

DOCKET NO. **SA - 510**

EXHIBIT NO. **13 H**

**NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.**

Group Chairman's Recorded Radar Study

NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Washington, D.C.

December 15, 1994

Group Chairman's Recorded Radar Study

A. ACCIDENT DCA-94-MA-076

Location: Aliquippa, Pennsylvania
Date : September 8, 1994
Time : 1904 Eastern Daylight Time
Aircraft: Boeing 737-300, N513AU

B. GROUP IDENTIFICATION

The group met at the accident site on September 8 through 15, 1994. The following group members participated in the investigation:

Chairman: Thomas R. Jacky
 National Transportation Safety Board
 Washington, D.C.

Member: Steven E. O'Neal
 Federal Aviation Administration
 Renton, WA

Member: Bob McCullough
 USAir, Inc.
 Pittsburgh, PA

Member: Keakini Kaulia
 Air Line Pilots Association
 Herndon, VA

C. SUMMARY

On September 8, 1994 at 1904 Eastern Daylight Time USAir Flight 427, a Boeing 737-3B7, N513AU, crashed while maneuvering to land at Pittsburgh International Airport, Pittsburgh, Pennsylvania. The airplane was being operated on an instrument flight rules (IFR) flight plan under the provisions of Title 14, code of Federal Regulation (CFR), Part 121, on a regularly scheduled flight from Chicago O'Hare

International Airport, Chicago, Illinois, to Pittsburgh. The airplane was destroyed by impact forces and fire near Aliquippa, Pennsylvania. All 132 persons on board the airplane were fatally injured.

D. DETAILS OF INVESTIGATION

Printouts of USAir Flight 427's (transponder code 6255) recorded radar tracking data (TD) of Automated Radar Terminal System (ARTS) III data from the Pittsburgh Terminal Radar Approach Control (TRACON) were acquired and processed by the National Transportation Safety Board (Attachment 1). In addition, a Continuous Disc/Time Sequenced Output (CDTSO) extractor tape of ARTS III data was processed and hand-carried to Washington, D.C. where the tape was read by Vehicle Performance Division personnel. The resultant extracted data for Delta Airlines Flight 1083 (transponder code 2257 - Attachment 2) and Blue Ridge Flight 425 (transponder code 6054 - Attachment 3) were used for airplane separation calculations.

The radar data printouts and extractor tape data covered the time period of the accident and represented aircraft position in Coordinated Universal time (UTC), Mode C altitude, and X and Y position (or range and azimuth from magnetic north) from the Pittsburgh Airport Surveillance Radar (ASR). The ASR sensor for the TRACON system provided position information every approximately five seconds. The ASR position, supplied by the FAA, was 40° 28' 22.8" North, 80° 15' 47.2" West, at an elevation of 1217' and tower height of 77'. A magnetic variation of 8° degrees west was used for all calculations.

The TD returns for USAir 427 and Delta 1083 were rotated into a true north/x and y coordinate system relative to the Pittsburgh ASR (Attachments 4 and 5, respectively). The final 6 rotated USAir 427 returns were then plotted onto a United States Geological Service (USGS) topographical map of the accident area. The data plot was prepared for inclusion in this report (Attachment 6).

Mode C altitude data for USA427, DL1083, and BLR425 were plotted versus time. The resultant plot is included in Attachment 7.

The unrotated TD data for USA427, DL1083, and BLR were plotted relative to the Pittsburgh ASR. Mode C altitude (100s of MSL feet) were annotated onto selected TD returns. The resultant plot is included in Attachment 8.

The USA427, DL1083, and BLR425 TD data were then used to calculate lateral distance between USA427 and DL1083 and

USA427 and BLR425. Radar returns at similar times were used for the calculations. Results of the calculations are included in Attachment 9.

Two additional plots of the rotated TD data for USA427 and DL1083 were produced. The first plot, in Attachment 10, denotes data plotted in True North coordinates relative to the Pittsburgh ASR, with annotations of Mode C altitude in 100's of MSL feet for each return. The second plot, in Attachment 11, is an expanded plot with each return denoted for local time and Mode C altitude.


Tom Jacky
Aerospace Engineer

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Attachments

1. USA427 Pittsburgh TRACON ARTS III Tracking Data Returns
2. DL1083 Pittsburgh TRACON ARTS III Tracking Data Returns
3. BLR425 Pittsburgh TRACON ARTS III Tracking Data Returns
4. Rotated USA427 Tracking Data Returns
5. Rotated DL1083 Tracking Data Returns
6. Plot of USA427 Tracking Data
7. Plot of Mode C Altitude Versus Time
8. Plot of USA427, DL1083, and BLR425 Tracking Data
9. Separation Data Tables
10. Plot of USA427 and DL1083 Rotated Tracking Data
11. Expanded Plot of USA427 and DL1083 Rotated Tracking Data

ATTACHMENT 1

USA427 Pittsburgh TRACON ARTS III Tracking Data Returns

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
 USAir 427 in X & Y coordinates from Pittsburgh ASR

Coordinated Universal Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
22	55	16.1400	-25.5630	35.1250	150.0000
22	55	20.7300	-25.2500	34.7500	147.0000
22	55	25.4500	-24.7500	34.3750	144.0000
22	55	30.0500	-24.3750	34.0630	142.0000
22	55	34.6200	-23.9380	33.7500	140.0000
22	55	39.2000	-23.3130	33.5630	138.0000
22	55	43.7800	-22.9380	33.1250	136.0000
22	55	48.4500	-22.6250	32.7500	134.0000
22	55	53.0900	-22.1250	32.4380	133.0000
22	55	57.7000	-21.6250	32.1880	131.0000
22	56	2.4500	-21.3130	31.8130	129.0000
22	56	7.0700	-20.8750	31.5000	127.0000
22	56	11.6300	-20.4380	31.1880	125.0000
22	56	16.2700	-20.0000	30.8750	122.0000
22	56	20.9500	-19.6250	30.5000	120.0000
22	56	25.5200	-19.1880	30.2500	117.0000
22	56	30.1200	-18.7500	29.9380	115.0000
22	56	34.7300	-18.3750	29.6250	114.0000
22	56	39.3400	-18.0000	29.3130	113.0000
22	56	43.9700	-17.5630	29.0000	112.0000
22	56	48.6000	-17.1250	28.7500	111.0000
22	56	53.1800	-16.7500	28.4380	111.0000
22	56	57.7700	-16.3130	28.1250	110.0000
22	57	2.3800	-16.0000	27.8750	110.0000
22	57	7.0100	-15.6880	27.5630	111.0000
22	57	11.6300	-15.2500	27.3130	111.0000
22	57	16.2300	-14.8750	27.1250	111.0000
22	57	20.8900	-14.5630	26.8130	111.0000
22	57	25.4700	-14.2500	26.5630	111.0000
22	57	30.0700	-13.8750	26.3130	111.0000
22	57	34.6600	-13.5000	26.0630	111.0000
22	57	39.2900	-13.3130	25.7500	111.0000
22	57	43.9500	-13.0630	25.4380	111.0000
22	57	48.5700	-12.7500	25.1250	111.0000
22	57	53.1200	-12.6880	24.7500	111.0000
22	57	57.7600	-12.4380	24.5000	111.0000
22	58	2.3400	-12.3750	24.1250	111.0000
22	58	6.9700	-12.2500	23.7500	110.0000
22	58	11.5900	-12.1250	23.4380	110.0000
22	58	16.2700	-11.9380	23.1250	110.0000
22	58	20.8200	-11.7500	22.8750	109.0000
22	58	25.4500	-11.6880	22.5000	108.0000
22	58	30.0500	-11.5000	22.2500	107.0000
22	58	34.6300	-11.4380	21.8750	106.0000
22	58	39.2700	-11.3130	21.5630	105.0000
22	58	43.9600	-11.1880	21.3130	104.0000
22	58	48.5200	-11.0630	21.0000	103.0000

FILE NAME: USA427.TRK

PAGE NUMBER: 2

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
 USAir 427 in X & Y coordinates from Pittsburgh ASR

Coordinated Universal Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
22	58	53.0900	-10.9380	20.6250	102.0000
22	58	57.7200	-10.8750	20.3130	100.0000
22	59	2.4500	-10.7500	20.0000	99.0000
22	59	6.9700	-10.5630	19.6880	98.0000
22	59	11.6000	-10.5000	19.3750	97.0000
22	59	16.2000	-10.3130	19.0630	96.0000
22	59	20.7700	-10.1880	18.7500	95.0000
22	59	25.4500	-10.0630	18.4380	94.0000
22	59	30.0200	-9.9380	18.1250	93.0000
22	59	34.6500	-9.8130	17.8750	93.0000
22	59	39.2600	-9.6880	17.5000	92.0000
22	59	43.8300	-9.6250	17.1880	91.0000
22	59	48.5100	-9.4380	16.8750	90.0000
22	59	53.1100	-9.3130	16.6250	89.0000
22	59	57.7000	-9.2500	16.3130	88.0000
23	0	2.3200	-9.1250	16.0000	88.0000
23	0	6.9800	-9.0000	15.6880	87.0000
23	0	11.5600	-8.8750	15.4380	86.0000
23	0	16.2000	-8.7500	15.1250	85.0000
23	0	20.7700	-8.6250	14.8130	84.0000
23	0	25.4500	-8.5000	14.5000	83.0000
23	0	29.9500	-8.3750	14.2500	82.0000
23	0	34.5700	-8.1880	14.0000	81.0000
23	0	39.2300	-8.0000	13.7500	80.0000
23	0	43.9500	-7.8750	13.4380	79.0000
23	0	48.4500	-7.5630	13.2500	79.0000
23	0	53.0600	-7.3750	13.0000	78.0000
23	0	57.6700	-7.1880	12.8130	77.0000
23	1	2.2700	-7.0000	12.5630	76.0000
23	1	6.9500	-6.8130	12.3130	76.0000
23	1	11.5100	-6.5630	12.0630	75.0000
23	1	16.1300	-6.4380	11.8750	74.0000
23	1	20.7200	-6.2500	11.6250	74.0000
23	1	25.3300	-6.0630	11.4380	73.0000
23	1	30.0100	-5.8750	11.1880	72.0000
23	1	34.5900	-5.6880	10.9380	72.0000
23	1	39.1700	-5.5000	10.7500	71.0000
23	1	43.7800	-5.3130	10.5630	70.0000
23	1	48.4500	-5.1250	10.3750	69.0000
23	1	53.0600	-4.9380	10.1250	68.0000
23	1	57.6500	-4.7500	9.9380	67.0000
23	2	2.3200	-4.5630	9.7500	66.0000
23	2	6.9500	-4.3130	9.5000	65.0000
23	2	11.5500	-4.1250	9.3130	64.0000
23	2	16.1400	-4.0000	9.1250	63.0000
23	2	20.7100	-3.8130	8.8750	62.0000
23	2	25.4500	-3.6250	8.6250	61.0000

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PAGE NUMBER: 3

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
USAir 427 in X & Y coordinates from Pittsburgh ASR

Coordinated Universal Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
23	2	30.0800	-3.4380	8.4380	60.0000
23	2	34.7000	-3.2500	8.2500	60.0000
23	2	39.2900	-2.9380	8.0630	60.0000
23	2	43.9500	-2.7500	7.9380	60.0000
23	2	48.5300	-2.5000	7.8130	60.0000
23	2	53.1500	-2.1880	7.7500	60.0000
23	2	57.7600	-1.9380	7.6250	60.0000
23	3	2.4500	-1.6250	7.6250	60.0000
23	3	7.1300	-1.3130	7.6250	58.0000
23	3	11.7700	-1.1880	7.8130	53.0000
23	3	16.4500	-0.8130	7.8750	53.0000
23	3	20.9600	-1.0000	8.0000	23.0000
23	3	25.5800	-0.9380	8.0630	23.0000
23	3	30.2000	-0.8750	8.1880	23.0000
23	3	34.8200	-0.7500	8.3130	23.0000
23	3	39.4500	-0.6250	8.3750	23.0000
23	3	44.0300	-0.5630	8.5000	23.0000
23	3	48.6100	-0.4380	8.6250	23.0000
23	3	53.2900	-0.3130	8.6880	23.0000
23	3	57.9600	-0.2500	8.8130	23.0000
23	4	2.4700	-0.1250	8.9380	23.0000

ATTACHMENT 2

DL1083 Pittsburgh TRACON ARTS III Tracking Data Returns

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Delta 1083 in X & Y coordinates from Pittsburgh ASR

Coordinated Universal Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
22	52	48.8300	-12.6250	42.3130	124.0000
22	52	53.4500	-12.5630	42.0000	123.0000
22	52	58.0600	-12.7500	41.5630	121.0000
22	53	2.6700	-12.6880	41.1880	120.0000
22	53	7.2500	-12.8750	40.7500	118.0000
22	53	11.9500	-12.9380	40.3750	116.0000
22	53	16.5100	-13.1250	39.9380	115.0000
22	53	21.0700	-13.1250	39.5630	113.0000
22	53	25.7000	-13.1250	39.1880	112.0000
22	53	30.4500	-13.3130	38.7500	110.0000
22	53	34.9500	-13.2500	38.4380	109.0000
22	53	39.5300	-13.2500	38.0000	108.0000
22	53	44.2000	-13.3750	37.6250	107.0000
22	53	48.7600	-13.4380	37.1880	106.0000
22	53	53.4500	-13.5000	36.8130	106.0000
22	53	58.0300	-13.5000	36.4380	105.0000
22	54	2.6300	-13.3130	36.1250	105.0000
22	54	7.2600	-13.3750	35.7500	104.0000
22	54	11.8500	-13.5000	35.3130	104.0000
22	54	16.4500	-13.4380	35.0000	104.0000
22	54	21.0700	-13.4380	34.5630	103.0000
22	54	25.7000	-13.5000	34.1880	102.0000
22	54	30.2900	-13.5000	33.8130	102.0000
22	54	34.9500	-13.8750	33.3130	101.0000
22	54	39.4500	-13.5000	33.1250	101.0000
22	54	44.0200	-13.5630	32.7500	101.0000
22	54	48.6300	-13.6250	32.3750	100.0000
22	54	53.2100	-13.6250	32.0630	100.0000
22	54	57.8400	-13.6250	31.6880	100.0000
22	55	2.4500	-13.6880	31.3750	100.0000
22	55	7.0500	-13.6880	31.0000	100.0000
22	55	11.6600	-13.6250	30.6880	100.0000
22	55	16.2700	-13.6880	30.3750	100.0000
22	55	20.9500	-13.5630	30.0630	100.0000
22	55	25.5500	-13.6250	29.6880	100.0000
22	55	30.1500	-13.4380	29.4380	100.0000
22	55	34.7700	-13.1880	29.1880	100.0000
22	55	39.3400	-13.2500	28.8130	100.0000
22	55	44.0100	-13.3130	28.3750	100.0000
22	55	48.5900	-13.0630	28.1880	100.0000
22	55	53.2200	-13.0000	27.8130	100.0000
22	55	57.8300	-12.8750	27.5630	100.0000
22	56	2.4500	-12.7500	27.2500	100.0000
22	56	7.0700	-12.6880	26.9380	100.0000
22	56	11.6400	-12.5630	26.6250	100.0000
22	56	16.2700	-12.5000	26.3130	100.0000
22	56	20.9500	-12.3130	26.0000	100.0000

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PAGE NUMBER: 2

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Delta 1083 in X & Y coordinates from Pittsburgh ASR

Coordinated Universal Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
22	56	25.5200	-12.2500	25.7500	100.0000
22	56	30.1200	-12.1250	25.4380	100.0000
22	56	34.7300	-12.1250	25.0630	100.0000
22	56	39.3500	-12.0000	24.7500	100.0000
22	56	43.9700	-11.8750	24.4380	100.0000
22	56	48.6100	-11.8130	24.1880	100.0000
22	56	53.1800	-11.5630	23.8750	100.0000
22	56	57.7700	-11.5000	23.5630	100.0000
22	57	2.3800	-11.3750	23.2500	100.0000
22	57	7.0200	-11.3130	22.9380	100.0000
22	57	11.6400	-11.1250	22.6250	100.0000
22	57	16.2300	-11.0000	22.3130	100.0000
22	57	20.9000	-10.9380	22.0000	100.0000
22	57	25.4700	-10.8750	21.6880	100.0000
22	57	30.0800	-10.6880	21.3750	100.0000
22	57	34.6600	-10.6250	21.0630	100.0000
22	57	39.2900	-10.5630	20.7500	100.0000
22	57	43.9500	-10.3750	20.4380	100.0000
22	57	48.5700	-10.3130	20.1250	100.0000
22	57	53.1200	-10.1250	19.8130	100.0000
22	57	57.7500	-10.0630	19.5000	100.0000
22	58	2.3400	-9.9380	19.1880	100.0000
22	58	6.9600	-9.7500	18.8750	100.0000
22	58	11.5900	-9.6250	18.6250	100.0000
22	58	16.2700	-9.5000	18.3130	100.0000
22	58	20.8200	-9.4380	18.0000	100.0000
22	58	25.4500	-9.3750	17.6880	99.0000
22	58	30.0500	-9.1880	17.3750	98.0000
22	58	34.6300	-9.1250	17.0630	97.0000
22	58	39.2600	-9.0000	16.7500	97.0000
22	58	43.9500	-8.9380	16.4380	96.0000
22	58	48.5200	-8.7500	16.1880	95.0000
22	58	53.0900	-8.6880	15.8130	94.0000
22	58	57.7200	-8.6250	15.5630	93.0000
22	59	2.4500	-8.4380	15.2500	92.0000
22	59	6.9600	-8.3750	14.9380	92.0000
22	59	11.5900	-8.1880	14.6880	91.0000
22	59	16.2000	-8.1250	14.3750	90.0000
22	59	20.7700	-8.0000	14.1250	89.0000
22	59	25.4500	-7.8750	13.8130	88.0000
22	59	30.0200	-7.7500	13.5000	87.0000
22	59	34.6400	-7.6250	13.2500	86.0000
22	59	39.2600	-7.5000	12.9380	85.0000
22	59	43.8300	-7.3750	12.6250	84.0000
22	59	48.5100	-7.2500	12.3750	83.0000
22	59	53.1000	-7.1250	12.0630	82.0000
22	59	57.7000	-7.0630	11.7500	81.0000

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Delta 1083 in X & Y coordinates from Pittsburgh ASR

Coordinated Universal Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
23	0	2.3200	-6.9380	11.4380	80.0000
23	0	6.9700	-6.8130	11.1880	80.0000
23	0	11.5600	-6.6880	10.8750	79.0000
23	0	16.2000	-6.6250	10.6250	78.0000
23	0	20.7600	-6.4380	10.3750	77.0000
23	0	25.4500	-6.3750	10.0630	76.0000
23	0	29.9500	-6.1880	9.7500	76.0000
23	0	34.5700	-6.0630	9.5630	75.0000
23	0	39.2300	-5.8750	9.2500	75.0000
23	0	43.9500	-5.6880	9.0630	74.0000
23	0	48.4500	-5.5000	8.8130	74.0000
23	0	53.0500	-5.2500	8.6880	73.0000
23	0	57.6700	-5.0000	8.5000	72.0000
23	1	2.2700	-4.8130	8.3750	71.0000
23	1	6.9500	-4.5630	8.2500	70.0000
23	1	11.5100	-4.2500	8.1880	69.0000
23	1	16.1400	-3.9380	8.0630	68.0000
23	1	20.7200	-3.6880	8.0630	67.0000
23	1	25.3300	-3.3750	8.0000	67.0000
23	1	30.0900	-3.0630	7.9380	66.0000
23	1	34.7000	-2.8130	7.8130	66.0000
23	1	39.4500	-2.5630	7.7500	65.0000
23	1	43.9500	-2.2500	7.6880	64.0000
23	1	48.5700	-1.9380	7.6250	63.0000
23	1	53.1600	-1.6880	7.5630	62.0000
23	1	57.9500	-1.3750	7.5000	61.0000
23	2	2.5400	-1.1250	7.5000	61.0000
23	2	7.1700	-0.8130	7.4380	61.0000
23	2	11.7700	-0.5000	7.3750	61.0000
23	2	16.4600	-0.1880	7.3750	61.0000
23	2	21.1400	0.0000	7.3750	61.0000
23	2	25.7600	0.3130	7.3130	61.0000
23	2	30.4500	0.5630	7.3130	61.0000
23	2	35.0200	0.8130	7.2500	60.0000
23	2	39.6400	1.1250	7.2500	60.0000
23	2	44.2000	1.3750	7.1880	60.0000
23	2	48.9600	1.6880	7.1880	60.0000
23	2	53.6100	1.9380	7.1250	60.0000
23	2	58.1600	2.2500	7.0630	60.0000
23	3	2.8100	2.5000	7.0630	60.0000
23	3	7.4600	2.8130	7.0000	60.0000
23	3	12.1400	3.0630	6.9380	60.0000
23	3	16.8300	3.3130	6.9380	60.0000
23	3	21.4500	3.6250	6.8750	59.0000
23	3	25.9600	3.8750	6.8130	58.0000
23	3	30.5900	4.1250	6.7500	57.0000
23	3	35.2900	4.3750	6.7500	57.0000

FILE NAME: DAL1083.TRK

PAGE NUMBER: 4

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Delta 1083 in X & Y coordinates from Pittsburgh ASR

Coordinated Universal Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
23	3	40.0100	4.6880	6.6880	56.0000
23	3	44.5700	4.9380	6.6250	55.0000
23	3	49.2000	5.1250	6.6250	54.0000
23	3	53.8300	5.4380	6.6250	52.0000
23	3	58.4600	5.6880	6.5630	51.0000
23	4	3.0900	5.9380	6.5000	50.0000
23	4	7.6400	6.1880	6.4380	49.0000
23	4	12.4400	6.5000	6.4380	48.0000
23	4	17.0300	6.7500	6.3750	47.0000
23	4	21.6400	7.0630	6.3750	46.0000
23	4	26.2700	7.2500	6.3130	46.0000
23	4	30.9500	7.5000	6.3130	45.0000
23	4	35.4500	7.8130	6.2500	44.0000
23	4	40.0800	8.0630	6.1880	43.0000
23	4	44.7000	8.3130	6.1880	42.0000
23	4	49.3400	8.5630	6.1880	42.0000
23	4	53.9600	8.8130	6.1880	42.0000
23	4	58.5800	9.0630	6.1250	41.0000
23	5	3.3400	9.3130	6.1250	41.0000
23	5	7.9500	9.6250	6.1250	41.0000
23	5	12.5400	9.8130	6.1250	41.0000
23	5	17.1300	10.1250	6.0000	40.0000
23	5	21.7300	10.3750	6.0000	40.0000
23	5	26.3300	10.6250	5.9380	40.0000
23	5	31.0100	10.9380	5.9380	40.0000
23	5	35.5700	11.1250	5.8750	40.0000
23	5	40.2000	11.4380	5.8750	40.0000
23	5	44.8300	11.6880	5.8130	40.0000
23	5	49.4500	11.9380	5.8750	40.0000
23	5	54.0800	12.1880	5.8130	40.0000
23	5	58.6300	12.4380	5.7500	40.0000
23	6	3.2600	12.6880	5.7500	40.0000
23	6	7.9500	12.9380	5.6880	40.0000
23	6	12.4600	13.1880	5.6880	40.0000
23	6	17.0700	13.4380	5.6250	40.0000
23	6	21.9500	13.6880	5.5630	40.0000
23	6	26.5100	14.0000	5.5630	40.0000
23	6	31.0700	14.2500	5.5630	40.0000
23	6	35.6600	14.5000	5.5000	40.0000
23	6	40.2800	14.7500	5.4380	40.0000
23	6	44.9500	15.0000	5.4380	40.0000
23	6	49.5300	15.3130	5.3750	40.0000
23	6	54.1300	15.5630	5.3750	41.0000
23	6	58.7600	15.8130	5.3130	40.0000
23	7	3.3400	16.0630	5.3130	40.0000
23	7	7.9700	16.2500	5.3130	40.0000
23	7	12.5700	16.5630	5.2500	41.0000

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Delta 1083 in X & Y coordinates from Pittsburgh ASR

Coordinated Universal Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
23	7	17.2000	16.8130	5.1880	41.0000
23	7	21.8200	17.0630	5.1250	40.0000
23	7	26.4600	17.3130	5.0000	41.0000
23	7	31.0300	17.5000	4.8750	40.0000
23	7	35.6400	17.7500	4.6880	40.0000
23	7	40.2700	17.8750	4.5000	40.0000
23	7	44.9500	18.0000	4.2500	40.0000
23	7	49.4600	18.1880	4.1250	40.0000
23	7	54.0800	18.3130	3.8750	40.0000
23	7	58.8100	18.4380	3.6880	40.0000
23	8	3.4500	18.6250	3.5000	40.0000
23	8	8.0700	18.7500	3.3130	40.0000
23	8	12.7000	18.8750	3.1250	40.0000
23	8	17.2800	19.0000	2.8130	40.0000
23	8	21.9500	19.1250	2.5630	40.0000
23	8	26.5800	19.1880	2.3750	41.0000
23	8	31.1400	19.1880	2.1250	40.0000
23	8	35.7300	19.1880	1.8750	40.0000
23	8	40.3400	19.1880	1.6250	40.0000
23	8	45.0100	19.1880	1.3750	40.0000
23	8	49.6300	19.1880	1.1250	40.0000
23	8	54.2000	19.1250	1.0000	40.0000
23	8	58.7800	19.1880	0.6880	40.0000
23	9	3.4600	19.1250	0.5000	40.0000
23	9	8.0700	19.1250	0.3130	40.0000
23	9	12.6300	19.1250	0.1250	40.0000
23	9	17.4500	19.0630	-0.1880	40.0000
23	9	22.0200	18.9380	-0.3750	40.0000
23	9	26.6400	18.8130	-0.5630	40.0000
23	9	31.2600	18.6250	-0.6880	40.0000
23	9	35.9500	18.4380	-0.8750	40.0000
23	9	40.5200	18.2500	-0.8130	40.0000
23	9	45.0700	18.0000	-0.9380	40.0000
23	9	49.7000	17.7500	-1.0000	40.0000
23	9	54.3300	17.5000	-0.9380	40.0000
23	9	58.9500	17.3130	-0.9380	40.0000
23	10	3.5800	17.0630	-0.9380	41.0000
23	10	8.1400	16.8750	-0.9380	41.0000
23	10	12.7600	16.6250	-0.9380	41.0000
23	10	17.4500	16.3750	-0.8750	41.0000
23	10	21.9600	16.1250	-0.8750	41.0000
23	10	26.6300	15.9380	-0.8750	40.0000
23	10	31.2000	15.6880	-0.9380	40.0000
23	10	35.7800	15.4380	-0.8750	40.0000
23	10	40.4600	15.2500	-0.8750	40.0000
23	10	45.0700	15.0630	-0.8750	40.0000
23	10	49.6700	14.8130	-0.8130	40.0000

FILE NAME: DAL1083.TRK

PAGE NUMBER: 6

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Delta 1083 in X & Y coordinates from Pittsburgh ASR

Coordinated Universal Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
23	10	54.2700	14.5630	-0.6250	40.0000
23	10	58.9500	14.3750	-0.6880	40.0000
23	11	3.5100	14.1250	-0.6880	40.0000
23	11	8.1300	13.8750	-0.6250	40.0000
23	11	12.7000	13.6880	-0.5630	40.0000
23	11	17.3300	13.5000	-0.5000	40.0000
23	11	21.9500	13.2500	-0.5000	40.0000
23	11	26.5700	13.0000	-0.5000	40.0000
23	11	31.1300	12.8130	-0.3750	40.0000
23	11	35.8300	12.5630	-0.3750	40.0000
23	11	40.4500	12.3130	-0.3130	40.0000
23	11	45.0100	12.1250	-0.3130	40.0000
23	11	49.6400	11.8750	-0.3750	40.0000
23	11	54.2700	11.6880	-0.3130	40.0000
23	11	58.8300	11.4380	-0.1880	41.0000
23	12	3.4500	11.2500	-0.1880	41.0000
23	12	8.0700	11.0000	-0.1250	41.0000
23	12	12.7000	10.8130	-0.1250	41.0000
23	12	17.2700	10.5630	-0.0630	40.0000
23	12	21.9500	10.3750	0.0000	40.0000
23	12	26.4500	10.1250	0.0000	40.0000
23	12	31.0200	9.8750	0.0630	40.0000
23	12	35.6400	9.6880	0.0630	40.0000
23	12	40.2000	9.4380	0.1250	39.0000
23	12	44.8200	9.1880	0.1250	39.0000
23	12	49.4500	8.9380	0.1880	38.0000
23	12	54.0700	8.7500	0.1880	37.0000
23	12	58.7000	8.5000	0.2500	36.0000

ATTACHMENT 3

BLR425 Pittsburgh TRACON ARTS III Tracking Data Returns

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Blue Ridge 425 in X & Y coordinates from Pittsburgh ASR

Coordinated Universal Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
23	2	53.4700	0.1880	4.2500	42.0000
23	2	58.0500	0.2500	4.5000	43.0000
23	3	2.7000	0.3130	4.6880	45.0000
23	3	7.3300	0.3750	4.9380	46.0000
23	3	11.9700	0.3750	5.1880	47.0000
23	3	16.5500	0.4380	5.3750	48.0000
23	3	21.0900	0.4380	5.6250	49.0000
23	3	25.7700	0.5000	5.8750	50.0000
23	3	30.3000	0.5630	6.1250	51.0000
23	3	34.9600	0.5630	6.3750	51.0000
23	3	39.5700	0.6250	6.5630	51.0000
23	3	44.2000	0.6250	6.8130	51.0000
23	3	48.8400	0.6880	7.1250	51.0000
23	3	53.4500	0.7500	7.3750	51.0000
23	3	58.0300	0.8130	7.6880	51.0000
23	4	2.6400	0.8130	7.9380	51.0000
23	4	7.2800	0.8130	8.2500	52.0000
23	4	11.8200	0.8750	8.5630	52.0000
23	4	16.4800	0.9380	8.8750	52.0000
23	4	21.0400	1.0000	9.1250	52.0000
23	4	25.6500	1.1880	9.4380	52.0000
23	4	30.3300	1.2500	9.7500	52.0000
23	4	34.9500	1.5000	10.0000	52.0000
23	4	39.5200	1.6250	10.2500	52.0000
23	4	44.1100	1.8750	10.4380	52.0000
23	4	48.7200	2.1880	10.6250	52.0000
23	4	53.5400	2.4380	10.8750	52.0000
23	4	58.0800	2.6880	11.0000	53.0000
23	5	2.7000	3.0000	11.0630	55.0000
23	5	7.3300	3.3130	11.1880	56.0000
23	5	11.9600	3.6880	11.1880	58.0000
23	5	16.5600	4.0000	11.1250	60.0000
23	5	21.1600	4.3130	11.0630	61.0000
23	5	25.9500	4.5630	11.0000	62.0000
23	5	30.5700	4.8130	10.8750	63.0000
23	5	35.1500	5.0630	10.6880	64.0000
23	5	39.7700	5.3750	10.5630	65.0000
23	5	44.4500	5.6250	10.3750	66.0000
23	5	48.9600	5.8130	10.2500	67.0000
23	5	53.5800	6.0630	10.0630	68.0000
23	5	58.2200	6.3130	9.8750	69.0000
23	6	2.9500	6.5630	9.7500	70.0000
23	6	7.5700	6.8130	9.5000	70.0000
23	6	12.1400	7.0000	9.3750	71.0000
23	6	16.7700	7.3130	9.1880	72.0000
23	6	21.4500	7.5630	9.0000	73.0000
23	6	26.0500	7.7500	8.8750	74.0000

FILE NAME: blr425.trk

PAGE NUMBER: 2

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Blue Ridge 425 in X & Y coordinates from Pittsburgh ASR

Coordinated Universal Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
23	6	30.6500	8.0630	8.6250	75.0000
23	6	35.2700	8.3130	8.4380	76.0000
23	6	40.0200	8.5630	8.3130	76.0000
23	6	44.6000	8.8750	8.1880	77.0000
23	6	49.2600	9.1250	8.0630	78.0000
23	6	53.8400	9.3750	7.9380	79.0000
23	6	58.4600	9.6880	7.8130	79.0000
23	7	3.0800	9.9380	7.6880	80.0000
23	7	7.7100	10.1880	7.5000	81.0000
23	7	12.3400	10.5000	7.3750	0.0000
23	7	16.9600	10.7500	7.2500	0.0000
23	7	21.6300	11.0000	7.1880	83.0000
23	7	26.3300	11.3130	7.0000	84.0000
23	7	30.9500	11.5630	6.8750	85.0000
23	7	35.5400	11.8130	6.6880	86.0000
23	7	40.1400	12.1250	6.5630	87.0000
23	7	44.7600	12.3750	6.5000	88.0000
23	7	49.3300	12.6880	6.3130	88.0000
23	7	53.9600	12.9380	6.1880	89.0000
23	7	58.5300	13.1880	6.0630	90.0000
23	8	3.2000	13.5000	5.9380	91.0000
23	8	7.7700	13.7500	5.8130	92.0000
23	8	12.5400	14.0630	5.6880	93.0000
23	8	17.2000	14.3130	5.6250	94.0000
23	8	21.7600	14.6250	5.4380	94.0000
23	8	26.3400	14.8750	5.3750	95.0000
23	8	31.0200	15.1880	5.1880	95.0000
23	8	35.6400	15.4380	5.0630	96.0000
23	8	40.2700	15.7500	5.0000	97.0000
23	8	44.8300	16.0000	4.8130	98.0000
23	8	49.4500	16.2500	4.6880	99.0000
23	8	54.0800	16.5630	4.6250	100.0000
23	8	58.7100	16.8130	4.4380	101.0000
23	9	3.3200	17.1250	4.3750	102.0000
23	9	7.9500	17.3750	4.2500	103.0000
23	9	12.5200	17.6250	4.0630	103.0000
23	9	17.1400	17.9380	4.0630	104.0000
23	9	21.7300	18.1880	3.8130	105.0000
23	9	26.3400	18.5000	3.7500	106.0000
23	9	31.1300	18.7500	3.6250	107.0000
23	9	35.7000	19.0630	3.5000	108.0000
23	9	40.3200	19.3130	3.4380	109.0000
23	9	44.9500	19.6250	3.3130	109.0000
23	9	49.5300	19.8750	3.1250	110.0000
23	9	54.1400	20.1880	3.1250	110.0000
23	9	58.7600	20.4380	3.0000	111.0000
23	10	3.4500	20.7500	2.8130	110.0000

FILE NAME: blr425.trk

PAGE NUMBER: 3

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Blue Ridge 425 in X & Y coordinates from Pittsburgh ASR

Coordinated Universal Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
23	10	8.0100	21.0630	2.6880	110.0000
23	10	12.6300	21.3130	2.6250	110.0000
23	10	17.2200	21.6250	2.4380	110.0000
23	10	21.8200	21.9380	2.3130	111.0000
23	10	26.4500	22.2500	2.2500	111.0000
23	10	31.0700	22.5630	2.0630	111.0000
23	10	35.7000	22.8750	1.9380	110.0000
23	10	40.3200	23.1880	1.8750	110.0000
23	10	44.9500	23.5000	1.7500	111.0000
23	10	49.5400	23.8130	1.7500	111.0000
23	10	54.1000	24.1250	1.4380	111.0000
23	10	58.7600	24.4380	1.3750	111.0000
23	11	3.3400	24.8130	1.2500	110.0000
23	11	7.9700	25.1250	1.1880	110.0000
23	11	12.5800	25.4380	1.0000	110.0000
23	11	17.2100	25.8130	0.8130	110.0000
23	11	21.8000	26.1250	0.8750	110.0000
23	11	26.4500	26.4380	0.6250	109.0000
23	11	31.0100	26.7500	0.6880	109.0000
23	11	35.6300	27.1250	0.4380	109.0000
23	11	40.2200	27.4380	0.2500	110.0000
23	11	44.8400	27.8130	0.1250	110.0000
23	11	49.6400	28.1250	0.1250	111.0000
23	11	54.2700	28.4380	0.0000	112.0000
23	11	58.8300	28.7500	-0.1250	113.0000
23	12	3.4500	29.0630	-0.2500	113.0000
23	12	8.0700	29.3750	-0.4380	114.0000
23	12	12.7000	29.6880	-0.5000	115.0000
23	12	17.2700	30.0000	-0.6880	115.0000
23	12	21.9500	30.2500	-0.7500	116.0000
23	12	26.5700	30.6250	-0.9380	116.0000
23	12	31.1400	30.8750	-0.9380	117.0000
23	12	35.7600	31.1880	-1.1880	118.0000
23	12	40.4500	31.5000	-1.2500	118.0000
23	12	44.9500	31.8130	-1.3750	119.0000
23	12	49.5700	32.1250	-1.6250	119.0000
23	12	54.2000	32.4380	-1.6880	120.0000
23	12	58.8200	32.7500	-1.6880	120.0000

ATTACHMENT 4**Rotated USA427 Tracking Data Returns**

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
 USAir 427 rotated into True North X & Y coordinates

HOURS	Local Time MINUTES	SECONDS	X Nautical	Y Miles	ALTITUDE 100s MSL Ft
18	55	16.1400	-30.2027	31.2255	150.0000
18	55	20.7300	-29.8405	30.8977	147.0000
18	55	25.4500	-29.2932	30.5959	144.0000
18	55	30.0500	-28.8784	30.3392	142.0000
18	55	34.6200	-28.4021	30.0900	140.0000
18	55	39.2000	-27.7572	29.9918	138.0000
18	55	43.7800	-27.3249	29.6103	136.0000
18	55	48.4500	-26.9627	29.2825	134.0000
18	55	53.0900	-26.4242	29.0431	133.0000
18	55	57.7000	-25.8942	28.8651	131.0000
18	56	2.4500	-25.5331	28.5372	129.0000
18	56	7.0700	-25.0558	28.2882	127.0000
18	56	11.6300	-24.5796	28.0401	125.0000
18	56	16.2700	-24.1023	27.7911	122.0000
18	56	20.9500	-23.6788	27.4719	120.0000
18	56	25.5200	-23.2112	27.2852	117.0000
18	56	30.1200	-22.7341	27.0372	115.0000
18	56	34.7300	-22.3192	26.7794	114.0000
18	56	39.3400	-21.9044	26.5226	113.0000
18	56	43.9700	-21.4281	26.2735	112.0000
18	56	48.6000	-20.9596	26.0869	111.0000
18	56	53.1800	-20.5448	25.8301	111.0000
18	56	57.7700	-20.0685	25.5810	110.0000
18	57	2.3800	-19.7237	25.3770	110.0000
18	57	7.0100	-19.3714	25.1114	111.0000
18	57	11.6300	-18.9028	24.9248	111.0000
18	57	16.2300	-18.5053	24.7908	111.0000
18	57	20.8900	-18.1529	24.5253	111.0000
18	57	25.4700	-17.8082	24.3213	111.0000
18	57	30.0700	-17.4020	24.1259	111.0000
18	57	34.6600	-16.9959	23.9305	111.0000
18	57	39.2900	-16.7671	23.6466	111.0000
18	57	43.9500	-16.4762	23.3724	111.0000
18	57	48.5700	-16.1226	23.1060	111.0000
18	57	53.1200	-16.0091	22.7433	111.0000
18	57	57.7600	-15.7267	22.5305	111.0000
18	58	2.3400	-15.6121	22.1680	111.0000
18	58	6.9700	-15.4361	21.8140	110.0000
18	58	11.5900	-15.2689	21.5224	110.0000
18	58	16.2700	-15.0402	21.2385	110.0000
18	58	20.8200	-14.8192	21.0171	109.0000
18	58	25.4500	-14.7056	20.6544	108.0000
18	58	30.0500	-14.4847	20.4330	107.0000
18	58	34.6300	-14.3711	20.0703	106.0000
18	58	39.2700	-14.2039	19.7787	105.0000
18	58	43.9600	-14.0453	19.5485	104.0000
18	58	48.5200	-13.8780	19.2560	103.0000

FILE NAME: usa427a.trk

PAGE NUMBER: 2

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
 USAir 427 rotated into True North X & Y coordinates

Local Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
18	58	53.0900	-13.7020	18.9020	102.0000
18	58	57.7200	-13.5962	18.6018	100.0000
18	59	2.4500	-13.4288	18.3093	99.0000
18	59	6.9700	-13.2002	18.0263	98.0000
18	59	11.6000	-13.0943	17.7251	97.0000
18	59	16.2000	-12.8657	17.4422	96.0000
18	59	20.7700	-12.6983	17.1496	95.0000
18	59	25.4500	-12.5311	16.8581	94.0000
18	59	30.0200	-12.3638	16.5655	93.0000
18	59	34.6500	-12.2052	16.3353	93.0000
18	59	39.2600	-12.0292	15.9814	92.0000
18	59	43.8300	-11.9234	15.6812	91.0000
18	59	48.5100	-11.6947	15.3973	90.0000
18	59	53.1100	-11.5361	15.1671	89.0000
18	59	57.7000	-11.4303	14.8669	88.0000
19	0	2.3200	-11.2630	14.5743	88.0000
19	0	6.9800	-11.0958	14.2828	87.0000
19	0	11.5600	-10.9372	14.0526	86.0000
19	0	16.2000	-10.7698	13.7600	85.0000
19	0	20.7700	-10.6026	13.4685	84.0000
19	0	25.4500	-10.4353	13.1759	83.0000
19	0	29.9500	-10.2767	12.9457	82.0000
19	0	34.5700	-10.0567	12.7242	81.0000
19	0	39.2300	-9.8358	12.5028	80.0000
19	0	43.9500	-9.6686	12.2112	79.0000
19	0	48.4500	-9.3334	12.0685	79.0000
19	0	53.0600	-9.1125	11.8471	78.0000
19	0	57.6700	-8.9013	11.6879	77.0000
19	1	2.2700	-8.6803	11.4665	76.0000
19	1	6.9500	-8.4603	11.2450	76.0000
19	1	11.5100	-8.1780	11.0322	75.0000
19	1	16.1300	-8.0280	10.8634	74.0000
19	1	20.7200	-7.8071	10.6420	74.0000
19	1	25.3300	-7.5959	10.4829	73.0000
19	1	30.0100	-7.3749	10.2615	72.0000
19	1	34.5900	-7.1549	10.0399	72.0000
19	1	39.1700	-6.9426	9.8799	71.0000
19	1	43.7800	-6.7314	9.7208	70.0000
19	1	48.4500	-6.5190	9.5608	69.0000
19	1	53.0600	-6.2991	9.3392	68.0000
19	1	57.6500	-6.0869	9.1802	67.0000
19	2	2.3200	-5.8755	9.0201	66.0000
19	2	6.9500	-5.5932	8.8073	65.0000
19	2	11.5500	-5.3810	8.6483	64.0000
19	2	16.1400	-5.2310	8.4795	63.0000
19	2	20.7100	-5.0111	8.2580	62.0000
19	2	25.4500	-4.7901	8.0366	61.0000

FILE NAME: usa427a.trk

PAGE NUMBER: 3

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
USAir 427 rotated into True North X & Y coordinates

Local Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
19	2	30.0800	-4.5789	7.8774	60.0000
19	2	34.7000	-4.3665	7.7174	60.0000
19	2	39.2900	-4.0316	7.5756	60.0000
19	2	43.9500	-3.8280	7.4780	60.0000
19	2	48.5300	-3.5630	7.3890	60.0000
19	2	53.1500	-3.2453	7.3701	60.0000
19	2	57.7600	-2.9803	7.2811	60.0000
19	3	2.4500	-2.6704	7.3246	60.0000
19	3	7.1300	-2.3614	7.3681	58.0000
19	3	11.7700	-2.2638	7.5716	53.0000
19	3	16.4500	-1.9011	7.6852	53.0000
19	3	20.9600	-2.1037	7.7830	23.0000
19	3	25.5800	-2.0510	7.8540	23.0000
19	3	30.2000	-2.0060	7.9865	23.0000
19	3	34.8200	-1.8996	8.1277	23.0000
19	3	39.4500	-1.7845	8.2065	23.0000
19	3	44.0300	-1.7405	8.3389	23.0000
19	3	48.6100	-1.6341	8.4801	23.0000
19	3	53.2900	-1.5191	8.5599	23.0000
19	3	57.9600	-1.4741	8.6924	23.0000
19	4	2.4700	-1.3677	8.8336	23.0000

ATTACHMENT 5

Rotated DL1083 Tracking Data Returns

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Delta 1083 rotated into True North X & Y coordinates

HOURS	Local Time		X Nautical	Y Miles	ALTITUDE 100s MSL Ft
	MINUTES	SECONDS			
18	52	48.8300	-18.3910	40.1442	124.0000
18	52	53.4500	-18.2860	39.8428	123.0000
18	52	58.0600	-18.4104	39.3841	121.0000
18	53	2.6700	-18.2968	39.0213	120.0000
18	53	7.2500	-18.4210	38.5616	118.0000
18	53	11.9500	-18.4312	38.1815	116.0000
18	53	16.5100	-18.5556	37.7227	115.0000
18	53	21.0700	-18.5034	37.3513	113.0000
18	53	25.7000	-18.4512	36.9800	112.0000
18	53	30.4500	-18.5764	36.5201	110.0000
18	53	34.9500	-18.4706	36.2199	109.0000
18	53	39.5300	-18.4096	35.7861	108.0000
18	53	44.2000	-18.4812	35.3974	107.0000
18	53	48.7600	-18.4828	34.9559	106.0000
18	53	53.4500	-18.4920	34.5759	106.0000
18	53	58.0300	-18.4398	34.2046	105.0000
18	54	2.6300	-18.2111	33.9206	105.0000
18	54	7.2600	-18.2203	33.5406	104.0000
18	54	11.8500	-18.2832	33.0905	104.0000
18	54	16.4500	-18.1783	32.7892	104.0000
18	54	21.0700	-18.1175	32.3564	103.0000
18	54	25.7000	-18.1267	31.9764	102.0000
18	54	30.2900	-18.0745	31.6051	102.0000
18	54	34.9500	-18.3762	31.0578	101.0000
18	54	39.4500	-17.9787	30.9238	101.0000
18	54	44.0200	-17.9889	30.5437	101.0000
18	54	48.6300	-17.9981	30.1637	100.0000
18	54	53.2100	-17.9547	29.8547	100.0000
18	54	57.8400	-17.9025	29.4834	100.0000
18	55	2.4500	-17.9213	29.1647	100.0000
18	55	7.0500	-17.8692	28.7933	100.0000
18	55	11.6600	-17.7633	28.4931	100.0000
18	55	16.2700	-17.7822	28.1744	100.0000
18	55	20.9500	-17.6150	27.8828	100.0000
18	55	25.5500	-17.6242	27.5028	100.0000
18	55	30.1500	-17.4042	27.2813	100.0000
18	55	34.7700	-17.1218	27.0685	100.0000
18	55	39.3400	-17.1310	26.6886	100.0000
18	55	44.0100	-17.1325	26.2460	100.0000
18	55	48.5900	-16.8589	26.0957	100.0000
18	55	53.2200	-16.7443	25.7331	100.0000
18	55	57.8300	-16.5857	25.5029	100.0000
18	56	2.4500	-16.4184	25.2104	100.0000
18	56	7.0700	-16.3136	24.9100	100.0000
18	56	11.6400	-16.1462	24.6175	100.0000
18	56	16.2700	-16.0404	24.3173	100.0000
18	56	20.9500	-15.8117	24.0333	100.0000

FILE NAME: dal1083a.trk

PAGE NUMBER: 2

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Delta 1083 rotated into True North X & Y coordinates

Local Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
18	56	25.5200	-15.7145	23.7945	100.0000
18	56	30.1200	-15.5473	23.5030	100.0000
18	56	34.7300	-15.4951	23.1316	100.0000
18	56	39.3500	-15.3277	22.8391	100.0000
18	56	43.9700	-15.1605	22.5475	100.0000
18	56	48.6100	-15.0644	22.3086	100.0000
18	56	53.1800	-14.7732	22.0334	100.0000
18	56	57.7700	-14.6674	21.7332	100.0000
18	57	2.3800	-14.5001	21.4406	100.0000
18	57	7.0200	-14.3953	21.1403	100.0000
18	57	11.6400	-14.1655	20.8565	100.0000
18	57	16.2300	-13.9983	20.5649	100.0000
18	57	20.9000	-13.8934	20.2636	100.0000
18	57	25.4700	-13.7875	19.9634	100.0000
18	57	30.0800	-13.5588	19.6795	100.0000
18	57	34.6600	-13.4530	19.3793	100.0000
18	57	39.2900	-13.3480	19.0780	100.0000
18	57	43.9500	-13.1184	18.7952	100.0000
18	57	48.5700	-13.0135	18.4939	100.0000
18	57	53.1200	-12.7839	18.2111	100.0000
18	57	57.7500	-12.6789	17.9097	100.0000
18	58	2.3400	-12.5117	17.6182	100.0000
18	58	6.9600	-12.2820	17.3344	100.0000
18	58	11.5900	-12.1234	17.1042	100.0000
18	58	16.2700	-11.9562	16.8126	100.0000
18	58	20.8200	-11.8513	16.5113	100.0000
18	58	25.4500	-11.7455	16.2111	99.0000
18	58	30.0500	-11.5167	15.9272	98.0000
18	58	34.6300	-11.4109	15.6270	97.0000
18	58	39.2600	-11.2436	15.3344	97.0000
18	58	43.9500	-11.1387	15.0341	96.0000
18	58	48.5200	-10.9178	14.8127	95.0000
18	58	53.0900	-10.8042	14.4500	94.0000
18	58	57.7200	-10.7070	14.2112	93.0000
18	59	2.4500	-10.4783	13.9272	92.0000
18	59	6.9600	-10.3725	13.6271	92.0000
18	59	11.5900	-10.1525	13.4055	91.0000
18	59	16.2000	-10.0465	13.1043	90.0000
18	59	20.7700	-9.8880	12.8742	89.0000
18	59	25.4500	-9.7208	12.5826	88.0000
18	59	30.0200	-9.5534	12.2900	87.0000
18	59	34.6400	-9.3948	12.0599	86.0000
18	59	39.2600	-9.2276	11.7683	85.0000
18	59	43.8300	-9.0603	11.4757	84.0000
18	59	48.5100	-8.9017	11.2456	83.0000
18	59	53.1000	-8.7345	10.9540	82.0000
18	59	57.7000	-8.6295	10.6527	81.0000

FILE NAME: dal1083a.trk

PAGE NUMBER: 3

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Delta 1083 rotated into True North X & Y coordinates

HOURS	Local Time		X Nautical	Y Miles	ALTITUDE 100s MSL Ft
	MINUTES	SECONDS			
19	0	2.3200	-8.4623	10.3611	80.0000
19	0	6.9700	-8.3038	10.1309	80.0000
19	0	11.5600	-8.1364	9.8384	79.0000
19	0	16.2000	-8.0392	9.5996	78.0000
19	0	20.7600	-7.8193	9.3780	77.0000
19	0	25.4500	-7.7135	9.0778	76.0000
19	0	29.9500	-7.4847	8.7939	76.0000
19	0	34.5700	-7.3349	8.6261	75.0000
19	0	39.2300	-7.1052	8.3423	75.0000
19	0	43.9500	-6.8940	8.1832	74.0000
19	0	48.4500	-6.6730	7.9618	74.0000
19	0	53.0500	-6.4080	7.8728	73.0000
19	0	57.6700	-6.1343	7.7214	72.0000
19	1	2.2700	-5.9317	7.6237	71.0000
19	1	6.9500	-5.6668	7.5347	70.0000
19	1	11.5100	-5.3482	7.5168	69.0000
19	1	16.1400	-5.0218	7.4365	68.0000
19	1	20.7200	-4.7743	7.4713	67.0000
19	1	25.3300	-4.4555	7.4524	67.0000
19	1	30.0900	-4.1379	7.4345	66.0000
19	1	34.7000	-3.8730	7.3455	66.0000
19	1	39.4500	-3.6166	7.3179	65.0000
19	1	43.9500	-3.2981	7.3000	64.0000
19	1	48.5700	-2.9803	7.2811	63.0000
19	1	53.1600	-2.7241	7.2545	62.0000
19	1	57.9500	-2.4054	7.2356	61.0000
19	2	2.5400	-2.1578	7.2704	61.0000
19	2	7.1700	-1.8403	7.2525	61.0000
19	2	11.7700	-1.5215	7.2336	61.0000
19	2	16.4600	-1.2126	7.2771	61.0000
19	2	21.1400	-1.0264	7.3032	61.0000
19	2	25.7600	-0.7078	7.2854	61.0000
19	2	30.4500	-0.4603	7.3202	61.0000
19	2	35.0200	-0.2039	7.2926	60.0000
19	2	39.6400	0.1050	7.3360	60.0000
19	2	44.2000	0.3612	7.3094	60.0000
19	2	48.9600	0.6712	7.3530	60.0000
19	2	53.6100	0.9275	7.3254	60.0000
19	2	58.1600	1.2451	7.3074	60.0000
19	3	2.8100	1.4927	7.3422	60.0000
19	3	7.4600	1.8114	7.3234	60.0000
19	3	12.1400	2.0676	7.2968	60.0000
19	3	16.8300	2.3152	7.3316	60.0000
19	3	21.4500	2.6329	7.3126	59.0000
19	3	25.9600	2.8891	7.2860	58.0000
19	3	30.5900	3.1454	7.2584	57.0000
19	3	35.2900	3.3930	7.2932	57.0000

FILE NAME: dal1083a.trk

PAGE NUMBER: 4

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Delta 1083 rotated into True North X & Y coordinates

Local Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
19	3	40.0100	3.7116	7.2754	56.0000
19	3	44.5700	3.9679	7.2478	55.0000
19	3	49.2000	4.1531	7.2738	54.0000
19	3	53.8300	4.4631	7.3173	52.0000
19	3	58.4600	4.7193	7.2907	51.0000
19	4	3.0900	4.9756	7.2632	50.0000
19	4	7.6400	5.2318	7.2365	49.0000
19	4	12.4400	5.5407	7.2800	48.0000
19	4	17.0300	5.7971	7.2524	47.0000
19	4	21.6400	6.1070	7.2959	46.0000
19	4	26.2700	6.3008	7.2606	46.0000
19	4	30.9500	6.5484	7.2954	45.0000
19	4	35.4500	6.8671	7.2765	44.0000
19	4	40.0800	7.1233	7.2499	43.0000
19	4	44.7000	7.3709	7.2847	42.0000
19	4	49.3400	7.6185	7.3195	42.0000
19	4	53.9600	7.8660	7.3543	42.0000
19	4	58.5800	8.1224	7.3267	41.0000
19	5	3.3400	8.3699	7.3615	41.0000
19	5	7.9500	8.6789	7.4049	41.0000
19	5	12.5400	8.8651	7.4311	41.0000
19	5	17.1300	9.1914	7.3507	40.0000
19	5	21.7300	9.4390	7.3855	40.0000
19	5	26.3300	9.6952	7.3589	40.0000
19	5	31.0100	10.0051	7.4025	40.0000
19	5	35.5700	10.1991	7.3661	40.0000
19	5	40.2000	10.5090	7.4097	40.0000
19	5	44.8300	10.7652	7.3831	40.0000
19	5	49.4500	11.0042	7.4793	40.0000
19	5	54.0800	11.2604	7.4527	40.0000
19	5	58.6300	11.5167	7.4251	40.0000
19	6	3.2600	11.7643	7.4599	40.0000
19	6	7.9500	12.0205	7.4333	40.0000
19	6	12.4600	12.2680	7.4681	40.0000
19	6	17.0700	12.5244	7.4405	40.0000
19	6	21.9500	12.7806	7.4139	40.0000
19	6	26.5100	13.0895	7.4573	40.0000
19	6	31.0700	13.3371	7.4921	40.0000
19	6	35.6600	13.5934	7.4645	40.0000
19	6	40.2800	13.8496	7.4379	40.0000
19	6	44.9500	14.0972	7.4727	40.0000
19	6	49.5300	14.4159	7.4538	40.0000
19	6	54.1300	14.6635	7.4886	41.0000
19	6	58.7600	14.9197	7.4620	40.0000
19	7	3.3400	15.1672	7.4968	40.0000
19	7	7.9700	15.3524	7.5229	40.0000
19	7	12.5700	15.6712	7.5040	41.0000

FILE NAME: dal1083a.trk

PAGE NUMBER: 5

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Delta 1083 rotated into True North X & Y coordinates

Local Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
19	7	17.2000	15.9273	7.4774	41.0000
19	7	21.8200	16.1837	7.4498	40.0000
19	7	26.4600	16.4486	7.3608	41.0000
19	7	31.0300	16.6512	7.2631	40.0000
19	7	35.6400	16.9248	7.1127	40.0000
19	7	40.2700	17.0748	6.9439	40.0000
19	7	44.9500	17.2333	6.7138	40.0000
19	7	49.4600	17.4369	6.6161	40.0000
19	7	54.0800	17.5955	6.3860	40.0000
19	7	58.8100	17.7453	6.2182	40.0000
19	8	3.4500	17.9566	6.0580	40.0000
19	8	8.0700	18.1064	5.8903	40.0000
19	8	12.7000	18.2564	5.7215	40.0000
19	8	17.2800	18.4236	5.4299	40.0000
19	8	21.9500	18.5822	5.1997	40.0000
19	8	26.5800	18.6707	5.0223	41.0000
19	8	31.1400	18.7055	4.7748	40.0000
19	8	35.7300	18.7403	4.5272	40.0000
19	8	40.3400	18.7751	4.2796	40.0000
19	8	45.0100	18.8099	4.0321	40.0000
19	8	49.6300	18.8447	3.7845	40.0000
19	8	54.2000	18.7997	3.6520	40.0000
19	8	58.7800	18.9055	3.3518	40.0000
19	9	3.4600	18.8693	3.1568	40.0000
19	9	8.0700	18.8953	2.9716	40.0000
19	9	12.6300	18.9215	2.7855	40.0000
19	9	17.4500	18.9036	2.4669	40.0000
19	9	22.0200	18.8059	2.2643	40.0000
19	9	26.6400	18.7083	2.0607	40.0000
19	9	31.2600	18.5395	1.9108	40.0000
19	9	35.9500	18.3803	1.6996	40.0000
19	9	40.5200	18.1855	1.7348	40.0000
19	9	45.0700	17.9554	1.5762	40.0000
19	9	49.7000	17.7164	1.4801	40.0000
19	9	54.3300	17.4602	1.5067	40.0000
19	9	58.9500	17.2751	1.4806	40.0000
19	10	3.5800	17.0275	1.4458	41.0000
19	10	8.1400	16.8413	1.4197	41.0000
19	10	12.7600	16.5938	1.3849	41.0000
19	10	17.4500	16.3374	1.4125	41.0000
19	10	21.9600	16.0898	1.3777	41.0000
19	10	26.6300	15.9047	1.3517	40.0000
19	10	31.2000	15.6659	1.2545	40.0000
19	10	35.7800	15.4095	1.2821	40.0000
19	10	40.4600	15.2234	1.2559	40.0000
19	10	45.0700	15.0382	1.2299	40.0000
19	10	49.6700	14.7820	1.2565	40.0000

FILE NAME: dal1083a.trk

PAGE NUMBER: 6

Pittsburgh TRACON ARTS III Tracking Data (TD) returns for
Delta 1083 rotated into True North X & Y coordinates

Local Time			X	Y	ALTITUDE
HOURS	MINUTES	SECONDS	Nautical	Miles	100s MSL Ft
19	10	54.2700	14.5083	1.4079	40.0000
19	10	58.9500	14.3309	1.3193	40.0000
19	11	3.5100	14.0833	1.2845	40.0000
19	11	8.1300	13.8270	1.3121	40.0000
19	11	12.7000	13.6331	1.3475	40.0000
19	11	17.3300	13.4382	1.3837	40.0000
19	11	21.9500	13.1906	1.3489	40.0000
19	11	26.5700	12.9431	1.3141	40.0000
19	11	31.1300	12.7405	1.4119	40.0000
19	11	35.8300	12.4929	1.3771	40.0000
19	11	40.4500	12.2367	1.4037	40.0000
19	11	45.0100	12.0506	1.3775	40.0000
19	11	49.6400	11.8116	1.2813	40.0000
19	11	54.2700	11.6178	1.3167	40.0000
19	11	58.8300	11.3529	1.4057	41.0000
19	12	3.4500	11.1667	1.3795	41.0000
19	12	8.0700	10.9103	1.4071	41.0000
19	12	12.7000	10.7252	1.3811	41.0000
19	12	17.2700	10.4690	1.4077	40.0000
19	12	21.9500	10.2740	1.4439	40.0000
19	12	26.4500	10.0265	1.4091	40.0000
19	12	31.0200	9.7701	1.4367	40.0000
19	12	35.6400	9.5849	1.4107	40.0000
19	12	40.2000	9.3288	1.4373	39.0000
19	12	44.8200	9.0812	1.4025	39.0000
19	12	49.4500	8.8249	1.4301	38.0000
19	12	54.0700	8.6387	1.4039	37.0000
19	12	58.7000	8.3825	1.4305	36.0000

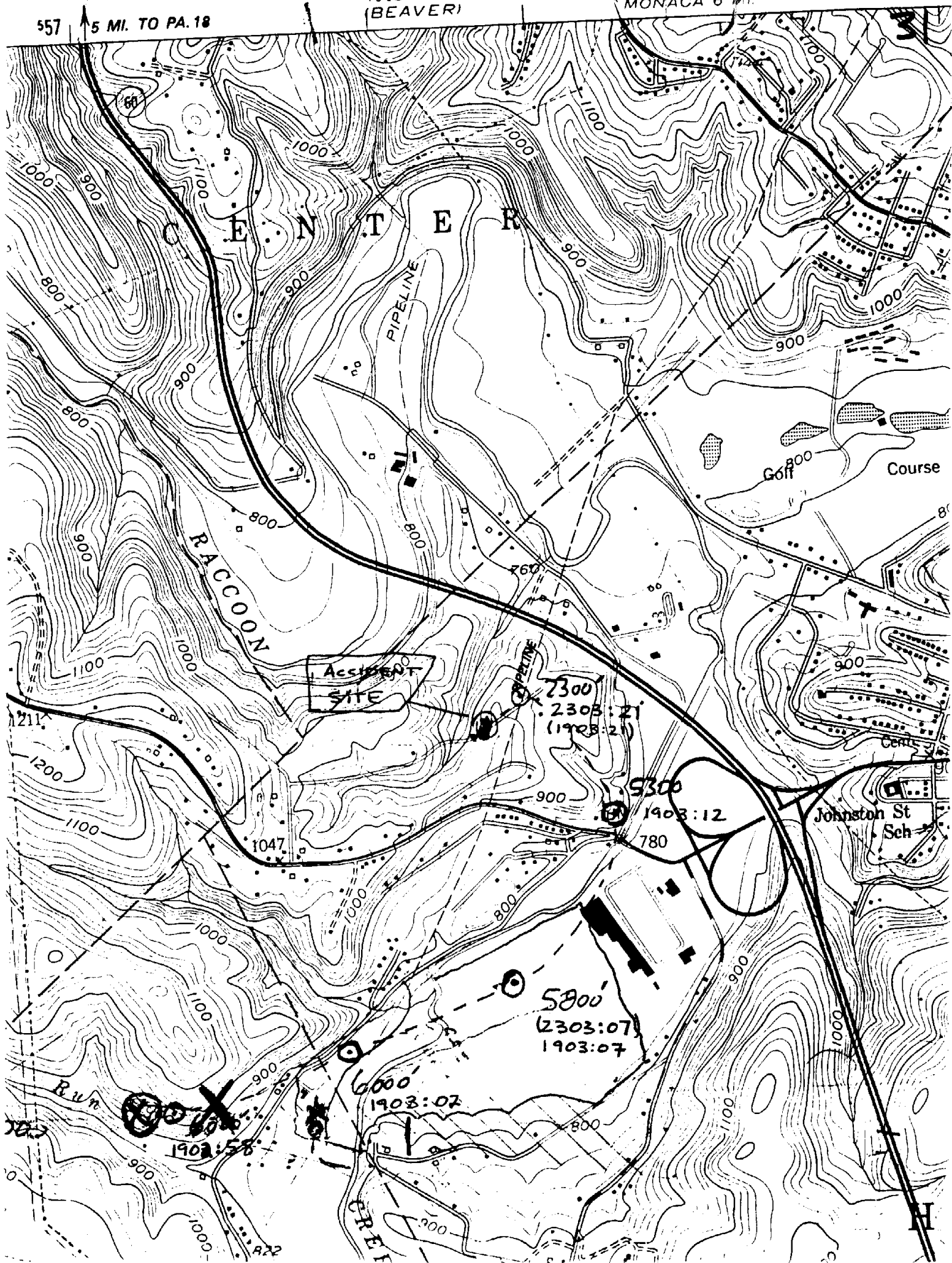
ATTACHMENT 6

Plot of USA 427 Tracking Data

557 5 MI. TO PA. 18

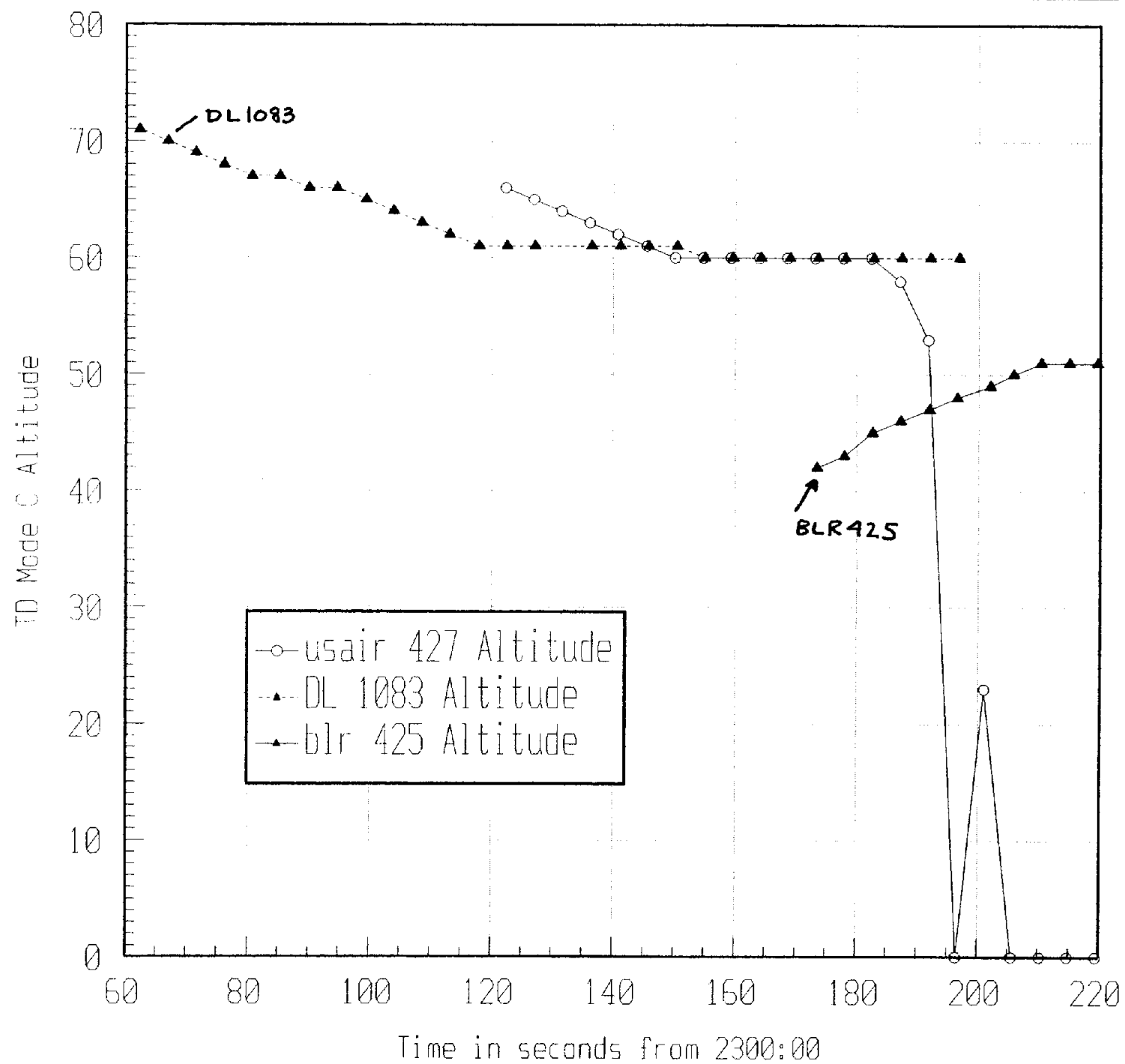
(BEAVER)

MONACA 6 MI.



ATTACHMENT 7

Plot of Mode C Altitude Versus Time

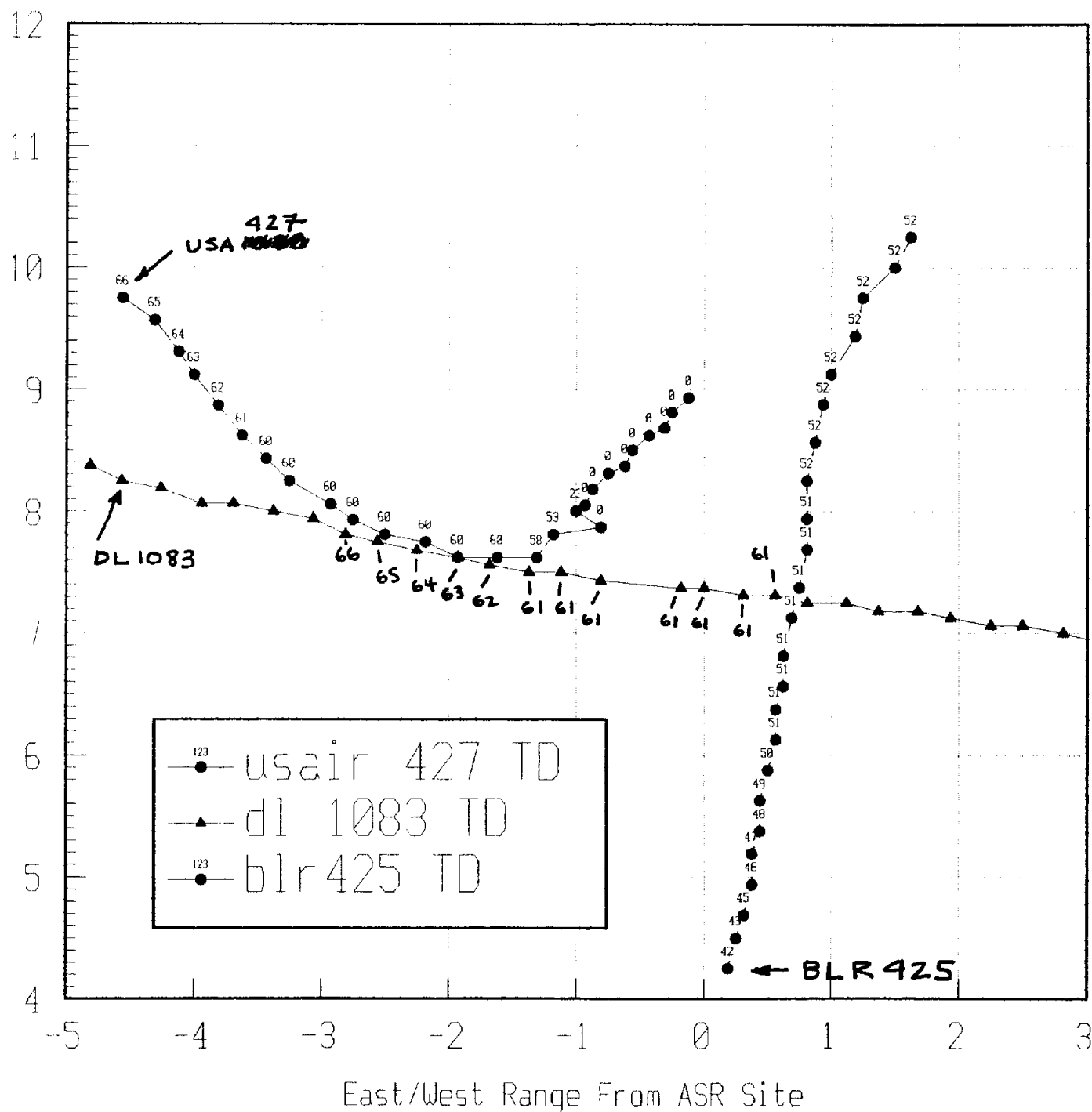


ATTACHMENT 8

Plot of USA427, DL1083, & BLR425 Tracking Data

X & Y
positions
plotted
are
"X" & "Y"
From
Tracking
Data
Sets
& extracted
from
extractor
tapes

North/South Range from ASR site



ATTACHMENT 9

Separation Data Tables

USAir 427 & Delta 1083 Separation Table

Aircraft	Radar Return UCT	X - Position (n.m.)	Y - Position (n.m.)	Mode C Alt (100s of Ft)	Vertical Separation (Feet)	Lateral Separation (n.m.)
USAir 427 Delta 1083	2301:30.01 2301:30.09	-5.875 -3.063	11.188 7.938	72 66	600	4.3
USAir 427 Delta 1083	2301:34.59 2301:34.70	-5.688 -2.813	10.938 7.813	72 66	600	4.2
USAir 427 Delta 1083	2301:39.17 2301:39.45	-5.500 -2.563	10.750 7.750	71 65	600	4.2
USAir 427 Delta 1083	2301:43.78 2301:43.95	-5.313 -2.250	10.375 7.688	70 64	600	4.2
USAir 427 Delta 1083	2301:48.45 2301:48.57	-5.125 -1.938	10.375 7.625	69 63	600	4.2
USAir 427 Delta 1083	2301:53.06 2301:53.16	-4.938 -1.688	10.125 7.563	68 62	600	4.1
USAir 427 Delta 1083	2301:57.65 2301:57.95	-4.750 -1.375	9.938 7.500	67 61	600	4.2
USAir 427 Delta 1083	2302:02.32 2302:02.54	-4.563 -1.125	9.750 7.500	66 61	500	4.1
USAir 427 Delta 1083	2302:06.95 2302:07.17	-4.313 -0.813	9.500 7.438	65 61	400	4.1
USAir 427 Delta 1083	2302:11.95 2302:11.77	-4.125 -0.500	9.313 7.375	64 61	300	4.1
USAir 427 Delta 1083	2302:16.14 2302:16.46	-4.000 -0.188	9.125 7.375	63 61	200	4.2
USAir 427 Delta 1083	2302:20.71 2302:21.14	-3.813 0.000	8.875 7.375	62 61	100	4.1
USAir 427 Delta 1083	2302:25.45 2302:25.76	-3.625 0.313	8.625 7.313	61 61	0	4.2
USAir 427 Delta 1083	2302:30.08 2302:30.45	-3.438 0.563	8.438 7.313	60 61	0	4.2
USAir 427 Delta 1083	2302:34.70 2302:35.02	-3.250 0.813	8.250 7.250	60 60	0	4.2
USAir 427 Delta 1083	2302:39.29 2302:39.64	-2.938 1.125	8.063 7.250	60 60	0	4.1
USAir 427 Delta 1083	2302:43.95 2302:44.20	-2.750 1.375	7.938 7.188	60 60	0	4.2
USAir 427 Delta 1083	2302:48.53 2302:48.96	-2.500 1.688	7.813 7.188	60 60	0	4.2
USAir 427 Delta 1083	2302:53.15 2302:53.61	-2.188 1.938	7.750 7.125	60 60	0	4.2
USAir 427 Delta 1083	2302:57.76 2302:58.16	-1.938 2.250	7.625 7.063	60 60	0	4.5
USAir 427 Delta 1083	2303:02.45 2303:02.81	-1.625 2.500	7.625 7.063	60 60	0	4.2
USAir 427 Delta 1083	2303:07.13 2303:07.46	-1.313 2.813	7.625 7.000	58 60	-200	4.2
USAir 427 Delta 1083	2303:11.77 2303:12.14	-1.188 3.063	7.813 6.938	53 60	-700	4.3

28

USAir 427 & Blue Ridge 425 Separation Table

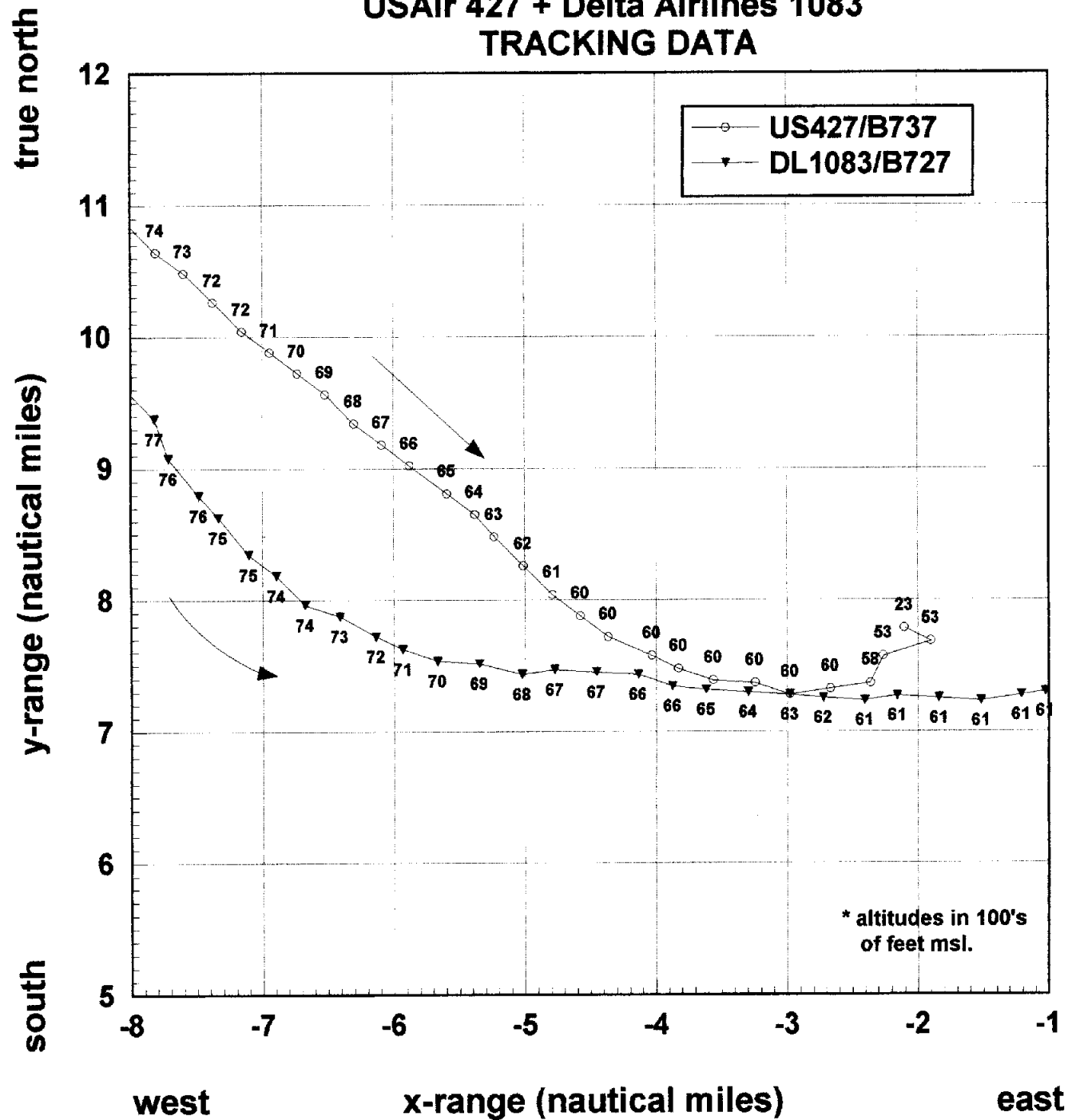
Aircraft	Radar Return UCT	X - Position (n.m.)	Y - Position (n.m.)	Mode C Alt (100s of Ft)	Vertical Separation (Feet)	Lateral Separation (n.m.)
USAir 427 BLR 425	2302:48.53 2302:48.00	-2.500 0.120	7.810 4.050	60 41	1900	4.2
USAir 427 BLR 425	2302:53.15 2302:53.47	-2.188 0.188	7.75 4.250	60 42	1800	4.2
USAir 427 BLR 425	2302:57.76 2302:58.05	-1.938 0.250	7.625 4.500	60 43	1700	3.8
USAir 427 BLR 425	2303:02.45 2303:02.70	-1.625 0.313	7.625 4.688	60 45	1500	3.5
USAir 427 BLR 425	2303:07.14 2303:07.33	-1.313 0.375	7.625 4.938	58 46	1200	3.2
USAir 427 BLR 425	2303:11.76 2303:11.97	-1.188 0.375	7.813 5.188	53 47	600	3.1
USAir 427 BLR 425	2303:20.96 2303:21.97	-1.000 0.438	8.000 5.625	23 49	-2600	2.8

ATTACHMENT 10

Plot of USA427 and DL1083 Rotated Tracking Data

40

USAir 427 + Delta Airlines 1083 TRACKING DATA



4.1

ATTACHMENT 11

Expanded Plot of USA427 and DL1083 Rotated Tracking Data

USAir 427 + Delta Airlines 1083 TRACKING DATA EXPANDED

