U.S. DEPT. COMM./NOAA/OAO - DATA SECTION WORK FORM NO.1 OAOWF1 FILE

FLT ID: 960329H	FM: PVD/OQU	TO: OQU
FLT NO: 96-008	BLK IN: 2126	ATA: 0123 2523
ETD: 1600Z	BLK OUT: 1552	ATD: 1601
ETE: 0130Z	BLK TIME: 9 +34/9.5	FLT TIME: 9 +22/9.3
SPONSOR ORG: ~~NARE~~ NOAA	PROGRAM: NARE/OZONE	PURPOSE: OZONE 96

OAO PERSONNEL

AC KENNEDY ✓	SYS ENG ROLES ✓
CP PLAYER ✓	DATA SYS DELGADO ✓
NAV RATHBUN ✓	RADAR
FE WADE	DT/ODW
RADIO	CLD PHYS
FD WHITE/PARRISH ✓	DOPPLER

PARTICIPATING SCIENTIST/VISITORS/OAO

LAST, FIRST NAME	ACTIVITY ON A/C	AFFILIATION
MCFADDEN, J ✓	NOAA/AOC	
~~ROLES, J~~ → SW	—	
~~DELGADO, J~~ SW	—	
HUBLER, G/SHERIDAN, P	CU - CIRES	
RYERSON, T/WILLIAMS, J	"	
JOBSON, T/HOLLOWAY, J	"	
FRIED, A/~~PETERSON, J~~ SW	NCAR/NOAA/AL	
LEE, J-N	BNL	

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

ATIS PVD "J" 1450Z 60SE IC 4FF18F ∞ 30.13"

30.12

" "

U.S. DEPT. COMM./NOAA/OAO - DATA SECTION WORK FORM NO.2 OAOWF2 FI

FLT ID: 960329H TIME OFF: TIME ON:

	A/C T/O	WX STN	A/C LAND	WX STN
PRESSURE	1020 mb	1601	0125	1021

	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

Flight on 29 March 1996

Takeoff : 11:00 EST planned

1601
Time 00:00 (hh:mm) is at the full hour or 15 min increments here from.

From Pt. A, Quonset, ~~head direction of Pt. B~~ → North Vineyard → Nantucket
Pt. A to Pt. B: 1620 km, 3 hr 45 min at 240 knots
Climb to 7000 ft MSL for calibration

O Change altitudes according to HC sample and NOy zeros (Observer calls).
Climb or descend at 1000 ft/min

1633 At time (00:33) descend to 2000 ft. 2300'/2400' find moist layers
1648 At time (00:48) descend to 1000 ft AGL,
1702:52 at (01:03) climb to 5000 ft, 5300'
1718 at (01:18) climb to 9000 ft, 9000'
1733 at (01:33) climb to 13000 ft, delay @ 13K beyond #48
1803 at (01:48) climb to 17000 ft,
1818 at (~~02:03~~) descend to 1000 ft AGL, upt 1014mb
1903:38 at (03:03) climb to 25 kft

O Profile over Cape Norman
start descent in route, once over Cape Norman continue with racetrack profile (reverse direction every 2.5 min) descend at 1000 ft/min

1949:15 at (03:48) descend to 18 kft, hold altitude at 18 kft for HC sample and NOy zero
2002:51 at (04:03) descend to 12 kft, " 5 min "
2018:02 at (04:18) descend to 6000 ft, " " "
2033 at (04:33) descend to lowest possible altitude and cross over the site hold @ 4500'
St Anthony clrd Rwy 11 29.70
2100 3 At (4:48) head direction of Pt. C at 1000 ft
Pt. B to Pt. C: 430 km, 1 hr at 240 knots

2148 2100 At (5:48) head direction of Pt. D and climb to 25 kft
Pt. C to Pt. D: 1260 km, 3 hr
2248:02 at (6:48) descend to 8 kft and ~~hold~~ stay 3 min descend
2302:58 at (7:03) climb to 12 kft + 5 min (~~climb~~ at 1200 ft/min)
2318:05 at (7:18) climb to 16 kft "
2332:54 at (7:33) climb to 20 kft "
2347:52 at (7:48) climb to ~~25~~ 28 kft

0002:56 O At (8:03) descend to 18 kft for calibration
0032:50 at (8:33) ascend to 25 kft

~~0043:05~~

O Racetrack Profile at Pt. D, 25 kft to < 500 ft AGL, (reverse direction every 2.5 min) descend at 1000 ft/min

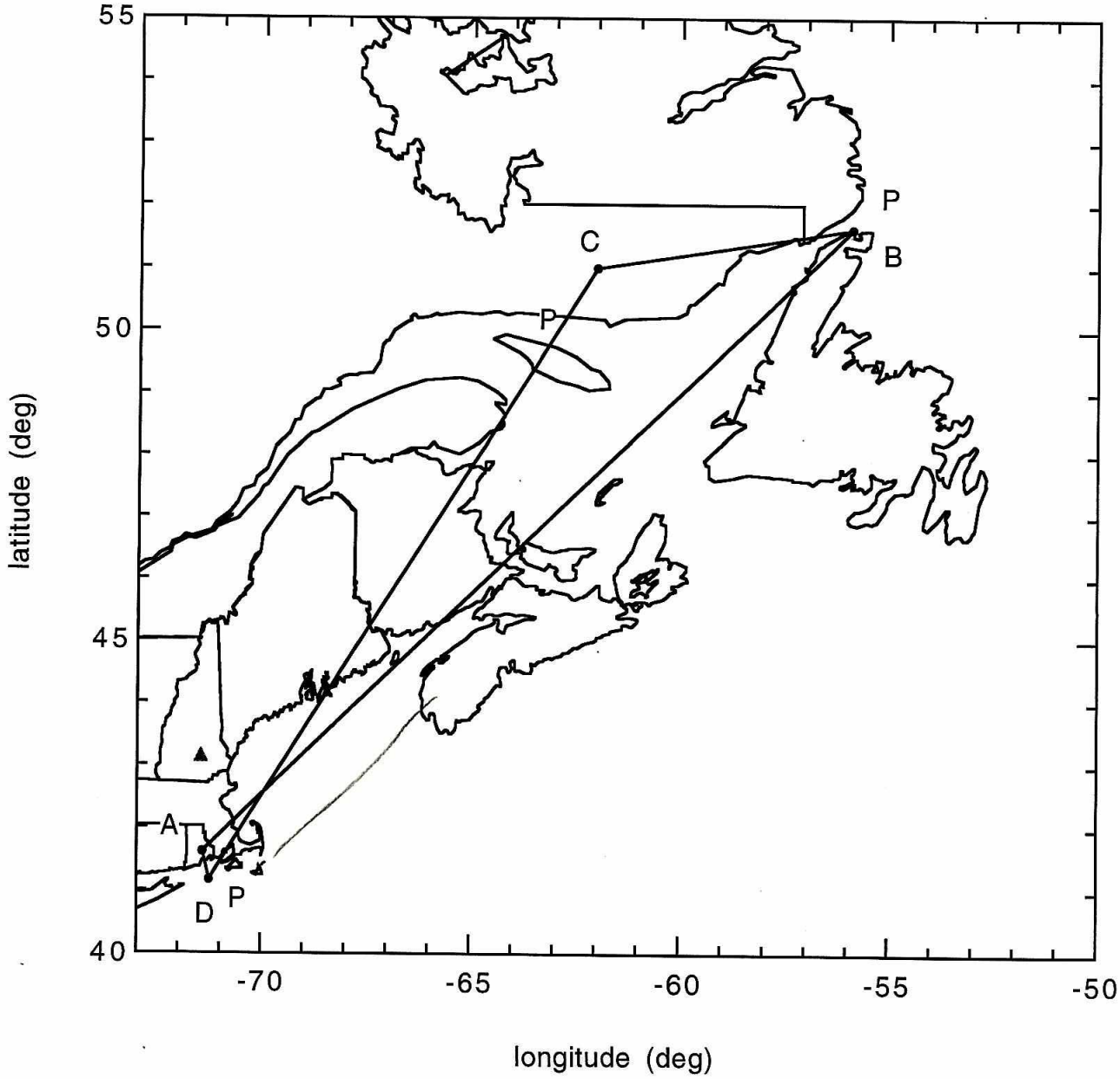
O Return to Pt. A

Estimated flight duration 9 hr 15 min to 9 hr 30 min.

Pt. A	(41 37, -71 25)	
Pt. B	(51 37.75, -55 54.5)	Cape Norman
Pt. C	(51 00, -62 00)	
Pt. D	(41 10, -71 15)	Block Island
Pt. A	(41 37, -71 25)	

Goal of the flight is to get a profile over the Cape Norman ground site in Newfoundland. The surface flow at Cape Norman is from the NW, as Newfoundland is on the back site of a low. It is the low that was over the midwest by about 3/25/96 and brought heavy amounts of snow to the midwest. We will not be looking at recent Arctic outflow. The temperatures in this air mass are colder than the surrounding, but on its dip to the US the low should have picked up fresh pollution over the US. The 3D model runs for the summer NARE case indicate transport of pollution to the N in such systems.

Over the NE US we have on shore flow at the northern side of a low that is centered over or east of Virginia. The weather forecast had predicted rain and possibly heavy snow for this morning. This would have put today's flight in jeopardy.



Triangles : Power Plants
P: indicates profiles

960329H

START 1554:54 / 1552:01
END 0126:~~27~~00

1950:56	0007:36
1951:00	0007:40
2158:50	
~~2158:50~~	
2158:51	
2159:00	

INE#1 w/ GPS

1800	-2.1	+1.3
1900	-3.3	+1.4
2000	-4.2	+2.5
2100	-3.6	+4.2
2200	-3.8	+5.8
2300	-3.6	+8.1
0000	-2.2	+8.2
0126:00	-0.9	+9.2

Patched APINS
160101 - 160400

```
      TITLE (MAX 21 CHARACTERS) -- EX  HURRICANE PAINE
OZONE FLIGHT 5
YYMMDDL  FLT I.D.
960329H
HHMMSS START TIME    -99999 DEFAULT TO START OF DATA FOR PRINTOUT ONLY
155201
HHMMSS END TIME      999999 DEFAULT TO END OF DATA FOR PRINTOUT ONLY
012600
HHMMSS TAKE OFF TIME
160101
* NUMBER OF TAPES (I2) ...FOR STANDARD TAPE OUTPUT ONLY
05
* -------LOGICAL UNIT OF INPUT DATA (I1)  5, 8 OR 9 FOR TAPE DRIVE
9
* -------LOGICAL UNIT OF OUTPUT TAPE DRIVE (I1) [FOR STANDARD TAPE ONLY]
9
* -------LOGICAL UNIT OF PRINTER (I1)
6
* -------DATE OF PROGRAM (MMDDY)
06094
* -------STATIC PRESSURE PROBE (I1)
* 1 = PSW (WINGTIP)
* 2 = PSF (CO-PILOT/FUSELAGE)
* 3 = FUTURE USE
2
* -------DYNAMIC PRESSURE PROBE (I1)
* 0 = PQW(WINGTIP)
* 1 = PQF1 (FUSELAGE 1281)
* 2 = PQF2 (FUSELAGE 1221)
* 3 =FUTURE US
1
* ---------INE SELECTION  (I1)
* 1 = INE 1
* 2 = INE 2
1
* ---------ACCELEROMETER (I1) - USUALLY THE SAME AS YOUR INE SELECTION
1
* --------- TOTAL TEMPERATURE PROBE (I1) [1 OR 2]
1
* --------- DEWPONT TEMPERATURE PROBE (I1) [1 OR 2]
1
* ---------ALTIMETER OPTION (I1) - FOR VERTICAL WIND COMPUTATION
* 0 = PRESSURE ALTITUDE (OVER LAND)
* 1 = RADAR ALTITUDE APN-159 (OVER WATER)
* 2 = RADAR ALTITUDE APN-232 (OVER WATER)
1
* ---------PRINTOUT RATE  SECONDS (I2)
30
* ---------WINDSPEED/DIRECTION RUNNING AVERAGE TIME, SECONDS (I2)
10                                  ! FOR STANDARD TAPE OUTPUT ONLY
* ---------TIME OPTION (I1)
* 1 = MICRO 29
* 2 = TIME BASED GENERATOR #1
* 3 = TIME BASED GENEATOR #2
1
* ---------NAME OF CONSTANTS FILE EX CO3863.CON
CO2962.CON
*****************************************************************
```

OZONE 96 FLT #5

FLIGHT #03 H960329

TYPE OF DATA	SENSOR OR OPTION
INE	1
Accelerometer	1
Temperature probe	1
Altitude change option (for vertical winds)	RA159
Static pressure	Rosemount fuselage
Dynamic pressure	Rosemount fuselage
Time source	Micro 99
Constants file	CO2962.CON

Notes:

There were seven time/data gaps: 1950:56 1951:00 2158:50 2158:51 2159:00 0007:36 0007:40

Dewpoint temperature (TD) calculation on standard tape is +0.5 C higher than printout from aircraft due to a -0.5 C offset inadvertantly present onboard the aircraft.

Downward spikes in radar altimeter values were generated from overflying land.

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.

	Takeoff	Landing
Aircraft static pressure	1020.0mb	1025.0mb
Corrected tower pressure	1016.0mb	1021.0mb

Flight Meteorologist: Sean White: (813) 828-3310 ext. 3072

OAA FORM 59-4
2-72)

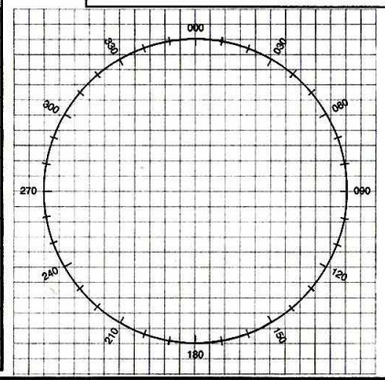
960329H 020DE96 / FCT#

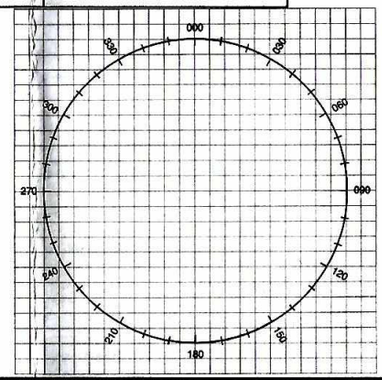
Time	LAT	LONG	Temp	DP	WS	WD	SP	PS	REMARKS
1533			5.0	-5.4	—	—	1018.3	1215.5	TWR 060/18
1601	41 37.1	71 26.2	4.0	-4.8	08.8	046	1006.1	1199	T/O
1604									APN 232 started @ 3000ft
1623									turn toward Yarmouth
1633	BL top 2500'								descend to 2000'
1644	42 7.6	68 43.9	-2.8	-19.4	15.1	036	1020.4	993.5	
	multiple thin layers obs as trapped layers ≈ 100-500' thick								
1707:30			-1.9	-25.1	15.2	356	1017.8	846.8	level 5K
1725:06			-6.3	-22.6	18.6	3.5	1014.2	725.9	level 9K
1755:27	41 16.5	64 21.7			31.9	306			climb/descend @ 13K
1805:30	46 08	63 27.0	-21.5	-27.0	45.7	297	—	—	remain within black layer
1821:45									TW1 & TW2 split
1835:30			-12.4	-13.0	25.0	320	1015.7	916.3	level at 2700' in stratus
1839:30									base at 2100'
1841:21	47.36.4	61 30.5	-8.3	-11.7	24.4	310	1014.1	774.0	level @ 1000'
1903:38	base 1700'		3000'						climbing to 25K
1955:40	51 28.9	56 11.5	-33.7	-37.1	11.0	207	—	—	level @ 18K
2024:42	51 55.9	56 2.3	-2.1	-7.1	4.7	323	1000.5	804.2	level @ 6K
2038:20			-2.7	-4.5	18.5	339	1002.6	877.5	Appr to St Anthony Rwy 11
2051:50				3500' tops		2100' bottom			
2054:50	mark on top Cape Norman site twice ⇨ C								
2148:10	51 34.4	61 10.2		4500' base/					climb 25K ⇨ D
2212:46			-43.3	-59.6	31.8	252	—	—	level @ 26K
2248:02			-42.2	-53.2	71	264	—	—	3005
2302:58									climb to 12K
2310:48									climb to 13K
2318:05			-26.5	-38.5	55.5	275	—	—	climb to 16K
0002:56									descend to 18K
0033:43			-21.5	-27.0	37.0	296	—	—	climb to 25K
0041			RA 232/159 - askew					232	oscillates
0043:05									descend to sfc
0111:16			-0.3	-7.2	15.4	020	1020.2	965.4	500'

60 240

CLEARANCES			
FREQ	ALT	HDG	OTHER
			V146 NAN
			~~A~~ YQE ~~A~~ YY6
			~~A~~ Y6R ~~A~~ YAY
			~~A~~ Y6P ~~A~~ B6R
			~~A~~ ENE 105/015
			~~A~~ BANGAR ~~A~~ KOQU

MISSION LOG PAGE ___ OF ___





POSITION REPORT

1. POSITION
2. TIME
3. ALTITUDE
4. NEXT POSITION
5. ETA
6. NEXT POSITION

EMERGENCY MESSAGE

TRANSMIT THE FOLLOWING MESSAGE TO ANY AGENCY ON THE AIR-GROUND FREQUENCY IN USE. IF UNABLE TO ESTABLISH COMMS, ATTEMPT CONTACT ON ANY OF THE FOLLOWING EMERGENCY FREQUENCIES:

UHF/VOICE	VHF/VOICE	MF/VOICE	HF/CW	MF/CW
243.0	121.5	2182 KHZ	8364 KHZ	500 KHZ

MAYDAY, MAYDAY, MAYDAY
THIS IS NOAA _____, NOAA _____, NOAA _____

- POSITION _____ N / S _____ E / W AT _____ Z
- HEADING _____ TRUE/MAG
- AT _____ KTS TRUE/INDICATED
- FLIGHT LEVEL OR ALTITUDE _____
- WE ARE A P-3 AIRCRAFT WITH _____ SOULS ON BOARD
- NATURE OF EMERGENCY
- ASSISTANCE DESIRED
- PILOT INTENTIONS
- WE HAVE _____ ENDURANCE REMAINING

TIME	FIX TYPE	POSITION	INS 1 POSITION	K ERR	INS 2 POSITION	K ERR	MH	VAR +E==>	TH	DR +R==>	TRK	GS	WD	WS	ALT	TAS	NEXT PT	DIST	TIME	ETA	REMARKS
1548																					ENG START
1552																					TAXI
1601																					TAKEOFF
1612	LOPS FM1	4129.2 7051.4	4129.3 7051.2	-.1 +.2	4129.5 7051.5	-.3 -.1			119	2R	121	218	050	07	7K	221					
1639		4155.7 6903.5	4156.5 6902.7	-.8 +.8	4156.7 6903.2	-1.0 +.3			049	2L	047	203	075	14	2K	212					
1650		4221.0 6824.5	4221.9 6823.5	-.9 +1.0	4222.1 6823.7	-1.1 +.8			050	1L	049	194	051	15	1K	208					
1707		4258.4 6725.6	4259.6 6724.7	-1.2 +.9	4259.8 6724.2	-1.4 +1.4			045	2R	047	215	345	10	5K	220					
1722		4333.3 6631.5	4334.8 6630.9	-1.5 +.6	4335.0 6630.1	-1.7 +1.4			049	4R	053	235	302	16	9K	230					
1738		4417.4 6531.2	4419.3 6530.5	-1.9 +.7	4419.4 6529.9	-2.0 +1.3			036	4R	040	258	272	23	13K	245					
1809		4558.6 6330.0	4600.8 6328.4	-2.2 +1.6	4601.2 6327.6	-2.6 +2.4			032	8R	040	280	291	41	17K	269					
1842		4736.7 6130.3	4739.6 6129.6	-2.9 +1.3	4740.1 6126.9	-3.4 +3.4			038	5R	043	205	318	17	1K	209					
1926		4940.9 5848.0	4944.2 5845.7	-3.3 +2.3	4944.7 5843.9	-3.8 +4.1			052	6L	046	303	168	38	25K	284					
1958		5138.8 5603.0	5143.0 5600.6	-4.2 +2.4	5143.3 5557.2	-4.5 +3.8			016	1L	015	254	178	15	18K	237					
2010		5134.3 5606.5	5138.8 5603.8	-4.5 +2.7	5139.0 5559.8	-4.7 +6.7					CIRCLING				12K						
2025		5141.1 5602.0	5145.6 5558.7	-4.5 +3.3	5145.8 5555.0	-4.7 +7.0					CIRCLING				6K						
2110		5124.3 5716.5	5128.0 5712.0	-3.7 +4.5	5128.6 5709.5	-4.3 +7.0			265	2L	263	226	009	9	1K	224					
2212		4955.0 6249.2	4958.3 6248.4	-3.3 +.8	4958.7 6241.1	-3.7 +8.1			223	4L	219	294	269	34	26K	302					

037/05

2148

MISSION LOG | PAGE ___ OF ___

FIX TYPES
(G) - GPS (I) - INS (R) - RADIO (V) - VISUAL (C) - CELESTIAL (D) - DR

TIME	FIX TYPE	POSITION	INS 1 POSITION	K ERR	INS 2 POSITION	K ERR	MH	VAR +E==>	TH	DR +R==>	TRK	GS	WD	WS	ALT	TAS	NEXT PT	DIST	TIME	ETA	REMARKS
2232		4845.8 6423.8	4848.8 6417.3	-3.0 +6.5	4849.5 6415.4	-3.7 +8.4			229	9L	220	262	268	65	26K	310					
2300		4715.9 6614.9	4719.5 6606.9	-3.6 +8.0	4718.5 6604.7	-2.6 +10.2			228	6L	222	232	321	22	8K	229					
2322		4610.1 6727.1	4613.0 6719.4	-2.9 +7.7	4612.2 6717.5	-2.1 +9.6			226	9L	217	233	280	43	16K	253					
2337		4519.8 6810.2	4522.0 6802.9	-2.2 +7.3	4522.0 6801.3	-2.2 +8.9			214	11L	203	263	278	54	20K	285					
2358		4352.8 6902.8	4354.9 6854.7	-2.1 +8.1	4355.0 6853.2	-2.2 +9.6			214	10L	204	283	271	60	28K	313					
0030		4147.4 7022.9	4149.5 7013.4	-2.1 +9.5	4147.6 7012.2	-.2 +10.7			234	7L	227	252	309	34	18K	260					
0122 0125		4136.0 7125.0	4136.9 7115.9	-.9 +9.1	4135.7 7114.7	+.3 +10.3															LAND BLOCK