

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

Flt ID: 040830 I	From: KNCF	To: TBPB
Flt. No: 04-053	Blk In: 2301Z	Time On: 2245Z
ETD: 1315Z	Blk Out: 1313Z	Time Off: 1322Z
ETE: 10+30	Blk Time: 9+48 9.8 Hrs	Fit Time: 9+23 9.4 Hrs
Sponsoring Org: NOAA/NHC	Program: HUR 2004	Purpose: H. FRANCIS

AOC Flight Crew

Aircraft Commander: TE BEEST, R ✓	Data System: LYNCH, T ✓
Co-Pilot: STRONG, T ✓ CHOY, B^S	AVAPS: TONG, R ✓
Navigator: ADLER, J^S GALLAGHER, T ✓	System Eng: SMITH, J ✓
Flight Eng: FLOYD, D^S BAST, G ✓⁺¹⁵	A A: McFADDEN, J ✓
Flight Director: SHEPHERD, T ✓	A A:
Avionics: SANS SOUCI, D ✓	Crew Chief: Mitchell, R ✓

Participating Scientists / Visitors

Name (Last, First)	Activity on Aircraft	Affiliation
ROGERS, Rob ✓	PI	NOAA/HRD
WILDRN, ERIC ✓	SFMR	↓
DODGE, PETE ✓	RADAR	↓

Remarks (Storm Name, Mission ID, Recco Times, Fix Times)	<u>Recco Times</u>		<u>Fix #</u>	<u>Fix Time</u>
	Storm Name: <u>FRANCES</u>	1424 2014	1	1813
Mission ID: <u>NOAA3 0506A FRANCES</u>	1600	2	1933	
Penetration number and time	1639-4	3	2117	
	1658-5			
	1730-6			
	1842			
	1912			
	1954			

1000

(See reverse for additional remarks)

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

Flight ID: 040830 I Time Off: 1322 Z Time On: Z

	A/C - Takeoff	Wx Station - Takeoff	A/C - Land	Wx Station - Land
Pressure	<u>1015.4</u> mb	<u>30.00</u> mb	mb	<u>29.92</u> mb

ATIS	Time	Observation
Takeoff	<u>Turbo 1259Z</u>	<u>120/3 28/25 30.00</u>
Land	<u>Z</u>	

	Number	Data Disposition / Date / Quality
Flight Level Tapes	<u>4</u>	
Radar Tapes	<u>1</u>	
Cloud Physics Tapes / CDs		
Video Tapes	<u>4</u>	
Dropsondes	<u>20</u>	<u>Good: 20 Bad: 2 prototypes Charge 6 NHC 12 HRD</u>
AXBT		
AXCP		
AXCTD		

Remarks: START DATA RECORD 1334
TBPB 1304, 5930
FRANCES 18Z 1906, 5912
DATA SYS ↓ ~1435



**NOAA P-3 N43RF
CBLAST 2004
FLIGHT #1**

Flight ID: I040830

Sensor or system

Number or Name

INE	1
Accelerometer	1
Temperature Probe	1
Dew Point Probe	2
Altimeter (for vertical wind)	RA-159
Static Pressure	Rosemount (fuselage)
Dynamic Pressure	Rosemount (fuselage)
Time Source	Micro 99
Constants File	CO3043.con

Local Met. Data: Not copied at takeoff

Take off: 1322Z

Land: 2245Z

The RA-232 was substituted for the RA-159 during take off and landing due to spiking (T.O. 131901 – 132244; Land 224524 – 224800)

The RA-159 had spikes that were removed and patched (135400 – 135414, 135708 – 135713, 135723 – 135729).

There were data gaps noted: 135028-135040, 143348-143709, 143738-143909, 143918-143929, 181720-181740, 212236-212245, 215843-215855, 221608-221614. The data gaps up through 143929 were associated with an unstable main data system that ultimately crashed and was restarted. These problems associated with the main data system crash were at the beginning of the flight prior to pertinent data collection.

There were multiple times during heavy precipitation events (e.g. eye wall penetrations) when the dew point exceeded ambient temperature yielding a RH of greater than 100%. This is probably due to a wet bulb effect on the total temperature probe and/or the dew pointer over heating while trying to remove excess moisture. In these instances, no corrections were attempted.

The aircraft INE positions were re-navigated with respect to GPS.

SPECIAL NOTE: Locations 80, 81, and 82 of record 5 in the standard data contain vertical ground speed, vertical air speed, and vertical wind speed computed using Dr. Dave Jorgensen's vertical wind algorithm. It is recommended that these values be used for vertical wind analysis.

	Take off	Land
Aircraft Static Pressure	1015.4 mb	1006.5 mb
Corrected Tower Pressure	1015.9 mb	1013.2 mb

Flight Director: Tom Shepherd
813-828-3310 x3053

Mission Frances-SFMR Fit ID 040830I

SED Crew Lynch, Sans Souci, Smith, Tong

Pre-Flight 11:00 Z Take-Off 13:22 Landing 22:45

System		Pre-Flight		In-Flight			Post-Flight			
NAV	GPS	FM: 1	JS				LAT	LO	CS	RE
	INE #1 Time On:	Aligned to: 0	JS				-4.3	+5.7	3	7
	INE #2 Time On:	Aligned to: 0	JS				+16.9	-9.9	7	20
	Diff GPS		JS							
RADAR	MARS Data	Start	Stop	Ready?	HRD?		# DATs ?	Given To:		
	MARS	13:36	22:19	Y	Y/N		1	P. Dodge		
	MARS Data / Tape Status				LFRec	TARec	EOF's			
	MARS LU8	Clear		Y	3498	5392	54			
	MARS LU9	Clear		Y						
PMS	RADAR R/T SN Tail	102	LF 102	RT	Mod Switches	ON	Mod Switches	OFF		
	Nose			OX			Power	OFF		
	FSSP Ref VDC:	Covers	OFF	NE			Covers	ON		
	Cloud Mono	Covers	OFF				Covers	ON		
SEAS	CIP	Covers	OFF				Covers	ON		
	SEA Data DAT	Start	Stop:	Ready?	#DATS	Errors	Disk Write	Given To:		
DAT	Clean?					Y / N				
TEMP		Cal High	Cal Low				Cal High	Cal Low		
	Temp #1	30.9	30.4	JS			30.6	30.2		
	Temp #2			JS			Power	OFF		
	Temp #3			NU			Power	OFF		
PRES	Dewpoint	#1 #2 #3 (TDL)	JS				Power	OFF		
	Attack / Slip Angle	AP QAP BP QDBP	JS				Power	OFF		
	Differential	PO1 PO2 PO3 PO4	JS				Power	OFF		
FLTLVL	Absolute	PS1 PS2 CBPS	JS				Power	OFF		
	Apn-159 SN:	66-024	JS				Power	OFF		
	Apn-232 SN:	1761	RT				Power	OFF		
	Liquid Water	J&W Khr	TL	28V WOW: ON?			Power	OFF		
RAMS	Radiometer	CO2 SST	JS	28V WOW: ON?			Power	OFF		
	RAMS Data	Start	Stop	Ready?	Errors 8:	Errors 9:	# DATs ?	Given To: T. Shep		
CPU: A B	13:11	14:35	TL (3)	0	2	Power	OFF			
RAMS Data / Tape Status	14:39	23:00		Slow Rec	Fast Rec	Disk Records:	3017			
RAMS U8	Clear		Y	3016	3019	561 A				
RAMS U9	Clear		Y	3017	30133	561 A				
Flight Director Laptop			JS			Power	OFF			
Network			NU							
ASDL Mission #	0506	Name: Frances	TL	Freq: 30	Block: 05	Power	OFF			
C.I. Printer	Start	Stop	Ready?	Paper Bin Stores		Given To:				
PRATE: 10	13:10		TL	0%	25%	50%	75%	100%	Power	OFF
MISC	Exterior Walk Around	Plugs	Covers	W	JS	Plugs	Covers			
	SATCOM	W/S Inmarsat	GlobalStar	JS		Power	OFF			
	AXBT Internal	# Loaded: 5		JS		# Launched:	-			
	AXBT External	# Loaded: -		N/A	28V WOW	# Launched:	-			
	AVAPS	# On Board: 107		JS		# Dropped:	20			
VIDEO	Video Cameras	Start	Stop	Ready?	Cameras	Mode	# Tapes ?	Given To:		
	VHS (SVHS)	13:10	22:34	Y	(NLRD)	2 / (12)	Lens Cap ?:	✓		
FCU	B-C-D		TL			UPS	OFF			
USER	SFMR	FIR AOC	TL			Accelerometers				
	NASA SRA		NU			#1 (2 G):	8202			
	ARL BAT Probe, SST & ID		JS			#2 (2.5 G):	6087			
	UW PDA		NU			#3 (3 G):	5967			
	Scripps MASS, Laser Alt, IR Cam & Sono		TL	(2) (4)		#4 (3.5 G):	2892			
RSMAS Licor		TL								

Please Note any Discrepancies

Item #	Zulu Time	Problem Description	Initials	Status
1		Spere tail transmitter mount in B3 cab vibrates - use hat section for mount?	TL	
2		Scripts Down camera controller has intermittent power module	TL	OK
3	14:35	Eric U. leaned against tapes + ejected both DAT's	TL	-
4	15:00	Swapped CS 43 + CS 24 AT N RACK to record scripts IR camera on UCR	TL	-
5	15:10	modified the 8th coefficient + the 9th coef in SFMR (Heb)	TL	-
6	17:53	Disabled AOL SFMR Freq #1 (5.31) per EU (AOL)	TL	-
7	18:39	Switched from Q SFMR to AOL SFMR		-
8	2122	AVARS serial to C3X map	JS	

4.74 5.21 5.57 6.02 | 6.69 7.09
 190 91 92 93 | 94 95

DATE 30 Aug 2004	SCHEDULED RX TIME 18Z	AIRCRAFT NUMBER N43RF	FLIGHT DIRECTOR SHEPHERD
WX MISSION IDENTIFIER NOAA3 0506A FRANCES			OB NUMBER 9
VORTEX DATA MESSAGE			
A	30 1 18 13Z	DATE and TIME of FIX	
B	19 DEG 23 MIN N S	LATITUDE of FIX	
	59 DEG 21 MIN W E	LONGITUDE of FIX	
C	700 MB 2666 M	MINIMUM HEIGHT of STANDARD LEVEL	
D	N/A KT	ESTIMATE of MAXIMUM SURFACE WIND OBSERVED	
E	N/A DEG NM	BEARING and RANGE FROM CENTER of MAXIMUM SURFACE WIND	
F	017 DEG 89 KT	MAXIMUM FLIGHT LEVEL WIND NEAR CENTER 1928.5 59 49.6	
G	296 DEG 26 NM	BEARING and RANGE FROM CENTER OF MAXIMUM FLIGHT LEVEL WIND	
H	951 MB	MINIMUM SEA LEVEL PRESSURE COMPUTED FROM DROPSONDE OR EXTRAPOLATED FROM FLIGHT LEVEL. IF EXTRAPOLATED, CLARIFY IN REMARKS.	
I	16.8 C 13022M	MAXIMUM FLIGHT LEVEL TEMP / PRESSURE ALTITUDE OUTSIDE EYE	
J	16.5 C 13022M	MAXIMUM FLIGHT LEVEL TEMP / PRESSURE ALTITUDE INSIDE EYE	
K	16.5 C 1 NA C	DEWPOINT TEMP / SEA SURFACE TEMP INSIDE EYE	
L	CLOSED	EYE CHARACTER: Closed wall, poorly defined, open SW, etc.	
M	CO18-48	EYE SHAPE/ORIENTATION/DIAMETER: Code eye shape as: C - Circular; CO - Concentric; E - Elliptical. Transmit orientation of the major axis in tens of degrees, i.e., 01-010 to 190; 17 - 170 to 350. Transmit diameter in nautical miles. Examples: C8= Circular eye 8 miles in diameter. E09/15/5=Elliptical eye, major axis 090-270, length of major axis 15 NM, length of minor axis 5 NM. CO8-14=Concentric eye, diameter inner eye 8 NM, outer eye 14 NM.	
N	12345/1	FIX DETERMINED BY / FIX LEVEL. FIX DETERMINED BY: 1-Penetration; 2-Radar; 3-Wind; 4-Pressure; 5-Temperature. FIX LEVEL (Indicate surface center if visible; indicate both surface and flight level centers ONLY when same): 0-Surface; 1-1500 ft; 9-925mb; 8-850mb; 7-700mb; 5-500mb; 4-400mb; 3-300mb; 2-200mb; NA-Other	
O	1 1 1 NM	NAVIGATION FIX ACCURACY / METEOROLOGICAL ACCURACY	
P	REMARKS MAX FL WIND 89 KT NW QUAD 1806 Z 90 KT SE QUAD 1820		

INSTRUCTIONS: Items A thru G (and H when extrapolated) are transmitted from the aircraft immediately following the fix. The remainder of the message is transmitted as soon as available for scheduled fixes and at the Flight Director's discretion for unscheduled

DATE 30 Aug 2009	SCHEDULED RX TIME 22Z	AIRCRAFT NUMBER N43RF	FLIGHT DIRECTOR SHEPHERD
WX MISSION IDENTIFIER NOAA3 0506A FRANCES			OB NUMBER 24

VORTEX DATA MESSAGE

A	301 2117 Z	DATE and TIME of FIX
B	19 DEG 26MIN N S	LATITUDE of FIX
	60 DEG 03MIN W E	LONGITUDE of FIX
C	700 MB 2646 M	MINIMUM HEIGHT of STANDARD LEVEL
D	NA KT	ESTIMATE of MAXIMUM SURFACE WIND OBSERVED
E	NA DEG NM	BEARING and RANGE FROM CENTER of MAXIMUM SURFACE WIND
F	091 DEG 112 KT	MAXIMUM FLIGHT LEVEL WIND NEAR CENTER
G	006 DEG 26 NM	BEARING and RANGE FROM CENTER OF MAXIMUM FLIGHT LEVEL WIND
H	948 MB	MINIMUM SEA LEVEL PRESSURE COMPUTED FROM DROPSONDE OR EXTRAPOLATED FROM FLIGHT LEVEL. IF EXTRAPOLATED, CLARIFY IN REMARKS.
I	19 C 13053 M	MAXIMUM FLIGHT LEVEL TEMP / PRESSURE ALTITUDE OUTSIDE EYE
J	18 C 13053 M	MAXIMUM FLIGHT LEVEL TEMP / PRESSURE ALTITUDE INSIDE EYE
K	15 C 1 NA C	DEWPOINT TEMP / SEA SURFACE TEMP INSIDE EYE
L	OPEN North	EYE CHARACTER: Closed wall, poorly defined, open SW, etc.
M	C 45	EYE SHAPE/ORIENTATION/DIAMETER: Code eye shape as: C - Circular; CO - Concentric; E - Elliptical. Transmit orientation of the major axis in tens of degrees, i.e., 01-010 to 190; 17 - 170 to 350. Transmit diameter in nautical miles. Examples: C8= Circular eye 8 miles in diameter. E09/15/5=Elliptical eye, major axis 090-270, length of major axis 15 NM, length of minor axis 5 NM. CO8-14=Concentric eye, diameter inner eye 8 NM, outer eye 14 NM.
N	12345/7	FIX DETERMINED BY / FIX LEVEL. FIX DETERMINED BY: 1-Penetration; 2-Radar; 3-Wind; 4-Pressure; 5-Temperature. FIX LEVEL (Indicate surface center if visible; indicate both surface and flight level centers ONLY when same): 0-Surface; 1-1500 ft; 9-925mb; 8-850mb; 7-700mb; 5-500mb; 4-400mb; 3-300mb; 2-200mb; NA-Other
O	111 NM	NAVIGATION FIX ACCURACY / METEOROLOGICAL ACCURACY

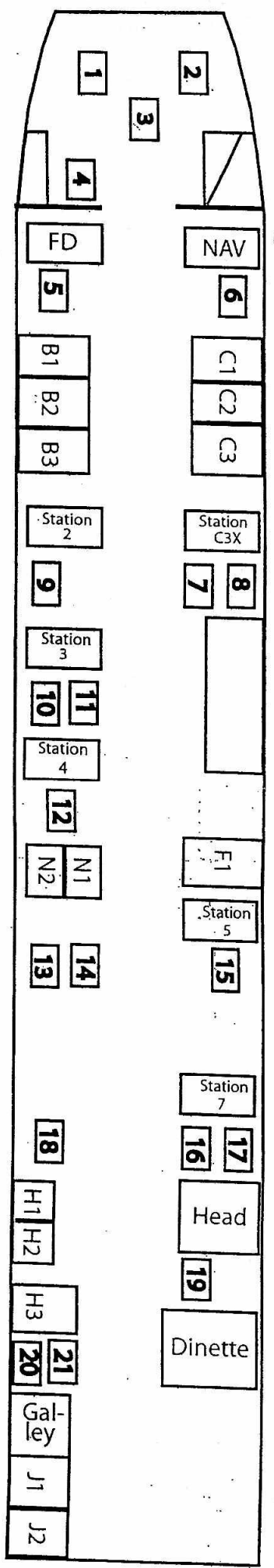
P	REMARKS MAX FL WIND 112 KT N QUAD 2110 Z ON OUTBOUND LEG MAX FL WIND 118 S QUAD 2122 SLP FROM DROPSONDE S 118 2122 S QUAD
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INSTRUCTIONS: Items A thru G (and H when extrapolated) are transmitted from the aircraft immediately following the fix. The remainder of the message is transmitted as soon as available for scheduled fixes and at the Flight Director's discretion for unscheduled

5/80

NOAA AIRCRAFT OPERATIONS CENTER

Flight ID 040830 I



- 1. TEBESST, R PILOT
- 2. STRONG, T COPILOT
- 3. FLOYD, D FLIGHT ENGINEER
- 4. Mc FADDEN, J STATION 1
- 5. SHEPHERD FLIGHT DIRECTOR
- 6. SMYTH, R NAVIGATOR
- 7. ADLER, J STATION C3X
- 8. BAST, G STATION C3X
- 9. DOBBS, P STATION 2
- 10. WILSON, E STATION 3
- 11. ROGERS, R STATION 3
- 12. LYNCH, T STATION 4
- 13. PROJECT SEAT
- 14. CHAY, B PROJECT SEAT
- 15. SWITTE, J STATION 5
- 16. TONG, R STATION 7
- 17. STANS SOUTI STATION 7
- 18. MITCHELL, R STATION 8
- 19. DINETTE
- 20. GALLEY
- 21. GALLEY

0913

091

323

MISSION PREFLIGHT LOG										NAVIGATOR	AIRCRAFT COMMANDER		FLIGHT DIRECTOR		SCHEDULED / ACTUAL TAKEOFF Z			DATE OF TAKEOFF	
W/P	U/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	
	DESTINATION TERR	MISSION RAVENS # 1				EWS GRUNGERE		LSPR TERRIST		SITE PRAES		13 15 21 13 22					30AD901		
1	27-51.0 082-31.3	A→																	
2	086-40.0 076-38.9		9W	AH			118	200	C		17000	200	488 +20	3:49	13:15	13:22	13:29		
3	076-38.9		6W	1D			110						1246 +20	14:35	14:42	14:41			
4	074-45.9		8W	1B			120						972 +20	14:56	15:03	15:28			
5	072-30.0		8W	1C			120						154 +30	15:52	15:51	15:20			15:25
6	059-12.0		19	109			109						397 +20	18:28	18:43	18:12			
7	059-29.6	A	18	183			183						369 +20	22:06	22:13				
	DEPART	13-04-95												8+50	22:06	22:13			
	ARRIVE	13-09-16												15:12	23:21	23:26			
	DEPART	19-06																	
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33-1-18
19 28.5 59 49.6

350/15

040830E

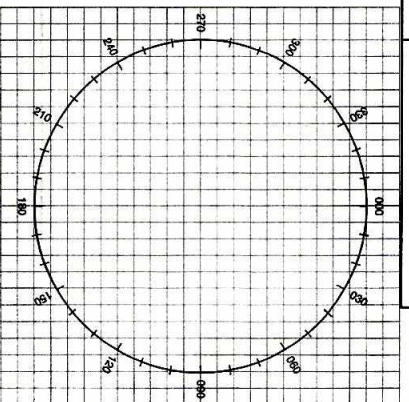
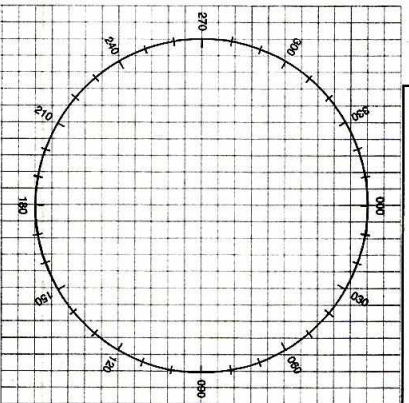
185 CLEARANCES

OTHER

AS-1085 SQC 6617

MISSION LOG

PAGE ___ OF ___



POSITION REPORT

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

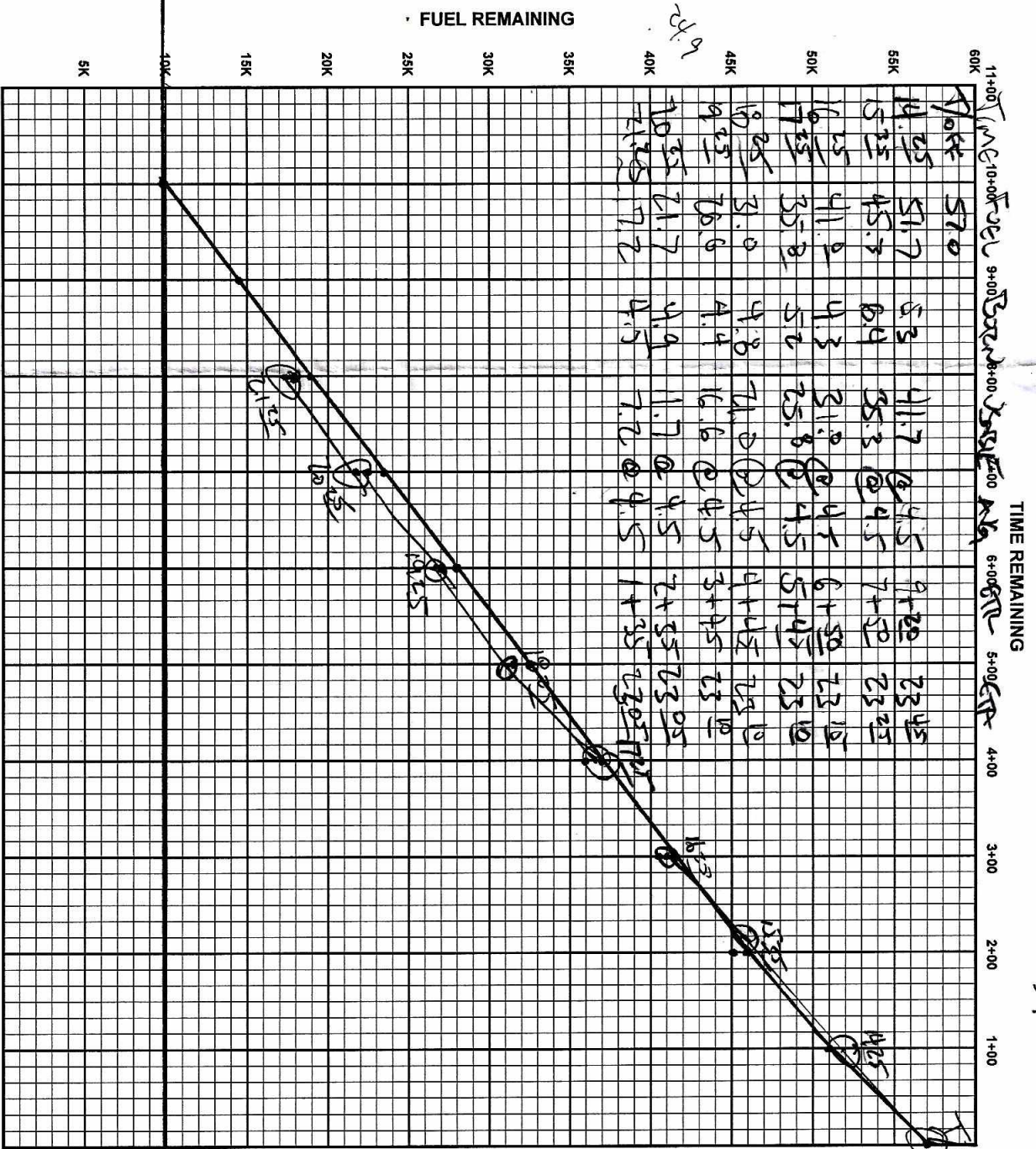
EMERGENCY MESSAGE

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 8384 KHZ 500 KHZ
 MAYDAY, MAYDAY, MAYDAY
 THIS IS NOAA _____ NOAA _____ NOAA _____
 - POSITION _____ TRUE/MAG _____ N/S
 - HEADING _____ E/W AT _____ Z
 - 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	TH	DR	TRK	GS	WD	WS	ALT	TAS	NEXT PT	DIST	TIME	ETA	REMARKS
1320	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1325	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1330	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1335	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1340	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1345	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1350	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1355	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1400	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1405	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1410	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1415	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1420	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1425	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1430	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1435	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1440	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1445	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1450	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1455	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1500	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1505	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1510	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1515	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1520	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1525	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1530	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1535	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1540	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1545	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1550	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1555	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1600	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1605	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1610	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1615	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1620	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1625	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1630	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1635	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1640	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1645	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1650	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1655	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1700	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1705	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1	130	4W	122	ZL	143	232	225	10	15000	232	PEL	142	137	1402	INS #1 R4
1710	X	27-46.3 082-32.7	27-46.3 082-32.7	-	27-46.3 082-32.8	-0.1															

RANGE CONTROL GRAPH

180/20
57.0
- 17.2
39.8



DISTANCE REMAINING

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

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

ENROUTE FUEL	
ENROUTE TIME	10+15
ENROUTE FUEL (6K 5K/45K RULE)	47.0
RESERVE AT DESTINATION	10.0
REQUIRED RAMP	57.0
ACTUAL RAMP FUEL	57.0

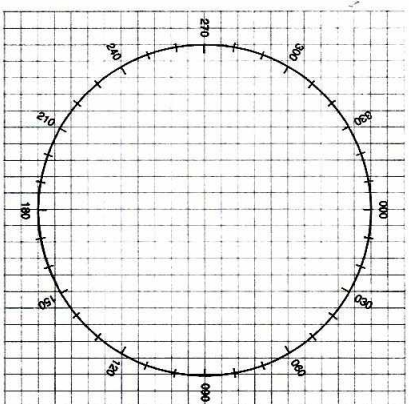
TACTICAL (OFFSTA TO DESTINATION)	
DISTANCE (OFFSTA TO DEST)	
ENROUTE TIME (OFFSTA TO DEST)	
BURN RATE (LBS/HR)	4500
ENROUTE FUEL REQUIRED	5500
RESERVE AT DESTINATION	
FUEL AT OFFSTA	

POINT OF SAFE RETURN	
ETP DISTANCE (TO DEPARTURE)	
ENROUTE TIME (TO DEPARTURE)	
BURN RATE (LBS/HR)	4500
FUEL REQUIRED	5500
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
MIRB (DAL 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	



TRUE AIRSPEED CROSS-CHECK

TIME	IAS	PRESS ALT	"F" FACTOR	EAS	OAT	TAS	ITAS
16:20	221	20000	.98	216	1	301	299

6 11 10L
36 19-50.2
47 060-58.0