

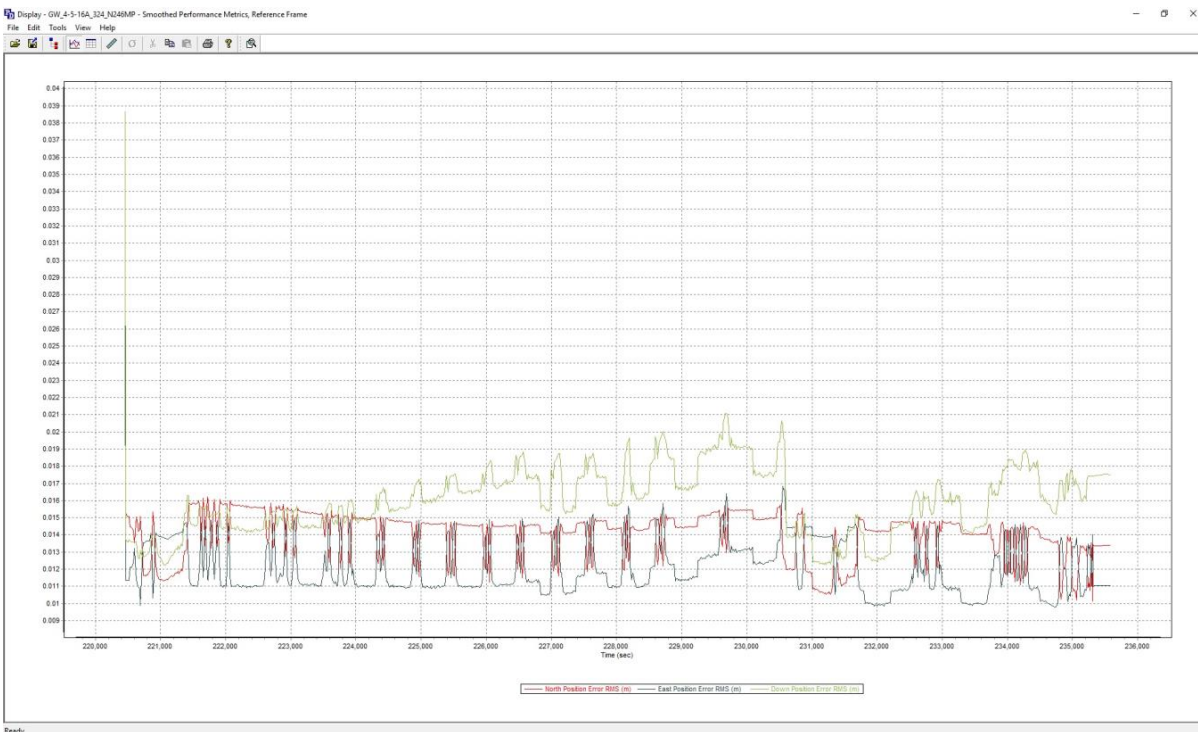
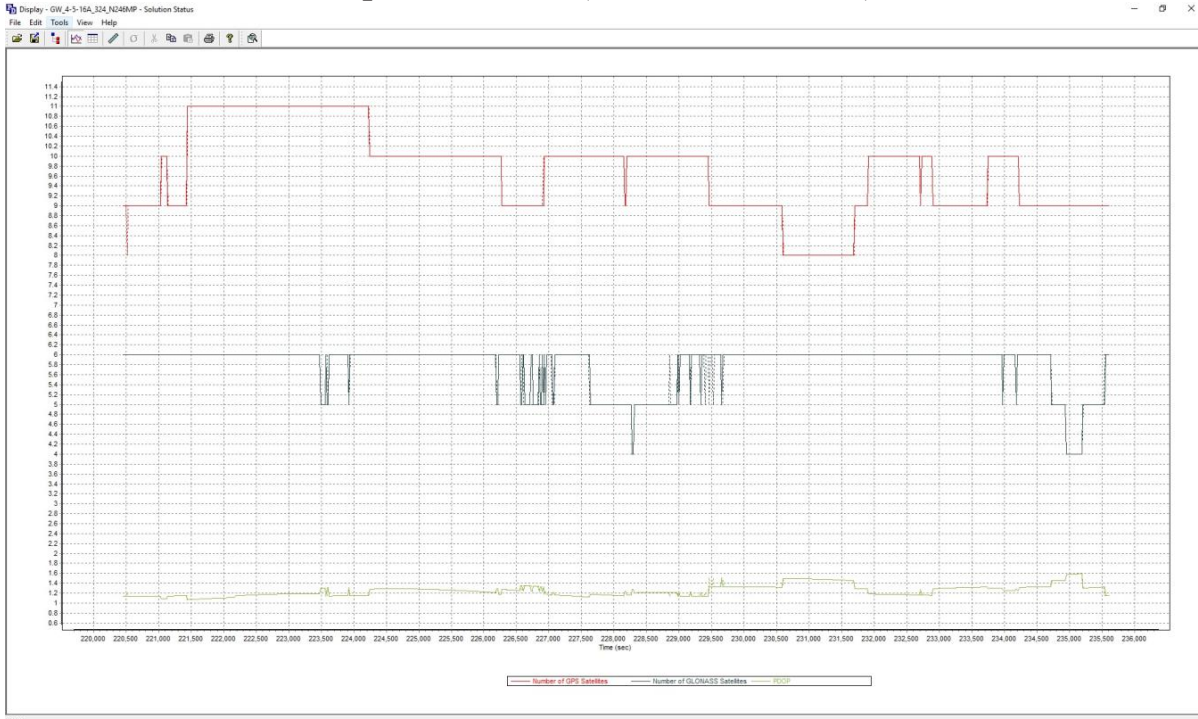
Appendix A:

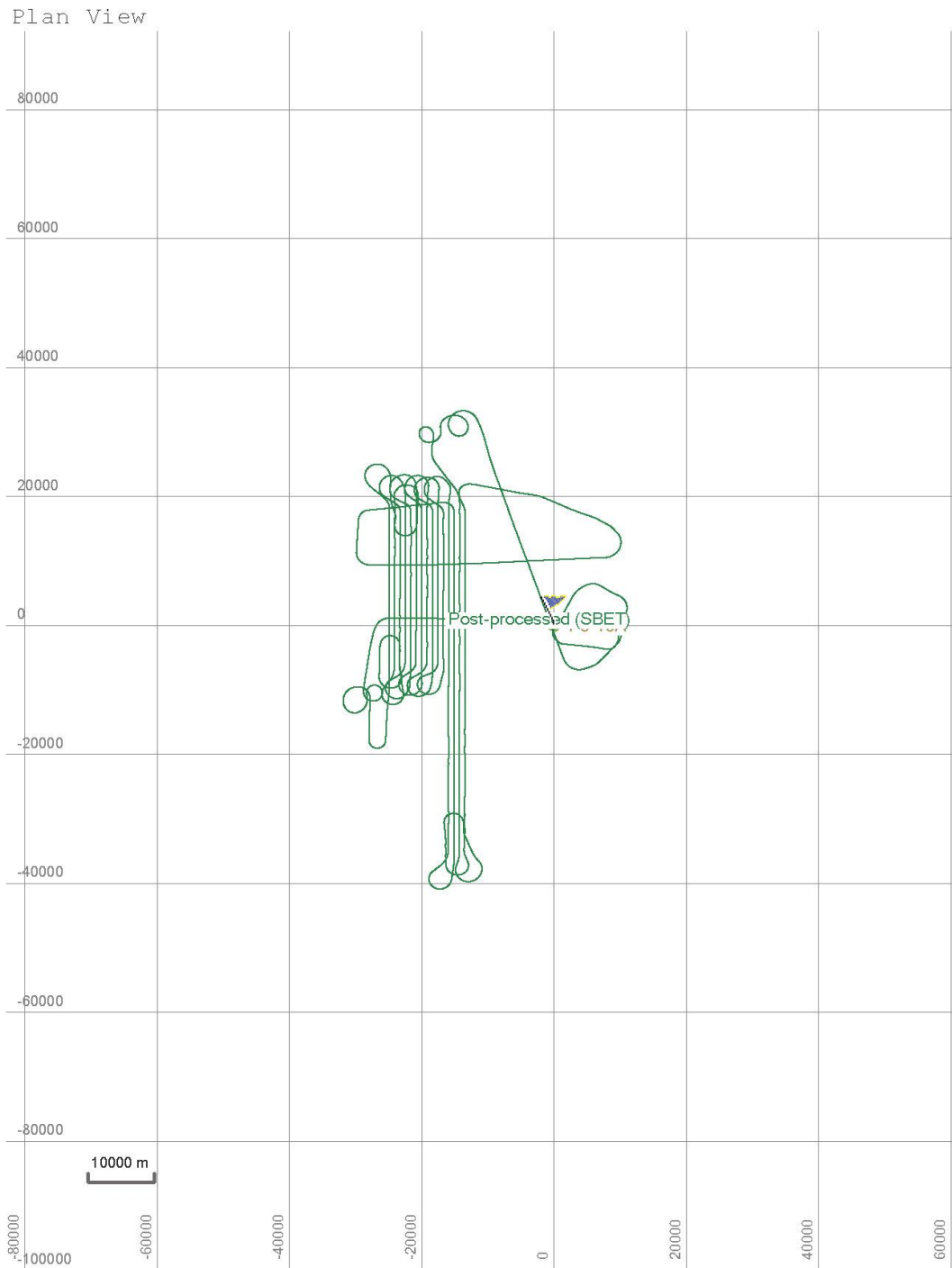
GPS/IMU Statistics, Flight Logs, and Base Station Logs

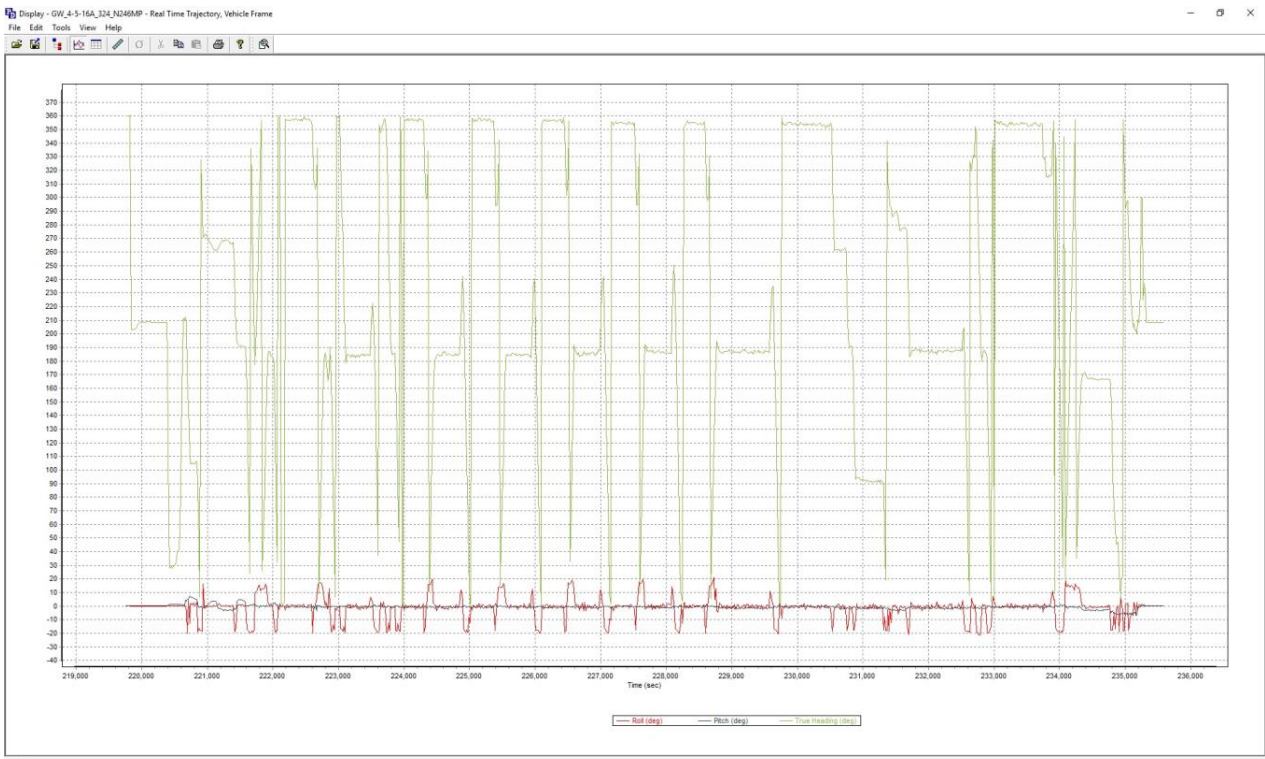
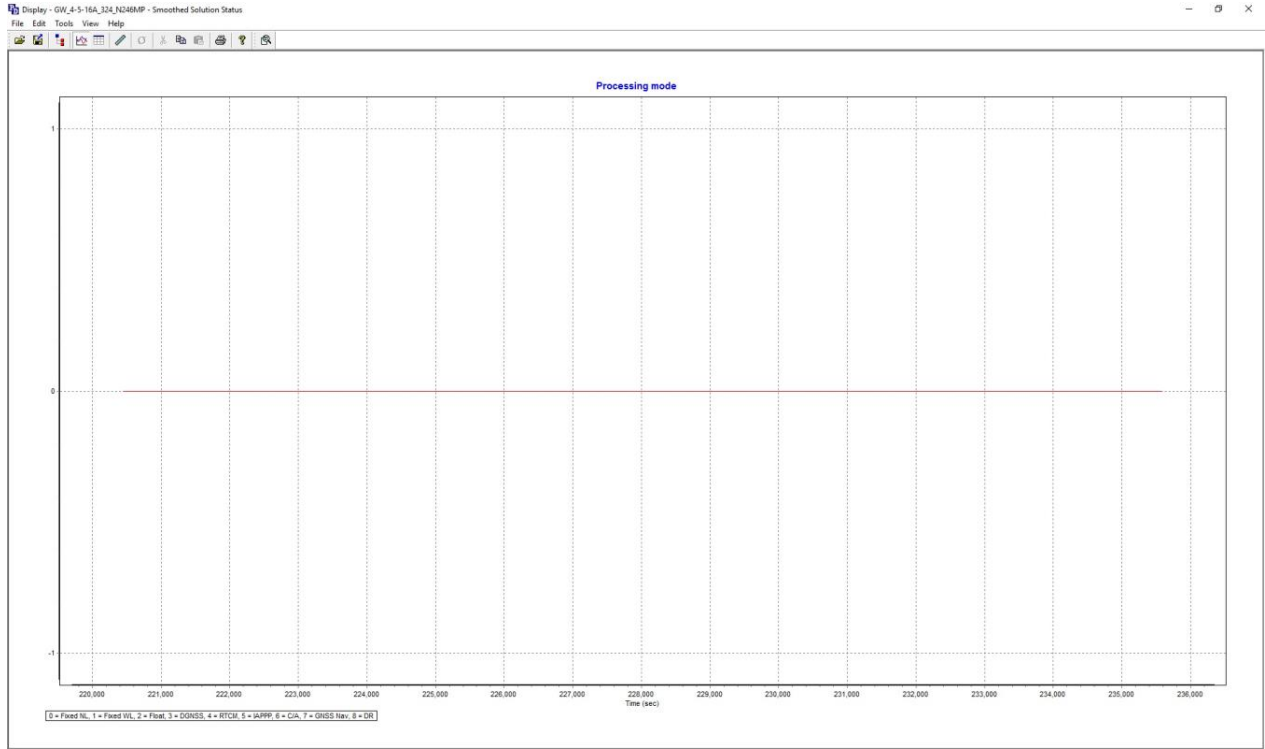
There were six total lifts (five were used). Graph reports generated from processing software, flight logs, and base station logs are found on the following pages.

Apr 5, 2016-A (N246MP, SN324).....	2
Apr 12, 2016-A (N246MP, SN324).....	7
Apr 13, 2016-A (N246MP, SN324).....	12
Apr 13, 2016-B (N246MP, SN324).....	17
Apr 14, 2016-A (N246MP, SN324).....	23
Apr 14, 2016-B (N246MP, SN324).....	28

Apr 5, 2016-A (N246MP, SN324)







Coordinate Manager

Station Information

Station ID: 4-5-16A

Coordinates

Latitude: N 44 32 43.97813000

Longitude: W 89 32 7.26649000

Altitude: 300.6030 m

Decimal Degrees

Antenna Frame

Height: 1.711 m

Method: Bottom of notch

Manufacturer: Trimble

Type: Zephyr Geodetic 2

Offset from Measured Point to APC: 0.033 m

Ground Reference Point (GRP) coordinates Apply Changes

Station Database

Station ID: 4-5-16A Station Fullname: 4-5-16A

Primary Service ID: Edit Coordinate Accuracy: UNKNOWN_ACC

Secondary Service ID: Edit Add Delete Update

Station ID	Station Full...	Frame	Epoch	Ellipsoid	Latitude	Longitude	Altitude	Coord Acc

< >

Import Coordinates Export Coordinates

Close

Date: 4/5/16
 LITE (A) B C D E Pg. 1 of 1

Airborne LIDAR Data Collection Log Sheet :: Quantum Spatial, Inc
(email log daily to flight_log_distribution_list@quantumspatial.com)

Project: WROC PORTAGE CO. Proj #: 27131 Flight Mgmt File: 20160405
 Aircraft: 1246MP Begin Hobbs: 947.0 End Hobbs: 947.0 Total: 5.3 Pilot: McDONALD Co-Pilot: Tech: NELSON
 Dep Apt: 1145 Dep Time (Lcl): 6:45 (Z): 11:45 Arr Apt: KSTE Arr Time (Local): 12:21 (Z): 17:21 Tot Time Aloft: 5.3
 CORS: Y/N Sta 1: STPT Sta 2: Flyovers: Y/N If Y, times: Sta 1) 13:24(2) Sta 2) 17:12(2)
 GPS Unit: Y/N Sta 1: KSTE Sta 2: Flyovers: Y/N If Y, times: Sta 1) AT KSTE Sta 2)

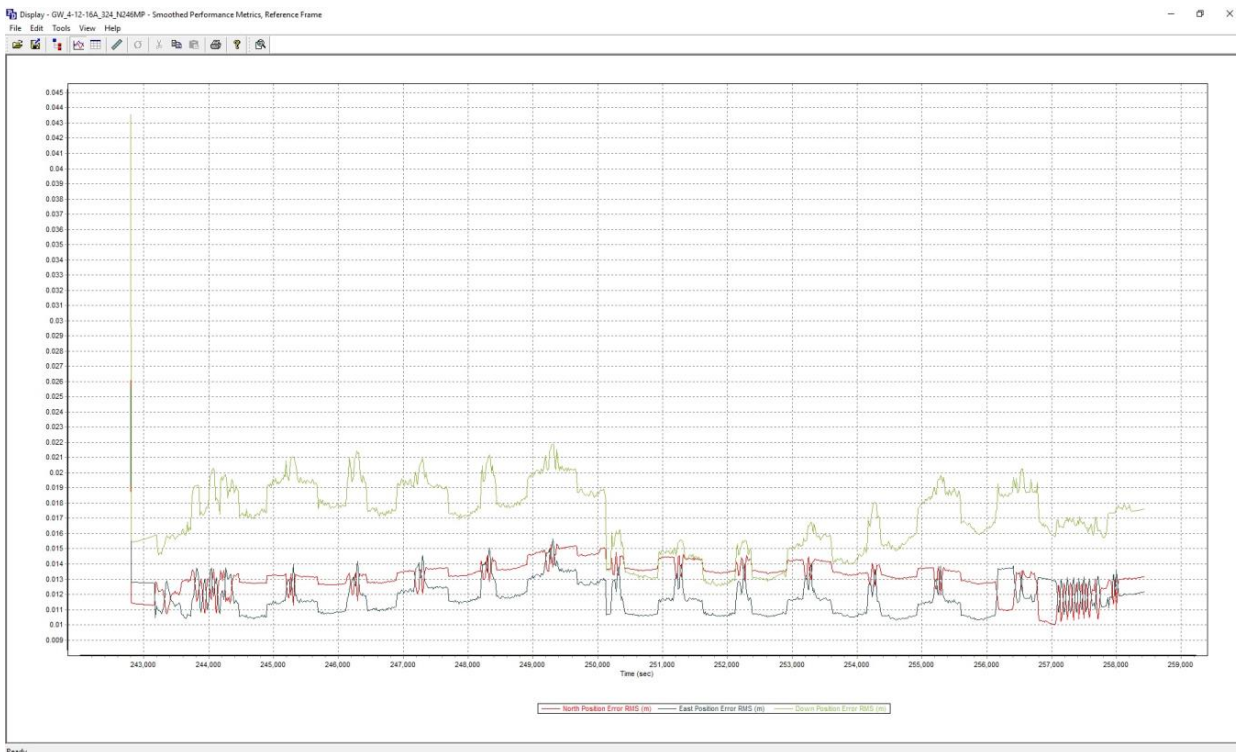
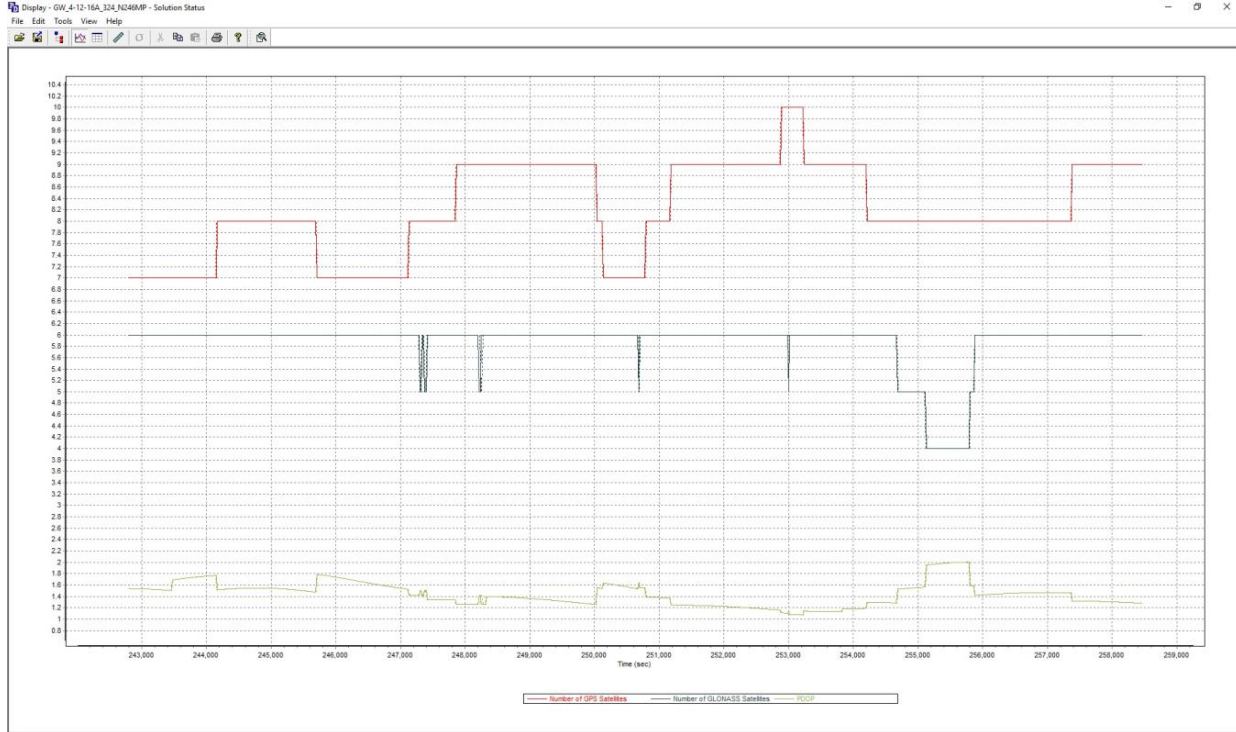
Gd Temp	beg	°C	End:	°C	OAT	beg:	°C	End:	°C	Alt	AMSL	2050	Avg Terr	350	Max	30.38	end:	30.29	Range	0	End	44.8	2
LIDAR	Type	LIDAR	Serial #	3032	FOV	Scan	52	MPIA	Y/N	Pulses	In Air	3	Pulse	Rate	225	Power:	HIGH	PPSM	2+	End	44.8	Tot	44.8

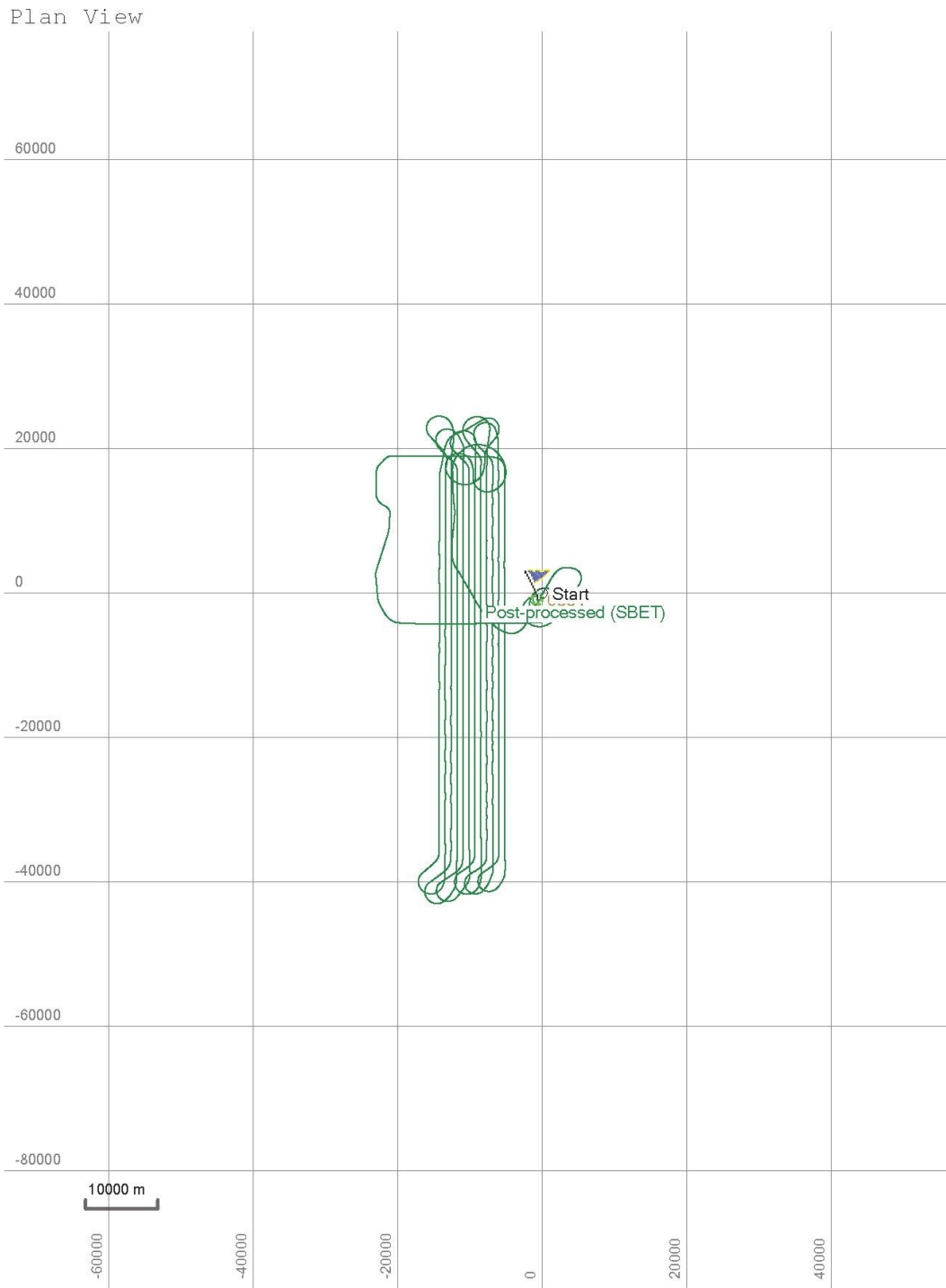
Line #	Hdg	Start (UTC)	End (UTC)	Gd Spd	PP0P/+sias	GPS Altitude	Turb (0..-1)	Crab
62	0	13:44	13:50	135	1.07	1660		3
61	180	14:58	14:04	140	1.07	1690		-4
60	0	14:13	14:18	140	1.07	1680		3
59	180	14:22	14:27	135	1.07	1690		5
58	0	14:31	14:36	140	1.07	1690		3
57	180	14:40	14:45	130	1.07	1690		4
56	0	14:49	14:53	140	1.07	1690		4
55	180	14:57	15:03	135	1.07	1690		4
54	0	15:06	15:11	140	1.23	1690		4
53	180	15:15	15:20	125	1.18	1690		6
52	0	15:24	15:30	135	1.18	1700		5
51	180	15:33	15:45	130	1.18	1690		6
50	0	15:50	16:01	140	1.16	1700		6
X-FUT	E	16:08	16:15	160	1.3	1680		X
49	180	16:23	16:35	135	1.2	1690		5
48	0	16:43	16:55	135	1.2	1705		5

FLIGHT LINE NOTES - visibility, clouds, smoke, partial, etc.
 SET BASE AT KSTE 12:20(2) + 13:15(2)
 3 TEST FINES
 LI SNOW IN DITCHES
 1990 M ALT
 QING SOUTH END OF AOI
 CROSSFLIGHT
 CLD 6 NMI SOUTH END OF AOI
 CLD 17 NMI FSE + 21 NMI REPLY?

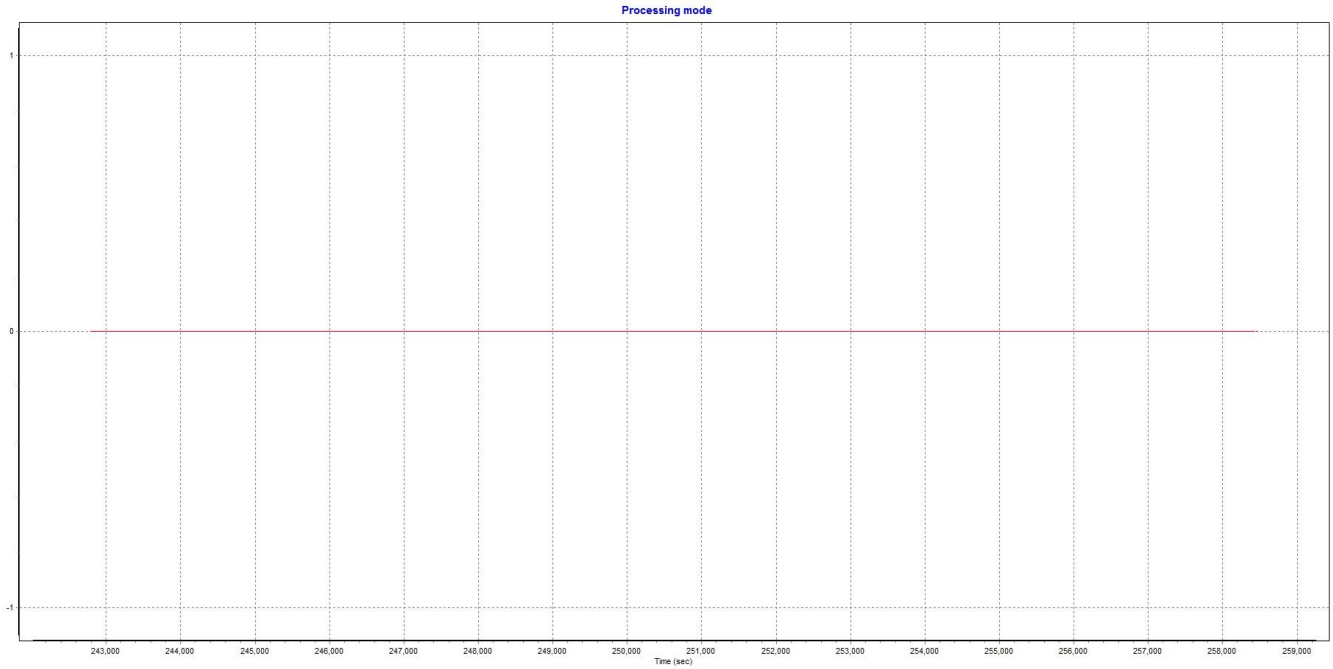
Total Proj Lines: 63 Lines Flown: 15 Lines Remain: 48 Online Time: 3.2 Mob Time: 2.1 Notes:

Apr 12, 2016-A (N246MP, SN324)



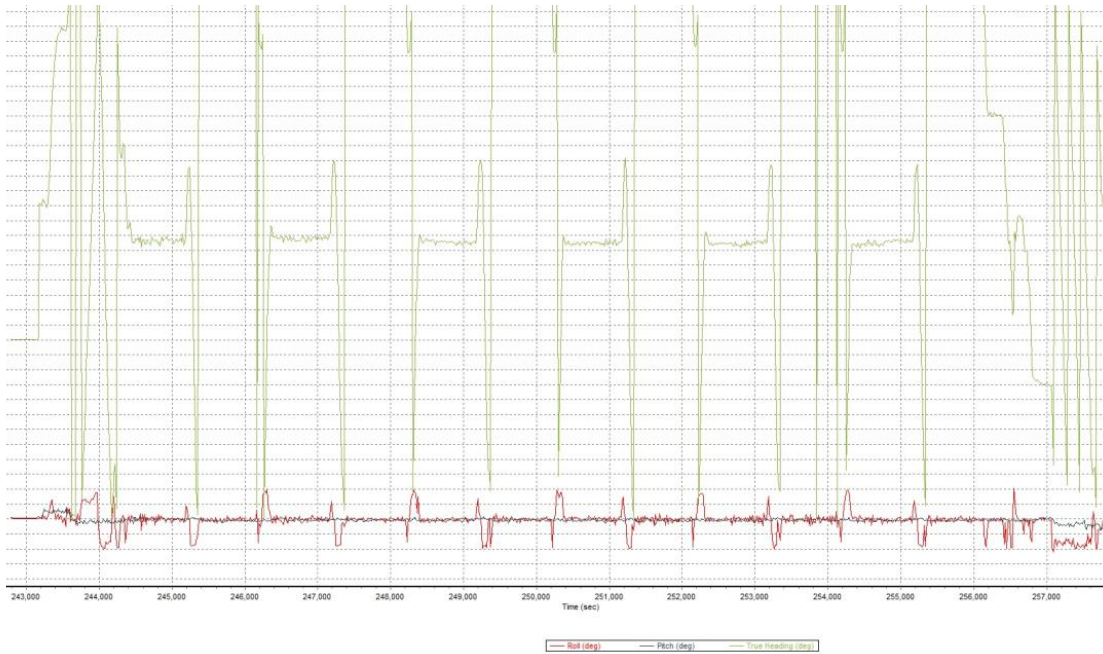


splay - GW_4-12-16A_324_N246MP - Solution Status



0 = Fixed NL, 1 = Fixed VL, 2 = Float, 3 = DGSS, 4 = RTCM, 5 = uAPPP, 6 = CIA, 7 = GNSS Nav, 8 = DR

Forward Reverse



Coordinate Manager

Station Information

Station ID: 0884

Coordinates

Latitude: N 44 32 43.97813000

Longitude: W 89 32 7.26649000

Altitude: 300.6030 m

Decimal Degrees

Antenna Frame

Height: 1.652 m

Method: Bottom of notch

Manufacturer: Trimble

Type: Zephyr Geodetic 2

Offset from Measured Point to APC: 0.032 m

Ground Reference Point (GRP) coordinates Apply Changes

Station Database

Station ID: 0884 Station Fullname: 0884

Primary Service ID: Edit Coordinate Accuracy: UNKNOWN_ACC

Secondary Service ID: Edit Add Delete Update

Station ID	Station Full...	Frame	Epoch	Ellipsoid	Latitude	Longitude	Altitude	Coord Acc

Date: 1/12/2016
 LIT: (A) B C D E / F I Pg 1 of 1

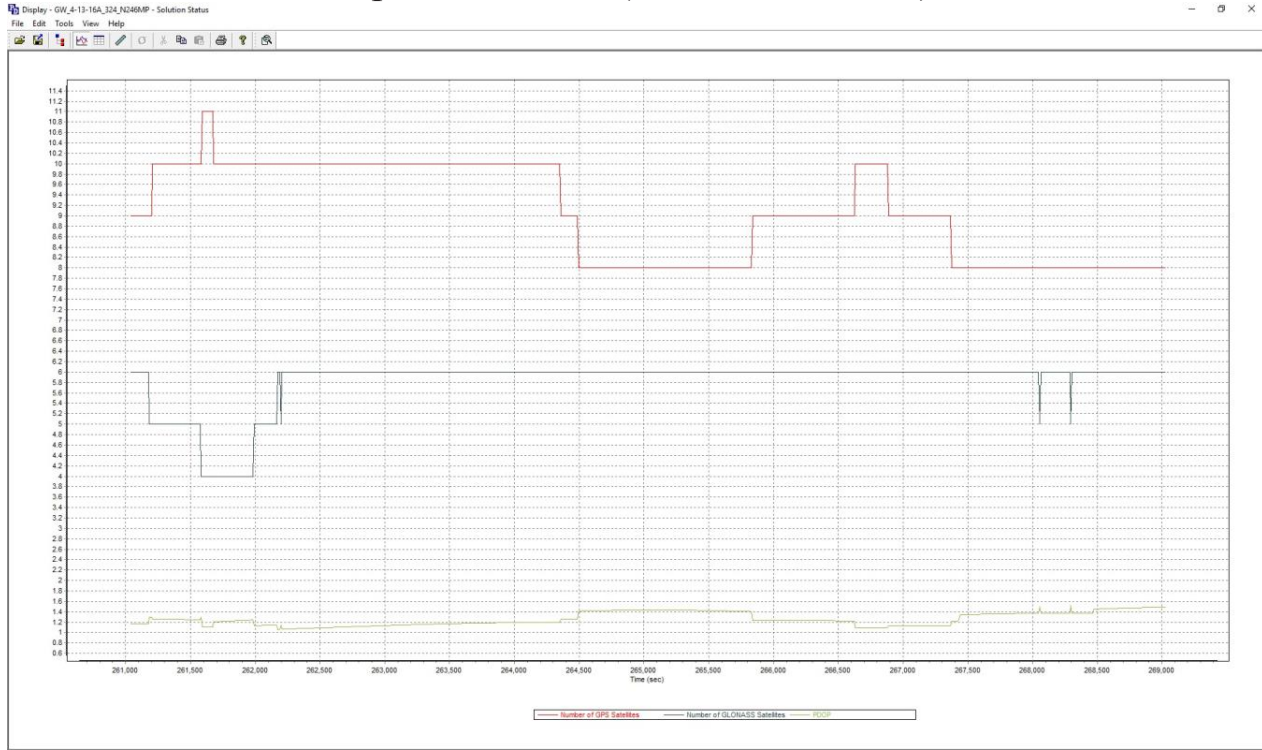
Airborne LIDAR Data Collection Log Sheet :: Quantum Spatial, Inc
(email Log daily to flight_log_distribution_list@quantumspatial.com)

Project: 27131 WROC_AYRES_3DEP Proj #: 27131 Flight Mgmt File: 2=160412A
 Aircraft: N246MP Begin Hobbs: 949.9 End Hobbs: 954.0 Total: 4.1 Pilot: Log McDonald Co-Pilot: Tech: Gary Tao
 Dep Apt: KSTE Dep Time (Lcl): 2:31 (Z): 19:31 Arr Apt: KSTE Arr Time (Local): 6:38 (Z): 23:38 Tot Time Aloft: 4.1
 CORS: Y/N Sta 1: S+PT Sta 2: Flyovers: Y/N If Y, times: Sta1) Sta2)
 GPS Unit: (Y/N) Sta 1: KSTE Sta 2: Flyovers: Y/N If Y, times: Sta1) Sta2)

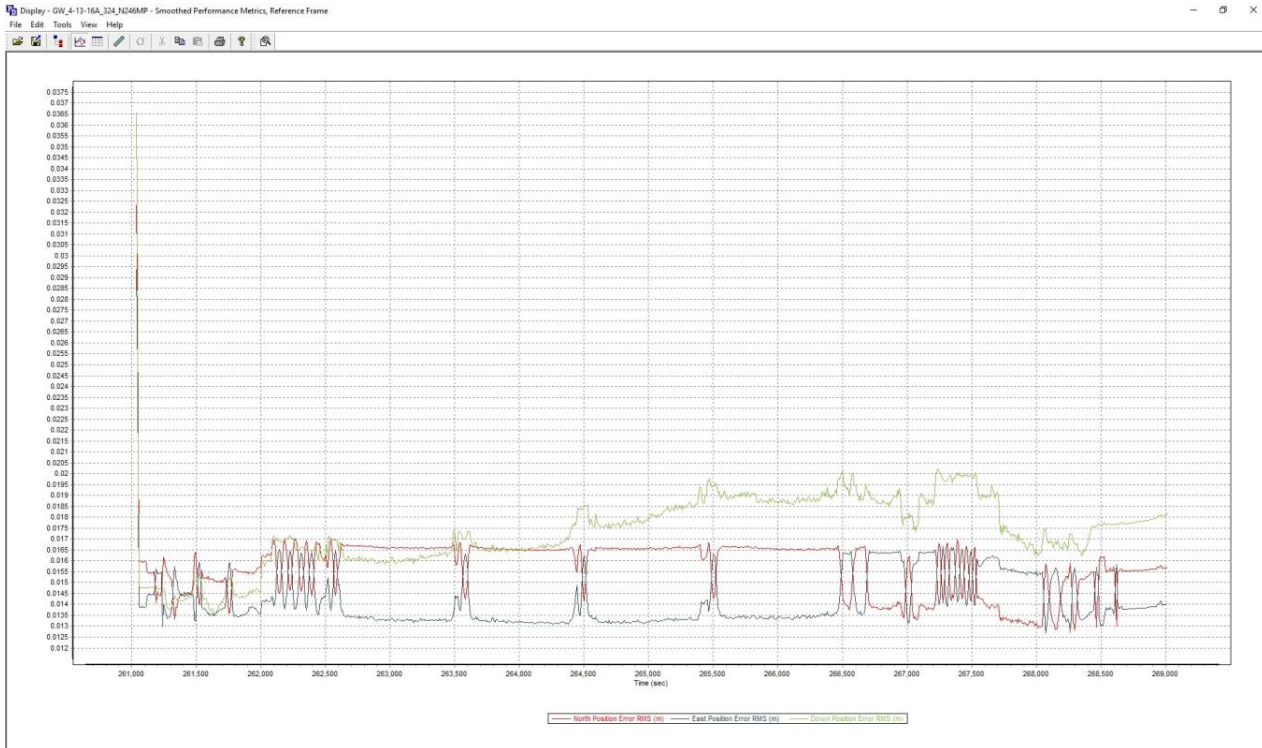
Gd Temp beg:		°C End:		°C OAT beg:		°C End:		°C Altimeter begin:		end:		Mag		Storage		
Type	Serial #	ALT AGL	ALT ANSL	Avg Terr Hc	Max Glided	Pulse Rate	Pulse Rate	Avg Pt	Power	PPPM	Mag GA	End GA	Mag GA	End GA	Tot GA	Storage Name/No
LIDAR	FOV	19/38	Scan Freq	52	MPIA Y/N	3	3	High	2.6	2.6	6/8	19:42-19:49	19:42-19:49	19:40	13SEN	33/1
FLIGHT LINE NOTES - visibility, clouds, smoke, partial, etc.																
a little faster start, fishtailing 4-6 NM from Nord																
CrossTie																
Approaching storm from west ; RTB																

Total Proj Lines: 63 Lines Flown: 27 Lines Remain: 36 Online Time: 3.5 Mob Time: .6 Notes: Clear
 19:10 on - 23:50 off

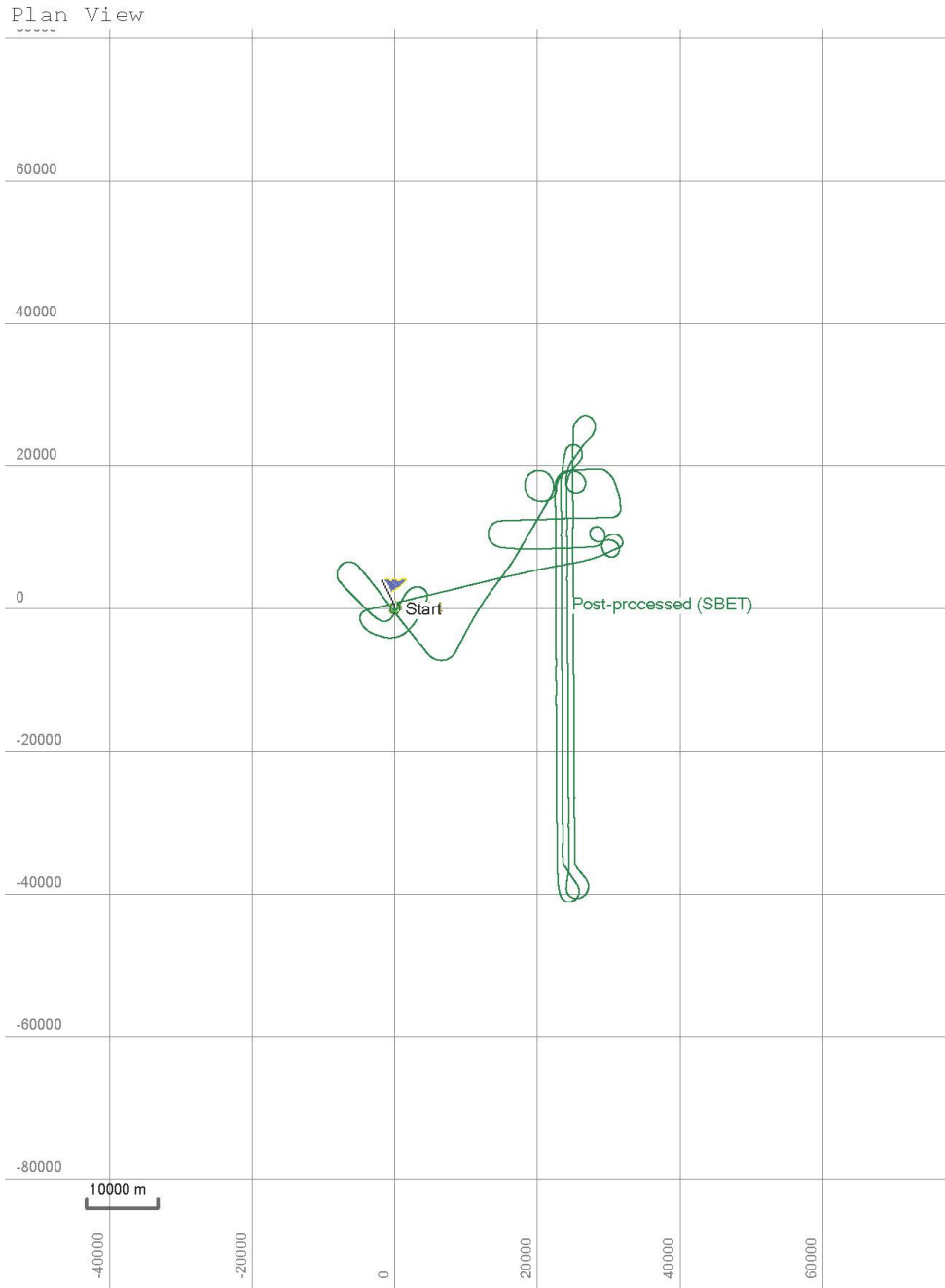
Apr 13, 2016-A (N246MP, SN324)



Ready



Ready



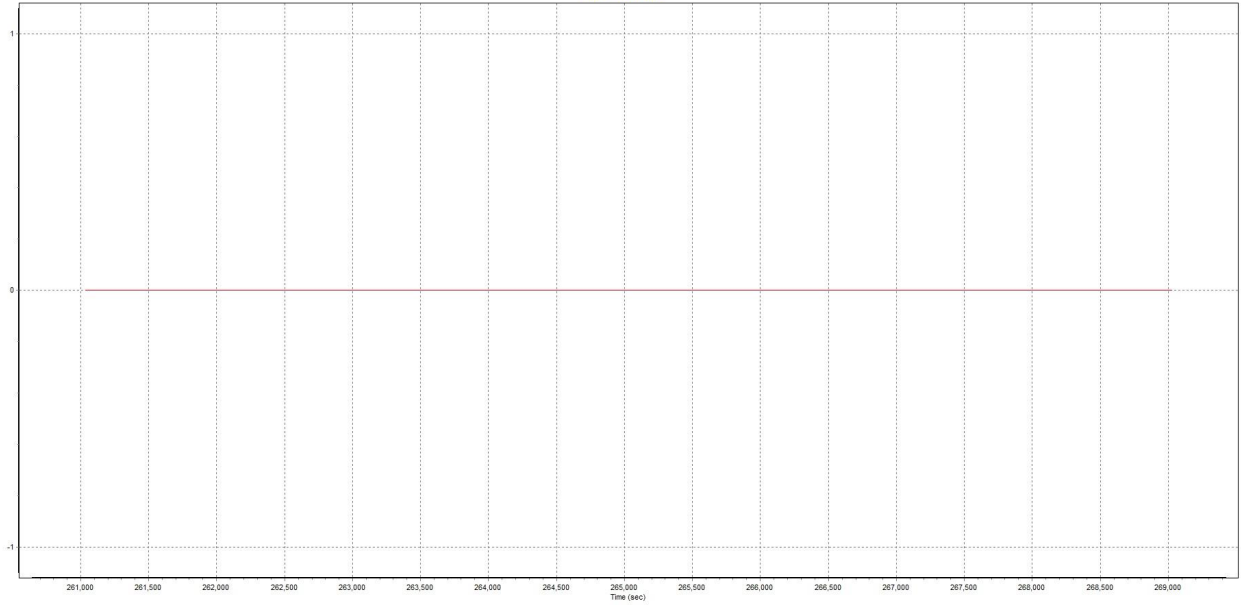
Display - GW_4-13-16A_324_N246MP - Solution Status

— □

1 Edit Tools View Help

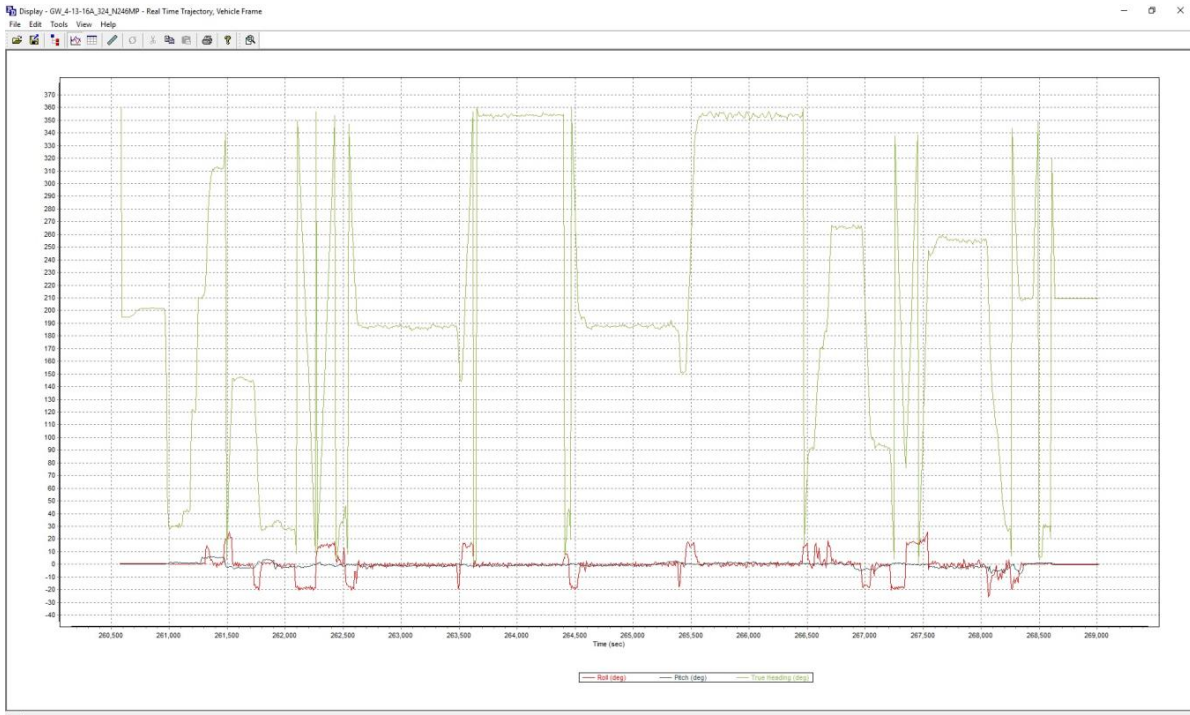


Processing mode



0 = Fixed NL, 1 = Fixed WL, 2 = Float, 3 = DGNS, 4 = RTCM, 5 = IAPPP, 6 = CIA, 7 = GNSS Nav, 8 = DR

-- Forward -- Reverse



Coordinate Manager

Station Information

Station ID: 0884

Coordinates

Latitude: N 44 32 43.97813000

Longitude: W 89 32 7.26649000

Altitude: 300.6030 m

Decimal Degrees

Antenna Frame

Height: 1.652 m

Method: Bottom of netch

Manufacturer: Trimble

Type: Zephyr Geodetic 2

Offset from Measured Point to APC: 0.032 m

Ground Reference Point (GRP) coordinates Apply Changes

Station Database

Station ID: 0884 Station Fullname: 0884

Primary Service ID: Edit Coordinate Accuracy: UNKNOWN_ACC

Secondary Service ID: Edit Add Delete Update

Station ID	Station Full...	Frame	Epoch	Ellipsoid	Latitude	Longitude	Altitude	Coord Acc
[Empty Table]								

Import Coordinates Export Coordinates Close

Date: 4/12/16 Pg 1 of 1
Utr: A B C D E

Airborne LIDAR Data Collection Log Sheet :: Quantum Spatial, Inc
(email: Log daily to flight_log_distribution_list@quantumspatial.com)

Project: PORTAGE WROC Proj #: 2713 Flight Mgmt File: 20160413A Tech: NELSON
Aircraft: N246MP Begin Hobbs: 9560 End Hobbs: 9560 Total: 2 Pilot: McDONALD Co-Pilot:
Dep Apt: STE Dep Time (Lcl): 19:30 (Z): 0:30 Arr Apt: STE Arr Time (Local): 2:30 (Z): 2:30 Tot Time Aloft: 2
CORS: (Y) N Sta 1: STPT Sta 2:
GPS Unit: (Y) N Sta 1: KSTE Sta 2:
Flyovers: (Y) N If Y, times: Sta1) 0:40, 2:25 (Sta2)
Flyovers: Y / N If Y, times: Sta1) STARTUP Sta2)

Gd Temp beg: 6 °C End: 5 °C OAT beg: °C End: °C Altimeter begin: 30.26 end: 30.76
Type Serial # Alt AGL Alt AMSL Avg Pt Spacing
LIDAR FOV 38 324 52 Mpa Y / N Pulses In Air Pulses Rate Power PFSM
38 52 225 HIGH 2.6

Line #	Hdg	Start (UTC)	End (UTC)	Gd Spd	Foot/s	GPS Altitude	Crab	Turb	Notes
1	180	0:58	1:11	130	10.17	1700	8		
2	0	1:14	1:26	140	10.17	1705	6		
3	180	1:30	1:43	130	10.17	1700	7		
4	0	1:47	2:01	120	10.17	1700	4		
X-FTW		2:06	2:08	120	14.17	1700	X		
X-FT E		2:11	2:13	135	14.17	1700	X		

FLIGHT LINE NOTES - visibility, clouds, smoke, partial, etc.

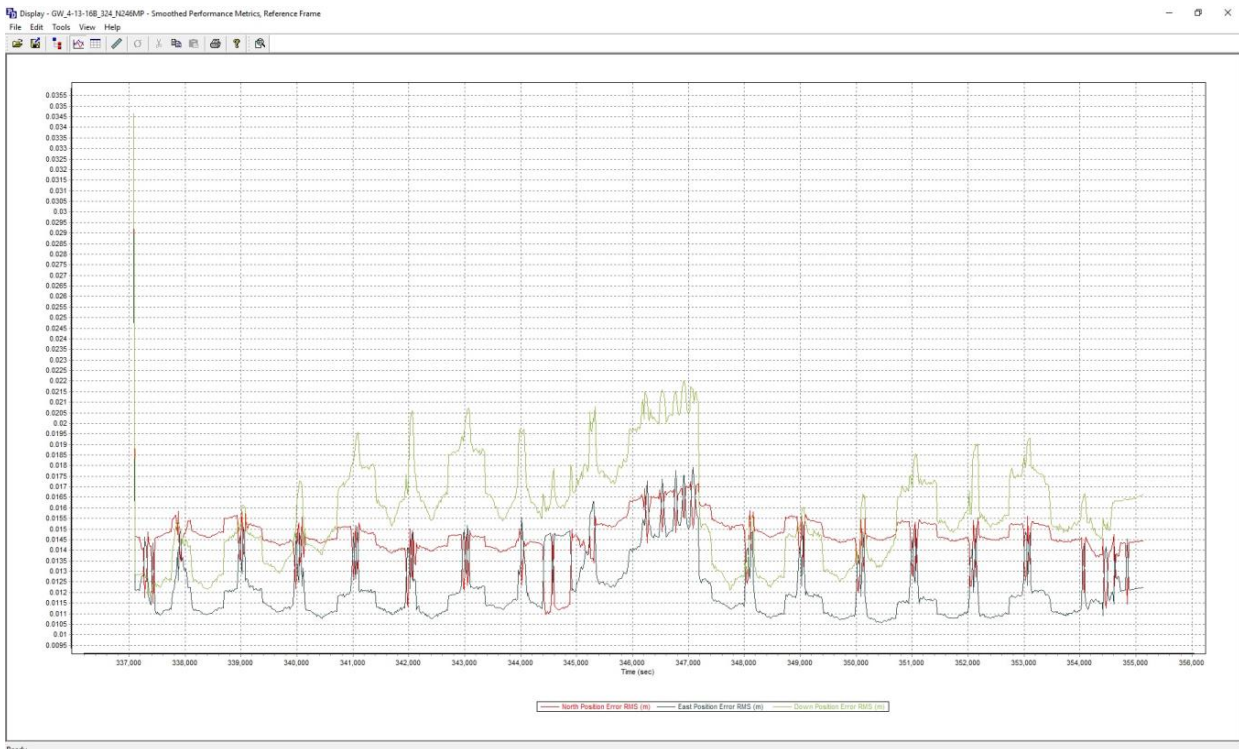
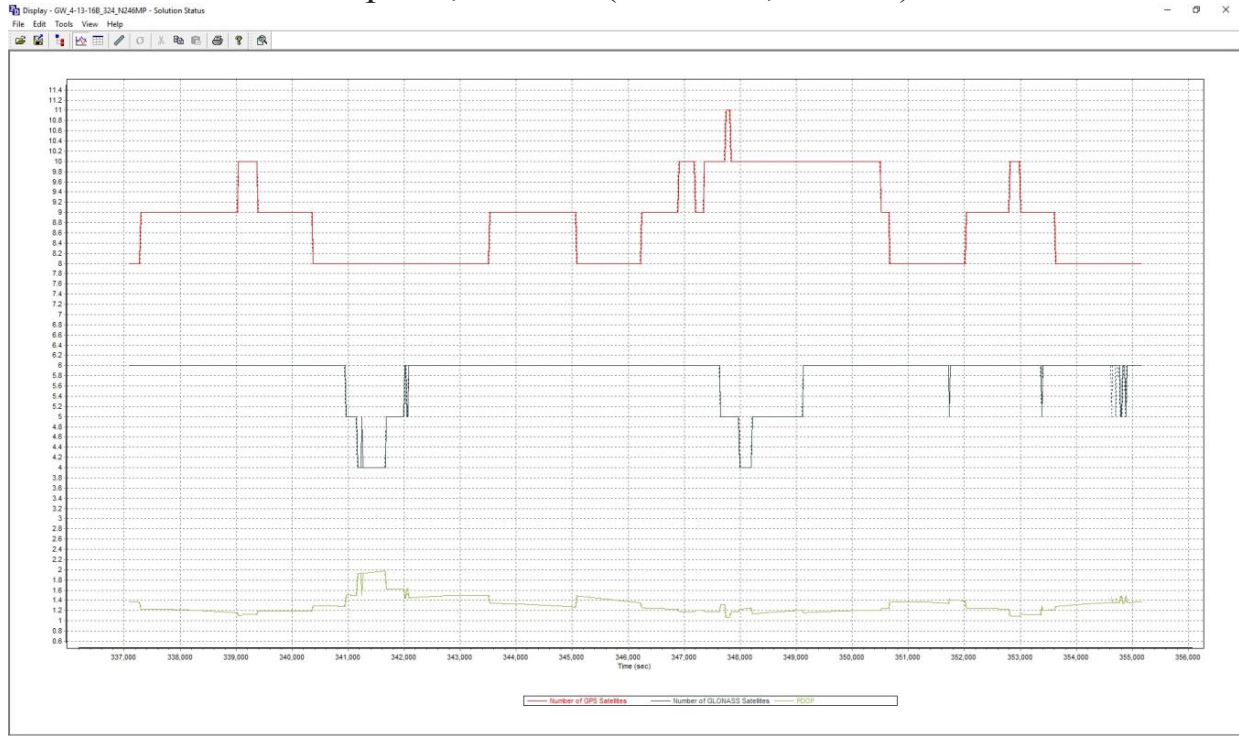
Two TEST FPRES

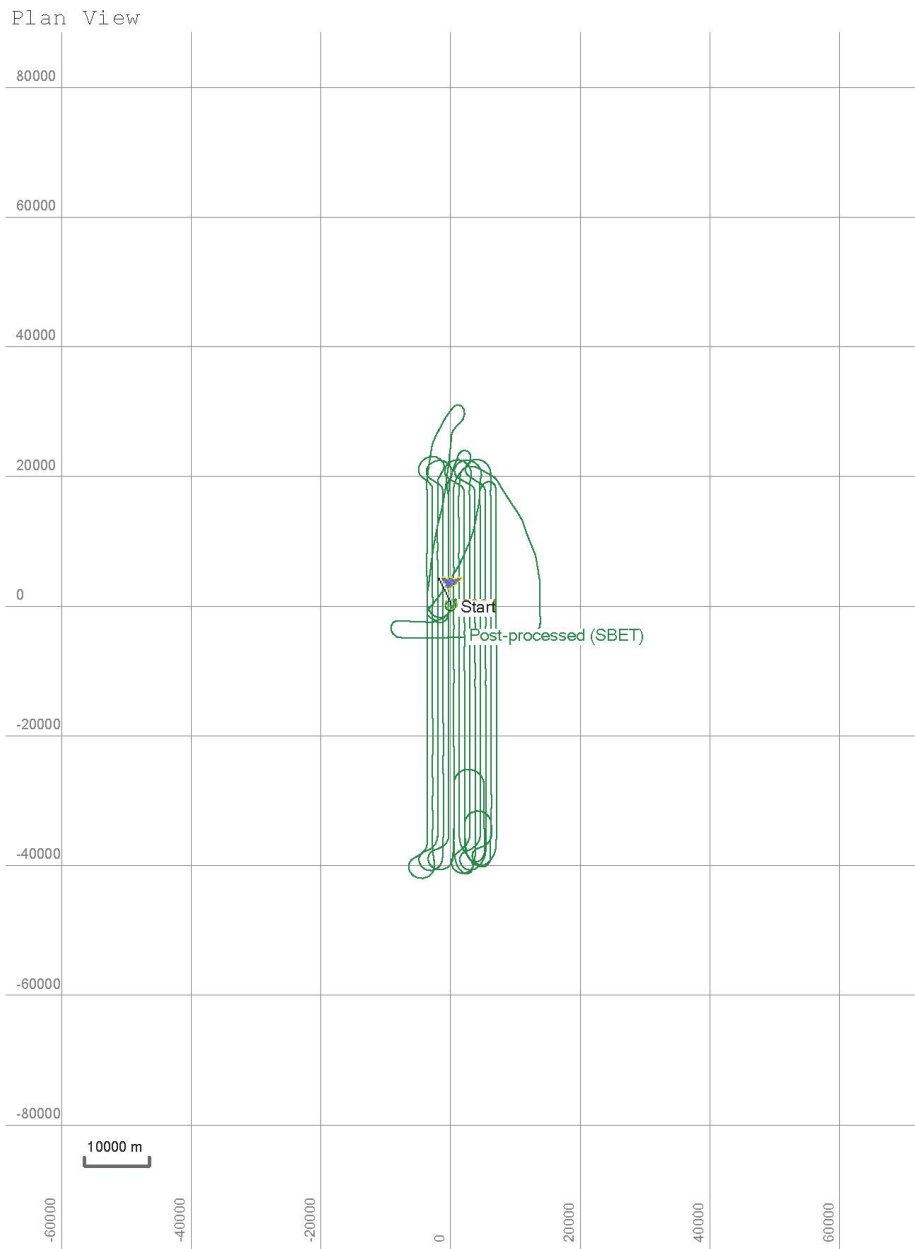
LT PREC SOUTH END VIRGA
PREC INCREASING VIRGA
CROSSFLIGHT PREC VIRGA
CROSSFLIGHT 5000 ALT

RTD

Total Proj Lines: Lines Flown: 4 Lines Remain: Online Time: 1.3 Mob Time: 0.7 Notes:

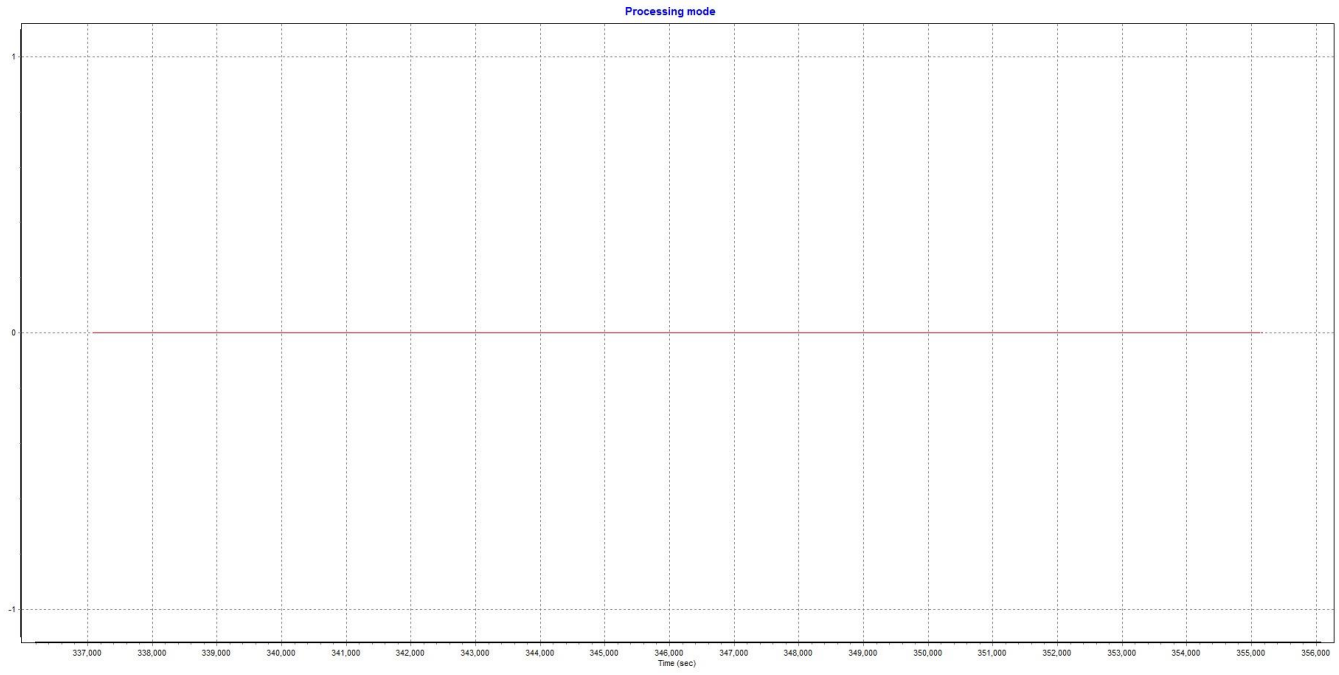
Apr 13, 2016-B (N246MP, SN324)





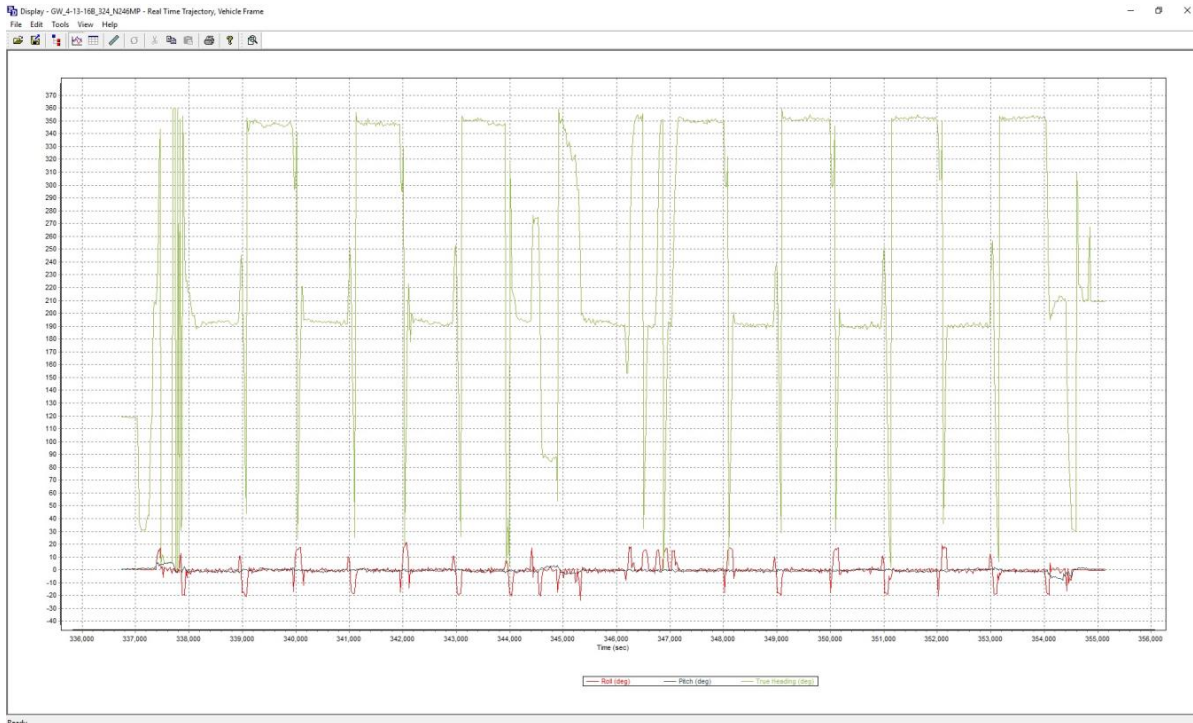
play - GW_4-13-16B_324_N240MP - Solution Status

Edit Tools View Help



0 = Fixed NL, 1 = Fixed VL, 2 = Float, 3 = DGNSS, 4 = RTCM, 5 = IAPPP, 6 = CIA, 7 = GNSS Nav, 8 = DR

Forward Reverse



Coordinate Manager

Station Information

Station ID: 0884

Coordinates

Latitude: N 44 32 43.97813000

Longitude: W 89 32 7.26649000

Altitude: 300.6030 m

Decimal Degrees

Antenna Frame

Height: 1.594 m

Method: Bottom of notch

Manufacturer: Trimble

Type: Zephyr Geodetic 2

Offset from Measured Point to APC: 0.032 m

Ground Reference Point (GRP) coordinates Apply Changes

Station Database

Station ID: 0884 Station Fullname: 0884

Primary Service ID: Edit Coordinate Accuracy: UNKNOWN_ACC

Secondary Service ID: Edit Add Delete Update

Station ID	Station Full...	Frame	Epoch	Ellipsoid	Latitude	Longitude	Altitude	Coord Acc
[Empty Table]								

Import Coordinates Export Coordinates

Close

Date: 4/13/2016
Pg 2 of 2

Ultr. A B C D E

Airborne LIDAR Data Collection Log Sheet :: Quantum Spatial, Inc
(email Log daily to flight_log_distribution_list@quantumspatial.com)

Project: W606-AYRES-3DEP Proj #: 27131 Flight Mgmt File: AYRES-3DEP-Portage-Boom
Aircraft: M24-MP Begin Hobbs: 956.0 End Hobbs: 960.8 Total: 4.8 Pilots: Cory McDonald Co-Pilot: Tech: Cory Teo
Dep Apt: KSTP Dep Time (Lcl): (Z): Arr Time (Local): (Z): Tot Time Aloft: 1.45 hrs

CORS: Y / N Sta 1: (Z): Sta 2: (Z):
Flyovers: Y / N IF Y, times: Sta 1) Sta 2)
GPS Unit: Y / N Sta 1: (Z): Sta 2: (Z):
Flyovers: Y / N IF Y, times: Sta 1) Sta 2)

Gd Temp beg: °C End: °C OAT beg: °C End: °C Altimeter begin: end:
Sta 2: (Z): Sta 2: (Z):

LIDAR	Type	Serial #	Alt	Avg Terr	Max	Avg Pt	Storage
	FOV	Scan Freq	AGL	HT	Gdspd	Spacing	Name/#
	9/88	52	Mp/A	1700m	300m	140	59
			Y / N	2030m	225	2.19	135
				3	High	2.6	285

Log Ck: Broken
End Ck: 7500'
Tot Ck: 285

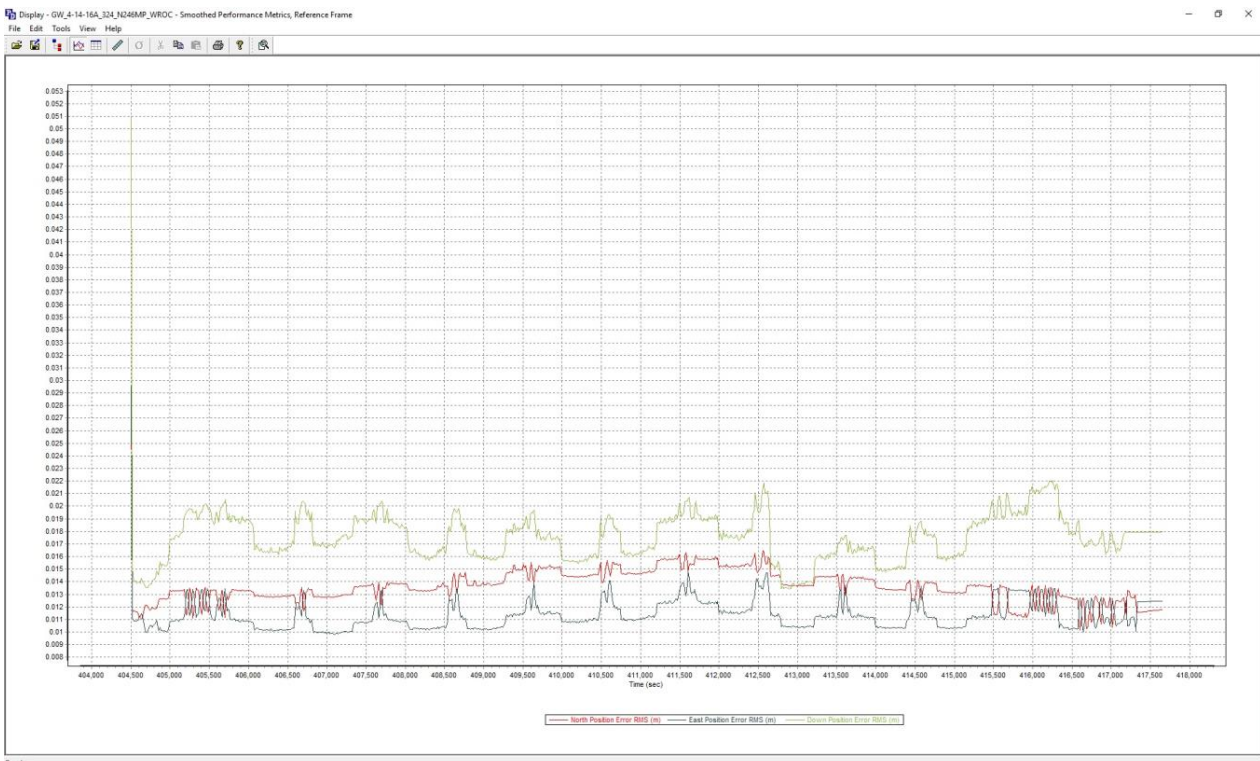
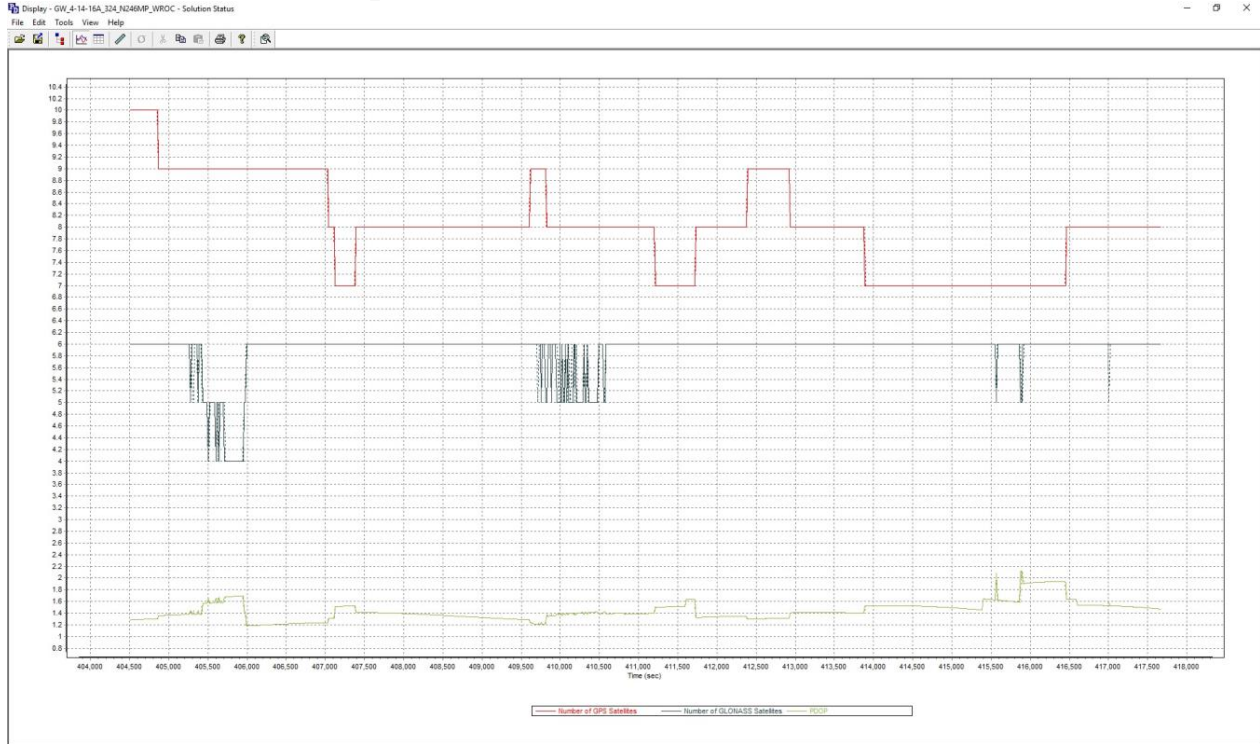
Line #	Hdg	Start (UTC)	End (UTC)	Gd Spd	POOP#/s	GPS Altitude	Crab	Turb
24	S	01:50	02:00	140	12/16	200m	10	-
23	N	02:00	02:20	111	12/17	203m	89	-

FLIGHT LINE NOTES - visibility, clouds, smoke, partial, etc

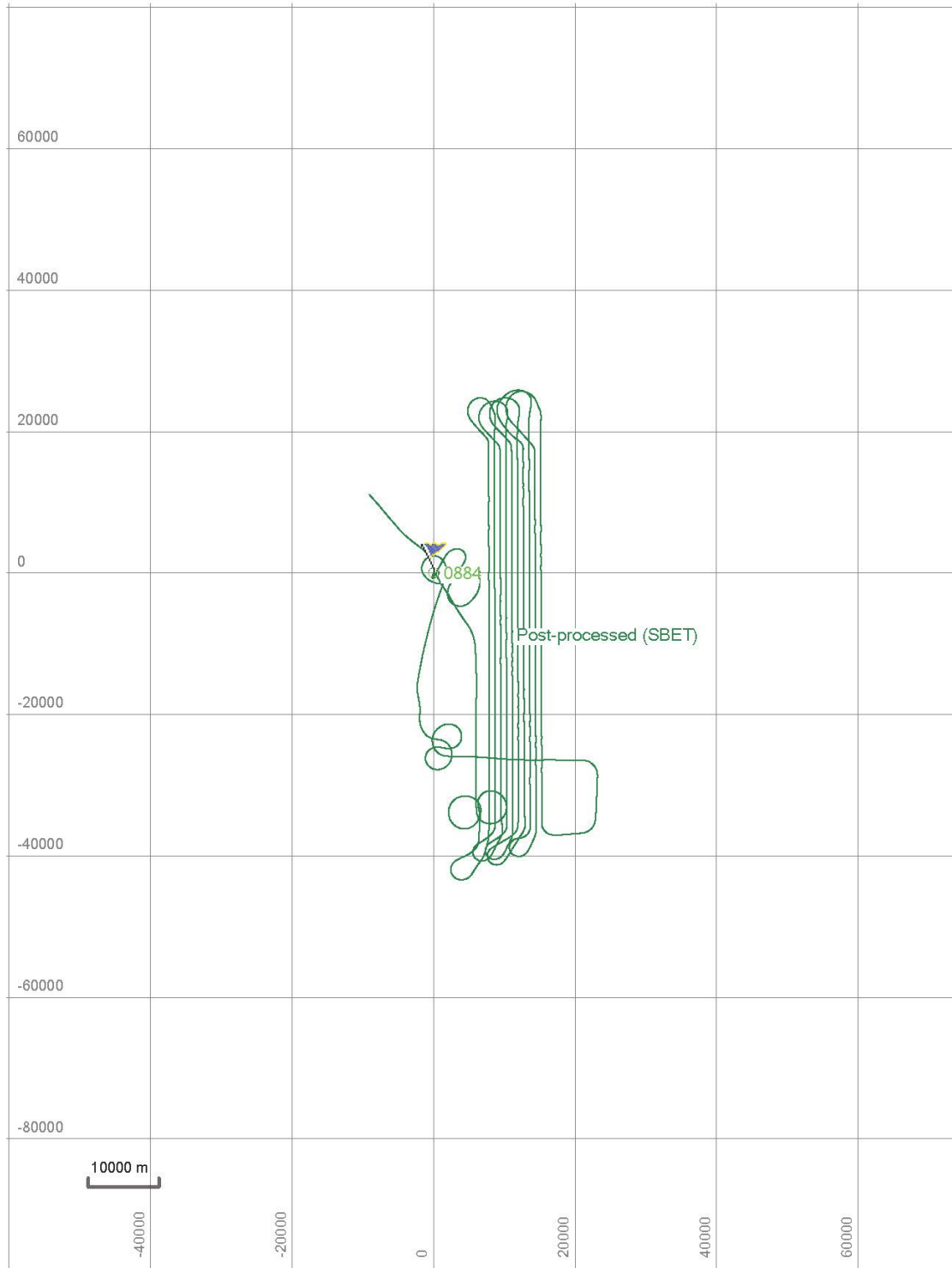
Cloud ceiling dropping => RTB

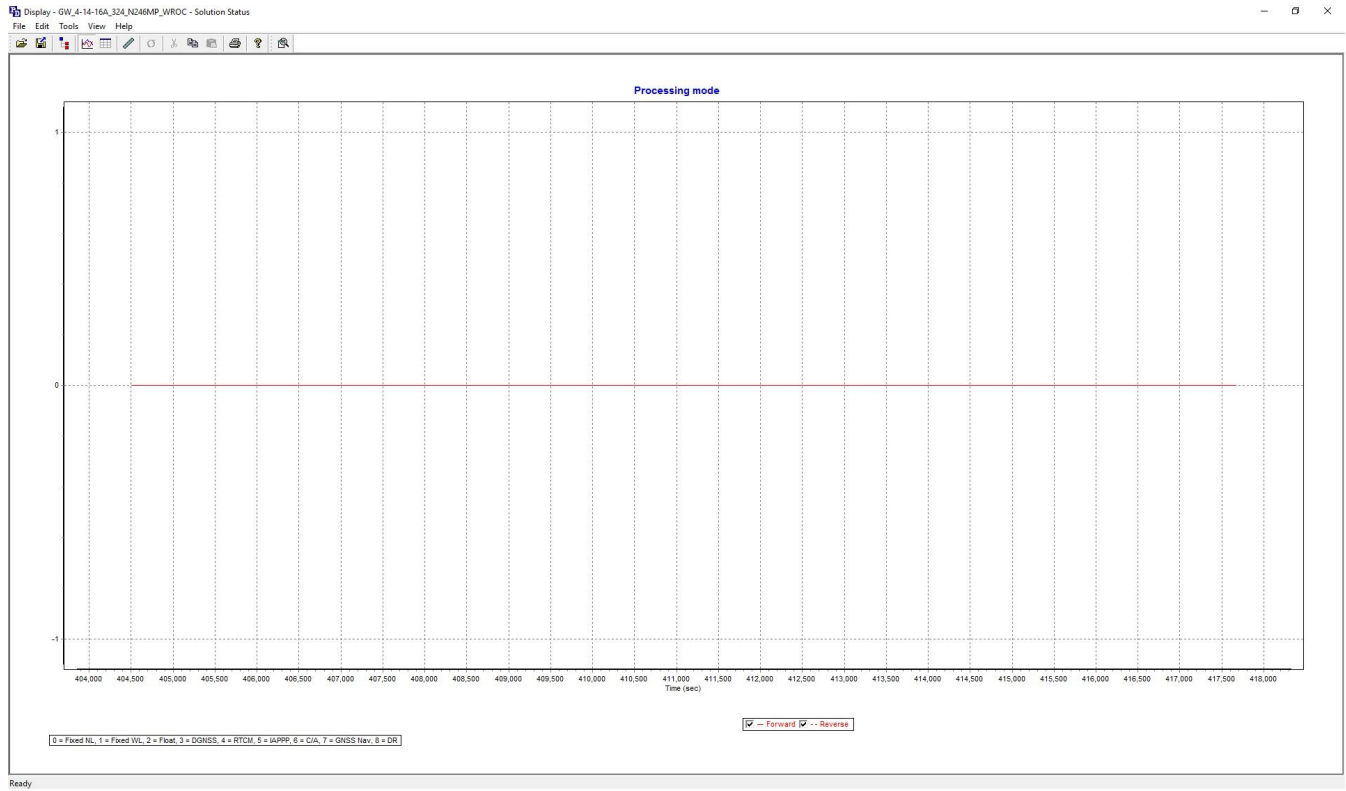
Total Proj Lines: 63 Lines Flown: 14/43 Lines Remain: 20 Online Time: 4.5 Mob Time: 2.3 Notes:

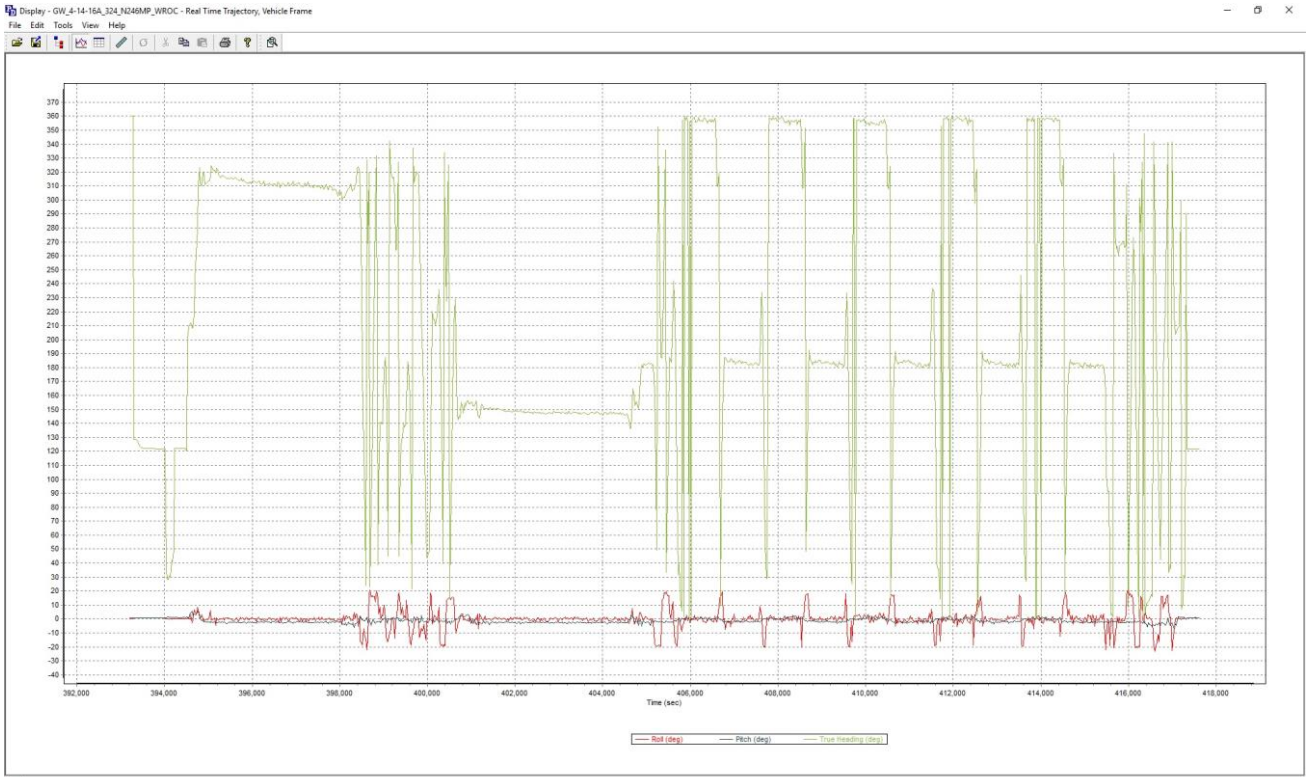
Apr 14, 2016-A (N246MP, SN324)



Plan View







Coordinate Manager

Station Information

Station ID: 0884

Coordinates

Latitude: N 44 32 43.97813000

Longitude: W 89 32 7.26649000

Altitude: 300.6030 m

Decimal Degrees

Antenna Frame

Height: 1.593 m

Method: Bottom of notch

Manufacturer: Trimble

Type: Zephyr Geodetic 2

Offset from Measured Point to APC: 0.032 m

Ground Reference Point (GRP) coordinates Apply Changes

Station Database

Station ID: 0884 Station Fullname: 0884

Primary Service ID: Edit Coordinate Accuracy: UNKNOWN_ACC

Secondary Service ID: Edit Add Delete Update

Station ID	Station Full...	Frame	Epoch	Ellipsoid	Latitude	Longitude	Altitude	Coord Acc

Import Coordinates Export Coordinates Close

Date: 4/14/16
Lift: A B C D E Pg. 1 of 1

Airborne LiDAR Data Collection Log Sheet :: Quantum Spatial, Inc
(email: Log daily to flight_log_distribution_list@quantumspatial.com)

Project: PORTAGE Proj #: 27131 Flight Mgmt File: 20160417A Tech: NELSON

Aircraft: N246MP Begin Hobbs: 9636 End Hobbs: 9671 Total: PILOT: CHRISTOPHER Co-Pilot: [blank]

Dep Apt: KSTE Dep Time (Lcl): 11:36 (Z): 16:36 Air Apt: KSTE Arr Time (Local): 14:50 (Z): 19:50 Tot Time Aloft: 3:54/6.3

CORS: (Y)N Sta 1: STPT Flyovers: (Y)N If Y, times: Sta 1) 16:25 Sta 2) 19:45

GPS Unit: (Y)N Sta 1: KSTE Flyovers: (Y)N If Y, times: Sta 1) 16:25 Sta 2) 19:45

Gd Temp beg:	H	°C	End:	17	°C	OAT beg:	°C	End:	30.17	°C	Altimeter begin:	30.25	end:	30.17					
Type	ORBNH	Sentil #	324	Alt	AGL	5600	Alt	ANSI	6700	Avg Terr	Ht	1100	Max	Gdspd	140	Avg Pt	Spacing	2.2	
FOV	38	Scan	52	MPIA	Y (N)	3	Pulse	Rate	225	Power	HIGH	PPSM	2.6	Reg	GB	74300	Score	Name/r	
End (UTC)	16:44	16:56	17:12	17:28	17:45	18:01	18:18	18:34	18:51	19:07	19:24	19:32	19:45	End	GB	124700	Tot	GB	50.4

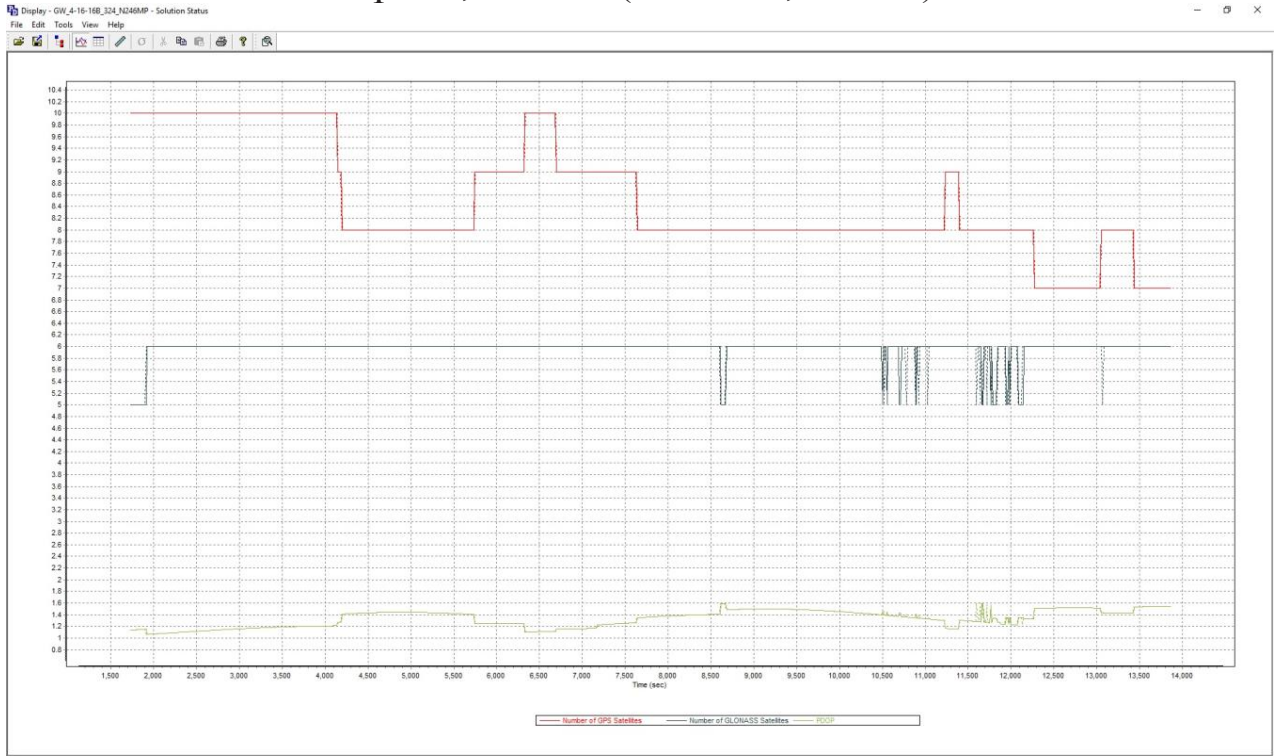
FLIGHT LINE NOTES - visibility, clouds, smoke, partial, etc

TWO TEST FIRES
BURNING NORTH END (HAZE)

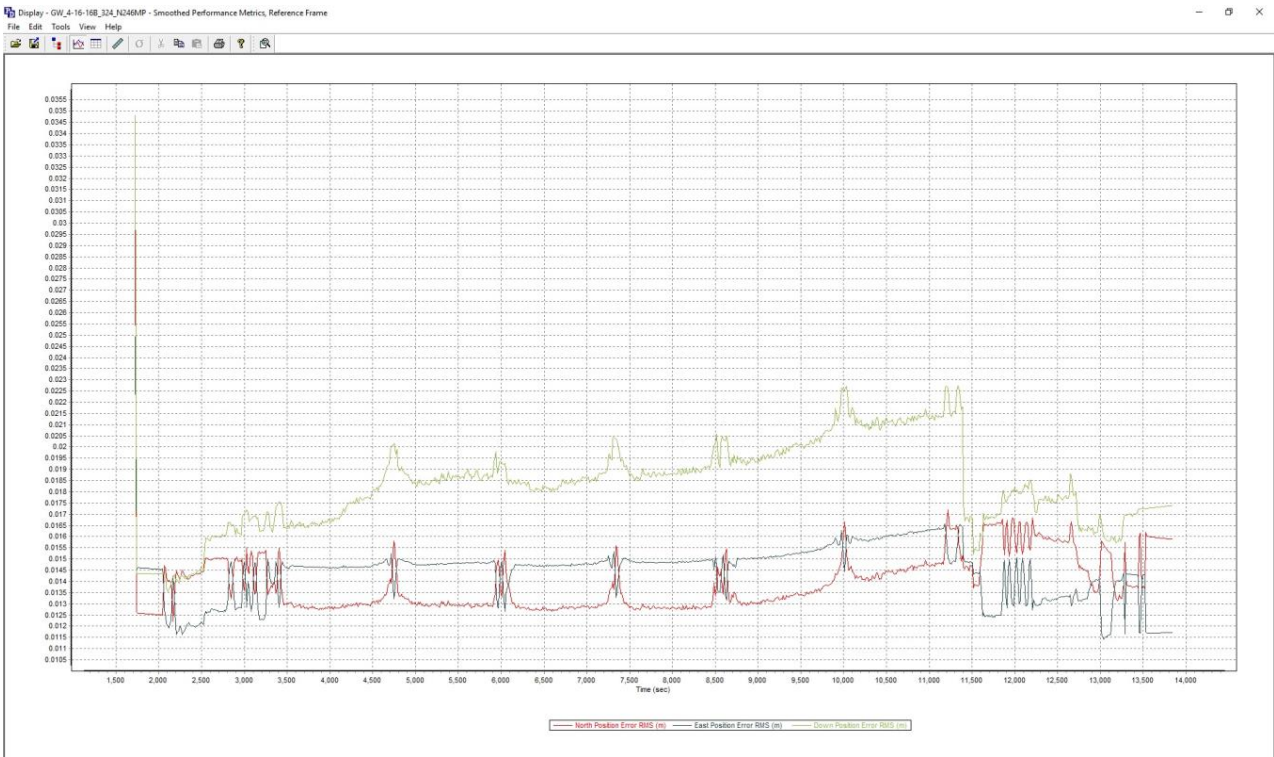
CROSS FLIGHT 2000 M ALT = 1700 M

Total Proj Lines: Lines Flown: 10 Lines Remain: 0 Online Time: 2:8 Mob Time: 0.7 Notes:

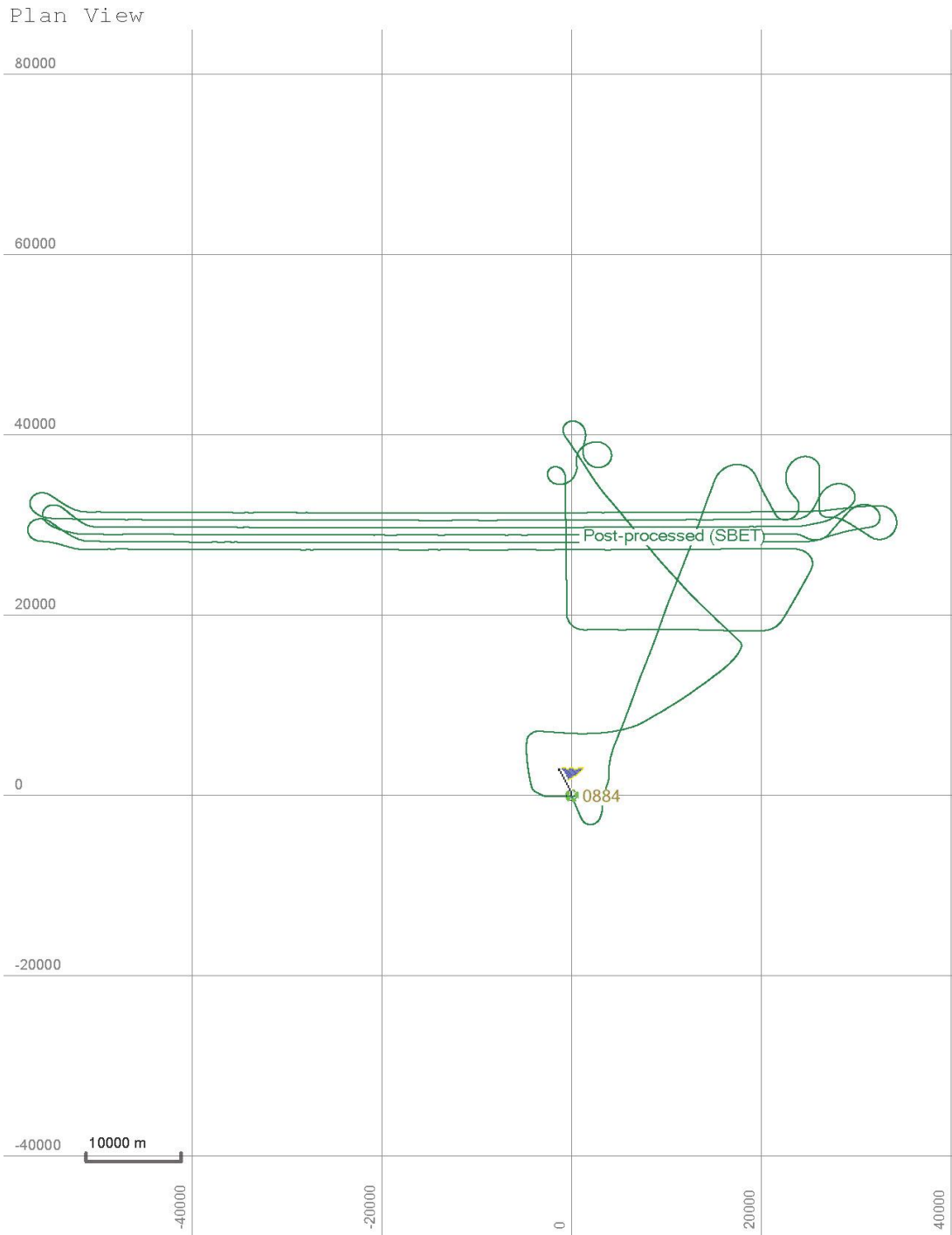
Apr 14, 2016-B (N246MP, SN324)

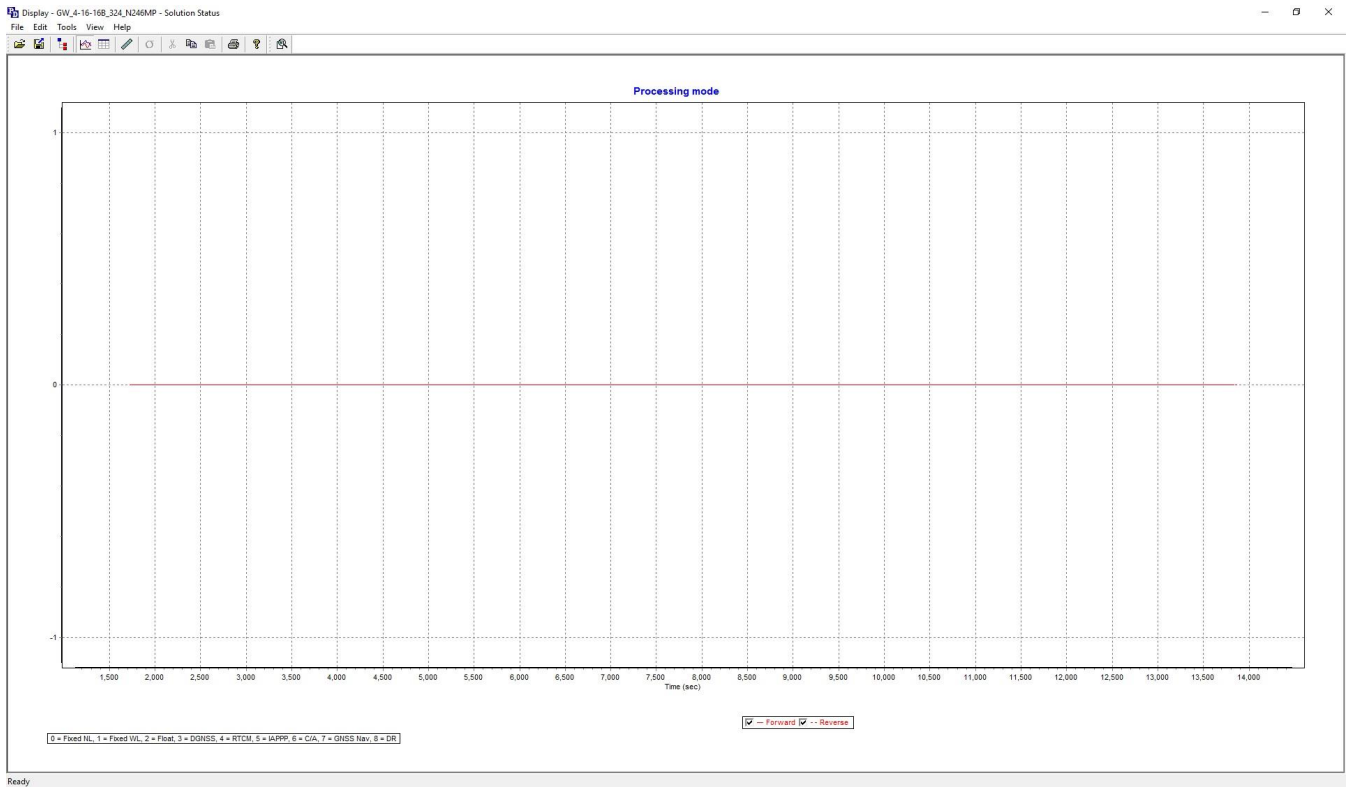


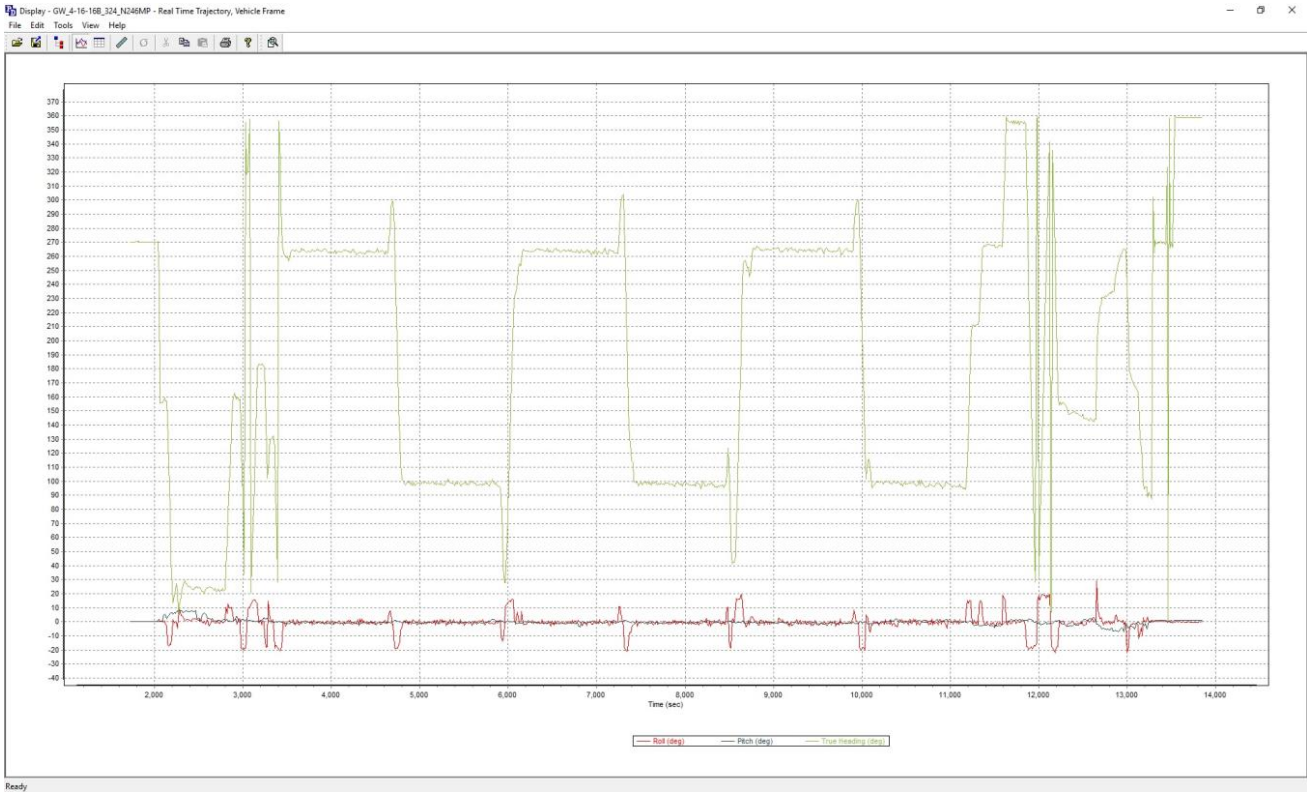
Ready



Ready







Coordinate Manager

Station Information

Station ID:

Coordinates

Latitude:

Longitude:

Altitude: m

Decimal Degrees

Antenna Reference Point (ARP) coordinates Apply Changes

Antenna Frame

Height: m

Method:

Manufacturer:

Type:

Offset from Measured Point to APC: m

Station Database

Station ID: Station Fullname:

Primary Service ID: Edit Coordinate Accuracy:

Secondary Service ID: Edit Add Delete Update

Station ID	Station Full...	Frame	Epoch	Ellipsoid	Latitude	Longitude	Altitude	Coord Acc
[Empty Table]								

Import Coordinates Export Coordinates Close

Airborne LIDAR Data Collection Log Sheet :: Quantum Spatial, Inc
(email: log_daily_to_flight_log_distribution_list@quantumspatial.com)

Date: 04/14/2016 **Uft:** A B C D E **Pg 1 of 2**

Project: 1600-AYRES-3DEP **Proj #:** 27131 **Flight Mgmt File:** 20160414B / AVRES - 3DEP Portage - 1700M

Aircraft: 1246MP **Begin Hobbs:** 967.1 **End Hobbs:** 973.1 **Total:** 6.0 **Pilot:** Gary McDonald **Co-Pilot:** Tech: Gary Toib

Dep Apt: KSTE **Dep Time (lcl):** 3:54 (Z) **Arr Apt:** KSTE **Arr Time (Local):** 9:47 (Z) **Tot Time Aloft:** 6.0 hrs

CORS: (Y) N **Sta 1:** STPT **Sta 2:** STLQ **Flyovers:** (Y) N **If Y, times: Sta1)** N/A **Sta2)** 01:00 Z

GPS Unit: (Y) N **Sta 1:** KSTE **Sta 2:** Flyovers: Y / N **If Y, times: Sta1)** **Sta2)**

Gd Temp beg: °C **End:** °C **OAT beg:** °C **End:** °C **Altimeter beg:** end:

LIDAR	Type	Serial #	Alt AGL	Alt AMSL	Avg Terr Ht	Max Glpsd	Avg Pt Spading	log GB	Storage Num/pt
	FOV	Scan Freq	MPIA (Y) N	Pulses In Air	Pulse Rate	Power	PPSM	End GB	331-1
12	S	21:03	124	2030m	17	0		135	
11	N	21:20	138	2016m	16	0		218	
10	S	21:39	130	2010m	74	-		286	
9	N	21:58	128	2017m	11	0			
8	S	22:15	130	2000m	11	0			
7	N	22:31	136	2012m	45	0			
6	S	22:47	126	2000m	4	0			
5	N	23:03	129	2010m	3	0			
4	S	23:20	134	2000m	36	0			
3	N	23:36	132	2000m	17	0			
2	S	23:53	138	2002m	32	0			
1	N	00:11	132	2000m	33	0			
63	W	00:30	130	2002m	62	0			
		00:43		2010m					
		00:48							

FLIGHT LINE NOTES - visibility, clouds, smoke, partial, etc.
 Test shot
 Portage Co
 CRASSTIE 63
 Fig 8
 → rilled to 27° bank after Fig 8 *
 → Proceeding to Taylor County AOI

Total Proj Lines: 63 **Lines Flown:** 63/63 **Lines Remain:** 0 **Online Time:** 5:3 **Mob Time:** 7 **Notes:**

(Portage Co)

Airborne LIDAR Data Collection Log Sheet :: Quantum Spatial, Inc

(email Log daily to flight_log_distribution_list@quantumspatial.com)

Project: WROC - AYRES - 3DEP Flight Mgmts File: 2016-11-18 / AYRES_3DEP - Taylor County

Altcraft: 2246 NR Begin Hobbs: 97.1 End Hobbs: 973.1 Total: 6.0 Pilot: Cory McDaniel Co-Pilot: Tech: Date: 4/14/2016

Dep Apt: K5IE Dep Time (Local): 3:47 Arr Apt: K5IE Arr Time (Local): 9:47 (Z): 02:47 Tot Time Aloft: 6.0 hrs

CORS: Y/N Sta 1: Sta 2: Flyovers: Y/N If Y, times: Sta 1) Sta 2) Log (CB) End (CB) Storage Name/Id

GPS Unit: Y/N Sta 1: Sta 2: Flyovers: Y/N If Y, times: Sta 1) Sta 2) End (CB) End (CB) Log (CB) End (CB) Storage Name/Id

Gd Temp beg: °C End: °C OAT beg: °C End: °C Altimeter begin: end: °C Avg Pt Spacing PFSM

Line # Hdg Start (UTC) End (UTC) Gd Spd PFSM/Rate GPS Altitude Turb (0..1) Crab Alt MSL Pulse In Air Avg Terr Ht Max Gdspd Power Avg Pt Spacing PFSM

12 W 01:17 01:33 124 119/17 2100m 51 0 1700m 2100m 3 400m 140 219

11 E 01:37 01:51 134 119/16 2050m 73 0 1700m 2050m 3 400m 140 219

10 W 01:55 02:10 134 112/17 2150m 35 0 1700m 2150m 3 400m 140 219

XIE N 02:17 02:19 128 131/15 2070m 43 0 1700m 2070m 3 400m 140 219

02:19 02:24 02:26 02:31 150

FLIGHT LINE NOTES - visibility, clouds, smoke, partial, etc

Proceeding to STL@ CoBs for Taylor County

Above of STL@

Fig 8

TEST fire → 2100 GBS alt

Taylor County AOI *

CROSS TIE

Fig 8 Closeout

Above of STL@ CoBs

Total Prof Lines: 51 Lines Flown: 3 Lines Remain: 48 (Taylor Co)

Online Time: 53 Mob Time: 17 Notes: