NOAA P-3 N43RF
Hurricane Ophelia Flight Three

Flight ID: 050911I

Sensor or system	Number or Name
INE	1
Accelerometer	1
Temperature Probe	1
Dew Point Probe	2 (Edgetech)
Altitude (for vertical wind)	Radar Altimeter 159
Static Pressure	Rosemount Fuselage
Dynamic Pressure	Rosemount Fuselage 1281
Time Source	Micro 99
Constants File	CO3051.CON

Notes:
There were several time data/gaps during this flight which occurred from 161101Z-161120Z, 170541Z-170600Z, 171301-171310Z,171401Z-171410Z, 174724Z-174730Z, 175247Z-175300Z, 181051Z-181100Z, 182711Z-182720Z, 202141Z-202150Z.

Data from radar altimeter 232 was substituted in place of radar altimeter 159 from 145201Z-145600Z, 232520Z-232610Z, and 234440Z-234800Z.

The difference in values between the dynamic attack pressure from the radome and the fuselage is greater than 20 mb. No corrections were made to the data.

There were numerous times during the flight where the dewpoint temperature exceeded ambient temperature resulting in RH>100%. This was likely due to rain, a wet-bulb effect on the total temperature sensor, and/or an artificial warming of the dewpoint sensor as it tried to burn off excess moisture. Edits to dewpoint sensor number two were made between 164125Z-164210Z, 185310Z-185539Z, 195100Z-195213Z, 212136Z-212200Z, and 224300Z-224420Z to bring the relative humidity values below 120%.

A balancing spike in dewpoint sensor number two was removed from 152750Z-153744Z.

The King Liquid Water sensor was not operating during this flight.

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	1018.5 mb	1013.3 mb
Corrected Tower Pressure	1018.9 mb	1016.9 mb

Flight Director: Martin Mayeaux (813) 828-3310 ext. 3086

U.S. Dept. of Commerce / NMAO / NOAA / Aircraft Operations Center

Flt ID: 050911I	From: Kmcf	To: Kmcf
Flt. No: 05-056	Blk In: 2354 Z	Time On: 2345 Z
ETD: 1500 Z	Bl k Out: 1443 Z	Time Off: 1455 Z
ETE: 9 + 00	Blk Time: 9 + 11 (9.2) Hrs	Flt Time: 8 + 50 (8.8) Hrs
Sponsoring Org: HRD	Program: Rainex	Purpose: ophelia

AOC Flight Crew

Aircraft Commander: Febrest	Data System: Lynch
Co-Pilot: Silah, Choy	AVAPS: Tony
Navigator: Brakob,	System Eng:
Flight Eng: Floyd, Klippel	A A:
Flight Director: Mayeaux, Damiano	A A:
Avionics: Sans Souci	Crew Chief:

Participating Scientists / Visitors

Name (Last, First)	Activity on Aircraft	Affiliation
Aberson, S	SCI	HRD
Rogers, R	~~PI~~	HRD
Dunion, J	SCI	HRD
Marks, F	SCI	HRD
Smull, B	PI	UW
Jorgensen, D	SCI	NCAR
Nolan, Dave	SCI	UmRass
Ash, N	OBS	AOC

Remarks (Storm Name, Mission ID, Recco Times, Fix Times)

Storm Name: Ophelia Tcal 4.0 21003 Bix

Mission ID: NOAA3 WX16A Ophelia

Penetration number and time

~~11000 ft~~ 12000

Tcal 38-10000 ft - until 18Z

Fix 31.6 75.7 978 mb

one Alpha Pattern.

Try 7000 ft a 5000 ft

Recco Times

100 Nm leg lengths map out field. Aft fig 4. Pick Rainband

10 Km from rainband, few turns in Rainband

If problem, we go to 8K 12K

NKL 14-12K

2115-2315 ~~60002~~

Fal 40

Fix # Fix Time

3066

~~1439~~ 3135 7542 980mb

1605 3132 7545 1605 979

71 kt fl

TD1 + TD3 seperate from TD2. TD2 may

30 Mar [?] 5-40°

believable

(See reverse for additional remarks)

U.S. Dept. of Commerce / NMAO / NOAA / Aircraft Operations Center

Flight ID: 05091FJ	Time Off: 1455 Z	Time On: 2345 Z

	A/C - Takeoff	Wx Station - Takeoff	A/C - Land	Wx Station - Land
Pressure	1018.5 mb	3009 mb	1013.3 mb	3003 mb

ATIS	Time	Observation
Takeoff	1255Z	06007KT P6sm 26/22 A3008
Land	2255Z	36006KT 7sm few050 30/21 / A3001

	Number	Data Disposition / Date / Quality
Flight Level Tapes		
Radar Tapes		
Cloud Physics Tapes / CDs		
Video Tapes		
Dropsondes	26	Good: 24 Bad: 2
AXBT	10	4 bad
AXCP		
AXCTD		

Remarks:

2230

TP 30°24" 77°05"
1355Z 07010KT P6sm 28/21 A3009
3242 7428

30 9" 73°
3248 7721

30 16
74 35
3030
7518

30.5 75.3

3115
7604

Fix 31°30" 75°52" 1637Z 973.1 mb

31° 26" 75° 56" 1800Z 972 mb 184°/7kt

31° 15" 76° 04" 22Z
31 17
7604

11 mins

1901Z
31 22W 75 55W
977 mb

2003Z
2011Z

2003Z
3121
0756
978 mb
Estimate

2100Z
3119
076 02
978 mb
78 kts

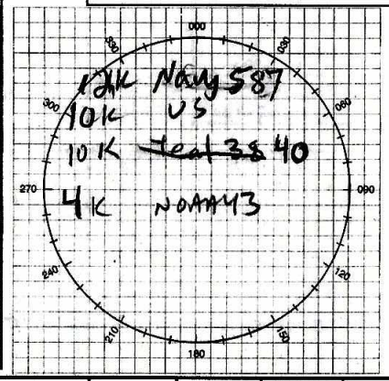
"U" 1255Z W0607 5k/5 26/22 30.08 RWY04

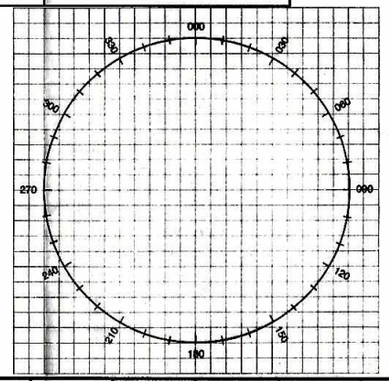
MISSION LOG

PAGE 1 OF 1

CLEARANCES

FREQ	ALT	HDG	OTHER
119.9	16	080	CAF SQ 6653 Ex150 +10





POSITION REPORT

1. POSITION 30-09 73-00
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

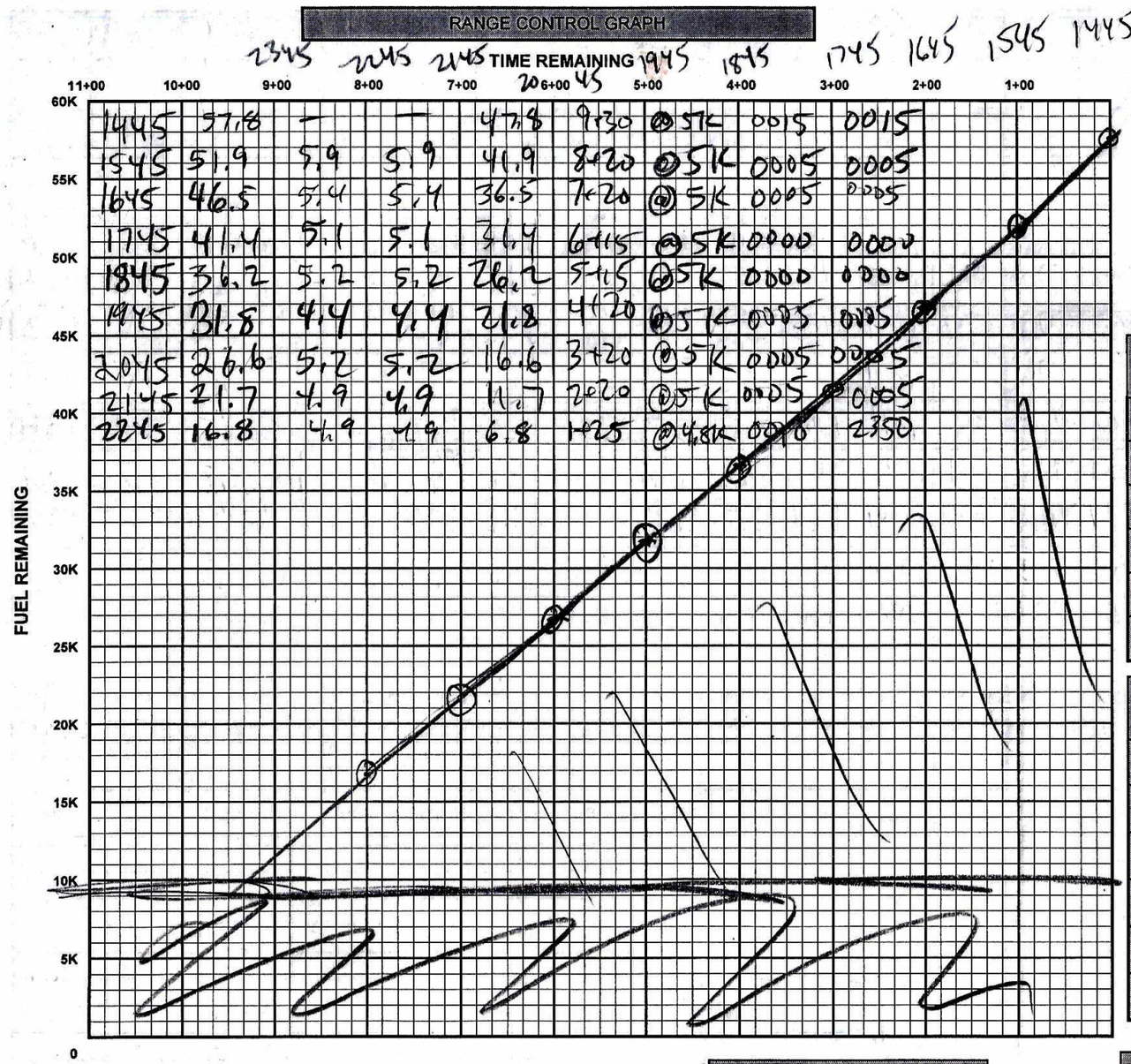
MAYDAY, MAYDAY, MAYDAY
THIS IS NOAA _____, NOAA _____, NOAA 43

- 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 19
- 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	
1438	ENG	N	N		N																NYR 11396	
1443	TAXI	W	W		W																	
1443	BLK																					
1455	TO																					
1500	X/	28-02.5 82-20.2	28-02.5 82-20.2	0 0	28-02.7 82-20.1	-.2 +.1	032	5W	027	1L	026	221	070	7	5K	231					040/14 MCF ✓	
1545	△	29-34.5 79-52.3	29-34.6 79-51.9	+.1 +.4	29-35.2 79-52.3	-.8 0	081	7W	074	0	074	289	280	4	150	282					NYR 13297 ✓	1555
1645	△	31-51.2 75-29.2	31-50.4 75-28.5	+.8 +.7	31-53.3 75-29.2	-2.1 0	071	10W	061	14L	047	247	130	60	120	254					NYR 13297 ✓	1655
1745	△	32-01.2 76-46.0	32-09.3 76-44.8	+1.9 +1.2	32-14.2 76-45.4	-3.1 +.6	139	10W	129	13R/14Z	261	040	60	120	252						NYR 13297 ✓	1755
1920	△	31-35.4 75-00.9	31-32.7 75-00.03	+3.2 +.9	31-40.9 74-59.2	-5.5 +1.7	172	11W	161	4L	157	202	180	50	100	244					NYR 11396 ✓	1855
1945	△	30-52.0 74-51.5	30-48.9 74-51.3	+3.0 +.2	30-59.8 74-50.2	-6.8 +1.3	017	11W	006	21R	010	310	297	60	100	253					NYR 11396 ✓	1955
2045	△	31-53.5 76-33.7	31-49.1 76-33.3	+4.4 +.4	32-01.4 76-31.2	-7.9 +2.5	044	10W	034	4L	030	197	050	50	100	245					NYR 2105 11396 ✓	
2145	△	30-50.3 75-54.0	30-44.3 75-54.1	+6.0 +.1	30-59.6 75-49.0	-9.3 +5.0	270	10W	260	0	260	202	260	45	100	246					NYR 22002 8998	
2250	△	29-45.0 79-06.3	29-38.3 79-07.4	+6.7 -1.1	29-56.0 79-01.1	-11.0 +5.2	270	7W	263	4L	259	301	350	25	145	299					NYR 23002 CHO	
2345	LAND	27-21.1 82-31.1	27-18.9 82-33.1	+2.2 -2.3	28-02.6 82-25.7	-7.7 +5.4																
2354	BLK																					

1555
1655
1755
1855
1955

RANGE CONTROL GRAPH



1445	57.8	—	—	47.8	9+30	@5K	0015	0015
1545	51.9	5.9	5.9	41.9	8+20	@5K	0005	0005
1645	46.5	5.4	5.4	36.5	7+20	@5K	0005	0005
1745	41.4	5.1	5.1	31.4	6+15	@5K	0000	0000
1845	36.2	5.2	5.2	26.2	5+15	@5K	0000	0000
1945	31.8	4.4	4.4	21.8	4+20	@5K	0005	0005
2045	26.6	5.2	5.2	16.6	3+20	@5K	0005	0005
2145	21.7	4.9	4.9	11.7	2020	@5K	0005	0005
2245	16.8	4.9	4.9	6.8	1+25	@4.8K	0010	2350

ETP = .5(TOTAL DISTANCE x OUTBOUND WIND FACTOR)

WIND FACTOR		
WINDSPEED	HEADWIND	TAILWIND
10	1.03	.97
20	1.06	.94
30	1.10	.92
40	1.14	.89
50	1.18	.87
60	1.22	.85

ENROUTE FUEL	
ENROUTE TIME	9+00
ENROUTE FUEL (6K 5K 4.5K RULE)	46K
RESERVE AT DESTINATION	10K
REQUIRED RAMP	56K
ACTUAL RAMP FUEL	57.8K

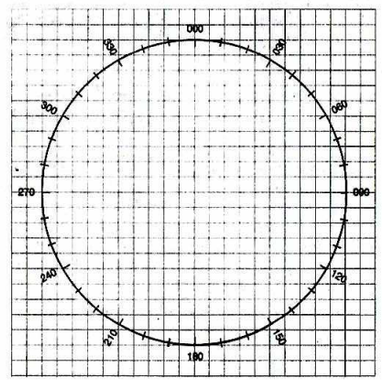
TACTICAL (OFFSTA TO DESTINATION)	4 ENG	3 ENG
DISTANCE (OFFSTA TO DEST)		
ENROUTE TIME (OFFSTA TO DEST)		
BURN RATE (LBS/HR)	4500	5500
ENROUTE FUEL REQUIRED		
RESERVE AT DESTINATION		
FUEL AT OFFSTA		

POINT OF SAFE RETURN	4 ENG	3 ENG
ETP DISTANCE (TO DEPARTURE)		
ENROUTE TIME (TO DEPARTURE)		
BURN RATE (LBS/HR)	4500	5500
FUEL REQUIRED		
RESERVE AT DEPARTURE		
PSR FUEL		

CEX - TRUE BEARING METHOD			
COMPASS TYPE	INS1	INS2	WET
MCH (READING)			
- MTH (SEXTANT)			
CE			
- VAR			
DEV			

CEX - ERB METHOD			
COMPASS TYPE	INS1	INS2	WET
MERB (DIAL 000)			
+ ZN			
= MTH			
MCH (READING)			
CE			
- VAR			
= DEV			

CEX SIGHT	
GMT	
GHA	
CORR	
GHA	
LONG +W -E	
EXACT LHA	
LAT	
BODY	
DEC	
HC / D	
CORR	
HC	
Z	
ZN	



"F" FACTOR	PRESS ALT	200	250	300	350
	10,000	1.0	1.0	.99	.99
	20,000	.99	.98	.97	.97
	30,000	.97	.96	.95	.94
	40,000	.96	.94	.92	.90

TRUE AIRSPEED CROSS-CHECK							
TIME	IAS	PRESS ALT	"F" FACTOR	EAS	OAT	TAS	ITAS
1537	226	150	X	X	+14	290	282

289

NOAA FORM 56-49
(2-95)

MISSION PREFLIGHT LOG

DESTINATION	MISSION	NAVIGATOR	AIRCRAFT COMMANDER	FLIGHT DIRECTOR	SCHEDULED / ACTUAL TAKEOFF Z	DATE OF TAKEOFF
KMCF	OPHELIA ~~RAINEX~~	LT BRAKOB	LCDR TEBEEST	DAMIANO	1500	11 Sep 05

	WP	LAT / LON	RTE	MH	VAR +E==>	TH	DR +R==>	TRK	GS	WD	WS	ALT	TAS	LEG / TOT DIST	LEG / TOT TIME	PROP ETA	ETA	ATA	REMARKS
MCF	1	N 27-51 W 82-30						053		M	V	160	270	50 50	+20 +20				→ JENSN
JENSN	2	28-20.6 81-45.8						031				160		40 90	+10 +30				→ KIZER
KIZER	3	28-55.4 81-22.3						031						25 115	+05 +35				→ OMN
OMN	4	29-18.2 81-06.8						075						115 230	+25 1+00				→ LOTUS
LOTUS	5	29-46.5 79-01.2						069						105 335	+25 1+25				→ SW
SW	6	30-24 77-05						045				120	240	100 435	+25 1+50				→ O
O	9	31-36 75-42						045						100 535	+25 2+15				→ NE
NE	7	32-47 74-18						271						140 675	+35 2+50				→ NW
NW	8	32-47 77-06						135						200 875	+50 3+40				→ SE
SE		30-25 74-20						315						100 975	+25 4+05				→ O
O	9	31-36 75-42						238				170	270	205 1180	+45 +45				→ LOTUS
LOTUS	5	29-46.5 79-01.2						256				170		115 1295	+25 1+10				→ OMN
OMN	4	29-18.2 81-06.8						211						25 1320	+05 1+15				→ KIZER
KIZER	3	28-55.4 81-22.3						291						40 1360	+10 1+25				→ JENSN
JENSN	2	28-20.6 81-45.8						234						50 1410	+20 1+45				→ MCF
MCF	1	27-51 82-30																	

INS PERFORMANCE

	INS 1	INS 2
BEGIN ALIGN TIME	1305	1305
ALIGN STATUS (0-5)	1	1
END NAV TIME	2345	2345
START NAV TIME	1425	1425
DELTA T	9+20	9+20

TERMINAL ERRORS

	INS 1	INS 2
DELTA LAT	+7.2	-11.5
DELTA LON	-2.3	+5.4
RGS	0	4
RADIAL ERROR	8	13

10320
7590
13855
13362
12579

REMARKS

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
1637	G	31-29.5 75-51.6	31-30 75-52																		
1800	G	31-26.4 75-56.8	31-26 75-57																		
2212	G	31-15 76-09																			

1605Z 31-32 75-45 2003 31-21 75-56 2118Z 31-19 76-02 31-21 75-56

NOAA • AOC • SED

N43RF AVAPS DROP LOG

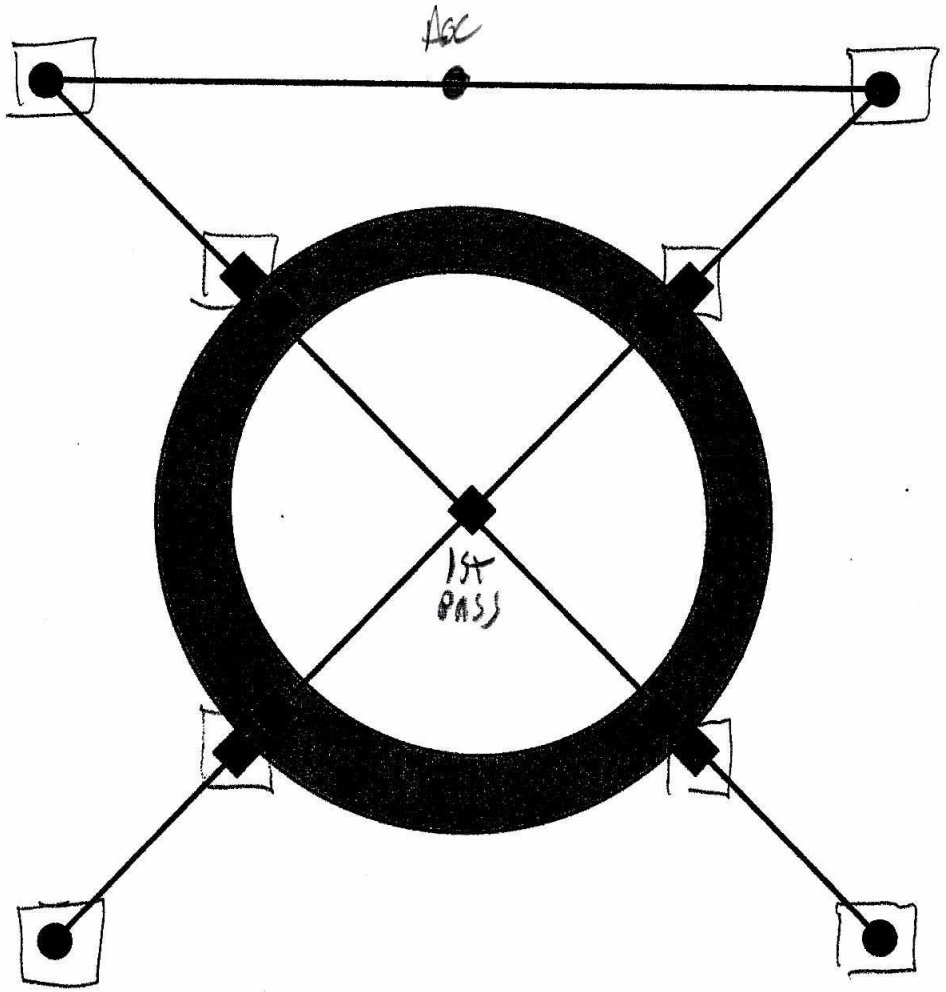
3 PENN105

Project : Hurricane '05 / RAINEX Mission : HURR. OPHELIA Flight ID : 05091113

Take Off : _____ Landing : _____ Flt Dir : MM Launcher S/N: _____

Drop #	Sonde Serial #	Rcvr #	Press Offset	Launch Time	Winds Time	Operator	Comments	Good ?
1	002 015 586	1	.5	1616	38	RT	HRD	✓
2	053 116 151	3	.5	1633	0		RX	✓
3	053 116 [illegible]	2	0	1635	0		RX	✓
4	053 116 153	4	.6	1637	0		RX	✓
5	053 116 070	1	.5	1642	0		RX	✓
6	043 835 090	2	.7	1644	0		NO GPS RX	
7	010 748 110	4	.6	1705	12		HRD	✓
8	002 525 207	1	.5	1720	30		AOC	✓
9	001 915 290	2	1.2	1735	27		HRD	✓
10	051 946 021	3	0	—	—		SYS LOCKED RX	—
11	043 845 244	1	0	1800	0		RX	✓
12	044 535 118	2	.6	1803	0		RX	✓
13	044 535 060	3	.5	1809	0		RX	✓
14	010 715 219	1	.7	1821	34		HRD	✓
15	044 415 106	2	.6	1903	0		RX	✓
16	051 926 268	3	0	1944	0	DSB	NO CALIBRATE RX	✓
17	051 926 257	4	0	1945	0		RX	
18	044 135 250	1	.5	2003	2			
19	044 535 122	3	.3	2011	0			
20	044 535 571	1	.3	2023	2			
21	044 835 029	1	.5	2032	4			
22	044 535 314	1	.4	2111	1			
23	044 535 123	1	.4	2128	2			
24	051 926 199	1	.4	2147	2			
25	044 535 064	1	0	2153	5			
26	053 116 154	1	.3	2206	3			

N43RF figure-4 drop pattern



HRD drop

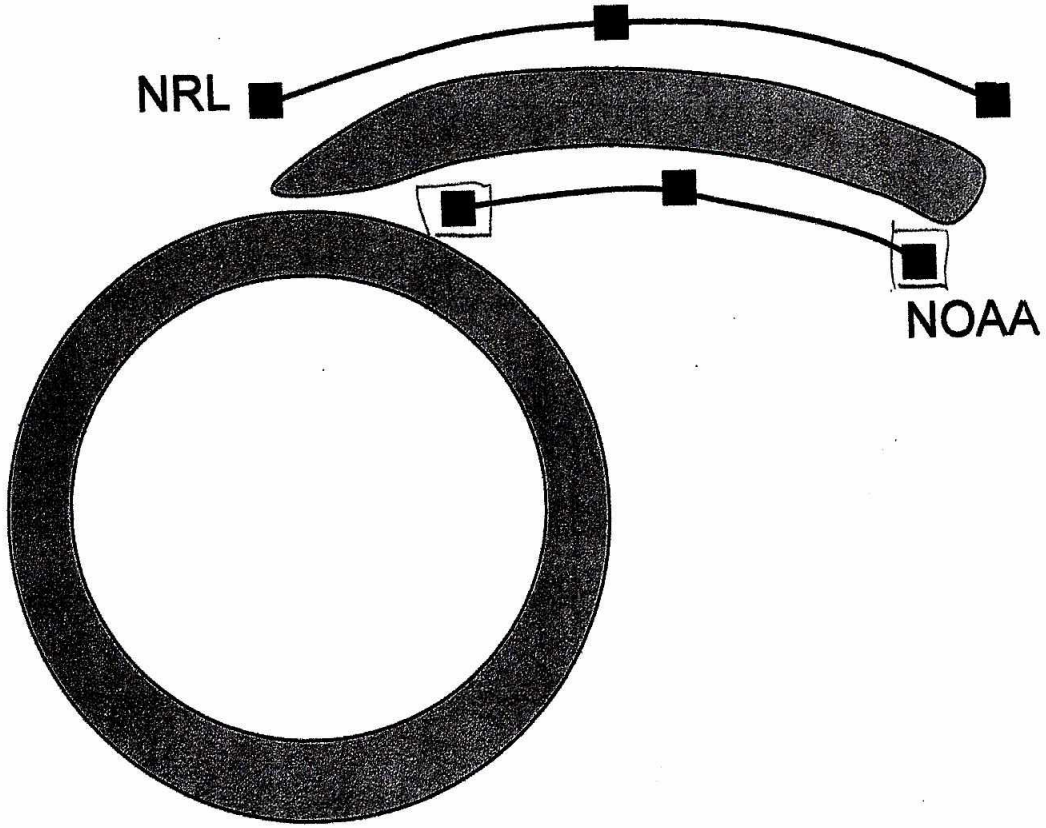
RAINEX drop

AXBT drop

Note: 100 nm leg length

Option 1: strong storm

Rainband drop pattern



Option 1: strong storm

■ RAINEX drop

□ AXBT drop

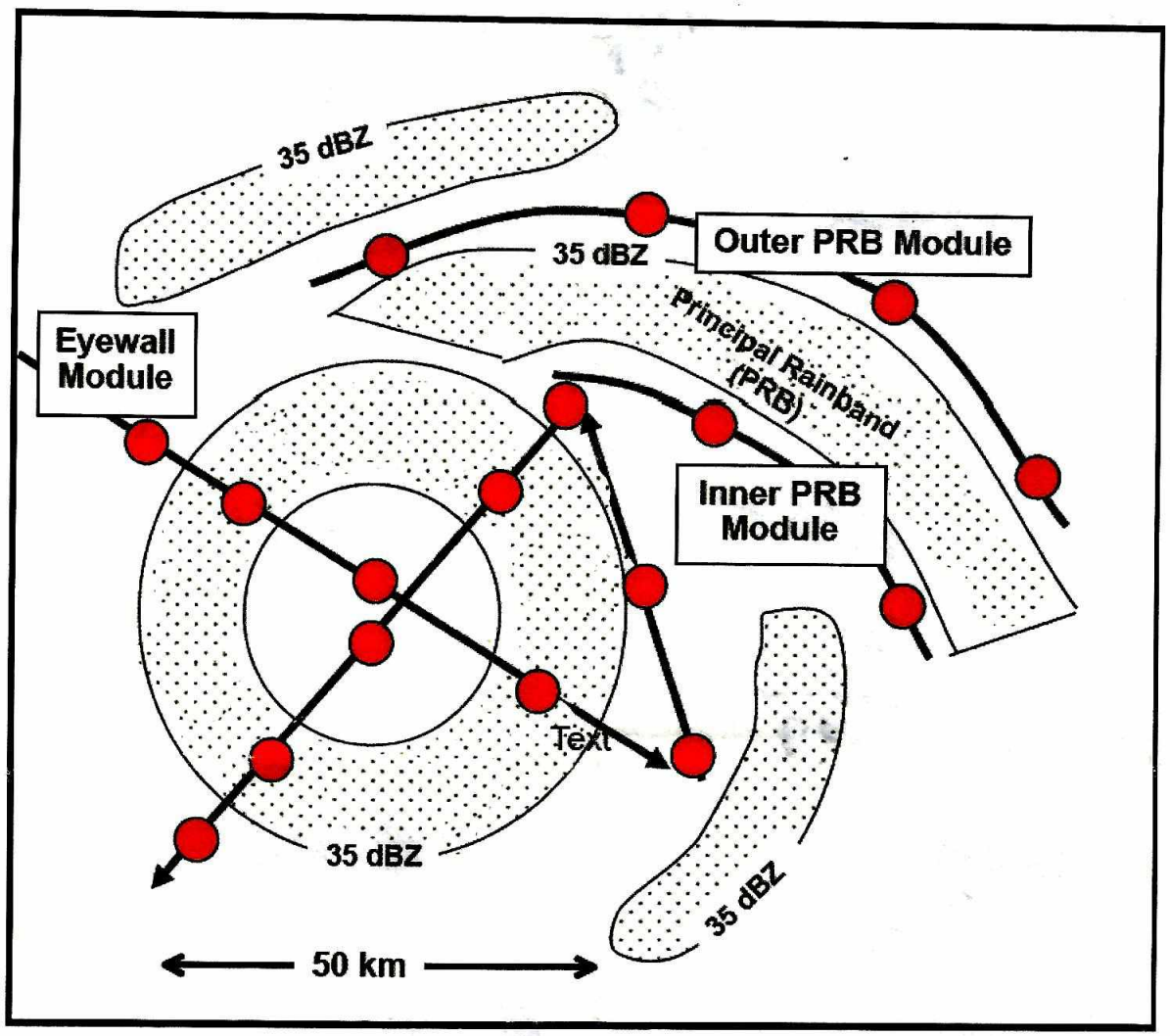


Figure RX-1. Doppler radar module nomenclature. Dots indicate possible dropsonde locations, to be adjusted depending on scale of storm features. The Eyewall module will be flown repeatedly, rotating its orientation by increments of ~45 deg. The Inner and Outer PRB Modules will be flown in tandem for quadruple Doppler coverage, and they will be flown a few km outside the 35 dBZ contour.

Note 1.	Doppler radars should be operated in single-PRF mode, at a PRF of 2400-3200. The default will be 2800 PRF. Radar scientist should verify this mode of operation with AOC engineers. If there is no assigned radar scientist, LPS should verify. *This is crucial for the testing and implementation of real-time quality control.*
Note 2.	Unless specifically requested by the LPS, both tail NOAA-P3 Doppler radars should be operated in fore/aft continuous scanning with a fore/aft angle of 20° relative to fuselage.