

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

FLT ID: 980806	FM: KMLF	TO: KMLF
FLT NO: 98-006	BLK IN: 1906Z	ATA: 1855Z
ETD: 1400Z	BLK OUT: 1358Z	RTD: 1410Z
ETE: 1900Z	BLK TIME: 5.08 5.1	FLT TIME: 4:45 4.8
SPONSOR ORG: NOAA	PROGRAM:	PURPOSE: CAL FLIGHT

0A0 PERSONNEL

RC	MCKIM, G / ✓	SYS ENG	LYNCH, T ✓
CP	TAGGART, B ✓	DATA SYS	
NAV	RATHBUN, D ✓	RADAR	
FE	WADE, S / MOORE, H ✓	BT/ODW	CARPENTER, D ✓
RADIO		CLD PHYS	
FD	CZYZYK, S / DAMIANO, B ✓	DOPPLER	

PARTICIPATING SCIENTIST/VISITORS/OAO

LAST, FIRST NAME	ACTIVITY ON A/C	AFFILIATION
31		
47		
PROPOSED/ACTUAL MISSION/REMARKS		

PROPOSED/ACTUAL MISSION	REMARKS (RECCO, FIXES, STORM, PENET, NIHOP #)
RADARS DOWN 1447Z	OTHER TIMES AS WELL (2ND HALF WORKED FINE)
WENT TO GIRD	BOTH AFTER ARRIVAL.

DATE : 8/10/98
TO : Chief, AOC Flight Operations
FROM : Pilot/Flight Director, Aircraft N43RF ON 1906 BLOCKTIME
SUBJECT: Hazardous Duty OFF 1358 5.1

PURPOSE OF FLIGHT: CAL FLIGHT / PMS TEST

Hazardous Duty Pay is required for flight made on 8/6/98
(DATE)

Request based on PENETRATION OF WEATHER FOR PMS TEST

Personnel on board authorized Hazard Pay:

<u>CZYZYK, S</u>	_____
<u>WARE, S</u>	_____
<u>MOORE, H</u>	_____
<u>CARPENTER, D</u>	_____
<u>LYNCH, T</u>	_____
<u>DAMIANO, B</u>	_____
_____	_____
_____	_____
_____	_____

PILOT/FLIGHT DIRECTOR: 

APPROVED: _____ DISAPPROVED: _____

CHIEF, AOC FLIGHT OPERATIONS: _____

N43RF CALIBRATION RESULTS FROM AUGUST 6 1998 FLIGHT

N43RF flew a five-hour mission on August 6, 1998 over the southeast Gulf of Mexico. Several maneuvers were executed that would determine the coefficients for the attack and slip angles. A yaw maneuver was done at 1500 feet and 15000 feet to provide input for deriving the slope for slip angle. Several speed runs, into and out of the wind, were flown at five altitudes and the data collected from those maneuvers were used to determine the slope and intercept for attack angle.

The slow data was stored on the HP system and the Sun System (Everest) via UCI's AOCPROC program. Through AOCPROC the flight level data was stored as a netCDF file. This allows the NCAR-provided plotting program, NCPLOT, not only to view the flight level parameters, but also store user-selected portions of the data as ASCII files. These ASCII files are used as input to the attack/slip angle derivation program ABD_TPCAL.o located in /home/users/barryd/cprog on Everest.

For the attack angle coefficients four separate ASCII files (one for each speed run) were created for each altitude. Each file was edited to remove data points that did not fit the specs for that particular run. Approximately one hundred (100) points are required for each speed run to make it statistically sufficient. After each file was edited, the four files were merged into one ASCII file. ABD_TPCAL.o uses that merged file as input to determine the attack angle coefficients for that altitude. The following table shows the attack angle coefficients for each of the five altitudes:

	Slope	Intercept
1500 feet	6.69712	1.1149
5000 feet	6.75386	1.1075
10000 feet	6.70276	0.9862
15000 feet	6.66549	1.0463
20000 feet	6.70470	1.0326

The above table is for reference purposes only. To obtain the "final" slope and intercept for attack angle all five ASCII files (one for each of the five altitudes) are merged into a single ASCII file, and that file would be used as input by ABD_TPCAL.o. For this calibration flight the slope and intercept for attack angle are as follows:

For all levels Slope: 6.73176 Intercept: 1.0564

The program also computes a correlation coefficient and it is .99755 for this data.

The input data to determine the slope for slip angle comes from the two yaw maneuvers. Each maneuver has its own ASCII file. Each file is edited to remove

unwanted data. Approximately one hundred (100) points are required per maneuver. ABD_TPCAL.o computes a slope for slip angle for each maneuver. For this flight the slip angle slopes are as follows:

1500 feet	Slope: 7.25118
15000 feet	Slope: 7.36462

As was for the attack angle derivation, the two files are merged into one ASCII file. The "final" slip angle slope is 7.33486.

To determine the slip intercept, a subjective technique is employed using plots of wind direction, wind speed and vertical wind from the circle maneuvers made at 5000 feet. Several plots of the aforementioned parameters are made varying the intercept value for slip angle. Through some simple statistics and a "meteorological eyeballing" of the plots, a determination for the slip angle intercept is made. For this flight the slip angle intercept is +0.475. As stated previously this method is very subjective, but it does provide a hands-on view of what is happening to the wind values when modifying the value for the slip angle intercept.

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