

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

AOCWF-1

Flt ID: 020725N	From: KMCF	To: KMCF
Flt No: 02-66	Blk In: 1649Z	ATA: 1640Z
ETD: 14Z	Blk Out: 1346Z	ATD: 1353Z
ETE: 17Z	Blk Time: 3:03 3.1	Flt Time: 2:47 2.8
Sponsor Org: NOAA	Program: CAL'S	Purpose: TEST FLIGHT

AOC Personnel

AC: FINKE, M	Sys Eng: GOLDSTEIN, A
CP: FINN, M	Data Sys: HORN BROOK, L
Nav:	Radar:
FE: KITSON, G / ROTTEVEEL, K	GPS/BT: BROGAN, D
FD: C2424K, S / PARRISH, J	Cld Phys:
Avionics:	

Participating Scientists / Visitors / AOC

Name (Last, First)	Activity on Aircraft	Affiliation

Proposed/Actual Mission Remarks (Recco, Fixes, Storm, PENET, NHOP #)

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

AOCWPF2

Flt ID: 020725N	Time Off: 1353Z	Time On: 1640Z			
	A/C (Take Off)	Wx Station (Take Off)	A/C (Land)	Wx Station (Land)	
Pressure	1020.1	30.10	1019.9		
	Number	Data Disposition / Date / Quality			
Flt Lvl Tapes					
Radar Tapes					
Cloud Physics Tapes					
Video Tapes					
AXBT					
AXCP					
AXCTD					
Dropsondes					
Video					
	Forward	Left Side	Right Side	Down	Remarks
Time On					
Time Off					
Rate					
Remarks					

N49RF AVAPS DropSonde Log

N49RF Project: Hurr 2002

Flight ID 020725N

Mission: Test Flight

Flight #: TF02

System Status: OK

Drop #	Sonde Serial Number	Chn. #	Time (Zulu)	Press. offset	Winds time	Operator Initials	Comments / Drop Status / Failure Reason	OOD <input checked="" type="checkbox"/>
1	003 515 107	15	1437	Ø	28	all	Rev B	✓
2	021 735 079	2	↓	Ø	—		Rev C ^{SOME WINDS} FAST FALL	
3	021 735 030	3	↓	Ø	21		Rev C - OSC. 7 sec period	✓
4	021 735 150	4	↓	Ø	—		Rev C ^{SLOW FALL} NO LAMP/4 DEG	
5	003 338 043	1	1547	Ø	46		Rev B -	✓
6	021 735 228	2	↓	.3	96		Rev C LATE WINDS ^{POOR WINDS}	
7	021 735 218	3	↓	.2	—		Rev C - FAST FALL	
8	021 735 077	4	↓	.3	41		Rev C	✓
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								

1

The G-IV conducted a test flight on Thursday July 25, 2002. The test flight took place in the Gulf of Mexico above buoy 42003. The aircraft released 4 dropsondes from FL450 at 1437Z above the buoy. Two of the dropsondes had valid data and this data was then compared to the data collected aboard the G-IV. Spot observations from the dropsondes in both the raw and QC format were compared to the data from the G-IV. The data from the G-IV was a 1-minute average of straight and level flight (30 seconds prior to the buoy and 30 seconds after the buoy). The G-IV flew four legs at FL430, FL410, FL390 and FL370 above the buoy at 1457Z, 1506Z, 1516Z and 1545Z respectively. Note: The leg conducted at FL370 had a closest approach to the buoy with straight and level flight at time 1545:45Z which was a distance of 6 nm. The data was collected for 60 seconds beyond the CPA and averaged. In addition, the temperature and moisture data from dropsonde 143725 at FL370 was interpolated based on the static pressure between 215.6 and 216.4 mb for the data at 216.0 mb.

The data from the G-IV compared quite well to the dropsonde data. As expected PS2M appears to be the better source of static pressure and compared much better with the dropsonde data than did PS1M. AT2 remains the best performing sensor in clear and stable conditions. DPRC provided a much closer reading to the dropsonde values than DPLC. At the highest altitudes, DPLC was significantly warmer (as has been the case in the past). Although DPRC provided lower/drier readings than DPLC, DPRC was maxed out at about -76C and was nearly 10 degrees warmer than the dropsonde readings at FL430. The CRYO dewpointer will be a significant increase in dewpoint measurement capability when installed and operational. The wind data on the G-IV did not provide quite as good of a comparison as the other meteorological parameters. The wind direction averaged about 30 degrees to the right of the dropsonde data (similar to past test flights) and the wind speeds were off by about 5 knots. The winds were relatively light, generally from the east at about 5-15 knots.

As mentioned previously the first set of dropsondes provided two valid data sets. The surface pressure from these dropsondes were 1019.1 (Rev B) and 1019.4 mb (Rev C) at 1451Z. Both of the dropsondes splashed within 3 nm of the buoy. The pressure reading from the buoy at 15Z was 1019.1 mb. The second set of dropsondes provided four valid surface pressure readings. The dropsondes splashed at 1600Z and had surface pressures of 1019.1, 1019.6, 1019.3, and 1019.0 mb. Although the third dropsonde was a fast fall, it provided the best comparison to the buoy reading which was 1019.2 mb at 1600Z. All four dropsondes splashed within 10 nm of the buoy. The first buoy was a Rev B dropsonde and the following three were all Rev C's.

On recent flights from Gulfstream and to/from Boca Chica, the aircraft flew around FL250 and showed a warm bias of approximately 1.0 degree. This was very similar to the warm bias seen with the old sensor at similar altitudes. This test flight was the first opportunity to fly the newly installed enhanced Rosemount temperature probe at high altitude (FL410-450). At FL450 the new sensor indicated a warm bias of approximately 2.3 degrees and at altitudes between FL370-FL430 the warm bias was only around 1.0 degrees. Previously, the warm bias at high altitudes averaged between 3.5 and 4.0 degrees.

Listed below are tables detailing the meteorological data comparison from the legwork at FL430, FL410, FL390 and FL370 from the G-IV and the dropsondes.

FL430						
Source	Altitude	Static Pressure (PS1M/ PS2M)	Ambient Temperature (ADCSAT/AT1/ AT2/AT3/AT4)	Dewpoint Temperature (DPRC/DPLC)	Wind Direction	Wind Speed
G-IV	13692	159.68 162.10	-62.3 -63.9 -63.8 -62.5 -63.1	-76.1 -64.5	141	7.6
Drop 143705						
Raw	13756	159.7	-63.1	-85 / 3%		
QC						
Raw	13668	162.0	-63.6	-86 / 3%		
QC						
Drop 143725						
Raw	13759	159.6	-62.8	-81 / 6%	110	9.11
QC						
Raw	13657	162.2	-63.6	-81 / 7%	110	9.5
QC						

FL410						
Source	Altitude	Static Pressure (PS1M/ PS2M)	Ambient Temperature (ADCSAT/AT1/ AT2/AT3/AT4)	Dewpoint Temperature (DPRC/DPLC)	Wind Direction	Wind Speed (m/s)
G-IV	13110	176.29 178.35	-58.6 -60.2 -59.9 -59.2 -59.0	-73.0 -63.3	112	8.4
Drop 143705						
Raw	13149	176.2	-61.2	-80 / 6%	90	9.5
QC	13205	176.2	-60.8		89	9.5
Raw	13077	178.3	-60.9	-80 / 6%	87	9.0
QC	13132	178.3	-60.3		85	8.2
Drop 143725						
Raw	13149	176.2	-61.4	-76 / 11%	89	9.4
QC	13202	176.2	-60.7		88	10.1
Raw	13075	178.3	-61.0	-76 / 11%	89	10.8
QC	13129	178.3	-60.4		87	9.7

FL390						
Source	Altitude	Static Pressure (PS1M/ PS2M)	Ambient Temperature (ADCSAT/AT1/ AT2/AT3/AT4)	Dewpoint Temperature (DPRC/DPLC)	Wind Direction	Wind Speed (m/s)
G-IV	12518	194.41 196.27	-55.9 -56.5 -57.0 -56.9 -56.3	-68.0 -61.2	137	3.3
Drop 143705						
Raw	12529	194.6	-57.3	-75 / 8%	81	5.4
QC	12585	194.5	-56.8		89	5.2
Raw	12472	196.3	-57.1	-74 / 9%	90	5.1
QC	12526	196.3	-57.0		97	4.7
Drop 143725						
Raw	12535	194.4	-57.6	-71 / 14%	74	4.7
QC	12588	194.4	-57.1		87	4.6
Raw	12477	196.2	-57.4	-71 / 15%	88	4.6
QC	12529	196.2	-57.2		96	4.5

FL370						
Source	Altitude	Static Pressure (PS1M/ PS2M)	Ambient Temperature (ADCSAT/AT1/ AT2/AT3/AT4)	Dewpoint Temperature (DPRC/DPLC)	Wind Direction	Wind Speed (m/s)
G-IV	11900	214.55 216.02	-50.4 -51.3 -51.5 -51.4 -50.9	-62.1 -60.0	147	4.4
Drop 143705						
Raw	11908	214.5	-53.5	-66 / 18%	95	1.9
QC	11961	214.5	-52.7	-65 / 18%	107	1.9
Raw	11862	216.0	-53.1	-65 / 19%	105	1.8
QC	11917	216.0	-52.3	-65 / 19%	117	1.8
Drop 143725						
Raw	11911	214.4	-53.8	-63 / 29%	107	1.4
QC	11961	214.4	-53.0	-62 / 29%	130	1.5
Raw *	11865	216.0	-53.4	-63 / 29%	118	1.6
QC *	11918	216.0	-52.6	-62 / 29%	136	1.6