,$\bar{Y}$), the true separation of two aircraft 1 and 2 can be expressed by

$$D_T = (x_2-x_1)^2 + (y_2-y_1)^2 \text{ on 17L coordinates} \qquad (5.1)$$

$$D_T = (\bar{Y}_2-\bar{Y}_1)^2 + (\bar{X}_2-\bar{X}_1)^2 \text{ on ATC radar coordinates} \qquad (5.2)$$

where D_T is the true separation distance. Since an x-t diagram does not include both x and y distances, aircraft separations in Fig. 5.1 (blue numbers) are x-component separations, D_x which is computed from

$$D_x = (x_2-x_1)^2 \text{ on 17L coordinates} \qquad (5.3)$$

$$D_x = (\bar{Y}_2-\bar{Y}_1)^2 \text{ on ATC radar coordinates} \qquad (5.4)$$

which are smaller than the true separation, when two aircraft deviate from the centerline significantly. With the help of the x-t diagram, a number of events experienced by these approaching aircraft will be discussed.

Table 5.1 Outer-marker crossing time (LOM Time) and 17L threshold-crossing time (17L Time) of the seven aircraft discussed in this chapter.

Aircraft	Type	LOM Time	17L Time	Remarks
Delta 963	B-737	1759:41	1801:48	Landed
Delta 1061	B-737	1800:38	1802:46	Landed
American 351	B-727	1801:46	1803:45	Landed
N715JF	Lear Jet	1803:20	1805:18	Landed
Delta 191	L-1011	1804:19	--------	Accident
American 539	MD-80	1806:17	1807:53	Go-around
Delta 557	B-727	1807:53	1809:41	Go-around

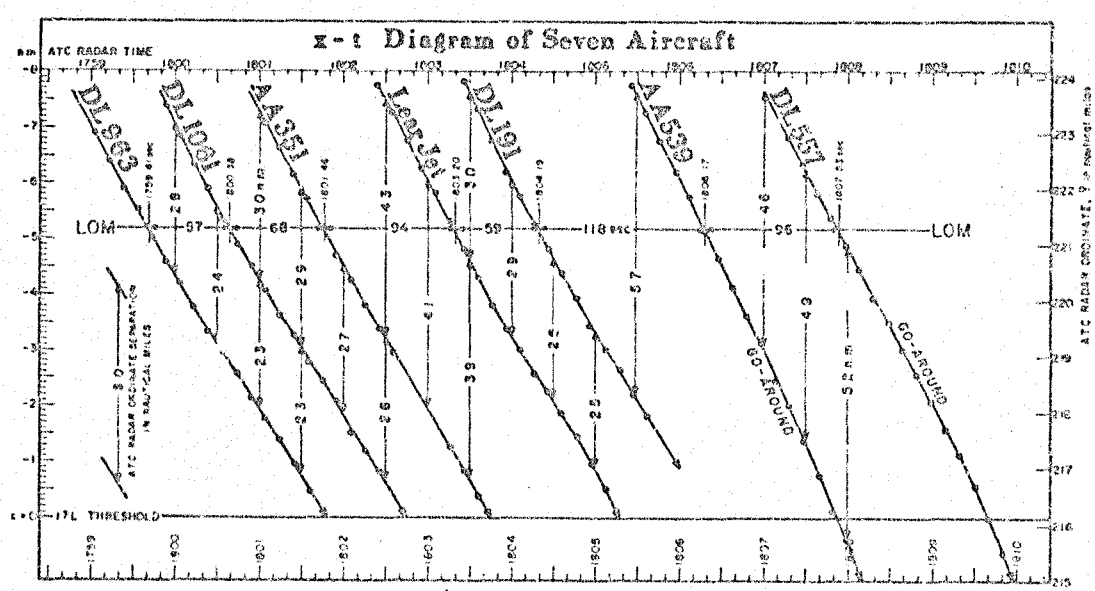

Fig. 5.1 Positions of the seven aircraft in Table 5.1 presented as functions of time which increases from left (1759 CDT) to right (1810 CDT). The vertical scale shown on the left is the distance (x) to the approach end of Runway 17L and the one on the right denotes the ATC radar ordinate (Y) which increases toward the north. Coordinates of DFW Airport are X = 471 + 6/16 n.m. and Y = 215 + 4/16 n.m. (For location, refer to Fig. I.2).

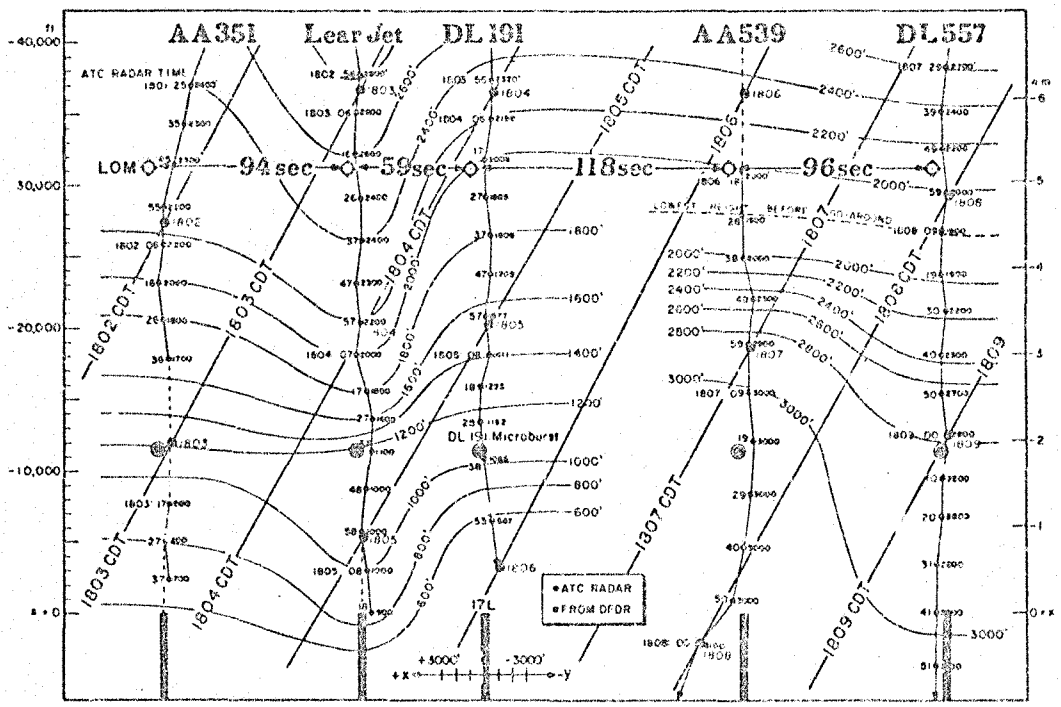

Fig. 5.2 Two-dimensional positions of the five aircraft on the x-y coordinates of each aircraft. Respective coordinates were shifted according to the time of LOM passage. Blue lines denote contour lines of the aircraft altitudes in ATC radar reports.

5.1 Delta 963 (B-737)

On the day of the accident, August 2, 1985 Captain J.A. Coughlin of Delta FLT 963 reported his experience during the final approach. His aircraft was cleared for a visual approach to 17L.

About one to two miles outside of the LOM, he observed a bowl-shaped cloud hanging from under the overcast. Shortly, thereafter, the aircraft flew under the bowl-shaped cloud just prior to the LOM, encountering abrupt heavy rain and lost sight of the approaching runway for a few seconds. ATC radar locations of his aircraft indicate that DL 963 passed the LOM at 1759:41 CDT. At that time his aircraft was located on the north edge of Echo "2" in Fig. 1.9.

The flight path between the LOM and the 17L threshold was beneath Echo "2" during which he saw cloud-to-ground lightning strikes on both sides of his aircraft. Between LOM to touchdown, he had a difficult time in keeping the airspeed from increasing.

While he was holding the aircraft, after landing, short of 17R, the first officer saw a waterspout-like, dark column, separating two silvery areas of rain. Captain Coughlin stated "I now believe that I saw the intense rain that could have been associated with a downburst".

5.2 Delta 1061 (B-737)

After a go-around, this aircraft flew close to the shower located just to the east of the LOM. The ATC radar time of the LOM passage was 1800:38. The aircraft encountered some rain just inside the outer marker, but it was of short duration and "out of the blue". From the LOM to the 17L touchdown at 1802:46, both approach and touchdown were normal with no turbulence or wind shear.

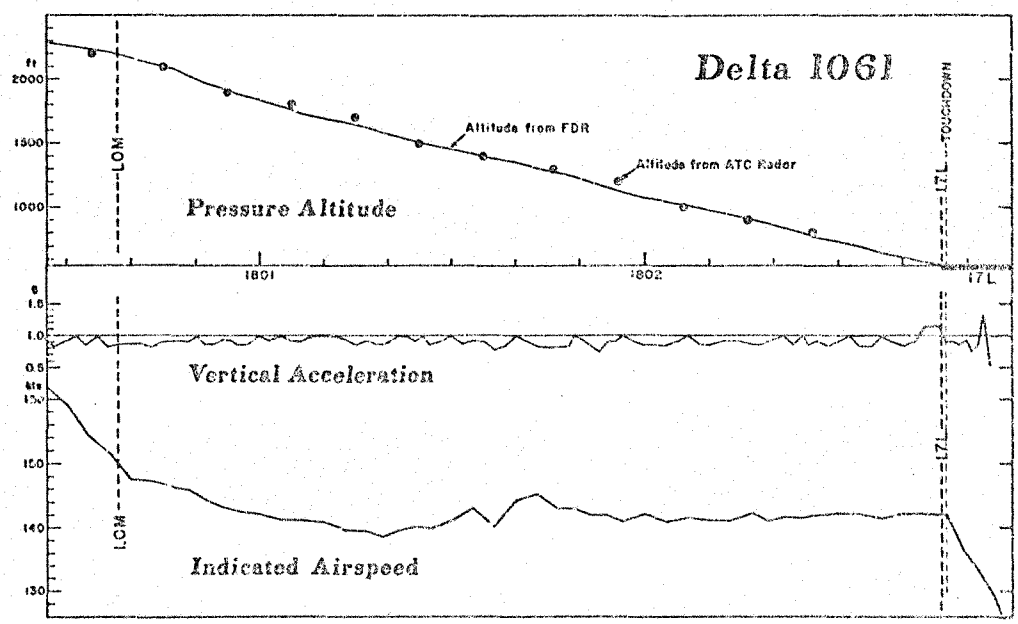

Fig. 5.3 FDR records showing the final approach and touchdown of Delta 1061 which was the third aircraft in front of Delta 191. Apparently, this aircraft was not affected by wind shear.

Radar pictures in Fig. 1.9 show that Echo "1" was located to the east of the LOM during the final approach of DL 1061. Echo "2" was centered just to the east of the 17L glideslope. The fact that DL 1061 did not encounter heavy rain while flying through this echo implies that a core of heavy rain has not yet descended to the glideslope height during final approach (between 1800:38 and 1802:46).

What did SEP radar see over the glideslope? The SEP radar is located 75 n.m. southwest of DFW airport. Its elevation (1350') is approximately 750' higher than the runway elevation (560'). The radar horizon at the 17L approach area is as high as 5,840' AGL. In other words, the SEP radar does not detect rain below approximately 6000' AGL.

The top of the 2° beam with 0.4° elevation angle reaches 17,070' AGL, indicating that what the SEP radar detected was the precipitation inside the pink section of the thunderstorm in Fig. 5.4. Theoretically, a radar will detect some rain outside the half-power beam width.

The bowl-shaped precipitation base penetrated by DL 963 at 1759:30 was, probably, the first indication of the rain descending to the glideslope. About one minute later at 1800:50, DL 1061 encountered some rain, suggesting that the base of the precipitation remained practically at the same height.

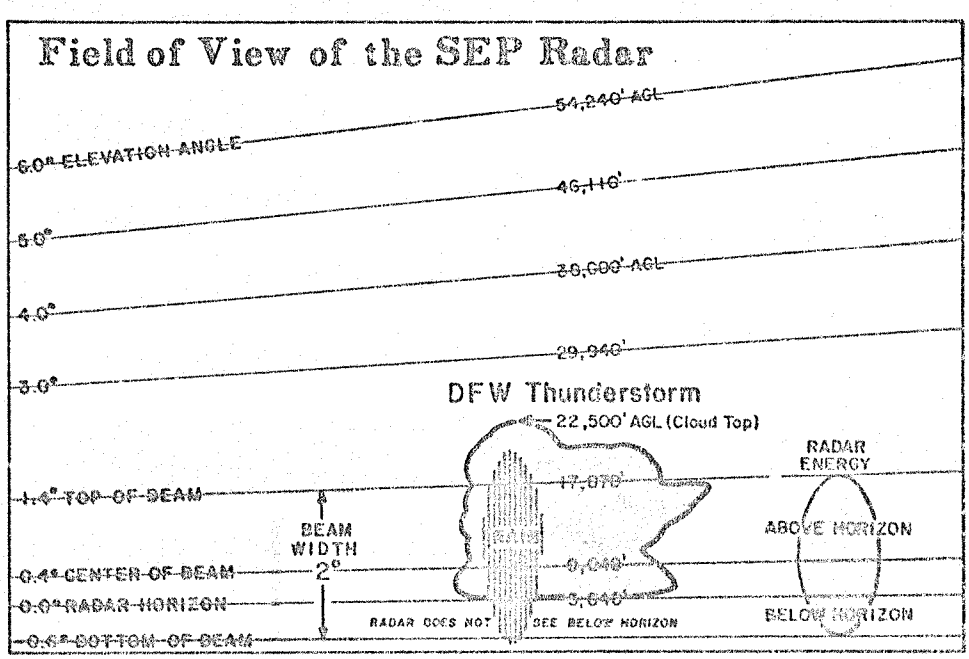

Fig. 5.4 The section of the DFW thunderstorm detected by the SEP radar at 0.4° elevation angle. AGL heights were computed with a straight-line propagation in the hot summer afternoon and 6378 km radius of the earth.

5.3 American 351 (B-727)

Analysis of the FDR records along with the statement of Captain Bob Hanel and First Officer Pat Davis reveals that AA 351 experienced a 22-kt loss of IAS from 174 to 152 kts in 20 sec between 1801:10 and 1801:30 in heavy rain. When it occurred, the aircraft was located 1 n.m. north of the LOM, near the northern edge of Echo "2" (See 1800 CDT radar photo in Fig. 1.9). Thereafter, heavy rain continued until 600' AGL at 1803:00 CDT.

It is evident that the core of heavy rain descended to the glideslope height within only one minute between the flights of DL 1061 and AA 351. In spite of the heavy rain experienced, the FDR records of AA 351 in Fig. 5.5 shows practically no sign of wind shear on the glideslope between LOM and 17L. That is to say, the heavy rain (1802-03 CDT) was not accompanied by a wind shear.

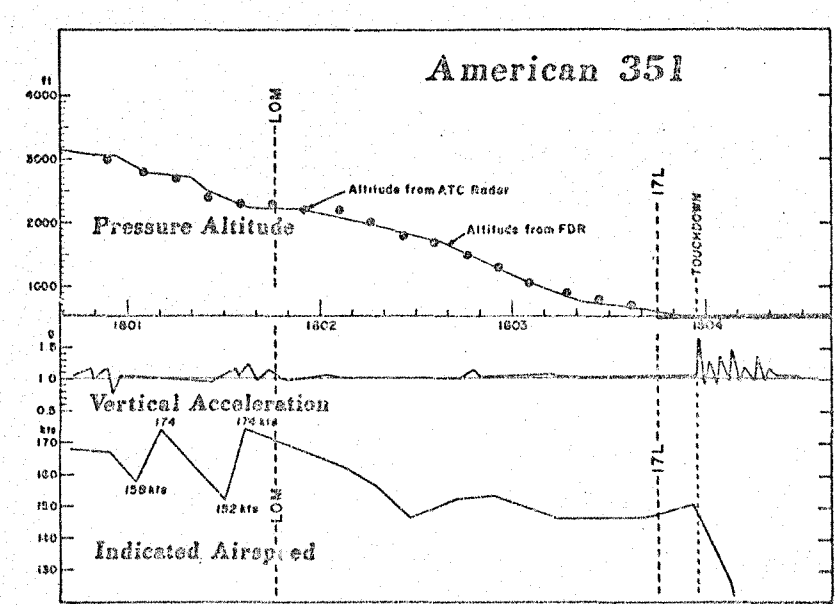

Fig. 5.5 FDR records of AA 351. Note a 22-kt loss of IAS shortly before reaching the LOM, but there was practically no wind shear after the LOM passage.

5.4 N715JF (Lear Jet)

The ATC radar fix of the Lear Jet positions reveals that its pressure altitude dropped 500' (1600' to 1100') in 10 seconds (between 1804:27 and 1804:37). Pilot Rufus Lewis of the Lear Jet reported that the aircraft lost a 25-kt airspeed instantly from 150 to 125 kts while the glideslope

height decreased from 1 dot "high" to 1 1/2 dot "low". He was not able to attribute these losses in speed and height to his power setting. He applied power to regain the 150-kt airspeed and retained a "hot/high" approach at 150 kts.

Rain became extremely heavy at 1 n.m inside the LOM (1804:38) at 1800' and the aircraft broke out of rain 1 1/2 n.m. from runway. The position of the aircraft when the losses occurred was only 0.2 n.m. northeast of the microburst center, penetrated by DL 191 only 1 min 5 sec later. The author suspects that the Lear Jet unknowingly flew through the head section of a descending microburst shaft which will be discussed in Chapter Six. The 500-ft drop was not serious for the Lear Jet, because its initial altitude was 1600'MSL or 1000' AGL. Should a similar event occur at much lower altitude, an aircraft could experience difficulties in flying out of the combined shear of downwind and tailwind.

5.5 American 539 (MD-80)

AA 539 was approximately 6 n.m. behind DL 191 (See Figs. 5.1 and 5.2). Captain Frank Becker, pilot in command, maintained a visual contact on DL 191 until it went into a rainshower. Before entering the shower, First Officer R.C. Dobson heard "Delta go-around". AA 539 was also instructed

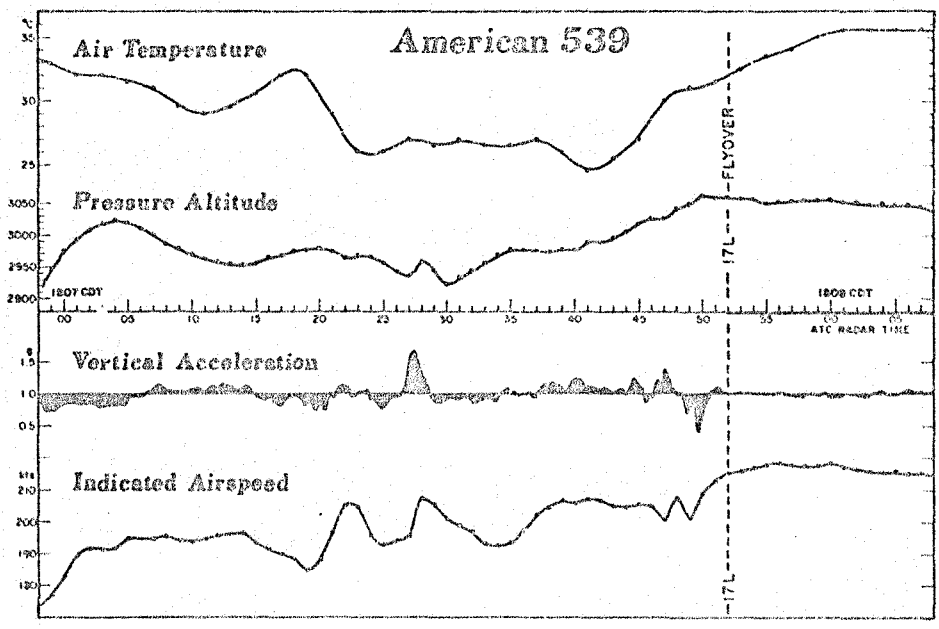

Fig. 5.6 DFDR readout from AA 539 which penetrated DL 191 microburst at 3,000' MSL. Because the readout does not include angle of attack, no wind was computed.

to go-around. It penetrated the fringe of the cell on the missed approach, experiencing a strong buffet and heavy rain. The aircraft turned right to exit the cell. As it came out, the first officer saw many pieces of debris passing by the cockpit window (For DFDR readout, refer to Fig. 5.6).

5.6 Delta 557 (B-727)

Captain Robert Groves of DL 557 continued inbound after LOM and executed a published missed approach when instructed by tower. The aircraft flew through a cloud which was greenish, very dense with moderate turbulence and exited the cloud over the approach end of 17L at 2,900' MSL at 1809:41 CDT (For FDR readout, refer to Fig. 5.7 and the aircraft location, to Fig. 5.2).

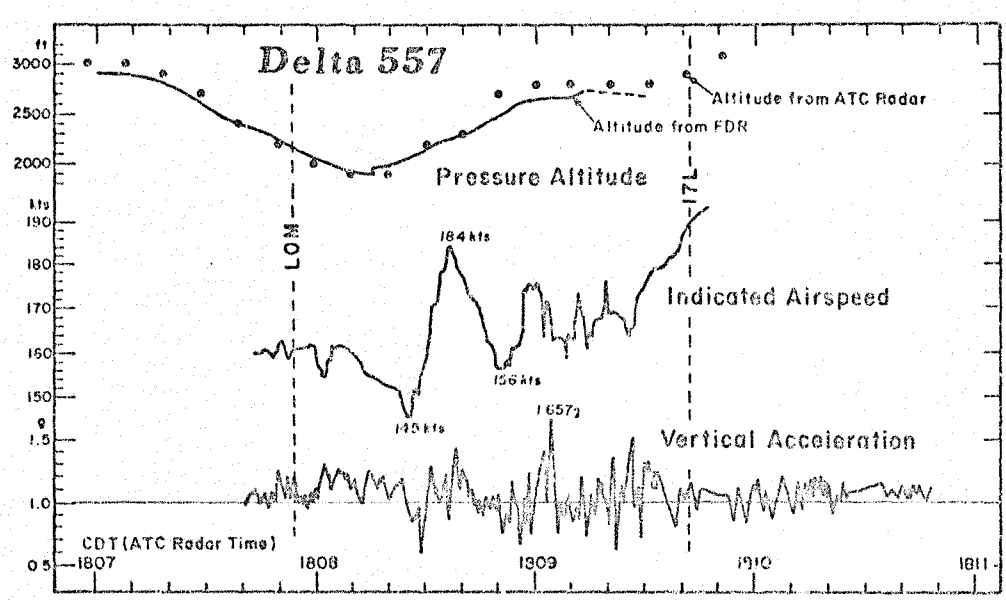

Fig. 5.7 FDR readout from DL 557 showing a strong wind shear experienced during the microburst overflight. Its IAS increased 39 kts (145 to 184 kts) in 11 sec followed by a 28-kt drop to 156 kts in 14 sec.

5.7 Descent and Expansion of Microburst

Analyses of the flight recorder data from the seven aircraft revealed that the DL 191 microburst descended very rapidly to the glideslope. As presented in Fig. 5.8, the microburst expanded into a dangerous wind-shear system within approximately one minute after its ground contact.

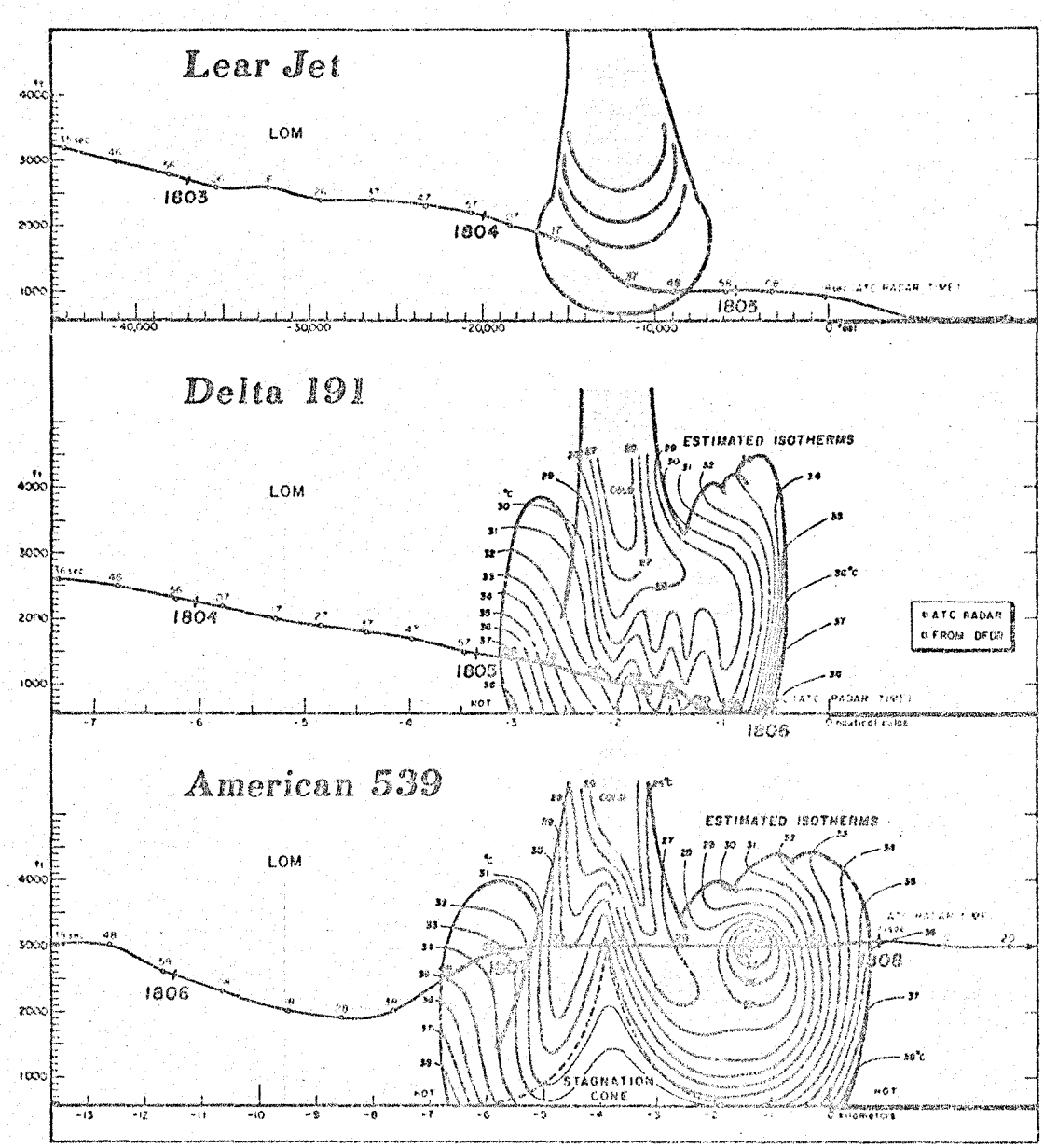

Fig. 5.8 Schematic cross section of the DL 191 microburst at three different times. Shown are penetrations by the Lear Jet at pre-contact stage, by DL 191 two minutes after the ground contact of the microburst and by AA 539 four minutes after the ground contact.

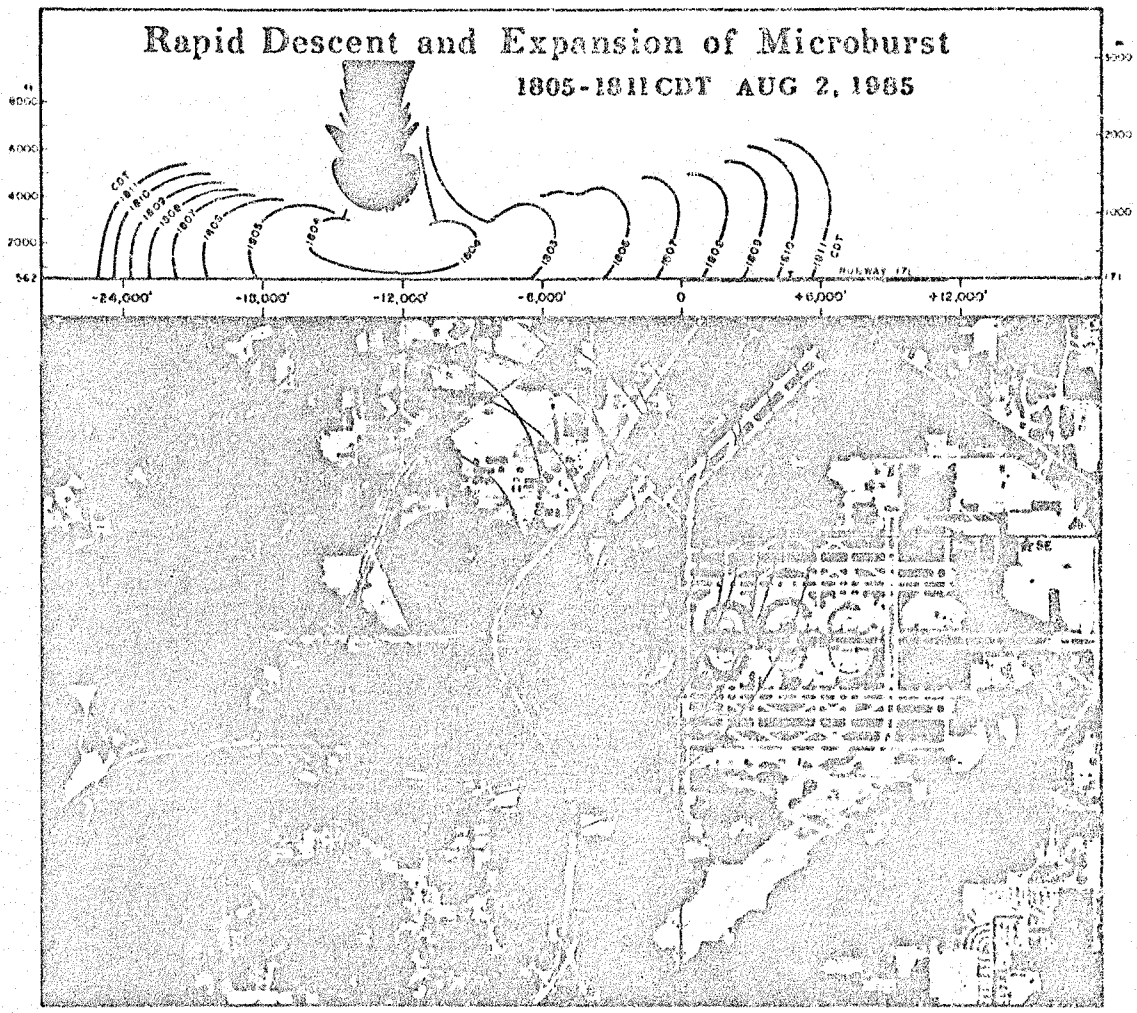

Fig. 5.9 Estimated boundary of the DL 191 microburst in vertical and horizontal planes. Five LLWAS anemometers shown with red stars indicate that the microburst front passed over these anemometers at 1806(NE), 1808(NW), and 1810(Centerfield).

DL 191 microburst was a wet microburst accompanied by heavy rain and thunder. Temperature inside the storm was approximately 8°C (14°F) colder than its environment near the ground (DL 191 measurement) and 12°C (21°F) colder at 3,000' MSL (AA 539 measurement). One minute isochrones of the microburst boundary in Fig. 5.9, superimposed upon an aerial photograph, cast a reasonable doubt upon the capability of detecting microbursts, such as DL 191 storm, using solely a ground-based anemometer network for effective warnings.

Chapter Six

Laboratory Model and Microburst Detection

Although we have a collection of pictures showing microbursts in action, it is difficult, if not impossible, to photograph their life cycles from birth to dissipation. Because of repeatability, a laboratory model will help in understanding the evolution of microburst winds.

6.1 University of Chicago Laboratory Model

As shown in Fig. 6.1, the University of Chicago model consists of numerous dry-ice plumes rising from holes on a circular plate and a plastic cylinder aloft. A shaft of descending air is created by an impulsive current of air which enters into the plastic cylinder. A compressor to generate the impulsive current is seen in the background near the right wall. The plastic cylinder is able to travel either left to right or right to left above the dry-ice plumes at a predetermined height.

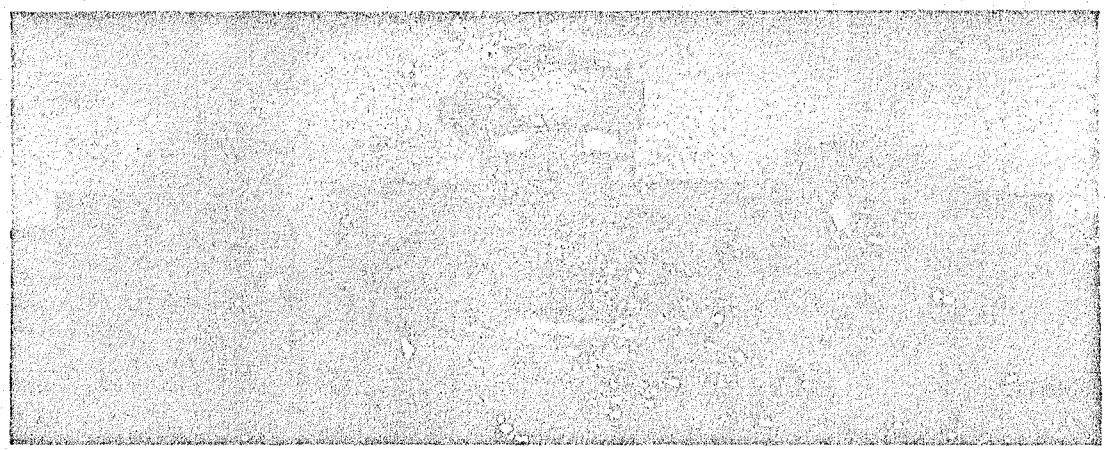

Fig. 6.1 A microburst-generating machine at the University of Chicago designed by Fujita. This machine was constructed initially to generate laboratory-model tornadoes. After Fujita's identification of the downburst, the machine was modified for generating pulsed downflows which induce microburst-like wind shears which are made visible by numerous plumes of dry-ice smoke.

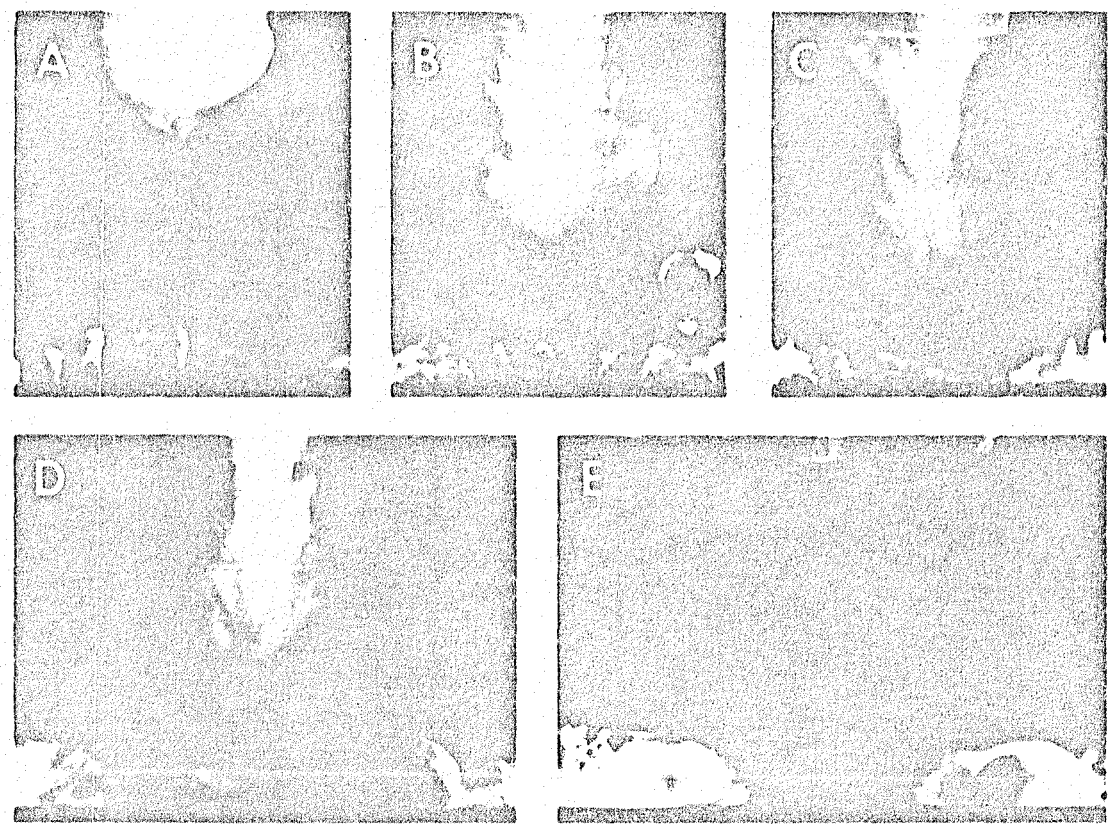

Fig. 6.2 Vertical cross section of a microburst in various stages generated by the University of Chicago machine. A and B, descending stage; C, near contact stage; D, contact and spreading stage; and E, stretching vortex stage.

In photographing the simulated microburst shaft in Fig. 6.2, the descending air was made visible by the dry-ice smoke inside the plastic cylinder. When the head section of the microburst shaft descends, a ring vortex encircling the head section appears. Upon contacting the surface, outflow winds expand rapidly along with a vortex ring encircling the outflow.

Oblique views of a simulated microburst in various stages were photographed by descending a pulsed downflow toward the surface of rising plumes. Although the time sequence of the events takes place very fast, all plumes remain undisturbed until a moment before the ground contact of the head. Upon contact, the radial flow shoots out in a starburst pattern followed by the formation of the stretching ring vortex (See Fig. 6.3).

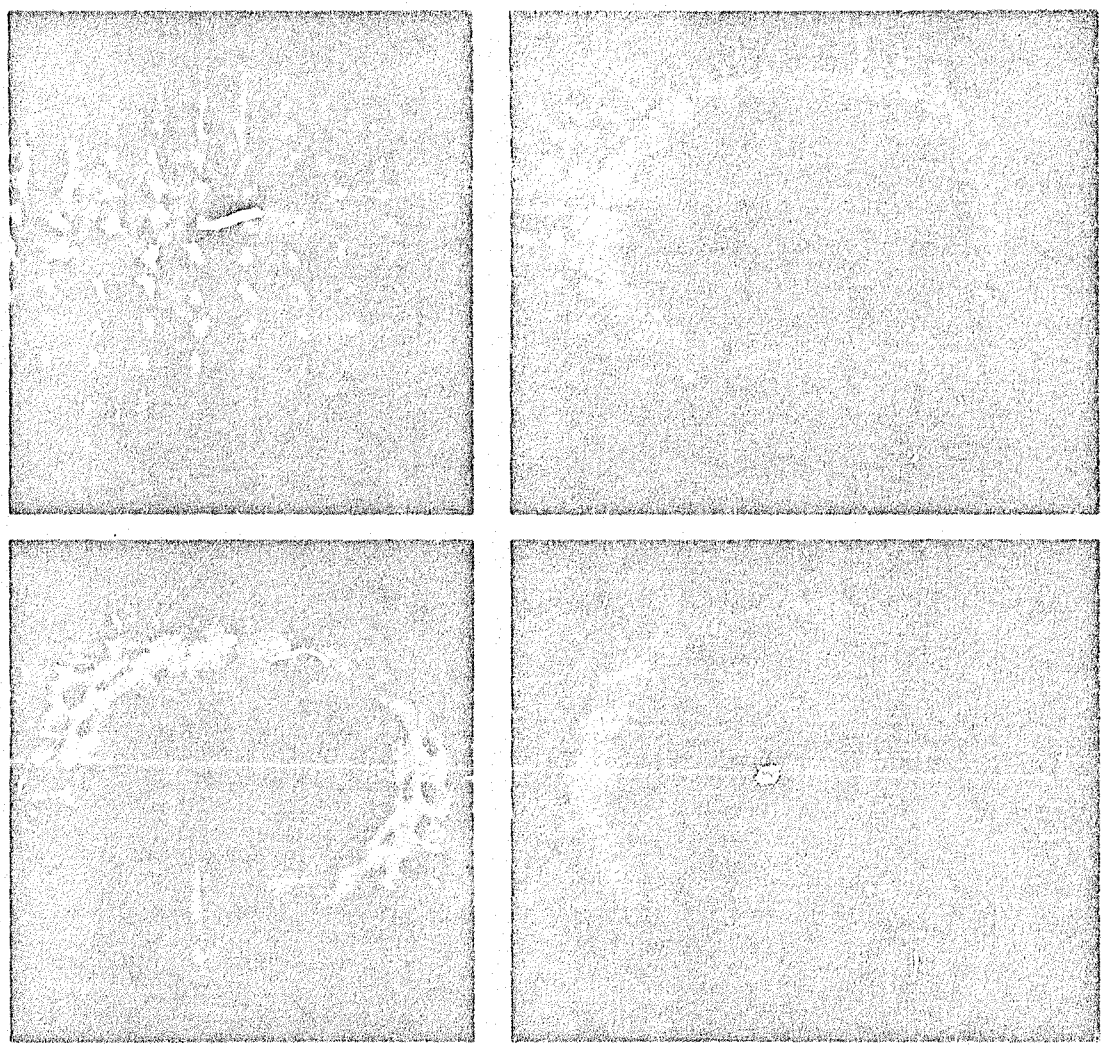

Fig. 6.3 Oblique views of a microburst in various stages. A and B, descending stage; C, near contact stage; D, contact stage, and E, stretching vortex stage.

Quite often, several vortex rings form one after another near the bottom of the microburst shaft and descend with it. They are the "descending vortices" (red). Almost immediately after the ground contact, vortex D forms near the surface and expands. This is the "stretching vortex" (blue) (See Fig. 6.4). It should be noted that Delta 191 penetrated through a descending vortex and two stretching vortices prior to its first ground contact.

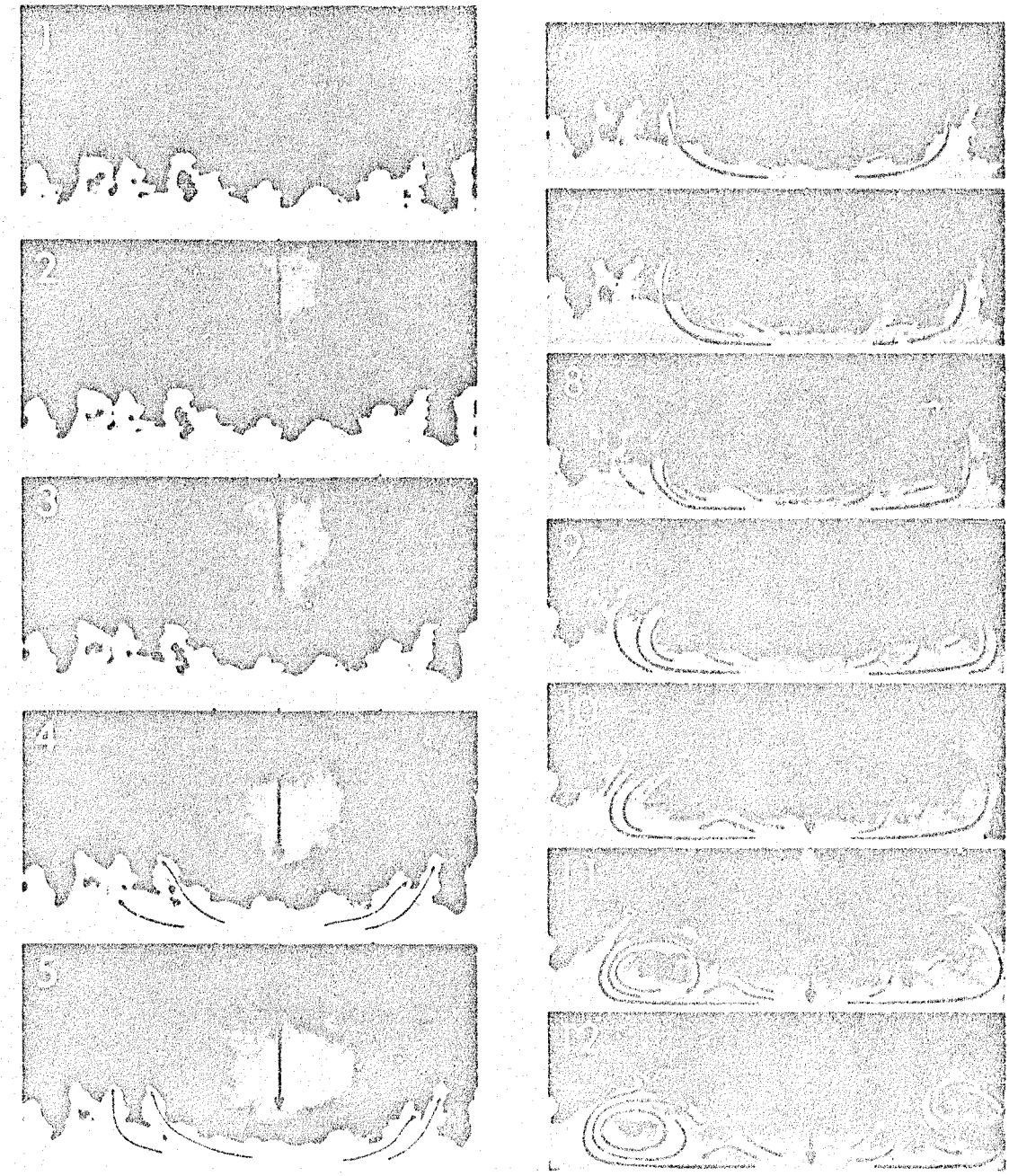

Fig. 6.4 Enlarged frames of a 16-mm movie taken at 54 frames per second. A is the oldest vortex (descending vortex) and D is the youngest vortex (stretching vortex).

6.2 Proposed Microburst-detection Project

Since the author identified the downburst (microburst and macroburst) as being the localized wind-shear system that endangers aircraft during the takeoff and landing operations, various U.S. Government agencies provided funds for the following fact-finding field projects. In support of the Doppler radar measurements, both ground-based weather stations and aircraft were used.

The first project for detecting downbursts was the NIMROD (Northern Illinois Meteorological Research on Downburst) Project in 1978 operated by the University of Chicago in the western suburbs of Chicago, Illinois. One Doppler radar was placed inside O'Hare International Airport (See THE DOWNBURST).

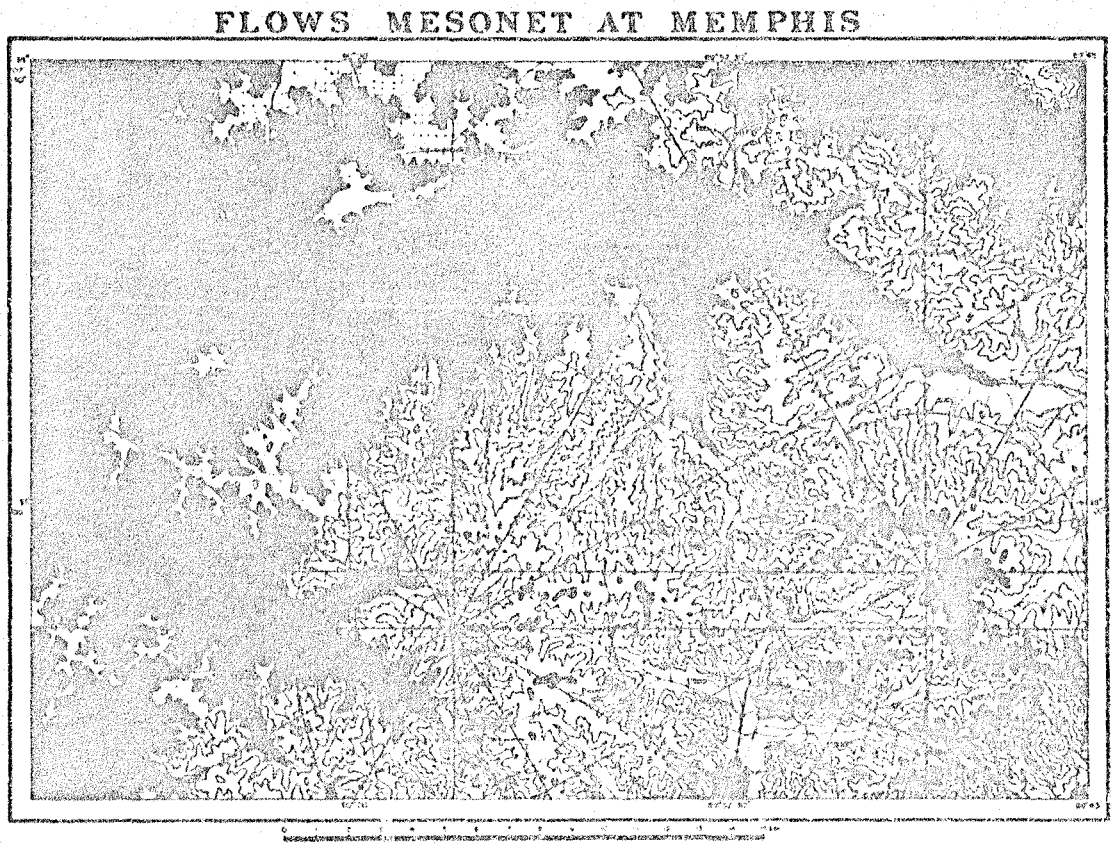

Fig. 6.5 The FAA-Lincoln Laboratory Operational Weather Studies (FLOWS) network at Memphis, Tennessee. The network consists of two Doppler radars and 30 ground-based weather stations.

The second and much larger project called JAWS (Joint Airport Weather Studies) was operated by NCAR (National Center for Atmospheric Research) and the University of Chicago in 1982 in the northern suburbs of Denver, Colorado. One Doppler radar was placed inside Stapleton International Airport.

For testing automated detection of microburst by Doppler radars, FAA and Lincoln Laboratory operated the FLOWS Network in 1984 at Memphis, Tennessee. A network map in Fig. 6.5 shows that two Doppler radars are capable of scanning the Memphis Airport area from the distance of 10 to 20 km.

A unique meteorological field experiment consisting of three separate experiments is being planned for a full-scale operation in June and July, 1986 in the Huntsville, Alabama area. The proposed COHMEX (COoperative Huntsville Meteorological EXperiment) will be sponsored by NASA (National Aeronautics and Space Administration), NSF (National Science Foundation), FAA (Federal Aviation Administration), and NOAA (National Oceanic and Atmospheric Administration). The three-component experiments under COHMEX are MIST, FLOWS, and SPACE.

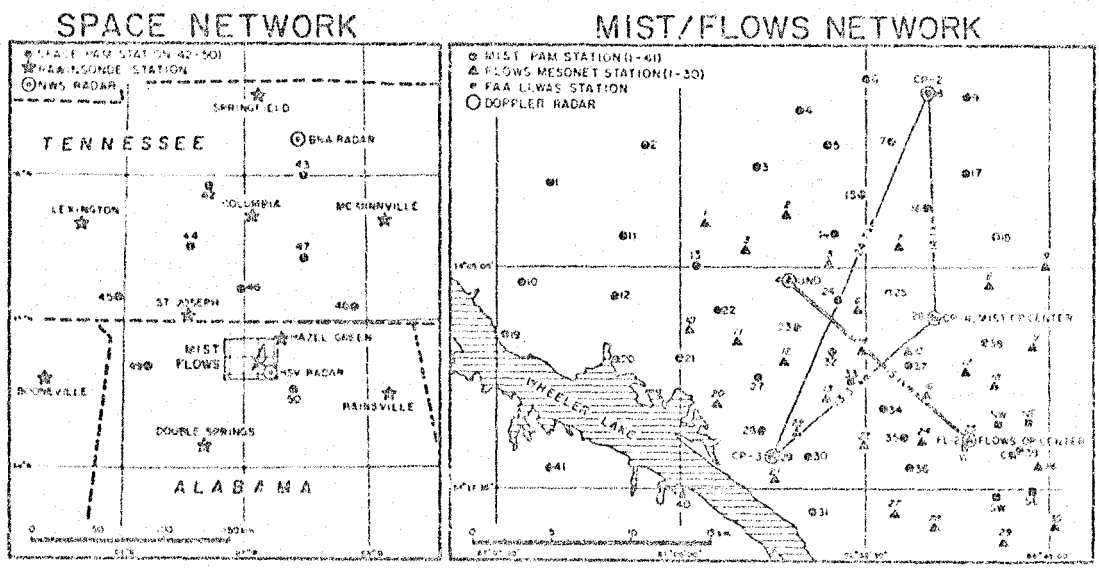

Fig. 6.6 A proposed, three-in-one network near Hunstville, Alabama. The NIST (NIcroburst and Severe Thunderstorm) network, along with the FLOWS network is nested inside a large SPACE (Satellite Precipitation And Cloud Experiment) network.

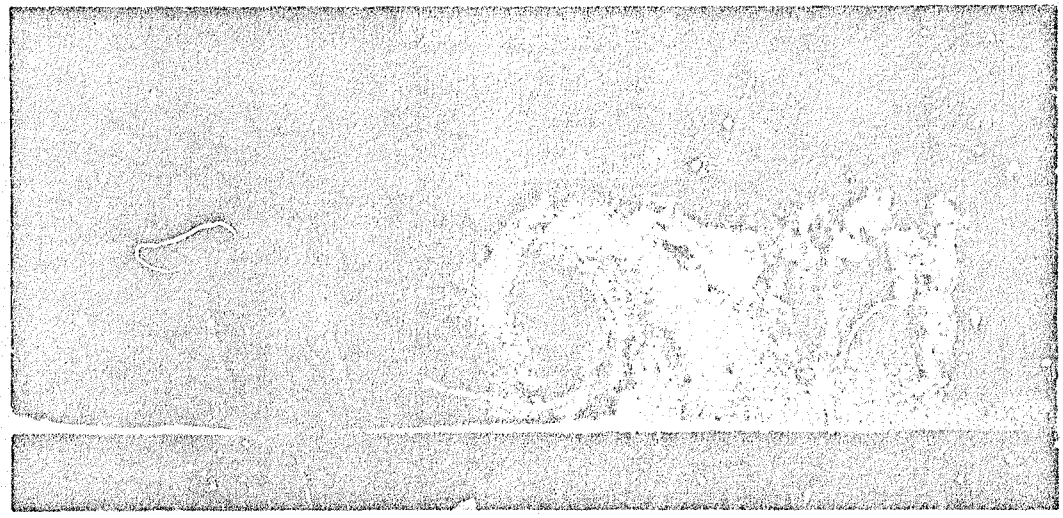

Fig. 6.7 A strong vortex (stretching vortex) with a horizontal axis located along the leading edge of an active microburst. An attempt will be made to detect by Doppler radars this type of vortices in their descending and stretching stages.

The MIST Project (NSF and NOAA) will focus on the data collection of microbursts from their midair stage to outburst stage, while the FLOWS Project (FAA-Lincoln Lab) will test the automated methods of microbursts and other wind-shear systems for immediate applications to air safety. The SPACE Project (NASA) will focus in a much broader scale in which all types of clouds form, develop, rain out and/or wind out and dissipate.

In addition to the ground-based radars and weather instruments, high altitude U-2, middle altitude P-3, penetrating T-28, and other aircraft will be utilized. Meanwhile, the geostationary weather satellite will take frequent pictures of clouds over a broader area.

This unique experiment will provide us with a wealth of data for revealing the structure of microbursts, including both descending and stretching vortices. Furthermore, the parent clouds of microbursts will be identified and monitored by the SPACE Network so as to single out a wind-shear spawning cloud as early as possible.

Summary and Conclusions

The purpose of the meteorological study presented in this book is to describe the factual evidence, both eyewitnessed and computer generated, related to the Delta 191 accident at Dallas/Ft. Worth, Texas Airport on August 2, 1985. With the help of the National Transportation Safety Board, the Federal Aviation Administration, the National Weather Service, Delta Airlines, and other agencies, the author attempted to collect all possible factual data available as of January 20, 1986.

In his previous book, "The Downburst", the author classified the parent cloud of downbursts into Types A(Anvil cloud), S(Super cell), B(Bow echo), I(Isolated shower), and C(Cumulus cloud). This analysis has led to the conclusion that the parent cloud of the DFW microburst was a Type I cloud with thunder. The parent cloud of the PAA 759 storm at New Orleans in 1982 was a Type I cloud, but no thunder was reported. Unlike huge, Types S and B thunderstorms, Type I and C clouds are often innocuous, giving an impression to pilots that they are simple shower clouds without wind shear underneath. Such an impression could be entirely misleading to pilots, although most of them are harmless and penetrable.

Satellite pictures of the DFW thunderstorm indicate that its cloud top reached as high as 23,000 ft AGL at 1805 CDT, the time of the Delta accident. In this regard, the author concurs with a pilot approaching DFW airport that the cloud top was high teens to low twenties. Some weather forecasters, as well as the general public, tend to think that severe local winds are induced by large and tall thunderstorms. In contrast to such an expectation, the relatively small, low-topped DFW thunderstorm spawned two strong microbursts: The DL 191 microburst with the 52-kt (60 mph) peak wind at 1805:51.8, 0.2 sec before the first ground contact and the 70-kt (80 mph) peak-gust microburst at 1824:30 CDT.

The DL 191 microburst was accompanied by the most complicated winds analyzed by the author since 1976 when he identified "downburst" after studying the Eastern 66 accident at JFK on June 24, 1975. Computer analysis of the DFDR readout from DL 191 revealed that this microburst was characterized by a 49-kt tailwind and an estimated 40-kt headwind near the ground (23 kts at flight level), a total of an 89-kt wind shear. In addition to these head- and tailwinds, there were at least one descending vortex and two stretching vortices embedded inside the microburst.

As presented on the cover picture of this book, the microburst descending from a Type I cloud is complicated and vicious. According to this study, the DL 191 accident occurred approximately two minutes after the microburst contacted the ground at 1804 CDT. For timely warnings to pilots, it is necessary to detect the winds during their descending stage by using the proposed terminal Doppler radar. Until then, we have to keep in mind the following facts which have been discussed both in THE DOWNBURST and in DFW MICROBURST. They are:

(1) An innocuous, isolated shower (Type I) could be an inducer of severe wind shear.

(2) Some microburst-spawning clouds are not associated with thunder. In particular, Type C clouds, such as mushroom, sinkhole, and giant anteater clouds are innocuous, but they could induce a 50 to 70-kt total wind shear, lasting for very short time.

(3) A microburst cloud could descend to the glideslope very quickly. An aircraft may land without a reportable wind shear; however, another aircraft, following only one to two minutes behind could experience serious difficulties because a descending microburst could alter the glideslope winds from nonsevere to severe within a couple of minutes.

(4) Aircraft will be able to fly out of some microbursts, but not out of every one. An example of a nonpenetrable microburst was the Andrews AFB microburst of August 1, 1983. Its total wind shear was 130 + 84 = 214 kts.

(5) Even when computer-generated analyses demonstrate that an aircraft may be aerodynamically capable of penetrating a microburst-induced wind shear safely, it may be unrealistic to expect even a well-trained crew to accomplish the penetration because of the complex nature of the winds. At the present time, a pilot has no equipment available to him to ascertain the exact nature of the winds until he flies into a microburst.

Until the proposed terminal Doppler radars become operational and pilots begin receiving timely and accurate wind-shear warnings, it will be necessary for pilots to understand the complex nature of microbursts and for pilots to receive all available weather data from ground-based meteorologists and air-traffic controllers as rapidly as possible when conditions at or near an airport suggest weather conditions conducive to severe wind shear. The first indication of a microburst experienced by an approaching aircraft is "an unusual headwind increase in front of a shower". Such an increase is likely to be followed by a tailwind increase on the other side of the approaching shower. Naturally, an aircraft must penetrate the tailwind section of the microburst before flying out of it. The dead center of a microburst, where the tailwind begins in a strong downflow, could turn into the point of no return for an aircraft caught in it.

APPENDICES

APPENDIX 1 COMPUTATION EQUATIONS

(A) Smoothing for generating data at 1/8 sec interval

Weighting functions used are:

For 1/4 sec raw data: 3(2/8) 7(1/8) and 10(0)
For 1/2 sec raw data: 1(5/8) 3(4/8) 5(3/8) 7(2/8) 9(1/8) and 10(0)
For 1 sec raw data: 1(9/8) 2(8/8) ..... 8(2/8) 9(1/8) and 10(0)
For 2 sec raw data: Hand smoothed and digitized
( ) denotes time in sec before and after the raw-data time.

(B) Indicated airspeed (IAS) to corrected airspeed (CAS)

$$CAS = IAS + 28/(IAS-100) + 20/(IAS-110)^2$$ *CAS and IAS in kts*

(C) Corrected airspeed (CAS) to true airspeed (TAS)

$$TAS = 1.8752\ (T_V/P_{TA})^{\frac{1}{2}}\ CAS$$ *T_V in °K, P_{TA} in mb*

(D) Air temperature (T or SAT) to virtual temperature (T_V)

$$T_V°K = T°C + 273.16 + 2.6$$

(E) Altitude fine (ALTF) to accelerometer height (H)

See Fig. 2.3, page 19

(F) Accelerometer height (H) to atmospheric pressure (P_{TA})

$$P_{TA} = -2.65 + 1013.25\left(\frac{288.16 - 0.0065\,(H/3.28)}{288.16}\right)^{5.2561}$$ *H in ft, P_{TA} in mb*

(G) Accelerometer height (H) to true altitude (TA)

$$TA\ ft = 550' + (T_V/0.0009296)\ [-1 + (992.3/P_{TA})^{0.00938}]$$ *P_{TA} in mb*

(H) Inertial altitude (z) to atmospheric pressure (P_z)

$$P_z = 992.3\left(\frac{314.09 - 0.00064\,(z-550')}{314.19}\right)^{15.255}$$ *z in ft, P_z in mb*

(I) DFDR acceleration ($A_x A_y A_z$) to corrected acceleration ($\ddot{L}\ \ddot{M}\ \ddot{N}$)

$$\ddot{L} = A_x - 0.02000, \quad \ddot{M} = A_y + 0.00792, \quad \ddot{N} = A_z + 0.01571$$ *in g*

(J) Component winds (u v w) to tailwind, crosswind and dd ff

Tailwind = $u \cos\psi + v \sin\psi$
Crosswind = $-u \sin\psi + v \cos\psi$
$dd = 180.26° + \tan^{-1}(v/u)$ $\quad ff = (u^2 + v^2)^{\frac{1}{2}}$

(K) Component winds (u v w) to total, vertical, horizontal winds and dfa

Total wind (TW) $= (u^2 + v^2 + w^2)^{\frac{1}{2}}$
Vertical wind (VW) $= (u^2 + w^2)^{\frac{1}{2}}$
Horizontal wind (HW) $= (u^2 + v^2)^{\frac{1}{2}}$
Downflow angle (dfa) $= \cos^{-1}(HW/TW)$

(L) Ground velocity (GVL) to Energy (KE and PE)

$GVL = (\dot{x}^2 + \dot{y}^2 + \dot{z}^2)$
Kinetic energy (KE) = $1/2\ GVL^2$
Potential energy (PE) = $g(z - z_{ist})$

(M) DFDR angle of attack to body angle of attack

$\alpha_{BODY} = 3.72 + (0.535\alpha_{DFDR})$

(N) Other corrections (For identification of parameters, see Table 2.1)

Angle of attack	AOA = AOA L - 0.244° = AOA R + 0.244°
Aileron	AIL = -AIL LO + 0.216° = -AIL LI - 1.452° = +AIL RO + 0.200° = +AIL RI + 1.037°
Rudder pedal position	RPP, add 0.1316°
Rudder position	RUD, add 0.336°
Roll control wheel	CWP = CWP L - 2.82° = CWP R + 0.61°
Pitch control column	CPP = CPP L + 4.49° = CPP R + 1.53°
Trim	TRIM = TRIM L - 0.032° = TRIM R - 0.028°
Spoiler	SPO = SPO L4 - 1.320° = SPO L5 + 0.783° = SPO R2 + 0.000° = SPO R6 + 0.379°

APPENDIX 2 DFDR READOUT DATA I

This tabulation is based on the NTSB DATA DUMP PROGRAM dated August 2, 1985 and September 13, 1985. Time in this table denotes the cockpit voice recorder time in CDT which is three seconds faster than the DFDR readout time.

T.HDG (True heading) = DFDR HDG + 7.02°
RPP (Rudder pedal position) in inches
RUD (Rudder position) in degrees
ALTF (Altitude fine) in feet
IAS (Indicated airspeed) in knots
AOA (Angle of attack) = AOA L - 0.244°
= AOA R + 0.244°
EPR (Engine pressure ratio)
T (Static air temperature) in Centigrade

1804:51 to 1804:56 CDT

CDT	T HDG	RPP	RUD	ALTF	IAS	Angle of Attack		EPR	T
h m s	deg	inches	deg	ft	kts	DFDR	Body		°C
1804 51	173.51			1651.8		8.051	8.03		
		0.0023	-0.447		152.48	7.717	7.85		
						7.812	7.90	1.0857	
		0.0023	0.000			7.746	7.86		
1804 52	173.51			1638.8		7.812	7.90		
		0.0023	0.000		152.48	7.603	7.79		
						7.460	7.71	1.0991	
		0.0023	0.000			7.128	7.53		37.12
1804 53	173.51			1625.2		8.051	8.03		
		0.0023	-0.447		151.80	7.977	7.99		
						8.172	8.09	1.0998	
		0.0023	-0.447			7.804	7.90		
1804 54	173.94			1608.9		8.539	8.29		
		0.0023	-0.447		151.80	7.977	7.99		
						8.539	8.29		
		0.0046	-0.447			8.751	8.40		37.47
1804 55	173.94			1592.4		8.555	8.83		
		0.0046	-0.895		152.09	8.300	8.16		
						8.913	8.49	1.0830	
		0.0023	-0.895			8.419	8.22		
1804 56	174.36			1576.9		8.296	8.69		
		0.0046	-1.342		152.29	8.270	8.14		
						9.157	8.62	1.0991	
		0.0046	-1.342			8.270	8.14		37.29

1804:57 to 1805:08 CDT

CDT	T HDG	RPP	RUD	ALTF	IAS	Angle of Attack		EPR	T
h m s	deg	inches	deg	ft	kts	DFDR	Body		°C
1804 57	174.79			1561.1		9.425	8.76		
		0.0046	-1.789		152.29	8.359	8.19		
						9.167	8.62	1.0894	
		0.0046	-1.789			8.419	8.22		
1804 58	175.65			1545.0		9.585	8.93		
		0.0046	-2.236		152.29	8.419	8.22		
						9.425	8.76		
		0.0023	-2.236			8.211	8.11		37.83
1804 59	176.94			1528.7		9.040	8.56		
		0.0046	-1.789		152.48	8.241	8.13		
						8.788	8.42	1.0828	
		0.0046	-1.789			8.182	8.10		
1805 00	177.81			1514.9		8.539	8.29		
		0.0023	-1.789		152.29	8.211	8.11		
						8.415	8.22	1.0991	
		0.0046	-1.342			8.182	8.10		37.29
1805 01	178.69			1498.1		8.415	8.22		
		0.0046	-0.447		151.90	8.449	8.24		
						9.040	8.56	1.0894	
		0.0046	0.000			8.690	8.37		
1805 02	179.13			1482.5		9.040	8.56		
		0.0046	0.000		152.48	8.934	8.50		
						8.913	8.49		
		0.0023	0.000			9.120	8.60		37.65
1805 03	180.01			1466.7		9.167	8.62		
		0.0023	0.000		153.05	9.048	8.99		
						9.167	8.62	1.0830	
		0.0023	0.000			9.120	8.60		
1805 04	180.45			1450.8		8.663	8.35		
		0.0023	0.000		153.64	9.089	8.58		
						9.167	8.62	1.0931	
		0.0023	-0.447			9.182	8.63		37.83
1805 05	181.33			1436.1		8.663	8.35		
		0.0046	-0.895		154.20	8.479	8.26		
						0.172	8.09	1.0889	
		0.0023	-0.447			9.913	9.02		
1805 06	181.78			1427.3		9.425	8.76		
		0.0046	0.000		154.39	9.307	8.70		
						8.788	8.42		
		0.0023	0.000			8.873	8.47		37.65
1805 07	182.22			1411.0		8.051	8.03		
		0.0023	0.000		157.46	8.182	8.10		
						8.293	8.16	1.0825	
		0.0023	0.000			8.211	8.11		
1805 08	182.66			1399.0		7.812	7.90		
		0.0023	0.000		157.38	7.717	7.65		
						7.576	7.77	1.1001	
		0.0023	0.000			7.547	7.76		37.29

1805:09 to 1805:20 CDT

CDT	T HDG	RPP	RUD	ALTF	IAS	Angle of Attack		EPR	T
h m s	deg	inches	deg	ft	kts	DFDR	Body		°C
1805 09	183.11			1385.4		7.460	7.71		
		0.0023	0.000		158.93	7.689	7.83		
						7.460	7.71	1.1089	
		0.0046	1.231			8.123	8.07		
1805 10	183.56			1374.9		7.344	7.65		
		0.0046	1.231		160.18	7.861	7.93		
						6.778	7.35		
		0.0046	-0.447			7.632	7.80		37.65
1805 11	184.00			1362.7		6.890	7.41		
		0.0046	0.784		162.42	7.239	7.59		
						6.890	7.41	1.0811	
		0.0023	1.231			5.689	6.76		
1805 12	184.00			1352.0		4.154	5.94		
		0.0023	1.231		163.68	3.631	5.67		
						2.579	5.10	1.0798	
		0.0046	1.231			2.510	5.06		36.84
1805 13	184.45			1347.4		3.361	5.52		
		0.0023	-0.447		162.42	5.154	6.46		
						3.706	5.70	1.0664	
		0.0023	1.231			6.667	7.20		
1805 14	184.45			1324.4		7.694	7.84		
		0.0023	1.679		161.08	10.173	9.16		
						9.555	8.83		
		0.0023	2.126			9.338	8.72		36.05
1805 15	184.00			1305.9		7.460	7.71		
		0.0023	3.020		162.42	7.128	7.53		
						6.890	7.41	1.0569	
		0.0023	2.573			8.211	8.11		
1805 16	183.56			1296.6		4.810	6.29		
		0.0023	2.573		165.23	0.565	4.02		
						-3.088	2.07	1.0571	
		0.0046	1.679			-1.999	2.45		34.88
1805 17	183.56			1293.5		-2.087	2.60		
		0.0046	2.126		170.05	1.636	4.60		
						2.136	4.86	1.0420	
		0.0046	3.020			6.067	6.97		
1805 18	182.66			1267.1		3.973	5.85		
		0.0023	2.573		173.20	6.273	7.08		
						6.668	7.29		
		0.0023	1.679			8.330	8.18		33.75
1805 19	182.22			1250.0		5.401	6.61		
		0.0023	1.679		171.65	5.940	6.90		
						5.502	6.66	1.0239	
		0.0046	1.679			5.370	6.59		
1805 20	181.78			1240.7		4.338	6.04		
		0.0046	-0.447		162.11	4.895	6.34		
						6.890	7.41	1.0320	
		0.0046	0.000			7.977	7.99		33.75

1805:21 to 1805:32 CDT

CDT	THDG	RPP	RUD	ALTF	IAS	Angle of Attack		EPR	T
h m s	deg	inches	deg	ft	kts	DFDR	Body		°C
1805 21	181.78			1217.4		9.425	8.76		
		0.0046	-0.447		159.27	9.182	8.63		
						8.172	8.09	1.0178	
		0.0023	0.000			7.775	7.88		
1805 22	181.33			1215.8		9.555	8.83		
		0.0023	1.679		151.20	13.106	10.73		
						9.425	8.76		
		0.0023	2.126			8.667	7.29		33.57
1805 23	180.45			1209.6		10.352	9.26		
		0.0000	2.573		156.04	12.849	10.59		
						11.889	10.08	1.0300	
		0.0000	0.000			13.892	11.15		
1805 24	180.01			1184.8		9.949	9.04		
		0.0000	-0.447		146.43	7.746	7.66		
						9.286	8.69	1.0583	
		0.0000	0.000			7.211	7.58		32.33
1805 25	179.56			1188.5		5.004	6.40		
		0.0000	1.679		143.32	4.020	5.87		
						5.102	6.45	1.0903	
		0.0023	1.679			7.100	7.52		
1805 26	179.13			1172.5		7.576	7.77		
		0.0023	0.000		137.88	9.496	8.60		
						5.811	6.83		
		0.0000	-0.447			7.378	7.67		32.69
1805 27	179.13			1161.8		9.817	8.97		
		0.0023	0.000		136.27	9.182	8.63		
						8.172	8.09	1.3066	
		0.0023	0.000			13.553	10.97		
1805 28	178.69			1141.9		11.745	10.00		
		0.0046	-0.447		128.36	14.156	11.29		
						13.215	10.79	1.3623	
		0.0000	3.020			17.157	12.90		32.69
1805 29	178.25			1117.6		16.669	12.64		
		0.0023	2.126		130.01	13.403	10.89		
						14.285	11.36	1.4299	
		0.0000	0.000			16.712	12.66		
1805 30	177.81			1098.0		15.225	11.87		
		0.0023	-0.447		133.60	17.198	12.92		
						14.752	11.61		
		0.0046	0.000			13.553	10.97		31.63
1805 31	177.38			1081.6		13.517	10.35		
		0.0023	0.000		140.42	15.123	11.81		
						11.386	10.87	1.4597	
		0.0046	0.000			15.162	11.83		
1805 32	176.51			1066.8		15.702	12.12		
		0.0046	0.000		146.75	16.201	11.85		
						12.471	10.38	1.4097	
		0.0023	1.679			13.217	10.79		30.92

1805:33 to 1805:44 CDT

CDT	THDG	RPP	RUD	ALTF	IAS	Angle of Attack		EPR	T
h m s	deg	inches	deg	ft	kts	DFDR	Body		°C
1805 33	174.79			1059.4		9.949	9.04		
		0.0000	2.573		144.56	7.294	7.62		
						6.233	7.05	1.3691	
		0.0023	3.466			8.300	8.16		
1805 34	173.09			1055.1		7.931	7.95		
		0.0023	1.231		139.82	2.140	4.86		
						4.619	6.19		
		0.0023	-0.447			2.803	5.22		31.63
1805 35	172.25			1083.1		9.817	9.97		
		0.0023	-3.129		139.58	11.388	9.81		
						18.803	13.79	1.3372	
		0.0023	-7.559			18.951	13.86		
1805 36	171.83			1143.4		27.659	18.52		
		0.0000	-7.998		120.81	25.947	17.60		
						28.369	18.90	1.3760	
		-0.0023	-7.998			33.633	21.71		31.99
1805 37	171.00			1065.3		32.761	21.25		
		-0.0113	-5.352		122.39	30.543	20.06		
						23.368	16.22	1.4121	
		-0.0136	1.231			22.965	16.01		
1805 38	173.09			994.9		24.009	16.56		
		-0.0136	2.573		133.47	20.907	14.91		
						22.683	15.96		
		-0.0113	2.126			19.167	13.97		31.98
1805 39	174.79			996.3		14.440	11.45		
		-0.0091	-0.447		133.47	8.330	8.18		
						7.694	7.84	1.4500	
		-0.0113	3.020			-0.114	3.66		
1805 40	174.79			989.3		0.900	4.20		
		-0.0113	5.248		136.90	4.619	6.19		
						0.699	4.09	1.4566	
		-0.0091	4.358			-0.796	3.29		30.75
1805 41	173.94			963.1		-0.911	3.23		
		-0.0091	3.912		125.65	0.931	4.22		
						1.675	4.62	1.5195	
		-0.0091	3.020			1.782	4.67		
1805 42	173.51			937.6		7.115	7.53		
		-0.0091	2.126		125.09	12.197	10.25		
						16.609	12.64		
		-0.0091	2.126			20.653	14.77		30.75
1805 43	173.09			881.0		18.473	13.60		
		-0.0091	4.358		129.50	18.260	13.49		
						15.863	12.21	1.5381	
		-0.0091	2.573			11.318	9.78		
1805 44	172.67			850.6		12.178	10.24		
		-0.0091	-0.447		137.27	8.479	8.26		
						4.431	6.09	1.5256	
		-0.0068	-2.683			1.187	4.36		31.27

1805:45 to 1805:56 CDT

CDT	T HDG	RPP	RUD	ALTF	IAS	Angle of Attack		EPR	T
h m s	deg	inches	deg	ft	kts	DFDR	Body		°C
1805 45	173.09			811.1		-0.911	3.23		
		-0.0068	-0.895		136.52	-2.186	2.55		
						-5.966	0.53	1.5249	
		-0.0068	2.573			-4.655	1.23		
1805 46	172.25			739.9		-0.245	3.59		
		-0.0091	3.466		143.44	4.756	6.26		
						5.707	6.77		
		-0.0068	1.679			10.173	9.16		30.57
1805 47	171.42			668.4		15.702	12.12		
		-0.0023	0.000		150.61	19.291	14.04		
						21.411	15.17	1.5391	
		-0.0023	0.000			25.754	17.50		
1805 48	170.59			642.5		26.485	17.89		
		-0.0023	2.126		155.55	26.973	18.15		
						22.883	15.96	1.5029	
		-0.0045	-0.895			23.087	16.07		31.27
1805 49	170.18			564.9		20.585	14.73		
		-0.0045	-6.679		161.63	18.137	13.42		
						14.910	11.70	1.5195	
		-0.0023	-4.908			8.244	8.67		
1805 50	171.00			546.7		8.051	8.02		
		0.0000	-1.789		174.90	2.825	5.23		
						2.315	4.96		
		-0.0045	0.000			3.303	5.49		31.45
1805 51	170.59			515.1		4.524	6.14		
		-0.0091	0.000		165.56	4.282	6.01		
						7.115	7.53	1.5344	
		-0.0091	0.000			8.152	8.09		
1805 52	169.77			492.8		9.167	8.62		
					169.23	-0.244	3.59		
						-1.244	3.05		
		-0.1386	-2.236			-1.387	2.98		30.57
1805 53	169.77			521.9		-1.845	2.73		
		-0.2501	-6.237		171.55	-1.937	2.68		
						0.900	4.20	1.5156	
		-0.2023	-6.679			-3.722	1.73		
1805 54	170.59			518.0		-0.354	3.53		
		-0.3570	-2.683		188.85	-0.059	3.69		
						0.287	3.87		
		-0.2615	-0.895			0.458	3.97		29.87
1805 55	170.59			511.1		-1.255	3.05		
		-0.4230	-1.789		182.59	0.297	3.88		
						-0.311	3.23	1.3020	
1805 56	170.18			487.7		-0.575	3.41		
					140.66				
						-7.350	-0.21		32.16

APPENDIX 3 DFDR READOUT DATA II

This tabulation is based on the NTSB DATA DUMP PROGRAM dated August 2, 1985 and September 13, 1985. Time in this table denotes the cockpit voice recorder time in CDT which is three seconds faster than the DFDR readout time.

CPP (Pitch control column) = CPP L + 4.49°
= CPP R + 3.53°
STAB (Stabilizer position) in degrees
TRIM (Pitch trim position) = TRIM L - 0.032°
= TRIM R - 0.028°
SPO (Spoiler position) = SPO L4 - 1.320°
= SPO L5 + 0.783°
= SPO R2 + 0.000°
= SPO R6 + 0.379°
CWP (Control wheel position) = CWP L - 2.82°
= CWP R + 0.61°
AIL (Aileron angle) = -AIL LO + 0.216°
= -AIL LI - 1.452°
= +AIL RO + 0.200°
= +AIL RI + 1.037°

1804:51 to 1804:56 CDT

CDT	θ	CPP	STAB	TRIM	SPOL4	SPOR2	φ	CWP	AIL	SPOL5	SPOR6
h m s	deg	deg	deg	deg	deg	deg	deg	deg	deg	deg	deg
1804 51		6.038			3.784			9.18	2.565	0.000	
							1.343		1.232		
		6.491	-4.980			2.460		1.87	1.207		1.171
	4.022			5.864					0.589		
1804 52		6.407			1.754			14.41	2.565	0.000	
							1.790		3.126		
		5.894	-5.004			1.231		7.80	2.325		
	4.022			5.805					3.162		
1804 53		6.108			1.816			21.15	3.569	0.000	
							2.684		6.553		
		6.342	-5.100			2.460		23.53	6.552		1.109
	4.022			5.852					7.279		
1804 54		6.257			1.754			29.95	6.126	0.000	
							4.467		6.113		
		5.994	-5.038			2.705		19.82	6.110		
	4.467			5.848					5.282		
1804 55		6.009			1.754			19.73	4.013	0.000	
							7.125		4.236		
		5.994	-5.064			1.231		15.05	3.669		1.171
	4.467			5.817					5.282		
1804 56		6.307			1.816			22.25	4.238	0.000	
							8.005		5.011		
		6.441	-5.112			1.231		13.59	4.445		
	4.467			5.852					3.050		

1804:57 to 1805:08 CDT

CDT	θ	CPP	STAB	TRIM	SPOL4	SPOR2	φ	CWP	AIL	SPOL5	SPOR6
h m s	deg	deg	deg	deg	deg	deg	deg	deg	deg	deg	deg
1804 57		6.407			1.754			9.53	2.116	0.000	
							6.443		1.455		
		6.491	-5.124			1.231		2.56	1.095		1.171
	4.022			5.790					0.366		
1804 58		6.307			1.754			-1.86	0.216	0.000	
							6.684		-0.109		
		5.894	-5.100			1.231		-3.54	-0.136		
	4.022			5.844					1.037		
1804 59		6.108			1.816			28.16	4.906	0.000	
							3.576		6.113		
		6.193	-5.040			3.688		21.01	5.778		1.109
	4.022			5.856					6.171		
1805 00		6.407			1.754			27.76	5.350	0.000	
							3.576		5.673		
		6.243	-5.136			3.688		5.35	3.665		
	4.022			5.872					0.477		
1805 01		6.009			1.754			-8.50	-0.679	0.000	
							5.356		-2.123		
		6.044	-5.004			1.231		-11.61	-1.031		1.171
	4.022			5.868					-1.758		
1805 02		6.108			1.816			-10.53	-1.797	0.000	
							4.467		-0.445		
		6.044	-4.980			1.231		-3.08	-0.503		
	4.022			5.864					0.366		
1805 03		6.209			1.754			13.05	1.782	0.000	
							3.130		2.904		
		6.243	-5.028			1.231		6.07	2.213		1.171
	4.022			5.860					0.701		
1805 04		6.058			1.754			-2.24	0.216	0.000	
							3.130		-0.109		
		5.994	-4.968			1.231		-3.69	-0.136		
	4.022			5.844					1.037		
1805 05		6.009			1.754			15.46	2.565	0.000	
							3.576		3.238		
		5.496	-4.860			2.572		6.53	2.437		1.171
	4.022			5.805					0.813		
1805 06		5.760			3.855			7.07	1.223	0.000	
							4.022		0.897		
		5.944	-4.872			3.911		0.69	-0.136		
	3.576			5.817					0.701		
1805 07		5.959			4.227			5.84	-0.232	0.000	
							4.467		0.785		
		5.894	-4.860			3.799		0.39	-0.136		1.171
	3.130			5.821					1.037		
1805 08		5.859			3.794			-2.74	-0.232	0.000	
							4.022		-1.676		
		5.596	-4.384			3.376		-18.71	-1.813		
	2.684			5.809					-5.868		

1805:09 to 1805:20 CDT

CDT	θ	CPP	STAB	TRIM	SPOL4	SPOR2	ϕ	CWP	AIL	SPOL5	SPOR6
h m s	deg	deg	deg	deg	deg	deg	deg	deg	deg	deg	deg
1805 09		5.511			9.773			-33.87	-7.459	0.000	
							3.130		-6.142		
		5.397	-4.716			4.245		-24.19	-5.378		1.171
	2.684			5.786					-4.097		
1805 10		5.461			8.082			-10.84	-1.462	0.000	
							0.000		-1.788		
		5.347	-4.692			5.688		-11.92	-1.254		
	2.237			5.782					-1.758		
1805 11		5.411			7.084			-7.50	-1.238	0.000	
							-2.125		-1.452		
		5.1[illegible]3	-4.560			6.084		-9.42	-.919		1.171
	1.790			5.743					-1.200		
1805 12		5.361			7.770			-6.53	-1.015	0.000	
							-3.019		-0.109		
		6.541	-4.728			7.235		-1.69	-0.248		
	1.343			5.860					0.142		
1805 13		6.805			3.237			-12.54	-1.127	0.000	
							-3.465		-2.795		
		5.546	-4.920			1.231		-13.18	-1.925		1.171
	2.237			5.790					-2.093		
1805 14		5.013			1.299			-19.63	-2.803	0.000	
							2.572		-4.359		
		6.044	-4.608			4.801		-26.15	-4.378		
	3.130			5.817					-6.198		
1805 15		6.009			8.144			-31.84	-[illegible].026	0.000	
							-1.231		-7.030		
		6.093	-4.872			1.795		-31.96	-6.373		1.294
	3.130			5.860					-6.198		
1805 16		6.158			4.289			-17.36	-2.914	0.000	
							-3.019		-[illegible].354		
		6.292	-4.800			1.343		-18.51	-3.376		
	3.[illegible]30			5.895					-3.096		
1805 17		6.755			1.678			-15.82	-2.133	0.000	
							-3.911		-2.683		
		6.789	-5.052			1.454		-14.65	-2.037		1.294
	4.467			5.825					-2.539		
1805 18		4.764			2.063			-18.55	-2.021	0.000	
							-4.356		-4.582		
		4.700	-4.200			2.572		-23.05	-4.[illegible]78		
	7.125			5.809					-[illegible].198		
1805 19		6.208			9.208			26.61	-5.915	0.447	
							-[illegible].634		-2.683		
		7.137	-5.124			1.678		-7.84	-1.366		1.356
	7.565			5.892					-[illegible].306		
1805 20		7.103			2.001			14.49	[illegible].782	0.000	
							-7.835		3.460		
		5.646	-4.824			1.343		9.38	2.437		
	9.317			5.817					3.050		

1805:21 to 1805:32 CDT

CDT	θ	CPP	STAB	TRIM	SPOL4	SPOR2	ϕ	CWP	AIL	SPOL5	SPOR5
h m s	deg	deg	deg	deg	deg	deg	deg	deg	deg	deg	deg
1805 21		5.959			1.939			4.64	2.118	0.000	
							-7.455		0.002		
		6.143	-4.932			1.343		-2.54	0.200		1.233
	10.620			5.848					-0.082		
1805 22		6.506			1.939			-10.65	-0.903	0.000	
							-2.465		-6.030		
		7.038	-5.436			1.231		-33.19	-5.821		
	11.051			5.852					-7.734		
1805 23		6.805			2.433			-38.87	-8.992	0.447	
							-0.336		-8.577		
		6.690	-5.472			1.231		-39.37	-8.134		1.294
	11.482			5.860					-8.171		
1805 24		6.407			2.433			-42.42	-9.536	0.447	
							-0.336		-9.457		
		6.541	-5.352			1.119		-42.84	-9.117		
	11.482			5.895					-9.258		
1805 25		7.551			4.041			-32.76	-7.019	1.678	
							-0.783		-7.362		
		7.981	-5.928			1.119		-29.15	-6.705		1.171
	11.482			5.872					-3.430		
1805 26		7.998			1.754			-14.68	-2.133	0.000	
							-4.356		-2.906		
		7.137	-6.156			1.007		-14.61	-2.260		
	12.766			5.860					-1.982		
1805 27		7.053			1.692			-11.69	-1.350	0.000	
							-7.455		-1.676		
		7.435	-5.916			1.007		-10.12	-1.366		1.109
	14.457			5.868					-1.647		
1805 28		7.203			1.631			-21.85	-4.140	0.000	
							-8.334		-1.788		
		7.131	-5.240			1.007		0.24	-0.360		
	15.293			5.876					3.386		
1805 29		7.249			1.631			18.20	3.792	0.000	
							-13.508		3.904		
		7.931	-6.492			1.007		15.13	3.553		1.109
	15.709			5.868					5.615		
1805 30		7.849			1.569			23.62	4.238	0.000	
							-15.189		6.553		
		7.435	-6.372			1.119		27.48	7.105		
	15.709			5.876					7.942		
1805 31		7.302			1.569			35.60	6.900	0.000	
							-13.931		6.662		
		7.236	-6.036			1.119		21.71	6.221		1.294
	15.293			5.880					5.504		
1805 32		6.954			1.631			-0.49	0.440	0.000	
							-9.209		0.002		
		5.944	-5.436			1.119		-2.54	0.200		
	14.876			5.819					0.336		

1805:33 to 1805:44 CDT

CDT	θ	CPP	STAB	TRIM	SPOL4	SPOR2	φ	CWP	AIL	SPOL5	SPOR6
h m s	deg	deg	deg	deg	deg	deg	deg	deg	deg	deg	deg
1805 33		6.050			3.464			20.94	3.792	0.000	
							-5.608		4.015		
		7.286	-5.568			6.573		1.19	2.549		1.109
	13.614			5.856					0.216		
1805 34		6.445			2.125			11.62	1.670	0.000	
							-3.019		2.347		
		7.733	-6.324			0.695		10.47	2.437		
	13.614			5.895					4.279		
1805 35		7.600			1.631			18.36	3.569	0.000	
							-0.783		2.013		
		7.981	-6.372			1.007		-4.53	1.207		1.048
	14.457			5.899					-5.426		
1805 36		6.257			13.187			-77.46	-15.803	3.020	
							12.359		-19.719		
		6.392	-6.072			0.895		-85.94	-18.670		
	14.457			5.931					-18.033		
1805 37		5.660			50.652			-88.66	-20.242	31.151	
							20.947		-19.618		
		3.256	-4.488			0.733		-85.01	-18.570		1.048
	12.766			5.696					-17.733		
1805 38		3.669			40.927			-56.42	-13.715	15.240	
							6.443		-4.582		
		4.451	-4.524			0.895		6.37	0.200		
	8.881			5.669					6.504		
1805 39		3.171			1.568			30.91	5.461	0.000	
							-4.356		7.538		
		5.596	-4.068			2.460		34.06	9.081		1.233
	3.576			5.774					9.590		
1805 40		6.506			1.507			36.89	7.231	0.000	
							-7.455		6.882		
		5.098	-4.764			6.131		25.81	7.325		
	1.790			5.700					7.942		
1805 41		0.540			1.692			19.60	4.127	0.000	
							-6.573		3.682		
		0.423	-2.340			5.134		21.34	4.445		0.986
	1.343			5.689					9.913		
1805 42		2.624			4.723			38.68	8.001	0.000	
							-4.350		7.423		
		2.908	-3.564			13.297		27.91	5.662		
	-0.336			5.715					7.831		
1805 43		1.532			6.150			37.91	7.451	0.000	
							-1.678		7.756		
		2.410	-3.216			13.191		31.05	8.643		2.158
	-3.911			5.723					9.918		
1805 44		5.063			7.084			33.62	6.679	0.000	
							0.895		6.003		
		8.625	-6.204			11.589		20.48	5.773		
	-6.334			5.825					2.721		

1805:45 to 1805:56 CDT

CDT	θ	CPP	STAB	TRIM	SPOL4	SPOR2	Φ	CWP	AIL	SPOL5	SPOR6
h m s	deg	deg	deg	deg	deg	deg	deg	deg	deg	deg	deg
1805 45		10.129			1.446			4.22	1.223	0.000	
							2.684		0.226		
		9.959	-7.620			1.343		0.39	-0.136		1.171
	-7.455			5.844					1.037		
1805 46		9.535			1.692			6.53	-0.003	0.000	
							0.446		1.120		
		8.526	-7.260			1.231		0.66	-0.007		
	-1.231			5.601					0.477		
1805 47		6.705			1.878			2.03	0.216	0.447	
							0.695		0.450		
		7.485	-6.036			1.454		-2.74	-0.024		1.233
	4.022			5.782					-0.194		
1805 48		6.407			2.001			10.28	0.887	0.447	
							2.237		1.567		
		5.596	-5.016			1.343		-0.16	-0.248		
	5.356			5.750					0.254		
1805 49		5.959			2.001			5.84	-0.344	0.447	
							1.790		1.455		
		6.491	-5.004			1.454		-1.32	-0.136		1.479
	1.790			5.735					-0.753		
1805 50		6.506			2.063			-16.02	-1.574	0.447	
							6.242		-4.917		
		9.466	-4.992			1.556		-34.70	-5.599		
	-0.336			5.817					-8.062		
1805 51		9.426			2.001			-34.40	-7.078	0.447	
							5.709		-3.130		
		3.503	-4.320			1.678		-6.43	-1.366		1.479
	3.130			5.727					2.156		
1805 52		3.918			1.878			31.91	4.572	0.447	
							-2.125				
									8.663		
	1.790			1.233					3.050		
1805 53		4.515			1.878			10.08	2.453	0.000	
							0.895		0.673		
		6.690	-4.296			1.790		-10.12	-0.583		1.479
	0.448			5.735					0.813		
1805 54		2.873			6.332			17.20	3.123	0.000	
							0.000		3.460		
		0.473	-2.076			9.752		10.50	2.884		
	1.343			5.739					4.725		
1805 55		3.615			9.083			-7.20	-0.120	0.447	
							-0.336		-2.235		
		2.853	-3.120			8.114		-5.16	-0.819		1.541
	4.912										
1805 56		0.184						-20.92		0.447	

APPENDIX 4 AIRCRAFT POSITIONS

Positions of Delta 191 on the 17L coordinates, x y z tabulated at 1/8 sec interval. For the 17L coordinates, see Fig. 2.4 (P 20) and for x-z and x-y plots, see Fig. 2.9 (P 25)

1804:56 to 1805:01 CDT

CDT	x			y		z		z − z_{rw}	
h m s	ft	m	n m	ft	m	ft	m	ft	m
1804 56	-21779.6	-6638.5	-3.582	264.4	80.6	1725.5	525.9	1156.4	352.1
	-21744.0	-6627.6	-3.576	263.0	80.2	1723.2	525.2	1156.1	352.4
	-21708.3	-6616.8	-3.570	261.5	79.7	1721.0	524.6	1153.9	351.7
	-21672.6	-6605.9	-3.564	260.2	79.3	1718.8	523.9	1151.7	351 0
	-21637.0	-6595.0	-3.559	258.9	78.9	1716.6	523.2	1149.5	350.4
	-21601.3	-6584.2	-3.553	257.6	78.5	1714.4	522.5	1147.3	349.7
	-21565.7	-6573.3	-3.547	256.4	78 2	1712.1	521.9	1145.0	349.0
	-21530.0	-6562.4	-3.541	255.3	77.8	1709.9	521.2	1142.8	348.3
1804 57	-21494.4	-6551.6	-3.535	254.3	77.5	1707.7	520.5	1140.6	347.7
	-21458.7	-6540.7	-3.529	253.3	77.2	1705.5	519.8	1138.4	347.0
	-21423.1	-6529.8	-3.523	252.3	76.9	1703.3	519.2	1136.2	346.3
	-21387.5	-6519.0	-3.518	251.4	76.6	1701.1	518.5	1134.0	345.7
	-21351.8	-6508.1	-3.512	250.6	76.4	1698.9	517.8	1131.8	345.0
	-21316.2	-6497.3	-3.506	249.8	76.1	1696.8	517.2	1129.7	344 3
	-21280.6	-6486.4	-3.500	249.1	75.9	1694.6	516.5	1127.5	343.7
	-21244.9	-6475.5	-3.494	248.5	75.7	1692.4	515.8	1125.3	343.0
1804 58	-21209.3	-6464.7	-3.488	247.8	75.5	1690.2	515.2	1123.1	342.3
	-21173.7	-6453.8	-3.482	247.3	75.4	1688.0	514.5	1120.9	341.7
	-21138.1	-6443.0	-3.477	246.8	75.2	1685.9	513.9	1118.8	341.0
	-21102.5	-6432.1	-3.471	246.3	75.1	1683.7	513 2	1116.6	340.3
	-21066.9	-6421.3	-3.465	245.9	75.0	1681.5	512.5	1114.4	339.7
	-21031.3	-6410.4	-3.459	245.5	74.8	1679.4	511.9	1112.3	339.0
	-20995.7	-6399.6	-3.453	245.2	74.7	1677.2	511.2	1110.1	338.4
	-20960.1	-6388.7	-3.447	244.9	74.6	1675.1	510.6	1108.0	337.7
1804 59	-20924.5	-6377.9	-3.441	244.6	74.5	1672.9	509.9	1105.8	337.1
	-20888.9	-6367.0	-3.436	244.3	74.5	1670.8	509.3	1103.7	336 4
	-20853.3	-6356.2	-3.430	244.1	74.4	1668.7	508.6	1101.6	335.8
	-20817.7	-6345.3	-3.424	243.9	74.3	1666.6	508.0	1099.5	335.1
	-20782.2	-6334.5	-3.418	243.7	74.3	1664.5	507.3	1097.4	334.5
	-20746.6	-6323.6	-3.412	243.5	74.2	1662.3	506.7	1095.2	333.8
	-20711.1	-6312.8	-3.406	243.3	74.2	1660.2	506.0	1093.1	333.2
	-20675.5	-6302.0	-3.400	243.2	74.1	1658.1	505.4	1091.0	332.5
1805 00	-20640.0	-6291.1	-3.395	243.1	74.1	1655.9	504.7	1088.8	331.9
	-20604.5	-6280.3	-3.389	243.0	74.1	1653.8	504.1	1086.7	331.2
	-20568.9	-6269.5	-3.383	243.0	74.1	1651.6	503.4	1084.5	330.6
	-20533.4	-6258.7	-3.377	243.0	74.1	1649.5	502.8	1082.4	329.9
	-20497.9	-6247.8	-3.371	243.0	74.1	1647.3	502.1	1080.2	329.2
	-20462.4	-6237.0	-3.365	243.0	74.1	1645.1	501.4	1078.0	328.6
	-20426.9	-6226.2	-3.360	243.1	74.1	1642.9	500.8	1075.8	327.9
	-20391.5	-6215.4	-3.354	243.2	74.1	1640.7	500.1	1073.6	327.2
1805 01	-20356.0	-6204.6	-3.348	243.4	74.2	1638.5	499.4	1071.4	326.6
	-20320.5	-6193.8	-3.342	243.6	74.2	1636.3	498.7	1069.2	325.9
	-20285.1	-6183.0	-3.336	243.8	74.3	1634.1	498.1	1067.0	325.2
	-20249.6	-6172.2	-3.330	244.1	74.4	1631.8	497.4	1064.7	324.5
	-20214.2	-6161.4	-3.325	244.4	74.5	1629.6	496.7	1062.5	323.9
	-20178.7	-6150.6	-3.319	244.7	74.6	1627.4	496.0	1060.3	323.2
	-20143.3	-6139.8	-3.313	245.1	74 7	1625.1	495.3	1058.0	322.5
	-20107.9	-6129.0	-3.307	245.6	74.9	1622.9	494.7	1055.8	321.8

1805:02 to 1805:08 CDT

CDT	x			y		z		$z - z_{ref}$	
h m s	ft	m	n m	ft	m	ft	m	ft	m
1805 02	-20072.5	-6118.2	-3.301	246.1	75.0	1620.7	494.0	1053.6	321.1
	-20037.0	-6107.4	-3.295	246.6	75.2	1618.4	493.3	1051.3	320.5
	-20001.6	-6096.6	-3.290	247.1	75.3	1616.2	492.6	1049.1	319.8
	-19966.2	-6085.8	-3.284	247.7	75.5	1614.0	492.0	1046.9	319.1
	-19930.9	-6075.0	-3.278	248.3	75.7	1611.8	491.3	1044.7	318.4
	-19895.5	-6064.2	-3.272	249.0	75.9	1609.7	490.6	1042.6	317.8
	-19860.1	-6053.4	-3.266	249.6	76.1	1607.5	490.0	1040.4	317.1
	-19824.7	-6042.6	-3.261	250.4	76.3	1605.3	489.3	1038.2	316.5
1805 03	-19789.3	-6031.9	-3.255	251.1	76.5	1603.2	488.6	1036.1	315.8
	-19754.0	-6021.1	-3.249	251.8	76.8	1601.0	488.0	1033.9	315.1
	-19718.6	-6010.3	-3.243	252.6	77.0	1598.9	487.3	1031.8	314.5
	-19683.2	-5999.5	-3.237	253.4	77.2	1596.7	486.7	1029.6	313.8
	-19647.9	-5988.8	-3.231	254.3	77.5	1594.6	486.1	1027.5	313.2
	-19612.6	-5978.0	-3.226	255.1	77.8	1592.5	485.4	1025.4	312.6
	-19577.2	-5967.2	-3.220	256.0	78.0	1590.5	484.8	1023.4	311.9
	-19541.9	-5956.4	-3.214	257.0	78.3	1588.4	484.2	1021.3	311.3
1805 04	-19506.6	-5945.7	-3.208	257.9	78.6	1586.4	483.5	1019.3	310.7
	-19471.3	-5934.9	-3.202	258.9	78.9	1584.4	482.9	1017.3	310.1
	-19435.9	-5924.1	-3.197	259.9	79.2	1582.4	482.3	1015.3	309.5
	-19400.6	-5913.4	-3.191	261.0	79.5	1580.4	481.7	1013.3	308.9
	-19365.3	-5902.6	-3.185	262.0	79.9	1578.4	481.1	1011.3	308.3
	-19330.0	-5891.9	-3.179	263.1	80.2	1576.5	480.5	1009.4	307.7
	-19294.8	-5881.1	-3.173	264.3	80.6	1574.5	479.9	1007.4	307.1
	-19259.5	-5870.4	-3.168	265.4	80.9	1572.6	479.3	1005.5	306.5
1805 05	-19224.2	-5859.6	-3.162	266.6	81.3	1570.7	478.8	1003.6	305.9
	-19188.9	-5848.9	-3.156	267.9	81.6	1568.8	478.2	1001.7	305.3
	-19153.7	-5838.1	-3.150	269.1	82.0	1567.0	477.6	999.9	304.8
	-19118.4	-5827.4	-3.144	270.4	82.4	1565.1	477.1	998.0	304.2
	-19083.2	-5816.6	-3.139	271.7	82.8	1563.3	476.5	996.2	303.6
	-19048.0	-5805.9	-3.133	273.0	83.2	1561.5	475.9	994.4	303.1
	-19012.7	-5795.2	-3.127	274.4	83.6	1559.7	475.4	992.6	302.5
	-18977.5	-5784.4	-3.121	275.8	84.1	1557.9	474.8	990.8	302.0
1805 06	-18942.3	-5773.7	-3.115	277.2	84.5	1556.1	474.3	989.0	301.4
	-18907.1	-5763.0	-3.110	278.6	84.9	1554.3	473.8	987.2	300.9
	-18871.9	-5752.2	-3.104	280.1	85.4	1552.5	473.2	985.4	300.4
	-18836.7	-5741.5	-3.098	281.6	85.8	1550.8	472.7	983.7	299.8
	-18801.5	-5730.8	-3.092	283.2	86.3	1549.1	472.2	982.0	299.3
	-18766.4	-5720.1	-3.086	284.8	86.8	1547.3	471.6	980.2	298.8
	-18731.2	-5709.3	-3.081	286.4	87.3	1545.6	471.1	978.5	298.3
	-18696.0	-5698.6	-3.075	288.1	87.8	1544.0	470.6	976.9	297.8
1805 07	-18660.9	-5687.9	-3.069	289.8	88.3	1542.3	470.1	975.2	297.2
	-18625.7	-5677.2	-3.063	291.5	88.8	1540.6	469.6	973.5	296.7
	-18590.6	-5666.5	-3.058	293.2	89.4	1539.0	469.1	971.9	296.2
	-18555.4	-5655.8	-3.052	295.0	89.9	1537.3	468.6	970.2	295.7
	-18520.3	-5645.1	-3.046	296.8	90.5	1535.6	468.1	968.5	295.2
	-18485.2	-5634.3	-3.040	298.7	91.0	1534.0	467.6	966.9	294.7
	-18450.0	-5623.6	-3.034	300.6	91.6	1532.3	467.1	965.2	294.2
	-18414.9	-5612.9	-3.028	302.5	92.2	1530.6	466.5	963.5	293.7
1805 08	-18379.8	-5602.2	-3.023	304.4	92.8	1529.0	466.0	961.9	293.2
	-18344.7	-5591.5	-3.017	306.4	93.4	1527.3	465.5	960.2	292.7
	-18309.6	-5580.8	-3.011	308.4	94.0	1525.6	465.0	958.5	292.2
	-18274.5	-5570.1	-3.006	310.5	94.6	1524.0	464.5	956.9	291.7
	-18239.4	-5559.4	-3.000	312.6	95.3	1522.3	464.0	955.2	291.1
	-18204.3	-5548.8	-2.994	314.7	95.9	1520.6	463.5	953.5	290.6
	-18169.3	-5538.1	-2.988	316.9	96.6	1518.9	463.0	951.8	290.1
	-18134.2	-5527.4	-2.982	319.1	97.2	1517.2	462.4	950.1	289.6

1805:09 to 1805:15 CDT

CDT	x			y		z		$z - z_{...}$	
h m s	ft	m	n m	ft	m	ft	m	ft	m
1805 09	-16099.1	-5516.7	-2.977	321.3	97.9	1515.5	461.9	948.4	289.1
	-16064.0	-5506.0	-2.971	323.5	98.6	1513.8	461.4	946.7	288.6
	-16029.0	-5495.3	-2.965	325.8	99.3	1512.1	460.9	945.0	288.0
	-17993.9	-5484.6	-2.959	328.1	100.0	1510.4	460.4	943.3	287.5
	-17958.8	-5473.9	-2.954	330.5	100.7	1508.7	459.8	941.6	287.0
	-17923.7	-5463.2	-2.948	332.8	101.4	1507.0	459.3	939.9	286.5
	-17888.6	-5452.5	-2.942	335.2	102.2	1505.3	458.8	938.2	286.0
	-17853.5	-5441.8	-2.936	337.6	102.9	1503.6	458.3	936.5	285.4
1805 10	-17818.4	-5431.1	-2.931	340.0	103.6	1501.9	457.8	934.8	284.9
	-17783.3	-5420.4	-2.925	342.4	104.4	1500.3	457.3	933.2	284.4
	-17748.2	-5409.7	-2.919	344.8	105.1	1498.6	456.8	931.5	283.9
	-17713.1	-5399.0	-2.913	347.2	105.8	1496.9	456.3	929.8	283.4
	-17678.0	-5388.3	-2.907	349.7	106.6	1495.3	455.8	928.2	282.9
	-17642.8	-5377.6	-2.902	352.1	107.3	1493.7	455.3	926.6	282.4
	-17607.7	-5366.9	-2.896	354.5	108.1	1492.0	454.8	924.9	281.9
	-17572.5	-5356.2	-2.890	356.9	108.8	1490.4	454.3	923.3	281.4
1805 11	-17537.4	-5345.5	-2.884	359.4	109.5	1488.8	453.8	921.7	280.9
	-17502.3	-5334.8	-2.879	361.8	110.3	1487.1	453.3	920.0	280.4
	-17467.1	-5324.0	-2.873	364.1	111.0	1485.5	452.8	918.4	279.9
	-17432.0	-5313.3	-2.867	366.5	111.7	1483.9	452.3	916.8	279.4
	-17396.8	-5302.6	-2.861	368.9	112.4	1482.2	451.8	915.1	278.9
	-17361.7	-5291.9	-2.855	371.2	113.2	1480.6	451.3	913.5	278.4
	-17326.6	-5281.2	-2.850	373.6	113.9	1479.0	450.8	911.9	277.9
	-17291.4	-5270.5	-2.844	375.9	114.6	1477.3	450.3	910.2	277.4
1805 12	-17256.3	-5259.8	-2.838	378.2	115.3	1475.7	449.8	908.6	276.9
	-17221.2	-5249.1	-2.832	380.5	116.0	1474.0	449.3	906.9	276.4
	-17186.1	-5238.4	-2.827	382.7	116.7	1472.3	448.8	905.2	275.9
	-17151.0	-5227.7	-2.821	385.0	117.3	1470.6	448.2	903.5	275.4
	-17115.9	-5217.0	-2.815	387.2	118.0	1468.8	447.7	901.7	274.8
	-17080.8	-5206.3	-2.809	389.4	118.7	1466.9	447.1	899.8	274.3
	-17045.7	-5195.6	-2.803	391.5	119.3	1465.0	446.5	897.9	273.7
	-17010.7	-5184.9	-2.798	393.7	120.0	1463.0	445.9	895.9	273.1
1805 13	-16975.6	-5174.2	-2.792	395.8	120.6	1460.9	445.3	893.8	272.4
	-16940.6	-5163.6	-2.786	397.9	121.3	1458.6	444.6	891.5	271.7
	-16905.6	-5152.9	-2.780	400.0	121.9	1456.3	443.9	889.2	271.0
	-16870.6	-5142.2	-2.775	402.1	122.6	1454.0	443.2	886.9	270.3
	-16835.7	-5131.6	-2.769	404.2	123.2	1451.5	442.4	884.4	269.6
	-16800.7	-5120.9	-2.763	406.3	123.8	1449.1	441.7	882.0	268.8
	-16765.8	-5110.3	-2.757	408.3	124.4	1446.6	440.9	879.5	268.1
	-16730.9	-5099.6	-2.752	410.3	125.1	1444.1	440.2	877.0	267.3
1805 14	-16696.0	-5089.0	-2.746	412.3	125.7	1441.6	439.4	874.5	266.5
	-16661.1	-5078.4	-2.740	414.3	126.3	1439.1	438.6	872.0	265.8
	-16626.2	-5067.7	-2.734	416.3	126.9	1436.6	437.9	869.5	265.0
	-16591.4	-5057.1	-2.729	418.3	127.5	1434.2	437.2	867.1	264.3
	-16556.5	-5046.5	-2.723	420.2	128.1	1431.9	436.5	864.8	263.6
	-16521.6	-5035.9	-2.717	422.2	128.7	1429.7	435.8	862.6	262.9
	-16486.8	-5025.2	-2.712	424.1	129.3	1427.5	435.1	860.4	262.2
	-16451.9	-5014.6	-2.706	426.1	129.9	1425.4	434.5	858.3	261.6
1805 15	-16417.1	-5004.0	-2.700	428.0	130.5	1423.4	433.8	856.3	261.0
	-16382.2	-4993.4	-2.694	430.0	131.1	1421.4	433.2	854.3	260.4
	-16347.4	-4982.7	-2.689	431.9	131.6	1419.5	432.7	852.4	259.8
	-16312.5	-4972.1	-2.683	433.8	132.2	1417.7	432.1	850.6	259.3
	-16277.7	-4961.5	-2.677	435.7	132.8	1415.8	431.6	848.7	258.7
	-16242.9	-4950.9	-2.671	437.7	133.4	1414.1	431.0	847.0	258.2
	-16208.1	-4940.3	-2.666	439.6	134.0	1412.3	430.5	845.2	257.6
	-16173.3	-4929.7	-2.660	441.5	134.6	1410.6	430.0	843.5	257.1

1805:16 to 1805:22 CDT

CDT	x			y		z		z − z_{ref}	
h m s	ft	m	n m	ft	m	ft	m	ft	m
1805 16	-16138.6	-4919.1	-2.654	443.4	135.1	1408.9	429.4	841.8	256.6
	-16103.8	-4908.5	-2.649	445.3	135.7	1407.2	428.9	840.1	256.1
	-16069.1	-4897.9	-2.643	447.1	136.3	1405.5	428.4	838.4	255.6
	-16034.4	-4887.3	-2.637	449.0	136.9	1403.9	427.9	836.8	255.1
	-15999.7	-4876.8	-2.631	450.8	137.4	1402.2	427.4	835.1	254 5
	-15965.1	-4866.2	-2.626	452.6	138.0	1400.5	426.9	833.4	254.0
	-15930.4	-4855.7	-2.620	454.5	138.5	1398.7	426.3	831.6	253.5
	-15895.8	-4845.1	-2.614	456.3	139.1	1396.8	425.8	829.7	252.9
1805 17	-15861.3	-4834.6	-2.609	458.1	139.6	1394.8	425.1	827.7	252.3
	-15826.8	-4824.1	-2.603	459.9	140.2	1392.6	424.5	825.5	251.6
	-15792.4	-4813.6	-2.597	461.7	140.7	1390.2	423.7	823.1	250.9
	-15758.0	-4803.1	-2.592	463.4	141.3	1387.7	423.0	820 6	250.1
	-15723.7	-4792.6	-2.586	465.2	141.8	1385.1	422.2	818.0	249.3
	-15689.4	-4782.2	-2.580	466.9	142.3	1382.4	421.4	815.3	248.5
	-15655.2	-4771.8	-2.575	468.7	142.9	1379.7	420 5	812.6	247 7
	-15621.1	-4761.4	-2.569	470.4	143.4	1377.0	419.7	809.9	246.8
1805 18	-15587.0	-4751.0	-2.564	472.0	143.9	1374.3	418.9	807.2	246.0
	-15552.9	-4740.6	-2.558	473.7	144.4	1371.7	418.1	804.6	245.3
	-15518.9	-4730.2	-2.552	475.3	144.9	1369.2	417.3	802.1	244.5
	-15485.0	-4719.9	-2.547	476.8	145.3	1366.8	416.6	799.7	243.8
	-15451.1	-4709.6	-2.541	478.3	145.8	1364.6	415.9	797.5	243.1
	-15417.3	-4699.2	-2.536	479.8	146.2	1362.4	415.3	795.3	242.4
	-15383.5	-4688.9	-2.530	481.2	146.7	1360.4	414.7	793.3	241.8
	-15349.8	-4678.7	-2.525	482.6	147.1	1358.4	414.1	791.3	241 2
1805 19	-15316.1	-4668.4	-2.519	484.0	147.5	1356.6	413.5	789.5	240.6
	-15282.6	-4658.2	-2.513	485.3	147.9	1354.9	413.0	787.8	240.1
	-15249.0	-4648.0	-2.508	486.5	148.3	1353.2	412.5	786.1	239.6
	-15215.6	-4637.8	-2.502	487.7	148.6	1351.6	412.0	784.5	239.1
	-15182.2	-4627.6	-2.497	488.8	149.0	1350.0	411.5	782.9	238.6
	-15148.8	-4617.4	-2.491	489.9	149.3	1348.4	411.0	781.3	238.1
	-15115.6	-4607.3	-2.486	490.9	149.6	1346.8	410.5	779.7	237.7
	-15082.4	-4597.2	-2.481	491.8	149.9	1345.3	410.0	778.2	237.2
1805 20	-15049.3	-4587.1	-2.475	492.7	150.2	1343.7	409.6	776.6	236.7
	-15016.2	-4577.0	-2.470	493.4	150.4	1342.1	409.1	775.0	236.2
	-14983.3	-4567.0	-2.464	494.2	150.6	1340.6	408.6	773.5	235.8
	-14950.4	-4556.9	-2.459	494.8	150.8	1339.0	408.1	771.9	235.3
	-14917.6	-4546.9	-2.453	495.3	151.0	1337.5	407.7	770 4	234.8
	-14884.8	-4536.9	-2.448	495.8	151.1	1335.9	407.2	768.8	234.3
	-14852.1	-4527.0	-2.443	496.3	151.3	1334.4	406.7	767.3	233.9
	-14819.5	-4517.0	-2.437	496.6	151.4	1332.9	406.3	765.8	233.4
1805 21	-14786.9	-4507.1	-2.432	496.9	151 5	1331.4	405.8	764.3	233.0
	-14754.5	-4497.2	-2.427	497.1	151.5	1330.0	405.4	762.9	232.5
	-14722.1	-4487.4	-2.421	497.2	151.6	1328.6	405.0	761.5	232.1
	-14689.8	-4477.5	-2.416	497.3	151.6	1327.3	404.6	760.2	231.7
	-14657.6	-4467.7	-2.411	497.3	151.6	1326.0	404.2	758.9	231.3
	-14625.5	-4457.9	-2.405	497.3	151.6	1324.8	403.8	757.7	231.0
	-14593.4	-4448.1	-2.400	497.2	151 6	1323.7	403.5	756.6	230.6
	-14561.5	-4438.4	-2.395	497.1	151.5	1322.7	403.2	755.6	230.3
1805 22	-14529.6	-4428.7	-2.390	497.0	151.5	1321.7	402.9	754.6	230.0
	-14497.8	-4419.0	-2.384	496.8	151.4	1320.7	402.5	753.6	229.7
	-14466.0	-4409.3	-2.379	496.6	151.4	1319.7	402.2	752.6	229.4
	-14434.4	-4399.7	-2.374	496.3	151.3	1318.7	402.0	751.6	229.1
	-14402.8	-4390.0	-2.369	496.1	151.2	1317.8	401.7	750.7	228.8
	-14371.4	-4380.4	-2.364	495.8	151.1	1317.8	401.4	749.7	228.5
	-14340.0	-4370.9	-2.358	495.5	151.0	1316.0	401.1	748.9	228.3
	-14308.6	-4361.3	-2.353	495.2	150.9	1315.1	400.9	748.0	228.0

1805:23 to 1805:29 CDT

CDT	x			y		z		$z - z_{ref}$	
h m s	ft	m	n m	ft	m	ft	m	ft	m
1805 23	-14277.4	-4351.8	-2.348	494.8	150.8	1314.3	400.6	747.2	227.8
	-14246.2	-4342.3	-2.343	494.5	150.7	1313.5	400.4	746.4	227.5
	-14215.2	-4332.8	-2.338	494.1	150.6	1312.7	400.1	745.6	227.3
	-14184.2	-4323.4	-2.333	493.7	150.5	1311.8	399.9	744.8	227.0
	-14153.3	-4314.0	-2.328	493.4	150.4	1311.1	399.6	744.0	226.8
	-14122.4	-4304.6	-2.323	493.0	150.3	1310.4	399.4	743.3	226.6
	-14091.7	-4295.2	-2.318	492.6	150.1	1309.7	399.2	742.6	226.4
	-14061.0	-4285.8	-2.313	492.2	150.0	1309.1	399.0	742.0	226.2
1805 24	-14030.4	-4276.5	-2.308	491.8	149.9	1308.6	398.9	741.5	226.0
	-13999.6	-4267.2	-2.303	491.4	149.8	1308.1	398.7	741.0	225.9
	-13969.4	-4257.9	-2.298	491.0	149.7	1307.7	398.6	740.6	225.7
	-13939.0	-4248.6	-2.293	490.7	149.6	1307.3	398.5	740.2	225.6
	-13908.6	-4239.4	-2.288	490.4	149.5	1306.9	398.3	739.8	225.5
	-13878.3	-4230.2	-2.283	490.0	149.4	1306.4	398.2	739.3	225.3
	-13848.1	-4221.0	-2.278	489.7	149.3	1305.9	398.1	738.8	225.2
	-13818.0	-4211.8	-2.273	489.4	149.2	1305.4	397.9	738.3	225.0
1805 25	-13787.9	-4202.6	-2.268	489.1	149.1	1304.7	397.7	737.6	224.8
	-13757.9	-4193.5	-2.263	488.8	149.0	1304.0	397.5	736.9	224.6
	-13728.0	-4184.3	-2.258	488.4	148.9	1303.2	397.2	736.1	224.4
	-13698.1	-4175.2	-2.253	488.1	148.8	1302.3	396.9	735.2	224.1
	-13668.2	-4166.1	-2.248	487.7	148.7	1301.3	396.6	734.2	223.8
	-13638.5	-4157.1	-2.243	487.3	148.5	1300.1	396.3	733.0	223.4
	-13608.7	-4148.0	-2.238	486.9	148.4	1298.9	395.9	731.8	223.0
	-13579.1	-4138.9	-2.233	486.5	148.3	1297.5	395.5	730.4	222.6
1805 26	-13549.4	-4129.9	-2.228	486.0	148.1	1296.0	395.0	728.9	222.2
	-13519.8	-4120.9	-2.224	485.5	148.0	1294.4	394.5	727.3	221.7
	-13490.3	-4111.9	-2.219	485.0	147.8	1292.8	394.0	725.7	221.2
	-13460.7	-4102.9	-2.214	484.4	147.7	1291.0	393.5	723.9	220.7
	-13431.2	-4093.9	-2.209	483.9	147.5	1289.2	392.9	722.1	220.1
	-13401.7	-4084.9	-2.204	483.2	147.3	1287.3	392.4	720.2	219.5
	-13372.2	-4075.9	-2.199	482.5	147.1	1285.4	391.8	718.3	218.9
	-13342.8	-4066.9	-2.194	481.8	146.9	1283.5	391.2	716.4	218.4
1805 27	-13313.3	-4058.0	-2.190	481.0	146.6	1281.5	390.6	714.4	217.8
	-13283.9	-4049.0	-2.185	480.2	146.4	1279.5	390.0	712.4	217.1
	-13254.5	-4040.0	-2.180	479.3	146.1	1277.5	389.4	710.4	216.5
	-13225.0	-4031.0	-2.175	478.3	145.8	1275.5	388.8	708.4	215.9
	-13195.6	-4022.1	-2.170	477.3	145.5	1273.4	388.2	706.3	215.3
	-13166.2	-4013.1	-2.165	476.2	145.2	1271.4	387.5	704.3	214.7
	-13136.8	-4004.2	-2.161	475.1	144.8	1269.3	386.9	702.2	214.0
	-13107.4	-3995.2	-2.156	473.9	144.5	1267.1	386.2	700.0	213.4
1805 28	-13078.0	-3986.2	-2.151	472.7	144.1	1265.0	385.6	697.9	212.7
	-13048.6	-3977.3	-2.146	471.4	143.7	1262.8	384.9	695.7	212.0
	-13019.2	-3968.3	-2.141	470.0	143.3	1260.5	384.2	693.4	211.4
	-12989.8	-3959.3	-2.136	468.6	142.8	1258.3	383.5	691.2	210.7
	-12960.4	-3950.4	-2.132	467.1	142.4	1256.0	382.8	688.9	210.0
	-12931.0	-3941.4	-2.127	465.5	141.9	1253.7	382.1	686.6	209.3
	-12901.6	-3932.5	-2.122	463.9	141.4	1251.4	381.4	684.3	208.6
	-12872.2	-3923.5	-2.117	462.2	140.9	1249.1	380.7	682.0	207.9
1805 29	-12842.8	-3914.5	-2.112	460.4	140.3	1246.8	380.0	679.7	207.2
	-12813.3	-3905.6	-2.107	458.4	139.7	1244.6	379.4	677.5	206.5
	-12783.9	-3896.6	-2.103	456.3	139.1	1242.3	378.7	675.2	205.8
	-12754.5	-3887.6	-2.098	454.1	138.4	1240.2	378.0	673.1	205.2
	-12725.0	-3878.6	-2.093	451.8	137.7	1238.0	377.4	670.9	204.5
	-12695.5	-3869.6	-2.088	449.3	136.9	1235.9	376.7	668.8	203.8
	-12666.0	-3860.7	-2.083	446.7	136.2	1233.8	376.1	666.7	203.2
	-12636.5	-3851.7	-2.078	444.0	135.3	1231.7	375.4	664.6	202.6

1805:30 to 1805:36 CDT

CDT	x			y		z		$z - z_{ref}$	
h m s	ft	m	n m	ft	m	ft	m	ft	m
1805 30	-12606.9	-3842.6	-2.073	441.1	134.5	1228.6	374.8	662.5	201.9
	-12577.4	-3833.6	-2.059	438.2	133.6	1227.5	374.2	660.4	201.3
	-12547.8	-3824.6	-2.064	435.0	132.6	1225.5	373.5	658.4	200.7
	-12518.1	-3815.6	-2.059	431.8	131.6	1223.5	372.9	656.4	200.1
	-12488.5	-3806.5	-2.054	428.4	130.6	1221.6	372.3	654.5	199.5
	-12458.8	-3797.5	-2.049	424.9	129.5	1219.7	371.8	652.6	198.9
	-12429.0	-3788.4	-2.044	421.2	128.4	1217.8	371.2	650.7	198.3
	-12399.3	-3779.3	-2.039	417.5	127.2	1216.0	370.6	648.9	197 8
1805 31	-12369.5	-3770.3	-2.034	413.6	126.1	1214.2	370.1	647.1	197.2
	-12339.7	-3761.2	-2.029	409.5	124.8	1212.5	369.6	645.4	196.7
	-12310.0	-3752.1	-2.025	405.4	123.6	1210.8	369.0	643.7	196.2
	-12280.2	-3743.0	-2.020	401.1	122.3	1209.1	368.5	642.0	195.7
	-12250.4	-3734.0	-2.015	396.7	120.9	1207.5	368.1	640.4	195.2
	-12220.6	-3724.9	-2.010	392.2	119.5	1206.0	367.6	638.9	194.7
	-12190.8	-3715.8	-2.005	387.6	118.1	1204.5	367.1	637.4	194.3
	-12161.0	-3706.7	-2.000	382.9	116.7	1203.1	366.7	636.0	193.9
1805 32	-12131.2	-3697.6	-1.995	378.1	115.2	1201.8	366.3	634.7	193.5
	-12101.4	-3688.5	-1.990	373.2	113.7	1200.5	365.9	633.4	193.1
	-12071.6	-3679.5	-1.985	368.2	112.2	1199.3	365.6	632.2	192.7
	-12041.8	-3670.4	-1.980	363.1	110.7	1198.2	365.2	631.1	192.4
	-12011.9	-3661.3	-1.976	358.0	109.1	1197.2	364.9	630.1	192.0
	-11982.1	-3652.2	-1.971	352.8	107.5	1196.2	364.6	629.1	191.8
	-11952.4	-3643.1	-1.966	347.5	105.9	1195.3	364.3	628.2	191.5
	-11922.6	-3634.1	-1.961	342.2	104.3	1194.6	364.1	627.5	191.3
1805 33	-11892.9	-3625.0	-1.956	336.9	102.7	1193.8	363.9	626.7	191.0
	-11863.1	-3615.9	-1.951	331.5	101.0	1193.1	363.7	626.0	190.8
	-11833.4	-3606.9	-1.946	326.0	99.4	1192.4	363.5	625.3	190.6
	-11803.7	-3597.8	-1.941	320.5	97.7	1191.7	363.2	624.6	190.4
	-11774.0	-3588.8	-1.936	315.0	96.0	1191.0	363.0	623.9	190.2
	-11744.3	-3579.7	-1.932	309.5	94.3	1190.2	362.8	623.1	189.9
	-11714.6	-3570.6	-1.927	303.9	92.6	1189.2	362.5	622.1	189.6
	-11684.9	-3561.6	-1.922	298.3	90.9	1188.2	362.2	621.1	189.3
1805 34	-11655.1	-3552.5	-1.917	292.7	89.2	1187.0	361.8	619.9	189.0
	-11625.4	-3543.5	-1.912	286.9	87.5	1185.7	361.4	618.6	188.6
	-11595.7	-3534.4	-1.907	281.2	85.7	1184.4	361.0	617.3	188.1
	-11566.0	-3525.4	-1.902	275.4	83.9	1182.9	360.6	615.8	187.7
	-11536.3	-3516.3	-1.897	269.5	82.2	1181.4	360.1	614.3	187.3
	-11506.6	-3507.3	-1.892	263.7	80.4	1179.9	359.6	612.8	186.8
	-11476.9	-3498.2	-1.888	257.8	78.6	1178.2	359.1	611.1	186.3
	-11447.2	-3489.2	-1.883	251.8	76.8	1176.4	358.6	609.3	185.7
1805 35	-11417.6	-3480.1	-1.878	245.8	74.9	1174.6	358.0	607.5	185.2
	-11387.9	-3471.1	-1.873	239.8	73.1	1172.6	357.4	605.5	184.6
	-11358.2	-3462.0	-1.868	233.7	71.2	1170.6	356.8	603.5	184.0
	-11328.5	-3453.0	-1.863	227.6	69.4	1168.6	356.2	601.5	183.3
	-11298.9	-3443.9	-1.858	221.4	67.5	1166.6	355.6	599.5	182.7
	-11269.2	-3434.9	-1.853	215.2	65.6	1164.6	355.0	597.5	182.1
	-11239.5	-3425.8	-1.849	209.0	63.7	1162.7	354.4	595.6	181.5
	-11209.8	-3416.8	-1.844	202.8	61.8	1161.0	353.9	593.9	181.0
1805 36	-11180.0	-3407.7	-1.839	196.6	59.9	1159.4	353.4	592.3	180.5
	-11150.2	-3398.6	-1.834	190.5	58.1	1158.0	352.9	590.9	180.1
	-11120.5	-3389.5	-1.828	184.5	56.2	1156.7	352.6	589.6	179.7
	-11090.8	-3380.4	-1.824	178.6	54.4	1155.6	352.2	588.5	179.4
	-11060.2	-3371.2	-1.819	172.8	52.7	1154.7	352.0	587.6	179.1
	-11030.0	-3362.0	-1.814	167.2	51.0	1153.9	351.7	586.8	178.9
	-10999.7	-3352.8	-1.809	161.8	49.3	1153.1	351.5	586.0	178.6
	-10969.3	-3343.5	-1.804	156.5	47.7	1152.4	351.3	585.3	178.4

1805:37 to 1805:43 CDT

CDT	x			y		z		$z - z_{ref}$	
h m s	ft	m	n m	ft	m	ft	m	ft	m
1805 37	-10938.9	-3334.2	-1.799	151.5	46.2	1151.8	351.1	584.7	178.2
	-10908.3	-3324.9	-1.794	146.6	44.7	1151.2	350.9	584.1	178.0
	-10877.7	-3315.6	-1.789	141.8	43.2	1150.6	350.7	583.5	177.9
	-10847.0	-3306.2	-1.784	137.3	41.8	1150.2	350.6	583.1	177.7
	-10816.1	-3296.8	-1.779	132.9	40.5	1149.8	350.5	582.7	177.6
	-10785.2	-3287.4	-1.774	128.6	39.2	1149.5	350.4	582.4	177.5
	-10754.2	-3277.9	-1.769	124.7	38.0	1149.2	350.3	582.1	177.4
	-10723.1	-3268.4	-1.764	120.8	36.8	1149.0	350.2	581.9	177.4
1805 38	-10691.9	-3258.9	-1.758	117.0	35.6	1148.8	350.2	581.7	177.3
	-10660.6	-3249.4	-1.753	113.2	34.5	1148.6	350.1	581.5	177.2
	-10629.2	-3239.8	-1.748	109.5	33.4	1148.4	350.0	581.3	177.2
	-10597.8	-3230.2	-1.743	105.9	32.3	1148.2	350.0	581.1	177.1
	-10566.3	-3220.6	-1.738	102.4	31.2	1148.0	349.9	580.9	177.1
	-10534.6	-3211.0	-1.733	98.8	30.1	1147.8	349.9	580.7	177.0
	-10502.9	-3201.3	-1.727	95.3	29.1	1147.7	349.8	580.6	177.0
	-10471.1	-3191.6	-1.722	91.8	28.0	1147.5	349.8	580.4	176.9
1805 39	-10439.1	-3181.9	-1.717	88.3	26.9	1147.4	349.7	580.3	176.9
	-10407.1	-3172.1	-1.712	84.8	25.8	1147.3	349.7	580.2	176.8
	-10374.9	-3162.3	-1.706	81.3	24.8	1147.1	349.6	580.0	176.8
	-10342.7	-3152.5	-1.701	77.8	23.7	1146.6	349.5	579.5	176.6
	-10310.3	-3142.6	-1.696	74.3	22.6	1146.0	349.3	578.9	176.4
	-10277.9	-3132.7	-1.690	70.8	21.6	1145.1	349.0	578.0	176.2
	-10245.4	-3122.8	-1.685	67.4	20.5	1143.8	348.6	576.7	175.8
	-10212.8	-3112.9	-1.680	63.9	19.5	1142.3	348.2	575.2	175.3
1805 40	-10180.1	-3102.9	-1.674	60.4	18.4	1140.4	347.6	573.3	174.7
	-10147.4	-3093.0	-1.669	57.0	17.4	1138.1	346.9	571.0	174.1
	-10114.6	-3083.0	-1.664	53.5	16.3	1135.6	346.1	568.5	173.3
	-10081.7	-3072.9	-1.658	50.0	15.2	1132.8	345.3	565.7	172.4
	-10048.7	-3062.9	-1.653	46.5	14.2	1129.7	344.3	562.6	171.5
	-10015.6	-3052.8	-1.647	42.9	13.1	1126.4	343.3	559.3	170.5
	-9982.4	-3042.7	-1.642	39.3	12.0	1123.0	342.3	555.9	169.4
	-9949.1	-3032.5	-1.636	35.7	10.9	1119.3	341.2	552.2	168.3
1805 41	-9915.7	-3022.3	-1.631	32.1	9.8	1115.5	340.0	548.4	167.1
	-9882.2	-3012.1	-1.625	28.4	8.7	1111.5	338.8	544.4	165.9
	-9848.5	-3001.9	-1.620	24.7	7.5	1107.2	337.5	540.1	164.6
	-9814.7	-2991.6	-1.614	20.9	6.4	1102.8	336.1	535.7	163.3
	-9780.8	-2981.2	-1.609	17.1	5.2	1098.2	334.7	531.1	161.9
	-9746.8	-2970.9	-1.603	13.3	4.1	1093.4	333.3	526.3	160.4
	-9712.7	-2960.5	-1.597	9.4	2.9	1088.4	331.8	521.3	158.9
	-9678.4	-2950.0	-1.592	5.5	1.7	1083.2	330.2	516.1	157.3
1805 42	-9644.0	-2939.5	-1.586	1.6	0.5	1077.8	328.5	510.7	155.7
	-9609.5	-2929.0	-1.580	-2.3	-0.7	1072.2	326.8	505.1	154.0
	-9574.9	-2918.5	-1.575	-6.3	-1.9	1066.4	325.0	499.3	152.2
	-9540.1	-2907.9	-1.569	-10.3	-3.1	1060.4	323.2	493.3	150.4
	-9505.2	-2897.2	-1.563	-14.3	-4.4	1054.2	321.3	487.1	148.5
	-9470.2	-2886.5	-1.558	-18.3	-5.6	1048.0	319.4	480.9	146.6
	-9435.0	-2875.8	-1.552	-22.4	-6.8	1041.7	317.5	474.6	144.7
	-9399.6	-2865.0	-1.546	-26.5	-8.1	1035.4	315.6	468.3	142.7
1805 43	-9364.0	-2854.2	-1.540	-30.6	-9.3	1029.1	313.7	462.0	140.8
	-9328.2	-2843.3	-1.534	-34.8	-10.6	1022.8	311.7	455.7	138.9
	-9292.2	-2832.3	-1.528	-39.0	-11.9	1016.5	309.8	449.4	137.0
	-9256.0	-2821.3	-1.522	-43.2	-13.2	1010.1	307.9	443.0	135.0
	-9219.6	-2810.2	-1.516	-47.5	-14.5	1003.7	305.9	436.6	133.1
	-9183.1	-2799.0	-1.510	-51.8	-15.8	997.3	304.0	430.2	131.1
	-9146.3	-2787.8	-1.504	-56.2	-17.1	990.8	302.0	423.7	129.1
	-9109.3	-2776.6	-1.498	-60.6	-18.5	984.3	300.0	417.2	127.1

1805:44 to 1805:50 CDT

CDT	x			y		z		$z - z_{ref}$	
h m s	ft	m	nm	ft	m	ft	m	ft	m
1805 44	-9072.2	-2765.2	-1.492	-65.0	-19.8	977.6	298.0	410.5	125.1
	-9034.9	-2753.9	-1.486	-69.5	-21.2	970.9	295.9	403.8	123.1
	-8997.4	-2742.4	-1.480	-74.0	-22.6	964.0	293.8	396.9	121.0
	-8959.7	-2730.9	-1.474	-78.5	-23.9	956.9	291.7	389.8	118.8
	-8921.8	-2719.4	-1.467	-83.1	-25.3	949.7	289.5	382.6	116.6
	-8883.8	-2707.8	-1.461	-87.6	-26.7	942.2	287.2	375.1	114.3
	-8845.6	-2696.2	-1.455	-92.1	-28.1	934.5	284.9	367.4	112.0
	-8807.3	-2684.5	-1.449	-96.6	-29.5	926.7	282.4	359.6	109.6
1805 45	-8768.8	-2672.8	-1.442	-101.2	-30.8	918.5	280.0	351.4	107.1
	-8730.1	-2661.0	-1.436	-105.6	-32.2	910.1	277.4	343.0	104.6
	-8691.2	-2649.1	-1.429	-110.1	-33.6	901.5	274.8	334.4	101.9
	-8652.2	-2637.2	-1.423	-114.6	-34.9	892.6	272.1	325.5	99.2
	-8613.1	-2625.3	-1.417	-119.0	-36.3	883.4	269.3	316.3	96.4
	-8573.8	-2613.3	-1.410	-123.4	-37.6	874.0	266.4	306.9	93.5
	-8534.3	-2601.3	-1.404	-127.8	-39.0	864.3	263.5	297.2	90.6
	-8494.7	-2589.2	-1.397	-132.3	-40.3	854.4	260.4	287.3	87.6
1805 46	-8455.0	-2577.1	-1.391	-136.6	-41.7	844.2	257.3	277.1	84.5
	-8415.1	-2565.0	-1.384	-141.0	-43.0	833.8	254.2	266.7	81.3
	-8375.1	-2552.8	-1.377	-145.4	-44.3	823.3	250.9	256.2	78.1
	-8334.9	-2540.5	-1.371	-149.9	-45.7	812.6	247.7	245.5	74.8
	-8294.6	-2528.2	-1.364	-154.3	-47.0	802.0	244.4	234.9	71.6
	-8254.0	-2515.9	-1.358	-158.7	-48.4	791.3	241.2	224.2	68.3
	-8213.3	-2503.5	-1.351	-163.2	-49.7	780.8	238.0	213.7	65.1
	-8172.4	-2491.0	-1.344	-167.7	-51.1	770.3	234.8	203.2	61.9
1805 47	-8131.4	-2478.5	-1.337	-172.2	-52.5	760.0	231.7	192.9	58.8
	-8090.1	-2465.9	-1.331	-176.8	-53.9	749.9	228.6	182.8	55.7
	-8048.7	-2453.3	-1.324	-181.3	-55.3	739.9	225.5	172.8	52.7
	-8007.1	-2440.6	-1.317	-185.9	-56.7	730.2	222.6	163.1	49.7
	-7965.3	-2427.8	-1.310	-190.5	-58.1	720.8	219.7	153.7	46.8
	-7923.3	-2415.0	-1.303	-195.0	-59.4	711.6	216.9	144.5	44.1
	-7881.1	-2402.2	-1.296	-199.6	-60.8	702.8	214.2	135.7	41.4
	-7838.7	-2389.3	-1.289	-204.2	-62.3	694.3	211.6	127.2	38.8
1805 48	-7796.1	-2376.3	-1.282	-208.9	-63.7	686.2	209.2	119.1	36.3
	-7753.4	-2363.3	-1.275	-213.5	-65.1	678.6	206.8	111.5	34.0
	-7710.4	-2350.2	-1.268	-218.2	-66.5	671.4	204.7	104.3	31.8
	-7667.3	-2337.0	-1.261	-223.0	-68.0	664.8	202.6	97.7	29.8
	-7623.9	-2323.8	-1.254	-227.8	-69.4	658.5	200.7	91.4	27.9
	-7580.3	-2310.5	-1.247	-232.6	-70.9	652.8	199.0	85.7	26.1
	-7536.5	-2297.2	-1.240	-237.5	-72.4	647.3	197.3	80.2	24.5
	-7492.6	-2283.8	-1.232	-242.4	-73.9	642.3	195.8	75.2	22.9
1805 49	-7448.5	-2270.3	-1.225	-247.4	-75.4	637.5	194.3	70.4	21.5
	-7404.2	-2256.8	-1.218	-252.3	-76.9	633.0	192.9	65.9	20.1
	-7359.7	-2243.3	-1.210	-257.2	-78.4	628.8	191.7	61.7	18.8
	-7315.1	-2229.7	-1.203	-262.2	-79.9	625.0	190.5	57.9	17.6
	-7270.3	-2216.0	-1.196	-267.1	-81.4	621.3	189.4	54.2	16.5
	-7225.4	-2202.3	-1.188	-272.0	-82.9	617.9	188.4	50.8	15.5
	-7180.3	-2188.6	-1.181	-276.9	-84.4	614.8	187.4	47.7	14.5
	-7135.0	-2174.8	-1.173	-281.7	-85.9	611.8	186.5	44.7	13.6
1805 50	-7089.6	-2160.9	-1.166	-286.6	-87.3	609.0	185.6	41.9	12.8
	-7044.0	-2147.0	-1.159	-291.4	-88.8	606.2	184.8	39.1	11.9
	-6998.3	-2133.1	-1.151	-296.1	-90.3	603.6	184.0	36.5	11.1
	-6952.5	-2119.1	-1.143	-300.8	-91.7	601.0	183.2	33.9	10.3
	-6906.5	-2105.1	-1.136	-305.5	-93.1	598.4	182.4	31.3	9.5
	-6860.5	-2091.1	-1.128	-310.1	-94.5	595.7	181.6	28.6	8.7
	-6814.3	-2077.0	-1.121	-314.7	-95.9	593.0	180.7	25.9	7.9
	-6768.0	-2062.9	-1.113	-319.2	-97.3	590.2	179.9	23.1	7.0

1805:51 to 1805:57 CDT

CDT		x			y		z		z − z$_{ref}$	
h m s		ft	m	n m	ft	m	ft	m	ft	m
1805 51		-6721.5	-2048.8	-1.105	-323.7	-98.7	587.4	179.0	20.3	6.2
		-6675.0	-2034.6	-1.098	-328.2	-100.0	584.5	178.2	17.4	5.3
		-6628.3	-2020.3	-1.090	-332.7	-101.4	581.6	177.3	14.5	4.4
		-6581.6	-2006.1	-1.082	-337.1	-102.8	578.8	176.4	11.7	3.6
		-6534.7	-1991.8	-1.075	-341.6	-104.1	576.0	175.6	8.9	2.7
		-6487.7	-1977.5	-1.067	-346.1	-105.5	573.4	174.8	6.3	1.9
		-6440.6	-1963.1	-1.059	-350.7	-106.9	571.0	174.1	3.9	1.2
		-6393.4	-1948.7	-1.052	-355.3	-108.3	568.9	173.4	1.8	0.6
1805 52		-6346.1	-1934.3	-1.044	-360.0	-109.8	567.1	172.9	0.0	0.0
		-6298.8	-1919.9	-1.036	-365.0	-111.3	566.7	172.7	-0.4	-0.1
		-6251.7	-1905.5	-1.028	-371.0	-113.0	566.9	172.8	-0.2	-0.1
	1st	-6204.9	-1891.3	-1.021	-376.0	-114.7	567.4	172.9	0.3	0.1
		-6158.3	-1877.1	-1.013	-382.0	-116.3	568.2	173.2	1.1	0.3
		-6111.8	-1862.9	-1.005	-387.0	-117.9	568.7	173.3	1.6	0.5
		-6065.5	-1848.8	-0.998	-392.0	-119.5	569.1	173.5	2.0	0.6
		-6019.2	-1834.7	-0.990	-397.0	-121.1	569.4	173.6	2.3	0.7
1805 53		-5972.8	-1820.5	-0.982	-403.0	-122.8	569.6	173.6	2.5	0.8
		-5926.4	-1806.4	-0.975	-408.0	-124.5	569.6	173.6	2.5	0.8
		-5879.8	-1792.2	-0.967	-414.0	-126.3	569.6	173.6	2.5	0.8
		-5833.2	-1778.0	-0.959	-420.0	-128.0	569.5	173.6	2.4	0.7
		-5786.4	-1763.7	-0.952	-426.0	-129.7	569.4	173.6	2.3	0.7
	2nd	-5739.6	-1749.5	-0.944	-431.0	-131.4	569.1	173.5	2.0	0.6
		-5692.8	-1735.2	-0.936	-436.0	-133.1	568.8	173.4	1.7	0.5
		-5645.8	-1720.9	-0.929	-443.0	-134.8	568.4	173.3	1.3	0.4
1805 54		-5598.7	-1706.5	-0.921	-448.0	-136.6	568.0	173.1	0.9	0.3
		-5551.6	-1692.2	-0.913	-454.0	-138.4	567.5	173.0	0.4	0.1
		-5504.4	-1677.8	-0.905	-460.0	-140.2	566.9	172.8	-0.2	-0.1
		-5457.1	-1663.4	-0.898	-466.0	-141.9	566.3	172.6	-0.8	-0.2
		-5409.8	-1648.9	-0.890	-471.0	-143.6	565.6	172.4	-1.5	-0.5
		-5362.4	-1634.5	-0.882	-477.0	-145.4	565.0	172.2	-2.1	-0.6
		-5315.0	-1620.0	-0.874	-483.0	-147.2	564.0	171.9	-3.1	-0.9
		-5267.5	-1605.6	-0.866	-489.0	-149.0	563.7	171.8	-3.4	-1.0
1805 55		-5220.0	-1591.1	-0.859	-495.0	-150.8	563.0	171.6	-4.1	-1.2
		-5172.5	-1576.6	-0.851	-501.0	-152.7	562.3	171.4	-4.8	-1.5
		-5125.0	-1562.1	-0.843	-507.0	-154.5	561.6	171.2	-5.5	-1.7
		-5077.4	-1547.6	-0.835	-513.0	-156.3	560.9	171.0	-6.2	-1.9
		-5029.9	-1533.1	-0.827	-519.0	-158.2	560.4	170.8	-6.7	-2.0
		-4982.3	-1518.6	-0.819	-525.0	-160.0	560.1	170.7	-7.0	-2.1
	3rd	-4934.8	-1504.1	-0.812	-531.0	-161.8	560.8	170.9	-6.3	-1.9
		-4887.5	-1489.7	-0.804	-537.0	-163.6	562.3	171.4	-4.8	-1.5
1805 56		-4840.3	-1475.3	-0.796	-543.0	-165.5	564.0	171.9	-3.1	-0.9
		-4793.3	-1461.0	-0.788	-549.0	-167.4	565.6	172.4	-1.5	-0.5
		-4746.5	-1446.8	-0.781	-556.0	-169.3	566.9	172.8	-0.2	-0.1
		-4700.0	-1432.6	-0.773	-562.0	-171.1	568.0	173.1	0.9	0.3
		-4653.7	-1418.5	-0.765	-567.0	-172.9	568.9	173.4	1.8	0.5
		-4607.6	-1404.4	-0.758	-573.0	-174.7	569.4	173.6	2.3	0.7
		-4561.8	-1390.4	-0.750	-579.0	-176.5	569.7	173.6	2.6	0.8
		-4516.2	-1376.6	-0.743	-586.0	-178.4	569.6	173.6	2.5	0.8
1805 57		-4470.8	-1362.7	-0.735	-591.0	-180.2	569.1	173.5	2.0	0.6
		-4425.8	-1349.0	-0.728	-597.0	-182.0	568.5	173.3	1.4	0.4
		-4380.9	-1335.3	-0.721	-603.0	-183.8	567.6	173.0	0.5	0.2
		-4336.3	-1321.7	-0.713	-609.0	-185.6	566.4	172.6	-0.7	-0.2
		-4292.0	-1308.2	-0.706	-615.0	-187.4	565.1	172.2	-2.0	-0.6
		-4247.8	-1294.8	-0.699	-621.0	-189.1	563.6	171.8	-3.5	-1.1
	4th	-4204.0	-1281.4	-0.691	-626.0	-190.9	562.2	171.4	-4.9	-1.5
		-4160.3	-1268.1	-0.684	-632.0	-192.6	560.6	170.9	-6.5	-2.0

APPENDIX 5 ACCELERATIONS

A_x A_y A_z are DFDR longitudinal, lateral, and vertical accelerations. $\ddot{L}$ $\ddot{M}$ $\ddot{N}$ are smoothed and corrected accelerations, and $\ddot{X}$ $\ddot{Y}$ $\ddot{Z}$ are three-component accelerations on the earth coordinates.

1804:56 to 1805:01 CDT

CDT	A_x	A_y	A_z	$\ddot{L}$	$\ddot{M}$	$\ddot{N}$	$\ddot{X}$	$\ddot{Y}$	$\ddot{Z}$
h m s	g	g	g	g	g	g	g	g	g
1804 56	0.0789			0.0589	-0.0267	1.0075	-0.0181	0.1134	0.0030
		-0.0335	0.9918	0.0591	-0.0275	1.0075	-0.0179	0.1148	0.0025
	0.0794			0.0587	-0.0297	1.0075	-0.0183	0.1143	0.0030
		-0.0417	0.9918	0.0578	-0.0319	1.0075	-0.0192	0.1139	0.0030
	0.0763			0.0571	-0.0328	1.0075	-0.0195	0.1144	0.0030
		-0.0397	0.9918	0.0568	-0.0314	1.0092	-0.0194	0.1173	0.0043
	0.0773			0.0572	-0.0298	1.0121	-0.0187	0.1198	0.0059
		-0.0356	1.0010	0.0575	-0.0296	1.0150	-0.0183	0.1208	0.0097
1804 57	0.0778			0.0575	-0.0308	1.0167	-0.0183	0.1195	0.0116
		-0.0417	1.0010	0.0575	-0.0327	1.0150	-0.0183	0.1168	0.0103
	0.0773			0.0572	-0.0338	1.0121	-0.0181	0.1144	0.0076
		-0.0417	0.9918	0.0568	-0.0330	1.0110	-0.0176	0.1142	0.0055
	0.0763			0.0574	-0.0318	1.0121	-0.0168	0.1140	0.0077
		-0.0376	1.0010	0.0586	-0.0305	1.0115	-0.0152	0.1132	0.0072
	0.0809			0.0599	-0.0297	1.0076	-0.0137	0.1098	0.0037
		-0.0376	0.9827	0.0604	-0.0297	1.0035	-0.0129	0.1050	0.0002
1804 58	0.0799			0.0600	-0.0297	1.0030	-0.0133	0.0994	0.0002
		-0.0376	0.9918	0.0596	-0.0293	1.0075	-0.0140	0.0946	0.0052
	0.0794			0.0599	-0.0287	1.0121	-0.0138	0.0930	0.0104
		-0.0356	1.0010	0.0604	-0.0269	1.0150	-0.0130	0.0911	0.0139
	0.0814			0.0607	-0.0247	1.0167	-0.0123	0.0743	0.0160
		-0.0295	1.0010	0.0606	-0.0224	1.0167	-0.0121	0.0681	0.0164
	0.0799			0.0601	-0.0206	1.0167	-0.0126	0.0631	0.0166
		-0.0274	1.0010	0.0596	-0.0199	1.0150	-0.0130	0.0572	0.0153
1804 59	0.0794			0.0586	-0.0195	1.0121	-0.0138	0.0519	0.0126
		-0.0274	0.9918	0.0571	-0.0188	1.0075	-0.0150	0.0472	0.0081
	0.0748			0.0556	-0.0175	1.0030	-0.0162	0.0448	0.0036
		-0.0234	0.9827	0.0545	-0.0155	0.9984	-0.0170	0.0438	-0.0011
	0.0743			0.0541	-0.0135	0.9938	-0.0170	0.0437	-0.0057
		-0.0193	0.9735	0.0535	-0.0110	0.9909	-0.0174	0.0443	-0.0087
	0.0728			0.0528	-0.0083	0.9892	-0.0176	0.0463	-0.0105
		-0.0132	0.9735	0.0520	-0.0066	0.9875	-0.0178	0.0475	-0.0124
1805 00	0.0712			0.0514	-0.0063	0.9846	-0.0177	0.0494	-0.0154
		-0.0152	0.9644	0.0509	-0.0069	0.9835	-0.0177	0.0506	-0.0166
	0.0707			0.0507	-0.0072	0.9846	-0.0180	0.0535	-0.0157
		-0.0152	0.9735	0.0504	-0.0066	0.9858	-0.0184	0.0579	-0.0149
	0.0702			0.0507	-0.0053	0.9846	-0.0180	0.0634	-0.0163
		-0.0112	0.9644	0.0512	-0.0044	0.9818	-0.0173	0.0664	-0.0194
	0.0723			0.0522	-0.0043	0.9801	-0.0161	0.0730	-0.0213
		-0.0132	0.9644	0.0531	-0.0053	0.9818	-0.0153	0.0769	-0.0199
1805 01	0.0738			0.0533	-0.0063	0.9846	-0.0153	0.0801	-0.0175
		-0.0152	0.9735	0.0533	-0.0077	0.9875	-0.0155	0.0813	-0.0145
	0.0723			0.0532	-0.0093	0.9892	-0.0157	0.0818	-0.0128
		-0.0193	0.9735	0.0533	-0.0103	0.9926	-0.0158	0.0823	-0.0094
	0.0738			0.0534	-0.0104	0.9983	-0.0161	0.0826	-0.0038
		-0.0173	0.9918	0.0533	-0.0102	1.0058	-0.0168	0.0828	0.0037
	0.0728			0.0538	-0.0104	1.0121	-0.0167	0.0807	0.0102
		-0.0193	1.0010	0.0550	-0.0110	1.0150	-0.0157	0.0775	0.0135

1805:02 to 1805:08 CDT

CDT	A_x	A_y	A_z	$\ddot{E}$	$\ddot{N}$	$\ddot{U}$	$\ddot{x}$	$\ddot{y}$	$\ddot{z}$
h m s	g	g	g	g	g	g	g	g	g
1805 02	0.0773			0.0566	-0.0114	1.0167	-0.0141	0.0737	0.0156
		-0.0193	1.0010	0.0581	-0.0114	1.0167	-0.0113	0.0707	0.0159
	0.0789			0.0592	-0.0111	1.0167	-0.0117	0.0663	0.0163
		-0.0193	1.0010	0.0604	-0.0106	1.0167	-0.0105	0.0630	0.0166
	0.0819			0.0608	-0.0097	1.0167	-0.0102	0.0599	0.0168
		-0.0152	1.0010	0.0604	-0.0089	1.0167	-0.0100	0.0579	0.0168
	0.0789			0.0594	-0.0043	1.0167	-0.0116	0.0571	0.0168
		-0.0091	1.0010	0.0586	-0.0039	1.0167	-0.0124	0.0547	0.0169
1805 03	0.0784			0.0582	-0.0053	1.0167	-0.0123	0.0518	0.0170
		-0.0173	1.0010	0.0576	-0.0056	1.0201	-0.0136	0.0505	0.0204
	0.0768			0.0577	-0.0033	1.0258	-0.0139	0.0522	0.0260
		-0.0051	1.0193	0.0583	0.0013	1.0333	-0.0138	0.0563	0.0333
	0.0799			0.0602	0.0049	1.0395	-0.0123	0.0597	0.0395
		-0.0010	1.0284	0.0622	0.0046	1.0407	-0.0104	0.0591	0.0408
	0.0845			0.0632	0.0029	1.0395	-0.0094	0.0577	0.0398
		-0.0011	1.0193	0.0634	0.0011	1.0350	-0.0089	0.0562	0.0354
1805 04	0.0824			0.0625	0.0008	1.0304	-0.0094	0.0565	0.0307
		-0.0051	1.0101	0.0616	0.0032	1.0293	-0.0102	0.0598	0.0294
	0.0809			0.0605	0.0058	1.0304	-0.0114	0.0630	0.0302
		0.0010	1.0193	0.0591	0.0059	1.0316	-0.0129	0.0625	0.0313
	0.0773			0.0578	0.0039	1.0304	-0.0141	0.0618	0.0301
		-0.0091	1.0101	0.0568	-0.0005	1.0310	-0.0151	0.0580	0.0308
	0.0753			0.0566	-0.0043	1.0349	-0.0156	0.0553	0.0340
		-0.0152	1.0284	0.0566	-0.0058	1.0407	-0.0160	0.0550	0.0407
1805 05	0.0768			0.0573	-0.0063	1.0141	-0.0156	0.0556	0.0441
		-0.0132	1.0284	0.0583	-0.0037	1.0424	-0.0134	0.0571	0.0424
	0.0799			0.0586	-0.0053	1.0395	-0.0136	0.0582	0.0395
		-0.0132	1.0193	0.0581	-0.0084	1.0333	-0.0131	0.0576	0.0333
	0.0763			0.0566	-0.0083	1.0258	-0.0130	0.0562	0.0256
		-0.0193	1.0010	0.0553	-0.0035	1.0184	-0.0140	0.0554	0.0184
	0.0743			0.0548	-0.0093	1.0121	-0.0137	0.0560	0.0120
		-0.0152	0.9918	0.0545	-0.0073	1.0127	-0.0135	0.0590	0.0124
1805 06	0.0748			0.0557	-0.0063	1.0166	-0.0117	0.0625	0.0162
		-0.0112	1.0101	0.0574	-0.0033	1.0258	-0.0097	0.0665	0.0252
	0.0799			0.0582	-0.0012	1.0349	-0.0085	0.0703	0.0341
		-0.0071	1.0284	0.0578	-0.0007	1.0372	-0.0092	0.0717	0.0363
	0.0758			0.0562	-0.0012	1.0349	-0.0087	0.0714	0.0339
		-0.0112	1.0101	0.0548	-0.0048	1.0292	-0.0089	0.0679	0.0284
	0.0738			0.0533	-0.0094	1.0258	-0.0093	0.0636	0.0252
		-0.0234	1.0101	0.0515	-0.0124	1.0241	-0.0101	0.0609	0.0236
1805 07	0.0692			0.0497	-0.0135	1.0213	-0.0109	0.0595	0.0208
		-0.0193	1.0010	0.0482	-0.0103	1.0150	-0.0111	0.0632	0.0142
	0.0672			0.0471	-0.0063	1.0076	-0.0109	0.0672	0.0064
		-0.0091	0.9827	0.0459	-0.0024	1.0001	-0.0107	0.0700	-0.0014
	0.0646			0.0447	0.0008	0.9933	-0.0107	0.0733	-0.0079
		-0.0051	0.9735	0.0436	-0.0002	0.9927	-0.0109	0.0717	-0.0090
	0.0626			0.0427	-0.0033	0.9938	-0.0110	0.0678	-0.0076
		-0.0173	0.9827	0.0419	-0.0052	0.9967	-0.0111	0.0652	-0.0046
1805 08	0.0611			0.0420	-0.0043	0.9984	-0.0102	0.0654	-0.0029
		-0.0071	0.9827	0.0428	-0.0011	0.9967	-0.0094	0.0676	-0.0047
	0.0646			0.0434	0.0008	0.9938	-0.0092	0.0684	-0.0076
		-0.0071	0.9735	0.0431	0.0012	0.9909	-0.0096	0.0677	-0.0105
	0.0616			0.0428	0.0018	0.9892	-0.0098	0.0674	-0.0122
		-0.0051	0.9735	0.0433	0.0024	0.9909	-0.0098	0.0672	-0.0104
	0.0651			0.0459	0.0028	0.9938	-0.0090	0.0659	-0.0073
		-0.0051	0.9827	0.0489	0.0032	0.9967	-0.0083	0.0641	-0.0041

1805:09 to 1805:15 CDT

CDT	A_x	A_y	A_z	$\ddot{L}$	$\ddot{M}$	$\ddot{N}$	$\ddot{X}$	$\ddot{Y}$	$\ddot{Z}$
h m s	g	g	g	g	g	g	g	g	g
1805 09	0.0729			0.0513	0.0039	0.9984	0.0029	0.0617	-0.0022
		-0.0030	0.9827	0.0525	0.0037	0 9984	0.0046	0.0586	-0.0019
	0.0723			0.0533	0.0029	0.9984	0.0063	0.0536	-0.0016
		-0.0071	0.9827	0.0548	0.0027	1.0018	0.0085	0.0482	0.0021
	0.0773			0.0572	0.0039	1.0076	0.0115	0.0426	0.0083
		-0.0010	1.0010	0.0596	0.0058	1.0133	0.0145	0.0377	0.0143
	0.0819			0.0607	0.0069	1.0167	0.0163	0.0318	0.0179
		-0.0010	1.0010	0.0609	0.0077	1.0150	0.0175	0.0254	0.0164
1805 10	0.0799			0.0591	0.0090	1.0121	0.0167	0.0203	0.0135
		0.0031	0.9918	0.0568	0.0106	1.0110	0.0153	0.0159	0.0124
	0.0738			0.0540	0.0120	1.0121	0.0133	0.0110	0.0135
		0.0051	1.0010	0.0512	0.0122	1.0133	0.0114	0.0043	0.0146
	0.0687			0.0482	0.0120	1.0121	0.0093	-0.0023	0.0133
		0.0031	0.9918	0.0449	0.0110	1.0092	0.0070	-0.0084	0.0102
	0.0611			0.0408	0.0100	1.0075	0.0039	-0.0135	0.0083
		0.0010	0.9918	0.0365	0.0097	1.0058	0.0005	-0.0184	0.0063
1805 11	0.0519			0.0329	0.0100	1.0030	-0.0021	-0.0222	0.0033
		0.0031	0.9827	0.0301	0.0118	0.9984	-0.0039	-0.0239	-0.0014
	0.0483			0.0278	0.0140	0.9938	-0.0052	-0.0234	-0.0060
		0.0092	0.9735	0.0252	0.0156	0.9909	-0.0068	-0.0233	-0.0089
	0.0422			0.0237	0.0161	0.9892	-0.0074	-0.0246	-0.0107
		0.0071	0.9735	0.0233	0.0143	0.9892	-0.0069	-0.0288	-0.0109
	0.0443			0.0225	0.0119	0.9892	-0.0068	-0.0340	-0.0111
		0.0010	0.9735	0.0205	0.0097	0.9858	-0.0079	-0.0384	-0.0147
1805 12	0.0366			0.0164	0.0079	0.9800	-0.0109	-0.0413	-0.0208
		-0.0010	0.9552	0.0123	0.0073	0.9606	-0.0137	-0.0421	-0.0403
	0.0230			0.0070	0.0069	0.9343	-0.0174	-0.0423	-0.0668
		-0.0010	0.8820	0.0012	0.0065	0.8977	-0.0215	-0.0420	-0.1035
	0.0143			-0.0053	0.0059	0.8611	-0.0263	-0.0419	-0.1403
		-0.0030	0.8087	-0.0116	0.0079	0.8330	-0.0312	-0.0393	-0.1684
	0.0026			-0.0156	0.0120	0.6106	-0.0348	-0.0347	-0.1906
		0.0112	0.7812	-0.0184	0.0157	0.8072	-0.0381	-0.0315	-0.1939
1805 13	0.0005			-0.0203	0.0170	0.8106	-0.0415	-0.0308	-0.1906
		0.0071	0.8087	-0.0226	0.0181	0.8295	-0.0457	-0.0311	-0.1718
	-0 0056			-0.0208	0.0212	0.8518	-0.0461	-0.0290	-0.1494
		0.0194	0.8636	-0.0159	0.0238	0.8862	-0.0437	-0.0280	-0.1148
	0.0138			-0.0073	0.0242	0.9251	-0.0383	-0.0284	-0.0758
		0.0132	0.9552	0.0006	0.0223	0.9606	-0.0338	-0.0305	-0.0402
	0.0275			0.0068	0.0211	0.9892	-0.0312	-0.0303	-0.0115
		0.0132	0.9918	0.0124	0.0226	1.0075	-0.0289	-0 0266	0.0071
1805 14	0.0372			0.0192	0.0252	1.0258	-0.0252	-0.0217	0.0238
		0.0214	1.0284	0.0273	0.0259	1.0578	-0.0207	-0.0193	0.0511
	0.0575			0.0374	0.0242	1.0990	-0.0152	-0.0199	0.0936
		0.0112	1.1383	0.0474	0.0229	1.1351	-0.0101	-0.0197	0.1361
	0.0773			0.0552	0.0242	1.1586	-0.0067	-0.0154	0.1600
		0.0214	1.1475	0.0616	0.0251	1.1580	-0.0032	-0.0103	0.1599
	0.0860			0.0631	0.0232	1.1540	-0.0026	-0.0078	0.1559
		0.0092	1.1292	0.0627	0.0182	1.1449	-0.0033	-0.0088	0.1467
1805 15	0.0794			0.0579	0.0140	1.1357	-0.0080	-0.0106	0.1372
		0.0031	1.1108	0.0520	0.0137	1.1214	-0.0136	-0.0088	0.1226
	0.0646			0.0446	0.0150	1.1036	-0.0202	-0.0077	0.1044
		0.0112	1.0851	0.0372	0.0191	1.0808	-0.0260	-0.0045	0.0813
	0.0499			0.0315	0.0232	1.0579	-0.0295	-0.0037	0.0582
		0.0194	1.0193	0.0268	0.0246	1.0436	-0.0324	-0.0063	0.0437
	0.0438			0.0257	0.0242	1.0350	-0.0321	-0.0119	0.0350
		0.0132	1.0193	0.0258	0.0223	1.0402	-0.0314	-0.0194	0.0401

1805:16 to 1805:22 CDT

CDT	A_x	A_y	A_z	$\ddot{L}$	$\ddot{M}$	$\ddot{N}$	$\ddot{X}$	$\ddot{Y}$	$\ddot{Z}$
h m s	g	g	g	g	g	g	g	g	g
1805 16	0.0476			0.0262	0.0211	1.0487	-0.0313	-0.0268	0.0484
		0.0132	1.0468	0.0256	0.0234	1.0470	-0.0320	-0.0305	0.0466
	0.0433			0.0190	0.0272	1.0350	-0.0384	-0.0308	0.0344
		0.0255	0.9918	0.0096	0.0311	0.9852	-0.0454	-0.0274	-0.0157
	0.0158			-0.0071	0.0334	0.9205	-0.0588	-0.0232	-0.0810
		0.0255	0.8179	-0.0258	0.0368	0.8387	-0.0733	-0.0166	-0.1635
	-0.0274			-0.0421	0.0426	0.7603	-0.0859	-0.0076	-0.2422
		0.0438	0.6714	-0.0548	0.0464	0.7128	-0.0964	-0.0022	-0.2901
1805 17	-0.0422			-0.0607	0.0466	0.6825	-0.1014	-0.0006	-0.3207
		0.0336	0.6622	-0.0655	0.0404	0.6965	-0.1081	-0.0084	-0.3057
	-0.0488			-0.0644	0.0334	0.7283	-0.1105	-0.0175	-0.2767
		0.0173	0.7529	-0.0604	0.0279	0.7872	-0.1124	-0.0271	-0.2185
	-0.0320			-0.0506	0.0242	0.8518	-0.1102	-0.0353	-0.1542
		0.0153	0.9094	-0.0398	0.0243	0.9265	-0.1085	-0.0405	-0.0776
	-0.0076			-0.0274	0.0252	1.0075	-0.1074	-0.0455	0.0014
		0.0194	1.0742	-0.0149	0.0246	1.0848	-0.1074	-0.0521	0.0786
1805 18	0.0178			-0.0029	0.0222	1.1586	-0.1094	-0.0607	0.1521
		0.0092	1.2116	0.0085	0.0202	1.2084	-0.1103	-0.0673	0.2017
	0.0392			0.0158	0.0201	1.2456	-0.1143	-0.0720	0.2385
		0.0153	1.2482	0.0207	0.0186	1.2485	-0.1173	-0.0761	0.2410
	0.0422			0.0238	0.0140	1.2410	-0.1200	-0.0830	0.2327
		-0.0030	1.2024	0.0280	0.0123	1.2250	-0.1201	-0.0850	0.2165
	0.0539			0.0306	0.0181	1.2135	-0.1199	-0.0831	0.2052
		0.0234	1.1932	0.0308	0.0225	1.2038	-0.1210	-0.0825	0.1955
1805 19	0.0478			0.0273	0.0211	1.1906	-0.1238	-0.0885	0.1813
		0.0031	1.1566	0.0235	0.0121	1.1603	-0.1246	-0.1002	0.1496
	0.0392			0.0140	0.0039	1.1219	-0.1295	-0.1103	0.1090
		-0.0112	1.0559	0.0012	-0.0014	1.0785	-0.1369	-0.1159	0.0634
	0.0031			-0.0098	-0.0053	1.0395	-0.1434	-0.1222	0.0223
		-0.0152	0.9918	-0.0159	-0.0043	1.0264	-0.1487	-0.1241	0.0080
	0.0051			-0.0125	-0.0012	1.0258	-0.1474	-0.1265	0.0073
		-0.0030	1.0284	-0.0075	-0.0016	1.0338	-0.1457	-0.1329	0.0149
1805 20	0.0199			-0.0025	-0.0063	1.0349	-0.1437	-0.1424	0.0150
		-0.0254	1.0101	0.0009	-0.0099	1.0258	-0.1421	-0.1490	0.0050
	0.0219			0.0028	-0.0083	1.0166	-0.1424	-0.1490	-0.0045
		-0.0071	0.9918	0.0052	-0.0003	1.0178	-0.1438	-0.1437	-0.0027
	0.0285			0.0086	0.0069	1.0258	-0.1456	-0.1388	0.0060
		0.0051	1.0264	0.0121	0.0119	1.0441	-0.1491	-0.1371	0.0244
	0.0356			0.0155	0.0160	1.0624	-0.1525	-0.1349	0.0430
		0.0112	1.0651	0.0189	0.0172	1.0825	-0.1559	-0.1355	0.0629
1805 21	0.0422			0.0232	0.0170	1.1036	-0.1587	-0.1356	0.0841
		0.0071	1.1108	0.0280	0.0215	1.1282	-0.1622	-0.1308	0.1094
	0.0539			0.0336	0.0303	1.1540	-0.1655	-0.1192	0.1367
		0.0377	1.1658	0.0390	0.0376	1.1660	-0.1664	-0.1058	0.1505
	0.0641			0.0411	0.0395	1.1677	-0.1678	-0.0950	0.1531
		0.0255	1.1383	0.0413	0.0342	1.1454	-0.1666	-0.0887	0.1310
	0.0585			0.0403	0.0293	1.1174	-0.1655	-0.0818	0.1032
		0.0173	1.0651	0.0405	0.0275	1.0842	-0.1621	-0.0718	0.0707
1805 22	0.0626			0.0395	0.0273	1.0533	-0.1594	-0.0606	0.0405
		0.0214	1.0101	0.0362	0.0236	1.0361	-0.1611	-0.0541	0.0230
	0.0499			0.0340	0.0161	1.0258	-0.1621	-0.0515	0.0123
		-0.0051	1.0101	0.0345	0.0085	1.0430	-0.1658	-0.0506	0.0291
	0.0590			0.0416	0.0049	1.0716	-0.1649	-0.0467	0.0566
		-0.0010	1.1017	0.0504	0.0061	1.0935	-0.1619	-0.0380	0.0870
	0.0819			0.0528	0.0069	1.1128	-0.1627	-0.0296	0.1017
		-0.0010	1.0525	0.0489	0.0046	1.0790	-0.1606	-0.0227	0.0679

1805:23 to 1805:29 CDT

CDT	A_x	A_y	A_z	$\ddot{L}$	$\ddot{M}$	$\ddot{N}$	$\ddot{X}$	$\ddot{Y}$	$\ddot{Z}$
h m s	g	g	g	g	g	g	g	g	g
1805 23	0.0560			0.0397	0.0008	1.0258	-0.1599	-0.0183	0.0139
		-0.0132	0.9277	0.0330	-0.0072	0.9966	-0.1612	-0.0202	-0.0161
	0.0499			0.0371	-0.0165	1.0029	-0.1587	-0.0263	-0.0092
		-0.0156	1.0468	0.0462	-0.0193	1.0556	-0.1606	-0.0267	0.0442
	0.0824			0.0586	-0.0165	1.1037	-0.1564	-0.0223	0.0938
		-0.0132	1.1292	0.0685	-0.0046	1.1312	-0.1545	-0.0085	0.1227
	0.0946			0.0743	0.0079	1.1494	-0.1524	0.0051	0.1417
		0.0132	1.1383	0.0799	0.0188	1.1454	-0.1461	0.0168	0.1389
1805 24	0.1053			0.0843	0.0283	1.1357	-0.1399	0.0259	0.1303
		0.0275	1.1017	0.0881	0.0308	1.1037	-0.1299	0.0279	0.0997
	0.1109			0.0814	0.0303	1.0624	-0.1284	0.0266	0.0579
		0.0173	0.9918	0.0682	0.0271	1.0006	-0.1292	0.0228	-0.0053
	0.0656			0.0513	0.0252	0.9343	-0.1328	0.0203	-0.0736
		0.0173	0.8453	0.0382	0.0199	0.8868	-0.1363	0.0145	-0.1228
	0.0509			0.0364	0.0110	0.8564	-0.1321	0.0047	-0.1530
		-0.0112	0.8362	0.0382	0.0005	0.8587	-0.1308	-0.0070	-0.1505
1805 25	0.0556			0.0408	-0.0073	0.8656	-0.1296	-0.0163	-0.1433
		-0.0193	0.8636	0.0400	-0.0141	0.8484	-0.1270	-0.0244	-0.1604
	0.0545			0.0391	-0.0226	0.8106	-0.1204	-0.0347	-0.1979
		-0.0417	0.7263	0.0413	-0.0265	0.7712	-0.1105	-0.0406	-0.2362
	0.0682			0.0463	-0.0257	0.7511	-0.1019	-0.0430	-0.2552
		-0.0254	0.7446	0.0499	-0.0213	0.7655	-0.1015	-0.0426	-0.2405
	0.0717			0.0587	-0.0196	0.7832	-0.0976	-0.0468	-0.2218
		-0.0295	0.7904	0.0720	-0.0197	0.7958	-0.0885	-0.0537	-0.2074
1805 26	0.1124			0.0913	-0.0186	0.8015	-0.0727	-0.0613	-0.1987
		-0.0234	0.7812	0.1097	-0.0140	0.8106	-0.0586	-0.0563	-0.1867
	0.1470			0.1250	-0.0083	0.8290	-0.0498	-0.0716	-0.1661
		-0.0091	0.8453	0.1389	-0.0024	0.8610	-0.0454	-0.0782	-0.1326
	0.1709			0.1520	0.0029	0.8930	-0.0421	-0.0847	-0.0991
		-0.0010	0.9094	0.1656	0.0073	0.9148	-0.0362	-0.0907	-0.0754
	0.2004			0.1779	0.0120	0.9297	-0.0301	-0.0959	-0.0585
		0.0092	0.9186	0.1885	0.0125	0.9360	-0.0240	-0.1000	-0.0507
1805 27	0.2167			0.1970	0.0099	0.9434	-0.0206	-0.1074	-0.0424
		-0.0051	0.9369	0.2056	0.0055	0.9492	-0.0166	-0.1160	-0.0356
	0.2345			0.2127	0.0036	0.9526	-0.0141	-0.1212	-0.0316
		-0.0051	0.9369	0.2186	0.0032	0.9440	-0.0102	-0.1217	-0.0387
	0.2427			0.2228	0.0009	0.9297	-0.0065	-0.1200	-0.0516
		-0.0030	0.9211	0.2270	0.0068	0.9137	-0.0023	-0.1157	-0.0656
	0.2513			0.2284	0.0110	0.9023	-0.0005	-0.1105	-0.0758
		0.0092	0.8820	0.2277	0.0140	0.9028	-0.0032	-0.1086	-0.0752
1805 28	0.2442			0.2327	0.0150	0.9068	-0.0004	-0.1104	-0.0702
		0.0051	0.9003	0.2432	0.0153	0.9194	0.0054	-0.1144	-0.0558
	0.2823			0.2550	0.0170	0.9343	0.0111	-0.1195	-0.0388
		0.0132	0.9369	0.2618	0.0162	0.9457	0.0129	-0.1278	-0.0270
	0.2813			0.2637	0.0119	0.9526	0.0112	-0.1420	-0.0218
		-0.0051	0.9369	0.2671	0.0001	0.9595	0.0116	-0.1648	-0.0178
	0.2930			0.2730	-0.0135	0.9709	0.0142	-0.1919	-0.0099
		-0.0376	0.9735	0.2788	-0.0198	1.0012	0.0118	-0.2156	0.0168
1805 29	0.3047			0.2884	-0.0196	1.0395	0.0110	-0.2360	0.0528
		-0.0173	1.0742	0.3005	-0.0113	1.0624	0.0162	-0.2464	0.0762
	0.3362			0.3156	-0.0043	1.0670	0.0289	-0.2520	0.0834
		-0.0071	1.0284	0.3304	-0.0015	1.0458	0.0482	-0.2535	0.0660
	0.3647			0.3361	-0.0002	1.0258	0.0582	-0.2532	0.0477
		-0.0091	0.9918	0.3361	0.0015	1.0109	0.0614	-0.2504	0.0329
	0.3474			0.3315	0.0049	0.9983	0.0598	-0.2513	0.0197
		0.0031	0.9735	0.3297	0.0079	1.0029	0.0566	-0.2536	0.0233

1805:30 to 1805:36 CDT

CDT	A_x	A_y	A_z	$\ddot{L}$	$\ddot{M}$	$\ddot{N}$	$\ddot{x}$	$\ddot{y}$	$\ddot{z}$
h m s	g	g	g	g	g	g	g	g	g
1805 30	0.3520			0.3375	0.0030	1.0166	0.0606	-0.2584	0.0378
		-0.0010	1.0284	0.3491	0.0096	1.0424	0.0552	-0.2658	0.0648
	0.3861			0.3581	0.0120	1.0670	0.0676	-0.2696	0.0907
		0.0092	1.0742	0.3618	0.0163	1.0693	0.0708	-0.2655	0.0950
	0.3774			0.3589	0.0201	1.0578	0.0712	-0.2572	0.0849
		0.0153	1.0101	0.3572	0.0186	1.0481	0.0724	-0.2542	0.0755
	0.3769			0.3492	0.0140	1.0533	0.0638	-0.2566	0.0778
		-0.0030	1.0651	0.3361	0.0095	1.0636	0.0492	-0.2598	0.0837
1805 31	0.3352			0.3200	0.0080	1.0624	0.0347	-0.2557	0.0792
		0.0031	1.0284	0.3071	0.0129	1.0596	0.0232	-0.2447	0.0756
	0.3189			0.3057	0.0191	1.0670	0.0197	-0.2330	0.0852
		0.0194	1.0742	0.3088	0.0223	1.0916	0.0161	-0.2275	0.1115
	0.3388			0.3142	0.0222	1.1174	0.0145	-0.2228	0.1393
		0.0092	1.1232	0.3165	0.0205	1.1226	0.0155	-0.2143	0.1466
	0.3342			0.3146	0.0212	1.1128	0.0165	-0.1999	0.1391
		0.0173	1.0651	0.3130	0.0218	1.0963	0.0197	-0.1849	0.1251
1805 32	0.3317			0.3127	0.0201	1.0899	0.0220	-0.1751	0.1202
		0.0071	1.0834	0.3132	0.0192	1.1025	0.0205	-0.1678	0.1338
	0.3347			0.3113	0.0212	1.1174	0.0163	-0.1573	0.1493
		0.0194	1.1200	0.3071	0.0257	1.1357	0.0091	-0.1444	0.1679
	0.3195			0.2931	0.0293	1.1540	-0.0079	-0.1332	0.1835
		0.0234	1.1566	0.2748	0.0275	1.1517	-0.0238	-0.1250	0.1775
	0.2701			0.2584	0.0232	1.1357	-0.0339	-0.1193	0.1583
		0.0071	1.0834	0.2475	0.0230	1.0905	-0.0312	-0.1063	0.1130
1805 33	0.2650			0.2426	0.0283	1.0396	-0.0209	-0.0881	0.0641
		0.0336	0.9644	0.2361	0.0350	0.9887	-0.0123	-0.0694	0.0147
	0.2472			0.2272	0.0375	0.9434	-0.0076	-0.0560	-0.0305
		0.0255	0.6911	0.2183	0.0277	0.8696	-0.0007	-0.0546	-0.0852
	0.2294			0.2079	0.0140	0.8244	0.0069	-0.0570	-0.1516
		-0.0132	0.7263	0.1954	-0.0099	0.7660	0.0115	-0.0713	-0.2125
	0.2035			0.1909	-0.0368	0.7237	0.0175	-0.0909	-0.2564
		-0.0763	0.6897	0.1903	-0.0505	0.7380	0.0147	-0.1018	-0.2431
1805 34	0.2172			0.1940	-0.0521	0.7740	0.0105	-0.1016	-0.2069
		-0.0437	0.8270	0.1954	-0.0415	0.8170	0.0024	-0.0892	-0.1637
	0.2137			0.1967	-0.0348	0.8427	-0.0020	-0.0797	-0.1376
		-0.0417	0.8270	0.2000	-0.0349	0.8376	0.0026	-0.0758	-0.1415
	0.2264			0.2007	-0.0359	0.8290	0.0049	-0.0729	-0.1494
		-0.0458	0.7996	0.1975	-0.0406	0.8101	0.0056	-0.0731	-0.1684
	0.2086			0.1919	-0.0471	0.7878	0.0043	-0.0751	-0.1913
		-0.0641	0.7446	0.1886	-0.0551	0.7644	0.0008	-0.0797	-0.1953
1805 35	0.2086			0.1921	-0.0623	0.7969	-0.0002	-0.0830	-0.1821
		-0.0763	0.8179	0.1980	-0.0749	0.8439	-0.0071	-0.0911	-0.1348
	0.2274			0.2224	-0.0918	0.8977	0.0014	-0.0994	-0.0760
		-0.1231	0.9460	0.2567	-0.1003	0.9772	0.0126	-0.0969	0.0106
	0.3261			0.2982	-0.0989	1.0670	0.0277	-0.0771	0.1093
		-0.0905	1.1566	0.3343	-0.0780	1.1534	0.0385	-0.0326	0.2024
	0.3825			0.3687	-0.0541	1.2272	0.0521	0.0282	0.2812
		-0.0335	1.2665	0.4073	-0.0378	1.2616	0.0802	0.0866	0.3210
1805 36	0.4721			0.4393	-0.0297	1.2822	0.1067	0.1459	0.3436
		-0.0417	1.2665	0.4628	-0.0227	1.2856	0.1302	0.2031	0.3451
	0.4934			0.4648	-0.0084	1.2914	0.1343	0.2711	0.3388
		0.0092	1.2848	0.4612	0.0026	1.2610	0.1428	0.3278	0.2942
	0.4690			0.4434	0.0039	1.2043	0.1433	0.3551	0.2249
		-0.0173	1.0925	0.4218	-0.0037	1.1322	0.1424	0.3576	0.1453
	0.4146			0.3968	-0.0074	1.0761	0.1341	0.3519	0.0834
		-0.0132	1.0284	0.3732	-0.0061	1.0784	0.1140	0.3667	0.0746

1805:37 to 1805:43 CDT

CDT	A_x	A_y	A_z	$\ddot{L}$	$\ddot{M}$	$\ddot{N}$	$\ddot{X}$	$\ddot{Y}$	$\ddot{Z}$
h m s	g	g	g	g	g	g	g	g	g
1805 37	0.3718			0.3673	-0.0053	1.1036	0.1066	0.3817	0.0935
		-0.0132	1.1473	0.3717	-0.0103	1.1460	0.1054	0.3955	0.1332
	0.4115			0.3879	-0.0186	1.1769	0.1184	0.3953	0.1686
		-0.0397	1.1749	0.4017	-0.0261	1.1700	0.1374	0.3805	0.1693
	0.4319			0.4021	-0.0298	1.1494	0.1449	0.3545	0.1563
		-0.0356	1.0925	0.3959	-0.0319	1.0962	0.1524	0.3158	0.1120
	0.3998			0.3781	-0.0368	1.0349	0.1514	0.2629	0.0599
		-0.0339	0.9460	0.3592	-0.0353	0.9857	0.1488	0.2194	0.0157
1805 38	0.3586			0.3439	-0.0267	0.9525	0.1482	0.1839	-0.0149
		-0.0152	0.9277	0.3320	-0.0127	0.9537	0.1439	0.1613	-0.0135
	0.3454			0.3331	-0.0023	0.9617	0.1508	0.1342	-0.0025
		-0.0051	0.9644	0.3394	0.0066	0.9869	0.1603	0.1069	0.0258
	0.3734			0.3487	0.0181	1.0167	0.1733	0.0830	0.0577
		0.0255	1.0376	0.3549	0.0292	1.0310	0.1866	0.0598	0.0730
	0.3764			0.3556	0.0375	1.0304	0.1988	0.0390	0.0717
		0.0336	0.9918	0.3556	0.0461	0.9749	0.2190	0.0206	0.0152
1805 39	0.3749			0.3393	0.0577	0.8977	0.2249	0.0154	-0.0654
		0.0661	0.7721	0.3125	0.0714	0.7724	0.2234	0.0214	-0.1944
	0.2900			0.2667	0.0832	0.6368	0.2023	0.0334	-0.3347
		0.0845	0.4700	0.2240	0.0847	0.5114	0.1762	0.0376	-0.4648
	0.1979			0.1929	0.0812	0.4033	0.1593	0.0390	-0.5762
		0.0621	0.3052	0.1718	0.0704	0.3518	0.1461	0.0298	-0.6312
	0.1857			0.1662	0.0598	0.3209	0.1457	0.0208	-0.6645
		0.0417	0.3052	0.1608	0.0508	0.3260	0.1427	0.0096	-0.6620
1805 40	0.1760			0.1651	0.0425	0.3346	0.1488	-0.0006	-0.6552
		0.0275	0.3326	0.1753	0.0426	0.3706	0.1595	-0.0058	-0.6200
	0.2147			0.1923	0.0476	0.4215	0.1763	-0.0075	-0.5690
		0.0519	0.4791	0.2076	0.0526	0.4982	0.1909	-0.0124	-0.4926
	0.2406			0.2203	0.0527	0.5772	0.2024	-0.0221	-0.4143
		0.0377	0.6439	0.2328	0.0410	0.6201	0.2148	-0.0386	-0.3733
	0.2650			0.2427	0.0263	0.6367	0.2247	-0.0541	-0.3584
		-0.0010	0.5981	0.2511	0.0164	0.6224	0.2337	-0.0586	-0.3733
1805 41	0.2772			0.2563	0.0181	0.6138	0.2391	-0.0560	-0.3816
		0.0214	0.5981	0.2608	0.0255	0.6172	0.2435	-0.0472	-0.3770
	0.2844			0.2632	0.0303	0.6230	0.2459	-0.0408	-0.3706
		0.0234	0.6164	0.2649	0.0271	0.6167	0.2481	-0.0407	-0.3771
	0.2854			0.2631	0.0211	0.6001	0.2475	-0.0419	-0.3944
		0.0031	0.5524	0.2598	0.0190	0.5818	0.2455	-0.0394	-0.4130
	0.2742			0.2571	0.0222	0.5727	0.2447	-0.0324	-0.4223
		0.0255	0.5615	0.2563	0.0296	0.5789	0.2456	-0.0225	-0.4162
1805 42	0.2783			0.2575	0.0344	0.5864	0.2489	-0.0152	-0.4091
		0.0275	0.5798	0.2583	0.0343	0.6092	0.2514	-0.0141	-0.3871
	0.2783			0.2690	0.0334	0.6413	0.2638	-0.0145	-0.3558
		0.0234	0.6714	0.2868	0.0351	0.7128	0.2837	-0.0147	-0.2852
	0.3352			0.3128	0.0395	0.8015	0.3122	-0.0120	-0.1974
		0.0397	0.9003	0.3374	0.0407	0.8954	0.3397	-0.0117	-0.1046
	0.3795			0.3553	0.0375	0.9755	0.3626	-0.0136	-0.0266
		0.0194	1.0193	0.3704	0.0277	0.9989	0.3843	-0.0185	-0.0061
1805 43	0.4013			0.3734	0.0181	0.9983	0.3953	-0.0223	-0.0102
		0.0010	0.9460	0.3711	0.0066	0.9754	0.3999	-0.0274	-0.0364
	0.3810			0.3618	-0.0064	0.9617	0.3971	-0.0346	-0.0529
		-0.0295	0.9460	0.3531	-0.0170	0.9583	0.3954	-0.0395	-0.0590
	0.3652			0.3458	-0.0247	0.9525	0.3946	-0.0413	-0.0672
		-0.0356	0.9277	0.3391	-0.0246	0.9297	0.3928	-0.0351	-0.0920
	0.3530			0.3299	-0.0226	0.8977	0.3869	-0.0276	-0.1263
		-0.0254	0.8362	0.3185	-0.0168	0.8467	0.3818	-0.0168	-0.1799

1805:44 to 1805:50 CDT

CDT	A_x	A_y	A_z	$\ddot{L}$	$\ddot{M}$	$\ddot{N}$	$\ddot{X}$	$\ddot{Y}$	$\ddot{Z}$
h m s	g	g	g	g	g	g	g	g	g
1805 44	0.3240			0.3038	-0.0104	0.7924	0.3712	-0.0060	-0.2368
		-0.0112	0.7172	0.2890	-0.0044	0.7415	0.3594	0.0040	-0.2699
	0.2940			0.2770	0.0008	0.6963	0.3499	0.0125	-0.3374
		-0.0030	0.6439	0.2669	0.0041	0.6648	0.3432	0.0186	-0.3714
	0.2798			0.2588	0.0059	0.6367	0.3379	0.0236	-0.4019
		0.0010	0.5981	0.2502	0.0208	0.6121	0.3313	0.0395	-0.4287
	0.2605			0.2441	0.0425	0.5864	0.3251	0.0628	-0.4563
		0.0682	0.5432	0.2405	0.0585	0.5606	0.3203	0.0800	-0.4837
1805 45	0.2605			0.2386	0.0629	0.5360	0.3159	0.0847	-0.5088
		0.0417	0.4974	0.2354	0.0519	0.5286	0.3122	0.0745	-0.5157
	0.2503			0.2322	0.0425	0.5314	0.3090	0.0651	-0.5117
		0.0275	0.5340	0.2303	0.0426	0.5394	0.3072	0.0652	-0.5028
	0.2503			0.2268	0.0476	0.5406	0.3015	0.0682	-0.4996
		0.0519	0.5157	0.2209	0.0526	0.5263	0.2909	0.0700	-0.5111
	0.2315			0.2144	0.0527	0.5086	0.2780	0.0660	-0.5248
		0.0377	0.4700	0.2097	0.0410	0.5286	0.2711	0.0512	-0.5010
1805 46	0.2279			0.2149	0.0263	0.5773	0.2749	0.0345	-0.4492
		-0.0010	0.6531	0.2247	0.0154	0.6963	0.2875	0.0237	-0.3274
	0.2615			0.2466	0.0130	0.8336	0.3092	0.0206	-0.1877
		0.0112	0.9827	0.2720	0.0142	0.9703	0.3308	0.0218	-0.0476
	0.3225			0.2979	0.0120	1.0899	0.3497	0.0200	0.0743
		-0.0030	1.1658	0.3208	0.0018	1.1695	0.3614	0.0100	0.1576
	0.3591			0.3390	-0.0103	1.2410	0.3656	-0.0007	0.2335
		-0.0335	1.2848	0.3572	-0.0104	1.2954	0.3662	0.0009	0.2929
1805 47	0.3952			0.3775	-0.0002	1.3463	0.3679	0.0139	0.3489
		0.0173	1.3764	0.3994	0.0157	1.3921	0.3714	0.0327	0.3986
	0.4436			0.4202	0.0252	1.4378	0.3753	0.0468	0.4496
		0.0173	1.4679	0.4389	0.0210	1.4871	0.3763	0.0483	0.5035
	0.4741			0.4528	0.0140	1.5366	0.3726	0.0484	0.5592
		-0.0051	1.5778	0.4656	-0.0018	1.6055	0.3669	0.0402	0.6305
	0.4975			0.4862	-0.0206	1.6804	0.3684	0.0287	0.7100
		-0.0519	1.7517	0.5124	-0.0432	1.7709	0.3734	0.0140	0.8058
1805 48	0.5672			0.5533	-0.0653	1.8635	0.3940	-0.0009	0.9047
		-0.0946	1.9440	0.5983	-0.0795	1.9134	0.4223	-0.0095	0.9614
	0.6694			0.6185	-0.0897	1.9322	0.4334	-0.0158	0.9839
		-0.0967	1.3891	0.6181	-0.0870	1.3705	0.4341	-0.0151	0.9235
	0.6068			0.5825	-0.0826	1.7857	0.4066	-0.0146	0.8356
		-0.0824	1.6510	0.5441	-0.0776	1.6925	0.3777	-0.0140	0.7389
	0.5214			0.5060	-0.0745	1.6163	0.3529	-0.0158	0.6581
		-0.0824	1.5503	0.4709	-0.0501	1.5866	0.3293	0.0053	0.6227
1805 49	0.4604			0.4525	-0.0094	1.5706	0.3251	0.0427	0.6013
		0.0478	1.5595	0.4422	0.0241	1.5615	0.3281	0.0732	0.5879
	0.4639			0.4341	0.0364	1.5431	0.3337	0.0851	0.5660
		0.0092	1.4954	0.4195	0.0289	1.5059	0.3335	0.0788	0.5255
	0.4151			0.3935	0.0293	1.4653	0.3221	0.0663	0.4804
		0.0336	1.4038	0.3664	0.0293	1.4161	0.3094	0.0948	0.4268
	0.3576			0.3399	0.0212	1.3646	0.2970	0.0988	0.3712
		-0.0071	1.2940	0.3150	0.0126	1.3011	0.2855	0.1011	0.3041
1805 50	0.3123			0.2916	0.0120	1.2318	0.2727	0.1112	0.2312
		0.0153	1.1383	0.2677	0.0217	1.1557	0.2577	0.1294	0.1509
	0.2630			0.2454	0.0302	1.0808	0.2409	0.1426	0.0728
		0.0295	0.9918	0.2247	0.0275	1.0024	0.2247	0.1408	-0.0072
	0.2264			0.2160	0.0181	0.9205	0.2182	0.1275	-0.0987
		-0.0091	0.8173	0.2137	0.0045	0.8721	0.2175	0.1124	-0.1351
	0.2411			0.2187	-0.0053	0.8519	0.2209	0.1008	-0.1546
		-0.0173	0.8545	0.2222	-0.0140	0.8839	0.2214	0.0954	-0.1209

1805:51 to 1805:57 CDT

CDT		A_x	A_y	A_z	$\ddot{L}$	$\ddot{M}$	$\ddot{N}$	$\ddot{X}$	$\ddot{Y}$	$\ddot{Z}$
h m s		g	g	g	g	g	g	g	g	g
1805 51		0.2432			0.2264	-0.0257	0.9251	0.2193	0.0832	-0.0766
			-0.0498	0.9644	0.2328	-0.0431	0.9921	0.2181	0.0660	-0.0058
		0.2625			0.2456	-0.0612	1.0670	0.2213	0.0410	0.0733
			-0.0885	1.1383	0.2603	-0.0726	1.1780	0.2241	0.0201	0.1875
		0.2981			0.2788	-0.0785	1.3050	0.2275	-0.0028	0.3173
			-0.0844	1.4404	0.2977	-0.0876	1.4115	0.2295	-0.0346	0.4265
		0.3373			0.3133	-0.1039	1.4882	0.2299	-0.0784	0.5049
			-0.1393	1.5045	0.3262	-0.1623	1.6284	0.2248	-0.1660	0.6449
1805 52		0.3551			0.2810	-0.2413	1.8407	0.1623	-0.5211	1.3784
			-0.3591	2.1454	0.1998	-0.2839	2.0324	-0.5000	-0.4520	1.2525
		0.0845			0.1275	-0.2817	2.1384	-0.5000	-0.1869	0.8198
			-0.2200	2.1000	0.0972	-0.2139	2.0117	-0.4000	0.1097	0.3312
		0.1500			0.1308	-0.1473	1.8157	-0.3000	0.2539	-0.0244
			-0.0905	1.5000	0.1649	-0.1008	1.4745	-0.2000	0.0914	-0.1971
		0.2198			0.1891	-0.0663	1.1059	0.0000	-0.2539	-0.2397
			-0.0580	1.6805	0.2062	-0.0680	0.8224	0.1832	-0.3860	-0.2326
1805 53		0.2325			0.2067	-0.0816	0.6230	0.1930	-0.2032	-0.2083
			-0.1210	0.5340	0.2033	-0.0864	0.5909	0.1935	-0.0305	-0.1697
		0.2142			0.1912	-0.0734	0.5864	0.1834	0.0305	-0.1443
			-0.0417	0.6073	0.1771	-0.0357	0.6316	0.1705	0.1219	-0.1493
		0.1801			0.1675	0.0008	0.6825	0.1613	0.1016	-0.1584
			0.0275	0.7263	0.1629	0.0133	0.7489	0.1570	-0.1320	-0.1453
		0.1857			0.1660	0.0110	0.8198	0.1594	-0.2641	-0.1240
			-0.0213	0.8820	0.1692	-0.0107	0.8857	0.1615	-0.1524	-0.1199
1805 54		0.1928			0.1706	-0.0307	0.9434	0.1604	-0.0406	-0.1250
			-0.0559	0.9735	0.1705	-0.0361	0.9772	0.1577	0.0305	-0.1249
		0.1882			0.1632	-0.0388	1.0030	0.1478	0.1320	-0.1077
			-0.0376	1.0010	0.1524	-0.0255	1.0201	0.1346	0.0914	-0.0904
		0.1567			0.1355	-0.0093	1.0396	0.1155	-0.1320	-0.0478
			0.0031	1.0468	0.1178	0.0011	1.0367	0.0961	-0.2539	0.0284
		0.1190			0.1003	0.0049	1.0167	0.0783	-0.1625	0.0530
			-0.0091	0.9552	0.0835	0.0045	0.9761	0.0622	-0.0406	0.0072
1805 55		0.0860			0.0677	0.0079	0.9389	0.0483	0.0000	-0.0488
			0.0092	0.8911	0.0517	0.0144	0.9189	0.0340	0.0000	-0.0041
		0.0555			0.0384	0.0191	0.9068	0.0232	0.0000	0.1564
			0.0132	0.8911	0.0271	0.0192	0.9085	0.0144	0.0000	0.4450
		0.0387			0.0624	0.0181	0.9114	0.0000	0.0000	0.8371
			0.0071	0.9003	0.1268	0.0070	0.9228	-0.1000	0.0000	1.1235
		0.2549			0.1466	-0.0094	0.9389	-0.3000	-0.0406	1.0361
			-0.0417	0.9460	0.1075	-0.0311	1.0222	-0.4000	-0.1625	0.5800
1805 56					-0.0284	-0.0511	1.9460	-0.4000	-0.2133	0.0498
			-0.0763	2.9145	-0.1699	-0.0476	2.3896	-0.4000	0.0305	-0.2976
					-0.2637	-0.0302	2.4729	-0.4000	0.3860	-0.4480
					-0.3200	-0.0063	1.9997	-0.5000	0.3454	-0.5140
					-0.3200	0.0080	1.5157	-0.5000	-0.0914	-0.5688
					-0.3200	0.0044	1.1982	-0.5000	-0.3047	-0.6176
					-0.3200	-0.0017	1.0025	-0.5000	-0.0406	-0.6318
			-0.0193	0.9735	-0.3200	-0.0041	0.8054	-0.5000	0.2235	-0.5943
1805 57					-0.3200	-0.0017	0.7524	-0.5000	0.1219	-0.5333
					-0.3200	0.0044	0.6045	-0.5000	-0.0914	-0.4856
					-0.3200	0.0080	0.5157	-0.5000	-0.0813	-0.4327
					-0.3200	0.0080	0.5157	-0.5000	0.1219	-0.3403
					-0.3200	0.0080	0.5157	-0.5000	0.2539	-0.2316
					-0.3200	0.0080	0.5157	-0.5000	0.1727	-0.1443
					-0.3200	0.0080	0.5157	-0.5000	0.0305	-0.0600
					-0.3200	0.0080	0.5157	-0.5000	0.0406	0.0498

1st
2nd
3rd
4th

APPENDIX 6 THREE-COMPONENT WINDS

Three-component winds in this table are relative to Runway 17L. They are in the direction of runway (u), cross runway (v), and vertical (w). dd ff are wind direction and speed.

1804:56 to 1805:01 CDT

CDT	u-component wind			v-component wind			w-component wind			dd ff		Tailwind		Crosswind	
h m s	m/s	fps	kts	m/s	fps	kts	m/s	fps	kts	deg	kts	m/s	kts	m/s	kts
1804 56	3.1	10	6	4.4	14	9	0.7	2	1	55	10	2.6	5	4.7	9
	3.1	10	6	4.3	14	8	0.7	2	1	55	10	2.6	5	4.6	9
	3.1	10	6	4.3	14	8	0.8	3	1	55	10	2.6	5	4.6	9
	3.0	10	6	4.3	14	8	0.8	3	2	55	10	2.6	5	4.6	9
	3.0	10	6	4.3	14	8	0.8	3	2	55	10	2.6	5	4.6	9
	3.0	10	6	4.3	14	8	0.8	3	2	56	10	2.6	5	4.6	9
	3.0	10	6	4.3	14	8	0.9	3	2	56	10	2.5	5	4.6	9
	3.0	10	6	4.3	14	8	1.0	3	2	56	10	2.5	5	4.6	9
1804 57	3.0	10	6	4.4	14	8	1.0	3	2	56	10	2.5	5	4.6	9
	2.9	10	6	4.3	14	8	1.0	3	2	56	10	2.5	5	4.6	9
	2.9	10	6	4.3	14	8	1.1	4	2	56	10	2.5	5	4.6	9
	2.9	10	6	4.3	14	8	1.1	4	2	56	10	2.5	5	4.6	9
	2.9	9	6	4.3	14	8	1.2	4	2	56	10	2.5	5	4.5	9
	2.9	9	6	4.3	14	8	1.2	4	2	56	10	2.5	5	4.5	9
	2.9	9	6	4.3	14	8	1.2	4	2	56	10	2.5	5	4.5	9
	2.8	9	5	4.2	14	8	1.3	4	2	56	10	2.5	5	4.4	9
1804 58	2.8	9	5	4.1	13	8	1.3	4	2	56	10	2.5	5	4.3	8
	2.8	9	5	4.0	13	8	1.3	4	2	55	9	2.5	5	4.2	8
	2.7	9	5	3.9	13	8	1.3	4	3	55	9	2.5	5	4.1	8
	2.7	9	5	3.8	12	7	1.4	4	3	54	9	2.4	5	3.9	8
	2.7	9	5	3.6	12	7	1.3	4	3	54	9	2.4	5	3.8	7
	2.6	9	5	3.5	11	7	1.3	4	2	53	9	2.4	5	3.7	7
	2.6	9	5	3.4	11	7	1.3	4	2	52	8	2.4	5	3.5	7
	2.6	9	5	3.3	11	6	1.3	4	2	52	8	2.4	5	3.4	7
1804 59	2.6	8	5	3.2	10	6	1.2	4	2	51	8	2.4	5	3.3	6
	2.6	8	5	3.1	10	6	1.1	4	2	51	8	2.4	5	3.2	6
	2.5	8	5	3.0	10	6	1.1	4	2	50	8	2.4	5	3.1	6
	2.5	8	5	3.0	10	6	1.1	4	2	50	8	2.4	5	3.1	6
	2.5	8	5	2.9	10	6	1.1	4	2	50	8	2.4	5	3.1	6
	2.5	8	5	2.9	10	6	1.0	3	2	50	7	2.4	5	3.0	6
	2.5	8	5	2.9	10	6	1.0	3	2	50	7	2.4	5	3.0	6
	2.5	8	5	2.9	9	6	1.0	3	2	50	7	2.4	5	3.0	6
1805 00	2.5	8	5	2.9	9	6	1.0	3	2	49	7	2.4	5	3.0	6
	2.5	8	5	2.9	9	6	0.9	3	2	49	7	2.4	5	3.0	6
	2.5	8	5	2.9	9	6	0.9	3	2	49	7	2.4	5	3.0	6
	2.5	8	5	2.9	10	6	0.9	3	2	49	7	2.4	5	3.0	6
	2.5	8	5	2.9	10	6	0.9	3	2	49	7	2.4	5	3.0	6
	2.5	8	5	2.9	10	6	0.8	3	2	50	8	2.4	5	3.0	6
	2.5	8	5	3.0	10	6	0.8	3	2	50	8	2.4	5	3.0	6
	2.5	8	5	3.0	10	6	0.8	3	2	50	8	2.4	5	3.0	6
1805 01	2.5	8	5	2.9	10	6	0.8	3	2	50	7	2.4	5	3.0	6
	2.5	8	5	2.9	9	6	0.8	3	2	50	7	2.4	5	3.0	6
	2.5	8	5	2.9	9	6	0.9	3	2	50	7	2.4	5	2.9	6
	2.4	8	5	2.8	9	5	0.9	3	2	50	7	2.4	5	2.9	6
	2.4	8	5	2.8	9	5	1.0	3	2	50	7	2.3	4	2.8	6
	2.3	8	4	2.8	9	5	1.0	3	2	50	7	2.3	4	2.8	5
	2.3	7	4	2.8	9	5	1.1	4	2	51	7	2.2	4	2.8	5
	2.2	7	4	2.7	9	5	1.2	4	2	52	7	2.2	4	2.8	5

1805:02 to 1805:08 CDT

CDT	u-component wind			v-component wind			w-component wind			dd ff		Tailwind		Crosswind	
h m s	m/s	fps	kts	m/s	fps	kts	m/s	fps	kts	deg	kts	m/s	kts	m/s	kts
1805 02	2.1	7	4	2.7	9	5	1.2	4	2	52	7	2.1	4	2.8	5
	2.1	7	4	2.7	9	5	1.2	4	2	53	7	2.0	4	2.7	5
	2.0	7	4	2.7	9	5	1.3	4	2	53	7	2.0	4	2.7	5
	2.0	6	4	2.7	9	5	1.3	4	3	54	7	1.9	4	2.7	5
	1.9	6	4	2.7	9	5	1.4	4	3	55	6	1.9	4	2.7	5
	1.9	6	4	2.7	9	5	1.4	5	3	55	6	1.9	4	2.7	5
	1.8	6	4	2.7	9	5	1.5	5	3	56	6	1.8	4	2.7	5
	1.8	6	3	2.7	9	5	1.5	5	3	56	6	1.8	3	2.7	5
1805 03	1.8	6	3	2.6	8	5	1.6	5	3	56	6	1.7	3	2.6	5
	1.7	6	3	2.4	8	5	1.7	6	3	55	6	1.7	3	2.4	5
	1.7	5	3	2.3	7	4	1.8	6	3	54	5	1.7	3	2.3	4
	1.6	5	3	2.1	7	4	1.8	6	4	53	5	1.6	3	2.2	4
	1.6	5	3	2.0	7	4	1.8	6	4	52	5	1.6	3	2.0	4
	1.5	5	3	1.9	6	4	1.8	6	4	52	5	1.5	3	1.9	4
	1.5	5	3	1.8	6	3	1.8	6	4	51	4	1.5	3	1.8	3
	1.4	5	3	1.7	6	3	1.8	6	3	50	4	1.4	3	1.7	3
1805 04	1.4	5	3	1.6	5	3	1.8	6	3	50	4	1.4	3	1.6	3
	1.3	4	3	1.6	5	3	1.8	6	3	50	4	1.3	3	1.5	3
	1.3	4	2	1.5	5	3	1.8	6	4	50	4	1.3	3	1.5	3
	1.2	4	2	1.5	5	3	1.9	6	4	51	4	1.3	2	1.5	3
	1.2	4	2	1.5	5	3	2.0	6	4	52	4	1.2	2	1.5	3
	1.1	4	2	1.5	5	3	2.0	7	4	53	4	1.2	2	1.5	3
	1.1	4	2	1.5	5	3	2.1	7	4	55	4	1.1	2	1.5	3
	1.0	3	2	1.5	5	3	2.1	7	4	57	4	1.0	2	1.5	3
1805 05	1.0	3	2	1.5	5	3	2.1	7	4	58	4	1.0	2	1.5	3
	0.9	3	2	1.5	5	3	2.0	7	4	59	3	0.9	2	1.4	3
	0.9	3	2	1.4	4	3	2.0	7	4	58	3	0.9	2	1.3	3
	0.8	3	2	1.3	4	2	2.1	7	4	58	3	0.8	2	1.3	2
	0.8	3	2	1.3	4	2	2.2	7	4	59	3	0.8	2	1.2	2
	0.7	2	1	1.3	4	2	2.4	8	5	60	3	0.8	2	1.2	2
	0.7	2	1	1.2	4	2	2.6	9	5	60	3	0.7	1	1.2	2
	0.7	2	1	1.2	4	2	2.8	9	5	61	3	0.7	1	1.2	2
1805 06	0.6	2	1	1.2	4	2	3.0	10	6	62	3	0.7	1	1.2	2
	0.6	2	1	1.2	4	2	3.1	10	6	65	3	0.6	1	1.2	2
	0.4	1	1	1.2	4	2	3.2	10	6	70	3	0.5	1	1.2	2
	0.3	1	1	1.2	4	2	3.2	11	6	76	2	0.4	1	1.2	2
	0.1	0	0	1.2	4	2	3.3	11	6	83	2	0.2	0	1.2	2
	-0.0	0	0	1.1	4	2	3.3	11	6	92	2	-0.0	0	1.1	2
	-0.3	0	0	1.2	4	2	3.3	11	6	102	2	-0.2	0	1.2	2
	-0.5	-1	0	1.2	4	2	3.3	11	6	111	3	-0.4	0	1.3	2
1805 07	-0.7	-1	0	1.3	4	2	3.3	11	6	117	3	-0.6	0	1.3	3
	-0.8	-2	-1	1.2	4	2	3.3	11	6	124	3	-0.8	0	1.2	2
	-0.9	-2	-1	1.2	4	2	3.3	11	6	129	3	-0.9	-1	1.2	2
	-1.0	-2	-1	1.2	4	2	3.4	11	7	131	3	-1.0	-1	1.2	2
	-1.1	-3	-1	1.2	4	2	3.4	11	7	132	3	-1.0	-1	1.3	2
	-1.1	-3	-1	1.2	4	2	3.4	11	7	132	3	-1.1	-1	1.3	2
	-1.1	-3	-1	1.2	4	2	3.5	11	7	134	3	-1.1	-1	1.2	2
	-1.1	-3	-1	1.2	4	2	3.5	11	7	134	3	-1.1	-1	1.2	2
1805 08	-1.1	-3	-1	1.2	4	2	3.5	11	7	135	3	-1.1	-1	1.2	2
	-1.2	-3	-1	1.1	4	2	3.5	11	7	136	3	-1.1	-1	1.2	2
	-1.2	-3	-1	1.1	3	2	3.4	11	7	138	3	-1.1	-1	1.1	2
	-1.2	-3	-1	1.0	3	2	3.4	11	7	142	3	-1.2	-1	1.0	2
	-1.3	-3	-2	0.9	3	2	3.4	11	7	147	3	-1.2	-1	0.9	2
	-1.4	-3	-2	0.8	3	2	3.4	11	7	150	3	-1.3	-2	0.9	2
	-1.5	-4	-2	0.7	2	1	3.4	11	7	154	3	-1.4	-2	0.8	2
	-1.6	-4	-2	0.7	2	1	3.4	11	7	156	3	-1.5	-2	0.8	1

1805:09 to 1805:15 CDT

CDT	u-component wind			v-component wind			w-component wind			dd ff		Tailwind		Crosswind	
h m s	m/s	fps	kts	m/s	fps	kts	m/s	fps	kts	deg	kts	m/s	kts	m/s	kts
1805 09	-1.7	-4	-2	0.7	2	1	3.5	11	7	158	3	-1.6	-2	0.7	1
	-1.7	-5	-2	0.6	2	1	3.5	12	7	161	4	-1.7	-2	0.7	1
	-1.8	-5	-3	0.6	2	1	3.6	12	7	163	4	-1.8	-2	0.6	1
	-1.9	-5	-3	0.5	2	1	3.7	12	7	166	4	-1.9	-3	0.6	1
	-1.9	-5	-3	0.4	1	1	3.8	13	7	169	4	-1.9	-3	0.5	1
	-2.0	-6	-3	0.3	1	1	4.0	13	8	173	4	-2.0	-3	0.4	1
	-2.1	-6	-3	0.1	0	0	4.1	13	8	177	4	-2.1	-3	0.2	0
	-2.1	-6	-3	-0.1	0	0	4.2	14	8	182	4	-2.1	-3	0.1	0
1805 10	-2.2	-6	-3	-0.2	0	0	4.3	14	8	185	4	-2.2	-3	-0.1	0
	-2.3	-7	-3	-0.3	0	0	4.3	14	8	187	4	-2.3	-3	-0.1	0
	-2.4	-7	-4	-0.3	0	0	4.4	14	9	188	5	-2.4	-4	-0.2	0
	-2.5	-7	-4	-0.4	0	0	4.4	15	9	188	5	-2.5	-4	-0.2	0
	-2.6	-8	-4	-0.4	0	0	4.5	15	9	188	5	-2.7	-4	-0.2	0
	-2.8	-8	-4	-0.3	0	0	4.5	15	9	187	5	-2.8	-4	-0.2	0
	-2.9	-9	-5	-0.4	0	0	4.6	15	9	187	6	-2.8	-5	-0.2	0
	-3.0	-9	-5	-0.4	0	0	4.6	15	9	188	6	-3.0	-5	-0.2	0
1805 11	-3.1	-9	-5	-0.5	-1	0	4.7	15	9	189	6	-3.2	-5	-0.3	0
	-3.2	-10	-5	-0.6	-1	0	4.8	16	9	192	6	-3.3	-5	-0.4	0
	-3.4	-10	-6	-0.8	-2	-1	4.8	16	9	193	7	-3.4	-6	-0.6	0
	-3.5	-10	-6	-0.9	-2	-1	4.8	16	9	195	7	-3.5	-6	-0.7	0
	-3.6	-11	-6	-1.0	-2	-1	4.7	15	9	196	7	-3.6	-6	-0.8	-1
	-3.7	-11	-6	-1.1	-3	-1	4.5	15	9	197	7	-3.7	-6	-0.8	-1
	-3.8	-11	-6	-1.1	-3	-1	4.2	14	8	197	8	-3.8	-6	-0.9	-1
	-3.9	-12	-6	-1.1	-3	-1	3.9	13	8	197	8	-3.9	-7	-0.9	-1
1805 12	-3.9	-12	-7	-1.2	-3	-1	3.5	12	7	197	8	-4.0	-7	-0.9	-1
	-4.0	-12	-7	-1.2	-3	-1	3.1	10	6	197	8	-4.1	-7	-0.9	-1
	-4.1	-12	-7	-1.3	-3	-1	2.7	9	5	197	8	-4.2	-7	-1.0	-1
	-4.1	-12	-7	-1.4	-4	-2	2.3	7	4	199	8	-4.2	-7	-1.1	-1
	-4.1	-13	-7	-1.6	-4	-2	1.9	6	4	201	9	-4.2	-7	-1.3	-1
	-4.1	-13	-7	-1.7	-5	-2	1.6	5	3	203	9	-4.2	-7	-1.4	-2
	-4.1	-12	-7	-1.9	-5	-3	1.3	4	3	205	9	-4.2	-7	-1.6	-2
	-4.0	-12	-7	-2.1	-6	-3	1.2	4	2	208	9	-4.2	-7	-1.8	-3
1805 13	-3.9	-12	-7	-2.3	-7	-3	1.0	3	2	211	9	-4.1	-7	-2.0	-3
	-3.8	-12	-6	-2.5	-7	-4	0.9	3	2	213	9	-4.0	-7	-2.2	-3
	-3.7	-11	-6	-2.6	-8	-4	0.8	3	2	215	9	-3.9	-7	-2.3	-4
	-3.6	-11	-6	-2.7	-8	-4	0.8	3	1	217	9	-3.8	-6	-2.4	-4
	-3.5	-10	-6	-2.8	-8	-4	0.8	3	2	219	9	-3.7	-6	-2.5	-4
	-3.4	-10	-6	-2.9	-9	-5	1.0	3	2	221	9	-3.6	-6	-2.6	-4
	-3.3	-10	-5	-3.0	-9	-5	1.2	4	2	222	9	-3.5	-6	-2.7	-4
	-3.2	-10	-5	-3.0	-9	-5	1.5	5	3	224	9	-3.4	-6	-2.8	-4
1805 14	-3.1	-9	-5	-3.0	-9	-5	1.9	6	4	224	8	-3.3	-5	-2.8	-4
	-3.1	-9	-5	-3.1	-9	-5	2.4	8	5	225	8	-3.3	-5	-2.8	-5
	-3.1	-9	-5	-3.1	-9	-5	2.8	9	5	226	8	-3.3	-5	-2.9	-5
	-3.1	-9	-5	-3.1	-9	-5	3.1	10	6	226	9	-3.3	-5	-2.9	-5
	-3.1	-9	-5	-3.1	-9	-5	3.2	11	6	225	8	-3.3	-5	-2.8	-5
	-3.2	-9	-5	-3.0	-9	-5	3.3	11	6	223	8	-3.4	-6	-2.7	-4
	-3.3	-10	-5	-2.9	-8	-5	3.2	10	6	221	9	-3.5	-6	-2.6	-4
	-3.4	-10	-6	-2.8	-8	-4	3.0	10	6	219	9	-3.6	-6	-2.6	-4
1805 15	-3.6	-11	-6	-2.8	-8	-4	2.8	9	5	218	9	-3.8	-6	-2.5	-4
	-3.7	-11	-6	-2.7	-8	-4	2.6	9	5	216	9	-3.9	-7	-2.5	-4
	-3.9	-12	-7	-2.7	-8	-4	2.5	8	5	215	9	-4.1	-7	-2.5	-4
	-4.1	-12	-7	-2.7	-8	-4	2.5	8	5	214	10	-4.2	-7	-2.5	-4
	-4.2	-13	-7	-2.7	-8	-4	2.5	8	5	213	10	-4.4	-8	-2.5	-4
	-4.4	-14	-8	-2.7	-8	-4	2.5	8	5	212	10	-4.6	-8	-2.5	-4
	-4.6	-14	-8	-2.8	-8	-4	2.3	8	4	211	10	-4.8	-8	-2.5	-4
	-4.9	-15	-9	-2.8	-8	-4	1.9	6	4	210	11	-5.0	-9	-2.5	-4

1805:16 to 1805:22 CDT

CDT	u-component wind			v-component wind			w-component wind			dd ff		Tailwind		Crosswind	
h m s	m/s	fps	kts	m/s	fps	kts	m/s	fps	kts	deg	kts	m/s	kts	m/s	kts
1805 16	-5.2	-16	-9	-2.8	-8	-5	1.2	4	2	209	11	-5.3	-9	-2.5	-4
	-5.5	-17	-10	-2.9	-9	-5	0.2	1	0	208	12	-5.6	-10	-2.6	-4
	-5.8	-18	-10	-3.1	-9	-5	-0.9	-2	-1	208	13	-6.0	-11	-2.8	-4
	-6.2	-19	-11	-3.3	-10	-5	-2.2	-6	-3	209	14	-6.3	-11	-3.0	-5
	-6.5	-20	-12	-3.6	-11	-6	-3.3	-10	-5	210	14	-6.7	-12	-3.2	-5
	-6.8	-21	-12	-3.9	-12	-7	-4.3	-13	-7	210	15	-7.0	-13	-3.5	-6
	-7.2	-23	-13	-4.0	-12	-7	-5.1	-16	-9	209	16	-7.4	-13	-3.5	-6
	-7.6	-24	-14	-3.9	-12	-7	-5.6	-17	-10	208	17	-7.8	-14	-3.5	-6
1805 17	-8.0	-25	-15	-3.8	-11	-6	-5.8	-18	-10	205	17	-8.2	-15	-3.3	-5
	-8.5	-27	-15	-3.5	-11	-6	-5.8	-18	-10	203	18	-8.6	-16	-3.1	-5
	-8.9	-28	-16	-3.3	-10	-5	-5.6	-17	-10	200	18	-9.1	-17	-2.8	-4
	-9.4	-30	-17	-2.9	-9	-5	-5.4	-17	-9	198	19	-9.5	-18	-2.4	-4
	-9.9	-31	-18	-2.6	-7	-4	-5.1	-16	-9	195	20	-10.0	-18	-2.1	-3
	-10.3	-33	-19	-2.3	-7	-3	-4.8	-15	-8	193	20	-10.4	-19	-1.8	-2
	-10.7	-34	-20	-2.1	-6	-3	-4.7	-15	-8	191	21	-10.8	-20	-1.6	-2
	-11.0	-35	-20	-1.9	-5	-3	-4.7	-14	-8	190	22	-11.1	-21	-1.4	-2
1805 18	-11.3	-36	-21	-1.7	-5	-2	-4.6	-14	-8	189	22	-11.4	-21	-1.2	-1
	-11.6	-37	-22	-1.5	-4	-2	-4.6	-14	-8	188	23	-11.7	-22	-1.0	-1
	-11.9	-38	-22	-1.3	-3	-1	-4.6	-14	-8	186	23	-11.9	-22	-0.8	-1
	-12.1	-39	-22	-1.1	-3	-1	-4.5	-14	-8	185	24	-12.1	-23	-0.6	0
	-12.2	-39	-23	-1.0	-2	-1	-4.4	-13	-8	185	24	-12.3	-23	-0.5	0
	-12.3	-40	-23	-0.9	-2	-1	-4.3	-13	-7	184	24	-12.4	-23	-0.4	0
	-12.4	-40	-23	-0.7	-1	0	-4.2	-13	-7	184	24	-12.4	-23	-0.3	0
	-12.4	-40	-23	-0.5	-1	0	-4.3	-13	-7	183	24	-12.4	-23	-0.1	0
1805 19	-12.3	-39	-23	-0.3	0	0	-4.3	-13	-7	182	24	-12.3	-23	0.1	0
	-12.1	-39	-23	-0.1	0	0	-4.5	-14	-8	181	24	-12.1	-23	0.3	1
	-11.9	-38	-22	0.1	0	0	-4.7	-14	-8	180	23	-11.8	-22	0.5	1
	-11.5	-37	-21	0.4	1	1	-4.9	-15	-9	178	22	-11.5	-21	0.7	1
	-11.0	-35	-20	0.6	2	1	-5.1	-16	-9	177	21	-11.0	-20	0.9	2
	-10.5	-34	-19	0.7	2	1	-5.4	-17	-9	176	21	-10.5	-19	1.0	2
	-10.0	-32	-18	0.8	3	2	-5.7	-18	-10	176	20	-10.0	-18	1.1	2
	-9.6	-30	-18	0.9	3	2	-6.0	-19	-11	175	19	-9.5	-18	1.1	2
1805 20	-9.2	-29	-17	0.8	3	2	-6.3	-20	-11	175	18	-9.2	-17	1.0	2
	-8.9	-28	-16	0.7	2	1	-6.5	-20	-12	176	17	-8.9	-16	0.9	2
	-8.7	-27	-16	0.5	2	1	-6.6	-21	-12	177	17	-8.6	-16	0.7	1
	-8.5	-27	-16	0.3	1	1	-6.6	-21	-12	178	17	-8.5	-16	0.5	1
	-8.5	-27	-15	0.0	0	0	-6.5	-20	-12	180	16	-8.5	-15	0.2	0
	-8.4	-27	-15	-0.3	0	0	-6.3	-20	-11	182	16	-8.5	-15	-0.1	0
	-8.4	-27	-15	-0.7	-1	0	-6.0	-19	-11	185	16	-8.5	-15	-0.5	0
	-8.4	-27	-15	-1.1	-3	-1	-5.7	-18	-10	188	16	-8.4	-15	-0.9	-1
1805 21	-8.3	-26	-15	-1.6	-4	-2	-5.5	-17	-10	191	17	-8.4	-15	-1.4	-2
	-8.2	-26	-15	-2.0	-6	-3	-5.4	-17	-10	194	16	-8.3	-15	-1.8	-3
	-8.1	-25	-15	-2.4	-7	-4	-5.4	-17	-10	197	16	-8.1	-15	-2.2	-3
	-7.8	-25	-14	-2.7	-8	-4	-5.5	-17	-10	199	16	-7.9	-14	-2.5	-4
	-7.6	-24	-14	-2.9	-9	-5	-5.7	-18	-10	201	16	-7.7	-14	-2.7	-4
	-7.4	-23	-13	-3.1	-9	-5	-5.8	-18	-10	203	16	-7.5	-13	-3.0	-5
	-7.2	-23	-13	-3.2	-9	-5	-5.8	-18	-10	204	15	-7.3	-13	-3.0	-5
	-7.1	-22	-13	-3.1	-9	-5	-5.6	-17	-10	204	15	-7.2	-13	-2.9	-5
1805 22	-7.1	-22	-13	-2.8	-8	-5	-5.4	-17	-9	202	15	-7.1	-13	-2.7	-4
	-7.2	-23	-13	-2.6	-8	-4	-5.2	-16	-9	200	15	-7.2	-13	-2.5	-4
	-7.4	-23	-13	-2.4	-7	-4	-5.0	-16	-9	199	15	-7.4	-13	-2.3	-4
	-7.7	-24	-14	-2.3	-7	-3	-5.1	-16	-9	197	16	-7.7	-14	-2.2	-3
	-8.0	-25	-15	-2.1	-6	-3	-5.2	-16	-9	195	16	-8.0	-15	-2.0	-3
	-8.4	-26	-15	-1.9	-5	-3	-5.4	-17	-9	193	17	-8.4	-15	-1.8	-3
	-8.7	-28	-16	-1.7	-5	-2	-5.5	-17	-10	191	17	-8.7	-16	-1.7	-2
	-9.0	-28	-16	-1.7	-4	-2	-5.5	-17	-10	191	18	-9.0	-16	-1.6	-2

1805:23 to 1805:29 CDT

CDT	u-component wind			v-component wind			w-component wind			dd	ff	Tailwind		Crosswind	
h m s	m/s	fps	kts	m/s	fps	kts	m/s	fps	kts	deg	kts	m/s	kts	m/s	kts
1805 23	-9.1	-29	-17	-1.7	-4	-2	-5.4	-17	-9	191	18	-9.1	-17	-1.6	-2
	-9.1	-29	-17	-1.6	-4	-2	-5.1	-16	-9	190	18	-9.1	-17	-1.6	-2
	-9.0	-28	-16	-1.4	-4	-2	-4.5	-14	-8	189	18	-9.0	-16	-1.4	-2
	-8.7	-27	-16	-1.3	-3	-2	-3.9	-12	-7	189	17	-8.7	-16	-1.3	-2
	-8.3	-26	-15	-1.4	-4	-2	-3.4	-10	-6	190	16	-8.3	-15	-1.4	-2
	-7.8	-25	-14	-1.6	-4	-2	-3.1	-9	-5	192	16	-7.8	-14	-1.7	-2
	-7.3	-23	-13	-1.8	-5	-2	-3.1	-9	-5	194	15	-7.3	-13	-1.8	-3
	-6.9	-22	-12	-1.9	-5	-3	-3.3	-10	-5	196	14	-6.9	-12	-1.9	-3
1805 24	-6.5	-20	-12	-2.0	-5	-3	-3.6	-11	-6	197	13	-6.5	-12	-2.0	-3
	-6.2	-19	-11	-2.1	-6	-3	-3.9	-12	-7	199	13	-6.2	-11	-2.2	-3
	-6.0	-19	-11	-2.1	-6	-3	-4.3	-13	-7	200	12	-6.0	-11	-2.2	-3
	-5.9	-18	-10	-1.9	-5	-3	-4.7	-15	-8	199	12	-5.9	-10	-2.0	-3
	-5.8	-18	-10	-1.5	-4	-2	-5.3	-16	-9	195	12	-5.8	-10	-1.6	-2
	-5.7	-18	-10	-1.2	-3	-1	-5.8	-18	-10	192	11	-5.7	-10	-1.2	-1
	-5.6	-17	-10	-0.9	-2	-1	-6.3	-20	-11	189	11	-5.6	-10	-1.0	-1
	-5.5	-17	-10	-0.7	-1	0	-6.8	-21	-12	188	11	-5.5	-10	-0.8	-1
1805 25	-5.4	-17	-10	-0.6	-1	0	-7.5	-22	-13	187	11	-5.4	-9	-0.7	0
	-5.3	-16	-9	-0.6	-1	0	-8.1	-26	-15	186	10	-5.3	-9	-0.6	0
	-5.1	-16	-9	-0.5	-1	0	-8.6	-27	-16	186	10	-5.1	-9	-0.6	0
	-4.9	-15	-9	-0.6	-1	0	-9.0	-29	-16	187	10	-4.9	-9	-0.7	0
	-4.7	-15	-8	-0.6	-1	0	-9.2	-29	-17	187	9	-4.7	-8	-0.7	0
	-4.5	-14	-8	-0.5	-1	0	-9.3	-30	-17	187	9	-4.5	-8	-0.6	0
	-4.3	-13	-7	-0.3	0	0	-9.3	-30	-17	184	8	-4.3	-7	-0.3	0
	-4.0	-12	-7	0.1	0	0	-9.3	-30	-17	179	8	-4.0	-7	-0.0	0
1805 26	-3.8	-12	-6	0.4	1	1	-9.3	-30	-17	175	7	-3.8	-6	0.3	1
	-3.6	-11	-6	0.5	2	1	-9.5	-30	-17	172	7	-3.6	-6	0.3	1
	-3.4	-10	-6	0.6	2	1	-9.8	-31	-18	171	7	-3.4	-6	0.5	1
	-3.2	-10	-5	0.6	2	1	-10.1	-32	-19	170	6	-3.2	-5	0.5	
	-3.1	-9	-5	0.5	2	1	-10.5	-33	-19	171	6	-3.1	-5	0.4	1
	-3.0	-9	-5	0.4	1	1	-10.7	-34	-20	172	6	-3.0	-5	0.3	1
	-2.9	-9	-5	0.3	1	1	-11.0	-35	-20	175	6	-2.9	-5	0.2	0
	-2.8	-8	-4	0.2	1	0	-11.2	-36	-21	176	5	-2.8	-4	0.2	0
1805 27	-2.7	-8	-4	0.2	1	0	-11.3	-36	-21	177	5	-2.7	-4	0.1	0
	-2.5	-7	-4	0.2	1	0	-11.5	-37	-21	177	5	-2.5	-4	0.1	0
	-2.2	-6	-3	0.2	1	0	-11.5	-37	-21	176	4	-2.2	-3	0.1	0
	-1.9	-5	-3	0.1	0	0	-11.5	-37	-21	176	4	-1.9	-3	0.1	0
	-1.6	-4	-2	0.1	0	0	-11.4	-36	-21	178	3	-1.6	-2	0.0	0
	-1.2	-3	-1	-0.1	0	0	-11.3	-36	-21	186	2	-1.2	-1	-0.1	0
	-0.7	-1	0	-0.3	0	0	-11.2	-36	-21	203	2	-0.7	0	-0.3	0
	-0.3	0	0	-0.5	1	0	-11.0	-35	-20	238	1	-0.3	0	-0.5	0
1805 28	0.1	0	0	-0.7	-1	0	-10.8	-34	-20	275	1	0.1	0	-0.7	0
	0.4	1	1	-0.8	-1	0	-10.5	-34	-19	297	2	0.4	1	-0.7	0
	0.7	2	1	-0.6	-1	0	-10.4	-33	-19	316	2	0.7	1	-0.6	0
	0.9	3	2	-0.3	0	0	-10.3	-33	-19	339	2	0.9	2	-0.3	0
	1.0	3	2	-0.0	0	0	-10.2	-33	-19	358	2	1.0	2	-0.0	0
	1.1	4	2	0.3	1	1	-10.1	-32	-19	15	2	1.1	2	0.3	1
	1.1	4	2	0.6	2	1	-9.9	-32	-18	28	2	1.1	2	0.6	1
	1.1	4	2	0.7	2	1	-9.9	-32	-18	35	3	1.1	2	0.8	2
1805 29	1.0	3	2	0.8	3	2	-10.0	-32	-18	39	3	1.0	2	0.9	2
	0.9	3	2	0.7	2	1	-10.1	-32	-19	37	2	0.9	2	0.8	1
	0.8	3	2	0.4	1	1	-10.1	-32	-19	28	2	0.8	2	0.5	1
	0.7	2	1	0.1	0	0	-10.2	-32	-19	12	1	0.7	1	0.2	0
	0.6	2	1	-0.2	0	0	-10.2	-33	-19	341	1	0.6	1	-0.2	0
	0.4	1	1	-0.4	-1	0	-10.2	-33	-19	311	1	0.5	1	-0.3	0
	0.3	1	1	-0.5	-1	0	-10.1	-32	-19	289	2	0.3	1	-0.7	0
	0.1	0	0	-1.0	-2	-1	-9.9	-31	-18	278	2	0.2	0	-1.0	1

1805:30 to 1805:36 CDT

CDT	u-component wind			v-component wind			w-component wind			dd ff		Tailwind		Crosswind	
h m s	m/s	fps	kts	m/s	fps	kts	m/s	fps	kts	deg	kts	m/s	kts	m/s	kts
1805 30	-0.1	0	0	-1.2	-3	-1	-9.6	-31	-18	266	2	-0.0	0	-1.2	-1
	-0.3	0	0	-1.6	-4	-2	-9.4	-30	-17	258	3	-0.3	0	-1.6	-2
	-0.6	-1	0	-1.9	-5	-3	-9.3	-30	-17	253	4	-0.5	0	-1.9	-3
	-0.9	-2	-1	-2.2	-6	-3	-9.4	-30	-17	248	5	-0.8	-1	-2.3	-3
	-1.2	-3	-1	-2.5	-7	-4	-9.5	-30	-17	245	5	-1.1	-1	-2.5	-4
	-1.5	-4	-2	-2.8	-8	-4	-9.6	-31	-18	241	6	-1.4	-2	-2.8	-4
	-1.9	-5	-3	-3.0	-9	-5	-9.7	-31	-18	238	7	-1.8	-2	-3.1	-5
	-2.3	-6	-3	-3.4	-10	-6	-9.8	-31	-18	236	8	-2.1	-3	-3.5	-6
1805 31	-2.7	-8	-4	-3.6	-11	-6	-9.8	-31	-18	234	9	-2.5	-4	-3.8	-6
	-3.1	-9	-5	-3.9	-12	-7	-9.8	-31	-18	232	10	-2.9	-5	-4.1	-7
	-3.5	-10	-6	-4.2	-13	-7	-9.6	-31	-18	231	11	-3.2	-5	-4.4	-8
	-3.9	-12	-7	-4.5	-14	-8	-9.4	-30	-17	230	12	-3.6	-6	-4.7	-8
	-4.3	-13	-7	-4.9	-15	-8	-9.0	-29	-17	229	13	-4.0	-7	-5.1	-9
	-4.8	-15	-8	-5.1	-16	-9	-8.7	-27	-16	227	14	-4.4	-8	-5.4	-9
	-5.2	-16	-9	-5.2	-16	-9	-8.3	-26	-15	226	14	-4.8	-8	-5.5	-10
	-5.6	-17	-10	-5.3	-16	-9	-8.0	-25	-15	224	15	-5.2	-9	-5.6	-10
1805 32	-5.9	-18	-11	-5.4	-17	-10	-7.7	-24	-14	223	16	-5.6	-10	-5.6	-10
	-6.3	-20	-11	-5.6	-17	-10	-7.5	-23	-14	222	16	-5.9	-10	-6.0	-11
	-6.5	-20	-12	-5.7	-18	-10	-7.3	-23	-13	222	17	-6.1	-11	-6.2	-11
	-6.7	-21	-12	-5.8	-18	-10	-7.2	-23	-13	221	17	-6.3	-11	-6.3	-11
	-6.9	-21	-12	-5.9	-18	-10	-7.2	-23	-13	221	18	-6.4	-11	-6.5	-12
	-6.9	-22	-12	-6.1	-19	-11	-7.3	-23	-13	222	18	-6.3	-11	-6.7	-12
	-6.8	-21	-12	-6.4	-20	-11	-7.5	-24	-14	223	18	-6.2	-11	-6.9	-12
	-6.6	-21	-12	-6.6	-21	-12	-7.8	-25	-14	225	18	-6.0	-11	-7.2	-13
1805 33	-6.4	-20	-11	-6.6	-21	-12	-8.2	-26	-15	226	18	-5.7	-10	-7.2	-13
	-6.0	-19	-11	-6.5	-20	-12	-8.6	-27	-16	228	17	-5.3	-9	-7.1	-13
	-5.6	-17	-10	-6.2	-19	-11	-9.0	-28	-17	228	16	-4.9	-8	-6.7	-12
	-5.1	-16	-9	-6.0	-19	-11	-9.5	-30	-17	230	15	-4.4	-8	-6.5	-12
	-4.7	-14	-8	-5.9	-18	-11	-9.9	-31	-18	232	15	-4.0	-7	-6.4	-11
	-4.3	-13	-7	-5.8	-18	-10	-10.2	-32	-19	234	14	-3.6	-6	-6.3	-11
	-3.9	-12	-7	-5.6	-17	-10	-10.5	-33	-19	236	13	-3.2	-5	-6.0	-11
	-3.5	-11	-6	-5.4	-17	-9	-10.9	-35	-20	237	13	-2.8	-5	-5.8	-10
1805 34	-3.2	-10	-5	-5.4	-17	-9	-11.4	-36	-21	239	12	-2.5	-4	-5.7	-10
	-3.1	-9	-5	-5.7	-18	-10	-11.9	-38	-22	242	13	-2.3	-3	-6.0	-11
	-2.9	-9	-5	-5.9	-18	-10	-12.4	-40	-23	244	13	-2.1	-3	-6.2	-11
	-2.8	-8	-4	-6.0	-19	-11	-13.0	-42	-24	245	13	-1.9	-3	-6.3	-11
	-2.7	-8	-4	-6.2	-19	-11	-13.6	-43	-25	247	13	-1.8	-3	-6.5	-12
	-2.7	-8	-4	-6.7	-21	-12	-13.9	-44	-26	248	14	-1.7	-2	-7.0	-13
	-2.7	-8	-4	-7.4	-23	-13	-13.7	-44	-26	250	15	-1.7	-2	-7.7	-14
	-2.7	-8	-4	-8.4	-27	-15	-13.3	-43	-25	252	17	-1.5	-2	-8.7	-16
1805 35	-2.6	-8	-4	-9.5	-30	-18	-12.6	-40	-24	255	19	-1.3	-1	-9.8	-18
	-2.3	-7	-4	-10.7	-34	-20	-11.7	-37	-22	253	21	-0.8	-1	-10.9	-20
	-1.8	-5	-2	-11.5	-37	-21	-10.5	-33	-19	261	23	-0.1	0	-11.6	-22
	-0.9	-2	-1	-11.8	-38	-22	-9.1	-29	-17	266	23	0.8	2	-11.8	-22
	0.2	1	0	-11.8	-38	-22	-7.6	-24	-14	271	23	1.9	4	-11.6	-22
	1.5	5	3	-11.3	-36	-21	-6.1	-19	-11	278	22	3.1	6	-11.0	-20
	2.9	10	6	-10.3	-33	-19	-4.5	-14	-8	286	21	4.4	9	-9.8	-18
	4.3	14	8	-8.8	-28	-16	-2.9	-9	-5	296	19	5.6	11	-8.0	-15
1805 36	5.6	18	11	-6.8	-21	-12	-1.6	-4	-2	310	17	6.6	13	-5.9	-10
	6.7	22	13	-4.9	-15	-9	-0.5	-1	0	324	16	7.4	14	-3.8	-6
	7.6	25	15	-3.2	-9	-5	0.6	2	1	338	16	8.0	16	-2.0	-3
	8.3	27	16	-1.6	-4	-2	1.8	6	3	349	16	8.4	16	-0.3	0
	8.9	29	17	-0.0	0	0	2.6	9	5	360	17	8.8	17	1.4	3
	9.3	31	18	1.3	4	3	3.6	12	7	8	18	9.0	17	2.7	5
	9.6	32	19	2.3	8	5	4.4	14	8	14	19	9.1	18	3.8	7
	9.8	32	19	3.0	10	6	5.1	17	10	17	20	9.2	18	4.6	9

1805:37 to 1805:43 CDT

CDT	u-component wind			v-component wind			w-component wind			dd ff		Tailwind		Crosswind	
h m s	m/s	fps	kts	m/s	fps	kts	m/s	fps	kts	deg	kts	m/s	kts	m/s	kts
1805 37	9.9	32	19	3.4	11	7	5.7	19	11	20	20	9.2	18	5.0	10
	9.8	32	19	3.7	12	7	6.0	20	12	21	20	9.1	18	5.2	10
	9.5	31	18	3.8	12	7	5.9	19	12	22	20	8.8	17	5.2	10
	9.0	30	17	3.5	12	7	5.7	19	11	22	19	8.3	16	4.9	9
	8.4	28	16	3.3	11	6	5.4	18	10	22	17	7.8	15	4.5	9
	7.7	25	15	3.0	10	6	5.2	17	10	21	16	7.2	14	4.0	8
	7.0	23	14	2.6	8	5	5.0	16	10	20	14	6.6	13	3.5	7
	6.3	21	12	2.0	7	4	4.9	16	10	18	13	6.0	12	2.8	6
1805 38	5.7	19	11	1.4	4	3	5.0	16	10	14	11	5.5	11	2.1	4
	5.3	17	10	0.5	2	1	5.4	18	10	6	10	5.2	10	1.2	2
	5.0	16	10	-0.4	0	0	5.9	19	11	356	10	5.0	10	0.2	0
	4.9	16	9	-1.4	-4	-2	6.3	21	12	344	10	5.0	10	-0.9	-1
	4.9	16	9	-2.5	-7	-4	6.7	22	13	333	11	5.1	10	-2.0	-3
	5.0	16	10	-3.6	-11	-6	6.9	23	13	324	12	5.3	10	-3.1	-5
	5.1	17	10	-4.7	-14	-8	6.9	23	13	318	13	5.6	11	-4.1	-7
	5.3	17	10	-5.6	-17	-10	6.8	22	13	314	15	5.8	11	-5.1	-9
1805 39	5.5	18	11	-6.4	-20	-11	6.4	21	12	311	16	6.1	12	-5.6	-10
	5.6	18	11	-6.9	-22	-12	5.8	19	11	309	17	6.3	12	-6.3	-11
	5.7	19	11	-7.1	-22	-13	5.0	16	10	309	18	6.3	12	-6.6	-12
	5.7	19	11	-7.2	-23	-13	3.9	13	8	309	18	6.4	12	-6.7	-12
	5.7	19	11	-7.2	-23	-13	2.6	9	5	309	18	6.3	12	-6.6	-12
	5.6	18	11	-6.9	-22	-12	1.3	4	3	310	17	6.2	12	-6.3	-11
	5.6	18	11	-6.4	-20	-11	0.3	1	1	311	17	6.2	12	-5.9	-10
	5.6	18	11	-6.0	-19	-11	-0.6	-1	0	313	16	6.1	12	-5.4	-10
1805 40	5.7	19	11	-5.7	-18	-10	-1.3	-3	-2	315	16	6.2	12	-5.1	-9
	5.9	19	11	-5.5	-17	-10	-2.0	-6	-3	317	16	6.4	12	-4.9	-9
	6.2	20	12	-5.3	-16	-9	-2.6	-8	-4	320	16	6.7	13	-4.7	-8
	6.8	22	13	-5.0	-15	-9	-3.2	-9	-5	324	16	7.2	14	-4.3	-7
	7.5	25	15	-4.7	-15	-8	-3.7	-11	-6	328	17	7.9	15	-3.9	-7
	8.4	28	16	-4.5	-14	-8	-4.4	-13	-7	332	18	8.8	17	-3.6	-6
	9.4	31	18	-4.3	-13	-7	-5.1	-16	-9	335	20	9.8	19	-3.3	-5
	10.4	34	20	-4.2	-13	-7	-5.9	-18	-11	338	22	10.8	21	-3.0	-5
1805 41	11.5	38	22	-4.0	-12	-7	-6.6	-21	-12	341	24	11.8	23	-2.7	-4
	12.4	41	24	-3.8	-12	-6	-7.1	-22	-13	343	25	12.8	25	-2.4	-4
	13.3	44	26	-3.8	-11	-6	-7.4	-23	-13	344	27	13.6	26	-2.3	-3
	14.0	46	27	-3.9	-12	-7	-7.7	-24	-14	345	28	14.3	28	-2.3	-3
	14.5	48	28	-4.0	-12	-7	-7.7	-24	-14	345	29	14.9	29	-2.3	-4
	15.0	49	29	-4.1	-13	-7	-7.7	-24	-14	345	30	15.4	30	-2.4	-4
	15.5	51	30	-4.1	-13	-7	-7.4	-23	-13	345	31	15.8	31	-2.3	-3
	15.9	52	31	-4.1	-13	-7	-6.9	-22	-12	346	32	16.3	32	-2.3	-3
1805 42	16.3	54	32	-4.3	-13	-7	-6.2	-19	-11	346	33	16.7	32	-2.3	-3
	16.8	55	33	-4.5	-14	-8	-5.2	-16	-9	345	34	17.2	33	-2.4	-4
	17.2	57	33	-4.6	-14	-8	-4.0	-12	-7	345	35	17.7	34	-2.5	-4
	17.7	58	34	-4.7	-14	-8	-2.7	-8	-4	345	36	18.2	35	-2.5	-4
	18.2	60	35	-4.6	-14	-8	-1.3	-3	-2	346	37	18.7	36	-2.3	-3
	18.7	61	36	-4.4	-13	-7	-0.1	0	0	347	37	19.1	37	-2.1	-3
	19.2	63	37	-4.1	-12	-7	1.0	3	2	348	38	19.5	38	-1.7	-2
	19.6	64	38	-3.7	-11	-6	1.9	6	4	350	39	19.9	39	-1.3	-1
1805 43	19.9	65	39	-3.4	-10	-6	2.6	9	5	351	39	20.2	39	-0.9	-1
	20.2	66	39	-3.2	-9	-5	3.2	10	6	351	40	20.4	40	-0.6	0
	20.3	67	39	-3.0	-9	-5	3.4	11	7	352	40	20.5	40	-0.4	0
	20.3	67	39	-2.8	-8	-4	3.4	11	7	352	40	20.5	40	-0.2	0
	20.2	66	39	-2.7	-8	-4	3.3	11	6	353	40	20.4	40	-0.1	0
	20.1	66	39	-2.7	-8	-4	3.3	11	6	353	39	20.3	39	-0.1	0
	20.0	66	39	-2.6	-8	-4	3.2	10	6	353	39	20.2	39	-0.0	0
	20.0	66	39	-2.5	-7	-4	3.0	10	6	353	39	20.1	39	0.1	0

1805:44 to 1805:50 CDT

CDT	u-component wind			v-component wind			w-component wind			dd ff		Tailwind		Crosswind	
h m s	m/s	fps	kts	m/s	fps	kts	m/s	fps	kts	deg	kts	m/s	kts	m/s	kts
1805 44	20.0	66	39	-2.4	-7	-4	2.8	9	5	354	39	20.2	39	0.3	1
	20.1	66	39	-2.2	-6	-3	2.4	8	5	354	39	20.3	39	0.4	1
	20.3	67	40	-2.3	-7	-4	1.9	6	4	354	40	20.5	40	0.3	1
	20.6	68	40	-2.7	-8	-4	1.3	4	2	353	40	20.8	40	-0.1	0
	20.8	68	40	-3.4	-10	-6	0.4	1	1	351	41	21.1	41	-0.7	0
	21.1	69	41	-4.1	-13	-7	-0.6	-1	0	349	42	21.4	42	-1.4	-2
	21.3	70	41	-4.6	-14	-8	-1.8	-5	-3	348	42	21.8	42	-1.9	-3
	21.6	71	42	-5.0	-15	-9	-3.0	-9	-5	347	43	22.1	43	-2.2	-3
1805 45	21.8	72	42	-5.4	-17	-9	-4.3	-13	-7	346	44	22.3	43	-2.5	-4
	22.0	72	43	-5.6	-17	-10	-5.7	-18	-10	346	44	22.5	44	-2.8	-4
	22.1	72	43	-5.7	-18	-10	-7.1	-22	-13	346	44	22.6	44	-2.8	-4
	22.1	73	43	-5.5	-17	-10	-8.6	-27	-16	346	44	22.6	44	-2.5	-4
	22.1	73	43	-5.1	-16	-9	-9.9	-31	-18	347	44	22.6	44	-2.2	-3
	22.0	72	43	-4.7	-14	-8	-11.0	-35	-20	348	44	22.5	44	-1.7	-2
	21.9	72	43	-4.3	-13	-7	-12.0	-38	-22	349	43	22.3	43	-1.3	-2
	21.8	72	42	-3.8	-11	-6	-12.8	-41	-24	350	43	22.1	43	-0.8	-1
1805 46	21.8	71	42	-3.2	-10	-5	-13.2	-42	-25	352	43	22.0	43	-0.2	0
	21.7	71	42	-2.6	-7	-4	-13.5	-43	-25	353	42	21.9	42	0.5	1
	21.7	71	42	-1.8	-5	-3	-13.5	-43	-25	355	42	21.8	42	1.3	3
	21.7	71	42	-1.1	-3	-1	-13.4	-43	-25	357	42	21.7	42	2.1	4
	21.8	71	42	-0.6	-1	0	-13.1	-42	-25	359	42	21.6	42	2.7	5
	21.8	72	42	-0.2	0	0	-12.7	-41	-24	360	42	21.6	42	3.1	6
	21.9	72	42	0.0	0	0	-12.1	-39	-23	360	42	21.6	42	3.4	7
	21.9	72	43	0.1	0	0	-11.4	-36	-21	1	43	21.7	42	3.5	7
1805 47	22.0	72	43	0.3	1	1	-10.5	-33	-19	1	43	21.7	42	3.7	7
	22.2	73	43	0.4	1	1	-9.4	-30	-17	1	43	21.8	42	3.8	7
	22.3	73	43	0.6	2	1	-8.3	-26	-15	2	43	22.0	43	4.1	8
	22.5	74	44	0.6	2	1	-7.1	-22	-13	2	44	22.1	43	4.3	8
	22.7	74	44	0.5	2	1	-5.8	-18	-10	1	44	22.3	43	4.2	8
	22.9	75	44	0.3	1	1	-4.6	-14	-8	1	44	22.5	44	4.0	8
	23.0	76	45	0.0	0	0	-3.3	-10	-6	360	45	22.7	44	3.8	7
	23.2	76	45	-0.4	0	0	-2.1	-6	-3	359	45	22.9	45	3.5	7
1805 48	23.3	76	45	-0.8	-2	-1	-0.9	-2	-1	358	45	23.1	45	3.1	6
	23.4	77	45	-1.4	-4	-2	0.2	1	0	357	45	23.3	45	2.6	5
	23.4	77	45	-1.9	-5	-3	1.1	3	2	356	46	23.4	45	2.2	4
	23.5	77	46	-2.1	-6	-3	1.8	6	3	355	46	23.5	46	2.0	4
	23.5	77	46	-2.0	-6	-3	2.5	8	5	355	46	23.5	46	2.1	4
	23.6	78	46	-1.4	-3	-2	3.1	10	6	357	46	23.5	46	2.8	5
	23.7	78	46	-0.7	-1	0	3.6	12	7	358	46	23.5	46	3.4	7
	23.7	78	46	-0.2	0	0	4.1	13	8	360	46	23.4	45	3.9	8
1805 49	23.8	78	46	0.3	1	1	4.6	15	9	1	46	23.3	45	4.5	9
	23.6	78	46	0.9	3	2	5.2	17	10	2	46	23.1	45	5.0	10
	23.3	77	45	1.5	5	3	5.7	19	11	4	45	22.7	44	5.5	11
	22.8	75	44	1.9	6	4	5.9	19	11	5	44	22.1	43	5.8	11
	22.0	72	43	2.1	7	4	6.0	20	12	6	43	21.4	42	5.9	11
	21.3	70	41	2.2	7	4	6.0	20	12	6	42	20.6	40	5.8	11
	20.6	68	40	2.4	8	5	5.9	19	11	7	40	19.9	39	5.7	11
	19.9	65	39	2.3	8	4	5.6	18	11	7	39	19.3	37	5.5	11
1805 50	19.5	64	38	2.2	7	4	5.0	17	10	7	38	18.9	37	5.3	10
	19.4	64	38	2.2	7	4	4.4	14	9	7	38	18.8	36	5.3	10
	19.6	64	38	2.2	7	4	3.8	13	7	7	38	19.0	37	5.4	10
	20.2	66	39	2.2	7	4	3.3	11	6	7	39	19.5	38	5.5	11
	20.9	69	41	2.3	7	4	2.7	9	5	6	41	20.3	39	5.6	11
	21.8	72	42	2.4	8	5	2.2	7	4	7	43	21.1	41	6.0	12
	22.8	75	44	2.7	9	5	1.8	6	3	7	45	22.0	43	6.5	13
	23.7	78	46	3.0	10	6	1.4	5	3	8	46	22.9	44	7.0	14

1805:51 to 1805:57 CDT

CDT	u-component wind			v-component wind			w-component wind			dd ff		Tailwind		Crosswind	
h m s	m/s	fps	kts	m/s	fps	kts	m/s	fps	kts	deg	kts	m/s	kts	m/s	kts
1805 51	24.6	81	48	3.3	11	6	1.2	4	2	8	48	23.7	46	7.4	14
	25.2	83	49	3.6	12	7	1.0	3	2	8	50	24.3	47	7.9	15
	25.8	85	50	3.8	12	7	0.9	3	2	9	51	24.7	48	8.1	16
	26.1	86	51	4.1	13	8	0.9	3	2	9	51	25.0	49	8.5	17
	26.3	86	51	4.3	14	8	1.0	3	2	10	52	25.2	49	8.8	17
	26.4	87	51	4.5	15	9	0.5	2	1	10	52	25.2	49	9.0	18
	26.3	86	51	4.5	15	9	0.4	1	1	10	52	25.1	49	9.1	18
	26.1	86	51	4.4	14	9	0.5	2	1	10	51	24.9	48	9.0	18
1805 52	25.8	85	50	4.2	14	8	0.6	2	1	10	51	24.6	48	8.9	17
	25.4	83	49	4.1	14	8	0.6	2	1	9	50	24.3	47	8.7	17
	25.0	82	49	4.1	13	8	0.5	2	1	10	49	23.8	46	8.6	17
	24.5	80	48	4.0	13	8	0.3	1	1	10	48	23.3	45	8.4	16
	24.0	79	47	3.8	13	7	0.8	3	2	9	47	22.9	44	8.2	16
	23.6	77	46	3.7	12	7	0.9	3	2	9	46	22.5	44	8.0	16
	23.3	76	45	3.6	12	7	0.8	3	2	9	46	22.2	43	7.9	15
1st	23.0	76	45	3.6	12	7	0.6	2	1	9	45	22.0	43	7.7	15
1805 53	22.7	75	44	3.4	11	7	0.4	1	1	9	45	21.7	42	7.5	15
	22.3	73	43	3.3	11	6	0.1	0	0	9	44	21.3	41	7.3	14
	21.7	71	42	3.2	10	6	-0.1	0	0	9	43	20.8	40	7.0	14
	20.8	68	40	3.1	10	6	-0.3	0	0	9	41	19.9	39	6.8	13
	19.8	65	38	3.1	10	6	-0.5	-1	0	9	39	19.0	37	6.5	13
	18.7	61	36	3.0	10	6	-0.7	-1	0	9	37	17.9	35	6.2	12
	17.7	58	34	3.0	10	6	-0.8	-2	-1	10	35	16.9	33	6.0	12
2nd	16.8	55	33	3.1	10	6	-1.0	-2	-1	11	33	16.1	31	5.9	11
1805 54	16.2	53	31	3.1	10	6	-1.1	-3	-1	11	32	15.4	30	5.8	11
	15.9	52	31	3.1	10	6	-1.3	-3	-1	11	31	15.1	29	5.8	11
	15.9	52	31	3.1	10	6	-1.4	-4	-2	11	31	15.1	29	5.8	11
	16.1	53	31	3.2	10	6	-1.5	-4	-2	11	32	15.3	30	5.9	11
	16.5	54	32	3.2	10	6	-1.5	-4	-2	11	33	15.7	31	6.0	12
	17.0	56	33	3.1	10	6	-1.6	-4	-2	11	34	16.2	31	6.1	12
	17.5	57	34	3.1	10	6	-1.6	-4	-2	10	35	16.7	32	6.1	12
	18.0	59	35	3.0	10	6	-1.6	-4	-2	10	35	17.2	33	6.2	12
1805 55	18.3	60	36	3.0	10	6	-1.6	-4	-2	9	36	17.5	34	6.2	12
	18.7	61	36	3.0	10	6	-1.4	-4	-2	9	37	17.8	35	6.3	12
	19.0	62	37	3.1	10	6	-1.1	-3	-1	10	37	18.1	35	6.5	13
	19.3	63	37	3.2	11	6	-0.6	-1	0	10	38	18.4	36	6.6	13
	19.4	64	38	3.3	11	6	0.2	1	0	10	38	18.5	36	6.8	13
	19.5	64	38	3.4	11	7	1.0	3	2	10	38	18.5	36	6.9	13
	19.5	64	38	3.4	11	7	1.7	6	3	10	38	18.5	36	7.0	14
3rd	19.5	64	38	3.5	11	7	2.3	8	5	10	38	18.5	36	7.1	14
1805 56	19.4	64	38	3.7	12	7	2.8	9	5	11	38	18.4	36	7.3	14
	19.2	63	37	4.0	13	8	2.9	10	6	12	38	18.0	35	7.6	15
	18.9	62	37	4.3	14	8	2.7	9	5	13	38	17.7	34	7.9	15
	18.5	61	36	4.5	15	9	2.2	7	4	14	37	17.2	33	8.1	16
	18.1	59	35	4.8	16	9	1.6	5	3	15	36	16.8	33	8.4	16
	17.8	58	35	5.4	18	10	0.9	3	2	17	36	16.3	32	8.9	17
	17.3	57	34	5.9	19	12	0.2	1	0	19	36	15.7	30	9.4	18
	17.0	56	33	6.3	21	12	-0.5	-1	0	21	35	15.2	30	9.8	19
1805 57	16.6	55	32	6.7	22	13	-1.2	-3	-1	22	35	14.8	29	10.2	20
	16.3	53	32	7.3	24	14	-1.8	-5	-2	25	35	14.2	28	10.9	21
	16.0	52	31	8.2	27	16	-2.3	-7	-4	28	35	13.6	26	11.7	23
	15.8	52	31	9.2	30	18	-2.8	-8	-4	30	36	13.1	26	12.7	25
	15.7	52	31	10.1	33	20	-3.1	-9	-5	33	36	12.7	25	13.7	27
	15.8	52	31	11.0	36	21	-3.3	-10	-5	35	37	12.4	24	14.8	29
	16.0	52	31	12.2	40	24	-3.5	-10	-6	38	39	12.0	23	16.1	31
4th	16.2	53	31	13.3	44	26	-3.4	-10	-6	40	41	11.6	23	17.4	34

APPENDIX 7 TOTAL WINDSPEEDS

Total wind denotes the magnitude of the vector wind, vertical wind, the total windspeed in vertical plane, and horizontal wind, the total windspeed in horizontal plane. The downflow angle (dfa) is the direction of wind vector measured from the horizon.

1804:56 to 1805:01 CDT

CDT	dd	dfa	Total Wind		Vertical Wind		Horizontal Wind		$\dot{\theta}$	$\dot{\phi}$	$\xi-\dot{\psi}$	ALTF RATE	
h m s	deg	deg	m/s	kts	m/s	kts	m/s	kts	deg/sec	deg/sec	deg/sec	fps	fpm
1804 56	55	7	5.4	11	3.2	6	5.4	10	0.0	1.0	0.3	-16.0	-959
	55	8	5.3	10	3.2	6	5.3	10	0.0	0.9	0.3	-16.0	-959
	55	8	5.3	10	3.1	6	5.3	10	0.0	0.8	0.3	-16.0	-959
	55	9	5.3	10	3.1	6	5.3	10	-0.1	0.7	0.3	-16.0	-959
	55	9	5.3	10	3.1	6	5.3	10	-0.2	0.6	0.1	-16.0	-959
	56	9	5.3	10	3.1	6	5.3	10	-0.2	0.4	0.1	-16.0	-959
	56	10	5.3	10	3.1	6	5.3	10	-0.2	0.2	0.2	-16.0	-959
	56	11	5.4	10	3.1	6	5.3	10	-0.1	0.0	0.2	-16.0	-959
1804 57	56	11	5.4	10	3.1	6	5.3	10	0.0	-0.2	0.2	-16.0	-959
	56	11	5.3	10	3.1	6	5.2	10	-0.1	-0.3	0.0	-16.0	-959
	56	12	5.3	10	3.1	6	5.2	10	-0.2	-0.4	-0.1	-16.0	-959
	56	12	5.3	10	3.1	6	5.2	10	-0.2	-0.6	-0.1	-16.0	-959
	56	13	5.3	10	3.1	6	5.2	10	-0.2	-0.8	-0.1	-16.0	-959
	56	13	5.3	10	3.1	6	5.1	10	-0.1	-1.3	-0.1	-16.0	-959
	56	13	5.3	10	3.1	6	5.1	10	0.0	-1.8	-0.1	-16.0	-959
	56	14	5.2	10	3.1	6	5.1	10	0.0	-2.2	-0.3	-16.0	-959
1804 58	56	14	5.1	10	3.1	6	5.0	10	0.0	-2.6	-0.6	-16.0	-959
	55	15	5.0	10	3.1	6	4.9	9	-0.1	-3.1	-0.7	-16.0	-959
	55	16	4.9	10	3.1	6	4.8	9	-0.2	-3.6	-0.8	-16.0	-959
	54	16	4.8	9	3.0	6	4.6	9	-0.2	-4.1	-0.8	-16.0	-959
	54	16	4.7	9	3.0	6	4.5	9	-0.2	-4.0	-0.7	-15.9	-952
	53	16	4.6	9	2.9	6	4.4	9	-0.1	-3.4	-0.8	-15.6	-935
	52	17	4.5	9	2.9	6	4.3	8	0.0	-3.0	-0.8	-15.3	-914
	52	17	4.4	8	2.9	6	4.2	8	0.0	-2.7	-0.8	-15.0	-897
1804 59	51	17	4.3	8	2.8	6	4.1	8	0.0	-2.4	-0.9	-14.7	-884
	51	16	4.2	8	2.8	5	4.0	8	0.0	-1.9	-0.9	-14.5	-866
	50	16	4.1	8	2.8	5	3.9	8	0.0	-1.4	-0.9	-14.1	-846
	50	16	4.0	8	2.8	5	3.9	8	0.0	-1.0	-0.8	-13.9	-836
	50	15	4.0	8	2.7	5	3.9	8	0.0	-0.8	-0.7	-14.1	-846
	50	15	4.0	8	2.7	5	3.9	7	-0.1	-0.6	-0.7	-14.5	-866
	50	15	4.0	8	2.7	5	3.8	7	-0.2	-0.2	-0.7	-14.7	-884
	50	15	3.9	8	2.7	5	3.8	7	-0.2	0.3	-0.6	-15.0	-897
1805 00	49	14	3.9	8	2.7	5	3.8	7	-0.2	0.8	-0.5	-15.4	-921
	49	14	3.9	8	2.7	5	3.8	7	-0.1	1.2	-0.3	-16.0	-959
	49	13	3.9	8	2.7	5	3.8	7	0.0	1.6	-0.2	-16.6	-997
	49	13	3.9	8	2.7	5	3.8	7	0.0	1.8	-0.3	-17.0	-1021
	49	13	3.9	8	2.7	5	3.9	7	0.0	2.0	-0.4	-17.1	-1028
	50	12	4.0	8	2.7	5	3.9	8	0.0	2.1	-0.4	-17.1	-1028
	50	12	4.0	8	2.6	5	3.9	8	0.0	2.2	-0.3	-17.0	-1021
	50	12	4.0	8	2.6	5	3.9	8	0.0	2.0	-0.3	-16.6	-997
1805 01	50	12	3.9	8	2.6	5	3.9	7	0.0	1.6	-0.3	-16.0	-959
	50	12	3.9	8	2.6	5	3.8	7	0.0	1.0	-0.3	-15.4	-921
	50	13	3.9	8	2.6	5	3.8	7	0.0	0.6	-0.3	-15.0	-897
	50	14	3.8	8	2.6	5	3.7	7	0.0	0.2	-0.2	-14.9	-890
	50	15	3.8	8	2.6	5	3.7	7	0.0	-0.2	-0.1	-14.9	-890
	50	16	3.8	8	2.5	5	3.6	7	0.0	-0.7	0.1	-15.0	-897
	51	17	3.7	7	2.5	5	3.6	7	0.0	-1.2	0.1	-15.3	-914
	52	19	3.7	7	2.5	5	3.5	7	0.0	-1.4	0.1	-15.6	-935

1805:02 to 1805:08 CDT

CDT	dd	d1a	Total Wind		Vertical Wind		Horizontal Wind		$\dot{\theta}$	$\dot{\phi}$	$\dot{\xi}-\dot{\psi}$	ALTF RATE	
h m s	deg	deg	m/s	kts	m/s	kts	m/s	kts	deg/sec	deg/sec	deg/sec	fps	fpm
1805 02	52	19	3.7	7	2.5	5	3.5	7	0.0	-1.6	0.1	-15.9	-952
	53	20	3.6	7	2.4	5	3.4	7	0.0	-1.7	-0.0	-16.0	-959
	53	21	3.6	7	2.4	5	3.4	7	0.0	-1.8	-0.2	-16.0	-959
	54	22	3.6	7	2.4	5	3.3	7	0.0	-1.9	-0.2	-16.0	-959
	55	22	3.6	7	2.4	5	3.3	6	0.0	-2.0	-0.2	-16.0	-959
	55	23	3.6	7	2.3	5	3.3	6	0.0	-1.8	-0.1	-16.0	-959
	56	24	3.6	7	2.3	5	3.3	6	0.0	-1.4	-0.0	-16.0	-959
	56	26	3.6	7	2.4	5	3.2	6	0.0	-1.0	-0.1	-16.0	-959
1805 03	56	28	3.5	7	2.4	5	3.1	6	0.0	-0.6	-0.3	-16.0	-959
	55	30	3.4	7	2.4	5	3.0	6	0.0	-0.5	-0.4	-16.0	-959
	54	32	3.3	6	2.4	5	2.8	5	0.0	-0.4	-0.5	-16.0	-959
	53	34	3.2	6	2.4	5	2.7	5	0.0	-0.3	-0.4	-16.0	-959
	52	36	3.2	6	2.4	5	2.6	5	0.0	-0.2	-0.2	-16.0	-959
	52	37	3.0	6	2.4	5	2.4	5	0.0	0.0	-0.2	-16.0	-959
	51	38	2.9	6	2.3	5	2.3	4	0.0	0.2	-0.2	-16.0	-959
	50	39	2.8	5	2.3	4	2.2	4	0.0	0.3	-0.3	-16.0	-959
1805 04	50	40	2.8	5	2.2	4	2.1	4	0.0	0.4	-0.4	-15.9	-952
	50	41	2.7	5	2.2	4	2.0	4	0.0	0.3	-0.4	-15.6	-935
	50	42	2.7	5	2.2	4	2.0	4	0.0	0.3	-0.4	-15.3	-914
	51	44	2.7	5	2.3	4	2.0	4	0.0	0.2	-0.4	-15.0	-897
	52	46	2.7	5	2.3	4	1.9	4	0.0	0.2	-0.4	-14.7	-884
	53	47	2.7	5	2.3	4	1.9	4	0.0	0.3	-0.4	-14.5	-866
	55	48	2.8	5	2.3	4	1.9	4	0.0	0.4	-0.4	-13.9	-832
	57	48	2.8	5	2.3	4	1.8	4	0.0	0.4	-0.4	-13.1	-788
1805 05	58	49	2.7	5	2.3	4	1.8	4	0.0	0.4	-0.4	-12.4	-743
	59	50	2.7	5	2.2	4	1.7	3	-0.1	0.4	-0.3	-11.6	-695
	58	52	2.6	5	2.2	4	1.6	3	-0.2	0.4	-0.2	-10.7	-644
	58	54	2.6	5	2.3	4	1.5	3	-0.2	0.4	-0.1	-9.8	-589
	59	57	2.7	5	2.4	5	1.5	3	-0.2	0.4	-0.0	-9.2	-551
	60	59	2.8	5	2.5	5	1.5	3	-0.2	0.4	-0.0	-9.2	-551
	60	61	3.0	6	2.7	5	1.4	3	-0.2	0.4	-0.0	-9.8	-589
	61	64	3.1	6	2.9	6	1.4	3	-0.3	0.5	-0.1	-10.9	-650
1805 06	62	66	3.2	6	3.0	6	1.3	3	-0.4	0.6	-0.2	-12.0	-719
	65	67	3.4	7	3.1	6	1.3	3	-0.4	0.6	-0.2	-13.1	-788
	70	68	3.4	7	3.2	6	1.3	3	-0.4	0.4	-0.1	-14.3	-856
	76	69	3.5	7	3.3	6	1.3	2	-0.4	0.2	0.1	-15.2	-911
	83	70	3.5	7	3.3	6	1.2	2	-0.4	0.2	0.3	-15.7	-938
	92	71	3.5	7	3.3	6	1.1	2	-0.4	0.2	0.3	-15.6	-935
	102	70	3.5	7	3.3	6	1.2	2	-0.4	0.2	0.2	-15.1	-908
	111	68	3.5	7	3.3	6	1.3	3	-0.4	0.2	0.1	-14.6	-873
1805 07	117	67	3.6	7	3.3	6	1.4	3	-0.4	0.2	-0.0	-14.0	-839
	124	66	3.6	7	3.4	7	1.5	3	-0.4	0.2	0.0	-13.4	-805
	129	66	3.6	7	3.5	7	1.5	3	-0.4	0.2	0.0	-12.9	-770
	131	65	3.7	7	3.5	7	1.6	3	-0.4	0.0	0.1	-12.4	-743
	132	64	3.8	7	3.6	7	1.6	3	-0.4	-0.2	0.1	-12.1	-726
	132	64	3.8	7	3.6	7	1.7	3	-0.4	-0.3	0.1	-12.0	-719
	134	65	3.8	7	3.7	7	1.6	3	-0.4	-0.4	0.0	-12.1	-726
	134	65	3.9	7	3.7	7	1.6	3	-0.4	-0.4	0.0	-12.4	-743
1805 08	135	65	3.8	7	3.7	7	1.6	3	-0.4	-0.4	0.0	-12.7	-764
	136	65	3.8	7	3.6	7	1.6	3	-0.3	-0.4	0.0	-13.0	-781
	138	65	3.8	7	3.6	7	1.6	3	-0.2	-0.4	0.0	-13.3	-794
	142	65	3.7	7	3.6	7	1.6	3	-0.2	-0.4	-0.0	-13.5	-812
	147	65	3.7	7	3.6	7	1.5	3	-0.2	-0.4	-0.2	-13.8	-825
	150	65	3.7	7	3.6	7	1.6	3	-0.2	-0.6	-0.2	-13.7	-818
	154	64	3.8	7	3.7	7	1.6	3	-0.2	-1.0	-0.2	-13.1	-788
	156	63	3.8	7	3.8	7	1.7	3	-0.2	-1.3	-0.1	-12.5	-750

1805:09 to 1805:15 CDT

CDT	dd	dfa	Total Wind		Vertical Wind		Horizontal Wind		$\dot{\theta}$	$\dot{\phi}$	$\dot{\zeta}-\dot{\psi}$	ALTF RATE	
h m s	deg	deg	m/s	kts	m/s	kts	m/s	kts	deg/sec	deg/sec	deg/sec	fps	fpm
1805 09	158	63	3.8	8	3.8	7	1.8	3	-0.2	-1.4	0.0	-12.0	-719
	161	62	4.0	8	3.9	8	1.8	4	-0.3	-1.6	-0.0	-11.5	-688
	163	62	4.1	8	4.0	8	1.9	4	-0.4	-2.2	-0.1	-10.9	-650
	166	62	4.2	8	4.2	8	1.9	4	-0.4	-2.8	-0.1	-10.3	-620
	169	63	4.3	8	4.3	8	2.0	4	-0.4	-3.2	-0.1	-10.2	-613
	173	63	4.4	9	4.4	9	2.0	4	-0.4	-3.2	-0.2	-10.5	-626
	177	63	4.6	9	4.6	9	2.1	4	-0.4	-3.2	-0.2	-10.7	-644
	182	63	4.7	9	4.7	9	2.1	4	-0.4	-3.0	-0.2	-11.0	-657
1805 10	185	63	4.8	9	4.8	9	2.2	4	-0.4	-2.8	-0.3	-11.3	-674
	187	62	4.9	10	4.9	10	2.3	4	-0.4	-2.8	-0.3	-11.6	-695
	188	61	5.0	10	5.0	10	2.4	5	-0.4	-3.0	-0.3	-11.9	-712
	189	60	5.1	10	5.1	10	2.5	5	-0.4	-3.0	-0.4	-12.0	-719
	188	59	5.2	10	5.2	10	2.7	5	-0.4	-2.6	-0.4	-12.0	-719
	187	58	5.3	10	5.3	10	2.8	5	-0.4	-2.1	-0.5	-12.0	-719
	187	58	5.4	11	5.4	11	2.9	6	-0.4	-2.0	-0.7	-11.9	-712
	188	57	5.6	11	5.5	11	3.1	6	-0.4	-2.0	-0.7	-11.6	-695
1805 11	189	56	5.7	11	5.7	11	3.2	6	-0.4	-1.8	-0.5	-11.3	-674
	192	55	5.8	11	5.8	11	3.3	6	-0.4	-1.3	-0.4	-11.0	-657
	193	55	5.9	12	5.9	11	3.4	7	-0.4	-0.8	-0.4	-10.9	-650
	195	53	6.0	12	5.9	11	3.6	7	-0.4	-0.8	-0.4	-10.9	-650
	196	52	6.0	12	5.9	11	3.7	7	-0.4	-1.0	-0.4	-10.6	-637
	197	50	5.9	11	5.8	11	3.8	7	-0.4	-1.2	-0.4	-10.2	-609
	197	47	5.8	11	5.7	11	3.9	8	-0.4	-1.2	-0.4	-9.5	-572
	197	44	5.6	11	5.5	11	4.0	8	-0.4	-0.9	-0.5	-8.7	-524
1805 12	197	41	5.4	11	5.3	10	4.1	8	-0.4	-0.6	-0.5	-8.0	-479
	197	37	5.2	10	5.1	10	4.2	8	-0.4	-0.6	-0.4	-7.3	-434
	197	32	5.0	10	4.9	9	4.3	8	-0.4	-0.6	-0.5	-6.5	-386
	199	28	4.9	10	4.7	9	4.3	8	-0.4	-0.6	-0.6	-5.8	-349
	201	23	4.8	9	4.5	9	4.4	9	-0.4	-0.6	-0.7	-5.9	-352
	203	19	4.7	9	4.4	9	4.5	9	-0.2	-0.5	-0.6	-7.1	-424
	205	16	4.7	9	4.3	8	4.5	9	0.2	-0.4	-0.4	-9.3	-558
	208	14	4.7	9	4.2	8	4.5	9	0.6	-0.3	-0.4	-11.8	-705
1803 13	211	13	4.7	9	4.1	8	4.6	9	0.8	-0.2	-0.4	-14.0	-839
	213	11	4.7	9	3.9	8	4.6	9	0.8	0.0	-0.4	-16.2	-973
	215	10	4.6	9	3.8	7	4.5	9	0.8	0.2	-0.4	-18.7	-1120
	217	10	4.6	9	3.7	7	4.5	9	0.9	0.5	-0.3	-20.9	-1254
	219	11	4.6	9	3.6	7	4.5	9	1.0	0.8	-0.2	-22.1	-1326
	221	12	4.6	9	3.5	7	4.5	9	1.1	1.1	-0.1	-22.2	-1329
	222	15	4.6	9	3.5	7	4.4	9	1.2	1.4	0.0	-21.7	-1298
	224	19	4.7	9	3.5	7	4.4	9	1.1	1.4	0.1	-21.1	-1268
1805 14	224	23	4.8	9	3.7	7	4.4	8	1.0	1.4	0.3	-20.6	-1237
	225	28	5.0	10	3.9	8	4.4	8	1.0	1.3	0.3	-19.9	-1192
	226	32	5.2	10	4.1	8	4.4	8	1.2	1.2	0.3	-19.0	-1137
	226	35	5.3	10	4.3	8	4.4	9	1.3	1.4	0.3	-18.3	-1100
	225	37	5.4	11	4.5	9	4.4	8	1.2	1.6	0.3	-17.9	-1072
	223	37	5.5	11	4.6	9	4.4	8	0.8	1.7	0.3	-17.3	-1034
	221	36	5.4	11	4.6	9	4.4	9	0.4	1.6	0.3	-16.2	-969
	219	34	5.4	10	4.6	9	4.4	9	0.2	1.2	0.3	-14.7	-880
1803 13	218	32	5.3	10	4.5	9	4.5	9	0.2	0.8	0.3	-13.4	-801
	216	29	5.3	10	4.6	9	4.6	9	0.2	0.2	0.3	-12.3	-736
	215	28	5.4	10	4.6	9	4.8	9	0.0	-0.4	0.4	-11.2	-671
	214	27	5.5	11	4.7	9	4.9	10	-0.2	-1.1	0.4	-10.2	-613
	213	26	5.6	11	4.9	10	5.0	10	-0.4	-1.8	0.4	-9.4	-561
	212	25	5.8	11	5.1	10	5.2	10	-0.4	-2.2	0.4	-8.7	-524
	211	23	5.9	11	5.2	10	5.4	10	-0.4	-2.4	0.3	-8.2	-489
	210	19	5.9	12	5.2	10	5.6	11	-0.2	-2.5	0.2	-7.2	-431

1805:16 to 1805:22 CDT

CDT	dd	dfa	Total Wind		Vertical Wind		Horizontal Wind		$\dot{\theta}$	$\dot{\phi}$	$\dot{\xi}-\dot{\psi}$	ALTF RATE	
h m s	deg	deg	m/s	kts	m/s	kts	m/s	kts	deg/sec	deg/sec	deg/sec	fps	fpm
1805 16	209	12	6.0	12	5.3	10	5.9	11	0.0	-2.6	0.0	-6.0	-359
	208	2	6.2	12	5.6	11	6.2	12	0.2	-2.4	-0.1	-4.8	-287
	208	-7	6.7	13	5.9	11	6.6	13	0.2	-1.8	-0.2	-3.8	-229
	209	-16	7.3	14	6.5	13	7.0	14	0.2	-1.2	-0.2	-3.3	-194
	210	-23	8.1	16	7.3	14	7.4	14	0.2	-1.0	-0.2	-3.3	-198
	210	-28	8.0	17	8.1	16	7.8	15	0.3	-1.0	-0.0	-4.2	-249
	209	-31	9.7	19	8.8	17	8.2	16	0.4	-1.0	0.1	-6.2	-373
	208	-32	10.2	20	9.4	18	8.5	17	0.5	-0.7	0.4	-9.4	-565
1805 17	205	-32	10.6	21	9.9	19	8.9	17	0.6	-0.4	0.6	-13.2	-791
	203	-31	10.8	21	10.2	20	9.2	18	0.9	-0.2	0.6	-17.0	-1021
	200	-30	11.0	21	10.5	20	9.5	18	1.2	0.0	0.5	-20.7	-1240
	198	-28	11.2	22	10.6	21	9.8	19	1.5	0.0	0.4	-24.1	-1442
	195	-26	11.4	22	11.1	22	10.2	20	1.8	0.0	0.4	-27.0	-1617
	193	-24	11.6	23	11.4	22	10.5	20	2.2	-0.1	0.5	-28.9	-1734
	191	-23	11.8	23	11.7	23	10.9	21	2.6	-0.2	0.7	-29.1	-1748
	190	-22	12.1	24	12.0	23	11.2	22	2.9	-0.3	0.6	-27.9	-1676
1805 18	189	-21	12.4	24	12.1	24	11.5	22	3.0	-0.4	0.4	-25.9	-1556
	188	-20	12.6	24	12.5	24	11.7	23	2.9	-0.6	0.2	-23.7	-1422
	186	-20	12.8	25	12.7	25	11.9	23	2.8	-0.8	0.1	-21.5	-1288
	185	-19	12.9	25	12.8	25	12.1	24	2.6	-1.0	0.1	-19.1	-1148
	185	-19	13.0	25	13.0	25	12.3	24	2.4	-1.0	0.0	-16.6	-993
	184	-18	13.1	25	13.1	25	12.4	24	1.9	-1.2	-0.1	-14.3	-860
	184	-18	13.1	26	13.1	25	12.4	24	1.2	-1.6	-0.2	-12.7	-764
	183	-18	13.1	26	13.1	25	12.4	24	0.7	-2.0	-0.1	-11.6	-695
1805 19	182	-18	13.1	25	13.1	25	12.3	24	0.4	-2.2	-0.0	-10.9	-650
	181	-19	12.9	25	12.9	25	12.1	24	0.3	-2.2	-0.0	-10.2	-613
	180	-20	12.7	25	12.7	25	11.9	23	0.2	-2.4	-0.1	-9.7	-582
	178	-22	12.5	24	12.5	24	11.5	22	0.2	-2.5	-0.4	-9.4	-565
	177	-24	12.2	24	12.2	24	11.1	21	0.4	-2.4	-0.6	-9.7	-578
	176	-26	11.9	23	11.8	23	10.6	21	0.7	-2.2	-0.7	-10.7	-640
	176	-28	11.5	22	11.5	22	10.1	20	1.0	-2.2	-0.7	-12.6	-753
	175	-31	11.3	22	11.3	22	9.6	19	1.2	-2.2	-0.7	-14.7	-884
1805 20	175	-33	11.1	22	11.1	22	9.2	18	1.4	-2.0	-0.8	-16.7	-1004
	176	-35	11.0	21	11.0	21	8.9	17	1.5	-1.6	-0.9	-18.7	-1120
	177	-36	10.9	21	10.9	21	8.7	17	1.6	-1.2	-0.8	-20.7	-1240
	178	-37	10.8	21	10.8	21	8.5	17	1.7	-0.8	-0.8	-22.5	-1346
	180	-37	10.7	21	10.7	21	8.5	16	1.8	-0.4	-0.8	-23.0	-1377
	182	-36	10.5	20	10.5	20	8.5	16	1.8	0.0	-0.9	-21.7	-1298
	185	-34	10.4	20	10.3	20	8.5	16	1.6	0.4	-1.0	-18.9	-1130
	188	-33	10.2	20	10.2	20	8.5	16	1.5	0.9	-1.0	-15.4	-925
1805 21	191	-32	10.1	20	10.0	19	8.5	17	1.6	1.4	-1.0	-12.1	-726
	194	-32	10.1	20	9.9	19	8.5	16	1.7	2.0	-0.9	-9.0	-537
	197	-32	10.0	19	9.7	19	8.4	16	1.6	2.8	-0.7	-5.9	-352
	199	-33	10.0	19	9.6	19	8.3	16	1.4	3.3	-0.5	-3.4	-201
	201	-34	9.9	19	9.5	18	8.2	16	1.2	3.6	-0.3	-1.9	-112
	203	-35	9.9	19	9.4	18	8.0	16	1.2	3.6	-0.2	-1.5	-92
	204	-35	9.8	19	9.2	18	7.9	15	1.2	3.6	-0.0	-2.1	-126
	204	-35	9.6	19	9.1	18	7.7	15	1.0	3.7	0.2	-2.9	-170
1805 22	202	-34	9.4	18	8.9	17	7.6	15	0.8	3.8	0.3	-3.5	-208
	200	-33	9.2	18	8.9	17	7.7	15	0.6	4.0	0.4	-4.0	-239
	199	-32	9.3	18	9.0	17	7.8	15	0.4	4.2	0.4	-4.5	-270
	197	-31	9.5	18	9.2	18	8.0	16	0.3	4.1	0.4	-5.1	-303
	195	-31	9.8	19	9.6	19	8.3	16	0.2	3.8	0.4	-6.2	-373
	193	-31	10.1	20	9.9	19	8.6	17	0.2	3.5	0.5	-7.7	-458
	191	-31	10.4	20	10.3	20	8.9	17	0.2	3.4	0.6	-9.7	-578
	191	-30	10.6	21	10.5	20	9.1	18	0.2	3.2	0.6	-12.5	-746

1805:23 to 1805:29 CDT

CDT	dd	dfa	Total Wind		Vertical Wind		Horizontal Wind		$\dot{\theta}$	$\dot{\phi}$	$\dot{\zeta}-\dot{\psi}$	ALTF RATE	
h m s	deg	deg	m/s	kts	m/s	kts	m/s	kts	deg/sec	deg/sec	deg/sec	fps	fpm
1805 23	191	-29	10.7	21	10.6	21	9.2	18	0.2	2.8	0.6	-15.7	-942
	190	-28	10.5	20	10.4	20	9.2	18	0.2	2.0	0.6	-19.2	-1151
	189	-26	10.1	20	10.0	19	9.1	18	0.2	1.4	0.6	-22.2	-1333
	189	-23	9.6	19	9.5	18	8.8	17	0.2	1.0	0.5	-24.3	-1456
	190	-21	9.1	18	9.0	17	8.4	16	0.2	0.8	0.4	-24.7	-1484
	192	-20	8.6	17	8.4	16	8.0	16	0.1	0.6	0.4	-23.0	-1381
	194	-21	8.2	16	8.0	15	7.6	15	0.0	0.4	0.4	-19.4	-1161
	196	-24	7.9	15	7.6	15	7.1	14	0.0	0.1	0.6	-14.7	-880
1805 24	197	-27	7.7	15	7.4	14	6.8	13	0.0	-0.2	0.8	-9.7	-582
	199	-30	7.6	15	7.3	14	6.6	13	0.0	-0.3	0.8	-5.0	-297
	200	-33	7.7	15	7.4	14	6.4	12	0.0	-0.4	0.6	-0.6	-37
	199	-36	7.8	15	7.5	15	6.2	12	0.0	-0.4	0.4	2.7	161
	195	-40	8.0	15	7.8	15	6.0	12	0.0	-0.4	0.3	4.0	240
	192	-44	8.2	16	8.1	16	5.8	11	0.0	-0.5	0.4	3.2	192
	189	-47	8.5	16	8.4	16	5.7	11	0.0	-0.6	0.4	0.9	51
	188	-50	8.8	17	8.8	17	5.6	11	0.0	-0.7	0.4	-2.1	-126
1805 25	187	-53	9.2	18	9.2	18	5.4	11	0.0	-0.8	0.3	-5.3	-314
	186	-56	9.7	19	9.7	19	5.3	10	0.0	-1.0	0.2	-8.5	-506
	186	-58	10.0	20	10.0	19	5.1	10	0.0	-1.4	0.1	-11.7	-702
	187	-60	10.3	20	10.3	20	5.0	10	0.1	-1.8	0.1	-14.5	-866
	187	-62	10.4	20	10.4	20	4.8	9	0.2	-2.2	0.1	-16.1	-966
	187	-63	10.4	20	10.4	20	4.5	9	0.3	-2.7	0.1	-16.6	-997
	184	-64	10.3	20	10.3	20	4.3	8	0.8	-3.4	0.0	-16.2	-969
	179	-66	10.1	20	10.1	20	4.0	8	1.0	-4.3	-0.1	-15.3	-918
1805 26	175	-67	10.1	20	10.0	20	3.8	7	1.2	-5.0	-0.3	-14.4	-863
	172	-68	10.1	20	10.1	20	3.6	7	1.3	-5.3	-0.4	-13.4	-805
	171	-70	10.3	20	10.3	20	3.4	7	1.4	-5.4	-0.6	-12.5	-748
	170	-71	10.6	21	10.6	21	3.3	6	1.4	-5.0	-0.6	-11.7	-698
	171	-72	10.9	21	10.9	21	3.1	6	1.4	-4.4	-0.7	-11.3	-678
	172	-73	11.1	22	11.1	22	3.0	6	1.4	-3.6	-0.7	-11.8	-705
	175	-74	11.3	22	11.3	22	2.9	6	1.4	-3.0	-0.7	-13.0	-777
	176	-75	11.5	22	11.5	22	2.8	5	1.5	-2.4	-0.7	-14.5	-866
1805 27	177	-76	11.6	23	11.6	23	2.7	5	1.6	-1.8	-0.6	-15.3	-952
	177	-77	11.7	23	11.7	23	2.5	5	1.7	-1.4	-0.6	-17.1	-1028
	176	-78	11.7	23	11.7	23	2.2	4	1.8	-1.0	-0.5	-18.3	-1096
	176	-79	11.6	23	11.6	23	1.9	4	1.8	-0.7	-0.5	-19.2	-1151
	178	-81	11.5	22	11.5	22	1.6	3	1.8	-0.4	-0.5	-19.9	-1192
	186	-83	11.4	22	11.4	22	1.2	2	1.4	-0.3	-0.5	-20.4	-1223
	203	-85	11.3	22	11.3	22	0.8	2	1.0	-0.4	-0.5	-20.9	-1250
	238	-86	11.1	21	11.1	21	0.6	1	0.7	-0.8	-0.5	-21.4	-1285
1805 28	275	-85	10.8	21	10.8	21	0.7	1	0.3	-1.2	-0.5	-22.0	-1319
	297	-84	10.6	21	10.5	20	0.5	2	0.6	-1.8	-0.5	-22.6	-1353
	316	-84	10.4	20	10.4	20	0.9	2	1.0	-2.6	-0.5	-23.1	-1388
	329	-84	10.4	20	10.4	20	0.9	2	1.0	-3.6	-0.6	-23.6	-1415
	353	-83	10.3	20	10.3	20	1.0	2	1.0	-4.6	-0.7	-23.8	-1423
	15	-83	10.1	20	10.1	20	1.1	2	0.8	-5.2	-0.8	-23.6	-1415
	28	-82	10.0	19	10.0	19	1.3	2	0.6	-5.6	-1.1	-23.1	-1388
	35	-81	10.0	19	10.0	19	1.3	3	0.5	-5.8	-1.4	-22.6	-1353
1805 29	39	-81	10.1	20	10.0	19	1.3	3	0.4	-6.0	-1.6	-22.0	-1319
	37	-82	10.1	20	10.1	20	1.2	2	0.4	-5.6	-1.7	-21.4	-1285
	28	-84	10.2	20	10.1	20	0.9	2	0.4	-4.6	-1.7	-20.9	-1250
	12	-85	10.2	20	10.2	20	0.7	1	0.4	-3.4	-1.6	-20.4	-1223
	341	-85	10.2	20	10.2	20	0.6	1	0.4	-2.6	-1.6	-20.0	-1199
	311	-85	10.2	20	10.2	20	0.7	1	0.3	-2.3	-1.5	-19.6	-1175
	292	-84	10.2	20	10.1	20	0.6	2	0.2	-2.0	-1.5	-19.1	-1148
	278	-83	9.9	19	9.9	19	1.0	2	0.1	-1.5	-1.5	-18.5	-1113

1805:30 to 1805:36 CDT

CDT	dd	dfa	Total Wind		Vertical Wind		Horizontal Wind		$\dot{\theta}$	$\dot{\phi}$	$\dot{\xi}-\dot{\psi}$	ALTF RATE	
h m s	deg	deg	m/s	kts	m/s	kts	m/s	kts	deg/sec	deg/sec	deg/sec	fps	fpm
1805 30	266	-82	9.7	19	9.6	19	1.2	2	0.0	-0.8	-1.4	-18.0	-1079
	258	-79	9.5	18	9.4	18	1.6	3	-0.1	-0.2	-1.4	-17.4	-1045
	253	-77	9.5	19	9.3	18	2.0	4	-0.2	0.2	-1.4	-16.9	-1010
	248	-75	9.7	19	9.4	18	2.4	5	-0.2	0.5	-1.5	-16.4	-983
	245	-73	9.9	19	9.6	19	2.8	5	-0.2	0.8	-1.5	-16.1	-966
	241	-71	10.1	20	9.7	19	3.2	6	-0.2	1.2	-1.4	-16.0	-959
	238	-69	10.4	20	9.9	19	3.6	7	-0.2	1.6	-1.3	-15.9	-952
	236	-67	10.6	21	10.1	20	4.1	8	-0.3	2.0	-1.2	-15.6	-935
1805 31	234	-64	10.8	21	10.2	20	4.5	9	-0.4	2.4	-1.1	-15.3	-914
	232	-62	11.0	21	10.2	20	5.0	10	-0.3	2.9	-1.0	-15.0	-897
	231	-59	11.0	21	10.2	20	5.5	11	-0.2	3.4	-1.0	-14.9	-890
	230	-56	11.1	22	10.1	20	6.0	12	-0.2	4.0	-0.9	-14.9	-890
	229	-53	11.1	22	10.0	19	6.5	13	-0.2	4.6	-0.9	-14.6	-877
	227	-50	11.1	22	9.9	19	7.0	14	-0.3	4.8	-0.7	-14.2	-849
	226	-48	11.1	22	9.8	19	7.3	14	-0.4	4.8	-0.5	-13.5	-812
	224	-45	11.1	22	9.8	19	7.7	15	-0.5	4.6	-0.2	-12.7	-764
1805 32	223	-43	11.1	22	9.7	19	8.0	16	-0.6	4.4	0.1	-11.9	-712
	222	-41	11.2	22	9.7	19	8.4	16	-0.7	4.5	0.3	-10.9	-650
	222	-39	11.3	22	9.8	19	8.7	17	-0.8	4.6	0.6	-9.7	-582
	221	-38	11.4	22	9.9	19	8.9	17	-0.7	4.4	0.7	-8.8	-527
	221	-37	11.6	22	9.9	19	9.1	18	-0.6	4.0	0.8	-8.3	-500
	222	-37	11.7	23	10.0	19	9.2	18	-0.6	3.5	0.8	-8.4	-503
	223	-38	12.0	23	10.1	20	9.3	18	-0.8	3.2	0.9	-8.7	-524
	225	-39	12.2	24	10.2	20	9.4	18	-1.0	3.1	1.0	-9.0	-541
1805 33	226	-41	12.3	24	10.4	20	9.2	18	-1.2	3.0	1.1	-8.9	-534
	228	-43	12.3	24	10.5	20	8.9	17	-1.2	3.0	1.2	-8.3	-500
	228	-46	12.3	24	10.6	21	8.3	16	-1.2	3.0	1.3	-7.3	-438
	230	-49	12.3	24	10.8	21	7.9	15	-1.1	3.0	1.5	-5.8	-345
	232	-52	12.5	24	10.9	21	7.6	15	-1.0	2.9	1.5	-3.9	-232
	234	-54	12.5	24	11.0	21	7.2	14	-0.6	2.6	1.3	-1.8	-109
	236	-56	12.5	24	11.2	22	6.8	13	-0.6	2.4	0.9	0.6	38
	237	-58	12.7	25	11.4	22	6.4	13	-0.5	2.5	0.6	3.4	202
1805 34	239	-60	13.0	25	11.8	23	6.3	12	-0.4	2.6	0.5	6.8	408
	242	-61	13.5	26	12.3	24	6.5	13	-0.3	2.5	0.5	10.9	655
	244	-61	14.0	27	12.7	25	6.6	13	-0.2	2.2	0.6	15.8	945
	245	-62	14.6	28	13.3	26	6.6	13	0.0	2.0	0.5	21.6	1296
	247	-62	15.2	29	13.8	27	6.8	13	0.2	2.0	0.2	28.9	1731
	248	-62	15.6	30	14.1	27	7.2	14	0.4	2.1	0.0	37.5	2253
	250	-59	15.8	31	14.0	27	7.9	15	0.6	2.0	-0.2	46.9	2811
	252	-55	16.0	31	13.6	26	8.8	17	0.7	2.2	-0.2	55.7	3343
1805 35	255	-51	16.0	31	12.9	25	9.9	19	0.8	2.8	-0.2	62.9	3775
	258	-46	16.0	31	11.9	23	10.9	21	1.0	4.0	-0.3	68.3	4101
	261	-41	15.6	30	10.6	21	11.6	23	1.2	5.2	-0.3	70.5	4231
	266	-36	14.9	29	9.1	18	11.8	23	1.3	6.6	-0.3	68.1	4087
	271	-32	14.0	27	7.6	15	11.8	23	1.2	8.2	-0.1	60.4	3624
	278	-27	13.0	25	6.3	12	11.4	22	0.9	10.7	0.2	48.5	2911
	286	-22	11.6	23	5.4	10	10.7	21	0.6	13.6	0.6	32.9	1971
	296	-16	10.2	20	5.2	10	9.8	19	0.4	16.1	1.3	13.9	837
1805 36	310	-9	9.0	17	5.8	11	8.8	17	0.2	17.8	1.9	-7.7	-462
	324	-3	8.3	16	6.7	13	8.3	16	0.0	18.5	2.6	-29.6	-1775
	338	4	8.3	16	7.6	15	8.3	16	-0.2	19.4	3.3	-49.1	-2944
	349	12	8.6	17	8.5	16	8.5	16	-0.3	17.9	3.5	-65.7	-3938
	360	17	9.3	18	9.3	18	8.9	17	-0.4	14.6	3.4	-78.9	-4796
	8	21	10.1	20	10.0	19	9.4	18	-0.6	10.1	3.2	-92.0	-5519
	14	24	10.8	21	10.6	21	9.9	19	-0.8	6.4	3.1	-100.6	-6033
	17	26	11.5	22	11.1	22	10.3	20	-1.2	4.1	2.9	-105.5	-6328

1805:37 to 1805:43 CDT

CDT	dd	dfa	Total Wind		Vertical Wind		Horizontal Wind		$\dot{\theta}$	$\dot{\phi}$	$\dot{\xi}-\dot{\psi}$	ALTF RATE	
h m s	deg	deg	m/s	kts	m/s	kts	m/s	kts	deg/sec	deg/sec	deg/sec	fps	fpm
1805 37	20	29	11.9	23	11.4	22	10.5	20	-1.6	2.0	2.6	-106.0	-6359
	21	30	12.1	23	11.5	22	10.5	20	-1.8	0.1	2.1	-103.1	-6184
	22	30	11.8	23	11.2	22	10.2	20	-2.0	-1.8	1.5	-96.0	-5759
	22	30	11.2	22	10.6	21	9.7	19	-1.8	-4.4	0.9	-84.9	-5090
	22	31	10.5	20	10.0	19	9.0	17	-1.6	-7.4	0.2	-70.6	-4237
	21	32	9.8	19	9.3	18	8.3	16	-2.0	-10.8	-0.4	-54.6	-3277
	20	34	9.0	17	8.6	17	7.5	14	-2.8	-14.0	-0.9	-38.7	-2324
	18	37	8.3	16	8.0	16	6.6	13	-3.6	-16.0	-1.1	-24.8	-1487
1805 38	14	40	7.7	15	7.6	15	5.9	11	-4.0	-17.6	-1.2	-13.7	-818
	6	45	7.5	15	7.5	15	5.3	10	-3.8	-18.3	-1.2	-6.2	-369
	356	49	7.7	15	7.7	15	5.0	10	-3.8	-18.8	-1.2	-2.1	-122
	344	51	8.1	16	8.0	16	5.1	10	-4.0	-18.0	-1.1	0.0	0
	333	51	8.6	17	8.3	16	5.5	11	-4.2	-16.4	-1.0	0.5	31
	324	48	9.2	18	8.5	16	6.1	12	-4.6	-14.3	-0.8	0.6	38
	318	45	9.8	19	8.6	17	6.9	13	-5.2	-12.8	-0.7	0.3	17
	314	41	10.3	20	8.6	17	7.7	15	-5.6	-11.1	-0.6	-0.3	-16
1805 39	311	37	10.6	21	8.4	16	8.4	16	-5.6	-8.8	-0.5	-1.0	-57
	309	33	10.6	21	8.1	16	8.9	17	-5.3	-7.0	-0.3	-1.9	-116
	309	29	10.4	20	7.6	15	9.1	18	-5.0	-6.2	-0.2	-3.4	-201
	309	23	10.0	19	6.9	13	9.2	18	-4.8	-6.0	-0.0	-5.0	-301
	309	16	9.5	18	6.3	12	9.1	18	-4.6	-5.2	0.1	-7.0	-421
	310	8	9.0	17	5.8	11	8.9	17	-4.2	-3.8	0.2	-9.5	-572
	311	2	8.5	17	5.6	11	8.5	17	-3.8	-2.6	0.4	-12.5	-746
	313	-3	8.2	16	5.6	11	8.2	16	-3.3	-1.7	0.6	-15.5	-928
1805 40	315	-8	8.1	16	5.8	11	8.0	16	-2.8	-1.0	0.8	-18.2	-1089
	317	-13	8.3	16	6.2	12	8.0	16	-2.4	-0.5	0.9	-20.5	-1226
	320	-17	8.6	17	6.7	13	8.2	16	-2.0	0.0	0.9	-22.6	-1353
	324	-20	9.0	17	7.5	14	8.4	16	-1.5	0.2	0.8	-24.3	-1456
	328	-22	9.6	19	8.4	16	8.9	17	-1.0	0.4	0.6	-25.2	-1511
	332	-24	10.5	20	9.5	18	9.5	18	-0.6	0.6	0.5	-25.4	-1525
	335	-25	11.5	22	10.7	21	10.3	20	-0.2	1.0	0.4	-25.3	-1514
	338	-27	12.7	25	12.0	23	11.2	22	-0.1	1.3	0.3	-25.1	-1508
1805 41	341	-28	13.8	27	13.2	26	12.1	24	0.0	1.4	0.2	-25.3	-1514
	343	-28	14.8	29	14.3	28	13.0	25	-0.1	1.5	0.2	-25.4	-1525
	344	-27	15.7	30	15.2	30	13.8	27	-0.2	1.8	0.1	-25.5	-1528
	345	-27	16.4	32	15.9	31	14.5	28	-0.4	2.1	0.1	-25.4	-1525
	345	-26	17.0	33	16.5	32	15.1	29	-0.6	2.2	0.1	-25.9	-1552
	345	-25	17.4	34	16.9	33	15.6	30	-1.0	2.2	0.1	-27.5	-1648
	345	-24	17.6	34	17.1	33	16.0	31	-1.4	2.4	0.2	-30.4	-1823
	346	-22	17.8	35	17.3	34	16.4	32	-1.6	2.5	0.3	-34.0	-2039
1805 42	346	-19	18.0	35	17.5	34	16.9	33	-1.6	2.4	0.5	-37.9	-2276
	345	-16	18.1	35	17.6	34	17.4	34	-1.5	2.2	0.5	-42.5	-2546
	345	-12	18.3	36	17.7	34	17.8	35	-1.6	2.2	0.3	-47.5	-2852
	345	-7	18.5	36	17.9	35	18.3	36	-1.7	2.4	0.1	-52.5	-3150
	346	-3	18.9	37	18.3	36	18.8	37	-1.6	2.6	0.1	-56.5	-3390
	347	0	19.2	37	18.7	36	19.2	37	-1.9	2.7	0.2	-59.3	-3558
	348	3	19.6	38	19.2	37	19.6	38	-2.6	2.8	0.3	-60.3	-3620
	350	5	20.0	39	19.7	38	19.9	39	-3.3	2.7	0.3	-59.3	-3554
1805 43	351	7	20.4	40	20.1	39	20.2	39	-3.6	2.6	0.2	-55.7	-3342
	351	9	20.7	40	20.4	40	20.4	40	-3.4	2.6	0.2	-50.3	-3020
	352	9	20.8	40	20.6	40	20.5	40	-3.4	2.6	0.2	-43.9	-2636
	352	10	20.8	40	20.6	40	20.5	40	-3.4	2.7	0.1	-36.8	-2207
	353	9	20.6	40	20.5	40	20.4	40	-3.2	2.8	0.1	-29.7	-1778
	353	9	20.5	40	20.4	40	20.3	39	-3.4	2.7	0.2	-24.1	-1442
	353	9	20.4	40	20.3	39	20.2	39	-4.0	2.6	0.2	-21.2	-1271
	353	9	20.4	40	20.2	39	20.1	39	-4.5	2.6	0.1	-21.0	-1261

1805:44 to 1805:50 CDT

CDT	dd	dta	Total Wind		Vertical Wind		Horizontal Wind		$\dot{\theta}$	$\dot{\psi}$	$\xi - \dot{\psi}$	ALTF RATE	
h m s	deg	deg	m/s	kts	m/s	kts	m/s	kts	deg/sec	rdg/sec	deg/sec	fps	fpm
1805 44	354	8	20.3	40	20.2	39	20.2	39	-4.8	2.6	-0.1	-22.7	-1364
	354	7	20.4	40	20.3	39	20.3	39	-4.7	2.6	-0.2	-25.7	-1542
	354	5	20.6	40	20.4	40	20.5	40	-4.8	2.4	-0.4	-30.0	-1799
	353	4	20.8	40	20.6	40	20.8	40	-4.8	2.2	-0.2	-34.9	-2090
	351	1	21.1	41	20.8	40	21.1	41	-4.4	2.0	-0.1	-39.8	-2389
	349	-1	21.5	42	21.1	41	21.5	42	-3.5	1.9	0.1	-44.4	-2663
	348	-4	21.9	43	21.4	42	21.8	42	-2.6	1.8	0.1	-48.5	-2910
	347	-7	22.4	43	21.8	42	22.2	43	-1.7	1.4	0.4	-52.2	-3133
1805 45	346	-10	22.9	44	22.2	43	22.5	44	-0.8	1.0	0.7	-54.7	-3280
	346	-13	23.4	45	22.7	44	22.7	44	0.0	0.4	0.9	-55.5	-3332
	346	-16	23.9	46	23.2	45	22.8	44	0.8	-0.2	1.0	-57.0	-3421
	346	-20	24.3	47	23.7	46	22.8	44	1.6	-1.0	0.8	-60.9	-3654
	347	-22	24.7	48	24.2	47	22.7	44	2.4	-2.0	0.8	-66.6	-3993
	348	-25	25.1	49	24.6	48	22.5	44	3.3	-2.8	1.0	-72.2	-4329
	349	-27	25.4	49	25.0	49	22.3	43	4.2	-3.2	1.3	-75.8	-4549
	350	-29	25.6	50	25.3	49	22.2	43	5.3	-2.8	1.5	-79.1	-4744
1805 46	352	-30	25.7	50	25.5	43	22.0	43	6.4	-2.0	1.4	-83.4	-5001
	353	-31	25.7	50	25.6	50	21.9	42	6.9	-1.2	1.1	-86.5	-5186
	355	-31	25.6	50	25.6	50	21.8	42	7.0	-0.6	1.1	-85.6	-5135
	357	-31	25.6	50	25.5	50	21.8	42	6.5	-0.4	1.1	-80.8	-4847
	359	-30	25.4	49	25.4	49	21.8	42	6.0	-0.2	1.0	-74.0	-4439
	360	-29	25.3	49	25.3	49	21.8	42	6.0	0.1	0.9	-67.8	-4065
	360	-28	25.0	49	25.0	49	21.9	42	6.4	0.4	0.7	-61.9	-3716
	1	-26	24.7	48	24.7	48	21.9	43	6.6	0.6	0.7	-55.4	-3321
1805 47	1	-24	24.4	47	24.4	47	22.0	43	6.2	0.8	0.8	-48.1	-2882
	1	-22	24.1	47	24.1	47	22.2	43	5.5	1.0	1.0	-40.9	-2454
	2	-19	23.8	46	23.8	46	22.4	43	5.0	1.4	1.1	-34.6	-2077
	2	-16	23.6	46	23.5	46	22.5	44	4.7	1.7	1.1	-29.4	-1765
	1	-13	23.4	46	23.4	46	22.7	44	4.4	1.8	0.9	-25.9	-1556
	1	-10	23.3	45	23.3	45	22.9	44	4.1	1.6	0.7	-24.3	-1460
	360	-7	23.3	45	23.3	45	23.0	45	3.8	1.4	0.6	-26.1	-1566
	359	-4	23.3	45	23.3	45	23.2	45	3.4	1.2	0.7	-31.4	-1885
1805 48	358	-1	23.3	45	23.3	45	23.3	45	3.0	1.0	0.7	-40.2	-2413
	357	0	23.4	45	23.4	45	23.4	45	2.3	0.7	0.5	-52.2	-3133
	356	3	23.5	46	23.4	46	23.5	46	1.4	0.4	0.4	-64.6	-3877
	355	4	23.6	46	23.5	46	23.6	46	0.6	0.1	0.2	-74.7	-4480
	355	6	23.7	46	23.6	46	23.6	46	0.0	-0.2	-0.0	-80.1	-4806
	357	7	23.9	46	23.8	46	23.7	46	-0.8	-0.4	-0.1	-80.1	-4802
	358	9	24.0	47	24.0	47	23.7	46	-2.0	-0.6	-0.2	-75.6	-4535
	360	10	24.1	47	24.1	47	23.7	46	-3.0	-0.7	-0.1	-67.1	-4024
1805 49	1	11	24.2	47	24.2	47	23.8	46	-3.6	-0.8	-0.1	-55.2	-3311
	2	12	24.2	47	24.2	47	23.7	46	-3.6	-0.4	-0.2	-42.8	-2567
	4	14	24.0	47	24.0	47	23.4	45	-3.6	0.4	-0.3	-31.8	-1905
	5	15	23.6	46	23.5	46	22.9	44	-3.7	1.7	-0.4	-23.8	-1425
	6	15	22.9	45	22.8	44	22.1	43	-3.8	3.0	-0.5	-19.0	-1137
	6	16	22.2	43	22.1	43	21.4	42	-3.9	4.1	-0.5	-16.6	-993
	7	16	21.5	42	21.4	42	20.7	40	-4.0	5.0	-0.6	-16.5	-993
	7	16	20.8	40	20.7	40	20.1	39	-3.7	5.4	-0.4	-18.2	-1089
1805 50	7	14	20.2	39	20.1	39	19.6	38	-3.2	5.8	-0.1	-20.6	-1233
	7	13	20.0	39	19.9	39	19.5	38	-2.6	5.4	0.4	-23.3	-1398
	7	11	20.1	39	20.0	39	19.7	38	-2.0	4.6	0.8	-26.1	-1566
	7	9	20.5	40	20.4	40	20.3	39	-1.5	3.4	1.0	-28.3	-1700
	6	7	21.2	41	21.1	41	21.0	41	-1.0	2.4	1.2	-29.7	-1778
	7	6	22.1	43	21.9	43	22.0	43	-0.0	1.3	1.1	-29.7	-1779
	7	4	23.0	45	22.9	44	23.0	45	1.2	0.0	1.0	-28.4	-1703
	8	3	24.0	47	23.8	46	23.9	46	2.4	-1.6	0.9	-26.6	-1593

1805:51 to 1805:57 CDT

CDT	dd	dfa	Total Wind		Vertical Wind		Horizontal Wind		$\dot{\theta}$	$\dot{\phi}$	$\dot{\zeta}-\dot{\psi}$	ALTF RATE	
h m s	deg	deg	m/s	kts	m/s	kts	m/s	kts	deg/sec	deg/sec	deg/sec	fps	fpm
1805 51	8	3	24.8	48	24.6	48	24.8	48	3.2	-3.2	0.9	-24.5	-1470
	8	2	25.5	50	25.3	49	25.5	50	3.4	-5.1	1.0	-22.6	-1353
	9	2	26.1	51	25.8	50	26.0	51	3.6	-7.2	0.9	-20.7	-1244
	9	2	26.4	51	26.1	51	26.4	51	3.8	-8.6	0.8	-18.9	-1130
	10	2	26.7	52	26.3	51	26.7	52	4.0	-9.4	0.7	-16.7	-1004
	10	1	26.7	52	26.4	51	26.7	52	3.8	-9.4	0.6	-14.6	-873
	10	1	26.7	52	26.3	51	26.7	52	3.2	-9.4	0.5	-12.5	-750
	10	1	26.5	51	26.1	51	26.5	51	2.0	-8.2	-1.0	-10.6	-633
1805 52	10	1	26.2	51	25.8	50	26.2	51	0.8	-6.0	-2.6	-8.9	-530
	9	1	25.8	50	25.5	49	25.8	50	-0.5	-3.1	-2.4	-7.3	-434
1st	10	1	25.3	49	25.0	49	25.3	49	-1.8	-0.6	-1.0	-5.7	-342
	10	1	24.8	48	24.5	48	24.8	48	-2.8	1.1	0.7	-4.4	-263
	9	2	24.3	47	24.0	47	24.3	47	-3.4	2.8	1.7	-3.3	-194
	9	2	23.9	46	23.6	46	23.9	46	-3.4	3.6	0.9	-2.2	-129
	9	2	23.6	46	23.3	45	23.6	46	-3.4	3.8	-2.0	-1.3	-74
	9	1	23.3	45	23.0	45	23.3	45	-3.0	3.2	-3.0	-0.4	-23
1805 53	9	1	23.0	45	22.8	44	23.0	45	-2.6	2.4	-1.0	0.4	24
	9	0	22.6	44	22.3	43	22.6	44	-2.0	1.6	-0.1	1.1	69
	9	0	21.9	43	21.7	42	21.9	42	-1.4	0.8	-1.0	1.9	113
	9	0	21.1	41	20.8	40	21.1	41	-1.0	0.1	-0.3	2.5	147
	9	0	20.1	39	19.8	39	20.1	39	-0.6	-0.4	0.3	2.6	158
2nd	9	-1	19.0	37	18.7	36	19.0	37	-0.2	-0.6	-2.1	2.6	154
	10	-2	18.0	35	17.7	34	18.0	35	0.2	-0.8	-3.0	2.4	144
	11	-2	17.1	33	16.8	33	17.1	33	0.6	-0.8	-1.0	2.2	130
1805 54	11	-3	16.5	32	16.2	32	16.5	32	1.0	-0.8	0.5	1.8	106
	11	-4	16.3	32	15.9	31	16.2	31	1.0	-0.8	0.4	1.0	62
	11	-4	16.3	32	15.9	31	16.2	31	1.0	-0.8	1.5	-0.2	-13
	11	-4	16.5	32	16.2	31	16.4	32	0.9	-0.7	1.5	-1.8	-109
	11	-4	16.9	33	16.6	32	16.8	33	0.8	-0.6	-0.6	-3.5	-208
	11	-4	17.4	34	17.1	33	17.3	34	0.6	-0.4	-1.2	-5.0	-301
	10	-4	17.9	35	17.6	34	17.8	35	0.2	-0.2	-0.2	-6.4	-383
	10	-4	18.3	36	18.1	35	18.3	35	-0.2	-0.1	0.8	-7.7	-462
1805 55	9	-4	18.7	36	18.4	36	18.6	36	-0.6	0.0	0.4	-8.9	-534
	9	-3	19.0	37	18.7	36	18.9	37	-0.9	0.0	0.4	-9.7	-578
	10	-2	19.3	37	19.0	37	19.2	37	-1.2	0.0	0.8	-9.8	-585
	10	-1	19.5	38	19.3	37	19.5	38	-1.4	0.2	0.8	-9.5	-572
	10	1	19.7	38	19.4	38	19.7	38	0.8	1.2	0.8	-9.1	-548
	10	3	19.8	39	19.5	38	19.8	38	5.5	1.0	0.7	-8.6	-517
3rd	10	5	19.8	39	19.5	38	19.8	38	4.0	0.0	0.6	-7.8	-465
	10	7	20.0	39	19.7	38	19.8	38	0.0	0.0	-0.1	-6.6	-393
1805 56	11	8	20.0	39	19.6	38	19.8	38	0.0	2.0	-1.2	-5.1	-308
	12	8	19.8	38	19.4	38	19.6	38	-4.0	4.0	0.6	-3.6	-215
	13	8	19.5	38	19.1	37	19.3	38	-4.0	6.0	4.1	-2.0	-119
	14	7	19.1	37	18.6	36	19.0	37	0.0	0.0	4.1	-0.4	-23
	15	5	18.8	37	18.2	35	18.8	36	-4.0	-8.0	0.3	1.0	62
	17	3	18.6	36	17.8	35	18.6	36	-4.0	-8.0	-1.1	2.2	130
	19	1	18.3	36	17.3	34	18.3	36	0.0	-8.0	1.7	3.0	182
	21	-1	18.1	35	17.0	33	18.1	35	0.0	-12.0	3.8	3.6	216
1805 57	22	-3	18.0	35	16.7	32	17.9	35	0.0	-16.0	3.6	4.1	247
	25	-5	17.9	35	16.4	32	17.9	35	0.0	-16.0	1.8	4.6	280
	28	-6	18.1	35	16.1	31	18.0	35	0.0	-16.0	2.6	5.6	336
	30	-8	18.5	36	16.1	31	18.3	36	0.0	-16.0	4.8	6.5	387
	33	-8	18.9	37	16.0	31	18.7	36	0.0	-16.0	6.3	7.4	442
	35	-9	19.6	38	16.2	31	19.3	37	0.0	-16.0	6.8	8.5	511
4th	38	-9	20.4	40	16.3	32	20.1	39	0.0	-12.0	5.7	9.9	593
	40	-8	21.3	41	16.6	32	21.0	41	0.0	4.0	5.2	11.1	665

APPENDIX 8 DISTURBED PRESSURE

Shown in this table are altitude fine (ALTF), true altitude (TA), pressure at true altitude (P_{TA}), inertial height (z), pressure at inertial altitude (P_z), kinetic energy of environmental wind in mb, static air temperature (T), and virtual temperature (T_v).

1804:56 to 1805:01 CDT

CDT	ALTF	TA	P_{TA}	z	P_z	TA-z	$P_{TA}-P_z$	$\frac{1}{2}\rho TW^2$	T	T_v
h m s	ft	ft	mb	ft	mb	ft	mb	mb	°C	°K
1804 56	1577.0	1725 8	954.33	1725.5	954.36	0.3	-0.03	0.16	37.3	313.1
	1575.0	1723.5	954.40	1723.2	954.43	0.3	-0.03	0.15	37.3	313.1
	1573.0	1721.3	954.47	1721.0	954.50	0.3	-0.03	0.15	37.3	313.1
	1571.0	1719.4	954.54	1718.8	954.57	0.6	-0.03	0.15	37.3	313.1
	1569.0	1717.2	954.61	1716.6	954.64	0.6	-0.02	0.15	37.3	313.1
	1567.0	1715.0	954.68	1714.4	954.71	0.6	-0.03	0.15	37.3	313.1
	1565.0	1712.7	954.75	1712.1	954.78	0.6	-0.03	0.15	37.3	313.
	1563.0	1710.5	954 82	1709.9	954.85	0.6	-0.03	0.15	37.3	313.
1804 57	1561.0	1708.6	954.88	1707.7	954.93	0.9	-0.05	0.15	37.3	313.1
	1559.0	1706.4	954.95	1705 5	954.99	0.9	-0.04	0.15	37.3	313.1
	1557 0	1704.1	955 02	1703.3	955.06	0.8	-0.04	0.15	37.4	313.1
	1555.0	1701.9	955.09	1701.1	955.13	0.8	-0.04	0.15	37.4	313.1
	1553.0	1699.7	955.16	1698.9	955.20	0.8	-0.04	0.15	37.4	313.1
	1551.0	1697.8	955.23	1696.8	955.26	1.0	-0.03	0.15	37.4	313.1
	1549.0	1695.5	955.30	1694.6	955.34	0.9	-0.01	0.	37.4	313.1
	1547.0	1693.3	955.37	1692.4	955.41	0.9	-0.04	0.14	37 4	313.1
1804 58	1545.0	1691.1	955.44	1690.2	955.48	0.9	-0.04	0.14	37.4	313.1
	1543.0	1688.9	955.51	1688.0	955.54	0.9	-0.03	0.13	37.4	313.1
	1541.0	1686.7	955.58	1685.9	955.61	0.8	-0.03	0.13	37.4	313 2
	1539.0	1684.7	955.65	1683.7	955.69	1.0	-0.04	0.12	37.4	313.2
	1537.0	1682.5	955.72	1681.5	955.75	1.0	-0.03	0.12	37.4	313.2
	1535.0	1680.3	955.79	1679.4	955.82	0.9	-0.03	0.11	37.4	313.2
	1533.0	1678.1	955.85	1677.2	955.89	0.9	-0.04	0.11	37.4	313.2
	1531.0	1675.8	955.92	1675.1	955.95	0.7	-0.03	0.10	37.4	313.2
1804 59	1529.2	1673.9	955.99	1672.9	956.03	1.0	-0.04	0.10	37.4	313.2
	1527.5	1672.0	956 05	1670.8	956.09	1.2	-0.04	0.09	37.4	313.2
	1525.8	1670.4	956.11	1668.7	956.16	1.7	-0.05	0.09	37.4	313.2
	1524.0	1668.2	956.17	1666.6	956.23	1.6	-0.06	0.09	37.5	313.2
	1522.2	1666.3	956.23	1664.5	956.29	1.8	-0.06	0.09	37.5	313.2
	1520.5	1664.4	956.29	1662.3	956.36	2.1	-0.07	0.08	37.5	313.2
	1518.8	1662.5	956.35	1660.2	956.43	2.3	-0.08	0.08	37.5	313.2
	1517.0	1660.6	956.41	1658.1	956.50	2.5	-0.09	0.08	37.5	313.2
1805 00	1515.0	1658.7	956.48	1655.9	956.56	2.8	-0.08	0.08	37.5	313.2
	1513.0	1656.4	956.55	1653.8	956.63	2.6	-0.08	0.08	37.5	313.3
	1511.0	1654.2	956.62	1651.6	956.70	2.6	-0.08	0.08	37.5	313.3
	1509.0	1652.0	956.69	1649.5	956.76	2.5	-0.07	0.08	37.5	313.3
	1506.8	1649.4	956.77	1647.3	956.84	2.1	-0.07	0.08	37.5	313.3
	1504.5	1647.2	956.85	1645.1	956.91	2.1	-0.06	0 08	37.5	313.3
	1502.2	1644.3	956.93	1642.9	956.98	1.4	-0.05	0.08	37.5	313.3
	1500.0	1642.1	957.01	1640.7	957.04	1.4	-0.02	0.08	37.5	313.3
1805 01	1498.0	1639.9	957.08	1638.5	957 12	1.4	-0.04	0.08	37.5	313.3
	1496.0	1637.6	957.15	1636.3	957 19	1.3	-0.04	0.08	37.5	313.3
	1494.2	1635.7	957.21	1634.1	957.26	1.6	-0.05	0.08	37.5	313 3
	1492.5	1633.8	957.27	1631.8	957.33	2.0	-0.06	0.08	37.5	313.3
	1490.8	1631.9	957.33	1 29 6	957.40	2.3	-0.06	0.03	37.6	313.3
	1489.0	1630.0	957.39	1627.4	957.47	2.6	-0.08	0.03	37.6	313.3
	1487.0	1627.8	957.46	1625.1	957.54	2.7	-0.08	0.07	37.6	313.3
	1485.0	1625.6	957.53	1622.9	957.61	2.7	-0.08	0.07	37.6	313.3

1805:02 to 1805:08 CDT

CDT	ALTF	TA	P_{TA}	z	P_z	TA-z	$P_{TA}-P_z$	$\frac{1}{2}\rho TW^2$	T	T_v
h m s	ft	ft	mb	ft	mb	ft	mb	mb	°C	°K
1805 02	1483.0	1623.4	957.60	1620.7	957.69	2.7	-0.09	0.07	37.6	313.4
	1481.0	1621.5	957.67	1618.4	957.76	3.1	-0.09	0.07	37.6	313.4
	1479.0	1619.2	957.74	1616.2	957.82	3.0	-0.08	0.07	37.6	313.4
	1477.0	1617.0	957.81	1614.0	957.89	3.0	-0.08	0.07	37.6	313.4
	1475.0	1614.8	957.88	1611.8	957.97	3.0	-0.09	0.07	37.6	313.4
	1473.0	1612.5	957.95	1609.7	958.04	2.8	-0.09	0.07	37.6	313.4
	1471.0	1610.3	958.02	1607.5	958.10	2.8	-0.08	0.07	37.6	313.4
	1469.0	1608.1	958.09	1605.3	958.17	2.8	-0.08	0.07	37.6	313.4
1805 03	1467.0	1605.8	958.17	1603.2	958.24	2.6	-0.07	0.07	37.6	313.4
	1465.0	1603.6	958.23	1601.0	958.30	2.6	-0.07	0.06	37.6	313.4
	1463.0	1601.7	958.30	1598.9	958.38	2.8	-0.08	0.06	37.6	313.4
	1461.0	1599.4	958.37	1596.7	958.45	2.7	-0.08	0.06	37.6	313.4
	1459.0	1597.2	958.45	1594.6	958.51	2.6	-0.06	0.05	37.6	313.4
	1457.0	1595.0	958.52	1592.5	958.58	2.5	-0.06	0.05	37.6	313.4
	1455.0	1592.7	958.58	1590.5	958.64	2.2	-0.06	0.05	37.7	313.4
	1453.0	1590.5	958.65	1588.4	958.70	2.1	-0.05	0.04	37.7	313.4
1805 04	1451.0	1588.6	958.72	1586.4	958.78	2.2	-0.06	0.04	37.7	313.4
	1449.0	1586.0	958.80	1584.4	958.84	1.6	-0.04	0.04	37.7	313.4
	1447.0	1584.1	958.87	1582.4	958.90	1.7	-0.03	0.04	37.7	313.4
	1445.0	1581.9	958.93	1580.4	958.96	1.5	-0.03	0.04	37.7	313.4
	1443.2	1579.7	959.00	1578.4	959.03	1.3	-0.03	0.04	37.7	313.4
	1441.5	1578.1	959.06	1576.5	959.09	1.6	-0.03	0.04	37.7	313.4
	1439.8	1576.1	959.12	1574.5	959.15	1.6	-0.03	0.04	37.7	313.4
	1438.0	1574.2	959.18	1572.6	959.22	1.6	-0.04	0.04	37.7	313.4
1805 05	1436.2	1572.0	959.25	1570.7	959.28	1.3	-0.03	0.04	37.7	313.5
	1434.5	1570.4	959.30	1568.8	959.34	1.6	-0.04	0.04	37.7	313.5
	1433.2	1568.8	959.35	1567.0	959.40	1.8	-0.05	0.04	37.7	313.5
	1432.0	1567.5	959.39	1565.1	959.46	2.4	-0.07	0.04	37.7	313.5
	1431.0	1566.5	959.42	1563.3	959.51	3.2	-0.09	0.04	37.7	313.5
	1430.0	1565.5	959.46	1561.5	959.57	4.0	-0.11	0.04	37.7	313.5
	1429.0	1564.3	959.49	1559.7	959.63	4.6	-0.14	0.05	37.7	313.5
	1428.0	1563.3	959.52	1557.9	959.68	5.4	-0.16	0.05	37.7	313.5
1805 06	1426.6	1562.0	959.57	1556.1	959.74	5.9	-0.17	0.06	37.7	313.5
	1425.0	1560.1	959.63	1554.3	959.80	5.8	-0.17	0.06	37.7	313.5
	1423.0	1558.2	959.69	1552.5	959.85	5.7	-0.16	0.06	37.7	313.5
	1421.0	1555.9	959.76	1550.8	959.91	5.1	-0.15	0.06	37.7	313.5
	1419.0	1553.7	959.83	1549.1	959.97	4.6	-0.14	0.06	37.7	313.5
	1417.0	1551.7	959.90	1547.3	960.02	4.4	-0.13	0.06	37.7	313.5
	1415.0	1549.5	959.96	1545.6	960.08	3.9	-0.12	0.06	37.7	313.5
	1413.0	1547.2	960.03	1544.0	960.13	3.2	-0.10	0.07	37.7	313.5
1805 07	1411.2	1545.3	960.09	1542.3	960.17	3.0	-0.08	0.07	37.7	313.5
	1409.5	1543.7	960.15	1540.6	960.24	3.1	-0.09	0.07	37.7	313.5
	1408.0	1542.1	960.20	1539.0	960.28	3.1	-0.08	0.07	37.7	313.5
	1406.5	1540.5	960.25	1537.3	960.33	3.2	-0.08	0.07	37.7	313.5
	1405.0	1538.9	960.30	1535.6	960.39	3.3	-0.09	0.08	37.7	313.5
	1403.5	1537.3	960.35	1534.0	960.44	3.3	-0.09	0.08	37.7	313.5
	1402.0	1535.6	960.40	1532.3	960.49	3.3	-0.09	0.08	37.7	313.5
	1400.5	1534.0	960.45	1530.6	960.55	3.4	-0.10	0.08	37.7	313.4
1805 08	1399.0	1532.4	960.50	1529.0	960.60	3.4	-0.10	0.08	37.7	313.4
	1397.5	1530.8	960.55	1527.3	960.66	3.5	-0.11	0.08	37.7	313.4
	1395.8	1529.1	960.61	1525.6	960.71	3.5	-0.10	0.08	37.7	313.4
	1394.0	1526.9	960.67	1524.0	960.76	2.9	-0.09	0.07	37.7	313.4
	1392.2	1525.3	960.74	1522.3	960.82	3.0	-0.08	0.07	37.7	313.4
	1390.5	1523.3	960.80	1520.6	960.87	2.7	-0.07	0.07	37.7	313.4
	1388.8	1521.4	960.85	1518.9	960.93	2.5	-0.08	0.08	37.7	313.4
	1387.0	1519.4	960.92	1517.2	960.98	2.2	-0.06	0.08	37.6	313.4

1805:09 to 1805:15 CDT

CDT	ALTF	TA	P_{TA}	z	P_z	TA−z	$P_{TA}-P_z$	$\frac{1}{2}\rho TW^2$	T	T_v
h m s	ft	ft	mb	ft	mb	ft	mb	mb	°C	°K
1805 09	1385.4	1517.5	960.97	1515.5	961.04	2.0	-0.07	0.08	37.6	313.4
	1384.0	1516.2	961.02	1513.8	961.09	2.4	-0.07	0.08	37.6	313.4
	1382.8	1514.9	961.06	1512.1	961.15	2.8	-0.09	0.08	37.6	313.4
	1381.5	1513.2	961.10	1510.4	961.20	2.8	-0.10	0.09	37.6	313.4
	1380.2	1511.9	961.15	1508.7	961.25	3.2	-0.10	0.10	37.6	313.4
	1379.0	1510.6	961.19	1507.0	961.31	3.6	-0.12	0.11	37.6	313.4
	1377.8	1509.6	961.22	1505.3	961.35	4.3	-0.13	0.11	37.6	313.4
	1376.5	1508.0	961.27	1503.6	961.42	4.4	-0.15	0.12	37.6	313.4
1805 10	1375.0	1506.4	961.32	1501.9	961.46	4.5	-0.14	0.12	37.6	313.4
	1373.5	1505.0	961.37	1500.3	961.53	4.7	-0.16	0.13	37.6	313.3
	1372.0	1503.4	961.42	1498.6	961.57	4.8	-0.15	0.13	37.6	313.3
	1370.5	1501.7	961.47	1496.9	961.62	4.8	-0.15	0.14	37.6	313.3
	1369.0	1500.1	961.52	1495.3	961.68	4.8	-0.16	0.15	37.5	313.3
	1367.5	1498.4	961.57	1493.7	961.73	4.7	-0.16	0.15	37.5	313.3
	1366.0	1496.8	961.62	1492.0	961.78	4.8	-0.16	0.16	37.5	313.3
	1364.5	1495.1	961.67	1490.4	961.83	4.7	-0.16	0.17	37.5	313.2
1805 11	1363.0	1493.4	961.72	1488.8	961.89	4.6	-0.17	0.17	37.5	313.2
	1361.5	1491.7	961.77	1487.1	961.94	4.6	-0.17	0.18	37.4	313.2
	1360.2	1490.4	961.81	1485.5	961.99	4.9	-0.18	0.19	37.4	313.2
	1359.0	1489.0	961.85	1483.9	962.04	5.1	-0.19	0.19	37.4	313.1
	1357.8	1487.6	961.89	1482.2	962.10	5.4	-0.21	0.19	37.4	313.1
	1356.5	1486.3	961.94	1480.6	962.15	5.7	-0.21	0.19	37.3	313.1
	1355.0	1484.6	961.99	1479.0	962.19	5.6	-0.20	0.18	37.3	313.1
	1353.5	1482.9	962.04	1477.3	962.26	5.6	-0.22	0.17	37.3	313.0
1805 12	1352.4	1481.8	962.07	1475.7	962.30	6.1	-0.23	0.16	37.2	313.0
	1351.5	1480.8	962.10	1474.0	962.35	6.8	-0.25	0.15	37.2	313.0
	1351.0	1480.0	962.12	1472.3	962.41	7.7	-0.29	0.14	37.2	312.9
	1350.5	1479.6	962.14	1470.6	962.46	9.0	-0.32	0.13	37.1	312.9
	1349.8	1478.8	962.16	1468.8	962.52	10.0	-0.36	0.12	37.1	312.8
	1349.0	1477.7	962.18	1466.9	962.58	10.8	-0.40	0.12	37.0	312.8
	1348.2	1476.6	962.21	1465.0	962.65	11.6	-0.44	0.12	37.0	312.7
	1347.5	1475.8	962.24	1463.0	962.71	12.8	-0.47	0.12	36.9	312.7
1805 13	1346.1	1473.7	962.30	1460.9	962.78	12.8	-0.48	0.12	36.9	312.6
	1344.0	1471.3	962.37	1458.6	962.85	12.7	-0.48	0.12	36.8	312.6
	1341.2	1468.0	962.47	1456.3	962.93	11.7	-0.46	0.11	36.8	312.6
	1338.5	1464.6	962.57	1454.0	963.00	10.6	-0.43	0.11	36.7	312.5
	1335.8	1461.3	962.67	1451.5	963.07	9.8	-0.40	0.11	36.7	312.4
	1333.0	1457.9	962.78	1449.1	963.16	8.8	-0.38	0.11	36.6	312.4
	1330.0	1454.2	962.89	1446.6	963.23	7.6	-0.34	0.11	36.6	312.3
	1327.0	1450.6	963.01	1444.1	963.32	6.5	-0.31	0.12	36.5	312.3
1805 14	1324.4	1447.2	963.10	1441.6	963.39	5.6	-0.29	0.12	36.5	312.2
	1322.0	1444.1	963.19	1439.1	963.47	5.0	-0.28	0.13	36.4	312.2
	1319.8	1441.4	963.28	1436.6	963.55	4.8	-0.27	0.14	36.3	312.1
	1317.5	1438.3	963.37	1434.2	963.63	4.1	-0.26	0.15	36.3	312.0
	1315.2	1435.6	963.45	1431.9	963.71	3.7	-0.26	0.16	36.2	312.0
	1313.0	1432.9	963.54	1429.7	963.78	3.2	-0.24	0.16	36.2	311.9
	1310.8	1430.2	963.62	1427.5	963.84	2.7	-0.22	0.16	36.1	311.9
	1308.5	1427.5	963.70	1425.4	963.91	2.1	-0.21	0.15	36.1	311.8
1805 15	1306.6	1425.0	963.77	1423.4	963.97	1.6	-0.20	0.15	36.0	311.8
	1305.0	1423.3	963.83	1421.4	964.04	1.9	-0.21	0.15	35.9	311.7
	1304.0	1421.8	963.87	1419.5	964.10	2.3	-0.23	0.16	35.9	311.6
	1303.0	1420.3	963.90	1417.7	964.16	2.6	-0.26	0.16	35.8	311.6
	1301.8	1419.2	963.94	1415.8	964.22	3.4	-0.28	0.17	35.7	311.5
	1300.5	1417.4	963.98	1414.1	964.27	3.3	-0.29	0.18	35.7	311.4
	1299.2	1415.9	964.03	1412.3	964.33	3.6	-0.30	0.19	35.6	311.4
	1298.0	1414.5	964.07	1410.6	964.39	3.9	-0.32	0.19	35.5	311.3

1805:16 to 1805:22 CDT

CDT	ALTF	TA	P_{TA}	z	P_z	TA-z	$P_{TA}-P_z$	$\frac{1}{2}\rho TW^2$	T	T_v
h m s	ft	ft	mb	ft	mb	ft	mb	mb	°C	°K
1805 16	1297.2	1413.6	964.09	1408.9	964.44	4.7	-0.35	0.20	35.4	311.2
	1296.5	1412.4	964.12	1407.2	964.49	5.2	-0.37	0.21	35.4	311.1
	1296.2	1411.9	964.13	1405.5	964.55	6.4	-0.42	0.24	35.3	311.0
	1296.0	1411.3	964.14	1403.9	964.60	7.4	-0.46	0.29	35.2	311.0
	1295.8	1410.8	964.15	1402.2	964.66	8.6	-0.51	0.36	35.1	310.9
	1295.5	1410.3	964.16	1400.5	964.71	9.8	-0.55	0.43	35.0	310.8
	1295.0	1409.4	964.18	1398.7	964.77	10.7	-0.59	0.51	34.9	310.7
	1294.5	1408.5	964.20	1396.8	964.83	11.7	-0.63	0.56	34.9	310.6
1805 17	1293.4	1406.9	964.24	1394.8	964.89	12.1	-0.65	0.60	34.8	310.5
	1292.0	1405.0	964.30	1392.6	964.96	12.4	-0.66	0.64	34.6	310.4
	1289.3	1401.5	964.40	1390.2	965.04	11.3	-0.64	0.66	34.5	310.3
	1286.0	1397.4	964.52	1387.7	965.12	9.7	-0.60	0.68	34.4	310.2
	1282.2	1392.7	964.67	1385.1	965.20	7.6	-0.53	0.70	34.3	310.1
	1278.5	1388.0	964.81	1382.4	965.28	5.6	-0.47	0.73	34.2	310.0
	1274.8	1383.3	964.95	1379.7	965.37	3.6	-0.42	0.76	34.1	309.9
	1271.0	1378.3	965.10	1377.0	965.46	1.3	-0.36	0.80	34.1	309.8
1805 18	1267.2	1373.4	965.26	1374.3	965.55	-0.9	-0.29	0.83	34.0	309.8
	1263.5	1368.8	965.41	1371.7	965.62	-2.9	-0.21	0.86	33.9	309.7
	1260.8	1365.2	965.52	1369.2	965.71	-4.0	-0.19	0.89	33.9	309.7
	1258.5	1362.2	965.61	1366.8	965.78	-4.6	-0.17	0.91	33.9	309.6
	1256.8	1359.6	965.69	1364.6	965.86	-5.0	-0.17	0.92	33.8	309.6
	1255.0	1357.3	965.77	1362.4	965.93	-5.1	-0.16	0.93	33.8	309.6
	1253.2	1355.0	965.84	1360.4	965.99	-5.4	-0.15	0.94	33.8	309.5
	1251.5	1352.7	965.91	1358.4	966.05	-5.7	-0.14	0.94	33.8	309.5
1805 19	1250.2	1351.4	965.95	1356.6	966.11	-5.2	-0.16	0.93	33.8	309.5
	1249.0	1349.8	966.00	1354.9	966.17	-5.1	-0.17	0.91	33.7	309.5
	1248.0	1348.8	966.04	1353.2	966.22	-4.4	-0.18	0.88	33.7	309.5
	1247.0	1347.5	966.07	1351.6	966.27	-4.1	-0.20	0.85	33.7	309.5
	1245.8	1346.3	966.11	1350.0	966.33	-3.7	-0.22	0.81	33.7	309.5
	1244.5	1344.6	966.17	1348.4	966.38	-3.8	-0.21	0.77	33.7	309.5
	1243.2	1343.0	966.22	1346.8	966.43	-3.8	-0.21	0.73	33.7	309.5
	1242.0	1341.4	966.27	1345.3	966.48	-3.9	-0.21	0.70	33.7	309.4
1805 20	1240.3	1339.2	966.34	1343.7	966.53	-4.5	-0.19	0.68	33.7	309.4
	1238.0	1336.7	966.42	1342.1	966.58	-5.4	-0.16	0.66	33.7	309.4
	1235.0	1333.2	966.54	1340.6	966.63	-7.4	-0.09	0.65	33.7	309.4
	1232.0	1329.7	966.65	1339.0	966.67	-9.3	-0.02	0.63	33.7	309.4
	1229.0	1325.8	966.77	1337.5	966.72	-11.7	0.05	0.62	33.7	309.4
	1226.0	1322.3	966.89	1335.9	966.77	-13.6	0.12	0.60	33.7	309.4
	1223.0	1318.5	967.01	1334.4	966.82	-15.9	0.19	0.59	33.6	309.4
	1220.0	1315.0	967.12	1332.9	966.87	-17.9	0.25	0.57	33.6	309.4
1805 21	1218.1	1312.7	967.19	1331.4	966.92	-18.7	0.27	0.56	33.6	309.4
	1217.0	1311.1	967.25	1330.0	966.97	-18.9	0.28	0.55	33.6	309.4
	1217.0	1310.8	967.25	1328.6	967.02	-17.8	0.23	0.54	33.6	309.4
	1217.0	1310.5	967.26	1327.3	967.05	-16.8	0.21	0.54	33.6	309.4
	1216.8	1310.1	967.28	1326.0	967.09	-15.9	0.19	0.54	33.6	309.4
	1216.5	1309.4	967.30	1324.8	967.13	-15.4	0.17	0.53	33.6	309.3
	1216.2	1308.7	967.32	1323.7	967.16	-15.0	0.16	0.52	33.6	309.3
	1216.0	1308.4	967.33	1322.7	967.20	-14.3	0.13	0.50	33.5	309.3
1805 22	1215.8	1308.0	967.34	1321.7	967.24	-13.7	0.10	0.48	33.5	309.3
	1215.5	1307.6	967.35	1320.7	967.26	-13.1	0.09	0.46	33.5	309.2
	1214.8	1306.6	967.38	1319.7	967.30	-13.1	0.08	0.47	33.5	309.2
	1214.0	1305.6	967.42	1318.7	967.32	-13.1	0.10	0.48	33.4	309.2
	1213.2	1304.5	967.45	1317.8	967.36	-13.3	0.09	0.52	33.4	309.2
	1212.5	1303.8	967.47	1316.8	967.38	-13.0	0.09	0.56	33.4	309.1
	1211.8	1302.7	967.49	1316.0	967.42	-13.3	0.07	0.59	33.3	309.1
	1211.0	1301.7	967.52	1315.1	967.45	-13.4	0.07	0.62	33.3	309.0

1805:23 to 1805:29 CDT

CDT	ALTF	TA	P_{TA}	z	P_z	TA−z	$P_{TA}-P_z$	$\frac{1}{2}\rho TW^2$	T	T_v
h m s	ft	ft	mb	ft	mb	ft	mb	mb	°C	°K
1805 23	1209.4	1300.0	967.58	1314.3	967.47	-14.3	0.11	0.62	33.2	309.0
	1207.5	1297.6	967.65	1313.5	967.50	-15.9	0.15	0.60	33.2	308.9
	1204.4	1294.0	967.76	1312.7	967.52	-18.7	0.24	0.56	33.1	308.9
	1201.0	1290.1	967.89	1311.9	967.54	-21.8	0.35	0.50	33.1	308.8
	1197.2	1285.9	968.02	1311.1	967.57	-25.2	0.45	0.45	33.0	308.8
	1193.5	1281.6	968.15	1310.4	967.59	-28.8	0.56	0.40	33.0	308.7
	1190.4	1278.3	968.26	1309.7	967.62	-31.4	0.64	0.36	32.9	308.7
	1187.5	1274.7	968.37	1309.1	967.64	-34.4	0.73	0.34	32.9	308.6
1805 24	1186.1	1273.4	968.41	1308.6	967.65	-35.2	0.76	0.32	32.8	308.6
	1185.5	1272.7	968.44	1308.1	967.67	-35.4	0.77	0.32	32.8	308.6
	1186.0	1272.9	968.42	1307.7	967.68	-34.8	0.74	0.32	32.8	308.5
	1186.5	1273.5	968.40	1307.3	967.69	-33.8	0.71	0.33	32.7	308.5
	1187.2	1274.3	968.37	1306.9	967.70	-32.6	0.67	0.35	32.7	308.4
	1188.0	1274.9	968.35	1306.4	967.73	-31.5	0.62	0.37	32.7	308.4
	1188.8	1275.8	968.32	1305.9	967.74	-30.1	0.58	0.39	32.6	308.4
	1189.5	1276.4	968.30	1305.4	967.75	-29.0	0.55	0.43	32.6	308.4
1805 25	1189.1	1276.0	968.31	1304.7	967.78	-28.7	0.53	0.47	32.6	308.4
	1188.0	1274.7	968.35	1304.0	967.80	-29.3	0.55	0.51	32.6	308.4
	1186.0	1272.5	968.42	1303.2	967.83	-30.7	0.59	0.55	32.6	308.4
	1184.0	1270.6	968.49	1302.3	967.85	-31.7	0.64	0.58	32.6	308.4
	1182.0	1268.1	968.56	1301.3	967.89	-33.2	0.67	0.59	32.6	308.4
	1180.0	1266.2	968.63	1300.1	967.92	-33.9	0.71	0.59	32.6	308.4
	1177.8	1263.7	968.71	1298.9	967.96	-35.2	0.75	0.58	32.6	308.4
	1175.5	1260.9	968.80	1297.5	968.01	-36.6	0.79	0.56	32.6	308.4
1805 26	1173.4	1258.3	968.88	1296.0	968.06	-37.7	0.82	0.55	32.6	308.4
	1171.5	1256.1	968.96	1294.4	968.11	-38.3	0.85	0.56	32.6	308.4
	1170.2	1254.6	969.01	1292.8	968.16	-38.2	0.85	0.59	32.6	308.4
	1169.0	1253.0	969.06	1291.0	968.22	-38.0	0.84	0.62	32.6	308.4
	1167.8	1251.4	969.11	1289.2	968.28	-37.8	0.83	0.65	32.6	308.4
	1166.5	1249.9	969.17	1287.3	968.34	-37.4	0.83	0.68	32.6	308.4
	1165.0	1248.0	969.23	1285.4	968.40	-37.4	0.83	0.70	32.6	308.4
	1163.5	1246.1	969.29	1283.5	968.46	-37.4	0.83	0.73	32.6	308.4
1805 27	1161.6	1243.6	969.37	1281.5	968.52	-37.9	0.85	0.74	32.7	308.4
	1159.5	1241.0	969.45	1279.5	968.58	-38.5	0.87	0.75	32.6	308.4
	1157.0	1238.2	969.55	1277.5	968.65	-39.3	0.90	0.75	32.6	308.4
	1154.5	1235.0	969.65	1275.5	968.72	-40.5	0.93	0.74	32.6	308.4
	1152.0	1231.8	969.75	1273.4	968.78	-41.6	0.97	0.72	32.6	308.4
	1149.5	1228.9	969.85	1271.4	968.85	-42.5	1.00	0.71	32.6	308.4
	1147.0	1225.8	969.94	1269.3	968.92	-43.5	1.02	0.69	32.6	308.4
	1144.5	1223.2	970.04	1267.1	968.99	-43.9	1.05	0.67	32.6	308.4
1805 28	1141.8	1220.0	970.14	1265.0	969.05	-45.0	1.09	0.64	32.6	308.4
	1139.0	1216.8	970.24	1262.8	969.12	-46.0	1.12	0.61	32.6	308.4
	1136.0	1213.3	970.35	1260.5	969.20	-47.2	1.15	0.60	32.6	308.3
	1133.0	1209.8	970.46	1258.3	969.27	-48.5	1.19	0.59	32.6	308.3
	1130.0	1206.3	970.58	1256.0	969.35	-49.7	1.23	0.58	32.5	308.3
	1127.0	1203.1	970.69	1253.7	969.42	-50.6	1.27	0.56	32.5	308.3
	1124.0	1199.5	970.80	1251.4	969.49	-51.9	1.31	0.55	32.5	308.3
	1121.0	1196.0	970.91	1249.1	969.57	-53.1	1.34	0.55	32.5	308.2
1805 29	1118.2	1192.8	971.01	1246.8	969.64	-54.0	1.37	0.56	32.4	308.2
	1115.5	1189.8	971.11	1244.6	969.71	-54.8	1.40	0.56	32.4	308.1
	1113.0	1186.9	971.20	1242.3	969.79	-55.4	1.41	0.57	32.3	308.1
	1110.5	1183.9	971.29	1240.2	969.85	-56.3	1.44	0.57	32.3	308.0
	1108.0	1181.3	971.38	1238.0	969.92	-56.7	1.46	0.58	32.2	308.0
	1105.5	1178.4	971.47	1235.9	970.00	-57.5	1.47	0.58	32.2	307.9
	1103.0	1175.4	971.57	1233.8	970.06	-58.4	1.51	0.57	32.1	307.9
	1100.5	1172.4	971.65	1231.7	970.13	-59.3	1.52	0.54	32.1	307.8

1805:30 to 1805:36 CDT

CDT	ALTF	TA	P_{TA}	z	P_z	TA−z	$P_{TA}-P_z$	$\frac{1}{2}\rho TW^2$	T	T_v
h m s	ft	ft	mb	ft	mb	ft	mb	mb	°C	°K
1805 30	1098.2	1169.8	971.74	1229.6	970.19	-59.8	1.55	0.52	32.0	307.8
	1096.0	1167.5	971.81	1227.5	970.25	-60.0	1.56	0.50	31.9	307.7
	1094.0	1165.1	971.88	1225.5	970.33	-60.4	1.55	0.50	31.9	307.6
	1092.0	1162.8	971.95	1223.5	970.39	-60.7	1.56	0.52	31.8	307.6
	1090.0	1160.5	972.02	1221.6	970.45	-61.1	1.57	0.54	31.8	307.5
	1088.0	1158.4	972.09	1219.7	970.51	-61.3	1.58	0.57	31.7	307.5
	1086.0	1156.1	972.16	1217.8	970.57	-61.7	1.59	0.59	31.6	307.4
	1084.0	1153.8	972.23	1216.0	970.63	-62.2	1.60	0.62	31.6	307.3
1805 31	1082.0	1151.8	972.30	1214.2	970.68	-62.4	1.62	0.64	31.5	307.3
	1080.0	1149.5	972.37	1212.5	970.74	-63.0	1.63	0.66	31.4	307.2
	1078.2	1147.4	972.44	1210.8	970.79	-63.4	1.65	0.67	31.4	307.1
	1076.5	1145.4	972.49	1209.1	970.85	-63.7	..64	0.68	31.3	307.1
	1074.8	1143.4	972.55	1207.5	970.90	-64.1	1.65	0.68	31.3	307.0
	1073.0	1141.4	972.61	1206.0	970.95	-64.6	1.66	0.68	31.2	307.0
	1071.0	1139.4	972.68	1204.5	971.00	-65.1	1.68	0.68	31.2	306.9
	1069.0	1137.1	972.75	1203.1	971.04	-66.0	1.71	0.68	31.1	306.9
1805 32	1067.4	1135.5	972.81	1201.8	971.09	-66.3	1.72	0.69	31.1	306.8
	1066.0	1134.1	972.85	1200.5	971.13	-66.4	1.72	0.70	31.0	306.8
	1065.0	1133.1	972.88	1199.3	971.16	-66.2	1.72	0.71	31.0	306.8
	1064.0	1132.1	972.91	1198.2	971.20	-66.1	1.71	0.72	31.0	306.7
	1063.0	1130.8	972.95	1197.2	971.24	-66.4	1.71	0.74	30.9	306.7
	1062.0	1129.9	972.98	1196.2	971.27	-66.3	1.71	0.76	30.9	306.7
	1061.0	1128.9	973.01	1195.3	971.30	-66.4	1.71	0.79	30.9	306.7
	1060 0	1128.0	973.04	1194.6	971.32	-66.6	1.72	0.82	30.9	306.7
1805 33	1058.8	1127.1	973.07	1193.8	971.35	-66.7	1.72	0.84	31.0	306.7
	1057.5	1125.9	973.11	1193.1	971.37	-67.2	1.74	0.84	31.0	306.8
	1056.2	1124.7	973.15	1192.4	971.38	-67.7	1.77	0.83	31.0	306.8
	1055.0	1123.8	973.19	1191.7	971.41	-67.9	1.78	0.84	31.1	306.8
	1054.4	1123.3	973.21	1191.0	971.43	-67.7	1.78	0.86	31.1	306.9
	1054.0	1123.4	973.21	1190.2	971.46	-66.8	1.75	0.86	31.2	306.9
	1054.2	1123.8	973.20	1189.2	971.49	-65.4	1.71	0.86	31.2	307.0
	1054.5	1124.6	973.18	1188.2	971.53	-63.6	1.65	0.88	31.3	307.0
1805 34	1055.0	1125.0	973.17	1187.0	971.57	-62.0	1.60	0.93	31.3	307.1
	1055.5	1125.7	973.14	1185.7	971.60	-60.0	1.54	1.01	31.4	307.1
	1056.8	1127.3	973.10	1184.4	971.65	-57.1	1.45	1.09	31.4	307.2
	1058.5	1129.3	973.03	1182.9	971.69	-53.6	1.34	1.17	31.5	307.2
	1061.8	1132.9	972.92	1181.4	971.74	-48.5	1.18	1.27	31.5	307.3
	1065.5	1137.1	972.79	1179.9	971.79	-42.8	1.00	1.34	31.6	307.3
	1070.8	1142.5	972.61	1178.2	971.85	-35.7	0.76	1.38	31.6	307.4
	1076.5	1148.9	972.40	1176.4	971.90	-27.5	0.50	1.40	31.7	307.4
1805 35	1084.5	1157.5	972.12	1174.6	971.96	-17.1	0.16	1.42	31.7	307.5
	1093.5	1167.1	971.81	1172.6	972.02	-5.5	-0.21	1.41	31.7	307.5
	1103 9	1178.2	971.45	1170.6	972.10	7.6	-0.65	1.34	31.8	307.5
	1114.0	1189.0	971.10	1168.8	972.16	20.4	-1.06	1.22	31.8	307.6
	1123.4	1199.1	970.77	1166.6	972.22	32.5	-1.45	1.08	31.8	307.6
	1132.5	1208.6	970.46	1164.6	972.28	44.0	-1.82	0.92	31.9	307.6
	1138.2	1214.7	970.26	1162.7	972.34	52.0	-2.08	0.74	31.9	307 7
	1142.0	1218.9	970.13	1161.0	972.40	57.9	-2.27	0.57	31.9	307.7
1805 36	1141.7	1218.3	970.14	1159.4	972.45	58.9	-2.31	0.44	31.9	307.7
	1140.5	1217.1	970.19	1158.0	972.50	59.1	-2.31	0.33	32.0	307.7
	1134.8	1211.1	970.39	1156.7	972.54	54.4	-2.15	0.28	32.0	307.8
	1127.0	1202.6	970.66	1155.6	972.58	47.0	-1.92	0.41	32.0	307.8
	1115.4	1190.4	971.07	1154.7	972.60	35.7	-1.53	0.48	32.0	307.8
	1103.5	1177.4	971.49	1153.9	972.64	23.5	-1.15	0.56	32.0	307.8
	1090.8	1163.9	971.93	1153.1	972.65	10.8	-0.72	0.64	32.0	307.8
	1073.0	1150.3	972.38	1152.4	972.67	-2.1	-0.29	0.73	32.0	307.8

1805:37 to 1805:43 CDT

CDT	ALTF	TA	P_{TA}	z	P_z	TA-z	$P_{TA}-P_z$	$\frac{1}{2}\rho TW^2$	T	T_v
h m s	ft	ft	mb	ft	mb	ft	mb	mb	°C	°K
1805 37	1064.3	1135.4	972.86	1151.8	972.70	-16.4	0.16	0.78	32.0	307.8
	1050.0	1120.6	973.36	1151.2	972.72	-30.6	0.64	0.80	32.0	307.8
	1035.8	1105.4	973.85	1150.6	972.74	-45.2	1.11	0.77	32.0	307.8
	1022.0	1090.9	974.33	1150.2	972.75	-59.3	1.58	0.69	32.0	307.8
	1011.4	1079.8	974.69	1149.8	972.76	-70.0	1.93	0.61	32.0	307.8
	1002.5	1070.3	975.01	1149.5	972.77	-79.2	2.24	0.53	32.0	307.8
	998.3	1066.2	975.14	1149.2	972.78	-83.0	2.35	0.45	32.0	307.7
	995.5	1063.6	975.22	1149.0	972.78	-85.4	2.44	0.33	32.0	307.7
1805 38	995.2	1064.2	975.21	1148.8	972.80	-84.6	2.41	0.33	31.9	307.7
	995.0	1064.5	975.19	1148.6	972.80	-84.1	2.39	0.31	31.9	307.7
	995.0	1065.1	975.17	1148.4	972.81	-83.4	2.36	0.33	31.9	307.6
	995.0	1065.8	975.14	1148.2	972.81	-82.3	2.33	0.36	31.8	307.6
	995.0	1066.5	975.12	1148.0	972.82	-81.5	2.30	0.41	31.8	307.5
	995.0	1067.3	975.09	1147.8	972.82	-80.5	2.27	0.47	31.7	307.5
	995.2	1068.2	975.05	1147.7	972.83	-79.5	2.22	0.53	31.7	307.4
	995.5	1069.6	975.01	1147.5	972.83	-77.9	2.18	0.59	31.6	307.4
1805 39	995.6	1070.5	974.97	1147.4	972.83	-76.9	2.14	0.62	31.5	307.3
	995.5	1071.3	974.94	1147.3	972.85	-76.0	2.09	0.62	31.4	307.2
	995.0	1071.8	974.93	1147.1	972.85	-75.3	2.08	0.60	31.4	307.1
	994.5	1071.7	974.92	1146.6	972.87	-74.9	2.05	0.55	31.3	307.1
	993.8	1071.8	974.91	1146.0	972.88	-74.2	2.03	0.50	31.2	307.0
	993.0	1071.7	974.91	1145.1	972.92	-73.4	1.99	0.45	31.2	306.9
	991.8	1071.0	974.93	1143.8	972.96	-72.8	1.97	0.40	31.1	306.9
	990.5	1070.3	974.95	1142.3	973.01	-72.0	1.94	0.37	31.0	306.8
1805 40	988.3	1068.3	975.02	1140.4	973.07	-72.1	1.95	0.37	31.0	306.7
	985.5	1065.7	975.10	1138.1	973.14	-72.4	1.96	0.38	30.9	306.7
	982.2	1062.5	975.20	1135.6	973.22	-73.1	1.98	0.41	30.9	306.6
	979.0	1059.3	975.30	1132.8	973.31	-73.5	1.99	0.45	30.9	306.6
	976.0	1056.4	975.40	1129.7	973.41	-73.3	1.99	0.51	30.8	306.6
	973.0	1053.2	975.51	1126.4	973.51	-73.2	2.00	0.61	30.8	306.5
	969.8	1049.7	975.62	1123.0	973.63	-73.3	1.99	0.74	30.8	306.5
	966.5	1046.2	975.73	1119.3	973.75	-73.1	1.98	0.90	30.7	306.5
1805 41	963.2	1042.7	975.85	1115.5	973.87	-72.8	1.98	1.06	30.7	306.5
	960.0	1039.2	975.97	1111.5	974.00	-72.3	1.97	1.22	30.7	306.5
	957.0	1036.0	976.07	1107.2	974.14	-71.2	1.93	1.36	30.7	306.4
	954.0	1032.6	976.18	1102.8	974.28	-70.2	1.90	1.49	30.7	306.4
	950.8	1029.4	976.29	1098.2	974.42	-68.8	1.87	1.60	30.7	306.4
	947.5	1026.0	976.40	1093.4	974.56	-67.4	1.82	1.67	30.7	306.4
	944.2	1022.5	976.51	1088.4	974.74	-65.9	1.77	1.72	30.7	306.4
	941.0	1019.4	976.62	1083.2	974.92	-63.8	1.70	1.76	30.7	306.4
1805 42	936.9	1015.3	976.75	1077.8	975.09	-62.5	1.66	1.79	30.7	306.4
	932.0	1010.6	976.91	1072.2	975.27	-61.6	1.64	1.82	30.7	306.5
	925.8	1004.0	977.13	1066.4	975.46	-62.4	1.67	1.86	30.7	306.5
	919.5	997.8	977.34	1060.4	975.66	-62.6	1.68	1.91	30.7	306.5
	912.4	990.2	977.58	1054.2	975.85	-64.0	1.73	1.98	30.8	306.5
	905.0	982.7	977.84	1048.0	976.05	-65.3	1.79	2.06	30.8	306.6
	897.0	974.6	978.11	1041.7	976.26	-67.1	1.85	2.14	30.8	306.6
	889.0	966.5	978.38	1035.4	976.46	-68.9	1.92	2.23	30.9	306.6
1805 43	881.0	958.6	978.64	1029.1	976.67	-70.5	1.97	2.31	30.9	306.6
	873.0	950.8	978.90	1022.8	976.87	-72.0	2.03	2.38	30.9	306.7
	866.7	944.6	979.11	1016.5	977.08	-71.9	2.03	2.40	30.9	306.7
	861.5	939.9	979.27	1010.1	977.27	-70.2	2.00	2.40	31.0	306.7
	858.4	937.1	979.36	1003.7	977.48	-66.6	1.88	2.37	31.0	306.8
	855.5	934.6	979.45	997.3	977.70	-62.7	1.75	2.34	31.0	306.8
	853.6	933.4	979.49	990.6	977.90	-57.4	1.59	2.32	31.1	306.8
	852.0	932.5	979.52	984.3	978.11	-51.8	1.41	2.31	31.1	306.9

1805:44 to 1805:50 CDT

CDT	ALTF	TA	P_{TA}	z	P_z	TA-z	$P_{TA}-P_z$	$\frac{1}{2}\rho TW^2$	T	T_v
h m s	ft	ft	mb	ft	mb	ft	mb	mb	°C	°K
1805 44	850.1	931.2	979.56	977.6	978.34	-46.4	1.22	2.30	31.1	306.9
	847.5	929.4	979.62	970.9	978.55	-41.5	1.07	2.31	31.1	306.9
	843.6	925.8	979.73	964.0	978.77	-38.1	0.96	2.35	31.1	306.9
	839.5	922.5	979.85	956.9	979.01	-34.4	0.84	2.41	31.1	306.9
	834.6	918.1	980.00	949.7	979.24	-31.6	0.76	2.48	31.1	306.9
	829.5	913.3	980.15	942.2	979.48	-28.9	0.67	2.57	31.1	306.9
	823.6	907.7	980.34	934.5	979.72	-26.8	0.62	2.67	31.1	306.9
	817.5	901.3	980.55	926.7	979.98	-25.4	0.57	2.79	31.1	306.9
1805 45	810.4	894.1	980.79	918.5	980.26	-24.4	0.53	2.91	31.1	306.9
	803.0	886.2	981.06	910.1	980.53	-23.9	0.53	3.05	31.1	306.8
	795.2	877.7	981.34	901.5	980.80	-23.8	0.54	3.18	31.1	306.8
	787.5	869.1	981.62	892.6	981.10	-23.5	0.52	3.30	31.0	306.8
	780.9	861.6	981.87	883.4	981.40	-21.8	0.47	3.41	31.0	306.8
	775.0	854.6	982.10	874.0	981.70	-19.4	0.40	3.51	31.0	306.7
	766.3	844.5	982.43	864.3	982.02	-19.8	0.41	3.60	30.9	306.7
	755.0	831.6	982.86	854.4	982.34	-22.8	0.52	3.65	30.9	306.7
1805 46	741.9	816.5	983.37	844.2	982.66	-27.7	0.71	3.68	30.9	306.7
	730.0	802.3	983.84	833.8	983.00	-31.5	0.84	3.69	30.9	306.6
	720.0	790.3	984.24	823.3	983.35	-33.0	0.89	3.68	30.9	306.6
	710.0	778.0	984.64	812.6	983.70	-34.6	0.94	3.65	30.8	306.6
	700.0	765.4	985.04	802.0	984.04	-35.6	1.00	3.62	30.8	306.6
	690.0	754.4	985.43	791.3	984.39	-36.9	1.04	3.57	30.8	306.6
	681.5	744.1	985.78	780.8	984.74	-36.7	1.04	3.50	30.8	306.6
	674.0	734.9	986.09	770.3	985.08	-35.4	1.01	3.42	30.8	306.6
1805 47	668.4	727.7	986.33	760.0	985.41	-32.3	0.92	3.34	30.8	306.6
	663.0	720.8	986.56	749.9	985.75	-29.1	0.81	3.26	30.8	306.6
	658.6	715.1	986.75	739.9	986.07	-24.8	0.68	3.19	30.9	306.6
	654.5	709.8	986.93	730.2	986.39	-20.4	0.54	3.13	30.9	306.6
	651.4	705.7	987.07	720.8	986.70	-15.1	0.37	3.08	30.9	306.7
	648.5	701.7	987.20	711.6	987.00	-9.9	0.20	3.05	30.9	306.7
	646.4	698.9	987.30	702.8	987.28	-3.9	0.02	3.04	31.0	306.8
	644.5	696.0	987.39	694.3	987.56	1.7	-0.17	3.04	31.0	306.8
1805 48	641.5	692.3	987.52	686.2	987.82	6.1	-0.30	3.05	31.1	306.8
	637.5	687.3	987.68	678.6	988.07	8.7	-0.39	3.07	31.1	306.9
	629.9	679.1	987.96	671.4	988.31	7.7	-0.35	3.10	31.2	306.9
	621.0	669.4	988.29	664.8	988.53	4.6	-0.24	3.13	31.2	307.0
	608.5	655.8	988.74	658.5	988.73	-2.7	0.01	3.16	31.3	307.0
	595.0	641.4	989.23	652.8	988.92	-11.4	0.31	3.20	31.3	307.1
	582.8	628.5	989.66	647.3	989.09	-18.8	0.57	3.23	31.4	307.1
	572.5	618.1	890.02	642.3	989.27	-24.2	0.75	3.26	31.4	307.2
1805 49	566.3	612.1	990.21	637.5	989.42	-25.4	0.79	3.29	31.4	307.2
	561.0	607.0	990.38	633.0	989.57	-26.0	0.81	3.29	31.5	307.2
	557.6	603.9	990.48	628.8	989.71	-24.9	0.77	3.25	31.5	307.3
	554.5	601.4	990.57	625.0	989.85	-23.6	0.74	3.13	31.5	307.3
	552.4	599.8	990.62	621.3	989.96	-21.5	0.66	2.95	31.5	307.3
	550.5	598.6	990.67	617.9	990.06	-19.3	0.61	2.78	31.6	307.3
	549.2	597.9	990.69	614.8	990.17	-16.9	0.52	2.60	31.6	307.3
	548.0	597.3	990.71	611.8	990.27	-14.5	0.44	2.43	31.6	307.3
1805 50	546.1	595.7	990.76	609.0	990.36	-13.3	0.40	2.30	31.6	307.3
	543.5	593.8	990.83	606.2	990.45	-12.4	0.39	2.24	31.6	307.3
	539.6	589.7	990.96	603.6	990.53	-13.9	0.43	2.27	31.5	307.3
	535.5	585.6	991.09	601.0	990.62	-15.4	0.47	2.37	31.5	307.3
	531.4	581.5	991.23	598.4	990.71	-16.9	0.52	2.53	31.5	307.3
	527.5	577.4	991.37	595.7	990.80	-18.3	0.57	2.74	31.5	307.2
	524.0	573.6	991.50	593.0	990.88	-19.4	0.62	2.98	31.5	307.2
	520.5	569.5	991.64	590.2	990.97	-20.7	0.67	3.23	31.4	307.2

1805:51 to 1805:57 CDT

CDT	ALTF	TA	P_{TA}	z	P_z	TA−z	$P_{TA}-P_z$	$\frac{1}{2}\rho TW^2$	T	T_v
h m s	ft	ft	mb	ft	mb	ft	mb	mb	°C	°K
1805 51	517.2	565.4	991.77	587.4	991.07	-22.0	0.70	2.47	31.4	307.1
	514.0	561.3	991.91	584.5	991.16	-23.2	0.75	3.66	31.4	307.1
	511.4	557.9	992.03	581.6	991.26	-23.7	0.77	3.82	31.3	307.1
	509.0	554.7	992.14	578.8	991.35	-24.1	0.79	3.93	31.3	307.0
	507.0	551.9	992.23	576.0	991.44	-24.1	0.79	4.01	31.2	307.0
	505.0	549.1	992.33	573.4	991.52	-24.3	0.81	4.03	31.1	306.9
	503.2	546.5	992.42	571.0	991.60	-24.5	0.82	4.02	31.1	306.9
	501.5	544.1	992.50	568.9	991.67	-24.8	0.83	3.96	31.1	306.9
1805 52	500.4	542.8	992.54	567.1	991.74	-24.3	0.80	3.87	31.0	306.8
	499.5	541.7	992.58	566.7	991.75	-25.0	0.83	3.75	30.9	306.7
	499.0	541.5	992.59	566.9	991.74	-25.4	0.85	3.61	30.9	306.6
	498.5	541.3	992.59	567.4	991.72	-26.1	0.87	3.47	30.8	306.6
	498.0	541.3	992.59	568.2	991.70	-26.9	0.89	3.33	30.8	306.5
	497.5	541.5	992.59	568.7	991.68	-27.2	0.91	3.22	30.7	306.4
	497.2	541.9	992.57	569.1	991.66	-27.2	0.91	3.14	30.6	306.4
	497.0	542.3	992.56	569.4	991.66	-27.1	0.90	3.07	30.6	306.3
1805 53	497.2	542.9	992.54	569.6	991.65	-26.7	0.89	2.99	30.5	306.3
	497.5	543.7	992.51	569.6	991.65	-25.9	0.86	2.87	30.4	306.2
	497.8	544.4	992.49	569.6	991.65	-25.2	0.84	2.71	30.4	306.1
	498.0	544.8	992.48	569.5	991.65	-24.7	0.83	2.51	30.3	306.1
	498.2	545.2	992.46	569.4	991.66	-24.2	0.80	2.27	30.3	306.0
	498.5	545.6	992.45	569.1	991.66	-23.5	0.79	2.04	30.2	306.0
	499.0	546.1	992.43	568.8	991.67	-22.7	0.76	1.83	30.2	305.9
	499.5	546.6	992.41	568.4	991.68	-21.8	0.73	1.66	30.1	305.9
1805 54	499.8	546.8	992.41	568.0	991.70	-21.2	0.71	1.55	30.1	305.9
	500.0	546.8	992.41	567.5	991.72	-20.7	0.69	1.49	30.0	305.8
	500.0	546.5	992.42	566.9	991.74	-20.4	0.68	1.49	30.0	305.8
	500.0	546.4	992.42	566.3	991.76	-19.9	0.66	1.54	30.0	305.7
	499.8	546.0	992.44	565.6	991.79	-19.6	0.65	1.61	29.9	305.7
	499.5	545.6	992.45	565.0	991.80	-19.4	0.65	1.70	29.9	305.7
	498.6	544.5	992.48	564.0	991.84	-19.5	0.64	1.80	29.9	305.7
	497.5	543.3	992.52	563.7	991.85	-20.4	0.67	1.90	29.9	305.7
1805 55	496.2	542.0	992.57	563.0	991.86	-21.0	0.71	1.97	30.0	305.7
	495.0	540.8	992.61	562.3	991.89	-21.5	0.72	2.03	30.0	305.8
	493.8	539.8	992.64	561.6	991.91	-21.8	0.73	2.10	30.2	305.9
	492.5	538.6	992.68	560.9	991.94	-22.3	0.74	2.15	30.3	306.1
	491.2	537.5	992.72	560.4	991.95	-22.9	0.77	2.20	30.5	306.2
	490.0	536.5	992.76	560.1	991.96	-23.6	0.80	2.22	30.6	306.4
	489.0	535.7	992.78	560.8	991.94	-25.1	0.84	2.22	30.8	306.6
	488.0	534.7	992.81	562.3	991.89	-27.6	0.92	2.24	30.9	306.7
1805 56	487.2	534.1	992.84	564.0	991.84	-29.9	1.00	2.25	31.1	306.9
	486.5	533.4	992.86	565.6	991.79	-32.2	1.07	2.21	31.2	307.0
	486.2	533.0	992.87	566.9	991.74	-33.9	1.13	2.15	31.4	307.2
	486.0	532.8	992.88	568.0	991.70	-35.2	1.18	2.06	31.6	307.4
	486.2	533.0	992.87	568.9	991.67	-35.9	1.20	1.99	31.8	307.6
	486.5	533.3	992.86	569.4	991.66	-36.1	1.20	1.94	31.9	307.7
	487.0	533.9	992.84	569.7	991.65	-35.8	1.19	1.89	32.1	307.9
	487.5	534.4	992.82	569.6	991.65	-35.2	1.17	1.84	32.3	308.0
1805 57	488.0	534.9	992.80	569.1	991.66	-34.2	1.14	1.81	32.4	308.2
	488.5	535.4	992.79	568.5	991.68	-33.1	1.11	1.81	32.6	308.3
	489.0	536.0	992.77	567.6	991.71	-31.6	1.06	1.84	32.7	308.5
	489.5	536.5	992.75	566.4	991.76	-29.9	0.99	1.91	32.9	308.6
	490.4	537.4	992.72	565.1	991.80	-27.7	0.92	2.01	33.1	308.8
	491.5	538.6	992.68	563.6	991.85	-25.0	0.83	2.14	33.2	309.0
	492.8	540.1	992.63	562.2	991.90	-22.1	0.73	2.32	33.4	309.1
	494.0	541.4	992.59	560.6	991.95	-19.2	0.64	2.53	33.5	309.3

1st 2nd 3rd 4th

APPENDIX 9 CURVATURES

Shown in this table are: ζ, horizontal path angle measured from x; ψ, aircraft heading measured from x; η, vertical path angle measured from X, and θ, pitch angle of aircraft. For curvatures, see Fig. 3.5 (P 31) and Fig. 3.8 (P 33).

1804:56 to 1805:01 CDT

CDT	ζ	ψ	$C_{\psi s}$	$\partial\psi/\partial s$	η	θ	$C_{\gamma s}$	$\partial\theta/\partial s$
h m s	deg	deg	radian/m	radian/m	deg	deg	radian/m	radian/m
1804 56	-2.42	-5.94	0.000146	0.000092	-3.57	4.40	0.000005	-0.000000
	-2.33	-5.89	0.000146	0.000089	-3.56	4.40	0.000004	-0.000003
	-2.23	-5.84	0.000147	0.000097	-3.56	4.40	0.000003	-0.000016
	-2.14	-5.79	0.000148	0.000105	-3.56	4.40	0.000004	-0.000024
	-2.05	-5.72	0.000150	0.000110	-3.56	4.38	0.000005	-0.000027
	-1.95	-5.64	0.000151	0.000113	-3.56	4.35	0.000007	-0.000025
	-1.86	-5.56	0.000152	0.000118	-3.55	4.32	0.000009	-0.000021
	-1.76	-5.49	0.000152	0.000126	-3.55	4.30	0.000009	-0.000021
1804 57	-1.66	-5.42	0.000151	0.000135	-3.54	4.30	0.000009	-0.000024
	-1.57	-5.34	0.000150	0.000144	-3.53	4.30	0.000009	-0.000030
	-1.47	-5.24	0.000149	0.000150	-3.52	4.28	0.000009	-0.000031
	-1.38	-5.14	0.000148	0.000153	-3.52	4.25	0.000008	-0.000027
	-1.29	-5.04	0.000145	0.000160	-3.51	4.22	0.000006	-0.000021
	-1.19	-4.94	0.000142	0.000174	-3.51	4.20	0.000005	-0.000014
	-1.10	-4.84	0.000138	0.000194	-3.50	4.20	0.000004	-0.000011
	-1.01	-4.74	0.000132	0.000217	-3.50	4.20	0.000004	-0.000015
1804 58	-0.93	-4.60	0.000126	0.000234	-3.50	4.20	0.000007	-0.000021
	-0.85	-4.44	0.000119	0.000242	-3.50	4.20	0.000010	-0.000027
	-0.78	-4.26	0.000112	0.000245	-3.49	4.18	0.000013	-0.000030
	-0.71	-4.09	0.000104	0.000243	-3.48	4.15	0.000015	-0.000026
	-0.65	-3.94	0.000097	0.000242	-3.47	4.12	0.000017	-0.000020
	-0.59	-3.79	0.000089	0.000242	-3.46	4.10	0.000017	-0.000013
	-0.53	-3.64	0.000082	0.000242	-3.45	4.10	0.000016	-0.000008
	-0.49	-3.49	0.000076	0.000242	-3.43	4.10	0.000014	-0.000006
1804 59	-0.44	-3.34	0.000070	0.000239	-3.42	4.10	0.000010	-0.000004
	-0.40	-3.19	0.000066	0.000233	-3.42	4.10	0.000006	-0.000003
	-0.36	-3.04	0.000063	0.000225	-3.41	4.10	0.000001	-0.000004
	-0.33	-2.89	0.000062	0.000217	-3.41	4.10	-0.000003	-0.000010
	-0.29	-2.76	0.000061	0.000209	-3.42	4.10	-0.000007	-0.000017
	-0.25	-2.64	0.000061	0.000200	-3.42	4.10	-0.000011	-0.000025
	-0.22	-2.52	0.000062	0.000187	-3.43	4.08	-0.000014	-0.000028
	-0.18	-2.39	0.000064	0.000172	-3.44	4.05	-0.000017	-0.000028
1805 00	-0.14	-2.28	0.000066	0.000159	-3.45	4.02	-0.000018	-0.000019
	-0.10	-2.19	0.000070	0.000153	-3.47	4.00	-0.000020	-0.000013
	-0.06	-2.12	0.000074	0.000153	-3.48	4.00	-0.000021	-0.000008
	-0.01	-2.04	0.000079	0.000156	-3.49	4.00	-0.000023	-0.000006
	0.04	-1.94	0.000084	0.000158	-3.51	4.00	-0.000024	-0.000004
	0.09	-1.84	0.000090	0.000159	-3.52	4.00	-0.000025	-0.000003
	0.15	-1.74	0.000095	0.000160	-3.54	4.00	-0.000025	-0.000002
	0.21	-1.64	0.000098	0.000160	-3.56	4.00	-0.000023	-0.000001
1805 01	0.28	-1.54	0.000102	0.000158	-3.57	4.00	-0.000021	-0.000001
	0.34	-1.44	0.000104	0.000153	-3.59	4.00	-0.000018	-0.000001
	0.41	-1.34	0.000105	0.000142	-3.60	4.00	-0.000014	-0.000000
	0.48	-1.24	0.000106	0.000128	-3.61	4.00	-0.000008	-0.000000
	0.54	-1.16	0.000106	0.000115	-3.61	4.00	-0.000002	-0.000000
	0.61	-1.09	0.000104	0.000104	-3.61	4.00	0.000004	-0.000000
	0.68	-1.04	0.000102	0.000098	-3.61	4.00	0.000009	-0.000000
	0.74	-0.99	0.000099	0.000099	-3.60	4.00	0.000012	-0.000000

1805:02 to 1805:08 CDT

CDT	ζ	ψ	C_{res}	$\partial\psi/\partial s$	η	θ	C_{veg}	$\partial\theta/\partial s$
h m s	deg	deg	radian/m	radian/m	deg	deg	radian/m	radian/m
1805 02	0.80	-0.94	0.000095	0.000104	-3.59	4.00	0.000015	-0.000000
	0.86	-0.89	0.000091	0.000110	-3.58	4.00	0.000017	-0.000000
	0.92	-0.82	0.000087	0.000112	-3.56	4.00	0.000018	-0.000000
	0.97	-0.74	0.000084	0.000108	-3.55	4.00	0.000019	-0.000000
	1.02	-0.66	0.000081	0.000104	-3.54	4.00	0.000020	-0.000000
	1.07	-0.59	0.000078	0.000103	-3.52	4.00	0.000020	-0.000000
	1.12	-0.54	0.000075	0.000109	-3.51	4.00	0.000021	-0.000000
	1.16	-0.49	0.000073	0.000120	-3.50	4.00	0.000023	-0.000000
1805 03	1.21	-0.42	0.000072	0.000129	-3.49	4.00	0.000027	-0.000000
	1.25	-0.34	0.000073	0.000132	-3.47	4.00	0.000032	-0.000000
	1.29	-0.24	0.000074	0.000132	-3.45	4.00	0.000037	-0.000000
	1.33	-0.14	0.000075	0.000128	-3.43	4.00	0.000042	-0.000000
	1.38	-0.06	0.000076	0.000128	-3.40	4.00	0.000045	-0.000000
	1.43	0.01	0.000076	0.000133	-3.37	4.00	0.000045	-0.000000
	1.48	0.08	0.000076	0.000140	-3.34	4.00	0.000044	-0.000000
	1.53	0.16	0.000077	0.000148	-3.31	4.00	0.000042	-0.000000
1805 04	1.57	0.26	0.000079	0.000153	-3.28	4.00	0.000041	-0.000000
	1.62	0.36	0.000080	0.000156	-3.26	4.00	0.000040	-0.000000
	1.67	0.46	0.000080	0.000158	-3.23	4.00	0.000040	-0.000000
	1.72	0.56	0.000080	0.000159	-3.21	4.00	0.000041	-0.000000
	1.77	0.66	0.000078	0.000160	-3.18	4.00	0.000042	-0.000000
	1.82	0.76	0.000077	0.000161	-3.16	4.00	0.000045	-0.000000
	1.87	0.86	0.000076	0.000159	-3.13	4.00	0.000048	-0.000002
	1.91	0.96	0.000076	0.000153	-3.10	4.00	0.000050	-0.000008
1805 05	1.96	1.06	0.000076	0.000143	-3.07	4.00	0.000050	-0.000017
	2.00	1.16	0.000076	0.000129	-3.03	4.00	0.000047	-0.000025
	2.05	1.24	0.000076	0.000115	-3.00	3.93	0.000043	-0.000030
	2.10	1.31	0.000076	0.000104	-2.97	3.95	0.000035	-0.000033
	2.15	1.36	0.000076	0.000098	-2.95	3.92	0.000030	-0.000038
	2.19	1.41	0.000077	0.000100	-2.93	3.90	0.000026	-0.000046
	2.24	1.46	0.000079	0.000105	-2.92	3.85	0.000025	-0.000055
	2.28	1.51	0.000082	0.000111	-2.91	3.85	0.000028	-0.000064
1805 06	2.33	1.58	0.000066	0.000110	-2.90	3.80	0.000032	-0.000070
	2.39	1.66	0.000089	0.000100	-2.88	3.75	0.000036	-0.000073
	2.44	1.74	0.000090	0.000085	-2.86	3.70	0.000039	-0.000076
	2.50	1.81	0.000090	0.000070	-2.83	3.65	0.000038	-0.000078
	2.56	1.84	0.000089	0.000062	-2.80	3.60	0.000037	-0.000079
	2.62	1.86	0.000087	0.000062	-2.78	3.55	0.000035	-0.000080
	2.67	1.88	0.000085	0.000066	-2.76	3.50	0.000031	-0.000080
	2.72	1.91	0.000085	0.000071	-2.74	3.45	0.000027	-0.000081
1805 07	2.77	1.96	0.000087	0.000075	-2.72	3.40	0.000020	-0.000081
	2.82	2.01	0.000089	0.000077	-2.70	3.35	0.000013	-0.000081
	2.87	2.06	0.000092	0.000078	-2.70	3.30	0.000006	-0.000081
	2.93	2.11	0.000093	0.000079	-2.69	3.25	0.000000	-0.000081
	2.99	2.16	0.000092	0.000080	-2.70	3.20	-0.000003	-0.000081
	3.05	2.21	0.000091	0.000080	-2.71	3.15	-0.000005	-0.000081
	3.11	2.26	0.000090	0.000081	-2.71	3.10	-0.000005	-0.000079
	3.16	2.31	0.000090	0.000081	-2.72	3.05	-0.000006	-0.000073
1805 08	3.21	2.36	0.000090	0.000083	-2.72	3.00	-0.000007	-0.000065
	3.27	2.41	0.000091	0.000090	-2.73	2.95	-0.000010	-0.000057
	3.32	2.46	0.000091	0.000098	-2.73	2.92	-0.000011	-0.000051
	3.38	2.51	0.000090	0.000106	-2.74	2.90	-0.000012	-0.000048
	3.44	2.56	0.000089	0.000109	-2.75	2.88	-0.000011	-0.000046
	3.49	2.66	0.000088	0.000106	-2.76	2.85	-0.000010	-0.000044
	3.55	2.74	0.000086	0.000101	-2.76	2.82	-0.000008	-0.000045
	3.60	2.81	0.000083	0.000094	-2.77	2.80	-0.000006	-0.000051

1805:09 to 1805:15 CDT

CDT	ζ	ψ	C_{xs}	$\partial\psi/\partial s$	η	θ	C_{ys}	$\partial\theta/\partial s$
h m s	deg	deg	radian/m	radian/m	deg	deg	radian/m	radian/m
1805 09	3.65	2.86	0.000079	0.000090	-2.77	2.70	-0.000004	-0.000058
	3.70	2.91	0.000073	0.000087	-2.77	2.75	-0.000001	-0.000066
	3.74	2.96	0.000068	0.000085	-2.77	2.70	0.000003	-0.000072
	3.79	3.01	0.000061	0.000084	-2.77	2.65	0.000008	-0.000075
	3.82	3.06	0.000054	0.000083	-2.77	2.60	0.000013	-0.000077
	3.86	3.11	0.000047	0.000083	-2.76	2.55	0.000016	-0.000078
	3.88	3.16	0.000040	0.000082	-2.75	2.50	0.000017	-0.000079
	3.91	3.21	0.000033	0.000082	-2.73	2.45	0.000018	-0.000080
1805 10	3.93	3.26	0.000026	0.000082	-2.72	2.40	0.000018	-0.000081
	3.94	3.31	0.000019	0.000082	-2.71	2.35	0.000018	-0.000081
	3.95	3.36	0.000012	0.000084	-2.70	2.30	0.000018	-0.000081
	3.96	3.41	0.000004	0.000090	-2.68	2.25	0.000017	-0.000081
	3.96	3.46	-0.000003	0.000096	-2.67	2.20	0.000015	-0.000081
	3.95	3.51	-0.000010	0.000098	-2.66	2.15	0.000013	-0.000081
	3.95	3.56	-0.000016	0.000093	-2.65	2.10	0.000009	-0.000081
	3.93	3.66	-0.000021	0.000082	-2.65	2.05	0.000006	-0.000081
1805 11	3.92	3.72	-0.000024	0.000070	-2.64	2.00	0.000001	-0.000081
	3.90	3.76	-0.000026	0.000060	-2.64	1.95	-0.000003	-0.000081
	3.88	3.78	-0.000029	0.000054	-2.65	1.90	-0.000007	-0.000081
	3.86	3.81	-0.000032	0.000050	-2.65	1.85	-0.000009	-0.000081
	3.84	3.84	-0.000036	0.000047	-2.66	1.80	-0.000012	-0.000081
	3.82	3.86	-0.000040	0.000045	-2.67	1.75	-0.000015	-0.000081
	3.79	3.88	-0.000045	0.000043	-2.68	1.70	-0.000022	-0.000081
	3.76	3.91	-0.000048	0.000042	-2.69	1.65	-0.000035	-0.000081
1805 12	3.73	3.94	-0.000050	0.000044	-2.71	1.60	-0.000055	-0.000081
	3.69	3.96	-0.000051	0.000050	-2.73	1.55	-0.000083	-0.000081
	3.66	3.98	-0.000052	0.000056	-2.78	1.50	-0.000117	-0.000074
	3.63	4.01	-0.000051	0.000057	-2.85	1.45	-0.000152	-0.000056
	3.59	4.06	-0.000048	0.000055	-2.95	1.40	-0.000184	-0.000024
	3.56	4.11	-0.000046	0.000050	-3.07	1.35	-0.000208	0.000019
	3.53	4.14	-0.000043	0.000046	-3.22	1.36	-0.000222	0.000060
	3.50	4.16	-0.000041	0.000045	-3.38	1.40	-0.000224	0.000094
1805 13	3.47	4.18	-0.000039	0.000041	-3.54	1.50	-0.000215	0.000120
	3.45	4.21	-0.000038	0.000034	-3.69	1.60	-0.000185	0.000141
	3.42	4.24	-0.000037	0.000023	-3.82	1.70	-0.000165	0.000162
	3.40	4.26	-0.000037	0.000008	-3.93	1.80	-0.000131	0.000183
	3.38	4.26	-0.000037	-0.000008	-4.01	1.92	-0.000095	0.000199
	3.35	4.26	-0.000036	-0.000026	-4.06	2.05	-0.000061	0.000207
	3.32	4.24	-0.000033	-0.000042	-4.09	2.20	-0.000027	0.000212
	3.30	4.21	-0.000031	-0.000055	-4.09	2.35	0.000009	0.000216
1805 14	3.28	4.16	-0.000029	-0.000065	-4.08	2.45	0.000049	0.000223
	3.26	4.11	-0.000027	-0.000070	-4.04	2.60	0.000091	0.000231
	3.25	4.06	-0.000025	-0.000074	-3.98	2.74	0.000123	0.000227
	3.23	4.01	-0.000022	-0.000077	-3.89	2.90	0.000156	0.000205
	3.22	3.96	-0.000018	-0.000078	-3.78	3.06	0.000173	0.000172
	3.21	3.91	-0.000016	-0.000080	-3.63	3.20	0.000161	0.000134
	3.20	3.86	-0.000015	-0.000080	-3.50	3.26	0.000181	0.000102
	3.19	3.81	-0.000013	-0.000081	-3.38	3.30	0.000174	0.000076
1805 15	3.18	3.76	-0.000012	-0.000081	-3.26	3.32	0.000162	0.000048
	3.18	3.71	-0.000010	-0.000082	-3.16	3.35	0.000144	0.000018
	3.17	3.66	-0.000008	-0.000082	-3.06	3.36	0.000123	-0.000010
	3.16	3.61	-0.000008	-0.000082	-2.93	3.35	0.000102	-0.000034
	3.15	3.56	-0.000010	-0.000080	-2.93	3.30	0.000086	-0.000046
	3.14	3.51	-0.000015	-0.000073	-2.89	3.25	0.000076	-0.000043
	3.13	3.46	-0.000021	-0.000063	-2.86	3.20	0.000070	-0.000032
	3.13	3.41	-0.000026	-0.000048	-2.83	3.15	0.000065	-0.000014

1805:16 to 1805:22 CDT

CDT	ζ	ψ	C_{meas}	∂Ψ/∂S	η	θ	C_{vts}	∂θ/∂S
h m s	deg	deg	radian/m	radian/m	deg	deg	radian/m	radian/m
1805 16	3.12	3.38	-0.000030	-0.000035	-2.80	3.14	0.000051	0.000002
	3.09	3.36	-0.000031	-0.000023	-2.76	3.15	0.000022	0.000015
	3.07	3.36	-0.000029	-0.000018	-2.73	3.18	-0.000027	0.000026
	3.04	3.36	-0.000025	-0.000019	-2.72	3.20	-0.000094	0.000038
	3.02	3.36	-0.000019	-0.000029	-2.76	3.22	-0.000169	0.000053
	3.00	3.36	-0.000012	-0.000047	-2.87	3.25	-0.000245	0.000070
	2.99	3.34	-0.000008	-0.000068	-3.04	3.30	-0.000305	0.000093
	2.99	3.31	-0.000007	-0.000087	-3.26	3.35	-0.000343	0.000124
1805 17	2.99	3.24	-0.000010	-0.000100	-3.52	3.42	-0.000354	0.000166
	2.98	3.16	-0.000016	-0.000108	-3.79	3.50	-0.000338	0.000215
	2.97	3.08	-0.000024	-0.000118	-4.03	3.64	-0.000298	0.000271
	2.95	3.01	-0.000032	-0.000135	-4.25	3.80	-0.000227	0.000333
	2.93	2.94	-0.000041	-0.000152	-4.41	4.02	-0.000162	0.000399
	2.90	2.86	-0.000050	-0.000164	-4.51	4.25	-0.000075	0.000461
	2.86	2.74	-0.000059	-0.000166	-4.55	4.56	0.000013	0.000510
	2.82	2.61	-0.000068	-0.000159	-4.52	4.90	0.000096	0.000542
1805 18	2.77	2.50	-0.000077	-0.000150	-4.43	5.28	0.000167	0.000556
	2.72	2.41	-0.000086	-0.000143	-4.29	5.65	0.000218	0.000552
	2.66	2.34	-0.000093	-0.000134	-4.12	6.00	0.000251	0.000528
	2.60	2.26	-0.000099	-0.000125	-3.92	6.35	0.000268	0.000478
	2.53	2.18	-0.000104	-0.000117	-3.73	6.65	0.000274	0.000409
	2.46	2.11	-0.000108	-0.000113	-3.54	6.95	0.000272	0.000326
	2.39	2.06	-0.000114	-0.000115	-3.37	7.13	0.000262	0.000252
	2.32	2.01	-0.000122	-0.000120	-3.21	7.25	0.000242	0.000190
1805 19	2.25	1.94	-0.000132	-0.000113	-3.05	7.30	0.000210	0.000145
	2.17	1.86	-0.000143	-0.000107	-2.92	7.35	0.000169	0.000119
	2.08	1.78	-0.000153	-0.000091	-2.81	7.38	0.000126	0.000113
	1.98	1.71	-0.000161	-0.000074	-2.74	7.40	0.000088	0.000120
	1.88	1.68	-0.000169	-0.000063	-2.71	7.44	0.000060	0.000153
	1.77	1.66	-0.000178	-0.000057	-2.70	7.50	0.000043	0.000189
	1.65	1.64	-0.000188	-0.000053	-2.70	7.62	0.000030	0.000225
	1.55	1.61	-0.000197	-0.000050	-2.70	7.75	0.000020	0.000258
1805 20	1.43	1.58	-0.000204	-0.000048	-2.69	7.92	0.000010	0.000288
	1.30	1.56	-0.000208	-0.000046	-2.69	8.10	0.000004	0.000315
	1.17	1.54	-0.000209	-0.000043	-2.70	8.30	0.000004	0.000336
	1.04	1.51	-0.000206	-0.000036	-2.70	8.50	0.000012	0.000347
	0.92	1.48	-0.000208	-0.000027	-2.71	8.72	0.000027	0.000351
	0.80	1.46	-0.000208	-0.000018	-2.70	8.95	0.000047	0.000351
	0.67	1.46	-0.000207	-0.000014	-2.68	9.16	0.000072	0.000351
	0.55	1.46	-0.000205	-0.000017	-2.64	9.35	0.000102	0.000352
1805 21	0.43	1.46	-0.000198	-0.000020	-2.58	9.54	0.000133	0.000347
	0.31	1.46	-0.000188	-0.000040	-2.50	9.75	0.000162	0.000335
	0.20	1.44	-0.000177	-0.000056	-2.40	9.96	0.000180	0.000318
	0.09	1.41	-0.000165	-0.000075	-2.27	10.15	0.000185	0.000301
	-0.00	1.38	-0.000153	-0.000095	-2.15	10.30	0.000175	0.000284
	-0.09	1.31	-0.000141	-0.000115	-2.02	10.45	0.000151	0.000264
	-0.17	1.24	-0.000128	-0.000134	-1.92	10.60	0.000123	0.000237
	-0.24	1.16	-0.000117	-0.000150	-1.85	10.75	0.000093	0.000202
1805 22	-0.30	1.06	-0.000107	-0.000160	-1.80	10.86	0.000072	0.000167
	-0.36	0.96	-0.000098	-0.000167	-1.76	10.95	0.000065	0.000134
	-0.41	0.86	-0.000091	-0.000172	-1.77	11.00	0.000073	0.000107
	-0.46	0.76	-0.000083	-0.000175	-1.75	11.05	0.000091	0.000087
	-0.51	0.66	-0.000073	-0.000178	-1.72	11.08	0.000104	0.000073
	-0.55	0.56	-0.000063	-0.000179	-1.66	11.10	0.000099	0.000064
	-0.58	0.46	-0.000055	-0.000181	-1.57	11.12	0.000078	0.000058
	-0.61	0.36	-0.000050	-0.000182	-1.50	11.15	0.000050	0.000054

1805:23 to 1805:29 CDT

CDT	ζ	ψ	$C_{\psi\psi s}$	$\partial\psi/\partial s$	η	θ	$C_{\theta\theta s}$	$\partial\theta/\partial s$
h m s	deg	deg	radian/m	radian/m	deg	deg	radian/m	radian/m
1805 23	-0.63	0.26	-0.000048	-0.000180	-1.47	11.18	0.000036	0.000052
	-0.65	0.16	-0.000047	-0.000174	-1.47	11.20	0.000047	0.000050
	-0.67	0.06	-0.000043	-0.000162	-1.49	11.22	0.000077	0.000046
	-0.70	-0.04	-0.000035	-0.000147	-1.47	11.25	0.000119	0.000038
	-0.72	-0.12	-0.000022	-0.000134	-1.41	11.28	0.000155	0.000028
	-0.74	-0.19	-0.000006	-0.000129	-1.32	11.30	0.000181	0.000019
	-0.74	-0.24	0.000008	-0.000127	-1.20	11.30	0.000191	0.000012
	-0.73	-0.29	0.000020	-0.000124	-1.07	11.30	0.000181	0.000008
1805 24	-0.71	-0.36	0.000028	-0.000115	-0.94	11.30	0.000148	0.000006
	-0.69	-0.44	0.000031	-0.000099	-0.84	11.30	0.000092	0.000004
	-0.66	-0.50	0.000031	-0.000087	-0.76	11.30	0.000021	0.000003
	-0.64	-0.54	0.000027	-0.000082	-0.74	11.30	-0.000056	0.000002
	-0.62	-0.56	0.000020	-0.000083	-0.78	11.30	-0.000123	0.000001
	-0.60	-0.59	0.000009	-0.000088	-0.88	11.30	-0.000173	0.000001
	-0.60	-0.64	-0.000005	-0.000091	-1.01	11.30	-0.000211	0.000001
	-0.60	-0.69	-0.000020	-0.000092	-1.16	11.30	000246	0.000000
1805 25	-0.61	-0.74	-0.000034	-0.000093	-1.30	11.30	000287	0.000003
	-0.63	-0.79	-0.000047	-0.000094	-1.45	11.30	-0.000334	0.000010
	-0.65	-0.84	-0.000058	-0.000095	-1.62	11.30	-0.000373	0.000028
	-0.69	-0.89	-0.000067	-0.000095	-1.84	11.30	-0.000399	0.000059
	-0.73	-0.94	-0.000076	-0.000093	-2.08	11.32	-0.000408	0.000101
	-0.77	-0.99	-0.000085	-0.000086	-2.32	11.35	-0.000404	0.000148
	-0.81	-1.04	-0.000095	-0.000074	-2.55	11.44	-0.000395	0.000193
	-0.86	-1.09	-0.000106	-0.000057	-2.76	11.55	-0.000379	0.000233
1805 26	-0.92	-1.12	-0.000116	-0.000041	-2.96	11.70	-0.000355	0.000266
	-0.98	-1.14	-0.000127	-0.000027	-3.15	11.85	-0.000321	0.000289
	-1.05	-1.14	-0.000139	-0.000018	-3.32	12.02	-0.000281	0.000306
	-1.12	-1.14	-0.000150	-0.000012	-3.47	12.20	-0.000238	0.000317
	-1.20	-1.14	-0.000160	-0.000011	-3.59	12.38	-0.000199	0.000327
	-1.29	-1.14	-0.000171	-0.000016	-3.67	12.55	-0.000166	0.000339
	-1.38	-1.14	-0.000183	-0.000025	-3.74	12.72	-0.000138	0.000355
	-1.47	-1.14	-0.000195	-0.000042	-3.79	12.90	-0.000116	0.000375
1805 27	-1.57	-1.16	-0.000205	-0.000058	-3.84	13.10	-0.000101	0.000393
	-1.68	-1.19	-0.000214	-0.000071	-3.89	13.30	-0.000094	0.000407
	-1.80	-1.24	-0.000218	-0.000080	-3.91	13.52	-0.000096	0.000416
	-1.92	-1.29	-0.000218	-0.000085	-3.95	13.75	-0.000105	0.000383
	-2.03	-1.34	-0.000217	-0.000089	-3.99	13.98	-0.000115	0.000343
	-2.15	-1.39	-0.000214	-0.000092	-4.05	14.20	-0.000123	0.000292
	-2.26	-1.44	-0.000213	-0.000094	-4.12	14.34	-0.000124	0.000254
	-2.37	-1.49	-0.000215	-0.000095	-4.19	14.45	-0.000116	0.000235
1805 28	-2.47	-1.54	-0.000220	-0.000096	-4.26	14.52	-0.000103	0.000231
	-2.58	-1.59	-0.000229	-0.000096	-4.32	14.60	-0.000087	0.000236
	-2.70	-1.64	-0.000244	-0.000097	-4.37	14.72	-0.000071	0.000220
	-2.82	-1.69	-0.000268	-0.000097	-4.40	14.85	-0.000057	0.000219
	-2.95	-1.74	-0.000299	-0.000094	-4.42	14.98	-0.000038	0.000198
	-3.10	-1.79	-0.000334	-0.000087	-4.44	15.10	-0.000011	0.000172
	-3.27	-1.84	-0.000368	-0.000077	-4.45	15.18	0.000022	0.000149
	-3.47	-1.89	-0.000398	-0.000067	-4.45	15.25	0.000059	0.000132
1805 29	-3.69	-1.92	-0.000422	-0.000064	-4.41	15.30	0.000087	0.000120
	-3.93	-1.94	-0.000437	-0.000067	-4.35	15.35	0.000101	0.000113
	-4.17	-1.96	-0.000447	-0.000074	-4.27	15.40	0.000101	0.000105
	-4.41	-1.99	-0.000453	-0.000082	-4.19	15.45	0.000090	0.000094
	-4.66	-2.04	-0.000456	-0.000090	-4.13	15.50	0.000079	0.000079
	-4.90	-2.09	-0.000459	-0.000100	-4.09	15.55	0.000074	0.000060
	-5.14	-2.14	-0.000463	-0.000112	-4.06	15.58	0.000078	0.000040
	-5.39	-2.19	-0.000468	-0.000123	-4.03	15.60	0.000095	0.000019

1805:30 to 1805:36 CDT

C D T	ζ	ψ	C_{roll}	$\partial\psi/\partial s$	η	θ	C_{yaw}	$\partial\theta/\partial s$
h m s	deg	deg	radian/m	radian/m	deg	deg	radian/m	radian/m
1805 30	-5.63	-2.26	-0.000471	-0.000127	-4.00	15.60	0.000117	-0.000001
	-5.88	-2.34	-0.000471	-0.000124	-3.95	15.60	0.000136	-0.000016
	-6.13	-2.42	-0.000467	-0.000121	-3.86	15.58	0.000147	-0.000027
	-6.38	-2.49	-0.000463	-0.000120	-3.77	15.55	0.000150	-0.000034
	-6.63	-2.54	-0.000460	-0.000127	-3.68	15.52	0.000151	-0.000041
	-6.87	-2.59	-0.000458	-0.000141	-3.60	15.50	0.000151	-0.000052
	-7.11	-2.66	-0.000455	-0.000155	-3.52	15.48	0.000151	-0.000061
	-7.36	-2.74	-0.000448	-0.000167	-3.44	15.45	0.000152	-0.000064
1805 31	-7.60	-2.84	-0.000439	-0.000175	-3.35	15.40	0.000159	-0.000062
	-7.84	-2.94	-0.000428	-0.000180	-3.28	15.35	0.000176	-0.000057
	-8.06	-3.04	-0.000416	-0.000186	-3.20	15.32	0.000198	-0.000056
	-8.28	-3.14	-0.000402	-0.000195	-3.10	15.30	0.000219	-0.000062
	-8.49	-3.24	-0.000386	-0.000212	-2.98	15.28	0.000231	-0.000073
	-8.70	-3.34	-0.000367	-0.000237	-2.84	15.25	0.000234	-0.000089
	-8.89	-3.46	-0.000347	-0.000268	-2.71	15.20	0.000230	-0.000107
	-9.08	-3.59	-0.000328	-0.000305	-2.58	15.15	0.000240	-0.000128
1805 32	-9.24	-3.76	-0.000310	-0.000340	-2.46	15.08	0.000253	-0.000144
	-9.40	-3.94	-0.000292	-0.000369	-2.34	15.00	0.000272	-0.000151
	-9.56	-4.16	-0.000275	-0.000388	-2.20	14.90	0.000289	-0.000155
	-9.70	-4.39	-0.000260	-0.000400	-2.05	14.80	0.000298	-0.000159
	-9.83	-4.62	-0.000245	-0.000409	-1.83	14.72	0.000290	-0.000172
	-9.95	-4.84	-0.000228	-0.000415	-1.71	14.65	0.000260	-0.000196
	-10.07	-5.06	-0.000206	-0.000418	-1.55	14.56	0.000213	-0.000221
	-10.18	-5.29	-0.000181	-0.000421	-1.42	14.45	0.000151	-0.000244
1805 33	-10.28	-5.52	-0.000158	-0.000425	-1.34	14.30	0.000079	-0.000257
	-10.35	-5.74	-0.000139	-0.000434	-1.30	14.15	-0.000004	-0.000259
	-10.41	-5.96	-0.000128	-0.000439	-1.31	14.00	-0.000095	-0.000250
	-10.47	-6.19	-0.000128	-0.000434	-1.37	13.85	-0.000191	-0.000230
	-10.52	-6.44	-0.000135	-0.000417	-1.48	13.72	-0.000271	-0.000205
	-10.58	-6.69	-0.000146	-0.000387	-1.65	13.60	-0.000324	-0.000176
	-10.65	-6.90	-0.000153	-0.000358	-1.87	13.52	-0.000343	-0.000149
	-10.75	-7.09	-0.000155	-0.000334	-2.11	13.45	-0.000334	-0.000124
1805 34	-10.84	-7.24	-0.000152	-0.000311	-2.32	13.40	-0.000316	-0.000096
	-10.93	-7.39	-0.000145	-0.000286	-2.50	13.35	-0.000299	-0.000064
	-11.01	-7.54	-0.000140	-0.000255	-2.64	13.32	-0.000294	-0.000027
	-11.08	-7.69	-0.000136	-0.000216	-2.77	13.30	-0.000302	0.000015
	-11.16	-7.80	-0.000135	-0.000181	-2.91	13.32	-0.000315	0.000055
	-11.22	-7.89	-0.000137	-0.000153	-3.06	13.35	-0.000326	0.000093
	-11.29	-7.94	-0.000141	-0.000133	-3.23	13.42	-0.000322	0.000129
	-11.37	-7.99	-0.000148	-0.000121	-3.41	13.50	-0.000294	0.000166
1805 35	-11.44	-8.04	-0.000154	-0.000112	-3.59	13.60	-0.000236	0.000201
	-11.53	-8.09	-0.000153	-0.000106	-3.74	13.70	-0.000145	0.000230
	-11.62	-8.14	-0.000138	-0.000102	-3.84	13.84	-0.000030	0.000242
	-11.71	-8.19	-0.000101	-0.000100	-3.87	14.00	0.000104	0.000232
	-11.79	-8.24	-0.000044	-0.000103	-3.81	14.16	0.000235	0.000207
	-11.84	-8.29	0.000031	-0.000116	-3.66	14.30	0.000352	0.000169
	-11.84	-8.34	0.000118	-0.000140	-3.43	14.38	0.000445	0.000128
	-11.78	-8.39	0.000215	-0.000172	-3.15	14.45	0.000508	0.000086
1805 36	-11.67	-8.48	0.000312	-0.000198	-2.83	14.48	0.000539	0.000044
	-11.50	-8.59	0.000404	-0.000209	-2.50	14.50	0.000533	0.000005
	-11.27	-8.74	0.000482	-0.000203	-2.17	14.48	0.000491	-0.000031
	-10.99	-8.89	0.000539	-0.000181	-1.87	14.45	0.000421	-0.000068
	-10.66	-9.00	0.000577	-0.000149	-1.62	14.40	0.000346	-0.000113
	-10.32	-9.09	0.000605	-0.000107	-1.45	14.35	0.000284	-0.000170
	-9.99	-9.14	0.000629	-0.000048	-1.34	14.26	0.000250	-0.000232
	-9.65	-9.19	0.000650	0.000031	-1.26	14.15	0.000246	-0.000296

1805:37 to 1805:43 CDT

CDT	ζ	ψ	C_{HOR}	$\partial\Psi/\partial S$	η	θ	C_{VER}	$\partial\theta/\partial S$
h m s	deg	deg	radian/m	radian/m	deg	deg	radian/m	radian/m
1805 37	-9.30	-9.18	0.000662	0.000125	-1.18	13.96	0.000255	-0.000343
	-8.94	-9.14	0.000663	0.000230	-1.07	13.75	0.000265	-0.000367
	-8.57	-8.98	0.000649	0.000329	-0.93	13.50	0.000261	-0.000389
	-8.21	-8.79	0.000616	0.000417	-0.77	13.25	0.000236	-0.000428
	-7.87	-8.50	0.000569	0.000485	-0.62	13.04	0.000195	-0.000498
	-7.57	-8.19	0.000514	0.000527	-0.49	12.85	0.000142	-0.000595
	-7.30	-7.84	0.000456	0.000546	-0.41	12.55	0.000094	-0.000685
	-7.08	-7.49	0.000401	0.000545	-0.38	12.15	0.000059	-0.000754
1805 38	-6.90	-7.16	0.000350	0.000526	-0.38	11.64	0.000042	-0.000800
	-6.74	-6.84	0.000303	0.000493	-0.39	11.15	0.000045	-0.000835
	-6.61	-6.56	0.000257	0.000449	-0.40	10.68	0.000058	-0.000879
	-6.50	-6.29	0.000215	0.000396	-0.38	10.20	0.000075	-0.000941
	-6.41	-6.08	0.000177	0.000341	-0.34	9.68	0.000077	-0.001009
	-6.34	-5.89	0.000144	0.000287	-0.29	9.15	0.000053	-0.001077
	-6.30	-5.76	0.000120	0.000238	-0.22	8.53	-0.000009	-0.001125
	-6.27	-5.64	0.000105	0.000195	-0.18	7.85	-0.000113	-0.001143
1805 39	-6.25	-5.56	0.000097	0.000160	-0.20	7.14	-0.000249	-0.001136
	-6.23	-5.49	0.000094	0.000129	-0.32	6.45	-0.000405	-0.001110
	-6.21	-5.44	0.000089	0.000098	-0.55	5.82	-0.000557	-0.001073
	-6.17	-5.39	0.000083	0.000065	-0.90	5.20	-0.000691	-0.001024
	-6.14	-5.36	0.000074	0.000027	-1.36	4.62	-0.000794	-0.000959
	-6.10	-5.34	0.000062	-0.000019	-1.89	4.05	-0.000863	-0.000879
	-6.08	-5.36	0.000050	-0.000065	-2.45	3.56	-0.000899	-0.000793
	-6.07	-5.39	0.000040	-0.000109	-3.03	3.10	-0.000903	-0.000703
1805 40	-6.06	-5.48	0.000031	-0.000140	-3.60	2.74	-0.000876	-0.000610
	-6.06	-5.58	0.000024	-0.000157	-4.14	2.40	-0.000821	-0.000515
	-6.07	-5.72	0.000014	-0.000165	-4.65	2.14	-0.000751	-0.000418
	-6.07	-5.84	0.000002	-0.000167	-5.09	1.90	-0.000680	-0.000322
	-6.09	-5.94	-0.000011	-0.000166	-5.46	1.76	-0.000622	-0.000236
	-6.11	-6.04	-0.000022	-0.000160	-5.78	1.65	-0.000582	-0.000165
	-6.15	-6.14	-0.000028	-0.000150	-6.08	1.62	-0.000555	-0.000114
	-6.20	-6.24	-0.000029	-0.000135	-6.37	1.60	-0.000536	-0.000084
1805 41	-6.25	-6.32	-0.000027	-0.000120	-6.66	1.60	-0.000520	-0.000072
	-6.30	-6.39	-0.000024	-0.000108	-6.96	1.60	-0.000510	-0.000077
	-6.33	-6.44	-0.000022	-0.000100	-7.24	1.58	-0.000507	-0.000098
	-6.37	-6.49	-0.000019	-0.000095	-7.53	1.55	-0.000510	-0.000135
	-6.40	-6.54	-0.000014	-0.000093	-7.82	1.48	-0.000512	-0.000179
	-6.44	-6.59	-0.000007	-0.000097	-8.13	1.40	-0.000511	-0.000223
	-6.47	-6.64	-0.000000	-0.000101	-8.44	1.24	-0.000503	-0.000257
	-6.49	-6.69	0.000006	-0.000102	-8.75	1.05	-0.000485	-0.000279
1805 42	-6.51	-6.76	0.000012	-0.000096	-9.05	0.84	-0.000452	-0.000295
	-6.52	-6.84	0.000016	-0.000084	-9.34	0.65	-0.000400	-0.000304
	-6.54	-6.90	0.000021	-0.000074	-9.61	0.46	-0.000327	-0.000320
	-6.55	-6.94	0.000025	-0.000070	-9.83	0.25	-0.000240	-0.000354
	-6.56	-6.96	0.000029	-0.000070	-9.98	0.04	-0.000155	-0.000408
	-6.57	-6.99	0.000030	-0.000074	-10.05	-0.15	-0.000083	-0.000478
	-6.59	-7.04	0.000030	-0.000076	-10.05	-0.43	-0.000034	-0.000544
	-6.60	-7.09	0.000027	-0.000077	-10.01	-0.80	-0.000003	-0.000591
1805 43	-6.62	-7.14	0.000023	-0.000078	-9.97	-1.26	0.000003	-0.000617
	-6.64	-7.19	0.000019	-0.000078	-9.93	-1.70	0.000005	-0.000623
	-6.67	-7.24	0.000016	-0.000078	-9.91	-2.12	0.000001	-0.000632
	-6.70	-7.29	0.000016	-0.000078	-9.90	-2.55	-0.000010	-0.000652
	-6.74	-7.34	0.000018	-0.000073	-9.90	-2.96	-0.000032	-0.000686
	-6.77	-7.39	0.000024	-0.000061	-9.91	-3.35	-0.000066	-0.000739
	-6.80	-7.44	0.000030	-0.000041	-9.94	-3.81	-0.000107	-0.000768
	-6.82	-7.49	0.000033	-0.000014	-10.00	-4.25	-0.000155	-0.000826

1805:44 to 1805:50 CDT

CDT	ζ	$\dot{\zeta}$	C_{vss}	$\partial\psi/\partial s$	η	θ	C_{vss}	$\partial\theta/\partial s$
h m s	deg	deg	radian/m	radian/m	deg	deg	radian/m	radian/m
1805 44	-6.83	-7.50	0.000046	0.000009	-10.11	-4.96	-0.000202	-0.000848
	-6.84	-7.49	0.000053	0.000025	-10.25	-5.55	-0.000246	-0.000850
	-6.83	-7.44	0.000061	0.000032	-10.44	-6.14	-0.000285	-0.000825
	-6.82	-7.39	0.000071	0.000033	-10.65	-6.75	-0.000320	-0.000764
	-6.81	-7.36	0.000083	0.000030	-10.88	-7.33	-0.000351	-0.000669
	-6.79	-7.34	0.000096	0.000020	-11.14	-7.85	-0.000379	-0.000548
	-6.75	-7.32	0.000106	0.000001	-11.41	-8.21	-0.000402	-0.000416
	-6.70	-7.29	0.000110	-0.000024	-11.70	-8.50	-0.000418	-0.000277
1805 45	-6.64	-7.30	0.000111	-0.000046	-12.00	-8.63	-0.000427	-0.000137
	-6.59	-7.34	0.000110	-0.000061	-12.32	-8.70	-0.000430	0.000004
	-6.54	-7.42	0.000108	-0.000074	-12.63	-8.63	-0.000430	0.000146
	-6.50	-7.49	0.000107	-0.000091	-12.93	-8.50	-0.000430	0.000292
	-6.45	-7.54	0.000103	-0.000116	-13.23	-8.23	-0.000428	0.000444
	-6.40	-7.59	0.000097	-0.000144	-13.53	-7.90	-0.000418	0.000605
	-6.36	-7.70	0.000088	-0.000164	-13.84	-7.41	-0.000389	0.000749
	-6.32	-7.84	0.000078	-0.000174	-14.14	-6.85	-0.000334	0.000893
1805 46	-6.30	-8.00	0.000071	-0.000177	-14.41	-6.09	-0.000257	0.000984
	-6.28	-8.14	0.000066	-0.000177	-14.62	-5.25	-0.000161	0.001026
	-6.27	-8.26	0.000062	-0.000174	-14.74	-4.36	-0.000062	0.001040
	-6.27	-8.39	0.000057	-0.000169	-14.77	-3.50	0.000033	0.001044
	-6.26	-8.52	0.000053	-0.000161	-14.70	-2.74	0.000118	0.001052
	-6.26	-8.64	0.000050	-0.000154	-14.56	-2.00	0.000192	0.001059
	-6.27	-8.74	0.000051	-0.000150	-14.37	-1.23	0.000258	0.001046
	-6.28	-8.84	0.000057	-0.000152	-14.14	-0.40	0.000316	0.001011
1805 47	-6.29	-8.94	0.000064	-0.000154	-13.87	0.41	0.000369	0.000959
	-6.28	-9.04	0.000070	-0.000154	-13.56	1.15	0.000418	0.000900
	-6.27	-9.16	0.000073	-0.000149	-13.23	1.78	0.000467	0.000844
	-6.25	-9.29	0.000073	-0.000138	-12.86	2.40	0.000518	0.000790
	-6.23	-9.40	0.000069	-0.000129	-12.46	2.96	0.000574	0.000735
	-6.21	-9.49	0.000062	-0.000126	-12.02	3.50	0.000636	0.000677
	-6.20	-9.56	0.000055	-0.000124	-11.53	3.98	0.000699	0.000610
	-6.20	-9.64	0.000048	-0.000122	-10.99	4.45	0.000757	0.000527
1805 48	-6.22	-9.74	0.000042	-0.000113	-10.39	4.84	0.000795	0.000430
	-6.24	-9.84	0.000037	-0.000096	-9.74	5.20	0.000805	0.000324
	-6.26	-9.92	0.000033	-0.000077	-9.06	5.41	0.000782	0.000211
	-6.29	-9.99	0.000030	-0.000057	-8.40	5.55	0.000748	0.000086
	-6.32	-10.02	0.000029	-0.000038	-7.79	5.56	0.000699	-0.000046
	-6.35	-10.04	0.000034	-0.000020	-7.25	5.55	0.000652	-0.000182
	-6.37	-10.04	0.000043	-0.000001	-6.78	5.35	0.000611	-0.000301
	-6.39	-10.04	0.000057	0.000021	-6.34	5.05	0.000577	-0.000393
1805 49	-6.39	-10.02	0.000069	0.000044	-5.92	4.60	0.000545	-0.000457
	-6.36	-9.99	0.000079	0.000066	-5.52	4.15	0.000514	-0.000499
	-6.32	-9.92	0.000085	0.000087	-5.14	3.70	0.000478	-0.000534
	-6.29	-9.84	0.000090	0.000105	-4.77	3.25	0.000439	-0.000562
	-6.25	-9.74	0.000094	0.000117	-4.43	2.78	0.000396	-0.000576
	-6.20	-9.64	0.000098	0.000120	-4.13	2.30	0.000349	-0.000572
	-6.15	-9.52	0.000103	0.000108	-3.87	1.80	0.000297	-0.000546
	-6.10	-9.39	0.000109	0.000082	-3.64	1.30	0.000242	-0.000499
1805 50	-6.04	-9.30	0.000114	0.000048	-3.46	0.78	0.000184	-0.000438
	-5.98	-9.24	0.000117	0.000011	-3.33	0.50	0.000124	-0.000370
	-5.90	-9.26	0.000116	-0.000021	-3.25	0.24	0.000067	-0.000288
	-5.82	-9.29	0.000112	-0.000044	-3.22	0.00	0.000017	-0.000187
	-5.74	-9.36	0.000105	-0.000061	-3.25	-0.14	-0.000020	-0.000065
	-5.68	-9.44	0.000099	-0.000071	-3.31	-0.25	-0.000038	0.000071
	-5.62	-9.52	0.000092	-0.000079	-3.39	-0.15	-0.000039	0.000198
	-5.57	-9.59	0.000082	-0.000089	-3.47	0.05	-0.000022	0.000305

1805:51 to 1805:57 CDT

CDT		ζ	ψ	C_{YZR}	$\partial\psi/\partial S$	η	θ	C_{YER}	$\partial\theta/\partial S$
h	m s	deg	deg	radian/m	radian/m	deg	deg	radian/m	radian/m
1805	51	-5.53	-9.66	0.000097	-0.000098	-3.52	0.44	0.000011	0.000388
		-5.49	-9.74	0.000097	-0.000106	-3.53	0.85	0.000059	0.000450
		-5.47	-9.84	0.000042	-0.000113	-3.51	1.30	0.000119	0.000493
		-5.46	-9.94	0.000023	-0.000121	-3.42	1.75	0.000184	0.000511
		-5.46	-10.04	-0.000003	-0.000125	-3.26	2.24	0.000257	0.000490
		-5.49	-10.14	-0.000065	-0.000124	-3.02	2.75	0.000395	0.000426
		-5.53	-10.26	-0.000132	-0.000113	-2.73	3.19	0.000520	0.000323
		-5.62	-10.39	-0.000174	-0.000095	-2.38	3.55	0.000601	0.000188
1805	52	-6.00	-10.48	-0.000177	-0.000077	-1.27	3.69	0.000618	0.000041
		-6.42	-10.54	-0.000117	-0.000061	-0.31	3.75	0.000502	-0.000106
		-6.68	-10.56	-0.000055	-0.000047	0.37	3.57	0.000346	-0.000233
	1st	-6.72	-10.59	-0.000040	-0.000032	0.69	3.30	0.000196	-0.000328
		-6.57	-10.62	-0.000066	-0.000013	0.73	2.88	0.000074	-0.000388
		-6.32	-10.64	-0.000101	0.000007	0.59	2.45	-0.000008	-0.000411
		-6.33	-10.62	-0.000116	0.000027	0.43	2.02	-0.000056	-0.000404
		-6.76	-10.59	-0.000094	0.000048	0.29	1.60	-0.000081	-0.000371
1805	53	-7.01	-10.54	-0.000044	0.000073	0.14	1.26	-0.000094	-0.000322
		-6.91	-10.49	-0.000004	0.000099	0.02	0.95	-0.000100	-0.000266
		-6.90	-10.40	0.000001	0.000122	-0.06	0.76	-0.000103	-0.000207
		-6.97	-10.29	-0.000016	0.000137	-0.14	0.60	-0.000104	-0.000149
		-6.70	-10.14	-0.000041	0.000139	-0.24	0.52	-0.000102	-0.000099
	2nd	-6.61	-9.99	-0.000061	0.000110	-0.35	0.45	-0.000099	-0.000029
		-6.94	-9.86	-0.000053	0.000070	-0.42	0.46	-0.000096	0.000025
		-7.10	-9.74	-0.000018	0.000030	-0.49	0.50	-0.000093	0.000067
1805	54	-7.00	-9.68	0.000011	-0.000010	-0.56	0.62	-0.000088	0.000094
		-7.08	-9.84	0.000011	-0.000027	-0.65	0.75	-0.000078	0.000107
		-7.07	-9.84	-0.000010	-0.000035	-0.72	0.88	-0.000059	0.000105
		-6.80	-9.94	-0.000040	-0.000044	-0.76	1.00	-0.000036	0.000097
		-6.79	-9.94	-0.000061	-0.000058	-0.83	1.10	-0.000019	0.000073
		-7.04	-10.04	-0.000059	-0.000062	-0.86	1.20	-0.000011	0.000038
		-7.20	-10.04	-0.000041	-0.000066	-0.78	1.24	-0.000007	-0.000003
		-7.20	-10.14	-0.000025	-0.000078	-0.72	1.25	0.000006	-0.000047
1805	55	-7.20	-10.24	-0.000016	-0.000081	-0.77	1.18	0.000056	-0.000089
		-7.19	-10.24	-0.000011	-0.000092	-0.84	1.10	0.000157	-0.000077
		-7.19	-10.34	-0.000008	-0.000104	-0.80	0.96	0.000298	0.000051
		-7.19	-10.44	-0.000014	-0.000108	-0.68	0.80	0.000432	0.000176
		-7.19	-10.54	-0.000036	-0.000112	-0.34	0.62	0.000502	0.000244
		-7.19	-10.64	-0.000067	-0.000115	0.34	1.00	0.000471	0.000272
	3rd	-7.21	-10.74	-0.000077	-0.000125	1.18	2.00	0.000346	0.000098
		-7.23	-10.84	-0.000043	-0.000145	1.77	2.00	0.000180	-0.000087
1805	56	-7.44	-10.94	0.000009	-0.000168	1.91	2.00	0.000017	-0.000135
		-7.73	-11.04	0.000031	-0.000193	1.74	2.00	-0.000117	-0.000281
		-7.59	-11.24	0.000008	-0.000221	1.48	1.00	-0.000221	-0.000337
		-7.10	-11.44	-0.000032	-0.000242	1.19	1.00	-0.000302	-0.000285
		-6.96	-11.64	-0.000050	-0.000262	0.86	1.00	-0.000361	-0.000306
		-7.44	-11.84	-0.000039	-0.000308	0.50	0.00	-0.000396	-0.000222
		-7.74	-12.14	-0.000023	-0.000349	0.09	0.00	-0.000410	-0.000116
		-7.52	-12.34	-0.000027	-0.000401	-0.32	0.00	-0.000406	-0.000092
1805	57	-7.29	-12.64	-0.000035	-0.000477	-0.68	0.00	-0.000387	-0.000061
		-7.42	-13.14	-0.000018	-0.000539	-0.98	0.00	-0.000353	-0.000039
		-7.64	-13.44	0.000013	-0.000632	-1.30	0.00	-0.000307	-0.000027
		-7.68	-14.04	0.000031	-0.000732	-1.57	0.00	-0.000250	-0.000018
		-7.54	-14.54	0.000031	-0.000799	-1.76	0.00	-0.000185	-0.000012
		-7.30	-15.24	0.000017	-0.000866	-1.87	0.00	-0.000114	-0.000008
	4th	-7.34	-16.04	-0.000012	-0.000950	-1.96	0.00	-0.000039	-0.000005
		-7.47	-16.84	-0.000048	-0.001014	-1.99	0.00	0.000035	-0.000004

APPENDIX 10 ENERGY

Total energy was computed as TE = PE + KE, where PE and KE are potential and kinetic energy, respectively, defined in (L), Appendix 1. The first contact height, Z_{1st} = 567.1 ft is the height of the accelerometer at 1805:52.

1804:58 to 1805:03 CDT

CDT	Corrected Airspeed		True Airspeed		GVL	KE	$Z-Z_{1st}$	PE	TE	dTE/dt	EPR
h m s	kts	m/s	kts	m/s	m/s	m^2/s^2	m	m^2/s^2	m^2/s^2	m^2/s^3	
1804 58	152.9	78.7	164.1	84.5	87.0	3787	342.3	3354	7141	-58.1	1.090
	152.9	78.7	164.1	84.5	87.0	3786	341.7	3348	7134	-59.0	1.090
	152.9	78.7	164.2	84.5	87.0	3785	341.0	3341	7126	-59.5	1.090
	152.9	78.7	164.2	84.5	87.0	3785	340.3	3335	7120	-59.5	1.090
	153.0	78.7	164.2	84.5	87.0	3784	339.7	3328	7112	-59.3	1.090
	153.0	78.8	164.2	84.5	87.0	3783	339.0	3322	7105	-59.5	1.090
	153.0	78.8	164.3	84.6	87.0	3782	338.4	3315	7097	-59.9	1.090
	153.0	78.8	164.3	84.6	87.0	3780	337.7	3309	7089	-60.4	1.090
1804 59	153.0	78.8	164.2	84.6	86.9	3779	337.1	3303	7082	-61.1	1.090
	153.0	78.8	164.2	84.5	86.9	3773	336.4	3296	7074	-61.9	1.090
	153.0	78.7	164.2	84.5	86.9	3776	335.8	3290	7066	-62.7	1.090
	152.9	78.7	164.1	84.5	86.9	3775	335.1	3284	7059	-63.2	1.090
	152.9	78.7	164.1	84.5	86.9	3773	334.5	3277	7050	-63.4	1.090
	152.9	78.7	164.1	84.5	86.9	3772	333.8	3271	7043	-63.5	1.090
	152.9	78.7	164.1	84.5	86.8	3770	333.2	3264	7034	-63.8	1.090
	152.9	78.7	164.1	84.5	86.8	3768	332.5	3258	7026	-63.9	1.090
1805 00	152.9	78.7	164.0	84.4	86.8	3767	331.9	3252	7019	-63.9	1.090
	152.8	78.7	164.0	84.4	86.8	3765	331.2	3245	7010	-64.1	1.090
	152.8	78.6	163.9	84.4	86.8	3764	330.6	3239	7003	-64.4	1.090
	152.7	78.6	163.9	84.4	86.7	3762	329.9	3232	6994	-64.7	1.090
	152.6	78.6	163.8	84.3	86.7	3760	329.2	3226	6986	-64.4	1.090
	152.6	78.6	163.7	84.3	86.7	3759	328.6	3219	6978	-63.8	1.090
	152.6	78.5	163.7	84.3	86.7	3758	327.9	3213	6971	-63.0	1.090
	152.5	78.5	163.6	84.2	86.7	3756	327.2	3206	6962	-62.7	1.090
1805 01	152.5	78.5	163.6	84.2	86.7	3755	326.6	3200	6955	-62.8	1.090
	152.5	78.5	163.6	84.2	86.6	3754	325.9	3193	6947	-63.3	1.090
	152.6	78.5	163.7	84.3	86.6	3753	325.2	3186	6939	-63.8	1.090
	152.6	78.6	163.7	84.3	86.6	3751	324.5	3180	6931	-64.3	1.090
	152.7	78.6	163.8	84.3	86.6	3750	323.9	3173	6923	-64.9	1.090
	152.8	78.6	163.9	84.4	86.6	3749	323.2	3166	6914	-65.6	1.090
	152.9	78.7	164.0	84.4	86.6	3747	322.5	3160	6907	-65.8	1.090
	152.9	78.7	164.1	84.5	86.5	3745	321.8	3153	6898	-65.1	1.090
1805 02	153.0	78.8	164.1	84.5	86.5	3744	321.1	3146	6890	-64.0	1.090
	153.1	78.8	164.2	84.5	86.5	3743	320.5	3140	6883	-62.8	1.090
	153.2	78.8	164.3	84.6	86.5	3741	319.8	3133	6874	-61.7	1.090
	153.2	78.9	164.4	84.5	86.5	3740	319.1	3127	6867	-60.8	1.090
	153.3	78.9	164.4	84.7	86.5	3739	318.4	3120	6859	-60.4	1.090
	153.4	79.0	164.5	84.7	86.5	3738	317.8	3114	6852	-60.6	1.090
	153.4	79.0	164.6	84.7	86.5	3737	317.1	3107	6844	-61.1	1.090
	153.5	79.0	164.6	84.7	86.4	3736	316.5	3101	6837	-61.6	1.090
1805 03	153.5	79.0	164.7	84.8	86.4	3735	315.8	3094	6829	-62.0	1.090
	153.6	79.1	164.7	84.8	86.4	3733	315.1	3088	6821	-62.5	1.090
	153.7	79.1	164.8	84.8	86.4	3732	314.5	3081	6813	-62.8	1.090
	153.7	79.1	164.9	84.9	86.4	3730	313.8	3075	6805	-62.4	1.090
	153.8	79.2	164.9	84.9	86.4	3729	313.2	3069	6798	-61.2	1.090
	153.9	79.2	165.0	84.9	86.3	3728	312.6	3062	6790	-59.4	1.090
	153.9	79.2	165.1	85.0	86.3	3726	311.9	3056	6782	-58.0	1.090
	154.0	79.3	165.1	85.0	86.3	3725	311.3	3050	6775	-57.1	1.090

1805:04 to 1805:10 CDT

CDT	Corrected Airspeed		True Airspeed		GVL	KE	Z-Z_{ref}	PE	TE	dTE/dt	EPR
h m s	kts	m/s	kts	m/s	m/s	m^2/s^2	m	m^2/s^2	m^2/s^2	m^2/s^3	
1805 04	154.0	79.3	165.1	85.0	85.9	3724	310.7	3044	6768	-56.8	1.090
	154.1	79.3	165.2	85.0	86.3	3723	310.1	3038	6761	-57.0	1.090
	154.1	79.4	165.3	85.1	86.3	3722	309.5	3032	6754	-57.7	1.090
	154.2	79.4	165.4	85.1	86.3	3721	308.9	3026	6747	-58.5	1.090
	154.3	79.4	165.4	85.2	86.2	3719	308.3	3020	6739	-59.2	1.090
	154.4	79.5	165.5	85.2	86.2	3718	307.7	3014	6732	-59.9	1.090
	154.4	79.5	165.6	85.2	86.2	3716	307.1	3009	6725	-60.1	1.090
	154.5	79.6	165.6	85.3	86.2	3714	306.5	3003	6717	-60.1	1.090
1805 05	154.6	79.6	165.7	85.3	86.2	3712	305.9	2997	6709	-59.4	1.090
	154.7	79.6	165.8	85.4	86.1	3711	305.3	2992	6703	-58.1	1.090
	154.7	79.7	165.9	85.4	86.1	3709	304.8	2986	6695	-56.8	1.090
	154.8	79.7	165.9	85.4	86.1	3708	304.2	2981	6689	-55.8	1.090
	154.8	79.7	165.9	85.4	86.1	3706	303.6	2975	6681	-55.3	1.090
	154.9	79.7	166.0	85.5	86.1	3705	303.1	2970	6675	-54.9	1.090
	154.9	79.8	166.1	85.5	86.1	3703	302.5	2964	6667	-54.5	1.090
	155.0	79.8	166.1	85.5	86.0	3702	302.0	2959	6661	-53.7	1.090
1805 06	155.0	79.8	166.1	85.5	86.0	3700	301.4	2954	6654	-52.4	1.090
	155.1	79.8	166.2	85.6	86.0	3699	300.9	2948	6647	-51.0	1.090
	155.2	79.9	166.4	85.6	86.0	3698	300.4	2943	6641	-50.0	1.090
	155.5	80.0	166.6	85.8	86.0	3697	299.8	2938	6635	-49.4	1.090
	155.8	80.2	167.0	86.0	86.0	3696	299.3	2933	6629	-49.1	1.090
	156.2	80.4	167.3	86.1	86.0	3695	298.8	2927	6622	-48.8	1.090
	156.6	80.6	167.8	86.4	86.0	3694	298.3	2922	6616	-48.7	1.090
	157.0	80.8	168.2	86.6	85.9	3693	297.8	2917	6610	-48.9	1.090
1805 07	157.4	81.0	168.7	86.8	85.9	3692	297.2	2912	6604	-49.0	1.090
	157.8	81.2	169.0	87.0	85.9	3691	296.7	2907	6598	-48.8	1.090
	157.9	81.3	169.2	87.1	85.9	3690	296.2	2902	6592	-48.2	1.090
	158.1	81.4	169.3	87.2	85.9	3689	295.7	2897	6586	-47.7	1.090
	158.1	81.4	169.4	87.2	85.9	3688	295.2	2893	6581	-47.5	1.090
	158.1	81.4	169.4	87.2	85.9	3687	294.7	2888	6575	-47.6	1.090
	158.1	81.4	169.4	87.2	85.9	3686	294.2	2883	6569	-47.9	1.090
	158.1	81.4	169.3	87.2	85.8	3685	293.7	2878	6563	-48.0	1.090
1805 08	158.0	81.3	169.3	87.1	85.8	3684	293.2	2873	6557	-47.3	1.090
	157.9	81.3	169.2	87.1	85.8	3683	292.7	2868	6551	-46.1	1.090
	158.0	81.3	169.2	87.1	85.8	3682	292.2	2863	6545	-45.2	1.090
	158.1	81.4	169.3	87.1	85.8	3682	291.7	2858	6540	-44.8	1.090
	158.2	81.4	169.5	87.2	85.8	3681	291.1	2853	6534	-44.6	1.090
	158.4	81.5	169.6	87.3	85.8	3681	290.6	2848	6529	-43.8	1.090
	158.6	81.6	169.9	87.4	85.8	3680	290.1	2842	6522	-41.9	1.090
	158.8	81.7	170.1	87.5	85.8	3680	289.6	2837	6517	-39.6	1.090
1805 09	159.0	81.8	170.3	87.6	85.8	3681	289.1	2832	6513	-37.6	1.090
	159.2	82.0	170.5	87.8	85.8	3681	288.6	2827	6508	-36.1	1.090
	159.4	82.0	170.6	87.9	85.8	3682	288.0	2822	6504	-34.7	1.090
	159.5	82.1	170.8	87.9	85.8	3683	287.5	2817	6500	-32.9	1.090
	159.7	82.2	171.0	88.0	85.8	3684	287.0	2812	6496	-30.8	1.090
	159.8	82.3	171.1	88.1	85.8	3685	286.5	2807	6492	-28.7	1.090
	160.0	82.4	171.3	88.2	85.9	3687	286.0	2802	6489	-27.0	1.090
	160.2	82.5	171.5	88.3	85.9	3688	285.4	2797	6485	-26.2	1.089
1805 10	160.4	82.6	171.7	88.4	85.9	3690	284.9	2792	6482	-26.4	1.089
	160.6	82.7	171.9	88.5	85.9	3692	284.4	2787	6479	-27.4	1.088
	160.8	82.8	172.2	88.6	85.9	3693	283.9	2782	6475	-28.8	1.088
	161.1	82.9	172.5	88.8	86.0	3694	283.4	2777	6471	-30.4	1.088
	161.4	83.1	172.8	89.0	86.0	3695	282.9	2772	6467	-32.0	1.088
	161.7	83.2	173.1	89.1	86.0	3696	282.4	2767	6463	-33.9	1.087
	162.0	83.4	173.4	89.2	86.0	3697	281.9	2762	6459	-36.2	1.087
	162.2	83.5	173.6	89.4	86.0	3697	281.4	2757	6454	-38.7	1.087

1805:11 to 1805:17 CDT

CDT	Corrected Airspeed		True Airspeed		GVL	KE	Z-Z_{ss}	PE	TE	dTE/dt	EPR
h m s	kts	m/s	kts	m/s	m/s	m^2/s^2	m	m^2/s^2	m^2/s^2	m^2/s^2	
1805 11	162.4	83.6	173.8	89.5	86.0	3697	280.9	2753	6450	-40.7	1.087
	162.7	83.7	174.1	89.6	86.0	3696	280.4	2748	6444	-42.0	1.087
	162.9	83.8	174.3	89.7	86.0	3696	279.9	2743	6439	-43.1	1.086
	163.1	84.0	174.5	89.8	86.0	3695	279.4	2738	6433	-44.2	1.086
	163.3	84.1	174.7	90.0	86.0	3695	278.9	2733	6428	-44.7	1.086
	163.5	84.2	174.9	90.0	86.0	3694	278.4	2728	6422	-44.7	1.085
	163.6	84.2	175.0	90.1	85.9	3693	277.9	2723	6416	-44.8	1.085
	163.7	84.3	175.1	90.1	85.9	3693	277.4	2718	6411	-45.9	1.084
1805 12	163.8	84.3	175.2	90.2	85.9	3692	276.9	2713	6405	-47.8	1.084
	163.9	84.4	175.2	90.2	85.9	3691	276.4	2708	6399	-50.0	1.084
	163.9	84.4	175.3	90.2	85.9	3689	275.9	2703	6392	-52.5	1.084
	163.9	84.4	175.3	90.3	85.9	3688	275.4	2698	6386	-55.5	1.083
	163.9	84.4	175.3	90.2	85.9	3686	274.8	2693	6379	-59.2	1.083
	163.9	84.4	175.2	90.2	85.8	3684	274.3	2687	6371	-63.3	1.082
	163.8	84.3	175.1	90.1	85.8	3681	273.7	2682	6363	-67.3	1.082
	163.6	84.2	174.9	90.1	85.8	3679	273.1	2676	6355	-71.7	1.081
1805 13	163.4	84.1	174.7	89.9	85.7	3676	272.4	2669	6345	-76.8	1.080
	163.2	84.0	174.4	89.8	85.7	3673	271.7	2663	6336	-81.9	1.080
	162.9	83.9	174.1	89.6	85.7	3669	271.0	2656	6325	-85.4	1.079
	162.7	83.7	173.8	89.5	85.6	3665	270.3	2649	6314	-86.5	1.078
	162.4	83.6	173.5	89.3	85.6	3662	269.6	2641	6303	-85.9	1.078
	162.1	83.5	173.2	89.1	85.5	3658	268.8	2634	6292	-85.0	1.077
	161.9	83.4	172.9	89.0	85.5	3655	268.1	2627	6282	-84.5	1.076
	161.8	83.3	172.8	89.0	85.5	3652	267.3	2619	6271	-83.6	1.075
1805 14	161.8	83.3	172.7	88.9	85.4	3649	266.5	2612	6261	-81.8	1.074
	161.7	83.2	172.6	88.8	85.4	3646	265.8	2604	6250	-79.3	1.073
	161.6	83.2	172.5	88.8	85.4	3644	265.0	2597	6241	-76.2	1.073
	161.7	83.2	172.5	88.8	85.3	3642	264.3	2590	6232	-72.6	1.072
	161.8	83.3	172.6	88.9	85.3	3640	263.6	2583	6223	-68.7	1.072
	161.9	83.4	172.8	88.9	85.3	3638	262.9	2576	6214	-64.6	1.071
	162.1	83.4	172.9	89.0	85.3	3637	262.2	2569	6206	-61.3	1.070
	162.3	83.5	173.1	89.1	85.3	3636	261.6	2563	6198	-60.0	1.068
1805 15	162.5	83.6	173.3	89.2	85.3	3634	261.0	2557	6191	-60.8	1.067
	162.7	83.8	173.5	89.3	85.2	3633	260.4	2551	6184	-63.1	1.065
	162.9	83.9	173.7	89.4	85.2	3630	259.8	2546	6176	-65.9	1.066
	163.1	84.0	173.9	89.5	85.2	3627	259.3	2540	6167	-68.3	1.065
	163.4	84.1	174.2	89.7	85.1	3624	258.7	2535	6159	-69.7	1.064
	163.6	84.2	174.4	89.8	85.1	3621	258.2	2529	6150	-70.3	1.062
	164.0	84.4	174.8	90.0	85.1	3617	257.6	2524	6141	-69.8	1.061
	164.4	84.6	175.1	90.2	85.0	3613	257.1	2519	6132	-69.0	1.060
1805 16	164.8	84.8	175.5	90.4	85.0	3610	256.6	2514	6124	-68.5	1.059
	165.2	85.0	176.0	90.6	84.9	3607	256.1	2509	6116	-69.5	1.058
	165.7	85.3	176.5	90.9	84.9	3603	255.6	2504	6107	-72.5	1.057
	166.2	85.6	177.0	91.1	84.8	3598	255.1	2499	6097	-77.8	1.056
	166.8	85.9	177.6	91.4	84.8	3593	254.5	2494	6087	-85.7	1.055
	167.4	86.2	178.2	91.7	84.7	3587	254.0	2489	6076	-95.2	1.054
	167.8	86.4	178.6	91.9	84.6	3580	253.5	2484	6064	-104.4	1.053
	168.1	86.5	178.9	92.1	84.5	3572	252.9	2478	6050	-112.3	1.052
1805 17	168.6	86.8	179.4	92.4	84.4	3564	252.3	2472	6036	-119.1	1.050
	169.4	87.2	180.2	92.8	84.2	3555	251.6	2465	6020	-126.2	1.049
	170.2	87.6	181.0	93.2	84.2	3546	250.9	2458	6004	-133.2	1.049
	170.9	88.0	181.7	93.6	84.1	3536	250.1	2451	5987	-139.2	1.048
	171.4	88.2	182.2	93.8	84.0	3526	249.3	2443	5969	-144.0	1.047
	171.9	88.5	182.7	94.1	83.9	3516	248.5	2435	5951	-148.5	1.045
	172.4	88.7	183.2	94.3	83.7	3505	247.7	2427	5932	-153.0	1.044
	172.8	89.0	183.6	94.5	83.6	3494	246.9	2419	5913	-157.6	1.043

1805:18 to 1805:24 CDT

CDT	Corrected Airspeed		True Airspeed		GVL	KE	Z - Z_{ref}	PE	TE	dTE/dt	EPR
h m s	kts	m/s	kts	m/s	m/s	m^2/s^2	m	m^2/s^2	m^2/s^2	m^2/s^3	
1805 18	173.1	89.1	183.9	94.7	83.4	3482	246.0	2411	5893	-161.4	1.042
	173.4	89.3	184.2	94.8	83.3	3469	245.3	2403	5872	-163.7	1.041
	173.6	89.4	184.4	94.9	83.1	3456	244.5	2396	5852	-164.8	1.040
	173.8	89.5	184.5	95.0	83.0	3442	243.8	2388	5830	-164.3	1.039
	173.8	89.5	184.5	95.0	82.8	3429	243.1	2382	5811	-162.0	1.039
	173.8	89.5	184.5	95.0	82.6	3415	242.4	2375	5790	-158.4	1.037
	173.6	89.4	184.3	94.9	82.5	3402	241.8	2369	5771	-154.7	1.036
	173.4	89.3	184.1	94.7	82.3	3388	241.2	2363	5751	-152.1	1.035
1805 19	173.0	89.1	183.6	94.5	82.2	3375	240.6	2356	5733	-150.0	1.034
	172.6	88.8	183.2	94.3	82.0	3362	240.1	2353	5715	-148.3	1.033
	171.8	88.4	182.3	93.9	81.8	3348	239.6	2348	5696	-148.3	1.032
	170.8	87.9	181.2	93.3	81.7	3334	239.1	2343	5677	-150.5	1.031
	169.4	87.2	179.7	92.5	81.5	3320	238.6	2338	5658	-153.4	1.030
	167.9	86.4	178.2	91.7	81.3	3305	238.1	2333	5638	-155.3	1.029
	166.5	85.7	176.7	91.0	81.1	3291	237.7	2329	5620	-154.8	1.029
	165.1	85.0	175.3	90.2	80.9	3276	237.2	2324	5600	-153.1	1.028
1805 20	164.1	84.5	174.1	89.6	80.8	3262	236.7	2319	5581	-151.0	1.027
	163.2	84.0	173.2	89.1	80.6	3248	236.2	2315	5563	-149.2	1.026
	162.7	83.8	172.6	88.9	80.4	3234	235.8	2310	5544	-148.6	1.026
	162.3	83.5	172.1	88.6	80.2	3220	235.3	2305	5525	-149.1	1.025
	162.0	83.4	171.8	88.5	80.1	3206	234.8	2301	5507	-150.7	1.025
	161.7	83.2	171.5	88.3	79.9	3191	234.3	2296	5487	-153.0	1.024
	161.4	83.1	171.2	88.1	79.7	3177	233.9	2292	5469	-155.5	1.024
	161.1	82.9	170.8	87.9	79.5	3162	233.4	2287	5449	-157.5	1.023
1805 21	160.7	82.7	170.4	87.7	79.3	3146	233.0	2283	5429	-159.3	1.023
	160.3	82.5	170.0	87.5	79.1	3131	232.5	2278	5409	-161.0	1.022
	159.6	82.2	169.3	87.1	78.9	3114	232.1	2274	5388	-162.0	1.022
	158.8	81.8	168.4	86.7	78.7	3098	231.7	2270	5366	-161.5	1.021
	157.9	81.3	167.4	86.2	78.5	3082	231.3	2266	5348	-159.7	1.021
	156.9	80.8	166.3	85.6	78.3	3065	231.0	2263	5328	-156.8	1.021
	156.0	80.3	165.4	85.2	78.1	3049	230.6	2260	5309	-153.0	1.021
	155.3	80.0	164.7	84.8	77.9	3034	230.3	2257	5291	-148.9	1.021
1805 22	155.0	79.8	164.3	84.6	77.7	3018	230.0	2254	5272	-146.0	1.021
	154.8	79.7	164.1	84.5	77.5	3003	229.7	2251	5254	-145.3	1.021
	154.9	79.7	164.2	84.6	77.3	2988	229.4	2249	5236	-146.1	1.022
	155.2	79.9	164.5	84.7	77.1	2972	229.1	2245	5217	-147.3	1.022
	155.6	80.1	165.0	84.9	76.9	2957	228.8	2242	5199	-146.3	1.023
	156.1	80.4	165.5	85.2	76.7	2941	228.5	2239	5180	-145.2	1.023
	156.5	80.6	165.9	85.4	76.5	2926	228.3	2236	5162	-143.4	1.024
	156.9	80.7	166.1	85.5	76.3	2911	228.0	2234	5145	-141.0	1.024
1805 23	156.8	80.7	166.1	85.5	76.1	2896	227.8	2231	5127	-138.9	1.025
	156.7	80.7	166.0	85.5	75.9	2881	227.5	2229	5110	-137.9	1.026
	156.1	80.3	165.3	85.1	75.7	2866	227.3	2227	5093	-137.5	1.027
	155.1	79.8	164.3	84.6	75.5	2851	227.0	2224	5075	-137.5	1.029
	153.6	79.1	162.7	83.7	75.3	2836	226.8	2222	5058	-138.1	1.031
	152.1	78.3	161.0	82.9	75.1	2822	226.6	2220	5042	-138.8	1.033
	150.6	77.5	159.5	82.1	74.9	2807	226.4	2218	5025	-138.5	1.035
	149.3	76.9	158.1	81.4	74.7	2793	226.2	2216	5009	-138.3	1.037
1805 24	148.4	76.4	157.1	80.9	74.6	2780	226.0	2214	4994	-115.2	1.040
	147.7	76.0	156.3	80.5	74.4	2768	225.9	2213	4981	-108.1	1.043
	147.2	75.8	155.8	80.2	74.2	2756	225.7	2212	4968	-104.2	1.046
	146.8	75.6	155.3	80.0	74.1	2744	225.6	2210	4954	-103.8	1.049
	146.4	75.4	155.0	79.8	73.9	2732	225.5	2209	4941	-105.5	1.054
	146.1	75.2	154.6	79.6	73.8	2720	225.3	2208	4928	-107.0	1.058
	145.7	75.0	154.2	79.4	73.6	2708	225.2	2206	4914	-106.7	1.063
	145.3	74.8	153.8	79.2	73.4	2697	225.0	2205	4902	-106.5	1.068

1805:25 to 1805:31 CDT

CDT	Corrected Airspeed		True Airspeed		GVL	KE	$\Sigma \cdot Z_m$	PE	TE	dTE/dt	EPR
h m s	kts	m/s	kts	m/s	m/s	m^2/s^2	m	m^2/s^2	m^2/s^2	m^2/s^3	
1805 25	144.9	74.6	153.4	78.9	73.3	2685	224.8	2203	4888	-106.6	1.074
	144.5	74.4	152.9	78.7	73.1	2674	224.6	2201	4875	-105.5	1.080
	143.9	74.1	152.3	78.4	73.0	2663	224.4	2198	4861	-101.9	1.087
	143.4	73.8	151.7	78.1	72.9	2654	224.1	2196	4850	-96.8	1.094
	142.6	73.5	151.1	77.8	72.7	2645	223.8	2193	4838	-93.6	1.102
	142.1	73.2	150.4	77.4	72.6	2637	223.4	2189	4825	-93.5	1.110
	141.4	72.8	149.6	77.0	72.5	2629	223.0	2185	4814	-93.0	1.120
	140.6	72.4	148.8	76.6	72.4	2621	222.6	2181	4802	-88.6	1.129
1805 26	139.9	72.0	148.0	76.2	72.3	2615	222.2	2177	4792	-81.2	1.140
	139.2	71.7	147.3	75.8	72.3	2610	221.7	2172	4782	-74.1	1.151
	138.8	71.4	146.8	75.6	72.2	2606	221.2	2167	4773	-70.3	1.163
	138.4	71.3	146.4	75.4	72.1	2603	220.7	2162	4765	-69.3	1.175
	138.2	71.2	146.2	75.3	72.1	2600	220.1	2156	4756	-68.8	1.187
	138.0	71.1	146.0	75.2	72.1	2597	219.5	2151	4748	-67.0	1.199
	137.9	71.0	145.8	75.1	72.0	2594	218.9	2145	4739	-64.1	1.210
	137.7	70.9	145.6	75.0	72.0	2592	218.4	2139	4731	-61.3	1.221
1805 27	137.5	70.8	145.4	74.9	72.0	2590	217.8	2134	4724	-59.0	1.233
	137.3	70.7	145.2	74.8	72.0	2589	217.1	2128	4717	-57.2	1.245
	136.8	70.4	144.7	74.5	71.9	2588	216.5	2122	4710	-55.3	1.257
	136.2	70.1	144.1	74.2	71.9	2587	215.9	2116	4703	-52.9	1.268
	135.4	69.7	143.1	73.7	71.9	2587	215.3	2109	4696	-50.0	1.280
	134.5	69.2	142.2	73.2	71.9	2587	214.7	2103	4690	-47.5	1.291
	133.6	68.8	141.3	72.7	71.9	2588	214.0	2097	4685	-47.0	1.302
	132.7	68.3	140.2	72.2	71.9	2588	213.4	2091	4679	-47.8	1.314
1805 28	131.9	67.9	139.4	71.8	72.0	2588	212.7	2084	4672	-47.3	1.326
	131.1	67.5	138.6	71.4	72.0	2589	212.0	2078	4667	-45.0	1.337
	130.6	67.2	138.1	71.1	72.0	2591	211.4	2071	4662	-42.8	1.349
	130.2	67.0	137.6	70.9	72.0	2592	210.7	2064	4656	-42.3	1.361
	130.1	67.0	137.5	70.8	72.0	2593	210.0	2057	4650	-42.8	1.373
	130.1	67.0	137.5	70.8	72.0	2595	209.3	2051	4646	-42.5	1.384
	130.3	67.1	137.6	70.9	72.1	2597	208.6	2044	4641	-42.0	1.395
	130.4	67.1	137.8	70.9	72.1	2598	207.9	2037	4635	-42.9	1.405
1805 29	130.6	67.2	138.0	71.0	72.1	2599	207.2	2030	4629	-43.1	1.414
	130.8	67.4	138.2	71.1	72.1	2601	206.5	2023	4624	-38.7	1.422
	131.1	67.5	138.5	71.3	72.2	2602	205.8	2017	4620	-28.3	1.429
	131.5	67.7	138.8	71.5	72.2	2607	205.2	2010	4617	-15.3	1.436
	131.8	67.9	139.2	71.7	72.3	2612	204.5	2004	4616	-5.5	1.442
	132.2	68.1	139.6	71.8	72.4	2618	203.8	1997	4615	-1.0	1.447
	132.6	68.3	140.0	72.1	72.5	2625	203.2	1991	4616	-0.1	1.451
	133.0	68.5	140.4	72.3	72.5	2631	202.6	1985	4616	0.1	1.455
1805 30	133.5	68.7	140.9	72.5	72.6	2637	201.9	1979	4616	2.3	1.458
	133.9	69.0	141.3	72.8	72.7	2644	201.3	1972	4616	5.4	1.461
	134.6	69.3	142.0	73.1	72.8	2651	200.7	1966	4617	8.4	1.463
	135.4	69.7	142.8	73.5	72.9	2658	200.1	1960	4618	11.4	1.464
	136.2	70.1	143.7	74.0	73.0	2665	199.5	1955	4620	14.2	1.465
	137.1	70.6	144.5	74.4	73.1	2673	198.9	1949	4622	15.1	1.465
	137.8	70.9	145.3	74.8	73.2	2680	198.3	1943	4623	11.3	1.464
	138.6	71.4	146.1	75.2	73.3	2687	197.8	1938	4625	3.5	1.462
1805 31	139.5	71.8	147.0	75.7	73.4	2692	197.2	1933	4625	-5.0	1.459
	140.3	72.2	147.9	76.1	73.4	2695	196.7	1927	4623	-11.4	1.456
	141.2	72.7	148.8	76.6	73.5	2699	196.2	1923	4621	-14.9	1.452
	141.9	73.1	149.6	77.0	73.5	2702	195.7	1917	4619	-16.7	1.447
	142.7	73.5	150.3	77.4	73.6	2705	195.2	1913	4618	-17.0	1.443
	143.4	73.8	151.1	77.8	73.6	2708	194.7	1908	4616	-15.5	1.438
	144.2	74.2	151.9	78.2	73.6	2710	194.3	1904	4614	-12.9	1.434
	145.0	74.6	152.7	78.6	73.7	2713	193.9	1899	4612	-9.5	1.429

1805:32 to 1805:38 CDT

CDT	Corrected Airspeed		True Airspeed		GVL	KE	$Z-Z_{ref}$	PE	TE	dTE/dt	EPR
h m s	kts	m/s	kts	m/s	m/s	m^2/s^2	m	m^2/s^2	m^2/s^2	m^2/s^3	
1805 32	145.8	75.1	153.6	79.1	73.7	2716	193.5	1895	4611	-7.6	1.424
	146.6	75.5	154.4	79.5	73.7	2719	193.1	1892	4611	-7.7	1.419
	147.2	75.8	155.0	79.8	73.8	2721	192.7	1888	4609	-10.1	1.414
	147.7	76.0	155.5	80.0	73.8	2723	192.4	1885	4608	-15.7	1.410
	147.8	76.1	155.6	80.1	73.8	2724	192.0	1882	4606	-24.7	1.406
	147.9	76.1	155.7	80.1	73.8	2723	191.8	1879	4602	-33.4	1.401
	147.7	76.0	155.5	80.0	73.8	2721	191.5	1876	4597	-37.3	1.396
	147.5	75.9	155.3	79.9	73.7	2718	191.3	1874	4592	-34.8	1.392
1805 33	146.9	75.6	154.6	79.6	73.7	2717	191.0	1872	4589	-28.2	1.388
	146.2	75.3	153.9	79.2	73.7	2716	190.8	1870	4586	-22.3	1.383
	145.3	74.8	152.9	78.7	73.7	2715	190.6	1868	4583	-17.9	1.380
	144.4	74.3	152.0	78.2	73.7	2715	190.4	1865	4580	-13.2	1.376
	143.6	73.9	151.2	77.8	73.7	2716	190.2	1863	4579	-8.5	1.373
	142.8	73.5	150.4	77.4	73.7	2718	189.9	1861	4579	-4.5	1.369
	142.2	73.2	149.8	77.1	73.8	2720	189.6	1856	4578	-2.7	1.367
	141.6	72.9	149.1	76.8	73.8	2723	189.3	1855	4578	-5.4	1.364
1805 34	141.1	72.7	148.7	76.5	73.8	2726	189.0	1851	4577	-11.9	1.362
	140.7	72.4	148.3	76.3	73.9	2727	188.6	1848	4575	-19.8	1.361
	140.5	72.3	148.1	76.2	73.9	2729	188.1	1843	4572	-24.8	1.359
	140.4	72.3	147.9	76.1	73.9	2730	187.7	1839	4569	-25.4	1.358
	140.4	72.3	147.9	76.1	73.9	2731	187.3	1835	4566	-24.8	1.357
	140.3	72.2	147.9	76.1	73.9	2733	186.8	1830	4563	-25.4	1.355
	140.3	72.2	147.9	76.2	74.0	2734	186.3	1825	4559	-27.3	1.355
	140.3	72.2	148.0	76.2	74.0	2736	185.7	1820	4556	-30.5	1.354
1805 35	140.0	72.1	147.7	76.0	74.0	2738	185.2	1814	4552	-35.1	1.354
	139.6	71.8	147.2	75.8	74.0	2739	184.6	1808	4547	-39.4	1.354
	138.3	71.2	145.9	75.1	74.0	2739	184.0	1802	4541	-39.3	1.355
	136.8	70.4	144.4	74.3	74.0	2741	183.3	1796	4537	-35.5	1.355
	134.1	69.1	141.6	72.9	74.1	2743	182.7	1790	4533	-30.7	1.356
	131.0	67.4	138.3	71.2	74.1	2745	182.1	1784	4529	-25.6	1.357
	127.7	65.8	134.9	69.4	74.1	2748	181.5	1779	4527	-15.9	1.358
	124.8	64.3	131.8	67.9	74.2	2752	181.0	1774	4526	1.8	1.360
1805 36	123.2	63.4	130.1	67.0	74.3	2758	180.5	1769	4527	23.2	1.362
	122.1	62.8	128.9	66.4	74.4	2767	180.1	1765	4532	41.1	1.364
	121.9	62.7	128.7	66.2	74.5	2777	179.7	1761	4538	53.3	1.368
	121.8	62.7	128.6	66.2	74.7	2787	179.4	1758	4545	63.4	1.371
	122.0	62.8	128.8	66.3	74.8	2798	179.1	1755	4553	71.6	1.375
	122.1	62.8	128.8	66.3	75.0	2810	178.9	1752	4562	76.0	1.379
	122.1	62.9	128.9	66.3	75.1	2822	178.6	1750	4572	73.7	1.383
	122.3	62.9	129.0	66.4	75.3	2833	178.4	1748	4581	66.7	1.387
1805 37	122.7	63.2	129.4	66.6	75.4	2843	178.2	1746	4589	62.7	1.392
	123.2	63.4	129.9	66.9	75.5	2852	178.0	1744	4596	66.0	1.396
	123.9	63.8	130.6	67.2	75.7	2863	177.9	1743	4605	77.0	1.400
	124.7	64.2	131.4	67.6	75.8	2875	177.7	1741	4616	90.9	1.403
	125.9	64.8	132.7	68.3	76.0	2888	177.6	1740	4628	101.4	1.406
	127.4	65.6	134.3	69.1	76.2	2902	177.5	1739	4641	107.4	1.410
	129.4	66.6	136.3	70.1	76.4	2916	177.4	1739	4655	109.0	1.414
	131.2	67.5	138.2	71.1	76.6	2931	177.4	1738	4669	108.0	1.417
1805 38	132.6	68.2	139.6	71.9	76.7	2945	177.3	1737	4682	106.4	1.421
	133.7	68.8	140.8	72.5	76.9	2958	177.2	1737	4695	105.8	1.424
	134.2	69.1	141.3	72.8	77.1	2972	177.2	1736	4708	109.2	1.428
	134.5	69.3	141.7	72.9	77.3	2987	177.1	1735	4722	116.7	1.431
	134.5	69.3	141.7	72.9	77.5	3003	177.1	1735	4738	126.6	1.435
	134.5	69.3	141.6	72.9	77.7	3020	177.0	1734	4754	137.5	1.438
	134.5	69.2	141.6	72.9	78.0	3038	177.0	1734	4772	150.0	1.442
	134.4	69.2	141.5	72.9	78.2	3058	176.9	1733	4791	162.3	1.445

1805:39 to 1805:45 CDT

CDT	Corrected Airspeed		True Airspeed		GVL	KE	$Z-Z_{ref}$	PE	TE	dTE/dt	EPR
h m s	kts	m/s	kts	m/s	m/s	m^2/s^2	m	m^2/s^2	m^2/s^2	m^2/s^3	
1805 39	134.4	69.2	141.5	72.8	78.5	3079	176.9	1733	4812	168.6	1.449
	134.4	69.2	141.5	72.8	78.8	3101	176.8	1733	4834	164.7	1.451
	134.6	69.3	141.7	72.9	79.0	3122	176.8	1732	4854	150.2	1.455
	134.9	69.5	142.0	73.1	79.3	3140	176.6	1731	4871	131.5	1.458
	135.5	69.7	142.5	73.4	79.5	3158	176.4	1729	4887	116.3	1.462
	136.1	70.1	143.2	73.7	79.7	3174	176.2	1726	4900	106.6	1.465
	136.7	70.4	143.8	74.0	79.9	3191	175.8	1722	4913	101.7	1.468
	137.1	70.6	144.3	74.3	80.1	3208	175.3	1718	4926	99.5	1.471
1805 40	137.4	70.7	144.5	74.4	80.3	3226	174.7	1712	4938	100.4	1.474
	137.6	70.8	144.7	74.5	80.6	3245	174.1	1705	4950	104.9	1.477
	137.5	70.8	144.6	74.4	80.8	3267	173.3	1698	4965	110.7	1.480
	137.3	70.7	144.3	74.3	81.1	3289	172.4	1689	4978	114.7	1.482
	136.3	70.2	143.3	73.8	81.4	3313	171.5	1680	4993	117.2	1.485
	135.1	69.5	142.0	73.1	81.7	3337	170.5	1670	5007	120.6	1.488
	133.3	68.6	140.1	72.1	82.0	3363	169.4	1660	5023	125.4	1.491
	131.3	67.6	138.0	71.1	82.3	3390	168.3	1649	5039	130.4	1.494
1805 41	129.6	66.7	136.2	70.1	82.7	3416	167.1	1638	5056	133.7	1.498
	128.1	65.9	134.6	69.3	83.0	3447	165.9	1626	5073	134.8	1.500
	127.3	65.5	133.7	68.8	83.4	3476	164.6	1613	5089	134.7	1.503
	126.7	65.2	133.1	68.5	83.7	3506	163.3	1600	5106	134.5	1.505
	126.5	65.1	132.9	68.4	84.1	3537	161.9	1586	5123	133.8	1.508
	126.4	65.1	132.8	68.4	84.5	3568	160.4	1572	5140	132.4	1.510
	126.3	65.0	132.7	68.3	84.8	3599	158.9	1557	5156	130.5	1.513
	126.3	65.0	132.6	68.3	85.2	3631	157.3	1541	5172	128.9	1.515
1805 42	126.2	65.0	132.6	68.3	85.6	3663	155.7	1525	5188	127.4	1.517
	126.3	65.0	132.6	68.3	86.0	3696	154.0	1508	5204	126.8	1.519
	126 4	65.1	132.8	68.3	86.4	3729	152.2	1491	5220	129.3	1.521
	126.6	65.2	133.0	68.5	86.8	3763	150.4	1473	5236	135.2	1.522
	127.0	65.4	133.4	68.7	87.2	3799	148.5	1455	5254	143.6	1.524
	127.4	65.6	133.8	68.9	87.6	3836	146.6	1436	5272	152.8	1.525
	127.9	65.9	134.3	69.2	88.0	3875	144.7	1417	5292	163.4	1.527
	128.5	66.1	134.9	69.4	88.5	3915	142.7	1399	5314	176.8	1.528
1805 43	129.1	66.5	135.5	69.8	89.0	3957	140.8	1380	5337	189.3	1.530
	129.8	66.8	136.2	70.1	89.4	4000	138.9	1361	5361	197.3	1.531
	130.6	67.2	137.0	70.5	89.9	4044	137.0	1342	5386	200.5	1.532
	131.4	67.6	137.9	71.0	90.4	4088	135.0	1323	5411	201.6	1.532
	132.5	68.2	139.1	71.6	90.9	4132	133.1	1304	5436	203.4	1.533
	133.8	68.9	140.5	72.3	91.4	4177	131.1	1285	5462	206.1	1.533
	135.2	69.6	141.9	73.1	91.9	4222	129.1	1265	5487	208.8	1.533
	136.4	70.2	143.2	73.7	92.4	4268	127.1	1246	5514	210.5	1.533
1805 44	137.2	70.6	143.9	74.1	92.9	4314	125.1	1226	5540	210.1	1.533
	137.7	70.9	144.6	74.4	93.4	4360	123.1	1206	5566	208.1	1.533
	137.9	71.0	144.7	74.5	93.5	4407	121.0	1185	5592	206.2	1.533
	138.0	71.0	144.8	74.5	94.4	4454	118.8	1164	5618	204.8	1.533
	137.9	71.0	144.7	74.5	94.9	4501	116.6	1143	5644	203.2	1.533
	137.7	70.9	144.5	74.4	95.4	4548	114.3	1120	5668	201.1	1.532
	137.6	70.8	144.4	74.3	95.9	4596	112.0	1097	5693	199.2	1.532
	137.4	70.8	144.2	74.2	96.4	4645	109.6	1074	5719	196.1	1.532
1805 45	137.4	70.7	144.1	74.2	96.9	4694	107.1	1049	5743	196.5	1.532
	137.3	70.7	144.0	74.1	97.4	4743	104.6	1024	5767	193.0	1.532
	137.5	70.8	144.2	74.2	97.9	4793	101.9	999	5792	187.8	1.532
	137.8	71.0	144.5	74.4	98.4	4843	99.2	971	5815	181.8	1.532
	138.5	71.3	145.2	74.7	98.9	4892	96.4	945	5837	174.3	1.532
	139.3	71.7	145.9	75.1	99.4	4942	93.5	917	5859	165.0	1.532
	140.2	72.2	146.9	75.6	99.9	4990	90.6	888	5878	153.5	1.532
	141.2	72.7	147.9	76.1	100.4	5039	87.6	859	5897	140.7	1.531

1805:46 to 1805:52 CDT

CDT	Corrected Airspeed		True Airspeed		GVL	KE	Z - Z_{ref}	PE	TE	dTE/dt	EPR
h m s	kts	m/s	kts	m/s	m/s	m^2/s^2	m	m^2/s^2	m^2/s^2	m^2/s^3	
1805 46	142.2	73.2	148.9	76.6	100.9	5086	84.5	828	5914	126.3	1.531
	143.2	73.7	149.9	77.2	101.3	5132	81.3	797	5929	109.4	1.531
	144.1	74.2	150.8	77.6	101.7	5176	78.1	765	5941	92.8	1.531
	144.9	74.6	151.7	78.1	102.2	5218	74.8	733	5951	78.6	1.531
	145.8	75.1	152.6	78.5	102.6	5259	71.6	701	5960	67.5	1.531
	146.8	75.6	153.5	79.0	102.9	5299	68.3	670	5969	58.3	1.531
	147.8	76.1	154.5	79.5	103.3	5337	65.1	638	5975	48.9	1.531
	148.7	76.6	155.5	80.0	103.7	5374	61.9	607	5981	40.5	1.530
1805 47	149.6	77.0	156.4	80.5	104.0	5409	58.8	576	5985	36.0	1.530
	150.4	77.4	157.3	81.0	104.3	5444	55.7	546	5990	35.1	1.530
	151.2	77.8	158.0	81.4	104.7	5478	52.7	516	5994	35.6	1.530
	151.9	78.2	158.8	81.7	105.0	5511	49.7	487	5998	34.3	1.530
	152.6	78.5	159.5	82.1	105.3	5543	46.8	459	6002	29.5	1.530
	153.2	78.9	160.2	82.5	105.6	5574	44.1	432	6006	23.7	1.530
	153.9	79.2	160.9	82.8	105.9	5603	41.4	405	6008	21.6	1.530
	154.5	79.6	161.5	83.2	106.1	5631	38.8	380	6011	27.9	1.529
1805 48	155.1	79.9	162.2	83.5	106.4	5660	36.3	356	6016	49.8	1.529
	155.8	80.2	162.8	83.8	106.7	5691	34.0	333	6024	84.3	1.529
	156.4	80.5	163.5	84.1	107.0	5725	31.8	312	6037	119.9	1.529
	157.0	80.8	164.1	84.5	107.3	5762	29.8	292	6054	147.2	1.529
	157.7	81.2	164.7	84.8	107.7	5800	27.9	273	6073	159.6	1.529
	158.3	81.5	165.4	85.2	108.1	5838	26.1	256	6094	162.2	1.529
	159.1	81.9	166.2	85.6	108.4	5874	24.5	240	6114	161.4	1.529
	159.9	82.3	167.0	86.0	108.7	5909	22.9	224	6133	162.2	1.528
1805 49	160.6	82.7	167.8	86.4	109.0	5944	21.5	210	6154	172.6	1.528
	161.4	83.1	168.6	86.8	109.4	5980	20.1	197	6177	190.9	1.528
	162.4	83.6	169.6	87.3	109.7	6018	18.8	184	6202	210.0	1.528
	163.4	84.1	170.7	87.9	110.1	6057	17.6	173	6230	223.3	1.528
	164.7	85.3	173.1	89.1	110.4	6096	16.5	162	6258	228.2	1.528
	168.8	86.9	176.3	90.8	110.8	6135	15.5	152	6287	228.6	1.528
	171.9	88.5	179.6	92.4	111.1	6173	14.5	142	6315	227.8	1.528
	174.3	89.7	182.1	93.7	111.4	6210	13.6	133	6343	226.0	1.527
1805 50	175.1	90.1	182.8	94.1	111.3	6247	12.8	125	6372	222.4	1.527
	175.4	90.3	183.1	94.3	112.1	6282	11.9	117	6399	215.8	1.527
	174.9	90.0	182.6	94.0	112.4	6316	11.1	109	6425	206.2	1.527
	174.2	89.7	181.9	93.7	112.7	6349	10.3	101	6450	197.2	1.527
	173.1	89.1	180.8	93.1	113.0	6381	9.5	93	6474	193.3	1.527
	171.9	88.5	179.4	92.4	113.3	6413	8.7	85	6498	193.9	1.527
	170.2	87.6	177.7	91.5	113.5	6446	7.9	77	6523	195.2	1.527
	168.4	86.7	175.8	90.5	113.8	6479	7.0	69	6548	193.1	1.526
1805 51	167.1	86.0	174.4	89.8	114.1	6511	6.2	61	6572	187.3	1.526
	166.2	85.6	173.4	89.3	114.4	6543	5.3	52	6595	181.2	1.526
	166.3	85.6	173.5	89.3	114.7	6573	4.4	43	6616	176.9	1.526
	166.6	85.8	173.8	89.5	114.9	6604	3.6	35	6639	173.5	1.526
	167.1	86.0	174.3	89.7	115.2	6634	2.7	27	6661	171.2	1.526
	167.6	86.3	174.8	90.0	115.4	6663	1.9	19	6682	170.4	1.526
	168.1	86.5	175.3	90.2	115.7	6691	1.2	12	6703	167.9	1.526
	168.6	86.8	175.8	90.5	115.9	6718	0.6	5	6723	150.3	1.525
1805 52	169.0	87.0	176.2	90.7	116.1	6740	0.0	0	6740	-34.3	1.525
	169.4	87.2	176.5	90.9	115.9	6716	-0.1	0	6716	-387.7	1.525
	169.7	87.4	176.8	91.0	115.3	6644	-0.1	0	6644	-556.9	1.525
	170.0	87.5	177.2	91.2	114.7	6575	0.1	1	6576	-495.5	1.525
	170.3	87.6	177.4	91.3	114.2	6515	0.3	3	6519	-399.6	1.525
	170.5	87.5	177.6	91.4	113.8	6471	0.5	5	6476	-236.8	1.525
	170.7	87.9	177.8	91.5	113.6	6454	0.6	6	6460	28.5	1.525
	170.9	88.0	178.0	91.7	113.8	6476	0.7	7	6483	215.2	1.524

1805:53 to 1805:59 CDT

CDT	Corrected Airspeed		True Airspeed		GVL	KE	Z-Z$_{ref}$	PC	TE	dTE/dt	EPR
h m s	kts	m/s	kts	m/s	m/s	m^2/s^2	m	m^2/s^2	m^2/s^2	m^2/s^3	
1805 53	171.2	88.2	178.4	91.8	114.1	6507	0.8	7	6514	212.8	1.524
	171.6	88.3	178.7	92.0	114.3	6529	0.8	7	6536	183.2	1.523
	172.3	89.0	180.0	92.7	114.5	6553	0.8	7	6560	196.0	1.523
	174.7	89.9	181.9	93.6	114.7	6578	0.7	7	6585	161.2	1.521
	177.9	91.6	185.2	95.3	114.8	6593	0.7	7	6600	137.6	1.520
	181.4	93.4	188.8	97.2	115.0	6614	0.6	6	6620	200.2	1.518
	184.5	95.0	192.1	98.9	115.3	6645	0.5	5	6650	228.1	1.515
2nd	187.1	96.3	194.6	100.3	115.5	6673	0.4	4	6677	178.4	1.512
1805 54	188.2	96.9	195.9	100.9	115.7	6692	0.3	3	6695	163.5	1.507
	188.9	97.3	196.6	101.2	115.9	6716	0.1	1	6717	164.6	1.502
	188.8	97.2	196.5	101.2	116.1	6737	-0.1	0	6737	114.4	1.496
	188.5	97.0	196.2	101.0	116.2	6748	-0.2	-1	6747	99.8	1.490
	187.8	96.7	195.5	100.6	116.3	6766	-0.5	-3	6763	140.8	1.482
	187.1	96.3	194.7	100.3	116.5	6787	-0.6	-5	6782	136.3	1.474
	186.2	95.9	193.8	99.8	116.7	6804	-0.9	-8	6796	90.5	1.462
	185.3	95.4	192.8	99.3	116.7	6814	-1.0	-9	6805	58.1	1.447
1805 55	184.4	94.9	191.9	98.8	116.8	6822	-1.2	-11	6811	39.5	1.427
	183.6	94.5	191.1	98.4	116.9	6828	-1.5	-13	6815	24.6	1.405
	183.1	94.3	190.6	98.1	116.9	6832	-1.7	-15	6817	10.5	1.376
	184.6	95.0	192.2	98.9	116.9	6835	-1.9	-18	6817	-1.3	1.345
	183.6	94.5	191.2	98.4	116.9	6836	-2.0	-19	6817	-33.9	1.310
	182.6	94.0	190.3	98.0	116.9	6829	-2.1	-20	6809	-123.4	1.275
	181.7	93.5	189.3	97.5	116.6	6803	-1.9	-18	6785	-257.5	1.243
3rd	180.7	93.0	188.4	97.0	116.3	6758	-1.5	-13	6745	-345.4	1.212
1805 56	180.7	93.0	188.4	97.0	115.8	6708	-0.9	-8	6700	-360.8	1.187
	180.8	93.1	188.5	97.0	115.4	6658	-0.5	-3	6655	-416.3	1.163
	179.9	92.6	187.6	96.6	114.8	6595	-0.1	0	6595	-537.8	1.145
	179.9	92.6	187.7	96.6	114.2	6516	0.3	3	6519	-586.5	1.128
	180.0	92.7	187.9	96.7	113.5	6442	0.5	5	6447	-502.5	1.115
	179.1	92.2	187.0	96.3	113.0	6386	0.7	7	6393	-452.3	1.102
	179.3	92.3	187.2	96.4	112.5	6327	0.8	8	6335	-532.8	1.090
	178.4	91.8	186.3	95.9	111.8	6253	0.8	7	6260	-595.8	1.079
1805 57	178.5	91.9	186.5	96.0	111.2	6180	0.6	6	6186	-554.1	1.069
	178.8	92.1	186.9	96.2	110.6	6117	0.4	4	6121	-501.4	1.059
	178.0	91.7	186.1	95.8	110.1	6059	0.2	1	6060	-511.7	1.052
	177.5	91.4	185.5	95.5	109.5	5996	-0.2	-1	5995	-553.6	1.044
	177.8	91.5	186.0	95.7	108.9	5928	-0.6	-5	5923	-585.3	1.039
	177.3	91.3	185.5	95.5	108.2	5858	-1.1	-9	5849	-563.8	1.034
	175.0	90.1	183.1	94.3	107.7	5795	-1.5	-14	5781	-523.8	1.031
4th	174.7	89.9	182.8	94.1	107.1	5736	-2.0	-18	5718	-584.6	1.026
1805 58	173.2	89.2	181.3	93.4	106.4	5659	-2.5	-23	5636	-706.6	1.021
	171.0	88.0	179.1	92.2	105.5	5568	-2.9	-27	5541	-718.3	1.017
	170.1	87.5	178.2	91.7	104.8	5487	-3.3	-31	5456	-658.8	1.014
	167.8	86.4	175.9	90.5	104.0	5411	-3.6	-35	5376	-694.3	1.011
	165.8	85.4	173.8	89.5	103.2	5323	-3.9	-38	5285	-738.2	1.009
	164.9	84.9	172.9	89.0	102.3	5231	-4.2	-40	5191	-712.0	1.007
	164.0	84.4	172.0	88.5	101.5	5148	-4.3	-41	5107	-639.8	1.005
	163.3	84.1	171.4	88.2	100.7	5074	-4.5	-43	5031	-680.8	1.003
1805 59	161.2	83.0	169.1	87.1	99.8	4980	-4.5	-43	4937	-811.2	1.002
	159.3	82.0	167.2	86.1	98.7	4872	-4.5	-43	4829	-837.8	1.001
	159.6	82.2	167.6	86.3	97.7	4770	-4.5	-43	4727	-790.2	1.000
	160.0	82.4	168.0	86.5	96.7	4673	-4.4	-42	4631	-771.0	1.000
	159.3	82.0	167.3	86.1	95.7	4576	-4.3	-41	4535	-762.6	1.000
	159.7	82.2	167.8	86.4	94.7	4481	-4.3	-41	4440	-691.1	0.000
	159.1	81.9	167.3	86.1	93.8	4402	-4.2	-41	4361	-575.0	0.000
	161.5	83.1	169.8	87.4	93.1	4337	-4.2	-40	4297	-512.3	0.000

APPENDIX 11 SIDESLIP ANGLES

Sideslip angles computed with three terms, lateral acceleration (Term 1), rudder deflection term (Term 2), and yaw rate (Term 3). Gross weight W = 324,822 lbs, wing area A = 3456 sq. ft., RD is rudder deflection angle in deg., YR is yaw rate, and β sideslip angle.

1804:55 to 1805:00 CDT

CDT	$-\frac{c_y W}{\bar{q}_c CAS\ A}$	$C_{y_\beta} RD$	$C_{y_r} \frac{YR\ b}{2\ TAS}$	β_1	β_2	β_3 (deg)	v component Windspeeds (m/s)			
h m s				Term 1	Term 2	Term 3	$\beta=0$	Term 1	Terms 1+2	Terms 1+2+3
1804 55	0.0257	0.0023	0.0007	1.17	0.11	0.03	4.53	4.21	4.06	4.01
	0.0262	0.0026	0.0006	1.19	0.12	0.03	4.60	4.33	4.15	4.12
	0.0256	0.0023	0.0005	1.17	0.13	0.02	4.69	4.46	4.26	4.23
	0.0236	0.0032	0.0005	1.07	0.15	0.02	4.80	4.66	4.45	4.42
	0.0219	0.0035	0.0005	1.00	0.16	0.03	4.88	4.88	4.65	4.61
	0.0235	0.0035	0.0006	1.07	0.16	0.03	4.93	4.90	4.67	4.63
	0.0268	0.0035	0.0006	1.22	0.16	0.03	5.02	4.77	4.54	4.50
	0.0301	0.0037	0.0006	1.37	0.17	0.03	5.09	4.66	4.41	4.37
1804 56	0.0316	0.0041	0.0006	1.44	0.19	0.03	5.14	4.68	4.41	4.37
	0.0326	0.0044	0.0006	1.48	0.20	0.03	5.19	4.72	4.43	4.39
	0.0352	0.0047	0.0006	1.60	0.21	0.03	5.29	4.62	4.31	4.27
	0.0378	0.0050	0.0005	1.72	0.23	0.02	5.39	4.51	4.18	4.15
	0.0388	0.0052	0.0003	1.77	0.24	0.01	5.39	4.51	4.17	4.15
	0.0372	0.0052	0.0002	1.69	0.24	0.01	5.39	4.69	4.34	4.32
	0.0353	0.0052	0.0003	1.60	0.24	0.01	5.42	4.83	4.48	4.46
	0.0350	0.0055	0.0004	1.59	0.25	0.02	5.48	4.88	4.52	4.49
1304 57	0.0365	0.0058	0.0003	1.66	0.26	0.01	5.49	4.85	4.47	4.45
	0.0397	0.0061	0.0001	1.76	0.28	0.00	5.49	4.75	4.35	4.34
	0.0400	0.0064	-0.0001	1.82	0.29	-0.00	5.50	4.63	4.21	4.21
	0.0391	0.0067	-0.0001	1.78	0.31	-0.00	5.51	4.65	4.21	4.21
	0.0376	0.0070	-0.0001	1.71	0.32	-0.00	5.48	4.73	4.27	4.28
	0.0361	0.0070	-0.0001	1.64	0.32	-0.01	5.44	4.82	4.36	4.37
	0.0352	0.0070	-0.0002	1.60	0.32	-0.01	5.45	4.81	4.35	4.36
	0.0352	0.0072	-0.0005	1.60	0.33	-0.02	5.44	4.74	4.26	4.29
1804 58	0.0352	0.0076	-0.0010	1.60	0.34	-0.05	5.33	4.62	4.12	4.18
	0.0347	0.0078	-0.0014	1.58	0.36	-0.06	5.20	4.46	3.96	4.05
	0.0339	0.0081	-0.0015	1.54	0.37	-0.07	5.06	4.25	3.72	3.82
	0.0318	0.0085	-0.0014	1.45	0.39	[illegible]	4.93	4.13	3.57	3.66
	0.0292	0.0087	-0.0013	1.33	0.40	[illegible]	4.78	4.03	3.50	3.59
	0.0265	0.0087	-0.0014	1.20	0.40	-0.06	4.64	4.03	3.45	3.54
	0.0243	0.0087	-0.0015	1.11	0.40	-0.07	4.52	3.94	3.36	3.45
	0.0235	0.0085	-0.0015	1.07	0.39	-0.07	4.39	3.75	3.19	3.29
1804 59	0.0230	0.0081	-0.0016	1.05	0.37	-0.07	4.23	3.57	3.02	3.13
	0.0222	0.0078	-0.0016	1.01	0.36	-0.07	4.07	3.41	2.89	3.00
	0.0207	0.0076	-0.0017	0.94	0.34	-0.08	3.91	3.30	2.79	2.91
	0.0183	0.0072	-0.0015	0.83	0.33	-0.07	3.75	3.25	2.76	2.87
	0.0159	0.0070	-0.0013	0.72	0.32	-0.06	3.61	3.23	2.78	2.87
	0.0130	0.0070	-0.0012	0.59	0.32	-0.06	3.49	3.31	2.84	2.93
	0.0098	0.0070	-0.0013	0.45	0.32	-0.06	3.37	3.39	2.92	3.01
	0.0080	0.0070	-0.0012	0.36	0.32	-0.05	3.24	3.36	2.90	2.98
1805 00	0.0074	0.0070	-0.0009	0.34	0.32	-0.04	3.13	3.32	2.86	2.92
	0.0082	0.0070	-0.0006	0.37	0.32	-0.03	3.05	3.23	2.77	2.80
	0.0086	0.0070	-0.0005	0.39	0.32	-0.02	3.01	3.15	2.73	2.76
	0.0078	0.0067	-0.0005	0.36	0.31	-0.03	2.97	3.23	2.79	2.83
	0.0063	0.0064	-0.0007	0.29	0.29	-0.03	2.89	3.28	2.90	2.94
	0.0052	0.0061	-0.0007	0.24	0.28	-0.03	2.82	3.16	2.98	3.02
	0.0051	0.0058	-0.0006	0.23	0.26	-0.03	2.76	3.10	2.99	3.03
	0.0063	0.0050	-0.0006	0.29	0.23	-0.03	2.72	3.12	2.97	3.01

1805:01 to 1805:07 CDT

CDT h m s	$-\frac{n_z W}{\frac{1}{2}\rho(CAS)^2 A}$	$C_{n_\beta} RD$	$C_{n_r} \frac{YR\ b}{2\ TAS}$	β_1 Term 1	β_2 Term 2	β_3 (deg) Term 3	v-component Windspeeds (m/s) $\beta=0$	Term 1	Terms 1+2	Terms 1+2+3
1805 01	0.0075	0.0041	-0.0005	0.34	0.19	-0.02	2.66	3.13	2.95	2.99
	0.0091	0.0035	-0.0005	0.42	0.16	-0.02	2.60	3.10	2.88	2.91
	0.0110	0.0029	-0.0005	0.50	0.13	-0.02	2.56	2.95	2.77	2.80
	0.0122	0.0020	-0.0003	0.56	0.09	-0.02	2.51	2.85	2.72	2.74
	0.0123	0.0012	-0.0001	0.56	0.05	-0.01	2.47	2.84	2.77	2.78
	0.0121	0.0009	0.0001	0.55	0.04	0.00	2.46	2.87	2.81	2.80
	0.0123	0.0006	0.0002	0.56	0.03	0.01	2.49	2.84	2.81	2.79
	0.0130	0.0002	0.0002	0.59	0.01	0.01	2.53	2.78	2.77	2.75
1805 02	0.0135	-0.0000	0.0002	0.61	-0.00	0.01	2.54	2.74	2.74	2.73
	0.0134	-0.0000	-0.0000	0.61	-0.00	-0.00	2.55	2.72	2.72	2.72
	0.0134	-0.0000	-0.0003	0.61	-0.00	-0.01	2.54	2.65	2.65	2.67
	0.0125	-0.0000	-0.0004	0.57	-0.00	-0.02	2.51	2.62	2.62	2.65
	0.0109	-0.0000	-0.0004	0.50	-0.00	-0.02	2.47	2.63	2.63	2.65
	0.0081	-0.0000	-0.0002	0.37	-0.00	-0.01	2.43	2.73	2.73	2.75
	0.0050	-0.0000	-0.0001	0.23	-0.00	-0.00	2.43	2.76	2.76	2.76
	0.0016	-0.0000	-0.0002	0.21	-0.00	-0.01	2.43	2.72	2.72	2.71
1805 03	0.0062	-0.0000	-0.0005	0.28	-0.00	-0.02	2.39	2.72	2.71	2.73
	0.0055	-0.0000	-0.0007	0.30	-0.00	-0.03	2.32	2.63	2.63	2.66
	0.0038	-0.0000	-0.0008	0.17	-0.00	-0.04	2.23	2.49	2.49	2.43
	-0.0015	-0.0000	-0.0007	-0.07	-0.00	-0.03	2.15	2.05	2.05	2.01
	-0.0053	-0.0000	-0.0004	-0.26	-0.00	-0.02	2.11	1.72	1.72	1.69
	-0.0054	-0.0000	-0.0003	-0.25	-0.00	-0.01	2.08	1.72	1.72	1.70
	-0.0034	-0.0000	-0.0004	-0.16	-0.00	-0.02	2.06	1.83	1.83	1.80
	-0.0013	-0.0000	-0.0006	-0.06	-0.00	-0.03	2.02	1.93	1.93	1.89
1805 04	-0.0010	-0.0000	-0.0008	-0.04	-0.00	-0.04	1.94	1.88	1.88	1.82
	-0.0039	-0.0000	-0.0008	-0.17	-0.00	-0.03	1.86	1.61	1.61	1.56
	-0.0068	-0.0000	-0.0007	-0.31	-0.00	-0.03	1.79	1.33	1.33	1.28
	-0.0069	0.0002	-0.0007	-0.31	0.01	-0.03	1.72	1.25	1.27	1.22
	-0.0046	0.0006	-0.0007	-0.21	0.03	-0.03	1.64	1.33	1.37	1.32
	0.0006	0.0009	-0.0008	0.03	0.04	-0.03	1.56	1.59	1.65	1.60
	0.0050	0.0012	-0.0008	0.23	0.05	-0.04	1.48	1.80	1.82	1.81
	0.0067	0.0017	-0.0008	0.30	0.08	-0.04	1.40	1.72	1.62	1.66
1805 05	0.0073	0.0023	-0.0008	0.33	0.11	-0.04	1.32	1.61	1.46	1.52
	0.0066	0.0026	-0.0006	0.30	0.12	-0.03	1.25	1.58	1.41	1.46
	0.0061	0.0029	-0.0004	0.28	0.13	-0.02	1.21	1.56	1.38	1.40
	0.0074	0.0030	-0.0002	0.34	0.14	-0.01	1.18	1.45	1.26	1.27
	0.0096	0.0029	-0.0001	0.43	0.13	-0.00	1.17	1.31	1.12	1.12
	0.0109	0.0026	-0.0001	0.50	0.12	-0.00	1.14	1.24	1.06	1.07
	0.0107	0.0023	-0.0001	0.49	0.11	-0.00	1.11	1.28	1.12	1.13
	0.0084	0.0017	-0.0002	0.38	0.08	-0.01	1.08	1.46	1.34	1.35
1805 06	0.0061	0.0012	-0.0003	0.28	0.05	-0.02	1.02	1.43	1.48	1.46
	0.0038	0.0009	-0.0004	0.17	0.04	-0.02	0.97	1.23	1.29	1.26
	0.0014	0.0006	-0.0003	0.06	0.03	-0.01	0.93	1.03	1.06	1.05
	0.0003	0.0002	0.0001	0.04	0.01	0.01	0.91	0.97	0.98	0.99
	0.0013	-0.0000	0.0005	0.06	-0.00	0.02	0.94	1.03	1.03	1.07
	0.0054	-0.0000	0.0005	0.25	-0.00	0.02	0.99	1.35	1.35	1.38
	0.0106	-0.0000	0.0004	0.48	-0.00	0.02	1.02	1.35	1.35	1.32
	0.0139	-0.0000	0.0001	0.63	-0.00	0.01	1.04	1.14	1.14	1.13
1805 07	0.0151	-0.0000	-0.0000	0.68	-0.00	-0.00	1.03	1.05	1.05	1.05
	0.0114	-0.0000	0.0000	0.52	-0.00	0.00	1.02	1.28	1.29	1.28
	0.0070	-0.0000	0.0001	0.32	-0.00	0.00	1.02	1.48	1.48	1.49
	0.0026	-0.0000	0.0001	0.12	-0.00	0.01	1.02	1.20	1.20	1.21
	-0.0009	-0.0000	0.0001	-0.04	-0.00	0.01	1.01	0.95	0.95	0.96
	0.0002	-0.0000	0.0001	0.01	-0.00	0.01	1.01	1.02	1.02	1.03
	0.0036	-0.0000	0.0001	0.17	-0.00	0.01	1.02	1.26	1.26	1.27
	0.0057	-0.0000	0.0001	0.26	-0.00	0.01	1.03	1.41	1.41	1.41

1805:08 to 1805:14 CDT

CDT h m s	$-\frac{a_1 W}{\frac{1}{2}\rho CAS\ A}$	$C_{n_\beta} RD$	$C_{n_r} \frac{YR\ b}{2\ TAS}$	β_1 Term 1	β_2 Term 2	β_3 (deg) Term 3	v-component Windspeeds (m/s) β=0	Term 1	Terms 1+2	Terms 1+2+3
1805 08	0.0047	-0.0000	0.0001	0.22	-0.00	0.00	1.02	1.35	1.35	1.35
	0.0012	-0.0000	0.0001	0.05	-0.00	0.00	1.03	1.11	1.11	1.11
	-0.0009	-0.0000	0.0001	-0.04	-0.00	0.00	1.04	0.93	0.98	0.98
	-0.0014	-0.0000	-0.0001	-0.06	-0.00	-0.00	1.05	0.95	0.95	0.95
	-0.0020	-0.0000	-0.0003	-0.09	-0.00	-0.01	1.02	0.88	0.88	0.86
	-0.0027	-0.0000	-0.0004	-0.12	-0.00	-0.02	0.97	0.79	0.79	0.76
	-0.0031	-0.0000	-0.0003	-0.14	-0.00	-0.01	0.93	0.72	0.72	0.70
	-0.0035	-0.0000	-0.0001	-0.16	-0.00	-0.00	0.91	0.66	0.66	0.65
1805 09	-0.0043	-0.0000	0.0000	-0.20	-0.00	0.00	0.91	0.61	0.61	0.61
	-0.0041	-0.0000	-0.0000	-0.18	-0.00	-0.00	0.90	0.62	0.62	0.62
	-0.0032	-0.0000	-0.0001	-0.14	-0.00	-0.00	0.90	0.68	0.66	0.67
	-0.0030	-0.0007	-0.0002	-0.13	-0.03	-0.01	0.89	0.69	0.64	0.63
	-0.0043	-0.0016	-0.0002	-0.19	-0.07	-0.01	0.89	0.59	0.48	0.47
	-0.0063	-0.0024	-0.0003	-0.29	-0.11	-0.01	0.88	0.44	0.27	0.25
	-0.0075	-0.0032	-0.0003	-0.34	-0.15	-0.02	0.87	0.35	0.12	0.10
	-0.0083	-0.0041	-0.0004	-0.38	-0.19	-0.02	0.85	0.27	-0.02	-0.05
1805 10	-0.0097	-0.0048	-0.0005	-0.44	-0.22	-0.02	0.82	0.15	-0.19	-0.22
	-0.0114	-0.0048	-0.0005	-0.52	-0.22	-0.02	0.76	-0.03	-0.37	-0.40
	-0.0129	-0.0048	-0.0006	-0.58	-0.22	-0.03	0.75	-0.15	-0.49	-0.53
	-0.0130	-0.0039	-0.0007	-0.59	-0.18	-0.03	0.64	-0.14	-0.41	-0.45
	-0.0128	-0.0026	-0.0007	-0.58	-0.12	-0.02	0.52	-0.14	-0.33	-0.38
	-0.0117	-0.0015	-0.0009	-0.53	-0.07	-0.04	0.40	-0.10	-0.21	-0.28
	-0.0106	-0.0004	-0.0012	-0.48	-0.02	-0.05	0.24	-0.11	-0.14	-0.22
	-0.0102	0.0001	-0.0012	-0.46	0.01	-0.05	0.07	-0.18	-0.17	-0.25
1805 11	-0.0105	0.0001	-0.0009	-0.48	0.01	-0.04	-0.09	-0.28	-0.27	-0.33
	-0.0124	-0.0007	-0.0007	-0.56	-0.03	-0.03	-0.21	-0.47	-0.51	-0.56
	-0.0146	-0.0015	-0.0006	-0.66	-0.07	-0.03	-0.29	-0.67	-0.78	-0.82
	-0.0163	-0.0026	-0.0007	-0.74	-0.12	-0.03	-0.39	-0.86	-1.04	-1.09
	-0.0167	-0.0036	-0.0006	-0.76	-0.17	-0.03	-0.49	-0.95	-1.21	-1.25
	-0.0148	-0.0039	-0.0006	-0.67	-0.18	-0.03	-0.58	-0.87	-1.15	-1.19
	-0.0123	-0.0042	-0.0007	-0.56	-0.19	-0.03	-0.66	-0.75	-1.05	-1.11
	-0.0100	-0.0046	-0.0008	-0.46	-0.21	-0.04	-0.75	-0.69	-1.02	-1.08
1805 12	-0.0082	-0.0048	-0.0006	-0.37	-0.22	-0.04	-0.84	-0.68	-1.02	-1.07
	-0.0075	-0.0048	-0.0008	-0.34	-0.22	-0.03	-0.92	-0.73	-1.07	-1.13
	-0.0071	-0.0048	-0.0008	-0.32	-0.22	-0.04	-1.00	-0.80	-1.14	-1.20
	-0.0067	-0.0048	-0.0010	-0.31	-0.22	-0.05	-1.10	-0.88	-1.22	-1.29
	-0.0061	-0.0048	-0.0012	-0.28	-0.22	-0.05	-1.23	-0.98	-1.31	-1.39
	-0.0082	-0.0048	-0.0010	-0.37	-0.22	-0.05	-1.35	-1.25	-1.59	-1.66
	-0.0124	-0.0048	-0.0008	-0.56	-0.22	-0.03	-1.44	-1.65	-1.99	-2.04
	-0.0162	-0.0039	-0.0006	-0.74	-0.18	-0.03	-1.50	-1.98	-2.25	-2.30
1805 13	-0.0176	-0.0026	-0.0007	-0.80	-0.12	-0.03	-1.57	-2.12	-2.31	-2.36
	-0.0188	-0.0015	-0.0008	-0.86	-0.07	-0.04	-1.66	-2.24	-2.35	-2.41
	-0.0221	-0.0004	-0.0007	-1.01	-0.02	-0.03	-1.74	-2.52	-2.55	-2.60
	-0.0249	-0.0001	-0.0005	-1.13	-0.01	-0.02	-1.79	-2.77	-2.78	-2.81
	-0.0254	-0.0004	-0.0003	-1.16	-0.02	-0.02	-1.79	-2.84	-2.88	-2.90
	-0.0235	-0.0015	-0.0002	-1.07	-0.07	-0.01	-1.79	-2.75	-2.85	-2.87
	-0.0223	-0.0026	0.0000	-1.01	-0.12	0.00	-1.78	-2.66	-2.84	-2.84
	-0.0239	-0.0041	0.0003	-1.09	-0.19	0.01	-1.78	-2.75	-3.03	-3.02
1805 14	-0.0267	-0.0054	0.0004	-1.21	-0.24	0.02	-1.73	-2.89	-3.26	-3.23
	-0.0274	-0.0057	0.0005	-1.25	-0.26	0.02	-1.67	-2.89	-3.26	-3.25
	-0.0257	-0.0060	0.0005	-1.17	-0.27	0.02	-1.62	-2.71	-3.13	-3.09
	-0.0243	-0.0065	0.0005	-1.10	-0.30	0.02	-1.55	-2.57	-3.03	-3.00
	-0.0256	-0.0071	0.0005	-1.16	-0.32	0.02	-1.48	-2.65	-3.15	-3.11
	-0.0265	-0.0074	0.0006	-1.21	-0.34	0.03	-1.39	-2.71	-3.24	-3.19
	-0.0245	-0.0077	0.0006	-1.11	-0.35	0.03	-1.31	-2.57	-3.11	-3.07
	-0.0192	-0.0085	0.0006	-0.87	-0.39	0.03	-1.22	-2.19	-2.80	-2.75

1805:15 to 1805:21 CDT

CDT	$\frac{a_1 W}{\frac{1}{2}\rho CAS\ A}$	$C_{n_\beta} RD$	$C_{n_\beta} \frac{YR\ b}{2\ TAS}$	β_1	β_2	β_3 (deg)	v-component Windspeeds (m/s)			
h m s				Term 1	Term 2	Term 3	$\beta=0$	Term 1	Terms 1+2	Terms 1+2+3
1805 15	-0.0147	-0.0095	0.0006	-0.67	-0.43	0.03	-1.15	-1.86	-2.53	-2.49
	-0.0143	-0.0100	0.0006	-0.65	-0.46	0.03	-1.08	-1.81	-2.52	-2.48
	-0.0157	-0.0106	0.0006	-0.71	-0.48	0.03	-1.02	-1.85	-2.60	-2.56
	-0.0199	-0.0110	0.0006	-0.90	-0.50	0.03	-0.95	-2.08	-2.86	-2.81
	-0.0241	-0.0112	0.0006	-1.09	-0.51	0.03	-0.90	-2.27	-3.07	-3.02
	-0.0254	-0.0109	0.0006	-1.16	-0.50	0.03	-0.85	-2.26	-3.03	-2.99
	-0.0249	-0.0106	0.0006	-1.13	-0.48	0.03	-0.82	-2.10	-2.85	-2.81
	-0.0229	-0.0103	0.0003	-1.04	-0.47	0.02	-0.79	-1.86	-2.59	-2.56
1805 16	-0.0215	-0.0100	0.0000	-0.98	-0.46	0.00	-0.77	-1.72	-2.44	-2.44
	-0.0238	-0.0100	-0.0002	-1.08	-0.46	-0.01	-0.72	-1.92	-2.64	-2.65
	-0.0274	-0.0100	-0.0003	-1.25	-0.46	-0.02	-0.68	-2.30	-3.02	-3.04
	-0.0312	-0.0095	-0.0003	-1.42	-0.43	-0.01	-0.63	-2.71	-3.39	-3.42
	-0.0332	-0.0089	-0.0003	-1.51	-0.40	-0.01	-0.63	-3.00	-3.64	-3.66
	-0.0364	-0.0083	-0.0000	-1.65	-0.38	-0.00	-0.69	-3.32	-3.92	-3.92
	-0.0419	-0.0077	0.0002	-1.90	-0.35	0.01	-0.70	-3.74	-4.29	-4.28
	-0.0455	-0.0073	0.0006	-2.07	-0.33	0.03	-0.65	-3.95	-4.48	-4.43
1805 17	-0.0454	-0.0071	0.0010	-2.06	-0.32	0.04	-0.54	-3.85	-4.37	-4.29
	-0.0390	-0.0074	0.0010	-1.77	-0.34	0.04	-0.40	-3.25	-3.79	-3.72
	-0.0319	-0.0077	0.0008	-1.45	-0.35	0.04	-0.24	-2.60	-3.16	-3.10
	-0.0265	-0.0085	0.0006	-1.20	-0.39	0.03	-0.21	-2.06	-2.70	-2.65
	-0.0228	-0.0095	0.0006	-1.04	-0.43	0.03	-0.16	-1.69	-2.39	-2.34
	-0.0228	-0.0100	0.0009	-1.04	-0.46	0.01	-0.10	-1.57	-2.31	-2.24
	-0.0235	-0.0106	0.0012	-1.07	-0.48	0.05	0.02	-1.41	-2.20	-2.12
	-0.0228	-0.0110	0.0010	-1.04	-0.50	0.05	0.20	-1.17	-2.00	-1.92
1805 18	-0.0205	-0.0112	0.0007	-0.93	-0.51	0.03	0.38	-0.89	-1.73	-1.68
	-0.0186	-0.0109	0.0003	-0.85	-0.50	0.01	0.54	-0.69	-1.51	-1.48
	-0.0185	-0.0106	0.0002	-0.84	-0.48	0.01	0.65	-0.62	-1.42	-1.41
	-0.0171	-0.0098	0.0002	-0.78	-0.44	0.01	0.74	-0.42	-1.15	-1.14
	-0.0128	-0.0089	0.0001	-0.58	-0.40	0.00	0.82	-0.00	-0.67	-0.66
	-0.0122	-0.0083	-0.0001	-0.55	-0.38	-0.01	0.90	0.11	-0.51	-0.52
	-0.0166	-0.0077	-0.0003	-0.76	-0.35	-0.01	0.92	-0.16	-0.74	-0.76
	-0.0207	-0.0070	-0.0001	-0.94	-0.32	-0.01	0.98	-0.45	-0.97	-0.98
1805 19	-0.0195	-0.0065	-0.0000	-0.89	-0.30	-0.00	1.13	-0.32	-0.61	-0.61
	-0.0113	-0.0065	-0.0001	-0.51	-0.30	-0.00	1.13	0.30	-0.18	-0.19
	-0.0037	-0.0065	-0.0002	-0.17	-0.30	-0.01	1.16	0.90	0.41	0.39
	0.0013	-0.0065	-0.0007	0.06	-0.30	-0.03	1.21	1.28	0.82	0.77
	0.0051	-0.0065	-0.0011	0.23	-0.30	-0.05	1.18	1.06	1.07	1.00
	0.0042	-0.0065	-0.0012	0.19	-0.30	-0.05	1.11	1.11	0.94	0.86
	0.0012	-0.0065	-0.0012	0.05	-0.30	-0.05	1.03	1.11	0.64	0.56
	0.0016	-0.0054	-0.0012	0.07	-0.24	-0.05	0.94	1.05	0.68	0.59
1805 20	0.0065	-0.0038	-0.0014	0.29	-0.17	-0.06	0.84	1.06	1.03	0.93
	0.0103	-0.0024	-0.0015	0.47	-0.11	-0.07	0.72	0.81	0.97	1.07
	0.0087	-0.0010	-0.0015	0.39	-0.05	-0.07	0.58	0.90	0.97	1.00
	0.0003	0.0003	-0.0014	0.01	0.01	-0.06	0.53	0.55	0.57	0.47
	-0.0073	0.0012	-0.0014	-0.33	0.05	-0.06	0.50	-0.01	0.07	-0.02
	-0.0126	0.0009	-0.0016	-0.57	0.04	-0.07	0.47	-0.41	-0.35	-0.46
	-0.0170	0.0006	-0.0017	-0.77	0.03	-0.08	0.37	-0.81	-0.77	-0.89
	-0.0184	0.0005	-0.0017	-0.84	0.02	-0.08	0.25	-1.02	-0.99	-1.11
1805 21	-0.0182	0.0006	-0.0017	-0.83	0.03	-0.08	0.12	-1.13	-1.09	-1.21
	-0.0232	0.0009	-0.0015	-1.05	0.04	-0.07	-0.03	-1.63	-1.57	-1.67
	-0.0329	0.0012	-0.0012	-1.50	0.05	-0.05	-0.22	-2.47	-2.40	-2.48
	-0.0413	0.0012	-0.0008	-1.88	0.06	-0.04	-0.43	-3.25	-3.16	-3.22
	-0.0439	0.0012	-0.0006	-2.00	0.05	-0.03	-0.61	-3.59	-3.51	-3.55
	-0.0385	0.0009	-0.0003	-1.75	0.04	-0.02	-0.77	-3.37	-3.31	-3.33
	-0.0333	0.0006	-0.0000	-1.52	0.03	-0.00	-0.89	-3.13	-3.10	-3.10
	-0.0316	-0.0007	0.0003	-1.44	-0.03	0.01	-0.95	-3.07	-3.11	-3.09

1805:22 to 1805:28 CDT

CDT	$-\frac{a_0 W}{\frac{1}{2}\rho_0 CAS\ A}$	$C_{n_\beta} RD$	$C_{n_r} \frac{YR\ b}{2\ TAS}$	β_1	β_2	β_3 (deg)	v-component Windspeeds (m/s)			
h m s				Term 1	Term 2	Term 3	$\beta=0$	Term 1	Terms 1+2	Terms 1+2+3
1805 22	-0.0315	-0.0022	0.0006	-1.43	-0.10	0.03	-0.95	-3.06	-3.20	-3.16
	-0.0273	-0.0033	0.0007	-1.24	-0.15	0.03	-0.91	-2.73	-2.95	-2.90
	-0.0186	-0.0044	0.0007	-0.85	-0.20	0.03	-0.88	-2.12	-2.41	-2.36
	-0.0098	-0.0059	0.0008	-0.45	-0.27	0.03	-0.92	-1.57	-1.96	-1.91
	-0.0056	-0.0071	0.0008	-0.26	-0.32	0.04	-0.97	-1.34	-1.82	-1.77
	-0.0070	-0.0074	0.0009	-0.32	-0.34	0.04	-1.04	-1.51	-2.01	-1.95
	-0.0078	-0.0077	0.0010	-0.36	-0.35	0.05	-1.07	-1.60	-2.12	-2.05
	-0.0052	-0.0033	0.0011	-0.24	-0.38	0.05	-1.05	-1.40	-1.96	-1.89
1805 23	-0.0009	-0.0089	0.0012	-0.04	-0.40	0.05	-1.00	-1.06	-1.66	-1.58
	0.0081	-0.0092	0.0011	0.37	-0.42	0.05	-0.92	-1.39	-1.00	-0.93
	0.0187	-0.0095	0.0011	0.85	-0.43	0.05	-0.82	-2.06	-1.42	-1.50
	0.0222	-0.0084	0.0010	1.01	-0.38	0.04	-0.75	-2.22	-1.66	-1.73
	0.0193	-0.0067	0.0008	0.88	-0.30	0.04	-0.69	-1.97	-1.52	-1.58
	0.0055	-0.0050	0.0008	0.25	-0.23	0.03	-0.63	-0.99	-0.68	-0.71
	-0.0097	-0.0033	0.0008	-0.44	-0.15	0.04	-0.58	-1.21	-1.43	-1.38
	-0.0234	-0.0012	0.0011	-1.06	-0.05	0.05	-0.51	-2.02	-2.09	-2.02
1805 24	-0.0356	0.0006	0.0015	-1.62	0.03	0.07	-0.38	-2.67	-2.63	-2.54
	-0.0391	0.0009	0.0015	-1.78	0.04	0.07	-0.23	-2.73	-2.68	-2.59
	-0.0387	0.0012	0.0012	-1.76	0.05	0.05	-0.10	-2.58	-2.50	-2.43
	-0.0348	0.0012	0.0008	-1.58	0.06	0.04	-0.00	-2.23	-2.15	-2.10
	-0.0326	0.0012	0.0007	-1.48	0.05	0.03	0.06	-2.02	-1.95	-1.91
	-0.0258	0.0009	0.0008	-1.17	0.04	0.04	0.14	-1.52	-1.46	-1.41
	-0.0144	0.0006	0.0009	-0.65	0.03	0.04	0.20	-0.70	-0.66	-0.61
	-0.0007	-0.0007	0.0007	-0.03	-0.03	0.03	0.27	0.23	0.19	0.23
1805 25	0.0096	-0.0022	0.0006	0.44	-0.10	0.03	0.33	-0.14	-0.00	-0.04
	0.0187	-0.0033	0.0004	0.85	-0.15	0.02	0.39	-0.62	-0.41	-0.44
	0.0302	-0.0044	0.0003	1.37	-0.20	0.01	0.43	-1.23	-0.96	-0.98
	0.0357	-0.0056	0.0002	1.62	-0.26	0.01	0.48	-1.47	-1.1	-1.13
	0.0349	-0.0065	0.0002	1.59	-0.30	0.01	0.53	-1.30	-0.89	-0.90
	0.0291	-0.0065	0.0001	1.32	-0.30	0.01	0.60	-0.83	-0.43	-0.44
	0.0271	-0.0065	0.0001	1.23	-0.30	0.00	0.69	-0.56	-0.16	-0.16
	0.0275	-0.0056	-0.0002	1.25	-0.26	-0.01	0.78	-0.42	-0.08	-0.07
1805 26	0.0263	-0.0044	-0.0006	1.19	-0.20	-0.03	0.87	-0.15	0.11	0.14
	0.0200	-0.0033	-0.0009	0.91	-0.15	-0.04	0.95	0.40	0.60	0.65
	0.0119	-0.0022	-0.0012	0.54	-0.10	-0.05	1.01	1.04	1.17	1.24
	0.0034	-0.0007	-0.0013	0.16	-0.03	-0.06	1.03	1.24	1.20	1.12
	-0.0042	0.0006	-0.0014	-0.19	0.03	-0.06	0.99	0.74	0.77	0.69
	-0.0106	0.0009	-0.0015	-0.48	0.04	-0.07	0.91	0.28	0.33	0.25
	-0.0175	0.0012	-0.0015	-0.80	0.05	-0.07	0.84	-0.20	-0.13	-0.22
	-0.0183	0.0012	-0.0015	-0.83	0.06	-0.07	0.85	-0.23	-0.15	-0.24
1805 27	-0.0145	0.0012	-0.0013	-0.66	0.05	-0.05	0.89	0.03	0.10	0.02
	-0.0081	0.0009	-0.0012	-0.37	0.04	-0.06	0.89	0.41	0.46	0.39
	-0.0042	0.0006	-0.0011	-0.19	0.03	-0.05	0.84	0.59	0.63	0.56
	-0.0048	0.0002	-0.0012	-0.22	0.01	-0.05	0.72	0.44	0.46	0.39
	-0.0059	-0.0000	-0.0011	-0.27	-0.00	-0.05	0.60	0.25	0.25	0.19
	-0.0104	-0.0000	-0.0011	-0.47	-0.00	-0.05	0.57	-0.03	-0.03	-0.09
	-0.0171	-0.0000	-0.0010	-0.78	-0.00	-0.05	0.61	-0.36	-0.36	-0.42
	-0.0220	0.0002	-0.0010	-1.00	0.01	-0.05	0.65	-0.60	-0.59	-0.65
1805 28	-0.0239	0.0006	-0.0010	-1.09	0.03	-0.05	0.63	-0.72	-0.68	-0.74
	-0.0247	0.0009	-0.0011	-1.12	0.04	-0.05	0.56	-0.82	-0.77	-0.83
	-0.0276	0.0012	-0.0012	-1.26	0.05	-0.05	0.56	-0.97	-0.91	-0.98
	-0.0265	-0.0004	-0.0013	-1.20	-0.02	-0.06	0.59	-0.87	-0.90	-0.97
	-0.0195	-0.0028	-0.0016	-0.89	-0.13	-0.07	0.63	-0.44	-0.60	-0.69
	-0.0002	-0.0050	-0.0020	-0.01	-0.23	-0.09	0.71	0.69	0.42	0.31
	0.0220	-0.0073	-0.0024	1.00	-0.33	-0.11	0.84	1.19	1.58	1.51
	0.0322	-0.0093	-0.0030	1.46	-0.42	-0.14	0.97	0.64	1.16	1.33

1805:29 to 1805:35 CDT

CDT	$-\frac{a_y W}{\frac{1}{2}\rho_0 CAS\ A}$	$C_{n_\beta} RD$	$C_{n_r}\frac{YR\ b}{2\ TAS}$	β_1	β_2	β_3 (deg)	v-component Windspeeds (m/s)			
h m s				Term 1	Term 2	Term 3	$\beta=0$	Term 1	Terms 1+2	Terms 1+2+3
1805 29	0.0318	-0.0106	-0.0036	1.44	-0.46	-0.16	1.02	0.69	1.27	1.47
	0.0182	-0.0100	-0.0036	0.83	-0.46	-0.17	0.86	1.61	1.31	1.09
	0.0069	-0.0095	-0.0038	0.31	-0.43	-0.17	0.57	0.95	0.43	0.22
	0.0024	-0.0076	-0.0036	0.11	-0.35	-0.16	0.29	0.42	0.01	-0.19
	0.0003	-0.0055	-0.0034	0.01	-0.25	-0.15	0.09	0.11	-0.20	-0.38
	-0.0024	-0.0041	-0.0034	-0.11	-0.19	-0.15	0.06	-0.07	-0.30	-0.48
	-0.0077	-0.0028	-0.0033	-0.35	-0.13	-0.15	0.04	-0.38	-0.54	-0.72
	-0.0124	-0.0009	-0.0032	-0.56	-0.04	-0.14	-0.05	-0.74	-0.79	-0.96
1805 30	-0.0140	0.0006	-0.0030	-0.64	0.03	-0.14	-0.22	-0.99	-0.96	-1.12
	-0.0148	0.0009	-0.0030	-0.67	0.04	-0.13	-0.40	-1.23	-1.18	-1.34
	-0.0184	0.0012	-0.0031	-0.84	0.05	-0.14	-0.56	-1.58	-1.52	-1.69
	-0.0247	0.0012	-0.0032	-1.12	0.06	-0.15	-0.75	-2.13	-2.06	-2.24
	-0.0300	0.0012	-0.0033	-1.36	0.05	-0.15	-1.04	-2.74	-2.67	-2.86
	-0.0274	0.0009	-0.0030	-1.25	0.04	-0.14	-1.45	-3.01	-2.96	-3.13
	-0.0204	0.0006	-0.0028	-0.93	0.03	-0.13	-1.84	-3.01	-2.97	-3.13
	-0.0137	0.0002	-0.0025	-0.62	0.01	-0.12	-2.14	-2.93	-2.92	-3.07
1805 31	-0.0114	-0.0000	-0.0023	-0.52	-0.00	-0.11	-2.39	-3.05	-3.05	-3.18
	-0.0182	-0.0000	-0.0022	-0.83	-0.00	-0.10	-2.54	-3.60	-3.60	-3.72
	-0.0266	-0.0000	-0.0020	-1.21	-0.00	-0.09	-2.68	-4.25	-4.25	-4.36
	-0.0307	-0.0000	-0.0019	-1.39	-0.00	-0.09	-2.89	-4.70	-4.70	-4.81
	-0.0302	-0.0000	-0.0018	-1.37	-0.00	-0.08	-3.16	-4.97	-4.97	-5.07
	-0.0276	-0.0000	-0.0015	-1.26	-0.00	-0.07	-3.44	-5.09	-5.09	-5.18
	-0.0282	-0.0000	-0.0010	-1.28	-0.00	-0.05	-3.62	-5.33	-5.33	-5.39
	-0.0287	-0.0000	-0.0004	-1.31	-0.00	-0.02	-3.71	-5.46	-5.46	-5.49
1805 32	-0.0262	-0.0000	0.0002	-1.19	-0.00	0.01	-3.73	-5.34	-5.34	-5.33
	-0.0247	-0.0000	0.0007	-1.12	-0.00	0.03	-3.79	-5.32	-5.32	-5.27
	-0.0271	-0.0000	0.0012	-1.23	-0.00	0.06	-3.83	-5.51	-5.51	-5.44
	-0.0327	-0.0009	0.0015	-1.48	-0.04	0.07	-3.91	-5.95	-6.01	-5.92
	-0.0371	-0.0022	0.0015	-1.69	-0.10	0.07	-3.99	-6.32	-6.46	-6.36
	-0.0348	-0.0033	0.0015	-1.58	-0.15	0.07	-4.03	-6.22	-6.42	-6.33
	-0.0295	-0.0044	0.0017	-1.34	-0.20	0.08	-4.02	-5.66	-6.14	-6.03
	-0.0293	-0.0061	0.0020	-1.33	-0.28	0.09	-3.99	-5.82	-6.21	-6.03
1805 33	-0.0363	-0.0077	0.0022	-1.65	-0.35	0.10	-3.99	-6.25	-6.73	-6.60
	-0.0454	-0.0083	0.0024	-2.06	-0.38	0.11	-4.03	-6.85	-7.36	-7.21
	-0.0492	-0.0089	0.0027	-2.24	-0.40	0.12	-4.06	-7.10	-7.65	-7.48
	-0.0368	-0.0100	0.0030	-1.67	-0.46	0.14	-4.02	-6.28	-6.90	-6.77
	-0.0188	-0.0112	0.0031	-0.86	-0.51	0.14	-3.93	-5.03	-5.76	-5.57
	0.0134	-0.0118	0.0026	0.61	-0.54	0.12	-3.77	-3.28	-3.67	-3.51
	0.0503	-0.0124	0.0019	2.29	-0.56	0.09	-3.66	-5.55	-4.80	-4.92
	0.0697	-0.0118	0.0013	3.17	-0.54	0.06	-3.59	-6.79	-6.08	-6.15
1805 34	0.0724	-0.0106	0.0009	3.29	-0.48	0.04	-3.59	-7.06	-6.42	-6.48
	0.0580	-0.0092	0.0011	2.64	-0.42	0.05	-3.66	-6.25	-5.70	-5.76
	0.0488	-0.0077	0.0012	2.22	-0.35	0.05	-3.72	-5.69	-5.23	-5.30
	0.0490	-0.0051	0.0010	2.23	-0.23	0.04	-3.73	-5.71	-5.40	-5.46
	0.0504	-0.0026	0.0005	2.29	-0.12	0.02	-3.72	-5.85	-5.69	-5.72
	0.0570	-0.0015	0.0000	2.59	-0.07	0.00	-3.70	-6.34	-6.25	-6.25
	0.0662	-0.0004	-0.0004	3.01	-0.02	-0.02	-3.77	-7.03	-7.01	-6.99
	0.0774	0.0023	-0.0004	3.52	0.10	-0.02	-3.81	-7.85	-7.99	-7.97
1805 35	0.0879	0.0052	-0.0005	4.00	0.24	-0.02	-3.85	-8.68	-9.00	-8.97
	0.1064	0.0070	-0.0006	4.84	0.32	-0.03	-3.93	-10.03	-10.45	-10.41
	0.1328	0.0087	-0.0007	6.04	0.40	-0.03	-4.17	-11.94	-12.46	-12.42
	0.1483	0.0102	-0.0006	6.74	0.60	-0.03	-4.40	-13.08	-13.86	-13.82
	0.1521	0.0180	-0.0003	6.91	0.82	-0.01	-4.37	-13.11	-14.15	-14.13
	0.1258	0.0208	0.0004	5.72	0.35	0.02	-4.29	-11.34	-12.51	-12.54
	0.0917	0.0237	0.0014	4.17	1.08	0.07	-4.02	-9.02	-10.31	-10.39
	0.0671	0.0273	0.0029	3.05	1.24	0.13	-3.60	-7.11	-8.56	-8.71

1805:36 to 1805:42 CDT

CDT h m s	$-\frac{a_1 W}{\frac{1}{2}\rho CAS\ A}$	$C_{n_\beta} RD$	$C_{n_r}\frac{YR\ b}{2\ TAS}$	β_1 Term 1	β_2 Term 2	β_3 (deg) Term 3	v-component Windspeeds (m/s) $\beta=0$	Term 1	Terms 1+2	Terms 1+2+3
1805 36	0.0541	0.0300	0.0045	2.46	1.37	0.21	-3.09	-5.42	-6.99	-7.23
	0.0421	0.0303	0.0062	1.92	1.38	0.28	-2.54	-3.62	-5.17	-5.49
	0.0156	0.0306	0.0077	0.71	1.39	0.35	-1.67	-0.93	-2.47	-2.86
	-0.0049	0.0309	0.0083	-0.22	1.41	0.38	-0.53	-0.78	-0.11	-0.52
	-0.0073	0.0312	0.0082	-0.33	1.42	0.37	0.41	0.05	1.28	0.69
	0.0068	0.0312	0.0077	0.31	1.42	0.35	0.99	1.32	1.99	1.62
	0.0137	0.0312	0.0073	0.62	1.42	0.33	1.20	1.86	2 81	2.43
	0.0113	0.0297	0.0068	0.51	1.35	0.31	1.47	2.01	3.43	3.67
1805 37	0 0097	0.0278	0.0062	0.44	1.26	0.28	1.67	2.14	3.47	3.76
	0.0187	0.0260	0.0049	0.85	1.18	0.22	2.13	3.04	4.28	4.51
	0.0335	0.0243	0.0035	1.52	1.11	0.16	2.44	4.06	4.48	4.30
	0.0465	0.0187	0.0020	2.11	0.85	0.09	2.93	4.64	3.92	3.82
	0.0520	0.0123	0.0004	2.36	0.56	0.02	3.34	4.00	3.38	3.36
	0 0543	0.0080	-0.0008	2.47	0.37	-0.04	3.57	3.27	2.86	2.90
	0.0608	0.0038	-0.0019	2.77	0.17	-0.09	3.33	2.18	1.98	2.08
	0.0567	-0.0019	-0.0024	2.58	-0.09	-0.11	2.65	1.77	1.85	2.01
1805 38	0.0420	-0.0065	-0.0027	1.91	-0.30	-0.12	1.78	1.80	2.16	2.30
	0.0196	-0.0074	-0.0027	0.89	-0.34	-0.12	1.06	2.10	1.74	1.59
	0.0035	-0.0083	-0.0026	0.16	-0.38	-0.12	0.45	0.65	0.18	0.03
	-0.0101	-0.0090	-0.0024	-0.46	-0.41	-0.11	-0.13	-0.71	-1.23	-1.37
	-0.0277	-0.0095	-0.0021	-1.26	-0.43	-0.10	-0.65	-2.24	-2.78	-2.90
	-0.0417	-0.0092	-0.0018	-2.03	-0.42	-0.08	-1.04	-3.61	-4.14	-4.25
	-0.0574	-0.0089	-0.0015	-2.61	-0.40	-0.07	-1.25	-4.57	-5.08	-5.17
	-0.0706	-0.0071	-0.0013	-3.21	-0.32	-0.06	-1.36	-5.03	-5.44	-5.52
1805 39	-0.0884	-0 0049	-0.0010	-4.02	-0.22	-0.04	-1.43	-5.86	-6.15	-6.20
	-0.1004	-0.0033	-0.0006	-4.97	-0.15	-0.03	-1.48	-6.98	-7.17	-7.21
	-0.1271	-0.0016	-0.0003	-5.78	-0.07	-0.02	-1.46	-8.00	-8.09	-8.11
	-0.1288	-0.0016	-0.0001	-5.86	-0.07	-0.00	-1.46	-8.03	-8.18	-8.18
	-0.1225	-0.0028	0.0002	-5.57	-0.13	0.01	-1.48	-7.67	-7.83	-7.82
	-0.1053	-0.0050	0.0005	-4.78	-0.23	0.02	-1.47	-6.68	-6.97	-6.94
	-0.0887	-0.0073	0.0008	-4.03	-0.33	0.03	-1.32	-5.61	-6.23	-6.19
	-0.0748	-0.0111	0.0012	-3.40	-0.50	0.05	-1.20	-5.11	-5.75	-5.69
1805 40	-0.0623	-0.0147	0.0017	-2.83	-0.67	0.08	-1.10	-4.35	-5.21	-5.11
	-0.0623	-0.0161	0.0020	-2.83	-0.73	0.09	-1.18	-4.12	-5.06	-4.95
	-0.0687	-0.0176	0.0020	-3.17	-0.80	0.09	-1.25	-4.30	-5.33	-5.22
	-0.0773	-0.0187	0.0017	-3.51	-0.85	0.08	-1.27	-4.61	-5.70	-5.60
	-0.0785	-0.0193	0.0014	-3.57	-0.88	0.06	-1.23	-4.67	-5.79	-5.71
	-0.0622	-0.0187	0.0012	-2.83	-0.85	0.05	-1.14	-3.83	-4.91	-4.84
	-0.0410	-0.0182	0.0010	-1.86	-0.83	0.04	-1.10	-2.77	-3.80	-3.75
	-0.0296	-0.0172	0.0007	-1.34	-0.78	0.03	-1.15	-2.25	-3.21	-3.17
1805 41	-0.0299	-0.0164	0.0005	-1.36	-0.75	0.02	-1.24	-2.39	-3.30	-3.27
	-0.0431	-0.0161	0.0003	-1.96	-0.73	0.02	-1.37	-3.18	-4.06	-4.04
	-0.0516	-0.0158	0.0002	-2.36	-0.72	0.01	-1.48	-3.70	-4.56	-4.55
	-0.0468	-0.0150	0.0003	-2.13	-0.68	0.01	-1.60	-3.46	-4.27	-4.25
	-0.0365	-0.0141	0.0003	-1.66	-0.64	0.01	-1.69	-2.92	-3.68	-3.67
	-0.0329	-0.0135	0.0003	-1.50	-0.61	0.01	-1.76	-2.77	-3.50	-3.48
	-0.0385	-0.0129	0.0004	-1.75	-0.59	0.02	-1.81	-3.12	-3.81	-3.79
	-0.0514	-0.0113	0.0007	-2.34	-0.54	0.03	-1.92	-3.60	-4.44	-4.40
1805 42	-0.0598	-0.0106	0.0011	-2.72	-0.48	0.05	-2.02	-4.18	-4.76	-4.70
	-0.0596	-0.0100	0.0010	-2.71	-0.46	0.05	-2.15	-4.06	-4.60	-4.55
	-0.0579	-0.0095	0.0007	-2.63	-0.43	0.03	-2.27	-3.90	-4.41	-4.37
	-0.0606	-0.0088	0.0003	-2.76	-0.40	0.01	-2.42	-4.06	-4.53	-4.51
	-0.0678	-0.0083	0.0002	-3.08	-0.38	0.01	-2.52	-4.46	-4.91	-4.90
	-0.0694	-0.0083	0.0005	-3.15	-0.38	0.02	-2.58	-4.59	-5.04	-5.01
	-0.0634	-0.0083	0.0007	-2.88	-0.38	0.03	-2.37	-4.27	-4.73	-4.69
	-0.0465	-0.0095	0.0008	-2.11	-0.43	0.03	-2.51	-3.41	-3.94	-3.90

1805:43 to 1805:49 CDT

CDT	$-\frac{a_1 W}{\frac{1}{2}\rho_0 CAS\ A}$	$C_{n_\beta} RD$	$C_{Y_R} \frac{YR\ b}{2\ TAS}$	β_1	β_2	β_3 (deg)	v-component Windspeeds (m/s)			
h m s				Term 1	Term 2	Term 3	$\beta=0$	Term 1	Terms 1+2	Terms 1+2+3
1805 43	-0.0301	-0.0112	0.0005	-1.37	-0.51	0.02	-2.43	-2.59	-3.20	-3.18
	-0.0109	-0.0126	0.0004	-0.49	-0.57	0.02	-2.31	-1.72	-2.31	-2.29
	0.0104	-0.0141	0.0004	0.47	-0.64	0.02	-2.21	-2.78	-2.00	-2.02
	0.0272	-0.0148	0.0003	1.24	-0.67	0.01	-2.11	-3.63	-2.81	-2.82
	0.0389	-0.0147	0.0003	1.77	-0.67	0.01	-1.98	-4.17	-3.34	-3.36
	0.0380	-0.0135	0.0003	1.73	-0.61	0.02	-1.82	-3.98	-3.21	-3.23
	0.0342	-0.0124	0.0004	1.55	-0.56	0.02	-1.64	-3.61	-2.90	-2.92
	0.0250	-0.0093	0.0002	1.13	-0.42	0.01	-1.54	-2.96	-2.41	-2.43
1805 44	0.0153	-0.0061	-0.0001	0.69	-0.28	-0.01	-1.60	-2.28	-1.92	-1.91
	0.0064	-0.0041	-0.0005	0.29	-0.19	-0.02	-1.72	-1.66	-1.60	-1.63
	-0.0012	-0.0022	-0.0007	-0.05	-0.10	-0.03	-1.88	-1.95	-2.08	-2.12
	-0.0060	0.0013	-0.0005	-0.27	0.06	-0.02	-1.99	-2.34	-2.26	-2.29
	-0.0101	0.0046	-0.0001	-0.46	0.21	-0.01	-2.05	-2.64	-2.37	-2.38
	-0.0304	0.0061	0.0001	-1.38	0.28	0.01	-2.09	-3.86	-3.51	-3.50
	-0.0622	0.0076	0.0003	-2.83	0.34	0.01	-2.07	-5.71	-5.27	-5.25
	-0.0857	0.0082	0.0008	-3.90	0.37	0.03	-2.05	-7.07	-6.59	-6.55
1805 45	-0.0923	0.0081	0.0014	-4.20	0.37	0.06	-1.96	-7.36	-6.88	-6.80
	-0.0762	0.0070	0.0019	-3.47	0.32	0.09	-1.84	-6.28	-5.88	-5.77
	-0.0622	0.0058	0.0020	-2.83	0.26	0.09	-1.65	-5.29	-4.95	-4.83
	-0.0621	0.0026	0.0018	-2.82	0.12	0.08	-1.45	-5.08	-4.93	-4.83
	-0.0587	-0.0010	0.0016	-3.12	-0.05	0.07	-1.23	-5.27	-5.33	-5.24
	-0.0751	-0.0033	0.0021	-3.41	-0.15	0.10	-1.03	-5.47	-5.67	-5.54
	-0.0742	-0.0055	0.0028	-3.37	-0.25	0.13	-0.75	-5.17	-5.50	-5.34
	-0.0570	-0.0086	0.0030	-2.59	-0.39	0.14	-0.48	-3.90	-4.42	-4.24
1805 46	-0.0360	-0.0112	0.0023	-1.64	-0.51	0.13	-0.21	-2.38	-3.06	-2.89
	-0.0222	-0.0118	0.0023	-1.01	-0.54	0.10	0.01	-1.33	-2.04	-1.90
	-0.0174	-0.0124	0.0021	-0.79	-0.56	0.10	0.20	-0.86	-1.61	-1.48
	-0.0187	-0.0120	0.0022	-0.85	-0.55	0.10	0.40	-0.74	-1.48	-1.35
	-0.0156	-0.0112	0.0020	-0.71	-0.51	0.09	0.61	-0.36	-1.05	-0.92
	-0.0023	-0.0100	0.0017	-0.11	-0.46	0.08	0.77	0.62	-0.00	0.10
	0.0130	-0.0089	0.0014	0.59	-0.40	0.06	0.90	0.28	0.84	0.75
	0.0130	-0.0086	0.0014	0.59	-0.30	0.06	1.01	0.43	0.84	0.75
1805 47	0.0002	-0.0044	0.0015	0.01	-0.20	0.07	1.10	1.11	0.84	0.94
	-0.0192	-0.0033	0.0018	-0.87	-0.15	0.08	1.25	0.03	-0.18	-0.06
	-0.0305	-0.0022	0.0022	-1.39	-0.10	0.10	1.39	-0.56	-0.70	-0.56
	-0.0252	-0.0009	0.0021	-1.15	-0.04	0.10	1.56	-0.05	-0.11	0.03
	-0.0167	-0.0000	0.0018	-0.76	-0.00	0.08	1.70	0.63	0.63	0.75
	0.0021	-0.0000	0.0014	0.10	-0.00	0.06	1.82	1.95	1.95	2.04
	0.0240	-0.0000	0.0012	1.09	-0.00	0.05	1.88	1.34	1.34	1.26
	0.0500	-0.0012	0.0013	2.27	-0.05	0.06	1.95	-0.16	-0.08	-0.16
1805 48	0.0751	-0.0028	0.0013	3.41	-0.13	0.06	2.04	-1.61	-1.43	-1.52
	0.0907	-0.0041	0.0010	4.12	-0.19	0.05	2.16	-2.48	-2.21	-2.27
	0.1004	-0.0055	0.0007	4.56	-0.25	0.03	2.23	-3.04	-2.66	-2.72
	0.0977	-0.0054	0.0003	4.44	-0.25	0.01	2.33	-2.82	-2.45	-2.48
	0.0920	-0.0044	-0.0000	4.18	-0.20	-0.00	2.39	-2.47	-2.18	-2.18
	0.0856	-0.0024	-0.0002	3.89	-0.11	-0.01	2.44	-2.10	-1.94	-1.92
	0.0814	-0.0004	-0.0003	3.70	-0.02	-0.01	2.44	-1.90	-1.87	-1.85
	0.0542	0.0050	-0.0003	2.46	0.23	-0.01	2.42	-0.14	-0.48	-0.46
1805 49	0.0101	0.0110	-0.0002	0.46	0.50	-0.01	2.40	2.77	2.03	2.04
	-0.0256	0.0148	-0.0003	-1.16	0.67	-0.01	2.44	0.70	1.70	1.68
	-0.0382	0.0165	-0.0005	-1.74	0.94	-0.02	2.44	-0.17	1.10	1.06
	-0.0300	0.0218	-0.0007	-1.36	0.99	-0.03	2.44	0.38	1.68	1.83
	-0.0295	0.0237	-0.0008	-1.34	1.08	-0.04	2.47	0.41	2.06	2.01
	-0.0285	0.0226	-0.0009	-1.29	1.03	-0.01	2.58	0.56	2.16	2.10
	-0.0199	0.0214	-0.0010	-0.90	0.97	-0.05	2.66	1.22	2.77	2.70
	-0.0115	0.0184	-0.0007	-0.52	0.84	-0.03	2.63	1.79	3.13	3.08

1805:50 to 1805:53 CDT

CDT h m s	$-\frac{\sigma, W}{\frac{1}{2}\rho\, CAS\, A}$	$C_{n_\delta} RD$	$C_{Y_r}\frac{YR\, b}{2\, TAS}$	β_1 Term 1	β_2 Term 2	β_3 (deg) Term 3	v-component Windspeeds (m/s) $\beta = 0$	Term 1	Terms 1+2	Terms 1+2+3
1805 50	-0.0109	0.0151	-0.0002	-0.49	0.69	-0.01	2.49	1.69	2.80	2.79
	-0.0195	0.0131	0.0007	-0.89	0.59	0.03	2.38	0.94	1.90	1.95
	-0.0274	0.0110	0.0014	-1.25	0.50	0.06	2.49	0.48	1.29	1.39
	-0.0251	0.0077	0.0017	-1.14	0.35	0.08	2.65	0.82	1.39	1.51
	-0.0167	0.0046	0.0020	-0.76	0.21	0.09	2.04	1.63	1.96	2.11
	-0.0042	0.0035	0.0019	-0.19	0.16	0.09	2.91	2.60	2.85	2.99
	0.0050	0.0023	0.0018	0.23	0.11	0.08	2.96	3.32	3.48	3.61
	0.0136	0.0010	0.0016	0.62	0.05	0.07	2.99	3.94	3.99	3.92
1805 51	0.0255	-0.0000	0.0016	1.16	-0.00	0.07	3.15	3.32	3.32	3.20
	0.0432	-0.0000	0.0017	1.96	-0.00	0.08	3.40	2.14	2.14	2.02
	0.0612	-0.0000	0.0016	2.78	-0.00	0.07	3.80	0.93	0.93	0.82
	0.0724	-0.0000	0.0014	3.29	-0.00	0.06	4.15	0.17	0.17	0.07
	0.0778	-0.0000	0.0012	3.54	-0.00	0.05	4.44	-0.22	-0.22	-0.30
	0.0863	-0.0000	0.0011	3.92	-0.00	0.05	4.66	-0.89	-0.89	-0.97
	0.1018	-0.0000	0.0008	4.63	-0.00	0.04	4.84	-2.12	-2.12	-2.18
	0.1581	-0.0002	-0.0017	7.18	-0.01	-0.08	4.93	-6.31	-6.30	-6.17
1805 52	0.2339	-0.0004	-0.0045	10.63	-0.02	-0.21	4.47	-12.26	-12.23	-11.91
	0.2739	-0.0007	-0.0041	12.45	-0.03	-0.19	3.84	-15.81	-15.76	-15.46
1st	0.2708	-0.0009	-0.0017	12.31	-0.04	-0.08	3.46	-16.00	-15.93	-15.81
	0.2048	0.0003	0.0012	9.31	0.01	0.05	3.52	-11.20	-11.22	-11.31
	0.1406	0.0020	0.0030	6.39	0.03	0.14	3.90	-6.20	-6.35	-6.56
	0.0960	0.0037	0.0016	4.36	0.17	0.07	4.42	-2.46	-2.73	-2.84
	0.0630	0.0054	-0.0033	2.86	0.24	-0.15	4.38	-0.13	-0.52	-0.28
	0.0644	0.0095	-0.0052	2.93	0.43	-0.24	3.43	-1.19	-1.88	-1.50
1805 53	0.0770	0.0139	-0.0017	3.50	0.63	-0.06	2.87	-2.68	-3.68	-3.56
	0.0812	0.0165	-0.0002	3.69	0.75	-0.01	2.99	-2.87	-4.07	-4.05
	0.0680	0.0191	-0.0017	3.09	0.87	-0.03	2.97	-1.97	-3.36	-3.24
	0.0324	0.0223	-0.0004	1.47	1.02	-0.02	2.60	0.43	-1.22	-1.19
	-0.0007	0.0249	0.0004	-0.03	1.13	0.02	3.37	2.31	1.57	1.54
2nd	-0.0112	0.0252	-0.0033	-0.51	1.14	-0.15	3.62	2.77	2.56	2.81
	-0.0090	0.0255	-0.0047	-0.41	1.16	-0.21	3.00	2.31	1.72	2.09
	0.0034	0.0236	-0.0016	0.38	1.07	-0.07	2.65	2.02	0.17	0.29

For sideslip angles of Delta 191, refer to the preliminary draft (dated October 10, 1985) entitled

<u>ESTIMATION OF THE WINDS ALONG THE FLIGHTPATH FOR THE DELTA L1011 ACCIDENT AT THE DALLAS-FORT WORTH AIRPORT ON AUGUST 2, 1985</u>

by

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