

NOAA G-IV N49RF
HUR-09
18 Aug 2009, HRD HUR BILL



Flight ID: 090818n2

<u>Sensor or system</u>	<u>Number or Name</u>
Accelerometer	ACINS
Altitude	PALT
Attack Angle	AKRD1
Dew Point Probe	DPR
Dynamic Pressure	QC2M
Geopotential Altitude	GPGALT
Inertial Selected	VEW, VNS
Static Pressure	PS2M
Slip Angle	SSRD1
Temperature Probe	AT3/TT3
True Air Speed	TAS2
Constants File	49cal092
Project Directory	/proj/905

<u>Local Met Data:</u>	<u>Takeoff (1948Z)</u>	<u>Landing (0234Z)</u>
Aircraft Static Pressure	1008.6 mb	1008.6 mb
Tower Pressure (corrected)	Q1011	Q1011

Notes:

HGALT spikes from 200744-204530Z. Chose GPGALT.

All Inertial Reference System 2 (IRS2) or PITR had data spikes @ 225958Z-230004Z, and 235958-000002Z, ~~except VSPD PITR and ACINS PITR.~~ Chose IRS1.
all - PITR values go to 0

PS1C/M stair step down @ 230447Z and back up at 234628Z with steps in between. There is about a 2mb difference between PS1M and PS2M. From test flights comparing aircraft data to dropsonde data PS2M has been closer to representing the actual atmosphere. Chose PS2.

~~There were periods where the dewpoint temperature exceeded the ambient temperature resulting in RH values > 100%. This was likely due to passing through a cloud layer, 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. Corrections were not made to the data.~~

All other instruments worked optimally during the flight

29 dropsondes launched: 24 good, 5 bad

25 drops successfully sent to NCEP and ingested into the 19/00Z model run.

Flight Director:
Phone #:

Jess Williams/Paul Flaherty
(813) 828-3310 ext. 3140

U.S. Dep't. of Commerce / NMAO / NOAA / Aircraft Operations Center

FLT ID: 090818N	From: TBPB	To: TBPB
FLT #: 09-99	Blk In: 0237 Z	Lnd Time: 0234 Z 24
ETD: 2000 Z	Blk Out: 1940 Z	T/O Time: 1948 Z 12
ETE: 7.5	Total Blk: 6 ^{hrs} 57 ^m (7.0)	Total Flt: 6+46 (6.8)
Sponsoring Org: HRD	Program: SAC	Purpose: Hurr Bill

AOC Flight Crew

Aircraft Commander: Longenecker	Data System: H11
Co-Pilot: Twining /	Avaps: C. Lynch
Navigator: /	System Engineer: L. Miller
Flight Eng: /	AA: HRD M. Black
Flt Director: Flaherty / Williams	AA: HRD B. Black
Avionics:	Crew Chief:

Participating Scientists, Visitors, & Add'l Aircrew on back.

Total # of people on board:

of people listed on back:

	A/C - Takeoff	Wx Station - Takeoff	A/C - Land	Wx Station - Land
Pressure	1007 mb PSI 1008 mb PSI 20	Q1011	1008.6 mb	@ 1011

ATIS - Takeoff	
----------------	--

ATIS - Land	VRB 105m HZ 25/23 1011
-------------	------------------------

Data Source	Number	Data Disposition / Date / Quality / File Name(s)
-------------	--------	--

Flight Level Tapes	1	105rf10a
--------------------	---	----------

Radar Tapes		
-------------	--	--

Dropsondes	29	Good: 24 Bad: 5 Sent: 25
------------	----	--------------------------

AXBT		
------	--	--

List other data sources on back in Remarks section.

Remarks (Storm Name, Mission ID, Recco Times, Fix Times)	Recco Times:	Fix #	Fix Time
--	--------------	-------	----------

Storm Name: BILL			
------------------	--	--	--

Mission ID: WX03A BILL2			
-------------------------	--	--	--

[illegible]

T/O Time:

$$\underline{Z}$$

Lnd Time:

$$\underline{Z}$$

Activity on Aircraft

Affiliation

Remarks:

N49RF AVAPS DropSonde Log

Project: HURR 109 Flight ID: 090818n2 Flt Dir: WILLIAMS

Mission: BILL Flight #: _____ Status: Sys 1 _____ Sys 2 _____ Launcher S/N: 002

Drop #	Sonde Serial Number	Chn. #	Time (Zulu)	Press. offset	Winds time	Operator Initials	Comments /Status/ Failure Reason	\$	GOOD ☒
1	091 959 068	1	20:02:54	0	3	CL/LM		H	✓
2	091 519 027	2	20:13:13	0	3	CL/LM	lost LMDS		
3	091 849 300	1	20:23:14	0	6	CL/LM	Fast fall		
4	091 849 262	4	20:24:22	0		CL/LM	RS only		✓
5	091 459 128	2	2032	0		CL/LM			✓
6	091 459 064	1	2045	0	6	CL/LM			✓
7	091 849 298	2	2058	0			Fast Fall		
8	091 519 026	4	2059	0		CL/LM	RS only		✓
9	091 959 084	1	2110	0		CL/LM			✓
10	091 959 110	2	2121	0	5	CL/LM			✓
11	091 959 111	1	2143	0	6	CL/LM			✓
12	091 959 089	2	2159	0	7	CL/LM	all data lost below ~725ms		
13	091 519 014	1	2214	0	6	CL/LM			✓
14	091 459 127	2	2234	0	6	CL/LM			✓
15	091 959 113	1	22:52	0	5	CL/LM			✓
16	091 849 160	2	2309	0	8	CL/LM			✓
17	091 849 100	1	23 23	0	5	CL/LM			✓
18	091 459 146	2	23 38	0		CL/LM			✓
19	091 849 088	1	2354	0		CL/LM	RS Freeze, Data on LS		✓
20	083 259 031	1	0009	0	7	CL/LM			✓
21	091 459 121	2	0023	0	6	CL/LM			✓
22	084 419 036	1	0037	0	12	CL/LM			✓
23	084 419 011	2		0					✓
24	091 459 139	1	0114	0	8				✓
25	091 459 062	2	0133	0	7				✓
26	091 459 112	4	0149	0			Fast Fall		
27	085 119 003	1	0151	0	7				✓
28	084 919 170	2	0203	0					✓
29	091 519 002	4	0214	0			Fast Fall		
30									
31									
32									
33									

\$ Codes A = AOC N = NHC/NWS H = HRD OW = NESDIS _____ = _____ = _____

Flight Director: Flaherty / Williams

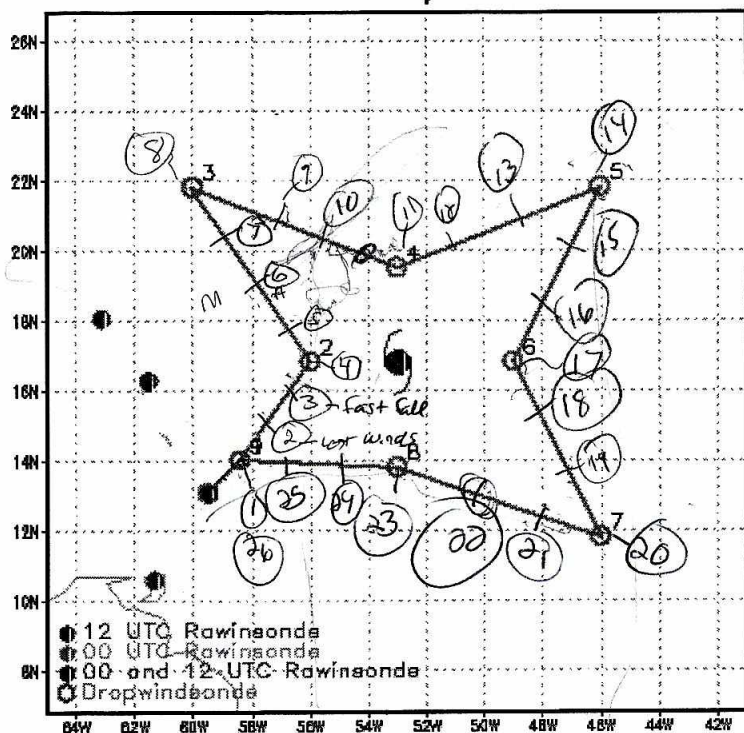
Flight Director:

Storm/Track:

Pg 1 of 1

[illegible]

090818N2 18/20Z Bill



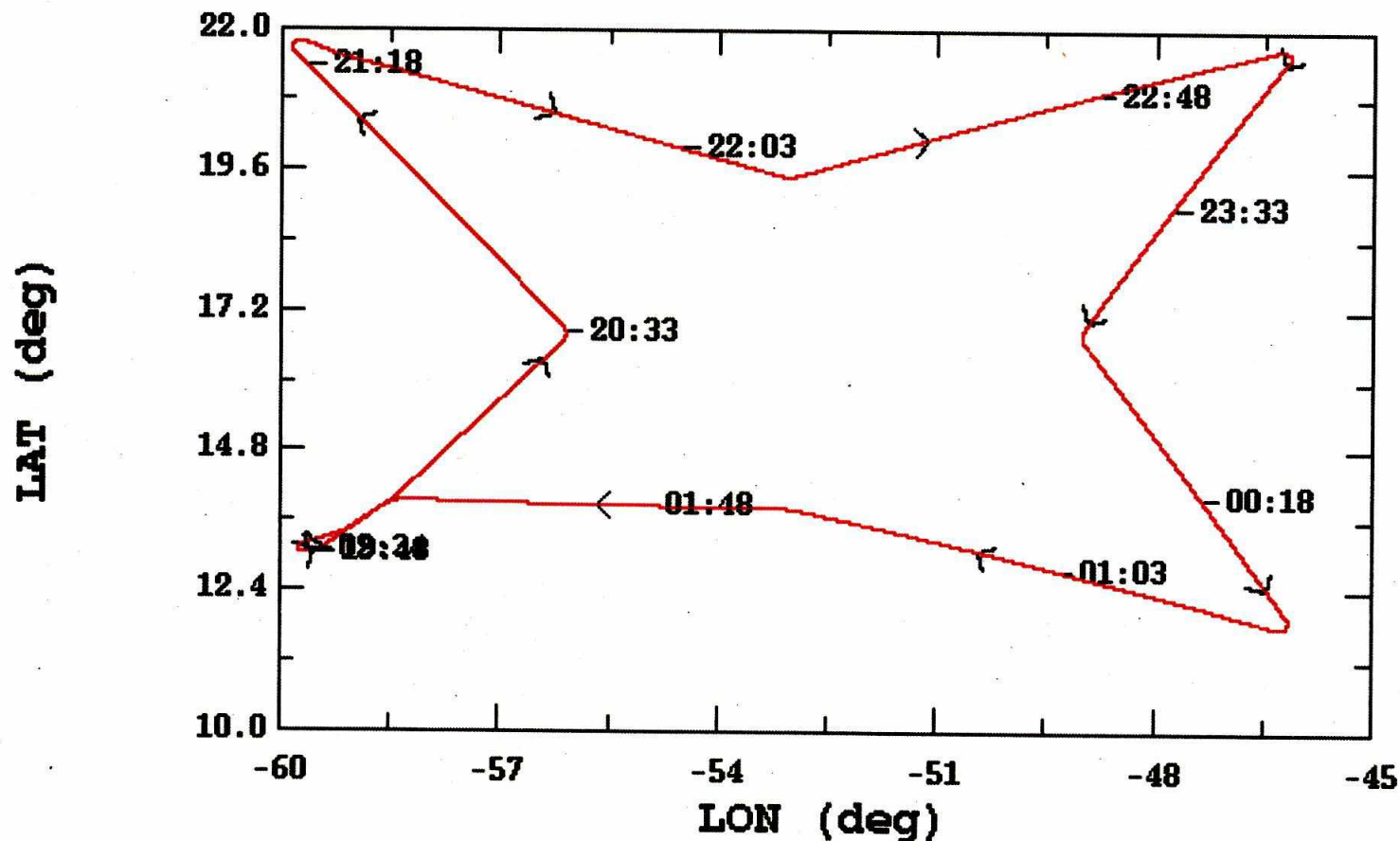
GRADE: COLA/16ES

2009-08-18-08:23

45 1-5 30 20 25 12 0

Hurricane_2009, Flight #090818n2

HUR BILL, 18 Aug 09, 19:48Z-02:34Z



	mean	sigma	min	max
LAT (deg), 1 s/sec	16.86	3.32	11.78	21.77
LON (deg), 1 s/sec	-53.05	4.65	-59.86	-46.13

090818N2turns

HURRICANE SALEX MISSION PLAN: BILL

Prepared by the Hurricane Research Division File: current1.ftk

Aircraft: N49RF Altitude: FL410-450 Proposed takeoff: 18/2000Z

TRACK DISTANCE TABLE

#	LAT (d m)	LON (d/m)	RAD/AZM (nm/dg)	LEG (nm)	TOTAL (nm)	TIME (h:mm)
0	BARBADOS			0.	0.	0:00
1	14 00	58 24		85.	85.	0:22
2	16 48	56 00		218.	303.	0:51
3	21 48	60 00		377.	680.	1:42
4	19 30	53 00		417.	1097.	2:39
5	21 48	46 00		417.	1514.	3:36
6	16 48	49 00		345.	1860.	4:22
7	11 48	46 00		348.	2207.	5:10
8	13 48	53 00		428.	2635.	6:08
9	14 00	58 24		315.	2950.	6:51
10	BARBADOS			85.	3035	7:12

36
24 12

HGALT spikes from 200744-200839 + 2024 - 20452

IRS2 spike 225958-2300052, 235958-0000002

PSIC/M stair steps ^{down @} 23 0447-~~up @ 23 0539~~ ~~23 0612~~ steps + back
up @ 2346:282

N49RF
Variable Checkoff List

Jess Williams

Flight: 090818N2

Spikes in IRS 2

Inertial Altitude

☒ ALT (m)
IRS Baro-Inertial
☒ Altitude - *2 spikes*
ALT_PITR (m)
☒ IRS Baro-Inertial
Altitude
ADCBCALT (m)
DADC Baro Corrected
Altitude

GPS Altitude

☒ GHALT_SG1 (m)
Honeywell GPS Altitude
(MSL)
☒ GHALT_SG2 (m) - *2 spikes*
Honeywell GPS Altitude
(MSL)
☒ GPALT (m)
Collins GPS Altitude
(MSL)

Pressure Altitude

☒ PALT (m)
NACA Pressure Altitude
☒ PALTf (feet)
☒ NACA Pressure Altitude
ADCPALT (m)
DADC Pressure Altitude

Radar Altitude

☒ HGM232 (m) - *spikes*
Geometric (Radar)
Altitude

D-Value

☒ DVALU (m)
D-VALUE
(HGME - PALT)

Geopotential Altitude

☒ GPGALT (m)
Collins GPS
☒ Geopotential Altitude
HGALT (m) - *spikes*
APN-232 Radar
Geopotential Altitude

Pitch vs Alt

☒ PITCH (deg)
Aircraft Pitch Angle
☒ PITCH_PITR (deg) - *2 spikes*
Aircraft Pitch Angle

Roll vs Hdg

☒ ROLL (deg)
Aircraft Roll Angle
☒ ROLL_PITR (deg) - *OK No spikes*
Aircraft Roll Angle

Heading vs Trk

☒ THDG (deg)
IRS1
☒ THDG_PITR (deg) - *spikes*
IRS2

Drift Angles

☒ AOCDA (deg)
Computed Drift Angle
☒ AOCDA_PITR (deg) - *spikes*
Computed Drift Angle
☒ DRFTA (deg)
IRS1 Drift Angle
☒ DRFTA_PITR (deg) - *spikes*
IRS2 Drift Angle

Track vs DA

☒ AOCTK (deg)
Computed Aircraft Track
Angle from IRS1
AOCTK_PITR (deg) - *only 1 spike @ 2300 Z*
Computed Aircraft Track
Angle from IRS2
TKAT (deg)
IRS1 Track Angle
☒ TKAT_PITR (deg) - *2 spikes*
IRS2 Track Angle
☒ TKAR (deg/s)
IRS1 Aircraft Track
Angle Rate
TKAR_PITR (deg/s)
IRS2 Aircraft Track
Angle Rate

Select the following variable references:

<u>1</u> ATTACK	AKRD(1, 2)	<u>2</u> QCX	QC(1, 2)M
<u>3</u> ATX	AT(1, 2, 3, 4)	<u>2</u> QCXC	QC(1, 2)C
<u>R</u> DPX	DP(L, R)	<u>1</u> SSLIP	SSRD(1, 2)
<u>R</u> DPXC	DP(L, R)C	<u>2</u> TASX	TAS(1, 2)
<u>0PG</u> DVALU	(HG, GPG)ALT	<u>3</u> TTX	TT(1, 2, 3, 4)
<u>2</u> PSX	PS(1, 2)M	<u>1</u> WI	IRS 1 or 2
<u>2</u> PSXC	PS(1, 2)C	<u>1</u> XLATC	IRS 1 or 2

☒ Print Trackline

Note: IRS = Inertial Reference System.

Equivalent to INS on P-3's. _PITR denotes IRS#2.

Flight: 090818N2

Latitudes

- ☒ GHLATF_SG1 (deg)
Honeywell GPS
- ☒ Latitude, Fine
- ☒ GHLATF_SG2 (deg)
Honeywell GPS
- ☒ Latitude, Fine
- ☒ GHLAT_SG1 (deg)
Honeywell GPS Latitude
- ☒ GHLAT_SG2 (deg) *2 spikes*
Honeywell GPS Latitude

- ☒ GPLAT (deg)
Collins GPS Latitude
 - ☒ LAT (deg)
IRS1 Latitude
 - ☒ LAT_PITR (deg) *2 spikes*
IRS2 Latitude
 - ☒ XLATC (deg)
GPS-Corrected Inertial Latitude

- GPS Differences

 - ☒ GDIF1
Position Difference
(Collins - IRS1)
 - ☒ GDIF2
Position Difference
(Collins - IRS2)

Longitudes

- ☒ GHLONF_SG1 (deg)
Honeywell GPS
- ☒ Longitude, Fine
- ☒ GHLONF_SG2 (deg)
Honeywell GPS
- ☒ Longitude, Fine
- ☒ GHLON_SG1 (deg)
Honeywell GPS
- ☒ Longitude *2 spikes*
- ☒ GHLON_SG2 (deg) *2 spikes*
Honeywell GPS
- ☒ Longitude

- ☒ GPLON (deg)
Collins GPS Longitude
 - ☒ LON (deg)
IRS1 Longitude
 - ☒ LON_PITR (deg) *2 spikes*
IRS2 Longitude
 - ☒ XLONC (deg)
GPS-Corrected Inertial Longitude

Compare GPS lat/lon to inertial lat/lon to see which inertial did better during the flight. Compare their differences.

2 spikes

HDOP

- ☒ GHHDOP_SG1 (none)
Honeywell GPS Horiz.
- ☒ Dilution of Position
- ☒ GHHDOP_SG2 (none)
Honeywell GPS Horiz.
- ☒ Dilution of Position

2 spikes

VDOP

- ☒ GHVDOP_SG1 (none)
Honeywell GPS Vertical
- ☒ Dilution of Position
- ☒ GHVDOP_SG2 (none)
Honeywell GPS Vertical
- ☒ Dilution of Position

-1 spike @ 2119Z

HFOM

- ☒ GHHFOM_SG1 (m)
Honeywell GPS Horiz.
- ☒ Figure of Merit
- ☒ GHHFOM_SG2 (m)
Honeywell GPS Horiz.
- ☒ Figure of Merit

2 spikes

VFOM

- ☒ GHVFOM_SG1 (m)
Honeywell GPS Vertical
- ☒ Figure of Merit
- ☒ GHVFOM_SG2 (m)
Honeywell GPS Vertical
- ☒ Figure of Merit

2 spikes

Flight: 090818N2

Temperatures

Ambient Temperature

☒ AT1 (degC)
Ambient Temperature,
Top Left
☒ AT2 (degC)
Ambient Temperature,
Bottom Right
☒ AT3 (degC)
Ambient Temperature,
Top Right
☒ AT4 (degC)
Ambient Temperature,
Bottom Left
3 ATX (degC)
Ambient Temperature,
Reference

Total Temperature

☒ TT1 (degC)
Total Temperature, Left
Top
☒ TT2 (degC)
Total Temperature,
Right Bottom
☒ TT3 (degC)
Total Temperature, Left
Bottom
☒ TT4 (degC)
Total Temperature,
Right Top
3 TTX (degC)
Total Temperature
Reference

Dewpoint Temperature

☒ DPLC (degC)
Dew Point Temperature,
Left
☒ DPRC (degC)
Dew Point Temperature,
Right
☒ DPXC (degC)
Dew Point Temperature,
Reference
☒ DPL (degC)
Left Dew/Frost Point
Temperature
☒ DPR (degC)
Right Dew/Frost Point
Temperature
P DPX (degC)
Dew/Frost Point
Temperature, Reference

Air Temperature

☒ ADCSAT (degC)
☒ DADC Static Air
Temperature
ADCTAT (degC)
DADC Total Air
Temperature

Potential Temperature

☒ THETA (K)
Potential Temperature
☒ THETA E (K)
Equivalent Potential
Temperature
☒ THETA V (K)
Virtual Potential Temperature

Hygrometers

☒ BCRYO (volts)
CR-2 Hygrometer
Balance
☒ CRYO (degC)
CR-2 Hygrometer
☒ CRYOC (degC)
CR-2 Hygrometer,
corrected
PCRYO (mb)
CR-2 Hygrometer
Pressure

Humidity

☒ RHODL (g/m3)
Absolute Humidity,
T-Electric Left
☒ RHODR (g/m3)
Absolute Humidity,
T-Electric Right
☒ RHUM (%)
Relative Humidity

Mixing Ratio

☒ MR (g/kg)
Mixing Ratio, T-Electric

Ambient Water Vapor Pressure

☒ EDPC (mb)
Ambient Water Vapor
Pressure, Reference

*dip in val's
2308-2348Z*

*DPL steps ↓ @ -35°C
+ slower to respond*

Flight: 090818N2

Pressures

Dynamic Pressure

✓ QC1C (mb)
Corrected Dynamic
Pressure, Left
✓ QC1M (mb)
Left Raw Dynamic
Pressure
✓ QC2C (mb)
Corrected Dynamic
Pressure, Right
✓ QC2M (mb)
Right Raw Dynamic
Pressure
2 QCX (mb)
2 Raw Dynamic Pressure,
Reference
QCXC (mb)
Corrected Dynamic
Pressure, Reference

Attack (compare to pitch)

✓ AP1 (mb)
Left Vertical Differential
Pressure
✓ AP2 (mb)
Right Vertical
Differential Pressure
DAP1 (mb)
Left Raw Dynamic
Attack Pressure
DAP2 (mb)
Right Raw Dynamic
Attack Pressure
ADCAOA (deg)
Air Data Computer
✓ Attack Angle
AKRD1 (deg)
Attack Angle,
Left Side
✓ AKRD2 (deg)
Attack Angle,
Right Side
1 ATTACK (deg)
Attack Angle,
Reference

Static Pressures

✓ PS1C (mb)
Corrected Static
Pressure, Top Fuselage
✓ PS1M (mb)
Raw Static Pressure,
Top Fuselage
✓ PS2C (mb)
Correct'd Static Pressure,
Bottom Fuselage
✓ PS2M (mb)
Raw Static Pressure,
Bottom Fuselage
2 PSX (mb)
2 Raw Static Pressure,
Reference
2 PSXC (mb)
Corrected Static
Pressure, Reference

Sideslip (compare to roll)

✓ BP1 (mb)
Top Horizontal
Differential Pressure
BP2 (mb)
Bottom Horizontal
Differential Pressure
DBP1 (mb)
Top Raw Dynamic Slip
Pressure
DBP2 (mb)
Bottom Raw Dynamic
Slip Pressure
SSDF1 (deg)
Sideslip Angle, Diff.
Pressure, Top
SSDF2 (deg)
Sideslip Angle, Diff.
Pressure, Bottom
SSRD1 (deg)
Sideslip Angle,
Top
✓ SSRD2 (deg)
Sideslip Angle,
Bottom
✓ SSLIP (deg)
Sideslip Angle,
Reference

Surface Pressure

✓ PSURF (mb)
Calculated Surface
Pressure

Cabin Pressure

✓ PCAB (mb)
Cabin Pressure

Horizontal Wind Direction

✓ IWD (deg)
Horizontal Wind
Direction (IRS)
✓ IWD_PITR (deg)
Horizontal Wind
Direction (IRS)
✓ WD (deg)
Horizontal Wind
Direction

Horizontal Wind Speed

✓ IWS (m/s)
Horizontal Wind Speed
(IRS)
✓ IWS_PITR (m/s)
Horizontal Wind Speed
(IRS)
✓ WS (m/s)
Horizontal Wind Speed
North/South Component
✓ VI (m/s)
Wind Vector, North
Component
East/West Component
✓ UI (m/s)
Wind Vector, East
Component

Vertical Winds

✓ WI (m/s)
Wind Vector, Vertical
Gust Component

UTAN/URAD Winds

✓ UX (m/s)
Wind Vector, UTAN
Longitudinal Component
✓ VY (m/s)
Wind Vector, Lateral
Component URAD

off
spike
2 spikes
23 x 002
25 spikes (from IRS)

2 spikes

2 spikes

N49RF
Variable Checkoff List

Jess Williams

Flight: 090818N2

AC + VV don't spike with other **W52**

Groundspeeds

- ☒ GHGSF_SG1 (m/s)
- Honeywell GPS Ground
- ☒ Speed
- GHGSF_SG2 (m/s) *2 spikes*
- Honeywell GPS Ground
- ☒ Speed
- GPGSPD (m/s)
- Collins GPS Ground
- ☒ Speed
- GSF (m/s)
- Inertial Ground Speed
- ☒ GSF_PITR (m/s) *2 spikes*
- Inertial Ground Speed

East/West Component

- ☒ GHVEW_SG1 (m/s)
- HoneyWell GPS Ground
- Speed Vector E/W
- GHVEW_SG2 (m/s)
- HoneyWell GPS Ground
- Speed Vector E/W
- ☒ GPVEW (m/s)
- Collins GPS Ground
- ☒ Speed Vector E/W
- VEW (m/s)
- Inertial Ground Speed
- ☒ Vector E/W
- VEW_PITR (m/s)
- Inertial Ground Speed
- ☒ Vector E/W
- ☒ XVEWC (m/s)
- GPS-Correc't'd Inertial
- Ground Spd Vector E/W

North/South Component

- ☒ GHVNS_SG1 (m/s)
- HnyWll GPS Grnd Spd
- Vector, Nrth/Sth Component
- GHVNS_SG2 (m/s)
- Hnywll GPS Grnd Spd
- Vector, Nrth/Sth Component
- ☒ XVNSC (m/s)
- GPS-Correc't'd Inertial Ground
- Spd Vector, North Component

Vertical Acceleration

- ☒ ACINS (m/s²)
- Aircraft Vertical
- ☒ Acceleration
- ACINS_PITR (m/s²)
- Aircraft Vertical
- Acceleration

Vertical Velocity

- ☒ GHVZL_SG1 (m/s)
- Hnywll GPS Comp'd
- ☒ aircraft Vert. Velocity
- GHVZL_SG2 (m/s)
- Hnywll GPS Comp'd
- ☒ aircraft Vert. Velocity

- GPVSPD (m/s)
- ClIns GPS Comp'd
- ☒ Aircraft Vertical Velocity
- VSPD (m/s)
- IRS-Computed Aircraft
- ☒ Vertical Velocity
- VSPD_PITR (m/s)
- IRS-Computed Aircraft
- ☒ Vertical Velocity

- WP3 (m/s)
- ☒ Damped Aircraft Vertical
- Velocity
- WP3_PITR (m/s)
- ☒ Damped Aircraft Vertical
- Velocity

Airspeeds

- ☒ ADCCAS (m/s)
- DADC Computed
- ☒ Airspeed
- IAS (Kts)
- Aircraft Indicated
- ☒ Airspeed
- ADCTAS (m/s)
- DADC True Airspeed
- ☒ TAS1 (m/s)
- Aircraft True Airspeed
- #1
- ☒ TAS2 (m/s)
- Aircraft True Airspeed
- #2
- ☒ TASHC (m/s)
- Aircraft True Airspeed,
- Humidity Corrected
- ☒ TASX (m/s)
- Aircraft True Airspeed,
- Reference

Mach

- ☒ ADCMACH (none)
- DADC Mach Number
- ☒ MACH (none)
- Aircraft Mach Number
- ☒ XMACH2 (none)
- Aircraft Mach Number
- Squared

DSM box for output for checked - PITR