

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



Flight ID: 090819n2

<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	PS1M
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 (1935Z)</u>	<u>Landing (0111Z)</u>
Aircraft Static Pressure	1003.6 mb	1004 mb
Tower Pressure (corrected)	Q1008	Q1009

Notes:

4 DATA GAPS: 20:55:12-210120Z, 213545-213600Z, 001454-001506Z, and 001826-003135Z
Spike in ALL data values @ 205512Z, just before first data gap.

HGALT spikes from 195031-195136Z. Chose GPGALT.

All Inertial Reference System 2 (IRS2) or PITR values go to zero from 195958-200005Z, 225958-230005Z, and 235959-001506Z. Chose IRS1.

PS2C/M stair step down @201239Z, up @ 2025Z and down @ 2215Z and several other steps throughout flight. These spikes effect PALT, which spikes @ same times. Chose PS1C/M.

No GPLON, WP3, or WP3_PITR Values. They are way off for this flight (-2147483648)!

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

20 dropsondes launched: 16 good, 4 bad

18 drops successfully sent to NCEP and ingested into the 20/00Z 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: 090819N2	From: TBFB	To: TBFB
FLT #: 09-101	Blk In: 0115 Z	Lnd Time: 0111 Z
ETD: 2000 Z	Blk Out: 1924 Z	T/O Time: 1935 Z
ETE: 6	Total Blk: 5hr 57min (5.9)	Total Flt: 5hr 36min (5.6)
Sponsoring Org: HRD	Program: SAT	Purpose: HURE BILL

AOC Flight Crew

Aircraft Commander: Longenecker	Data System: J. Hill
Co-Pilot: Twining 1	Avaps: L. Miller
Navigator: 1	System Engineer: C. Lynch
Flight Eng: 1	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	1001.6	Q1008		Q1009

ATIS - Takeoff	1903Z	23011KT	10SM	30/25	1008
ATIS - Land	0000Z	VRB 03KT		27/25	1009

Data Source	Number	Data Disposition / Date / Quality / File Name(s)
Flight Level Tapes	5a-e	905rf12a-e
Radar Tapes		
Dropsondes	20	Good: 16 Bad: 4 Sent: 18
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: NOAA 9 WX03A BILLY			

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[illegible]

Remarks:

DATA GAP 200062z

3 Ads Files or 4

N49RF AVAPS DropSonde Log

Project: HURR09 Flight ID: 090819n2 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	091 459 105	1	2031	0		CL/LM		H	☒
2	091 519 015	2	2044	0	5	CL/LM	Fast Fall	I	☐
3	091 459 004	4	2048	0		CL/LM			☒
4	091 519 025	1	2104	0		CL/LM			☒
5	091 459 242	2	2114	0		CL/LM	Fast Fall		☐
6	092 429 111	4	2115	0		CL/LM			☒
7	092 429 105	1	2123	0		CL/LM			☒
8	091 459 010	2	2132	0	7	CL/LM			☒
9	092 429 002	1	2144	0					☒
10	084 919 015	2	2200	0	5		R5 lost data below 225mB		☒
11	083 259 218	1	2215	0	6				☒
12	092 429 113	2	2226	0	4		R5 lost data below 225mB		☒
13	091 459 060	1	2240	0	7				☒
14	091 459 131	4	2254	0	7				☒
15	091 459 133	1	2319	0	5				☒
16	091 459 135	4	2338	0	8				☒
17	091 459 115	1	2355	0	8				☒
18	091 459 107	4	0015	0	7		Fast Fall		☐
19	092 429 161	4	0034	0	6				☒
20	092 429 008	1	0047	0	7				☒
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									

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

N49RF AOC GPS Dropwindsonde Log

Flight ID: 090819N2

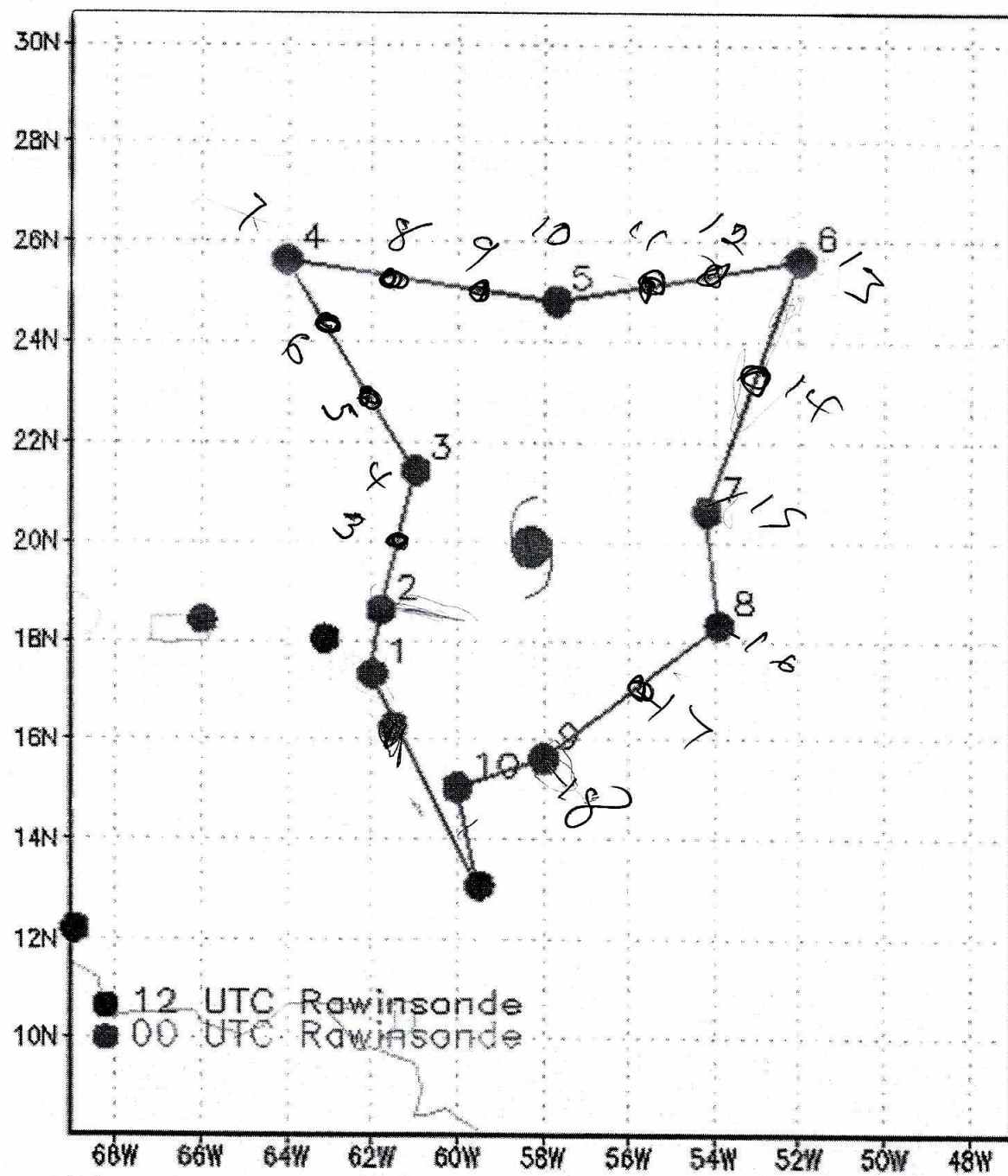
Flight Director: Flaherty/Williams

Mission ID: NOAA9 Wx03A BILLY

Storm/Track: Hurr Bill

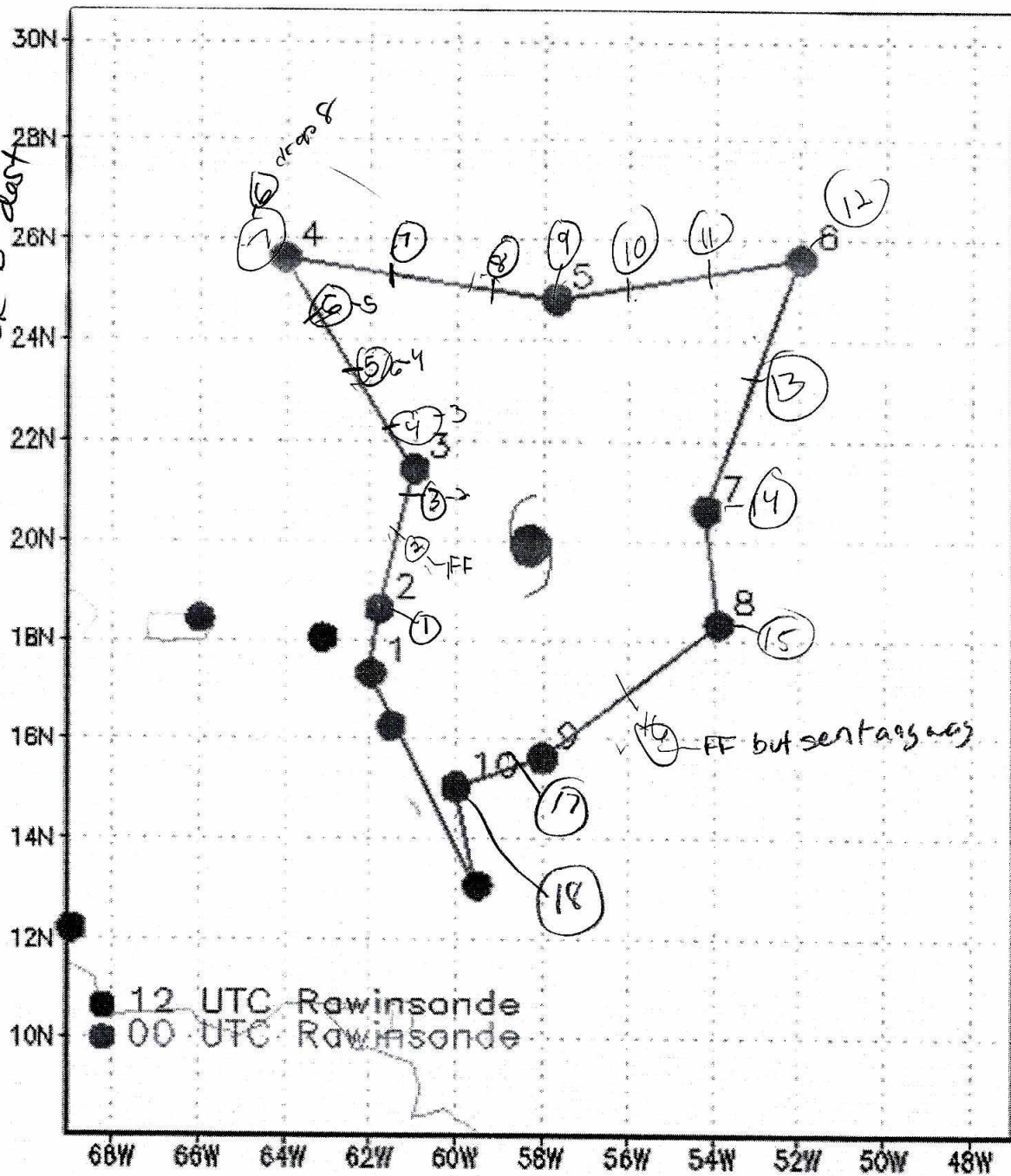
Pg ___ of ___

Ch. #	Drop #	Sonde ID	Drop Time (UTC)	Lat (°N)	Lon (°W)	Wx Cond.	L5/R5	SFC Prs (mb)	Ob #	R5 Lowest Winds (Ht, Ws, Wd)	L5 Lowest Winds (Ht, Ws, Wd)	Sent Time (UTC)
1	1	9105	203121	18 36	61 48	BKN AC/CS						
X 2	2	9015	204407	20 10	61 21	OVC CS/CS	---	FAST	FALL			
2	3	9004	204842	20 41	61 12	OVC CS/CS	---			lost w. rds b/w	10-23kft	
3	4	9025	210412	22 33	61 48	BKN AC						
X 4	5	9242	211407	23 39	62 35		---	FAST	FALL			
4	6	9111	211522	23 46	62 40	SCT CU						
5	7	9105	212358	24 45	62 22							
6	8	9010	213208	25 35	63 43	SCT TCU						
7	9	9002	214456	25 22	61 54	SCT CU						
8	10	9015	220042	25 05	57 42	OVC CS	(L5)					
9	11	9218	221544	24 42	57 41	OVC CS						
10	12	9113	222654	25 02	56 08		L5					
11	13	9060	224016	25 19	54 13	OVC CS						
12	14	9131	225440	25 30	52 06							
13	15	9133	231903	22 47	53 16							
14	16	9135	233837	20 31	54 11							
15	17	9115	235520	18 24	53 56							
16	18	9107	001547	17 10	55 39	FAST	FALL					
17	19	9161	003421	15 33	58 11							
18	20	9008	004750	15 03	57 34							



NY 6/7
 wants to know
 when finished
 current alt
 clearance request
 back to dest

NO HOLD sects in SSIDN
 for TPA



turns1

MISSION PLAN:

Prepared by the Hurricane Research Division File: current1.ftk

Aircraft: N49RF Altitude: FL410-450 Proposed takeoff: 19/2000Z

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	17 18	62 00		293.	293.	0:41
2	18 36	61 48		79.	372.	0:53
3	21 24	61 00		174.	547.	1:17
4	25 36	64 00		302.	848.	1:59
5	24 48	57 42		346.	1194.	2:47
6	25 36	52 00		314.	1508.	3:31
7	20 36	54 12		324.	1832.	4:16
8	18 18	53 54		139.	1972.	4:36
9	15 36	58 00		286.	2258.	5:16
10	15 00	60 00		121.	2379.	5:33
11	BARBADOS			120.	2500.	5:59

DATA GAPS

2055:12Z - 2101:20Z, 0018:26Z - 003135Z

Spike in all data @ 2055:12Z

2135:45 - 2136:00Z, 0014:54Z - 0015:06Z

step up @ 2025Z

PS2 step down @ 201239 0.2mb + step up @ 221541 ~ 0.2mb + 233801 ~ 0.2mb
↳ stay w/ PS2 b/c spikes are only 0.2mb changes + PS2 is ~ 1.5mb + than PS1 + closer to actual

IRS2 goes to 195958Z - 200005Z, 225958 - 230005Z, 235959Z -

20Z

23Z

flatlines

after
data gap
@ 001506Z
00Z

HGALT spikes from 195031Z - 195136Z

PACT step 4 @ 2005Z, 221543Z ~ 40 meters, 30 meters
↳ due to PS2 steps

GPLON incorrect entire flt (-2147483648!)

WP3 - way too high NO DATA

WP3-PTR - due to GPLON

210121

213600

001507

003135

PRINT + E.S.

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Inertial Altitude

☒ ALT (m)
IRS Baro-Inertial
Altitude
☒ ALT_PITR (m) *3x to 500*
IRS Baro-Inertial
Altitude
☒ ADCBCALT (m)
DADC Baro Corrected
Altitude

GPS Altitude

☒ GHALT_SG1 (m)
Honeywell GPS Altitude
(MSL)
☒ GHALT_SG2 (m) *3x to 4*
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)
APN-232 Radar
Geopotential Altitude

Pitch vs Alt

☒ PITCH (deg)
Aircraft Pitch Angle
☒ PITCH_PITR (deg) *3x goes to 0*
Aircraft Pitch Angle

Roll vs Hdg

☒ ROLL (deg)
Aircraft Roll Angle
☒ ROLL_PITR (deg) *3x goes to 0*
Aircraft Roll Angle

Heading vs Trk

☒ THDG (deg)
IRS1
☒ THDG_PITR (deg)
IRS2

Drift Angles

☒ AOCD A (deg)
Computed Drift Angle
☒ AOCD A_PITR (deg)
Computed Drift Angle
☒ DRFTA (deg)
IRS1 Drift Angle
☒ DRFTA_PITR (deg)
IRS2 Drift Angle

Track vs DA

☒ AOCTK (deg)
Computed Aircraft Track
☒ Angle from IRS1
AOCTK_PITR (deg)
Computed Aircraft Track
☒ Angle from IRS2
TKAT (deg)
IRS1 Track Angle
☒ TKAT_PITR (deg)
IRS2 Track Angle

Select the following variable references:

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

☒ Print Trackline

Note: IRS = Inertial Reference System.
Equivalent to INS on P-3's. _PITR denotes IRS#2.

have 3x spikes to 0
PITR
PALT spikes to 0
2025
10 meters

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Latitudes

✓ GHLATF_SG1 (deg)
Honeywell GPS
Latitude, Fine
✓ GHLATF_SG2 (deg)
Honeywell GPS
Latitude, Fine
✓ GHLAT_SG1 (deg)
Honeywell GPS Latitude
✓ GHLAT_SG2 (deg) 3x
Honeywell GPS Latitude

✓ GPLAT (deg)
Collins GPS Latitude
✓ LAT (deg)
IRS1 Latitude
✓ LAT_PITR (deg) 3x
IRS2 Latitude

✓ XLATC (deg)
GPS-Corrected Inertial
Latitude

✓ GPS Differences
GDIF1
Position Difference
(Collins - IRS1)
✓ GDIF2 3x
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
✓ GHLON_SG2 (deg) 3x
Honeywell GPS
Longitude

✓ GPLON (deg)
Collins GPS Longitude
✓ LON (deg)
IRS1 Longitude
✓ LON_PITR (deg) 3x
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.

HDOP

✓ GHHDDOP_SG1 (none)
Honeywell GPS Horiz.
Dilution of Position
✓ GHHDDOP_SG2 (none) 5T
Honeywell GPS Horiz.
Dilution of Position

VDOP

✓ GHVDOP_SG1 (none)
Honeywell GPS Vertical
Dilution of Position
✓ GHVDOP_SG2 (none)
Honeywell GPS Vertical
Dilution of Position

HFOM

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

VFOM

✓ GHVFOM_SG1 (m)
Honeywell GPS Vertical
Figure of Merit
✓ GHVFOM_SG2 (m)
Honeywell GPS Vertical
Figure of Merit

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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
☐ 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

☒ EDP C (mb)
Ambient Water Vapor
Pressure, Reference

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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
☒ QCX (mb)
 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
☒ 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
☒ PSX (mb)
 Raw Static Pressure,
 Reference
☒ 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

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Groundspeeds

☒ GHGSF_SG1 (m/s)
Honeywell GPS Ground Speed

☒ GHGSF_SG2 (m/s) *-3x*
Honeywell GPS Ground Speed

☒ GPGSPD (m/s)
Collins GPS Ground Speed

☒ GSF (m/s)
Inertial Ground Speed

☒ GSF_PITR (m/s) *-3x*
Inertial Ground Speed

East/West Component

☒ GHVEW_SG1 (m/s)
HoneyWell GPS Ground Speed Vector E/W

☒ GHVEW_SG2 (m/s) *-3x*
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) *-3x*
Inertial Ground Speed Vector E/W

☒ XVEWC (m/s)
GPS-Correc't'd Inertial Ground Spd Vector E/W

Vertical Acceleration

☒ ACINS (m/s²)
Aircraft Vertical Acceleration

☒ ACINS_PITR (m/s²)
Aircraft Vertical Acceleration

Vertical Velocity

☒ GHVZI_SG1 (m/s)
Hnywll GPS Comp'd aircraft Vert. Velocity

☒ GHVZI_SG2 (m/s) *-3x*
Hnywll GPS Comp'd aircraft Vert. Velocity

☒ GPVSPD (m/s)
Collins GPS Comp'd Aircraft Vertical Velocity

☒ VSPD (m/s)
IRS-Computed Aircraft Vertical Velocity

☒ VSPD_PITR (m/s) *-3x*
IRS-Computed Aircraft Vertical Velocity

☒ WP3 (m/s)
Damped Aircraft Vertical Velocity

☒ WP3_PITR (m/s)
Damped Aircraft Vertical Velocity

both missing

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) *-3x*
Aircraft True Airspeed, Reference

Mach

☒ ADCMACH (none)
DADC Mach Number

☒ MACH (none)
Aircraft Mach Number

☒ XMACH2 (none)
Aircraft Mach Number Squared

North/South Component

☒ GHVNS_SG1 (m/s)
Hnywll GPS Grnd Spd Vector, Nrth/Sth Component

☒ GHVNS_SG2 (m/s) *-3x*
Hnywll GPS Grnd Spd Vector, Nrth/Sth Component

☒ XVNSC (m/s) *-3x*
GPS-Correc't'd Inertial Ground Spd Vector, North Component

☒ GPVNS (m/s)
Collins GPS Grnd Spd Vector, Nrth/Sth Component

☒ VNS (m/s)
Inertial Ground Speed Vector, North/South Component

☒ VNS_PITR (m/s)
Inertial Ground Speed Vector, North/South Component