

U.S. Dep't. of Commerce / NMAO / NOAA / Aircraft Operations Center				
FLT ID: 090107N		From: KMCF		To: PANC
FLT #: 09-025		Blk In: 2351 Z 8.8		Lnd Time: 2347 8.6
ETD: 1500 Z		Blk Out: 1505 Z		T/O Time: 1511 Z
ETE: 8.5 hrs		Total Blk: 8hrs 46min		Total Flt: 8hrs 36min
Sponsoring Org: PWT		Program: TPARC		Purpose: TRANSIT
AOC Flight Crew				
Aircraft Commander: HAGAN			Data System:	
Co-Pilot: LONGENECKER / TWINING			Avaps: ROGERS	
Navigator: /			System Engineer:	
Flight Eng: /			AA: HILL	
Flt Director: ALMEIDA /			AA: CARPENTER	
Avionics:			Crew Chief: ROTTEVEEL	
Participating Scientists, Visitors, & Add'l Aircrew on back.				# of people listed on back: <u> </u>
	A/C - Takeoff	Wx Station - Takeoff	A/C - Land	Wx Station - Land
Pressure	~1010.2mb	1010.7mb	1001.4	1001.6
ATIS - Takeoff	1455 21017 10SM 23/22 29.86			
ATIS - Land	2353 1006.5 10SM 24/28 29.71			
Data Source	Number	Data Disposition / Date / Quality		
Flight Level Tapes	NO TAPE	9015fola.ads		
Radar Tapes	<u> </u>			
Dropsondes	<u> </u>	Good:	Bad:	Sent:
AXBT	<u> </u>			
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: _____ Mission ID: _____				

NO DROPS



NOAA G-IV N49RF
Ferry Flight (KMCF-PANC)
07 January 2009



Flight ID: 090107N

Sensor or system

Accelerometer
Altitude
Attack Angle
Dew Point Probe
Dynamic Pressure
Geopotential Altitude
Inertial Selected
Static Pressure
Slip Angle
Temperature Probe
True Air Speed
Constants File
Project Directory

Number or Name

ACINS_PITR
PALT
AKRD1
DPR
QC2M
HGALT
VEW_PITR, VNS_PITR
PS1M
SSRD1
AT3/TT3
TAS1
49cal082
/proj/901

Local Met Data:	<u>Takeoff (1511Z)</u>	<u>Landing (2347Z)</u>
Aircraft Static Pressure	1010.2 mb	1001.4 mb
Tower Pressure (corrected)	1010.7 mb	1001.6 mb

Notes:

There is about a 2mb difference between PS1M and PS2M. From test flights comparing aircraft data to drosoponde data PS2M has been closer to representing the actual atmosphere.

PS2M data seems unreliable. Spikes are most evident between 1755z-1836z and 2341z-2345z. PS1M data spikes at 162831z, but appears more reliable through rest of flight. PS1M is used in met calculations. Spikes in static pressure can affect the following variables: MR, PALT, PSURF, RHODL, RHODR, RHUM, THETA, THETA E, THETA V, XMACH2.

1.2° difference between SSRD1 & SSRD2 throughout flight. SSRD1 averages closer to 0° so it is used in met calculations.

At 163752z AKRD1 & AKRD2 diverge in opposite directions by ~0.1°. Unsure why they diverge, but it is a small difference and for a short duration. Could be due to turbulence.

At 163331z there is a small spike in both QC1M and QC2M that affects IAS and XMACH2. Spike could be turbulence.

Collins GPS went offline at 2220z and didn't recover for rest of flight.

Flight Director: LTJG Jackie Almeida
Phone #: (813) 828-3310



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HGALT spikes several times throughout flight. Most notably at: 153144z-153506z, 2118z-2247z, and 231106z-231259z. But is still used in met calculations because GPGALT goes out when the Collins went offline.

GHALT_SG1 & GHALT_SG2 drift from GPALT starting at 155224z and then drops about 30-40m at 163541z.

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

There were no dropsondes launched during this flight.

Flight Director:
Phone #:

LTJG Jackie Almeida
(813) 828-3310

Flight: 090107N Transit

Inertial Altitude

☒ ALT (m)
IRS Baro-Inertial
Altitude
☒ 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)
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)
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)
Aircraft Pitch Angle

Roll vs Hdg

☒ ROLL (deg)
Aircraft Roll Angle
☒ ROLL_PITR (deg)
Aircraft Roll Angle

Heading vs Trk

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

Drift Angles

☒ AOCD (deg)
Computed Drift Angle
☒ AOCD_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:

<u>pg 4</u>	<u>1</u>	ATTACK	AKRD(1, 2)	<u>2</u>	QCX	QC(1, 2)M <u>pg 4</u>
	<u>3</u>	ATX	AT(1, 2, 3, 4)	<u>2</u>	QCXC	QC(1, 2)C <u>pg 4</u>
	<u>R</u>	DPX	DP(L, R)	<u>1</u>	SSLIP	SSRD(1, 2) <u>pg 4</u>
	<u>R</u>	DPXC	DP(L, R)C	<u>1</u>	TASX	TAS(1, 2)
	<u>HG</u>	DVALU	(HG, GPG)ALT	<u>3</u>	TTX	TT(1, 2, 3, 4)
<u>pg 4</u>	<u>1</u>	PSX	PS(1, 2)M	<u>2</u>	WI	IRS 1 or 2
<u>pg 4</u>	<u>1</u>	PSXC	PS(1, 2)C	<u>2</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: 090107N Transit

NA Latitudes
NA GHLATF_SG1 (deg)
 Honeywell GPS
 Latitude, Fine
NA GHLATF_SG2 (deg)
 Honeywell GPS
 Latitude, Fine
 ✓ GHLAT_SG1 (deg)
 Honeywell GPS Latitude
 ✓ GHLAT_SG2 (deg)
 Honeywell GPS Latitude

NA Longitudes
NA GHLONF_SG1 (deg)
 Honeywell GPS
 Longitude, Fine
NA GHLONF_SG2 (deg)
 Honeywell GPS
 Longitude, Fine
 ✓ GHLON_SG1 (deg)
 Honeywell GPS
 Longitude
 ✓ GHLON_SG2 (deg)
 Honeywell GPS
 Longitude

HDOP
 ✓ GHHDOP_SG1 (none) → 0.68 → 1.80
 Honeywell GPS Horiz.
 ✓ Dilution of Position
 GHHDOP_SG2 (none) → 0.68 → 1.15
 Honeywell GPS Horiz.
 Dilution of Position

VDOP
 ✓ GHVDOP_SG1 (none) → 0.84 → 3.38
 Honeywell GPS Vertical
 ✓ Dilution of Position
 GHVDOP_SG2 (none) → 0.84 → 1.77
 Honeywell GPS Vertical
 Dilution of Position

HFOM
 ✓ GHHFOM_SG1 (m) → 1.58 → 3.81
 Honeywell GPS Horiz.
 ✓ Figure of Merit
 GHHFOM_SG2 (m) → 1.58 → 2.57
 Honeywell GPS Horiz.
 Figure of Merit

VFOM
 ✓ GHVFOM_SG1 (m) → 5.8 → 20.55
 Honeywell GPS Vertical
 ✓ Figure of Merit
 GHVFOM_SG2 (m) → 5.8 → 11.69
 Honeywell GPS Vertical
 Figure of Merit

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

✓ GPLON (deg)
 Collins GPS Longitude
 ✓ LON (deg)
 IRS1 Longitude
 ✓ LON_PITR (deg)
 IRS2 Longitude

2 ✓ XLATC (deg)
 GPS-Corrected Inertial
 Latitude

✓ XLONC (deg)
 GPS-Corrected Inertial
 Longitude

GPS Differences
 ✓ GDIF1 Avg 2512m
 Position Difference
 (Collins - IRS1)
 ✓ GDIF2 Avg 1235m
 Position Difference
 (Collins - IRS2)

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

dif
 INE LAT vs GPS LAT Avg
 ~ 0.01 → 0.02
 INE LON vs GPS LON Avg
 ~ 0.00 → 0.01

Flight: 090107N Transit

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
R DPXC (degC)
Dew Point Temperature,
Reference
☒ DPL (degC)
Left Dew/Frost Point
Temperature
☒ DPR (degC)
Right Dew/Frost Point
Temperature
R 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) -9.7 -8.99
☒ CR-2 Hygrometer
Balance
☒ CRYO (degC) -150.14 -749.93
☒ CR-2 Hygrometer
☒ CRYOC (degC) -146.86 -746.68
☒ CR-2 Hygrometer,
corrected
☒ PCRYO (mb)
☒ CR-2 Hygrometer
Pressure -799.45 -799.89

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

☒ EDPG (mb)
Ambient Water Vapor
Pressure, Reference

151948 - spike AKRD^{H2}, PITCH 102,

163752 - AKRD1 $\downarrow$ + AKRD2 $\uparrow$ (0.10 diff.)

1, 2° diff ~~SSRD~~ 1+2 constant throughout flight

162831 - jump in PS 1 M+C

PS2M decr start @ ~ 172200 - ~ 205100
especially pronounced betw. ~ 1755 - 1836
tagain decr @ ~ 2341 - 2345

QC1x2 163331 - small spike affects IAS + X Mach 2
 $\downarrow$
+ turb?

~~IWD spike @ 234617 - 234621 0-2360~~

Flight: 090107N Transit

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)
- Raw Dynamic Pressure, Reference
- 2 QCXC (mb)
- Corrected Dynamic Pressure, Reference

Attack (compare to pitch) ^{+mach 2}

- ☒ 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
- 1 PSX (mb)
- Raw Static Pressure, Reference
- 1 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
- 1 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

UTANURAD Winds

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

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GHVEW-1 spikes 190152 → 0159Z
+
VNS

Flight: 090107N Transit

Groundspeeds

- ☒ GHGSF_SG1 (m/s)
Honeywell GPS Ground Speed
- ☒ GHGSF_SG2 (m/s)
Honeywell GPS Ground Speed
- ☒ GPGSPD (m/s)
Collins GPS Ground Speed
- ☒ GSF (m/s)
Inertial Ground Speed
- ☒ GSF_PITR (m/s)
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'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'd Inertial Ground Spd Vector, North Component

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)
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)
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

diff
~ 0.03

Collins GPS @ 2220 went offline

HGALT - spikes 153144 - 153506, 163045, 163332

163558, 163828, 170915, 171125, 173120

174235, 175029, + more 2118-2247, 231106-1259

GHALT 1+2 spike @ 163529 - looks like #2 delayed
from ~155224 → 163541 Honeywell deviates from
Collins. + jumps ↓ ~30-40m to rejoin

Collins GPALT spikes @ ^{~12m} 203808 + ^{~7m} 213221?

Aviation Digital Data Service (ADDS)

Output produced by METARs form (1335 UTC 07 January 2009)
found at <http://weather.aero/metars/index.php>

T/O ~ 15Z
Lnd ~ 23Z

KMCF 071255Z 19013KT 10SM FEW025 BKN250 21/21 A2984 RMK AO2A SLPNO T02090209 \$

KMCF 0709/0809 20008KT 9999 BKN030 QNH2986INS
BECMG 0712/0713 19012G18KT 9999 BKN020 QNH2980INS
TEMPO 0717/0721 23020G30KT
BECMG 0720/0721 29012G18KT 8000 -SHRA BKN010 QNH2985INS
BECMG 0800/0801 33010KT 9999 NSW SKC QNH2995INS T23/0719Z T12/0811Z AUTOMATED SENSOR METWATCH 0709 TIL 0711

KTPA 071253Z 19011G17KT 10SM SCT011 BKN250 22/20 A2983 RMK AO2 SLP101 T02170200

KTPA 071326Z 0713/0812 20012G17KT P6SM SCT015 BKN250
TEMPO 0713/0715 BKN015
FM071500 21013G20KT P6SM VCSH SCT010 SCT030 BKN250
TEMPO 0715/0717 VRB15G30KT 3SM SHRA BKN020
FM071700 26015G22KT P6SM VCSH BKN030 BKN080
FM072100 29014G20KT P6SM SCT050 BKN250
FM080100 VRB05KT P6SM SCT250

T/O
SW wnds
13 G 20
VCSH

KPIE 071253Z 20014KT 10SM CLR 23/21 A2983 RMK AO2 SLP101 T02280206

KPIE 071326Z 0713/0812 20013KT P6SM SCT015 BKN250
TEMPO 0713/0715 BKN015
FM071500 22013G20KT P6SM VCSH SCT010 SCT030 BKN250
TEMPO 0715/0717 VRB15G30KT 3SM SHRA BKN025
FM071700 26015G22KT P6SM VCSH BKN030 BKN080
FM072100 30014G20KT P6SM SCT050 BKN250
FM080100 VRB05KT P6SM SCT250

PANC 071253Z 00000KT 6SM BR FEW003 SCT010 M25/M30 A2968 RMK AO2 SLP055 T12501300

PANC 071138Z 0712/0818 02004KT P6SM FEW003 SCT010
TEMPO 0712/0716 2SM BR SCT001 BKN005
FM072200 01003KT P6SM VCFG FEW005 SCT015
FM080400 00000KT 2SM BR SCT001 BKN005
FM080700 00000KT 3/4SM BR SCT001 BKN003

Lnd
LT Var Wnds
Fog