

AESOP Flight

Flight #6 1990706

<u>Sensor or system</u>	<u>Number or Name</u>
INE	2
Accelerometer	2
Temperature Probe	2
Dew Point Probe	2
Altitude (for vertical wind)	Pressure Altitude
Static Pressure	Rosemount Fuselage
Dynamic Pressure	Rosemount Fuselage
Time Source	Micro 99
Constants File	CO3992.CON

Notes:

The radar altimeter (RA159) had a spike at takeoff and was replaced by RA232 from 1610:01-1628:30. A spike also occurred on landing and RA159 was set to zero from 2349:39-2352:00.

Dewpoint (DW2) was replaced by DW1 due to balancing from 1655:45-1659:15. Dewpoint appears to be less responsive in such dry conditions 1647:00-1659:15, 2123:00-2142:30.

	<u>Takeoff</u>	<u>Landing</u>
Aircraft static pressure	998.0	994.4
Corrected tower pressure	1019.6	1015.9

The aircraft INE positions were renavigated with respect to GPS.

SPECIAL NOTE!!! Locations 80, 81 and 82 of record five on the standard tape contain vertical ground, vertical air and vertical speeds, respectively, computed using Dave Jorgensen's vertical wind algorithm.
It is recommended that these values be used for vertical wind analysis.

Flight Meteorologist: Stan Czyzyk, (813) 828-3310 ext. 3086

U.S. DEPT. COMM./NOAA/OAO - DATA SECTION WORK FORM NO.2-OROWF2

FLT ID: 990706I

TIME OFF: 1615Z

TIME ON: 2350Z

	A/C T/O	WX STN	A/C LAND	WX STN
PRESSURE	998.0	30.11		30.00

NO DATA DISPOSITION/DATE/QUALITY

1/SEC FLT LVL TAPES		
FAST FLT LVL TAPES		
RADAR TAPES		
DOPPLER TAPES		
ODW CASSETTES		
HARD COPIES		
AXBT		
AXCP		
ODW		

PHOTOGRAPHY

	FWD	LS	RS	VERT
ON				
OFF				
RATE				

REMARKS

U. S. DEPT. COMM. / NOAA / OAO - DATA SECTION WORK FORM NO. 1 OAO WF 1 FILE

FLT ID: 990706Z	FM: KBNA KBNA	TO: KBNA
FLT NO: 99-040	DLK IN: 2356	ATA: 2350Z
ETD: 1600Z	DLK OUT: 1606Z	RTD: 1615Z
ETE: 0000Z	DLK TIME: 7.50 7.8	FLT TIME: 7.75 7.6
SPONSOR ORG: NOAA-AL	PROGRAM: AESOP	PURPOSE: ATLANTA... #1

OAO PERSONNEL

AC KENNEDY, P ✓	SYS ENG LYNCH, T ✓
CP OMARA, T	DATA SYS HORN BROOK, C ✓
NAV NEWMAN, C / RATHBUN, D ✓	RADAR
FE MOORE, H	DT/ODW
RADIO ROGERS, M ✓	CLD PHYS
FD CZYZYK, S ✓	DOPPLER

PARTICIPATING SCIENTIST/VISITORS/OAO

LAST, FIRST NAME	ACTIVITY ON A/C	AFFILIATION
HUBLER, G ✓	PI	NOAA-AL
RYERSON, J / HUEY, G ✓	SCIENTIST	"
KUSTER, B ✓	"	"
PARRISH, D ✓	"	"
GRIMSDALE, A ✓	"	"
HOENNWINGER, G ✓	"	"
FLOCKE, F ✓	"	U OF HEIDELBERG
LEE, Y I	"	NCAR
		BROOKHALEN

PROPOSED/ACTUAL MISSION/REMARKS (RECCO, FIXES, STORM, PENET, NHOP #)

BALANCE DWH 1650Z, DWH 1656Z

POWER AT 2 ENGINE START

Proposed Flight Plans - Tuesday July 6, 1999

All three SOS aircraft - the NOAA **WP-3D Orion** (tail number N43RF, operating out of BNA), the TVA **Bell 205** (tail number N16TV, operating out of Dickson Municipal Airport), and the NOAA ETL-sponsored **Caribou** (tail number N6080 operating out of John Tune Airport) - are planning air quality/meteorological research flights on Tuesday, July 6, 1999.

The **Caribou** will depart John Tune at approximately 12:00 noon CDT to conduct a "bow tie and box pattern" across and around Nashville. The bow-tie will consist of 70 km long southeast to northwest and southwest to northeast legs centering on Nashville followed by a smaller box pattern around the Nashville urban area. The 4-hour flight will be at 10500 ft MSL returning to John Tune at about 4:00 PM CDT. Please see map A.

The **P-3** will depart BNA at 11:00 AM CDT to conduct urban characterization and transport studies. The Atlanta GA area will be the target of choice for the early part of the flight with low level passes upwind, over, and downwind of Atlanta followed by a return to the middle Tennessee area for a similar characterization of the Nashville plume in the late afternoon. Total flight time is estimated at 7 hours and 20 minutes. All urban characterization flights will be on the order of 1500 ft MSL with transit calibrations at maximum altitude (25000 ft MSL). Please see maps B, C & D along with additional flight descriptions in accompanying documents.

The TVA **Bell 205** helicopter will plan to depart Dickson Municipal Airport at about 1200 hrs CDT for a flight to study the evolution of the Cumberland plume under low-wind, west-to-east transport conditions. The helicopter will conduct a series of multiple crosswind traverses of the plume at 10, 25, and 50 mi. downwind of the plant. Flight altitudes will be between 1500 and 3000 ft MSL. The helicopter will refuel in Springfield and the mission will conclude with a return to Dickson at about 1900 hr. In the event that the Cumberland plant is operating at significantly less than 50% of capacity, an identical mission will be conducted in the Johnsonville plume, with refueling at Dickson.

Any significant alterations of this proposed flight plans will be communicated to the tower (by FAX) before 12:00 Noon on July 6, 1999.

Please telephone Bill Parkhurst or Jim Meagher at the Southern Oxidants Study Office at 366-5779 or 366-7582 if you have any questions.

124.1

Flight plan : 6 July 1999
Atlanta and Nashville Urban Survey

default climb rate 1500 ft/min

Access to plane : 7:00 am CDT

Preflight : 8:00 am CDT

Pt 0: Nashville (36 08N, 86 41W)

Doors closed:

Takeoff: 11 CDT

3000 MSL PT2-20

Head to Pt. 1 (34 20N, 83 46W) (330 km, 50 min) 15.5 PA

On way to Pt. 1 climb to 15 kft, Calibration at 15 kft arrive at Pt. 1 at 1500 ft AGL

Spinal
Down

Atlanta Urban Pattern (Forecast calls for light winds from the NE ??)

Pt. 1-Pt. 20 (1430 km, ~ 3 hrs 45 min)

Low Level Passes Upwind, Over and Downwind from Atlanta : 10 flight legs in North to

South orientation ~14 km apart, 130 km long (~ 20 min)

7-8 TRAFFIC CONE PBL
6-7 KPA

default Flight Altitude: 1500 ft AGL

Descent and ascent at the begin and the end of the pattern will give PBL height at northern end. Include two profiles out of the PBL to about (3 km) at the southern end of the pattern.

==> Collect **29 in-situ HC samples** inside and outside of the urban plume.

Head to Pt. 21 (36 04N, 87 14W) (283 km, 45 min)

On way to Pt. 21 climb to max altitude (25 kft) , Calibration in route at constant altitude (15 min)

5:20 @

Nashville Urban Pattern (Wind from 300 deg) Pt. 21-Pt.34 (~84 min)

Low Level Passes Upwind, Over and Downwind from Nashville (~7 km increments)

Flight Altitude: 1500 ft AGL or less

Keep track of the plume locations

==> Collect **10 in-situ HC samples** inside and outside of the urban plume.

Head to Nashville Pt. 26 (36 08N, 86 41W)

On return to BNA include low level pass over Cornelia Fort

Straight Flight Time is estimated as 7hrs 20min

Holding for Calibration, Traffic Cones, and Extra Probing of power plant plumes will add extra time.

Point	lat_070699	lng_070699	lat_deg_0706	lat_min_0706	lng_deg_0706	lng_min_0706
0	36.13	-86.68	36	7.8	-86	41
1	34.33	-83.77	34	20	-83	46
2	33.17	-83.77	33	10	-83	46
3	33.17	-83.98	33	10	-83	59
4	34.33	-83.98	34	20	-83	59
5	34.33	-84.13	34	20	-84	8
6	33.17	-84.13	33	10	-84	8
7	33.17	-84.28	33	10	-84	17
8	34.33	-84.28	34	20	-84	17
9	34.33	-84.43	34	20	-84	25.5
10	33.17	-84.43	33	10	-84	25.5
11	33.17	-84.58	33	10	-84	35
12	34.33	-84.58	34	20	-84	35
13	34.33	-84.73	34	20	-84	44
14	33.17	-84.73	33	10	-84	44
15	33.17	-84.88	33	10	-84	53
16	34.33	-84.88	34	20	-84	53
17	34.33	-85.03	34	20	-85	2
18	33.17	-85.03	33	10	-85	2
19	33.17	-85.18	33	10	-85	11
20	34.33	-85.18	34	20	-85	11
21	36.06	-87.23	35 36	50 3.64	-87	30 14.1
22	36.63	-86.53	36	38	-86	31.6
23	36.43	-86.51	36	25.9	-86	30.8
24	36.05	-86.99	36	3	-86	59.1
25	36	-86.93	36	0.17	-86	55.6
26	36.38	-86.46	36	23.1	-86	27.3
27	36.34	-86.4	36	20.2	-86	23.8
28	35.96	-86.87	35	57.3	-86	52.1
29	35.91	-86.81	35	54.5	-86	48.6
30	36.29	-86.34	36	17.4	-86	20.3
31	36.24	-86.28	36	14.6	-86	16.8
32	35.86	-86.75	35	51.7	-86	45.1
33	35.71	-86.8	35	42.4	-86	47.8

RNA

Lat 90° Steam Port

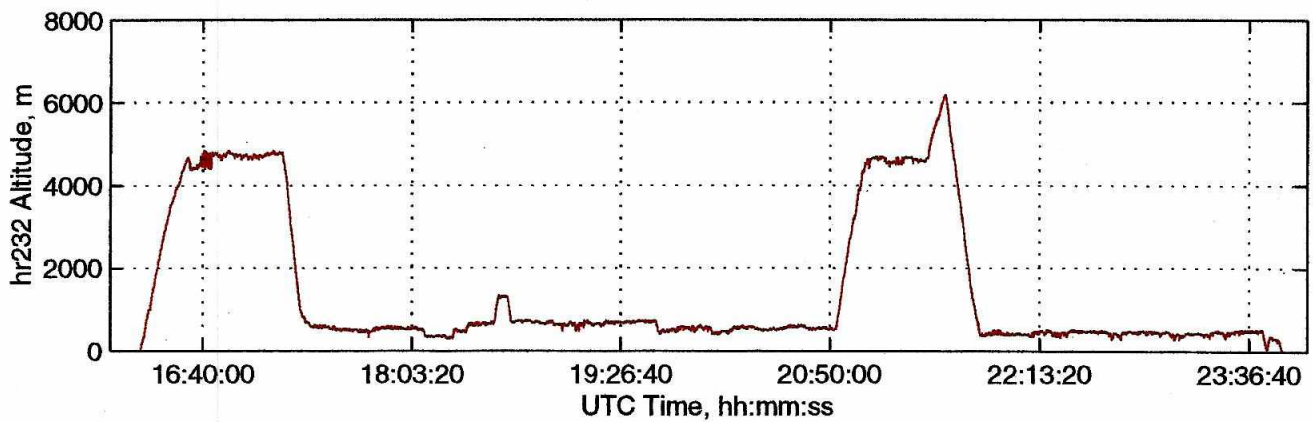
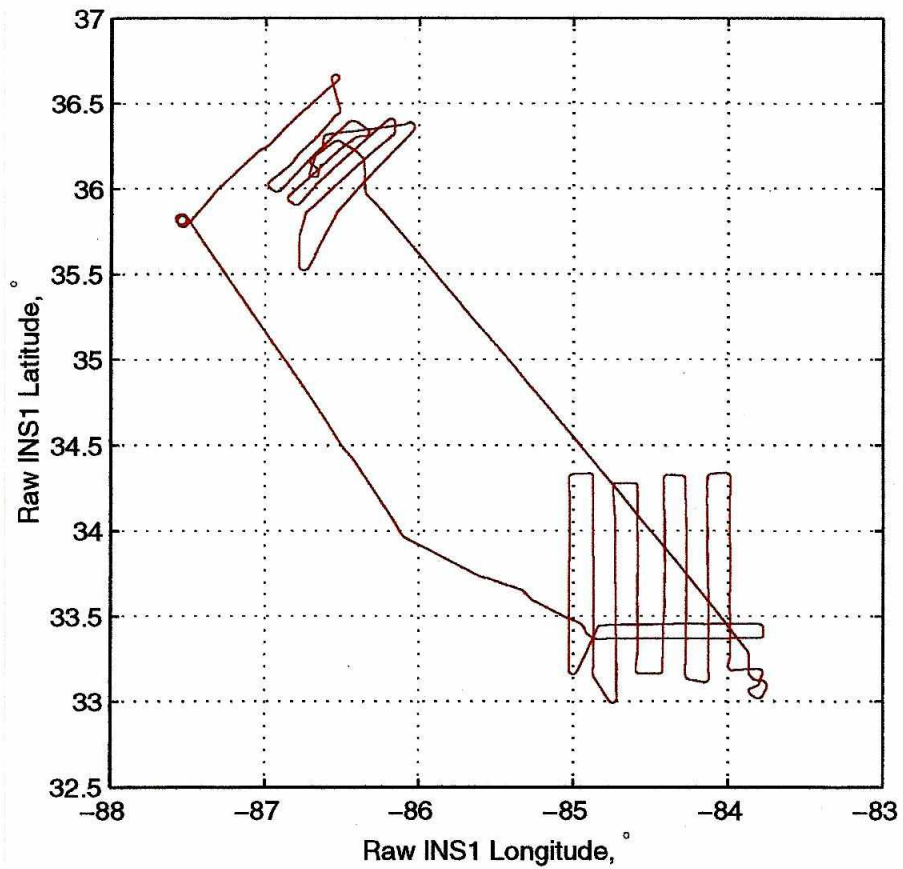
EXTEND LEG

Cedarville

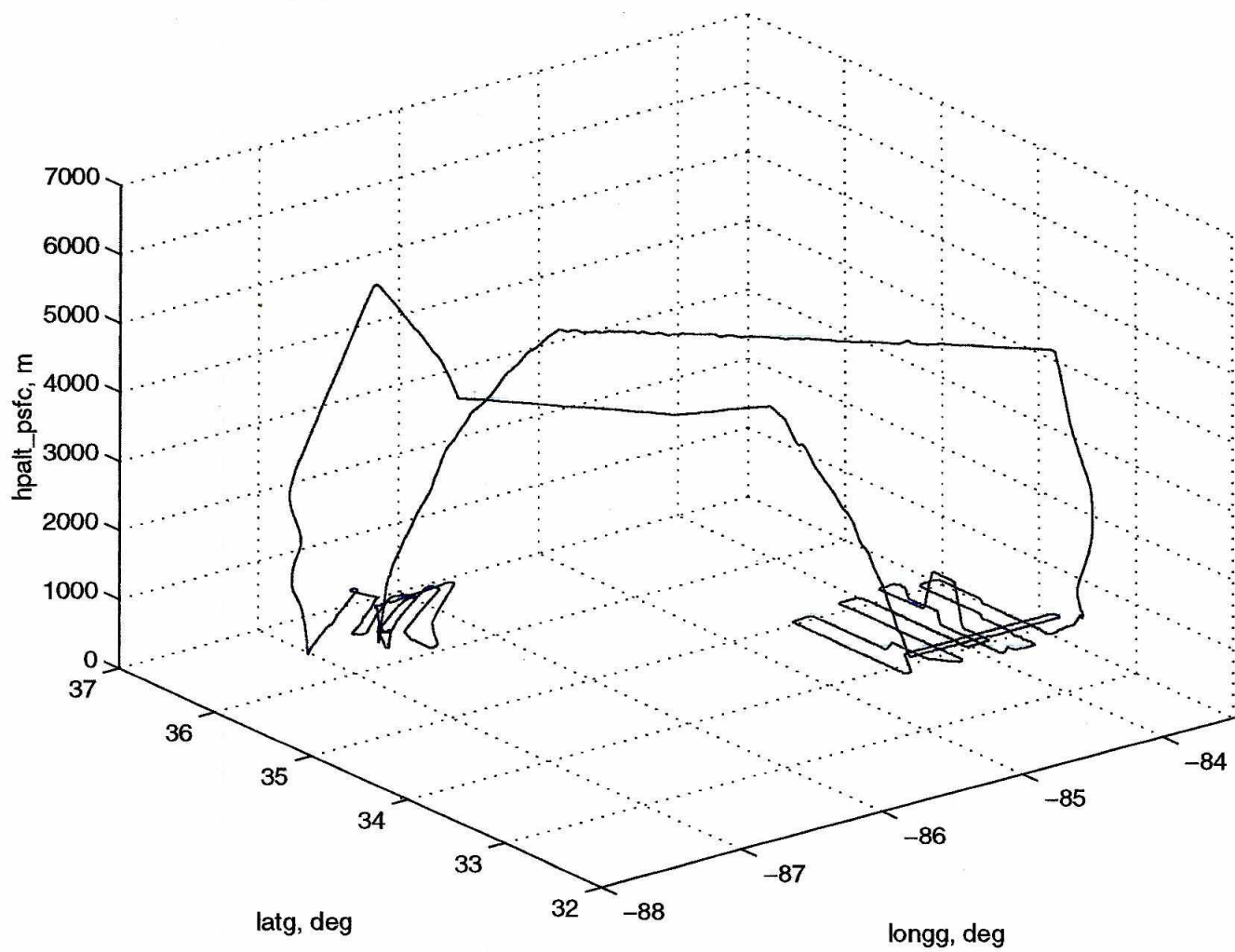
33 24

18.500

N43RF -- OZONE99 -- 06 July 1999 UTC



OZONE99 990706ls_P 16:02:41-23:59:50 UTC: 3-D FLIGHT TRACK 1/8



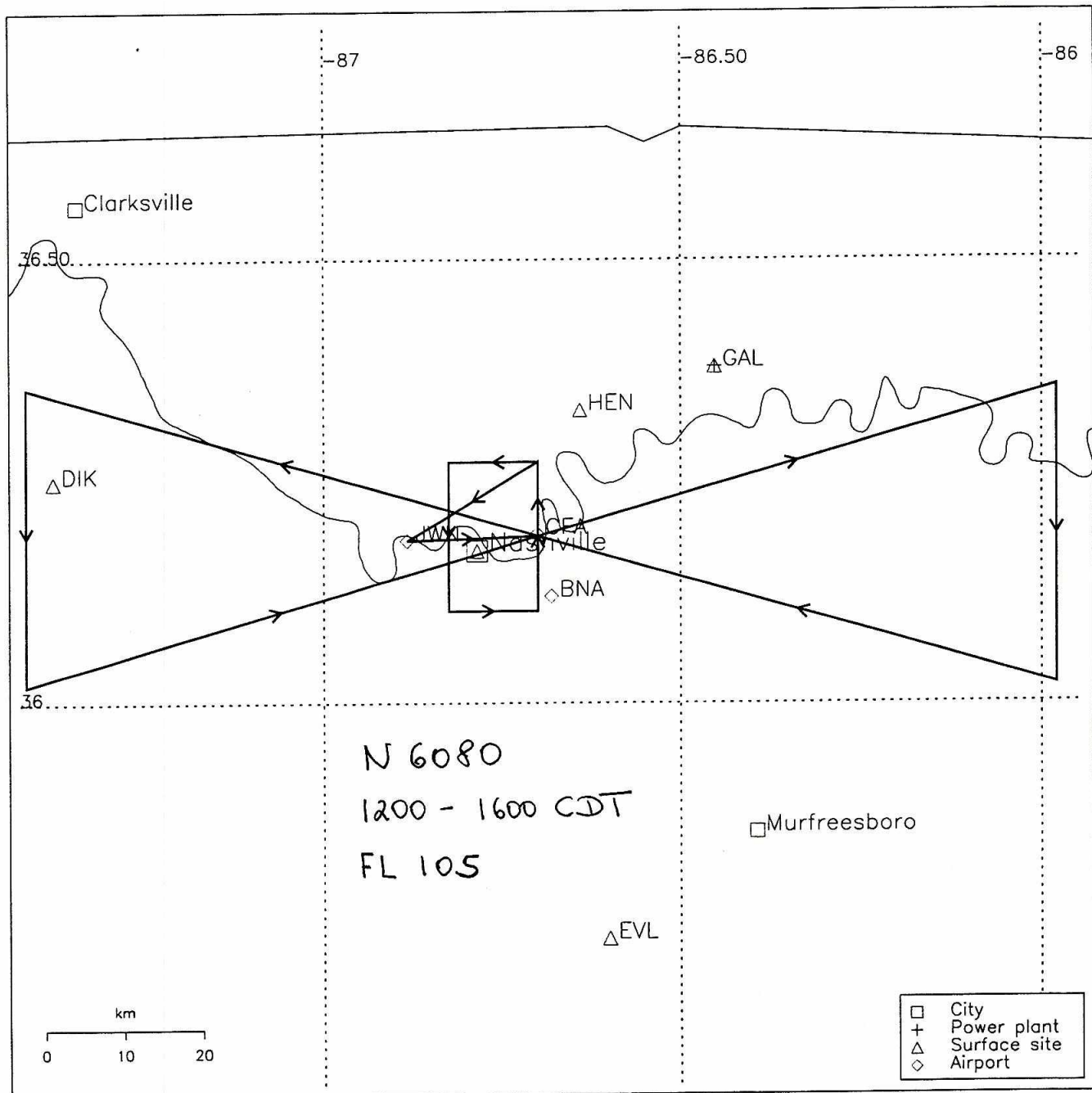
MAP A

CARIBOU flight plan 07-05-99

Elapsed
1:52 h
448.82 km

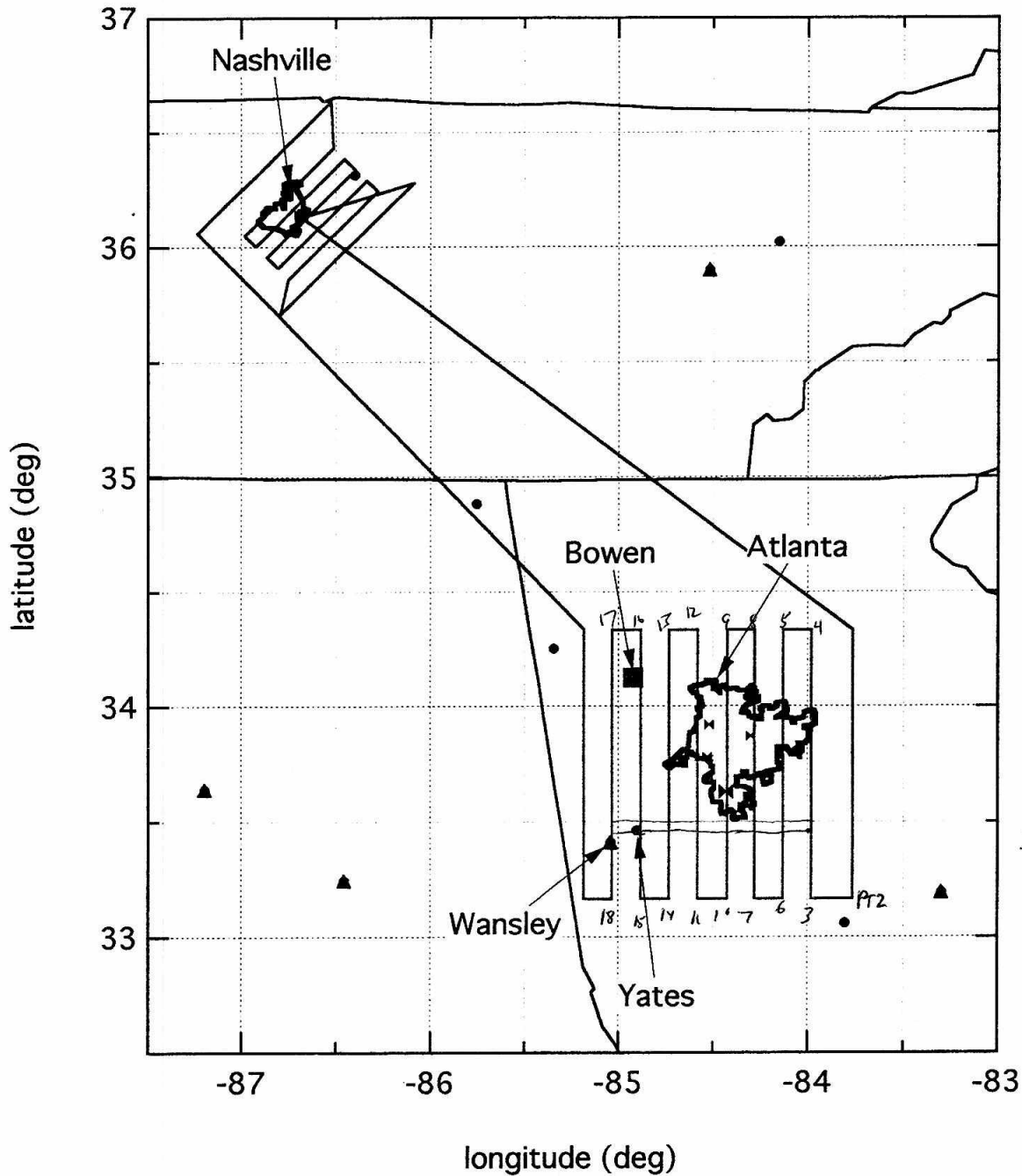
Remaining
2:08 h
514.74 km

Home
0:00 h
0.00 km



MAP B

Flight planned for 6 July 1999
Atlanta and Nashville Urban Study



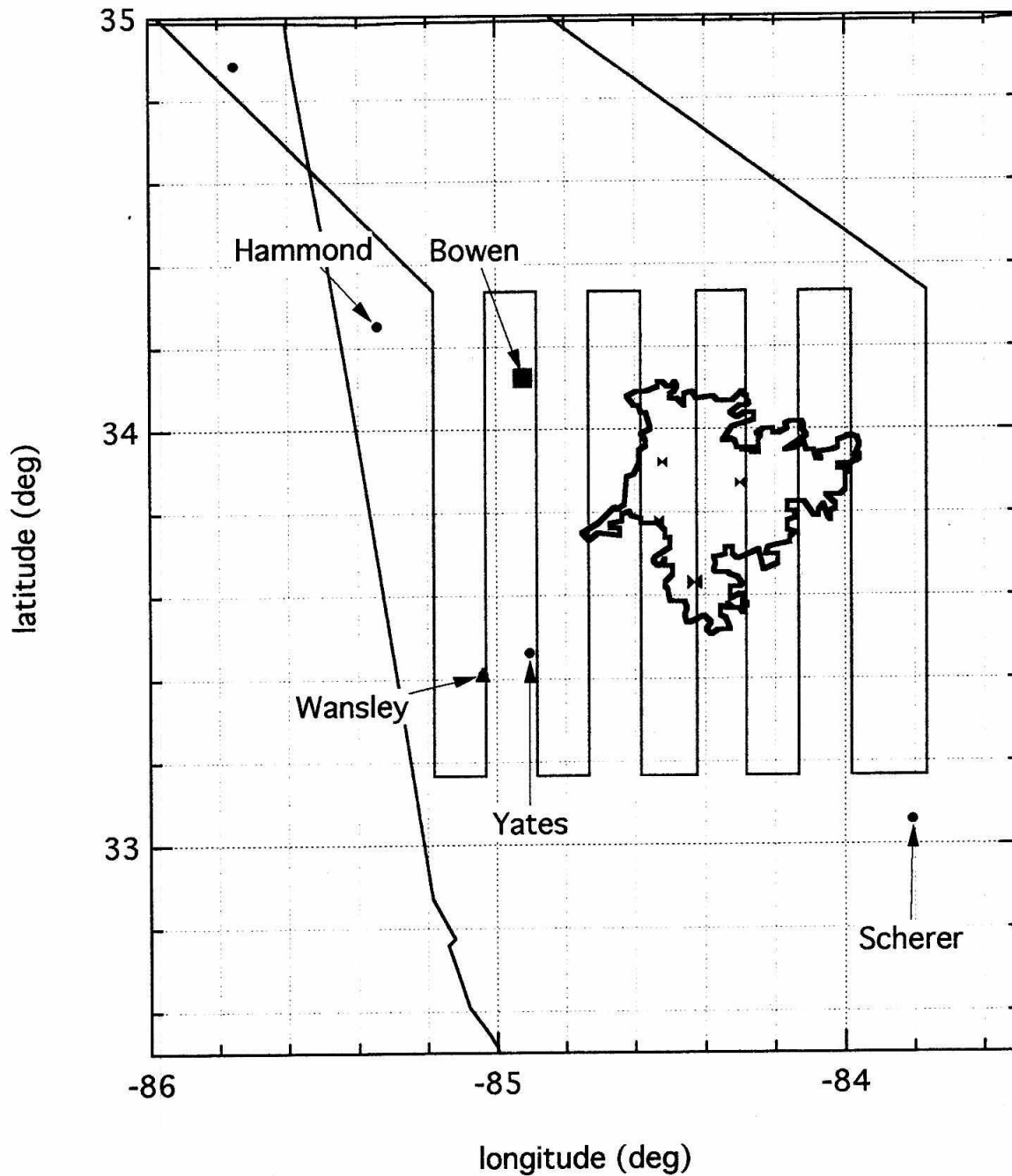
33 25 85 02.

Shoot an approach from east @ end

5000

MAPC

Atlanta Urban Flight Pattern for 6 July 1999



approximately 1425 km, 3 hrs 45 min at 105 m/s
default flight altitude is within the PBL at approximately 500m AGL (~ 800m MSL)
Approach pattern from higher altitude, and climb out of PBL at the end of pattern.
In addition include 2 profiles out of the PBL to about (3 km MSL) at the south end of the flight legs.