

F·A·A·M facility for airborne atmospheric measurements

FLIGHT FOLDER



Flight No.: B263
Date: 29 Jan 2007
Take Off 11:14:37
Landing: 15:31:22
Flight Time 4h16m45

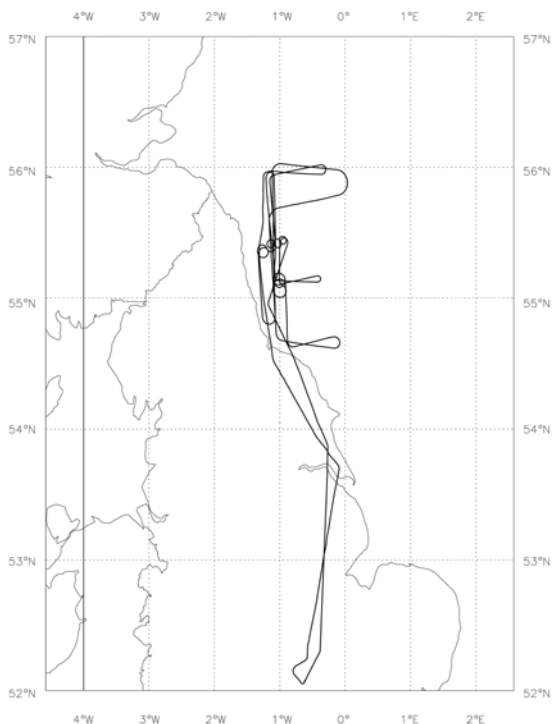
Campaign: Instrument Test – Turbulence Probe / ARIES / FWVS

Operating Area: N Sea

POB	Position	Name	Institute
1	Captain	Alan Foster	Directflight
2	Co-pilot	Ian Ramsey-Rae	Directflight
3	CCM	Gaynor Ottaway	Directflight
4	Mission Scientist	Phil Brown	Met Office
5	Flight Manager	Mo Smith	FAAM
6	Cloud Physics / CCM2	Paul James	FAAM
7	Mission Scientist Training	Ian Renfrew	University of East Anglia
8	Mission Scientist Training	Kent Moore	University of Toronto
9	FWVS	James Bowles	Met Office
10	Turb Probe Analysis	Alan Gadian	University of Manchester
11	ARIES	Stuart Rogers	Met Office
12			
13			
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15			
16			
17			
18			
19			
20			

Flight Track:

B263 Track 29-JAN-07



FLIGHT SUMMARY

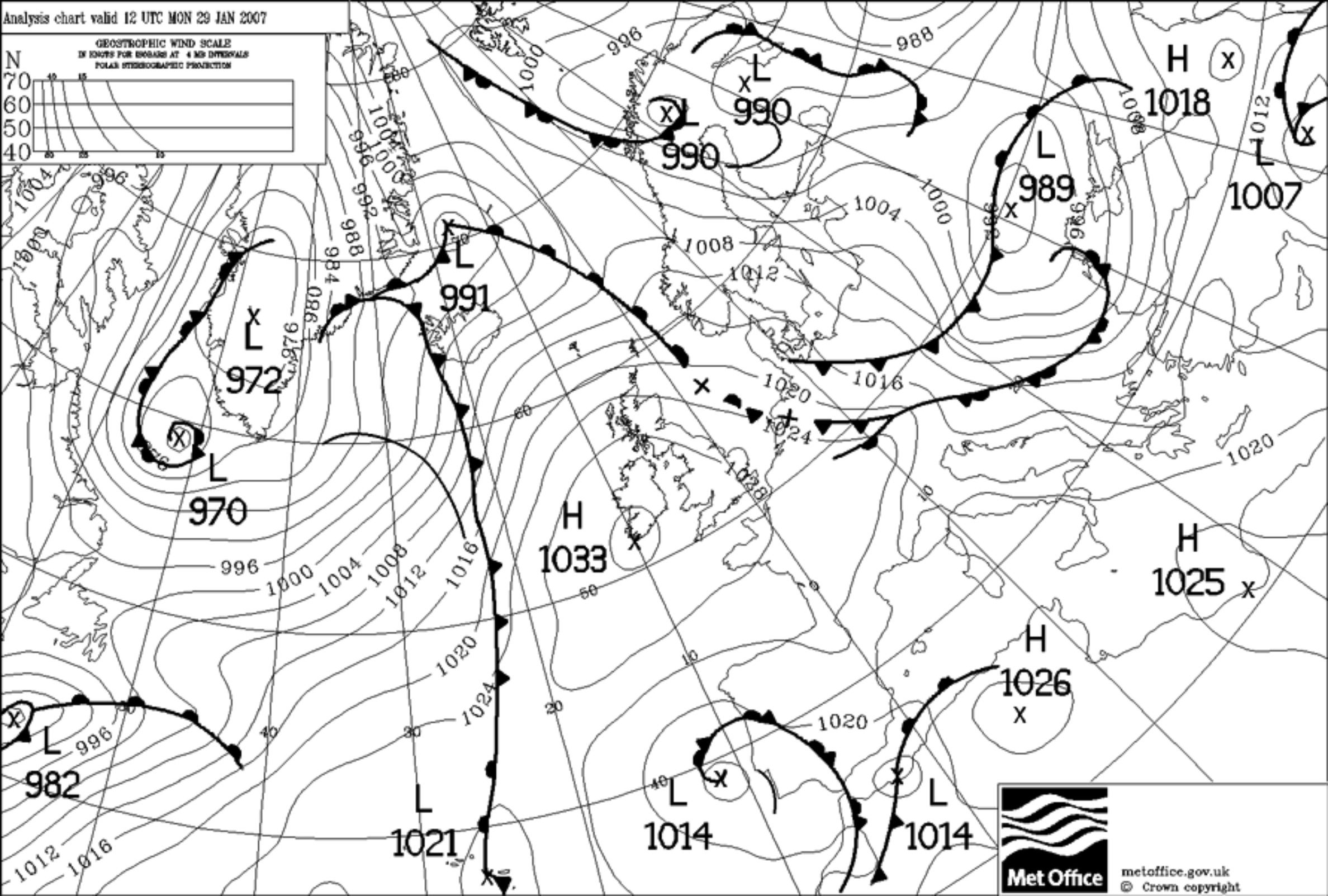
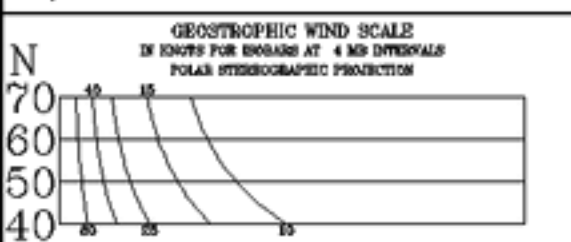
Flight No b263

Date: 29 January 2007

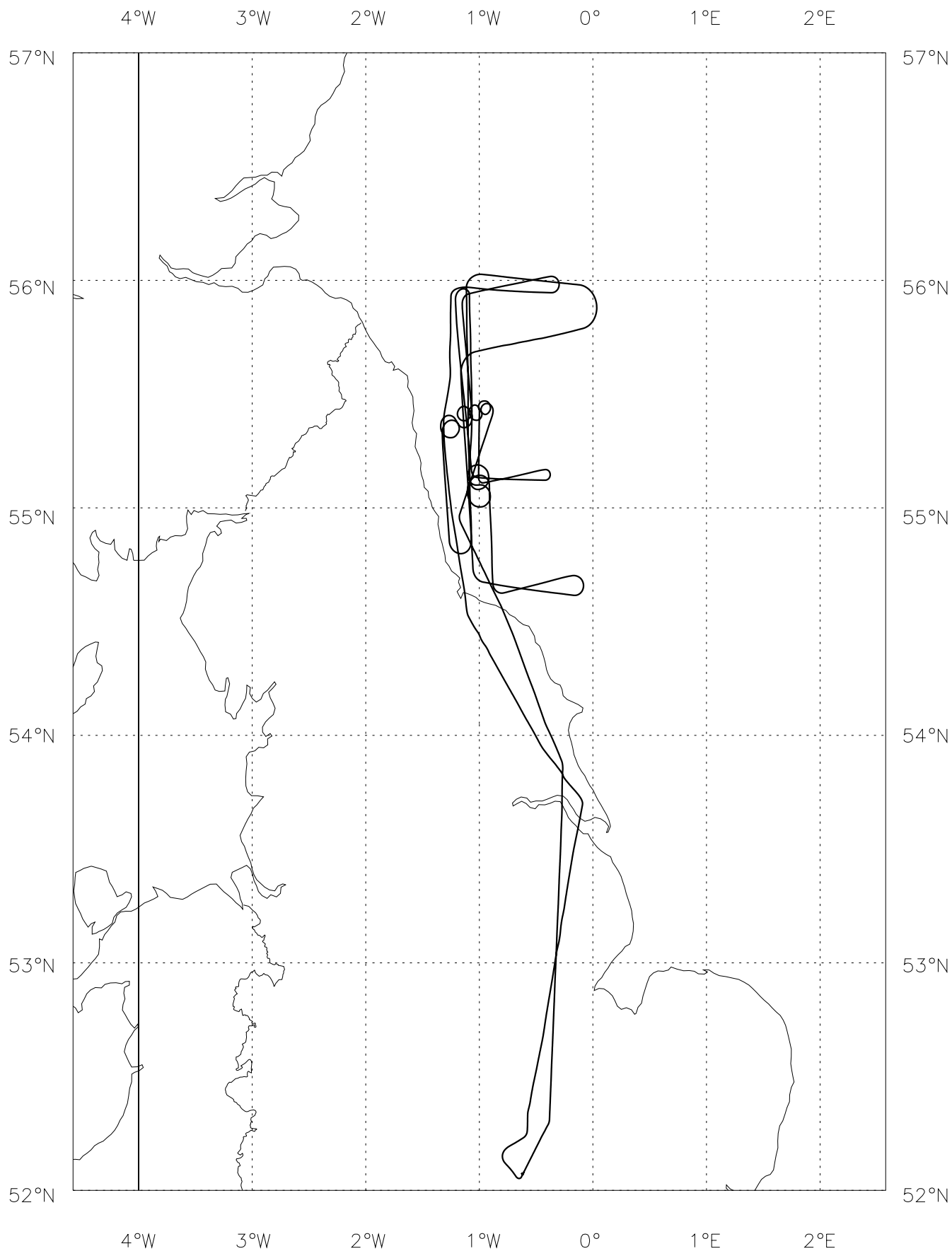
Project: WINTEX - Instrument Test

Location: North Sea

Start Time	End Time	Event	Height (s)	Hdg Comments
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100332		Start-Up	-.06 kft	095 52'04.36N, 0'37.48W
104723		INU	-.06 kft	095 To Navigate Mode
111437		T/O	0.61 kft	252 Cranfield
112254		ASPs	10.0 kft	011 Open
112750		Videos	15.0 kft	011 Start FFC & UFC
112827	113327	Run 1.1	15.0 kft	011 Yaw then st&lvl
113346	113729	Run 1.2	15.0 kft	010 Deceln run
113837	113936	Run 1.3	15.0 kft	318 Start at Vscience
113948	114236	Run 1.3	15.0 kft	320 Yaw then st & lvl
114308	114837	Profile 1	15.0 - 20.0 kft	328
114838	115239	Run 2.1	20.0 kft	329 Yaw oscillations
115319	115747	Run 2.2	20.0 kft	352 Acceln run
115754	120046	Run 2.3	20.0 kft	353 Yaw oscillations
120052	120413	Run 2.4	20.0 - 20.1 kft	355 Deceln run
120413	120916	Run 2.5	20.1 - 20.0 kft	003 L-pattern A1-B1
121046	121548	Run 2.6	20.0 kft	086 B1-C1
121806	122306	Run 2.7	20.0 kft	265 C1-B1
121959		Heimann	20.0 kft	266 Cal
122411	122918	Run 2.8	20.0 kft	181 B1-A1
123047	123345	Orbit 1.1	20.0 - 19.9 kft	314 Clockwise
123427	123759	Orbit 1.2	20.0 kft	300 Anticlockwise
123926	124434	Profile 2	20.0 - 25.0 kft	180
124646	125250	Profile 2	25.0 - 30.0 kft	001
125251	125710	Run 3.1	30.0 kft	358 Yaw oscillations
125751	130100	Run 3.2	30.0 kft	357
130059		Videos	30.0 kft	357 Change tapes
130219	130627	Run 3.2	30.0 kft	089 Acceln
130854	131337	Run 3.3	30.0 kft	264
131458	131650	Run 3.4	30.0 kft	177 Deceln
131819	132318	Run 3.5	30.1 - 30.0 kft	176 L-pattern leg1
132424	132924	Run 3.6	30.0 kft	091 L-pattern leg2
133131	133517	Run 3.7	30.0 kft	269 L-pattern leg3
133626	134126	Run 3.8	30.0 kft	357 L-pattern leg4
134245	134650	Orbit 2.1	30.0 kft	283 Anticlkwise + yaw
134714	135039	Orbit 2.2	30.0 kft	286 Clockwise + yaw
135129	140207	Profile 3	30.1 - 15.0 kft	354 1500fpm
140407	140914	Profile 3	15.1 - 8.0 kft	179 1500fpm
140925	141415	Run 4.1	8.0 kft	175 L-pattern leg1
141506	142007	Run 4.2	8.0 kft	087 L-pattern leg2
142146	142638	Run 4.3	8.0 kft	268 L-pattern leg3
142434		Heimann	8.0 kft	265 Cal
142732	143227	Run 4.4	8.0 kft	357 L-pattern leg4
143246	143531	Orbit 3.1	8.0 kft	330 Anticlokwise + yaw
143547	143826	Orbit 3.2	8.0 kft	316 Clockwise + Yaw
143614		Videos	8.0 kft	018 Change Tapes
144025	144234	Run 4.5	8.0 - 8.1 kft	203 Deceln with flaps
144314	144653	Run 4.6	8.0 kft	205 Acceln, no flap
144808	145219	Run 4.7	8.0 kft	151 Vscience + yaw
145219	145613	Profile 4	8.0 - 11.0 kft	150
145613	150054	Run 5.1	11.0 kft	157 Decel+flaps, accel
150059	150405	Run 5.2	11.0 kft	157 Decel, accel
150431	150807	Run 5.3	11.0 - 11.1 kft	186 Decel, accel
150902		ASPs	11.0 kft	184 Close
153122		Land	-.03 kft	356 Cranfield
153513		Shutdown	-.04 kft	306 52'04.36N, 0'37.50W



B263 Track 29-JAN-07



Sortie Brief: Turbulence Probe Self-Calibration flight

Flight Number: B263

Mission Scientist: Phil Brown

Date: 29 Jan 2007

Sortie Aims and Methodology: The principle aim of the flight is to provide further testing of the calibration of the turbulence probe system in a region in which the vertical air velocity can be assumed to be zero. In a turn, both the angle of attack and sideslip measurements will respond to vertical wind gusts. Hence, the aircraft will perform orbits during which yawing oscillations are performed to introduce fluctuating sideslip components. The best sideslip and attack calibrations are then chosen so as to minimise vertical wind fluctuations that oscillate in phase with the manoeuvre. During the flight, reverse-heading L-patterns (to check TAS calibration) and yaw oscillations in straight/level flight (to check AOSS cal.) will also be performed.

Sortie Location: N.Sea.

Weather: A region of uniform horizontal wind and expected zero vertical wind, above the boundary layer, cloud-free and avoiding significant orographic influences.

Sortie Summary:

- 1) Reverse-heading L-patterns. Each pattern commences at the apex of the L and consists of two pairs of legs of minimum 3 and maximum 5 minutes duration. The pairs are flown on headings of due N-S and E-W on air positions.
- 2) Yaw oscillation during orbit. The aircraft is flown in a standard-rate turn (22.5 deg bank angle). Yaw oscillations of period 10 seconds and amplitude +/- 2 deg are performed. Orbits will be flown to both left and right.
- 3) Airspeed acceleration run. Establish steady level flight at min airspeed (or 7 deg AoA) and accelerate maintaining constant altitude to max. airspeed (or 3deg AoA)
- 4) Climbs/descents are standard profiles (1000 ft/min). The standard IAS is 210 kt.

Sortie Detail:

- a) T+0 Take-off and climb to FL200 for transit to operating area. During this, perform 3 * 2-min legs at minimum, standard and maximum airspeed and 1 * 2-min yaw oscillation at standard airspeed. (40 min)
- b) T+40 Perform reverse-headings L-pattern at FL200. (25 min)
- c) T+65 At the same altitude, perform yaw-oscillating orbits to left and right. (5 min)
- d) T+70 At the same altitude, perform standard orbits to left and right. (5 min)
- e) T+75 At same altitude, perform 6 min leg with 2 min yaw oscillations 10 sec period, +/-4 deg amplitude in the centre. (6min).
- f) T+85 At the same altitude, perform airspeed acceleration run. (10 min)
- f) T+100 Repeat items b)—e) at other altitudes (eg. FL050, 100, 300) as time permits. (180 min). The lowest altitude flown should be above the boundary layer.
- g) Return transit is ideally at a different altitude to outbound. Repeat 3*2-min legs at minimum, standard and maximum airspeeds and yaw oscillation at standard airspeed.

Phil Brown

29 Jan 2007

Planned as a flight to acquire data for self-calibration of the turbulence probe prior to GFDEX. In addition to manoeuvres previously employed on similar such flights (steady speed legs, yaw oscillations in level flight, yawing orbits to left and right), it was also planned to include runs accelerating and decelerating in level flight. The purpose of the latter is again to provide data to calibrate angle of attack (AoA) measurements. The principle is to for the acceleration/deceleration run to maintain level flight, ie. Not accelerating in the vertical. In this situation, INU pitch angle may continue to be used as a proxy for AoA. Post flight processing of these runs should exclude any data for which the INU vertical acceleration exceeds some threshold amount above/below 1g.

Processing of yawing oscillations is conducted so as to minimize residual values of vertical wind component, w (parameter 716). In order to achieve this, offset and scaling factors are applied to the calculated AoA and AoSS, together with offsets to the measured values of INU pitch and roll angles. This processing is currently conducted by Al Rodi (Univ. Wyoming) on our behalf.

Transit up the east coast of England at 15000ft. Run 1.1 commenced at high airspeed (~ 250 kts IAS) – 6 min with 2 min yaw oscillations in the middle. Run 1.2 is deceleration to normal science speed (210kts IAS) – pitch angle increases from 2.5 to 7.5 deg. Run 1.3 at science speed, 6 min with 2 min yaw oscillation in the middle.

Profile ascent to 20000ft. Run 2.1, 6 min with 2 min yaw oscillation in the middle. Run 2.2 acceleration to high speed, starting at 6 deg pitch angle. Run 2.3 at high speed, 6 min with 2 min central yaw oscillation. Run 2.4 deceleration to science speed. Runs 2.5-2.8 are 4 legs of a reverse-heading L-pattern used to check derived wind components following calculation of self-calibration constants, flown in order of headings, north, east, west, south. Finally at 20000ft, two orbits of approx 25 deg bank angle with yawing oscillations of ~ +/- 2deg, directions to left and right.

Profile ascent to 30000ft. Run 3.1 level at science speed, 6 min with 2 min yaw oscillation. Run 3.2 acceleration to high speed, finishing at approx M=0.69. Run 3.3, 6 min at high speed with 2min yaw oscillation. Run 3.4 deceleration to science speed. Runs 3.5-3.8, reverse-headings L-pattern in order south, east, west, north. Orbits 2.1/2.2 to left and right with yawing oscillations superimposed.

Profile descent to 8000ft. Runs 4.1-4.4 are 4 legs of reverse-heading L-pattern in order south, east, west, north. Orbits 3.1/3.2 with yawing oscillations, to left and right, respectively. Run 4.5 was deceleration followed by acceleration with flaps set to 18 deg (reducing the pitch angle and AoA, for any given airspeed). This achieved a minimum pitch angle of around 0 deg (at which point the view from the flight deck felt like a significant diving attitude – obviously misleading). Run 4.6 was a repeat but with flaps retracted to cover normal range of attitude angles. Run 4.7, 6 min level at science speed, with 2 min yawing oscillation.

Profile ascent to 11000ft. Run 5.1, deceleration from 210 kts IAS to 140 kts with flaps 18 deg followed by acceleration back to science speed. Run 5.2 repeat but without flaps, minimum speed 162 kts IAS. Run 5.3 repeat.

Overall, the flight provided a good comprehensive dataset, with the important yawing orbits being conducted at 3 altitudes. Examination of Horace data in real-time suggested that the acceleration/deceleration runs were also successful in meeting their aims (*confirmed by post-flight analysis*).

General synoptic situation.

Anticyclone centred just to the SW of Ireland. NW'ly flow in the North Sea area with weak surface front lying from NE tip of Scotland into Netherlands / N.Germany. Flow in the experimental region expected to be stable / non-convective.

Mission Scientist's Log

Flight No **B.265** Date 29/1/07 Name Phil Brown Page 1 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
1114	/				Tto Coa field 7/8Sc.
					will send below
		4800			Main base ~ 3200
	/				Cloud top - fairly wet
					water streaming on screen.
1126		15000			LWC peaks were ~ 0.3
112827		"			Start R.1.1 hispeed.
1130					" R. start yaw.
113346					End R.1.1 / start 1.2
					decelerate
/					Vz fluctuations ~ +/- 0.5 ms ⁻¹
					during decel.
/					Pitch down were 2.5 to ~ 7.5 deg
113729					End 1.2
					Start 1.3 sci speed.
113943					Start yaw. wings not level
					on first cycle, use large pitch changes
114236		15000			End 1.3
					Profile 1 → F1200
114838		20000			Start R2.1 prob not steady at start.
					std. speeds.
114950					start yaws +/- 3 deg
/					looks OK.
115239		"			End 2.1.
					Start 2.2 accel. h.
					Starts at ~ 6 deg.

Aircraft Scientist's Log

Flight No

B.263

Date

29/1/07

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FAAM © 2004

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
1					Start 2.3. steady ^{1/2} speed
115755					Start yaw smaller
115949					end yaw. Pitch changes
120052		20000			End 2.3 / Start 2.4
					decelerate.
					repeats the accel. on alt
					didn't but then goes off
120413		20000			End 2.4 / Start 2.5
—			354	55 30 1 12.00	Nbound in L path.
					Vsci, 210kt 1AS.
			086		2.6 carb-bound
121806			266		2.7 wind 332/14 ms ⁻¹
122306					end 2.7 turn onto S
122411			178		2.8 325/16
122918					End 2.8
123047		20000	320		Orbit 1.1 to right, yawing
		"	300		Orbit 1.2 left, yawing.
—					w fluctuates +/- 5 ms ⁻¹
123926		"	180		Start P2 → FL300
124646		25000			restart P2 7/8 Ci above.
125257		30000	360		Start 3.1 Vsci.
125401					Yaw. 2 min.
125708		"			End 3.1
			360		Start 3.2 accelerate
—			90		3.2 interrupt. looks OK
130627					End 3.2 e reciprocal.

Mission Scientist's Log

Flight No **B.263** Date 29/1/07 Name Page 3 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
					M=0.69
130900		30000	264		Start 3.3
131032					you 2min.
131337					End 3.3 turn onto S.
131458		"	180		Start 3.4 decelerate.
131613					End repeats pretty well
—					on pitch vs. Po
131819					Start 3.5 Vsci.
132317		"			End 3.5
132423		"	92	54 30.0 0 18.0	Start 3.6
132923		"		54 30.0 0 60.0	End 3.6
133131		"	270		Start 3.7
133577					End bit short.
133626		30000	356		Start 3.8 Ci quite thick above.
—					also FL350 or above.
134126		"			End 3.8
134245		"	285		Orbit 2.1 left
134650					End 02.1
134740		"	295		Orbit 2.2
135129		30000	356		Start P3 1500ft/min
140207		15000			Intercept.
1408		9500			bit noisier at this level now
		8500			hold descent here. as
					cloud top bit higher
140925		"	175	55 24.0 1 6.0	Start 4.1 S'bound

141419

End 4.1

Mission Scientist's Log

Flight No **B.263** Date 29/1/07 Name Page 4 of 5

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
141506		8000	90	55 60 054.0	R 4.2 E bound
					330/12ms ⁻¹
					R 3 - appears to have both, along
					2 across - ldy wind changes on legs
142007		"			End 4.2
142140		"	265		Start 4.3
142638		"			End 4.3
142729		"	357	55 60 052.0	Start 4.4 wind diff appears
143227					End 4.4 mostly - E comp. on Horner display
143246		8000	325		Orbit 3.1 left.
					End 03.1
143546		"			Orbit 3.2 right.
143826					End 03.2 converge into
					Start 4.5 decel. flaps 18
					then accel
					End 4.6 no flaps
		8000			4.7 level with yaw.
					AdA diff pressure doesn't repeat
					on 4.5/4.6 but they need to be
					be scaled with P_0
					2 the ones were at diff airspeeds
		8000			Pl 4 → to 110
145612		11000			End Pl 4 18.8
					Start 5.1 flaps 18
145720	?				decel 20 → 140
145849					accel → 210 flaps 18

more or less repeats the flap run at 8000.

Mission Scientist's Log

Flight No **B.263** Date 29/1/07 Name Page 5 of 5
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[illegible]

CLOUD PHYSICS LOG Flight B263

Date: 29/01/07		Operator: papj		DRS Time: +0		AU1 Time: +0		DAU2 Time: +0		DAU3 Time: +0		Aux1 Time: +0		Aux2 Time: +0		Page 1of	
G.M.T	PCASP		FFSSP	SID1	SID2	2D2-C		2D2-P		CIP25			CIP100			Habit	Remarks
	Conc/cc	Mean R	Block TX	Count	Count	Conc/L	Max size	Conc/m3	Max size	Conc m3	Max size	LWC	Conc m3	Max size	LWC		
																	2dp and 2dc noisy
																	2dc settlled at 1134
1140	2	0.07															Start run 1.3
1142	2	0.07															
114308																	Start P1
114421	2	0.07															160
114625	2	0.07															180
114838	5	0.07															End p1
1151	4	0.09															
115239	2	0.09															End 2.1
115319	2	0.07															Run 2.2
1155	2	0.07															
1156	30	0.07															
	50	0.06															2dp and 2dc noisy because we are
1200	50	0.06															Going faster then normal
120046																	End 2.3
																	Start 2.4
1203	5	0.08															
1204	1	0.08															
1207	1	0.06															
120916	1	0.06															End run 2.5
121046	1	0.06															Start 2.6
1212	1	0.06															
1215	1	0.06															
121548	1	0.06															End run 2.6
121806	1	0.06															
1220	1	0.06															
122306	3	0.06															End 2.7
122411	1	0.06															Start 2.8
1227	1	0.14															
122918																	End run 2.8
1232	1	0.04															orbits
123345	1	0.04															
1236	1	0.04															
1339	1	0.04															
1242	1	0.1															
1245	1	0.04															climbing
1248	1	0.04															
1251	1	0.04															
125251	1	0.04															Start run 3.1
1256	1	0.1															
125710	1	0.04															End 3.1
125751	1	0.04															Start 3.2
1300	1	0.04															
1303	1	0.04															

CLOUD PHYSICS LOG Flight B263

Date: 29/01/07	Operator: papj	DRS Time: +0	AU1 Time: +0	DAU2 Time: +0	DAU3 Time: +0	Aux1 Time: +0	Aux2 Time: +0	Page 1 of
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[illegible]

CLOUD PHYSICS PROCESSING LOG

Flight number: B263
Date of flight: 29/1/07

T/O: 111437
Land: 153122

A) FFSSP PROCESSING		
Processing Stage	Done?	Comments
1) Transfer *.txt files from DVD to processing PC Bnnn_FFSSP_hh.txt for each hour of data Bnnn_FFSSP_HVMS.txt		hh = Last sec processed =
2) FTP the files (ascii) from the PC to directory PMSDATA: on FLOODS		File size =
3) FLOODS> RUN MRFB:[PMS.FAST_FSSP]FFSSP_EXTRACT_TAS a) Flight number: Bnnn b) Path name: MFDDATA:Bnnn_MFDX c) Output directory: PMSDATA: d) Start time: 0 if unknown (see comment box) e) End time: 240000 if unknown		Use time just before/after take-off/landing. If T/O /landing just after/before the hour, ensure start/end time is before/after the hour if there is an FFSSP_hh.txt file for that hour.
4) FLOODS> RUN MRFB:[PMS.FAST_FSSP]FFSSP_PROCESS_TXT a) Flight number: Bnnn b) Directory: PMSDATA: c) TAS in processing: Y d) Vel threshold (clicks) 0 e) Calibration file: Use the most recent calibration file. Format FFSSP_CALddmmyyyy.txt Calibration files to be stored in MRFB:[PMS.FAST_FSSP] f) Adjust FFSSP time Y/N g) If Y, enter value to add to data time (seconds)		Total glitches = Sec file written ok? Note calibration file used Yes only if gross errors occur in FFSSP time eg; ~ 1hour
5) FLOODS> WAVE a) WAVE> write procffssp_to_m5,'pmsdata:Bnnn_procffssp.dat', 'mfddata:Bnnn_mfdX','pmsdata:Bnnn_m5procffssp',/auto b) WAVE> exit		Use PVWAVE for this section Note time correction applied to FFSSP by /auto =
6) FLOODS> MODIFY a) Modifying datasets: pmsdata:Bnnn_m5procffssp b) Dataset: mfddata:Bnnn_mfdX c) New dataset: mfddata:Bnnn_mfdY (y=x+1) d) Parameter description file: leave blank to use default		Input file size = M5 output file size =
7) CHECKS: i). Are FFSSP and JW/Nevzorov LWC synchronized in time? In flight_plot, parameters JW LWC para 535 Nevzorov LWC para 602 FFSSP LWC para 1202 ii). If not, repeat from step 5b replacing /auto with addt=x which adds x+20 secs to FFSSP time.		Synchronized?

CLOUD PHYSICS PROCESSING LOG

Flight number: B263
Date of Flight: 29/1/07

B) 2D PROCESSING		REPROCESS +1hr
Processing Stage	Done?	Comments
1) Transfer B263.dat file from CD/DVD to PC	y	
2) Zip up file on PC (B263.zip)	Y	
3) FTP the zipped file (binary) from the PC to the directory SEADAS_DATA:[SEADAS_DATA] on FLOODS	Y	
4) Log on to FLOODS	Y	
5) Unzip SEADAS_DATA:[SEADAS_DATA]B263.zip		Size of B263.dat = 403493
6) FLOODS> WAVE WAVE> CONVERT_SEADAS_FILE a) Input file: SEADAS_DATA:[SEADAS_DATA]Bnnn.dat b) Output file: SEADAS_DATA:[SEADAS_DATA]Bnnn_seadas.dat WAVE> exit		Use PVWAVE for this section Blocks read = 72132 Blocks written = 72119 Bad reads = 9
7) FLOODS> RUN MRFB:[PMS.SEADAS]READM200_FILE a) Default directory: PMSDATA: b) Flight number: B263 c) Disk file name: SEADAS_DATA:[SEADAS_DATA]B263_seadas.dat d) Comment string: e) Start time: <i>0 if unknown (T/O – 5 min)</i> f) End time: <i>240000 if unknown (Land + 5 min)</i> g) Read 2DC: Y h) Read 2DP: Y i) Secondary data: Y j) FSP-SYNC: Y k) cmd.str: Y l) Auto time correction: N m) Full length secondary: N		Start = 0 End = 240000 Ignore error message scroll (vestigial error from tapes) Are FRW, FSP, IMB, PCA,SEC yes files in PMSDATA? Are they non-zero in size? no
8) FLOODS> WAVE i). WAVE> imagedisplay a) 2D directory name: PMSDATA: b) Flight number: Bnnn c) File generation no: 0 d) Time from IWC plot: N e) Select probe: (1) 2DC (2) 2DP f) Start time: <i>As in 7e above</i> g) End time: <i>As in 7f above</i> h) Time interval (sec): 5 recommended (0 for all images) ii). WAVE> auto_image a) 2D directory name: PMSDATA: b) Flight number: Bnnn c) Enter date: YYYYMMDD d) Enter start time: <i>0 if unknown (T/O – 1 min)</i> e) Enter end time: <i>240000 if unknown (Land – 1 min)</i> f) Enter time interval (sec) between successive imaged blocks: 10 iii). WAVE> exit to create files iv). FTP ascii *.PS files from PMSDATA: to PC v). Load each into Ghostview or other pdf-converter vi). Output as pdf file (720 dpi resolution), appending name prefix of CORE-CLOUD-PHY_ to converted files		2D image display and printing Must be done from FLOODS itself. Note any problems with images Prepare imagery for Core data From own PC again Start = End = FAAM_YYYYMMDD_R0_ Bnnn_2Dx-images.ps Notes on this in instructions

9) FLOODS> RUN MRFB:[PMS.SPEC2D.AUTO]PROCESS2D_AUTO	Y	NB. an error message may appear, floating point exception, rerun and use time quoted in error message, repeat until successful.
a) Flight number: Bnnn	Y	
b) Directory: PMSDATA:	Y	
c) File generation: <i>Hit enter</i>	Y	
d) Time correction: <i>Time offset of the 2D data</i>	Y	
e) TAS: Y	Y	
f) MFD directory: MFDDATA:Bnnn_MFDX	Y	X =b
g) Probe number: (1) 2DC (2) 2DP (0) Both <i>0 unless either probe known to be faulty</i>	Y	
h) Start time: <i>0 if unknown (T/O + 30sec)</i>	Y	Start =0
i) End time: <i>240000 if unknown (Land – 30sec)</i>	Y	End = 240000
j) Nominal averaging: 0.2 seconds for conversion to M5	Y	
k) Particle type 2DC: 8 if known to be in ice cloud	Y	Time data processed to =
11 if known to be in water cloud	Y	150454.0
l) Particle type 2DP: 8 if known to be in mixed-phase	Y	2dproc files present?
8 if unknown	Yy	*.2dc, *.2dp and *.dat
m) Coefficient choice: 2	Y	
n) Output root filename: PMSDATA:Bnnn_PROC2D	Y	
10) FLOODS> WAVE	Y	Use PVWAVE for this section
i) WAVE> WRITE_PROC2D_TO_M5, 'PMSDATA:BNNN_PROC2D.DAT', 'PMSDATA:BNNN_M5PROC2D'	Y	Error message about HDDR file should be ignored.
ii). exit	y	Records =
11) FLOODS> MODIFY		
a) Modifying datasets: pmsdata:Bnnn_m5proc2D		
b) Datset: mfddata:Bnnn_mfdX		X =b
c) New dataset: mfddata:Bnnn_mfdY		Y = (X+1) c
d) Parameter description file: leave blank to use default		
12) CHECKS:		
Are 2DC/2DP IWC of comparable magnitude and well-correlated with Nevzorov TWC? <i>In flight_plot, parameters</i> <i>Nevzerov TWC para 605</i> <i>2DC IWC para 1302</i> <i>2DP IWC para 1312</i>		Correlated?

CLOUD PHYSICS PROCESSING LOG

Flight number: B263
Date of Flight: 29/1/07

C) PCASP PROCESSING		
Processing Stage	Done?	Comments
1) Complete stage 7) in 2D processing	Y	
Ensures B263_FSP.DAT containing raw PCASP data is written to directory PMSDATA:	Y Y	
2) FLOODS> RUN MRFB:[PMS.PCASP]PROCPCASP_NEW	Y	
a) Flight number: Bnnn	Y	Min size =1 Vol flow rate = 1.8
b) File name: PMSDATA:B263_FSP.DAT	Y	
c) Root output name: PMSDATA:B263_PROCPCASP	Y	
Produces PMSDATA:Bnnn_PROCPCASP.DAT (binary)	Y	
PMSDATA:Bnnn_PROCPCASP.OUT (ascii)	Y	
d) Minimum size channel: <i>default = 1</i>	Y	
<i>If smallest size channel are known to be noisy the value of the highest noise free channel to be entered here</i>	Y Y	
e) Calibration volume flow rate:	Y	
<i>Use the most recent value. 1.8ccs⁻¹</i>	Y	
<i>Calibration files to be stored in Exeter</i>	Y	
<i>Entering zero gives default value = 1.0 cm³s⁻¹</i>	Y	
f) Time correction: <i>Same value as used in 2D processing stage 9d</i>	Y	
g) Start time: <i>0 if unknown</i>	Y	
h) End time: <i>240000 if unknown</i>	Y	
3) FLOODS> WAVE	Y	Use PVWAVE for this section
i).WAVE> write_procpcasp_to_m5, 'pmsdata:Bnnn_procpcasp.dat', 'pmsdata:Bnnn_m5procpcasp'	Y	
ii). WAVE> exit	Y	
4) FLOODS> MODIFY	Y	
a) Modifying datasets: pmsdata:Bnnn_m5procpcasp	Y	X =a Y = X+1 =b
b) Dataset: mfddata:Bnnn_mfdX	Y	
c) New dataset: mfddata:Bnnn_mfdY	Y	
d) Parameter description file: <i>leave blank to use default</i>	y	
5) CHECKS		
Are PCASP and JW peaks synchronous? <i>In flight_plot, parameters</i> <i>Neph – total blue scatter.</i> <i>PCASP conc para 1550</i>		Merged OK?

ARIES flight log

Flight: B263

page 1 of 6

Date: 29/Jan/07 Operator(s): S. ROGERS

Res: 1

Gain A: 2 B: 2

Loc./Notes: North Sea (Newcastle) ARIES testing.

Scans: either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]". View: mirror angle.

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
0953	on the ground	1x60	C	C	71	31	Cold
0954	"	1x60	H	C	71	31	Hot
103545	"	1x60	C	C	71	31	Cold
103624	"	1x60	H	C	71	31	Hot
11:15	TAKE OFF						
11 24 00	FL150??	1x60	C	C			Cold
11 24 38		"	H	C	71	30	Hot
11 25 27		180x1	Z	O			Zeith. No obs. Ci No pause after
11 27 14		1x60	C	C			Cold
11 27 52		1x60	H	C			Hot
	R1-1 FL150						To include gamma
11 28 55		1x60	C	C			Cold
11 29 46		1x30	C	C			
11 30 09		"	H	C			Tauwings.
11 30 45		90x1	Z	O			Z - no pause after
11 31 41		1x30	C	C			closing as C starts.
11 32 04		"	H	C			Slight loss of C above
	R1-new. R1-2						
11 34 04	FL150	1x60	C	C	71	31	
11 35 02		"	H	C			Thin Ci above - mostly to the east. - less above
11 35 49	ENDING	180x1	Z	O			Zeith. thin shutter closed pause afterwards
11 38 20		1x60	C	C			(looking at H30 during pause)
11 38 58		"	H	C	71	31	
11 40 07	FL150	1x60	C	C	71	31	
11 40 44		"	H	C			well, short pause!
11 41 30		600x1	Z	O			Zeith. No pause after. Thin Ci
11 43 03	P1 ↑						P1 start during Zeith view
11 47 20		1x60	C	C			11:46 Start of Housekeeping
11 48 05		"	H	C	71	30.5	- I knew I'd forgotten something!

ARIES flight log

Flight: B263

page 2 of 6

Date:	Operator(s):	Res:	Gain A: B:
Loc./Notes:			

Scans: either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]". View: mirror angle.

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
11 48	R2-1 FL200	1x60	C	C			
11 49 22	?	"	H	C			
11 50 16		600x1	Z	O	70	31	No pause after. Zeith - Ci above slightly more obvious
11 53 19	R2-2						(Yanking (same rolling at end of run) → 1152 ish. Ci thickening during view.
11 5531	FL200	1x60	C	C			
11 56 08		"	H	C	71	31	Acceleration during run.
11 57 16		1x60	C	C			
11 57 52		"	H	C			
11 58 40		120x1	Z	O			Zeith no pause Thicker Ci above
11 59 48		"	N	C	71	31	7/8 cloud below - almost 8/8.
12 01 03		1x60	C	C			
12 01 40		"	H	C			
12 02 17		1x60	C	C			
12 02 50		"	H	C			
12 03 31		120x1	N	C	71	30	7/8 below almost 8/8.
12 04 37		"	Z	O			Zeith ← Thin Ci above no pause after
12 05 50		1x60	C	C			
12 06 24		"	H	C			
							Changing Hg to 80°C
12 10 55		1x60	C	C	81	30	
12 11 32		"	H	C			
12 12 22		180x1	Z	O	80	30	Zeith - Ci above (too sunny to tell how much Ci above)
12 14 10		1x60	C	C	81	31	
12 14 47		"	H	C			
12 18 11		1x30	C	C	81	30	
12 19 07		"	H	C			
12 19 32		90x1	Z	O	80	30	Z no pause Ci above.
12 20 35		1x30	C	C			
12 20 52		"	H	C	81	31	

ARIES flight log

Flight: B263

page 3 of 6

Date:

Operator(s):

Res:

Gain A: B:

Loc./Notes:

Scans: either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]". View: mirror angle.

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
12 24	FL 300	1x60	C	C			
12 24 54		"	H	C			
12 25 40		180x1	Z	O			Ci above patchier than before. Pause 1min
12 25 15		1x60	C	C			
12 28 49		"	H	C	81	31	
	O1.1						
12 31		1x60	C	C			
12 31 38		1x60	H	C			
12 32 22		120x1	Z	O			Ci above. (yawing during orbit is not nice)
12 33 32		120x1	N	C	80	31	End O1.1 12 33 45
	O1.2						
12 34 43		1x60	C	C	81	31	
12 35 18	FL 200	"	H	C	81	30	
	P2 ↑						
12 52	FL 300 FL 300	1x60	C	C	81	31	
12 53 28		"	H	C			
12 54 12		120x1	Z	O			Yawing. Moderate Ci above.
12 55 14		"	N	C			Shutter closing after N start. 7/8 below.
12 56 37		1x60	C	C	81	31	
12 57 19		"	H	C			
12 57 58	FL 300	1x60	C	C			
12 58 38		"	H	C			
12 59 23		180x1	Z	O	80	31	Thinner Ci above. <u>No</u> pause.
12 01 04		1x60	C	C			
13 01 34		"	H	C			
13 02 20		1x60	C	C			
13 02 55		"	H	C			
13 03 35		180x1	Z	O	80	31	Thin Ci above. 1 min pause after (looking at C93)
13 06 10		1x60	C	C			
13 06 46		"	H	C	81	31	

ARIES flight log

Flight: B263

page 4 of 6

Date:

Operator(s):

Res:

Gain A: B:

Loc./Notes:

Scans: either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]". View: mirror angle.

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
13 08 58	FL300	1x60	C	C	81	31	
13 09 32		"	H	C			
13 10 24		180x1	Z	O			Yawing. - Moderate Ci above No pause
13 12 01		"	N	C			Edge of 7/8 in 1/8 gap.
13 13 46		1x60	C	C	81	31	
13 14 23		"	H	C			
13 15 03		1x60	C	C	81	31	Decelerating
13 15 39		"	H	C			
13 16 18		600x1	Z	O	80	31	Ci above.
13 21 31		1x60	C	C	81	31	
13 22 26		1x60	H	C			
13 24 25		1x30	C	C			
13 24 46		"	H	C			
13 25 18		90x1	Z	O	80	30	No pause.
13 26 15		1x30	C	C			
13 26 35		"	H	C			
13 26 59		90x1	Z	O	80	31	Thin Ci above No pause
13 27 51		1x30	C	C			Shutter closing during CBB view.
13 28 13		"	H	C			
13 28 41		90x1	Z	O	81	30	Thick Ci? + 1 min pause looking at CBB
13 30 30		1x30	C	C			
13 30 47		"	H	C	81	31	
13 31 33		1x60	C	C	84	30.5	
13 32 22		"	H	C			
13 33 05		180x1	Z	O	80	30	Moderate Ci above No pause
13 34 47		1x60	C	C			
13 35 19		"	H	C			
13 36 28		1x60	C	C			
13 37 01		"	H	C			
13 37 47		120x1	Z	O			Moderate Ci
38 48		120x1	N	C	81	30	Closing & start of N N + 5° (oops!)

ARIES flight log

Flight: B263

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Date:

Operator(s):

Res:

Gain A: B:

Loc./Notes:

Scans: either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]". View: mirror angle.

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
13 39 59	FL300	1 x 60	C	C			
13 40 34		"	H	C			
	OZ.1						
13 42 47	FL300	1 x 60	C	C			Orbit to the left
13 43 21		"	H	C			Yawing
13 44		120 x 1	Z	O			Thin C: above No pause
13 45 15		1 x 60	C	C	81	31	
13 45 50		"	H	C			
13 47 17	OZ.2	1 x 60	C	C			More yawing Orbit to the right
13 47 48		"	H	C			
13 48 35		120 x 1	Z	O			No pause
13 49 40		1 x 60	C	C			Closing drag stick - shudder
13 50 19		"	H	C			
	P3 ↓ 1500 ft/min FL080						Setting H ₈₈ = 60°C Setting α = 50°C Setting C ₈₈ = 20°C
14 12 10		1 x 30	C	C			Is C ₈₈ settled yet?
14 12 32		"	H	C			
14 13		120 x 1	Z	O			No pause Thin C: above.
14 14 23		1 x 30	C	C			
14 14 45		"	H	C			
14 15 10		1 x 60	C	C	51	22	
14 15 44		"	H	C			
14 16 26		180 x 1	Z	O	51	22	Thin C: above + contrails. No pause
14 18 05		1 x 60	C	C	51	22.5	
14 18 39		"	H	C			
14 19 24		1 x 60	C	C			
14 19 56		"	H	C			
14 21 40		1 x 60	C	C			
14 22 14		"	H	C			
14 22 52		180 x 1	Z	O	51	22	Pause 1 min after. Mod C: above
14 25 25		1 x 60	C	C			
14 25 54		"	H	C			

ARIES flight log

Flight: B263

page 6 of 6

Date:

Operator(s):

Res:

Gain A: B:

Loc./Notes:

Scans: either "[IGMs]X[co-adds]", or "[stop DRS time]" if in start/stop, or "[macro name]". View: mirror angle.

DRS time	Flt ptrn	Scans	View	Shtr	HBB	CBB	Comments
14 27 29	FL080	1 x 60	C	C	51	22.	
14 28 12		"	H	C			
14 28 53		600 x 1	Z	O	51	22	Ci slightly thinner than before.
14 34 06		1 x 60	C	C			← Bowing at 14 32 27, entering 03.1 (left)
14 34 40		"	H	C	51	23	
14 35 36	032 R	1 x 60	C	C			
14 36 08		"	H	C			
14 36 47		120 x 1	Z	O	51	22.	Pause a while after.
14 38 28		1 x 60	C	C	51	22.	
14 39 00		"	H	C			
14 39 59		1 x 60	C	C			Decelerating to 140 km/h → accelerating over & over.
14 40 40		"	H	C	51	22.	
14 41 20		120 x 1	Z	O	51	23.	Pause ^{40 sec.} with shutter open.
14 43 03		1 x 60	C	O	51	23	{ shutter open (close after H).
14 43 41		"	H	O	54	22.	}
14 46 31		1 x 60	C	C	51	23	
14 47 04		"	H	C			Pull up & turn.
14 48 15		1 x 60	C	C			
14 48 48		"	H	C			
14 49 28		120 x 1	Z	O	80.5	22.5	Then Ci above. Yawing
14 50 32		"	N	C	51	22	7/8 below.
14 51 43		1 x 60	C	C	51	23	
14 52 17		"	H	C	51	22.5	
	P ↑						Switching to H ₈₅ = 80; C ₈₅ = 40.
14 56 30	FL ???	1 x 60	C	C	81	41	
14 57 08		"	H	C			
14 57 46		120 x 1	Z	O	81	40	Ci & contrails above. Slowing down
14 58 50		"	N	C			7/8 below. Speeding up.
15 00 00		1 x 60	C	C	81	40	
15 00 39		"	H	C			

Flight:

b263

KEY

Not Fitted

Fitted, Not Operated

Duff Data

Minor Problems

OK

Thermometers

Cabin Temperature:

Heimann:

Deiced Temp:

Non-deiced Temp:

Hygrometers

FWVS:

General Eastern:

Johnson Williams:

Nevzorov:

Total Water Probe:

Cameras

Downward Facing:

Forward Facing:

Rearward Facing:

Upward Facing:

Navigation + Aircraft

Cruciform GPS:

GIN Applanix:

INU Honeywell:

Radar Altimeter:

RVSM IAS:

RVSM Static Pressure:

XR5 GPS:

Misc Core

AMTG:

AVAPS:

Cabin Pressure:

Fax machine:

Printer:

S9 Static Pressure:

Satcom C:

Satcom H:

Turbulence

Check Press:

Turbulence

Diff Press:

Weather Radar:

DLUs:

DLU AERACK:

DLU BBR Lower:

DLU BBR Upper:

DLU Core Chem:

DLU Core Consoles:

DLU Port Aft:

DLU Port Fwd:

DLU Stbd Fwd:

Radiometers

Lower:

BBR (clear) Lower:

BBR (IR) Lower:

BBR (red) Lower:

Upper:

BBR (clear) Upper:

BBR (IR) Upper:

BBR (red) Upper:

ARIES:

DEIMOS:

IR Camera:

JNO2 Lower:

JNO2 Upper:

JO1D Lower:

JO1D Upper:

MARSS:

SHIMS Lower:

SHIMS Upper:

SWS:

TAFTS:

Cloud Probes

2DC:

2DP:

FFSSP:

PCASP:

ADA:

CCN:

CDP:

CIP 100:

CIP 25:

CPI:

CVI:

SID1:

SID2:

Aerosol

CPC 3025A:

Filters 47mm:

Filters 90mm:

Neph - Dry:

Neph - Wet:

PSAP:

AMS:

CPC 3010A:

INC:

VACC:

Chemistry

CO Aerolaser 5002:

NOx TE42C:

Ozone TE49C:

Ozone TE49:

SO2 TE43C:

TDLAS (NIR) CH4:

TDLAS (NIR) CO2:

FAGE:

Formaldehyde:

NOxy:

ORAC:

PAN:

PERCA:

Peroxide:

PTRMS:

TDLAS (1C):

WAS Bags:

WAS Bottles:

Misc Non-Core

CASI/ATM:

LIDAR:

LTI:

SAW Hygrometer:

Report Created 05/02/2007 11:36:52

Last Updated:

30/01/2007 10:30:17



Faults / Incidents Log

Flight No. B263

Date: 29th January 2007

Instruments

1. TWC – u/s, not fitted
2. FWVS Rack– ethernet cable not connected (probably stowed behind dado panel) so can't see FWVS data on HORACE
3. Nevzorov – LWC winding not heating up or responding to water spray pre-flight.
4. HORACE – Satcom C page, “H” command to step through received message doesn't work.

Aircraft

Interference on intercom still present

Satcom H Calls

None

Pre-Flighter's Log

Date: 29 Jan 2007

Flight No: B263

Pre-Flighter: Bob Wells

Item	✓ or x	Location	Action	Comments
1	<input checked="" type="checkbox"/>	Hangar	Collect Dustbin, put on a/c	
Aircraft Cabin				
2	<input checked="" type="checkbox"/>	Core Chemistry	Gases x 3 ON	No CO
3	<input checked="" type="checkbox"/>	Cabin	All Racks Checked	
4	<input checked="" type="checkbox"/>	Fwd CorCon	All reqd CBs made	
5	<input checked="" type="checkbox"/>	Aft CorCon	CBs made, PCs ON	
6	<input checked="" type="checkbox"/>	HORACE	Optical Disk loaded	
7	<input checked="" type="checkbox"/>	HORACE	Recording data	
8	<input checked="" type="checkbox"/>	HORACE	DLU Status Checked	
9	<input checked="" type="checkbox"/>	HORACE	HORACE Status Checked	
10	<input checked="" type="checkbox"/>	Satcom H	Power LED ON	
11	<input checked="" type="checkbox"/>	Nevzorov	Checked and OFF	iWIC Net working?
12	<input checked="" type="checkbox"/>	GPS	Checked	GPS 13 sec ahead of ATIG OK
13	<input checked="" type="checkbox"/>	INU	Align	
14	<input checked="" type="checkbox"/>	Cameras Pictures	Checked x 4 OK	
15	<input checked="" type="checkbox"/>	Core Chemistry	Instruments Checked OK	No CO
16	<input checked="" type="checkbox"/>	Core Chemistry	CO Flows Checked OK	
17	<input checked="" type="checkbox"/>	FWVS	Set up	
18	<input checked="" type="checkbox"/>	Video x 2	Records okay, Rewind	
19	<input checked="" type="checkbox"/>	Delced Rosemount	Heater Checked / Set	
20	<input checked="" type="checkbox"/>	Heimann	Calibration Checked	
21	<input checked="" type="checkbox"/>	TWC	ON & Checked	
22	<input checked="" type="checkbox"/>	GE	Balance checked	
23	<input checked="" type="checkbox"/>	INU	Navigate then back to Align	
24	<input checked="" type="checkbox"/>	Hubs x 4	Checked ON	
25	<input checked="" type="checkbox"/>	Fwd Console	Miss. Sci Laptop CB made	& CB on Port Fwd SSP
26	<input checked="" type="checkbox"/>	CNC	Butanol filled	
27	<input checked="" type="checkbox"/>	CGPS	Set up	
28	<input checked="" type="checkbox"/>	Miss. Sci Laptop	Checked Onboard	
	<input type="checkbox"/>			
	<input type="checkbox"/>			
	<input type="checkbox"/>			

External Checks overleaf

Pre-Flighter's Log

<u>Item</u> <input type="checkbox"/> or <input checked="" type="checkbox"/>	<u>Location</u>	<u>Action</u>	<u>Comments</u>
<u>External</u>			
29	<input checked="" type="checkbox"/> Turb Probe	Clean if reqd, Photo taken	
30	<input checked="" type="checkbox"/> JW	Cleaned & Checked	
31	<input checked="" type="checkbox"/> DI Rosemount	Cleaned & Checked	
32	<input checked="" type="checkbox"/> NDI Rosemount	Cleaned & Checked	
33	<input type="checkbox"/> Nevzorov	Cleaned/windings checked	<i>Suspect TW</i>
34	<input checked="" type="checkbox"/> GE	Cleaned & Checked	
35	<input type="checkbox"/> Lower BBRs	Domes cleaned/checked	
36	<input checked="" type="checkbox"/> Camera Windows	Cleaned	
37	<input type="checkbox"/> Heimann	Lens checked OK	
38	<input checked="" type="checkbox"/> TWC Cover	Fitted if required	
39	<input checked="" type="checkbox"/> All other covers	Removed	
40	<input type="checkbox"/> Dustbin	Returned to hangar	
41	<input type="checkbox"/> Tools	Check ALL in Toolkit	
42	<input type="checkbox"/> Tools	Avalon informed	
<u>Avalon Checks</u>			Signed
43	<input type="checkbox"/> Upper BBRs Checked & Cleaned		
44	<input type="checkbox"/> ICEX applied		
45	<input type="checkbox"/> Traps empty (weekly only)		

MISSING LOG SHEETS:

The following log sheets are not available for flight B263:

Log	Reason
Core Chemistry	pre flight only, unmanned operation on auto calibrate so no In Flight log
FWVS	No log is ever taken for FWVS

Document control

Revision	Date	Author	Comments
r0	26 Mar 2007	Doug Anderson	Initial version missing the above noted logs
r1			
r2			

VIDEO RECORDINGS:

3 x Forward Facing Cameras

3 x Upward Facing Cameras

Digital8 video recordings from this flight reside with :

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