LiDAR Processing Report

Professional Management
and LiDAR Data Collection
and Processing Services

Block 4

PROJECT TITLE:	Professional Management and LiDAR Data Collection and Processing Services
WORK ORDER NAME:	Task Order A
WORK ORDER NUMBER:	2007058492720
CONSULTANT NAME:	3001, Inc., CH2M Hill, Inc.
PROJECT MANAGERS:	Jeremy Conner, 3001 Project Manager JoLee Gardner, CH2M Hill Project Manager

Services provided by:

3001, INC. THE GEOSPATIAL COMPANY
501 Robert Blvd. 2nd Floor
Slidell, Louisiana 70458

Table of Contents

- **Section 1** System Calibration Report

  System Configuration

- **Section 2** Flight Logs

  Flight Map

- **Section 3** Calibration Site Maps

  Pre and Post Calibration Maps and Cross Sections

Section 1

System Calibration Report

The data posting is a function of flight altitude, airspeed, scan angle, scan rate, laser pulse rates, and terrain relief. The above functions are taken into consideration at the time of flight planning. Data acquisition procedures play a role in the success of this method. Many parameters are considered in order to achieve the maximum possible Global Positioning System (GPS) positioning accuracy, such as the separation between the airborne and base station GPS receivers, satellite geometry as reflected by the Position Dilution of Precision (PDOP), signal multipath, and many other factors.

The post-flight data processing software maximizes detection probability while minimizing false alarms. It corrects for several unavoidable, but predictable, biases from the environment as well as removing effects inherent to the hardware configuration.

Monitoring the data during collection is only part of the process done to assure proper operation of equipment and ultimately, data quality. However, all subsystems may indicate correct operating parameters (precision), but that does not mean that together they are providing correct solutions (accuracy). In order to validate the collection process, calibration tests are performed. These procedures allow the operator to know if the subsystems have been set up properly and if there are any inherent biases in the instrumentation. Bore-sight configurations are flown before each mission to ensure the sensor is functioning properly and within specifications. After acquisition, each mission is calibrated separately before editing and filtering.

Prior to the calibration process, the GPS base stations, which are correlated to National Geodetic Surveys' (NGS) Continuously Operating Reference System (CORS) network stations, are processed in conjunction with the airborne GPS raw observables to determine the aircrafts positions. The processed GPS positions are combined with the inertial data (IMU) using the Applanix POSPac™ in a closed loop fashion (forward and backward solution with Kalman filter option) to compute the Smoothed Best Estimate of Trajectory (SBET) parameters, namely position, velocity, and attitude. The SBET file and the LiDAR data are used in the post-processing software (MFCCP) as input to compute the calibration parameters.

During the planning phase of this project, the airport/job site was chosen as the calibration test site. On a mission basis, the LiDAR was flown over this test area in two opposing directions and with additional parallel flights flown with a 30% overlap. The airborne results in each direction are then compared with results of the other flight directions. The attitude misalignment parameters derived from the calibration (bore sighting), and the modeled "windup" values were used in the post-processing software (MFCCP) to resolve the systematic errors in the data. Calibration charts and site maps are attached to this report. Once the calibration parameters and modeled "windup" value are acceptable, all mission data are processed.

System Configuration

Scanner Setup

Scan FOV (full angle)	degrees	14.00
Terrain Elevation AMSL (minimum in survey area)	meters	0.00
Terrain Elevation AMSL (maximum in survey area)	meters	50.00
Nominal Flying Height Above Minimum Terrain Elevation	meters	1400.00
Nominal Flying Altitude AMSL	meters	1400.00
Airspeed	knots	120.00
Range/Intensity Mode (1, 2, 3, 4)		3.00
Laser Pulse Rate	Hz	42300.00
System Controller Firmware (<V2.07, V2.07+)		V2.07+
Laser Power Class (3=3W, 4=4W)	Watts	4.00
Receiver Aperture Stop (45, 60, 65, 75, LM, ALS50)	degrees	ALS50
Scan Rate	Hz	48.00
Max Scan Rate (ALS50 Phase II only - SUBJECT TO CHANGE)	Hz	77.00
Max Scan Rate (ALS40/ALS50, 45-degree/3000 m mirror, gen 1c driver)	Hz	70.00
Max Scan Rate (ALS40, 45-degree/3000 m mirror, gen 1b driver)	Hz	46.61
Max Scan Rate (ALS40, 67-degree/6100 m mirror, all drivers)	Hz	23.31
Max Scan Rate (ALS40, 75-degree/6100 m mirror, all drivers)	Hz	20.37

Resulting Scan Pattern

Total Swath Width (nominal, at lowest terrain elev'n)	meters	343.80
Max Cross Track Spacing (occurs @ nadir)	meters	1.26
Max Along Track Spacing (occurs @ FOV edge)	meters	1.29
Illuminated Footprint Diameter (@ 1.e^2 energy)	meters	0.49
Point Density (average)	pts/meter^2	1.99
Area / Point (average)	meters^2	0.50

Section 2

LIDAR Daily Log

the spatial data company
5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

Field Crew	Project #	Project Description	Location	Aircraft
Cody	07190.01.001.551	Flidar-Acq FL Bis Palm Ba	Homestead, FL	N7961Q

1st Flgt T.O. 4

Flight Date (UTC)	Pilot	Operator	Sensor
8/30/2007	Satish	Travis/Ken D	ALS 05

Lever Arm

	x	y	z
GPS	-0.106	0.1	-1.120
IMU	-0.046	0.095	-0.260

Attenuator POS #

0.0	Open (Full Red) (High Altitude)
0.5	POS 1 (Half Red/Half Black) (Medium Altitude)
1.0	POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

GPS Information	
Base 1	
Base 2	
Base3	
Aero 2	

AGC
3/3

IMU Information	
Start Time	5:34:29
Stop Time	9:45:00

Meteorological Conditions

	Elevation	Temp		Pressure	
Airport	7ft	24.0°c	297.15°k	29.99 inHg	101558 Pa
@ Altitude	4,500	26.0°c	299.15°k	29.94 inHg	101388 Pa
@ Altitude					

GPS Base Station Information

	File Name	RNX File	Ant Hgt	Ant Type
Base 1	Home2420		1.846m	RMB ZEPHYR
Base 2				
Base 3				

Line/Dir		Start	Stop	Total Time	Altitude	Scan Angle/Rate		AGL (m)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
X5101	N	5:50:55	5:51:59	0:01:04	1645	22°	33°	1704	5593	0	3+3	38600	112 kts	129 mph	2.15		BORE SITE GODD
X5102	E	5:55:25	5:56:19	0:00:54	1660	22°	33°	1704	5593	0	3+3	42300	115 kts	132 mph	0.00		BORE SITE GODD
X5101	S	5:59:58	6:00:59	0:01:01	1648	29°	33°	1704	5593	0	3+3	42300	122 kts	140 mph	2.34		BORE SITE GODD
X5102	W			0:00:00		29°	33°	1704	5593	0	3+3	42300	129 kts	148 mph	0.00	Y	VOID DUE TO OVERSPEED
X5102	W	6:11:57	6:13:19	0:01:22	1646	29°	33°	1704	5593	0	3+3	42300	108 kts	124 mph	2.07		BORE SITE GODD
																	T.O. 4
6	E	6:21:49	6:31:02	0:09:13	1388	14°	48°	1400	4593	0	3+3	42300	109 kts	125 mph	18.82		Good
7	W	6:35:33	6:45:30	0:09:57	1388	14°	48°	1400	4593	0	3+3	42300	113 kts	130 mph	19.51		Good
8	E	6:49:59	7:00:03	0:10:04	1406	14°	48°	1400	4593	0	3+3	42300	114 kts	131 mph	21.86		Good
9	W	7:04:00	7:13:51	0:09:51	1391	14°	48°	1400	4593	0	3+3	42300	118 kts	136 mph	20.37		Good
10	E	7:17:46	7:27:52	0:10:06	1381	14°	48°	1400	4593	0	3+3	42300	110 kts	127 mph	21.10		Good
11	W	7:31:51	7:41:56	0:10:05	1377	14°	48°	1400	4593	0	3+3	42300	116 kts	133 mph	22.25		Good
12	E	7:46:40	7:56:44	0:10:04	1399	14°	48°	1400	4593	0	3+3	42300	107 kts	123 mph	20.52		Good
13	W	8:00:32	8:10:28	0:09:56	1388	14°	48°	1400	4593	0	3+3	42300	117 kts	135 mph	20.20		Good
14	E	8:14:42	8:24:47	0:10:05	1397	14°	48°	1400	4593	0	3+3	42300	108 kts	124 mph	20.71		Good
15	W	8:28:41	8:38:30	0:09:49	1370	14°	11°	1400	4593	0	3+3	42300	112 kts	129 mph	19.33		Good
16	E	8:43:04	8:52:45	0:09:41	1374	14°	48°	1400	4593	0	3+3	42300	120 kts	138 mph	20.71		Good
17	W	8:56:33	9:06:20	0:09:47	1405	14°	48°	1400	4593	0	3+3	42300	115 kts	132 mph	19.85		Good
18	E	9:09:56	9:19:26	0:09:30	1410	14°	48°	1400	4593	0	3+3	42300	113 kts	130 mph	19.51		Good
19	W	9:23:07	9:32:34	0:09:27	1400	14°	48°	1400	4593	0	3+3	42300	116 kts	133 mph	20.02		Good

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	4:10:31	Hobbs Time	
Laser Collection Time:	2:21:56	Start	996
Miles Flown on Flights:	291.32	Stop	1000.8
		Total	4.8

Data Collection		Survey	
Percent Complete		Percent Complete	
Total Flight Lines		Total Check Sites	
Lines Complete	14	Check Sites Complete	
Lines Completed Today	14	Sites Completed Today	

Comments

TO 4 clear lines, 5min pre/post on ground @ Homeport Base

Weather

x

3001 the spatial data company
5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

LIDAR Daily Log

Field Crew	Project #	Project Description	Location	Aircraft
Cody	07190.01.001.551	Flidar-Acq FL Bis Palm Ba	Homestead, FL	N7961Q

1st Flgt T.O. 4

Flight Date (UTC)	Pilot	Operator	Sensor
8/31/2007	Chad	Ken d	ALS 05

Lever Arm

	x	y	z
GPS	-0.106	0.1	-1.120
IMU	-0.046	0.095	-0.260

Attenuator POS #

0.0	Open (Full Red) (High Altitude)
0.5	POS 1 (Half Red/Half Black) (Medium Altitude)
1.0	POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

GPS Information

Base 1	
Base 2	
Base3	
Aero 2	

IMU Information

Start Time	2:11:47
Stop Time	6:57:23

AGC: 3/3

Meteorological Conditions

	Elevation	Temp		Pres
Airport	7ft	26.0°c	299.15°k	29.93 inHg
@ Altitude	4,500	26.0°c	299.15°k	29.93 inHg
@ Altitude				

GPS Base Station Information

	File Name	RNX File	Ant Hgt	Ant Type
Base 1	Home2430		1.846m	TRMB ZEPHYR
Base 2				
Base 3				

Line/Dir		Start	Stop	Total Time	Altitude	Scan Angle/Rate		AGL (m)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
X5101	S	2:38:40	2:39:30	0:00:00	1680	22°	33°	1704	5593	0	2+2	38600	115 kts	132 mph	0.00	Y	BORE SITE VOID DUE TO WRONG SETTIN
X5102	N	2:42:29	2:43:20	0:00:00	1675	22°	33°	1704	5593	0	2+2	38600	116 kts	133 mph	0.00	Y	BORE SITE VOID DUE TO WRONG SETTIN
X5103	S	2:46:13	2:47:00	0:00:00	1650	22°	33°	1704	5593	0	2+2	38600	120 kts	138 mph	0.00	Y	BORE SITE VOID DUE TO WRONG SETTIN
X5104	E	2:50:30	2:51:27	0:00:00	1650	29°	33°	1704	5593	0	2+2	38600	114 kts	131 mph	0.00	Y	BORE SITE VOID DUE TO WRONG SETTIN
X5101	N	2:54:51	2:55:45	0:00:00	1658	29°	33°	1704	5593	0	2+2	38600	99 kts	114 mph	0.00	Y	BORE SITE VOID DUE TO WRONG SETTIN
X5102	S	2:58:42	2:59:27	0:00:00	1646	29°	33°	1704	5593	0	2+2	38600	120 kts	138 mph	0.00	Y	BORE SITE VOID DUE TO WRONG SETTIN
X5103	N	3:02:18	3:03:10	0:00:00	1645	29°	33°	1704	5593	0	2+2	38600	102 kts	117 mph	0.00	Y	BORE SITE VOID DUE TO WRONG SETTIN
20	E	3:10:16	3:14:06	0:00:00	1400	14°	48°	1400	4593	0	2+2	42300	115 kts	132 mph	0.00	Y	LINE VOID DUE TO WRONG SETTTING!
20	E	3:21:33	3:30:59	0:09:26	1350	14°	48°	1400	4593	0	3+3	42300	116 kts	133 mph	20.02		TO4_ CLOUDS 400 MTS TO E.EOL
21	W	3:33:45	3:43:08	0:09:23	1350	14°	48°	1400	4593	0	3+3	42300	116 kts	133 mph	20.02		CLOUDS E.EOL TO 29,800 FRM W.EOL
22	E	3:46:10	3:55:15	0:09:05	1350	14°	48°	1400	4593	0	3+3	42300	120 kts	138 mph	20.71		CLOUDS 1000 MTS TO E.EOL
23	W	3:58:12	4:07:22	0:09:10	1350	14°	48°	1400	4593	0	3+3	42300	120 kts	138 mph	20.71		CLOUDS E.EOL TO 29,800 FRM W.EOL
24	E	4:10:40	4:19:58	0:09:18	1350	14°	48°	1400	4593	0	3+3	42300	120 kts	138 mph	20.71		CLOUDS 4000 MTS TO E. EOL
25	W	4:22:50	4:30:28	0:07:38	1340	14°	48°	1400	4593	0	3+3	42300	115 kts	132 mph	15.44		CLOUDS E.EOL TO 23,800 MTS FRM W.E
26	E	4:33:52	4:41:26	0:07:34	1350	14°	48°	1400	4593	0	3+3	42300	115 kts	132 mph	15.44		CLOUDS 2500 MTS TO E.EOL
27	W	4:44:13	4:52:08	0:07:55	1350	14°	48°	1400	4593	0	3+3	42300	115 kts	132 mph	15.44		CLOUDS E.EOL TO 23,800 MTS FRM W.E
28	E	4:55:46	5:03:42	0:07:56	1345	14°	11°	1400	4593	0	3+3	42300	118 kts	136 mph	15.84		CLOUDS 3,000 MTS TO E.EOL
29	W	5:06:59	5:15:02	0:08:03	1350	14°	48°	1400	4593	0	3+3	42300	116 kts	133 mph	17.80		CLOUDS E.EOL TO 24,000 MTS FRM W.E
30	E	5:18:29	5:27:13	0:08:44	1345	14°	48°	1400	4593	0	3+3	42300	110 kts	127 mph	16.88		CLOUDS 3,500 MTS TO E.EOL
31	W	5:30:06	5:38:15	0:08:09	1350	14°	48°	1400	4593	0	3+3	42300	115 kts	132 mph	17.65		CLOUDS E.EOL TO 23,000 MTS FRM W.E
32	E	5:41:36	5:50:12	0:08:36	1345	14°	48°	1400	4593	0	3+3	42300	107 kts	123 mph	16.42		CLOUDS 2000 MTS TO E.EOL
33	W	5:53:11	6:01:18	0:08:07	1340	14°	48°	1400	4593	0	3+3	42300	115 kts	132 mph	17.65		CLOUDS E.EOL TO 24,000 MTS FRM W.E
X5102	E	6:05:12	6:06:05	0:00:53	1671	22°	33°	1704	5593	0	3+3	38600	120 kts	138 mph	0.00		BORESITE GOOD
X5101	S	6:08:49	6:09:30	0:00:41	1670	22°	33°	1704	5593	0	3+3	38600	110 kts	127 mph	0.00		BORESITE GOOD
X5102	W	6:12:49	6:13:43	0:00:54	1670	29°	33°	1704	5593	0	3+3	38600	116 kts	133 mph	0.00		BORESITE GOOD
X5101	N	6:17:33	6:18:20	0:00:47	1680	29°	33°	1704	5593	0	3+3	38600	100 kts	115 mph	0.00		BORESITE GOOD
34	E	6:24:04	6:32:10	0:08:06	1350	14°	48°	1400	4593	0	3+3	42300	115 kts	132 mph	17.65		CLOUDS OFFSHORE
35	W	6:34:52	6:43:20	0:08:28	0:00:00	14°	48°	1400	4593	0	3+3	42300	110 kts	127 mph	16.88		CLOUDS OFFSHORE

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	4:45:36	Hobbs Time	
Laser Collection Time:	2:18:53	Start	1003.1
Miles Flown on Flights:	285.26	Stop	1008.1
		Total	5

Data Collection		Survey	
Percent Complete		Percent Complete	
Total Flight Lines		Total Check Sites	
Lines Complete	16	Check Sites Complete	
Lines Completed Today	16	Sites Completed Today	

Comments

TO 4 , 5min pre/post on ground @ Homeport Base

Weather

X

X

LIDAR Daily Log

the spatial data company
5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

Field Crew	
2nd flgt	

Project #	07190.01.001.551
Project Description	Flidar
Location	TO_4
Aircraft	N7961Q

Lever Arm	x	y	z
GPS	-0.106	0.1	-1.120
IMU	-0.046	0.095	-0.260

Attenuator POS #

- 0.0 Open (Full Red) (High Altitude)
- 0.5 POS 1 (Half Red/Half Black) (Medium Altitude)
- 1.0 POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

GPS Information		AGC
Base 1		
Base 2		3/3
Base3		
Aero 2		

IMU Information	
Start Time	8:42:25
Stop Time	12:57:18

Meteorological Conditions	Elevation	Temp		Pressure	
Airport	9	23.0°c	296.15°k	29.90 inHg	101253 Pa
@ Altitude		23.0°c	296.15°k	29.90 inHg	101253 Pa
@ Altitude					

GPS Base Station Information	File Name	RNX File	Ant Hgt	Ant Type
Base 1	Home2430		1.846	trmb zephyr
Base 2				
Base 3				

Flight Date (UTC)	Pilot	Operator	Sensor
8/31/2007	Satish Kher	Travis Pullen	als05

Line/Dir		Start	Stop	Total Time	Altitude	Scan Angle/Rate		AGL (m)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
36	E	8:58:47	9:07:22	0:08:35	1368	14°	48°	1400	4593	0	3+3	42300°	106 kts	122 mph	16.26		
37	W	9:11:41	9:20:10	0:08:29	1340	14°	48°	1400	4593	0	3+3	42300°	124 kts	143 mph	19.03		
38	E	9:25:04	9:33:29	0:08:25	1366	14°	48°	1400	4593	0	3+3	42300°	115 kts	132 mph	17.65		
39	W	9:36:56	9:45:08	0:08:12	1350	14°	48°	1400	4593	0	3+3	42300°	118 kts	136 mph	18.11		
40	E	9:49:29	9:58:37	0:09:08	1337	14°	48°	1400	4593	0	3+3	42300°	101 kts	116 mph	17.43		
41	W	10:01:33	10:10:19	0:08:46	1352	14°	48°	1400	4593	0	3+3	42300°	110 kts	127 mph	16.88		
42	E	10:14:03	10:22:49	0:08:46	1369	14°	48°	1400	4593	0	3+3	42300°	101 kts	116 mph	15.50		
43	W	10:26:00	10:34:33	0:08:33	1371	14°	48°	1400	4593	0	3+3	42300°	119 kts	137 mph	18.26		
44	E	10:37:44	10:46:52	0:09:08	1362	14°	48°	1400	4593	0	3+3	42300°	100 kts	115 mph	17.26		
45	W	10:50:02	10:58:26	0:08:24	1359	14°	48°	1400	4593	0	3+3	42300°	115 kts	132 mph	17.65		
46	E	11:02:12	11:11:08	0:08:56	1348	14°	48°	1400	4593	0	3+3	42300°	106 kts	122 mph	16.26		
47	W	11:14:23	11:22:46	0:08:23	1399	14°	48°	1400	4593	0	3+3	42300°	114 kts	131 mph	17.49		
48	E	11:26:56	11:36:14	0:09:18	1354	14°	48°	1400	4593	0	3+3	42300°	103 kts	119 mph	17.78		
49	W	11:40:36	11:49:14	0:08:38	1349	14°	48°	1400	4593	0	3+3	42300°	113 kts	130 mph	17.34		
50	E	11:54:40	12:03:24	0:08:44	1369	14°	48°	1400	4593	0	3+3	42300°	106 kts	122 mph	16.26		
51	W	12:06:12	12:15:47	0:09:35	1362	14°	48°	1400	4593	0	3+3	42300°	102 kts	117 mph	17.61		
X5101	N	12:25:04	12:26:02	0:00:58	1650°	22°	33°	1704	5593	0	3+3	38600°	106 kts	122 mph	0.00		
X5102	E	12:29:22	12:30:35	0:01:13	1650°	22°	33°	1704	5593	0	3+3	42300°	102 kts	117 mph	1.96		
X5101	S	12:33:22	12:34:16	0:00:54	1650°	29°	33°	1704	5593	0	3+3	42300°	112 kts	129 mph	0.00		
X5102	W	12:38:32	12:39:38	0:01:06	1655°	29°	33°	1704	5593	0	3+3	42300°	117 kts	135 mph	2.24		

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	4:14:53	Hobbs Time	
Laser Collection Time:	2:24:11	Start	1008.1
Miles Flown on Flights:	280.96	Stop	1013
		Total	4.9

Data Collection	
Percent Complete	
Total Flight Lines	
Lines Complete	16
Lines Completed Today	

Survey	
Percent Complete	
Total Check Sites	
Check Sites Complete	
Sites Completed Today	

Comments

Weather

LIDAR Daily Log

the spatial data company
5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

Field Crew

1st flight
david davis

Project #	07190.01.001.551
Project Description	Flidar
Location	TO_4
Aircraft	N7961Q

Lever Arm

	x	y	z
GPS	-0.106	0.1	-1.120
IMU	-0.046	0.095	-0.260

Attenuator POS #

- 0.0 Open (Full Red) (High Altitude)
- 0.5 POS 1 (Half Red/Half Black) (Medium Altitude)
- 1.0 POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

Flight Date (UTC)	Pilot	Operator	Sensor
10/9/2007	david swain	beau	ALS05

GPS Information

		AGC
Base 1	OPF3001	3/3
Base 2		
Base3		
Aero 2		

IMU Information

Start Time	15:11:55
Stop Time	17:47:36

Meteorological Conditions

	Elevation	Temp		Pressure	
Airport					
@ Altitude	2400 ft	23.0°c	296.15°k	29.93 inHg	101355 Pa
@ Altitude					

GPS Base Station Information

	File Name	RNX File	Ant Hgt	Ant Type
Base 1	opf02820		1.8m	trmb zeph
Base 2				
Base 3				

Line/Dir		Start	Stop	Total Time	Altitude	Scan Angle/Rate		AGL (m)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
02	E	15:54:49	15:55:53	0:01:04	691	25°	50°	731	2400	0.5	3+3	38600°	110 kts	127 mph	2.11		Boresite good
01	S	15:59:58	16:00:51	0:00:53	693	25°	50°	731	2400	0.5	3+3	38600°	105 kts	121 mph	0.00		Boresite good
02	W	16:06:02	16:07:00	0:00:58	675	25°	50°	731	2400	0.5	3+3	38600°	105 kts	121 mph	0.00		Boresite good
01	N	16:10:58	16:11:55	0:00:57	688	25°	50°	731	2400	0.5	3+3	38600°	98 kts	113 mph	0.00		Boresite good
155	W	16:28:29	16:38:42	0:10:13	692	25°	50°	731	2400	0.5	3+3		111 kts	128 mph	21.29		Offline start
154	E	16:44:38	16:55:27	0:10:49	707	25°	50°	731	2400	0.5	3+3	42300°	109 kts	125 mph	20.91		
153	W	16:59:46	17:09:46	0:10:00	750	25°	50°	731	2400	0.5	3+3	42300°	113 kts	130 mph	21.67		Alt changed to 750 ATC request
152	E	17:14:46	17:25:00	0:10:14	746	25°	50°	731	2400	0.5	3+3	42300°	102 kts	117 mph	19.56		

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	2:35:41	Hobbs Time	
Laser Collection Time:	0:45:08	Start	1060.8
Miles Flown on Flights:	85.54	Stop	1063.7
		Total	2.9

Data Collection		Survey	
Percent Complete		Percent Complete	
Total Flight Lines		Total Check Sites	
Lines Complete	4	Check Sites Complete	
Lines Completed Today		Sites Completed Today	

Comments

training flight captured 4 lines TO4 clouds 2400ft mission aborted

Weather

X

LIDAR Daily Log

the spatial data company
5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

Field Crew

Flight Date (UTC)	Pilot	Operator	Sensor
10/23/2007	Satish Kher	Travis Pullen	ALS05

Project #	07190.01.001.551
Project Description	Flidar
Location	TO_4
Aircraft	N7961Q

Lever Arm

	x	y	z
GPS	-0.106	0.1	-1.120
IMU	-0.046	0.095	-0.260

Attenuator POS #

0.0	Open (Full Red) (High Altitude)
0.5	POS 1 (Half Red/Half Black) (Medium Altitude)
1.0	POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

GPS Information

Base 1	opf_3001
Base 2	
Base3	
Aero 2	

IMU Information

Start Time	23:33:00
Stop Time	3:35:00

AGC: 3/3

Meteorological Conditions

	Elevation	Temp		Pressure	
Airport	9	27.0°c	300.15°k	29.92 inHg	101321 Pa
@ Altitude		26.0°c	299.15°k	29.95 inHg	101422 Pa
@ Altitude		25.0°c	298.15°k	29.95 inHg	101422 Pa

GPS Base Station Information

	File Name	RNX File	Ant Hgt	Ant Type
Base 1	opf3001296		1.8	trimble 5700
Base 2				
Base 3				

Line/Dir		Start	Stop	Total Time	Altitude	Scan Angle/Rate		AGL (m)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
OPF01	S	0:00:24	0:01:18	0:00:54	764	25°	50°	731	2400	0.5	3+3	47400°	113 kts	130 mph	0.00		
OPF02	N	0:03:30	0:04:00	0:00:30	774	25°	50°	731	2400	0.5	3+3	47400°	123 kts	142 mph	0.00		
OPF03	S	0:07:24	0:08:24	0:01:00	765	25°	50°	731	2400	0.5	3+3	47400°	106 kts	122 mph	2.03		
OPF04	W	0:11:44	0:12:40	0:00:56	760	25°	50°	731	2400	0.5	3+3	47400°	112 kts	129 mph	0.00		
OPF01	N	0:17:04	0:17:55	0:00:51	770	25°	50°	731	2400	0.5	3+3	47400°	122 kts	140 mph	0.00		
OPF02	S	0:21:26	0:22:19	0:00:53	773	25°	50°	731	2400	0.5	3+3	47400°	113 kts	130 mph	0.00		
OPF03	N	0:29:38	0:30:28	0:00:50	775	25°	50°	731	2400	0.5	3+3	47400°	117 kts	135 mph	0.00		
120	E	1:03:30	1:13:31	0:10:01	774	25°	50°	731	2400	0.5	3+3	47400°	112 kts	129 mph	21.48		
121	W	1:16:41	1:26:28	0:09:47	769	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	20.37		
122	E	1:29:01	1:39:04	0:10:03	764	25°	50°	731	2400	0.5	3+3	47400°	100 kts	115 mph	19.18		
123	W	1:42:16	1:52:17	0:10:01	770	25°	50°	731	2400	0.5	3+3	47400°	110 kts	127 mph	21.10		
124	E	1:55:42	2:06:31	0:10:49	776	25°	50°	731	2400	0.5	3+3	47400°	112 kts	129 mph	21.48		
125	W	2:09:29	2:20:00	0:10:31	762	25°	50°	731	2400	0.5	3+3	47400°	110 kts	127 mph	21.10		
126	E	2:23:44	2:33:58	0:10:14	793	25°	50°	731	2400	0.5	3+3	47400°	117 kts	135 mph	22.44		
127	W	2:37:41	2:48:14	0:10:33	762	25°	50°	731	2400	0.5	3+3	47400°	110 kts	127 mph	21.10		
128	E	2:51:51	3:02:24	0:10:33	757	25°	50°	731	2400	0.5	3+3	47400°	104 kts	120 mph	19.95		
129	W	3:25:27	3:37:00	0:11:33	760	25°	50°	731	2400	0.5	3+3	47400°	119 kts	137 mph	25.11		

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	4:02:00	Hobbs Time	
Laser Collection Time:	1:49:59	Start	1070
Miles Flown on Flights:	215.33	Stop	1075.3
		Total	5.3

Data Collection		Survey	
Percent Complete		Percent Complete	
Total Flight Lines		Total Check Sites	
Lines Complete		Check Sites Complete	
Lines Completed Today		Sites Completed Today	

Comments

Weather

the spatial data company
5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

LIDAR Daily Log

Field Crew	

Project #	A7190.01.001.551
Project Description	Flidar
Location	TO4_TO5
Aircraft	N7961Q

Flight Date (UTC)	Pilot	Operator	Sensor
11/4/2007	John Tinsley	Travis Pullen	ALS05

Lever Arm

	x	y	z
GPS	-0.106	0.1	-1.120
IMU	-0.046	0.095	-0.260

Attenuator POS #

0.0	Open (Full Red) (High Altitude)
0.5	POS 1 (Half Red/Half Black) (Medium Altitude)
1.0	POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

GPS Information		AGC
Base 1	3001_OPR	
Base 2		
Base3		
Aero 2		

IMU Information	
Start Time	2:04:00
Stop Time	7:29:00

Meteorological Conditions

	Elevation	Temp		Pressure	
Airport	9	22.0°c	295.15°k	30.05 inHg	101761 Pa
@ Altitude	731	22.0°c	295.15°k	30.07 inHg	101829 Pa
@ Altitude	731	21.0°c	294.15°k	30.06 inHg	101795 Pa

GPS Base Station Information

	File Name	RNX File	Ant Hgt	Ant Type
Base 1			1.8	
Base 2				
Base 3				

Line/Dir		Start	Stop	Total Time	Altitude	Scan Angle/Rate		AGL (m)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
opf 1	S	2:14:33	2:15:24	0:00:51	724	25°	50°	731	2400	0.5	3+3	47400°	113 kts	130 mph	0.00		Good Boresite
opf 2	W	2:18:42	2:19:45	0:01:03	748	25°	50°	731	2400	0.5	3+3	47400°	108 kts	124 mph	2.07		Good Boresite
opf 1	N	2:22:24	2:23:24	0:01:00	755	25°	50°	731	2400	0.5	3+3	47400°	108 kts	124 mph	2.07		Good Boresite
opf 2	E	2:25:47	2:26:47	0:01:00	736	25°	50°	731	2400	0.5	3+3	47400°	111 kts	128 mph	2.13		Good Boresite
105	W	2:33:57	2:44:02	0:10:05	750	25°	50°	731	2400	0.5	3+3	47400°	114 kts	131 mph	21.86		TO_5
106	E	2:47:21	2:57:22	0:10:01	760	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	22.63		TO_5
107	W	3:00:35	3:10:38	0:10:03	760	25°	50°	731	2400	0.5	3+3	47400°	116 kts	133 mph	22.25		TO_5
119	W	3:27:08	3:36:54	0:09:46	744	25°	50°	731	2400	0.5	3+3	47400°	120 kts	138 mph	20.71		TO_4
120	E	3:40:08	3:49:45	0:09:37	748	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	20.37		TO_4
121	W	3:52:36	4:02:16	0:09:40	743	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	20.37		TO_4
130	E	4:05:40	4:16:53	0:11:13	744	25°	50°	731	2400	0.5	3+3	47400°	117 kts	135 mph	24.68		TO_4
131	W	4:18:33	4:28:44	0:10:11	747	25°	50°	731	2400	0.5	3+3	47400°	117 kts	135 mph	22.44		TO_4
132	E	4:31:56	4:42:07	0:10:11	740	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	22.63		TO_4
133	W	4:45:23	4:55:30	0:10:07	747	25°	50°	731	2400	0.5	3+3	47400°	115 kts	132 mph	22.06		TO_4
134	E	4:59:09	5:09:13	0:10:04	746	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	22.63		TO_4
135	W	5:12:24	5:22:35	0:10:11	740	25°	50°	731	2400	0.5	3+3	47400°	112 kts	129 mph	21.48		TO_4
136	E	5:26:04	5:36:05	0:10:01	737	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	22.63		TO_4
137	W	5:35:07	5:46:15	0:11:08	748	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	24.90		TO_4
138	E	5:52:23	6:02:18	0:09:55	741	25°	50°	731	2400	0.5	3+3	47400°	120 kts	138 mph	20.71		TO_4
139	W	6:05:10	6:15:24	0:10:14	726	25°	50°	731	2400	0.5	3+3	47400°	120 kts	138 mph	23.02		TO_4
140	E	6:18:42	6:28:28	0:09:46	746	25°	50°	731	2400	0.5	3+3	47400°	120 kts	138 mph	20.71		TO_4
141	W	6:31:31	6:41:23	0:09:52	732	25°	50°	731	2400	0.5	3+3	47400°	120 kts	138 mph	20.71		TO_4
142	E	6:44:53	6:54:43	0:09:50	746	25°	50°	731	2400	0.5	3+3	47400°	121 kts	139 mph	20.89		TO_4
143	W	6:57:25	7:07:27	0:10:02	744	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	22.63		TO_4

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	5:25:00	Hobbs Time	
Laser Collection Time:	3:25:51	Start	1080.9
Miles Flown on Flights:	446.60	Stop	1087.7
		Total	6.8

Data Collection		Survey	
Percent Complete		Percent Complete	
Total Flight Lines		Total Check Sites	
Lines Complete		Check Sites Complete	
Lines Completed Today		Sites Completed Today	

Comments

Weather

3001 the spatial data company
5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

LIDAR Daily Log

Field Crew			
Flight Date (UTC)	Pilot	Operator	Sensor
11/6/2007	john tinsley	david davis	ALS05

Project #	07190.01.001.551
Project Description	Flidar
Location	TO_4_TO6_RF
Aircraft	N7961Q

Lever Arm	x	y	z
GPS	-0.106	0.1	-1.120
IMU	-0.046	0.095	-0.260

Attenuator POS #

- 0.0 Open (Full Red) (High Altitude)
- 0.5 POS 1 (Half Red/Half Black) (Medium Altitude)
- 1.0 POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

GPS Information		AGC
Base 1	OPF3001	
Base 2		3/3
Base3		
Aero 2		
IMU Information		
Start Time	4:53:10	
Stop Time	8:41:09	

Meteorological Conditions

	Elevation	Temp		Pressure	
Airport	9	24.5°c	297.65°k	29.99 inHg	101558 Pa
@ Altitude	2400 ft	23.0°c	296.15°k	29.93 inHg	101355 Pa
@ Altitude					

GPS Base Station Information

	File Name	RNX File	Ant Hgt	Ant Type
Base 1	04623101.t01		1.8m	trmb zeph
Base 2				
Base 3				

Line/Dir		Start	Stop	Total Time	Altitude	Scan Angle/Rate		AGL (m)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
opf01n	S	5:11:08	5:12:10	0:01:02	717	25°	50°	731	2400	0.5	3+3	47400°	102 kts	117 mph	1.96		Boresite good
OPF02E	W	5:13:33	5:14:44	0:01:11	713	25°	50°	731	2400	0.5	3+3	47400°	105 kts	121 mph	2.01		Boresite good
OPF01N	N	5:17:50	5:19:08	0:01:18	742	25°	50°	731	2400	0.5	3+3	47400°	106 kts	122 mph	2.03		Boresite good
OPF02S	E	5:22:00	5:23:33	0:01:33	730	25°	50°	731	2400	0.5	3+3	47400°	99 kts	114 mph	1.90		Boresite good
144E	E	5:43:22	5:53:50	0:10:28	735	25°	50°	731	2400	0.5	3+3	47400°	111 kts	128 mph	21.29		T0_4
145E	W	5:56:15	6:06:18	0:10:03	745	25°	50°	731	2400	0.5	3+3	47400°	110 kts	127 mph	21.10		T0_4
146E	E	6:09:34	6:19:55	0:10:21	733	25°	50°	731	2400	0.5	3+3	47400°	112 kts	129 mph	21.48		T0_4
147E	W	6:22:39	6:32:53	0:10:14	735	25°	50°	731	2400	0.5	3+3	47400°	113 kts	130 mph	21.67		T0_4
148E	E	6:36:03	6:46:17	0:10:14	730	25°	50°	731	2400	0.5	3+3	47400°	114 kts	131 mph	21.86		T0_4
149E	W	6:49:13	6:59:40	0:10:27	732	25°	50°	731	2400	0.5	3+3	47400°	110 kts	127 mph	21.10		T0_4
150E	E	7:02:54	7:12:43	0:09:49	736	25°	50°	731	2400	0.5	3+3	47400°	117 kts	135 mph	20.20		T0_4
151E	W	7:15:25	7:25:13	0:09:48	731	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	20.37		T0_4
152E	E	7:28:41	7:38:30	0:09:49	732	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	20.37		T0_4
105E	W	7:45:46	7:55:37	0:09:51	724	25°	50°	731	2400	0.5	3+3	47400°	110 kts	127 mph	18.99		T0_5
106E	E	7:58:52	8:08:50	0:09:58	744	25°	50°	731	2400	0.5	3+3	47400°	117 kts	135 mph	20.20		T0_5
107E	W	8:11:46	8:21:55	0:10:09	736	25°	50°	731	2400	0.5	3+3	47400°	114 kts	131 mph	21.86		TO_5

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	3:47:59	Hobbs Time	
Laser Collection Time:	2:06:15	Start	1092.3
Miles Flown on Flights:	258.39	Stop	1098
		Total	5.7

Data Collection	
Percent Complete	0.0%
Total Flight Lines	12
Lines Complete	0
Lines Completed Today	12

Survey	
Percent Complete	
Total Check Sites	
Check Sites Complete	
Sites Completed Today	

Comments

Weather

X

the spatial data company
5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

LIDAR Daily Log

Field Crew	
Flight Date (UTC)	11/15/2007
Pilot	John Tinsley
Operator	david davis
Sensor	ALS05

Project #	07190.01.001.551
Project Description	Flidar
Location	TO_4
Aircraft	N7961Q

Lever Arm	x	y	z
GPS	-0.106	0.1	-1.120
IMU	-0.046	0.095	-0.260

Attenuator POS #

- 0.0 Open (Full Red) (High Altitude)
- 0.5 POS 1 (Half Red/Half Black) (Medium Altitude)
- 1.0 POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

GPS Information		AGC
Base 1	Homeport	
Base 2		3/3
Base3		
Aero 2		

IMU Information	
Start Time	23:56:50
Stop Time	4:58:55

Meteorological Conditions	Elevation	Temp		Pressure	
Airport	9	22.0°c	295.15°k	29.91 inHg	101287 Pa
@ Altitude	2,400	22.0°c	295.15°k	29.91 inHg	101287 Pa
@ Altitude					

GPS Base Station Information	File Name	RNX File	Ant Hgt	Ant Type
Base 1	84623191.t01		1.8	trmp zeph
Base 2				
Base 3				

Line/Dir		Start	Stop	Total Time	Altitude	Scan Angle/Rate		AGL (m)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
X5104N	E	0:20:11	0:21:11	0:01:00	749	25°	50°	731	2400	0.5	3+3	47400°	114 kts	131 mph	2.19		BORESITE GOOD
X5102N	S	0:24:02	0:25:00	0:00:58	759	25°	50°	731	2400	0.5	3+3	47400°	116 kts	133 mph	0.00		BORESITE GOOD
X5104N	W	0:27:53	0:29:01	0:01:08	755	25°	50°	731	2400	0.5	3+3	47400°	105 kts	121 mph	2.01		BORESITE GOOD
X5102E	N	0:32:03	0:33:09	0:01:06	757	25°	50°	731	2400	0.5	3+3	47400°	104 kts	120 mph	1.99		BORESITE GOOD
1	W	0:42:11	0:52:24	0:10:13	748	25°	50°	731	2400	0.5	3+3	47400°	111 kts	128 mph	21.29		TO_4
2	E	0:55:33	1:05:07	0:09:34	753	25°	50°	731	2400	0.5	3+3	47400°	119 kts	137 mph	20.54		TO_4
3	W	1:09:00	1:18:59	0:09:59	763	25°	50°	731	2400	0.5	3+3	47400°	110 kts	127 mph	18.99		TO_4
66	E	1:27:51	1:36:25	0:08:34	777	25°	50°	731	2400	0.5	3+3	47400°	120 kts	138 mph	18.41		TO_4
67	W	1:39:43	1:48:42	0:08:59	780	25°	50°	731	2400	0.5	3+3	47400°	115 kts	132 mph	17.65		TO_4
68	E	1:51:42	2:00:35	0:08:53	762	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	18.11		TO_4
69	W	2:03:38	2:12:45	0:09:07	760	25°	50°	731	2400	0.5	3+3	47400°	112 kts	129 mph	19.33		TO_4
70	E	2:15:55	2:24:50	0:08:55	756	25°	50°	731	2400	0.5	3+3	47400°	112 kts	129 mph	17.18		TO_4
71	W	2:27:56	2:37:02	0:09:06	757	25°	50°	731	2400	0.5	3+3	47400°	111 kts	128 mph	19.16		TO_4
72	E	2:40:00	2:49:10	0:09:10	755	25°	50°	731	2400	0.5	3+3	47400°	112 kts	129 mph	19.33		TO_4
73	W	2:52:07	3:00:58	0:08:51	755	25°	50°	731	2400	0.5	3+3	47400°	114 kts	131 mph	17.49		TO_4
74	E	3:03:06	3:10:40	0:07:34	756	25°	50°	731	2400	0.5	3+3	47400°	113 kts	130 mph	15.17		TO_4
75	W	3:13:49	3:21:18	0:07:29	762	25°	50°	731	2400	0.5	3+3	47400°	113 kts	130 mph	15.17		TO_4
76	E	3:24:03	3:31:40	0:07:37	761	25°	50°	731	2400	0.5	3+3	47400°	115 kts	132 mph	15.44		TO_4
77	W	3:34:42	3:42:28	0:07:46	759	25°	50°	731	2400	0.5	3+3	47400°	114 kts	131 mph	15.31		TO_4
78	E	3:45:21	3:53:04	0:07:43	754	25°	50°	731	2400	0.5	3+3	47400°	115 kts	132 mph	15.44	Y - JOSH	TO_4
79	W	3:56:10	4:04:04	0:07:54	754	25°	50°	731	2400	0.5	3+3	47400°	111 kts	128 mph	14.90		TO_4
80	E	4:06:45	4:14:16	0:07:31	745	25°	50°	731	2400	0.5	3+3	47400°	116 kts	133 mph	15.57		TO_4
81	W	4:17:20	4:25:09	0:07:49	752	25°	50°	731	2400	0.5	3+3	47400	110 kts	127 mph	14.77		TO_4
82	E	4:28:18	4:35:58	0:07:40	745	25°	50°	731	2400	0.5	3+3	47400	115 kts	132 mph	15.44		TO_4
83	W	4:39:01	4:43:45	0:04:44	741	25°	50°	731	2400	0.5	3+3	47400	111 kts	128 mph	8.52		LINE STOPPED EARLY BECAUSE OF CLOUDS

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	5:02:05	Hobbs Time	
Laser Collection Time:	2:59:20	Start	1126.1
Miles Flown on Flights:	359.41	Stop	1133.9
		Total	7.8

Data Collection	
Percent Complete	
Total Flight Lines	
Lines Complete	20
Lines Completed Today	20

Survey	
Percent Complete	
Total Check Sites	
Check Sites Complete	
Sites Completed Today	

Comments

Weather

X

LIDAR Daily Log

the spatial data company
5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

Field Crew

Project #	07190.01.001.551
Project Description	Flidar
Location	TO4_TO6
Aircraft	N7961Q

Lever Arm

	x	y	z
GPS	-0.106	0.1	-1.120
IMU	-0.046	0.095	-0.260

Attenuator POS #

0.0	Open (Full Red) (High Altitude)
0.5	POS 1 (Half Red/Half Black) (Medium Altitude)
1.0	POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

Flight Date (UTC)	Pilot	Operator	Sensor
11/17/2007	John Tinsley	david davis	ALS05

GPS Information

		AGC
Base 1	Homeport	
Base 2		3/3
Base3		
Aero 2		

IMU Information

Start Time	1:25:36
Stop Time	5:19:05

Meteorological Conditions

	Elevation	Temp		Pressure	
Airport	9	16.0°c	289.15°k	30.09 inHg	101896 Pa
@ Altitude	2,400	16.0°c	289.15°k	30.09 inHg	101896 Pa
@ Altitude					

GPS Base Station Information

	File Name	RNX File	Ant Hgt	Ant Type
Base 1	84623210.TO1		1.8	trmp zeph
Base 2				
Base 3				

Line/Dir		Start	Stop	Total Time	Altitude	Scan Angle/Rate		AGL (m)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
X5104N	E	1:46:13	1:47:27	0:01:14	745	25°	50°	731	2400	0.5	3+3	47400°	103 kts	119 mph	1.98		BORESITE GOOD
X5102N	S	1:50:03	1:51:12	0:01:09	730	25°	50°	731	2400	0.5	3+3	47400°	103 kts	119 mph	1.98		BORESITE GOOD
X5104N	W	1:54:02	1:54:56	0:00:54	741	25°	50°	731	2400	0.5	3+3	47400°	119 kts	137 mph	0.00		BORESITE GOOD
X5102E	N	1:57:55	1:58:56	0:01:01	755	25°	50°	731	2400	0.5	3+3	47400°	110 kts	127 mph	2.11		BORESITE GOOD
83	W	2:11:08	2:19:35	0:08:27	747	25°	50°	731	2400	0.5	3+3	47400°	114 kts	131 mph	17.49		TO_4
84	E	2:22:44	2:31:31	0:08:47	746	25°	50°	731	2400	0.5	3+3	47400°	109 kts	125 mph	16.72		TO_4
85	W	2:34:12	2:42:34	0:08:22	753	25°	50°	731	2400	0.5	3+3	47400°	116 kts	133 mph	17.80		TO_4
86	E	2:46:10	2:55:02	0:08:34	751	25°	50°	731	2400	0.5	3+3	47400°	110 kts	127 mph	16.88		TO_4
87	W	2:57:56	3:06:27	0:08:31	744	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	18.11		TO_4
88	E	3:09:57	3:18:50	0:08:53	754	25°	50°	731	2400	0.5	3+3	47400°	112 kts	129 mph	17.18		TO_4
89	W	3:21:38	3:30:00	0:08:22	751	25°	50°	731	2400	0.5	3+3	47400°	119 kts	137 mph	18.26		TO_4
151	W	3:46:09	3:54:30	0:08:21	749	25°	50°	731	2400	0.5	3+3	47400°	117 kts	135 mph	17.95		T0_3
152	E	3:58:11	4:07:02	0:08:51	742	25°	50°	731	2400	0.5	3+3	47400°	111 kts	128 mph	17.03		T0_3
153	W	4:09:41	4:18:12	0:08:31	754	25°	50°	731	2400	0.5	3+3	47400°	115 kts	132 mph	17.65		T0_3
154	E	4:21:50	4:30:41	0:08:51	745	25°	50°	731	2400	0.5	3+3	47400°	107 kts	123 mph	16.42		TO_3
155	W	4:33:40	4:41:56	0:08:16	738	25°	50°	731	2400	0.5	3+3	47400°	117 kts	135 mph	17.95		T0_3
156	N	4:49:56	5:00:10	0:10:14	750	25°	50°	731	2400	0.5	3+3	47400°	112 kts	129 mph	21.48		TO_4 TIE LINE

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	3:53:29	Hobbs Time	
Laser Collection Time:	1:57:18	Start	1133.9
Miles Flown on Flights:	236.98	Stop	1138
		Total	4.1

Data Collection		Survey	
Percent Complete		Percent Complete	
Total Flight Lines		Total Check Sites	
Lines Complete	13	Check Sites Complete	
Lines Completed Today	13	Sites Completed Today	

Comments

TASK ORDER 4 COMPLETED.

Weather

X

the spatial data company
5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

LIDAR Daily Log

Field Crew			
Flight Date (UTC)	Pilot	Operator	Sensor
1/2/2008	Lane Morrison	Travis Pullen	ALS05

Project #	A7190.01.001.551
Project Description	Flidar
Location	Homestead (X51)
Aircraft	N7961Q

Lever Arm	x	y	z
GPS	-0.106	0.1	-1.120
IMU	-0.046	0.095	-0.260

Attenuator POS #	
0.0	Open (Full Red) (High Altitude)
0.5	POS 1 (Half Red/Half Black) (Medium Altitude)
1.0	POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

GPS Information		AGC
Base 1	meport_30	
Base 2		3/3
Base3		
Aero 2		

IMU Information	
Start Time	15:27:00
Stop Time	17:30:00

Meteorological Conditions	Elevation	Temp		Pressure	
Airport	9			30.33 inHg	102709 Pa
@ Altitude					
@ Altitude					

GPS Base Station Information	File Name	RNX File	Ant Hgt	Ant Type
Base 1			1.8	
Base 2				
Base 3				

Line/Dir		Start	Stop	Total Time	Altitude	Scan Angle/Rate		AGL (m)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
X5101	S	15:44:04	15:44:45	0:00:41	731	25°	50°	731	2399	0.5	3+3	47400°	119 kts	137 mph	0.00		Good Boresite
X5102	N	15:50:18	15:51:09	0:00:51	731	25°	50°	731	2399	0.5	3+3	47400°	122 kts	140 mph	0.00		Good Boresite
X5103	S	15:55:15	15:56:15	0:01:00	731	25°	50°	731	2399	0.5	3+3	47400°	124 kts	143 mph	2.38		Good Boresite
X5104	W	16:01:10	16:02:10	0:01:00	731	25°	50°	731	2399	0.5	3+3	47400°	119 kts	137 mph	2.28		Good Boresite
X5101	N	16:06:28	16:07:28	0:01:00	731	25°	50°	731	2399	0.5	3+3	47400°	120 kts	138 mph	2.30		Good Boresite
X5102	S	16:12:15	16:13:10	0:00:55	731	25°	50°	731	2399	0.5	3+3	47400°	118 kts	136 mph	0.00		Good Boresite
X5103	N	16:18:47	16:19:36	0:00:49	731	25°	50°	731	2399	0.5	3+3	47400°	120 kts	138 mph	0.00		Good Boresite
24	E	16:32:14	16:41:45	0:09:31	731	25°	50°	731	2399	0.5	3+3	47400°	116 kts	133 mph	20.02		TO_4
25	W	16:46:20	16:53:39	0:07:19	731	25°	50°	731	2399	0.5	3+3	47400°	120 kts	138 mph	16.11		TO_4
26	E	16:58:50	17:06:30	0:07:40	731	25°	50°	731	2399	0.5	3+3	47400°	120 kts	138 mph	16.11		TO_4
27	W	17:11:19	17:19:01	0:07:42	731	25°	50°	731	2399	0.5	3+3	47400°	120 kts	138 mph	16.11		TO_4

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	2:03:00	Hobbs Time	
Laser Collection Time:	0:38:28	Start	1255.9
Miles Flown on Flights:	75.32	Stop	1258.3
		Total	2.4

Data Collection	
Percent Complete	
Total Flight Lines	
Lines Complete	
Lines Completed Today	

Survey	
Percent Complete	
Total Check Sites	
Check Sites Complete	
Sites Completed Today	

Comments

Line files and programs put on computer and flew a test flight

Weather

LIDAR Daily Log

the spatial data company

5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

Field Crew

Flight Date (UTC)	Pilot	Operator	Sensor
1/3/2008	Lane Morrison	Travis Pullen	ALS05

Project #	A7190.01.001.551
Project Description	Flidar
Location	Homestead (X51)
Aircraft	N7961Q

Lever Arm

	x	y	z
GPS	-0.106	0.1	-1.120
IMU	-0.046	0.095	-0.260

Attenuator POS #

0.0	Open (Full Red) (High Altitude)
0.5	POS 1 (Half Red/Half Black) (Medium Altitude)
1.0	POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

GPS Information

Base 1	meport_30
Base 2	
Base3	
Aero 2	

IMU Information

Start Time	8:38:00
Stop Time	2:33:41

AGC

3/3

Meteorological Conditions

	Elevation	Temp		Pressure	
Airport	9			30.38 inHg	102878 Pa
@ Altitude	731			30.41 inHg	102980 Pa
@ Altitude					

GPS Base Station Information

	File Name	RNX File	Ant Hgt	Ant Type
Base 1			1.8	
Base 2				
Base 3				

Line/Dir		Start	Stop	Total Time	Altitude	Scan Angle/Rate		AGL (m)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
X5101	S	0:28:39	0:29:33	0:00:54	731	25°	50°	731	2399	0.5	3+3	47400°	100 kts	115 mph	0.00		Good Boresite
X5102	W	0:33:57	0:35:17	0:01:20	731	25°	50°	731	2399	0.5	3+3	47400°	84 kts	97 mph	1.61		Good Boresite
X5101	N	0:40:45	0:41:53	0:01:08	731	25°	50°	731	2399	0.5	3+3	47400°	104 kts	120 mph	1.99		Good Boresite
X5102	E	0:47:00	0:47:55	0:00:55	731	25°	50°	731	2399	0.5	3+3	47400°	122 kts	140 mph	0.00		Good Boresite
28	E	0:54:38	1:02:31	0:07:53	731	25°	50°	731	2399	0.5	3+3	47400°	132 kts	152 mph	17.72		TO_4
29	W	1:07:37	1:15:34	0:07:57	731	25°	50°	731	2399	0.5	3+3	47400°	119 kts	137 mph	15.98		TO_4
30	E	1:20:14	1:27:58	0:07:44	731	25°	50°	731	2399	0.5	3+3	47400°	115 kts	132 mph	15.44		TO_4
31	W	1:32:40	1:40:28	0:07:48	731	25°	50°	731	2399	0.5	3+3	47400°	114 kts	131 mph	15.31		TO_4
42	E	1:44:22	1:52:23	0:08:01	731	25°	50°	731	2399	0.5	3+3	47400°	118 kts	136 mph	18.11		TO_4
43	W	1:57:07	2:05:20	0:08:13	731	25°	50°	731	2399	0.5	3+3	47400°	118 kts	136 mph	18.11		TO_4
44	E	2:09:53	2:18:01	0:08:08	731	25°	50°	731	2399	0.5	3+3	47400°	119 kts	137 mph	18.26		TO_4

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	17:55:41	Hobbs Time	
Laser Collection Time:	1:00:01	Start	1258.3
Miles Flown on Flights:	122.52	Stop	1261.9
		Total	3.6

Data Collection		Survey	
Percent Complete		Percent Complete	
Total Flight Lines		Total Check Sites	
Lines Complete		Check Sites Complete	
Lines Completed Today		Sites Completed Today	

Comments

Weather

the spatial data company
5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

LIDAR Daily Log

Field Crew
brian koening

Project #	7190.01.001.551
Project Description	Flidar
Location	TO_3
Aircraft	N7961Q

Lever Arm	x	y	z
GPS	-0.106	0.1	-1.120
IMU	-0.046	0.095	-0.260

Attenuator POS #
- 0.0 Open (Full Red) (High Altitude)
- 0.5 POS 1 (Half Red/Half Black) (Medium Altitude)
- 1.0 POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

GPS Information		AGC
Base 1	Homestead	
Base 2	Thompson	3/3
Base3		
Aero 2		

IMU Information	
Start Time	4:44:00
Stop Time	10:23:00

Meteorological Conditions	Elevation	Temp		Pressure	
Airport		15.0°c	288.15°k	30.15 inHg	102100 Pa
@ Altitude		15.0°c	288.15°k	30.15 inHg	102100 Pa
@ Altitude					

GPS Base Station Information	File Name	RNX File	Ant Hgt	Ant Type
Base 1	84620080.t01		1.8m	trimble 5700
Base 2			1.8	novatel
Base 3				

Flight Date (UTC)	Pilot	Operator	Sensor
1/9/2008	lane morrison	david davis	ALS05

Line/Dir		Start	Stop	Total Time	Altitude	Scan Angle/Rate		AGL (m)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
X5101	N	5:03:02	5:04:03	0:01:01	708	25°	50°	731	2400	0.5	3+3	47400°	112 kts	129 mph	2.15		
X5102	E	5:10:31	5:11:48	0:01:17	688	25°	50°	731	2400	0.5	3+3	47400°	98 kts	113 mph	1.88		
X5101	S	5:14:58	5:15:46	0:00:48	696	25°	50°	731	2400	0.5	3+3	47400°	106 kts	122 mph	0.00		
X5102	W	5:19:22	5:20:32	0:01:10	678	25°	50°	731	2400	0.5	3+3	47400°	115 kts	132 mph	2.21		
152	E	5:55:19	6:05:19	0:10:00	697	25°	50°	731	2400	0.5	3+3	47400°	115 kts	132 mph	22.06		
151	W	6:09:31	6:19:24	0:09:53	700	25°	50°	731	2400	0.5	3+3	47400°	116 kts	133 mph	20.02		
150	E	6:24:12	6:33:55	0:09:43	714	25°	50°	731	2400	0.5	3+3	47400°	114 kts	131 mph	19.68		
129	W	6:37:46	6:47:53	0:10:07	695	25°	50°	731	2400	0.5	3+3	47400°	113 kts	130 mph	21.67		
128	E	6:52:26	7:02:54	0:10:28	704	25°	50°	731	2400	0.5	3+3	47400°	119 kts	137 mph	22.82		
127	W	7:06:47	7:17:14	0:10:27	682	25°	50°	731	2400	0.5	3+3	47400°	111 kts	128 mph	21.29		
123	W	7:32:11	7:41:58	0:09:47	690	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	20.37		
122	E	7:47:15	7:56:56	0:09:41	701	25°	50°	731	2400	0.5	3+3	47400°	116 kts	133 mph	20.02		
121	W	8:01:32	8:11:14	0:09:42	690	25°	50°	731	2400	0.5	3+3	47400°	116 kts	133 mph	20.02		
120	E	8:15:57	8:25:41	0:09:44	700	25°	50°	731	2400	0.5	3+3	47400°	115 kts	132 mph	19.85		REFLY FOR BLOCK DATA
119	W	8:29:49	8:39:33	0:09:44	700	25°	50°	731	2400	0.5	3+3	47400°	116 kts	133 mph	20.02		REFLY FOR BLOCK DATA
118	E	8:43:57	8:53:51	0:09:54	702	25°	50°	731	2400	0.5	3+3	47400°	117 kts	135 mph	20.20		POSSIBLE CLOUDS OVER WATER @ EAST ENDS
117	W	8:57:13	9:07:15	0:10:02	694	25°	50°	731	2400	0.5	3+3	47400°	118 kts	136 mph	22.63		POSSIBLE CLOUDS OVER WATER @ EAST ENDS
116	E	9:11:53	9:21:33	0:09:40	698	25°	50°	731	2400	0.5	3+3	47400°	113 kts	130 mph	19.51		POSSIBLE CLOUDS OVER WATER @ EAST ENDS
115	W	9:25:18	9:35:00	0:09:42	695	25°	50°	731	2400	0.5	3+3	47400°	119 kts	137 mph	20.54		POSSIBLE CLOUDS OVER WATER @ EAST ENDS
114	E	9:39:12	9:49:01	0:09:49	708	25°	50°	731	2400	0.5	3+3	47400°	119 kts	137 mph	20.54		POSSIBLE CLOUDS OVER WATER @ EAST ENDS
00	S	9:59:55	10:06:03	0:06:08	602	25°	50°	731	2400	0.5	3+3	47400°	115 kts	132 mph	13.23		TIE LINE COSTAL RUN

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	5:39:00	Hobbs Time	
Laser Collection Time:	2:48:47	Start	1279.6
Miles Flown on Flights:	350.72	Stop	1285.5
		Total	5.9

Data Collection		Survey	
Percent Complete	40.0%	Percent Complete	
Total Flight Lines	40	Total Check Sites	
Lines Complete	16	Check Sites Complete	
Lines Completed Today	16	Sites Completed Today	

Comments	Weather
	X

LIDAR Daily Log

the spatial data company
5525 MOUNES STREET, SUITE 102
NEW ORLEANS, LOUISIANA 70123
PH. 504.733.3001 - FX. 504.734.8938

Field Crew	
Project #	A7190.01.001.551
Project Description	Flidar
Location	X51
Aircraft	N56SA

Lever Arm	x	y	z
GPS	-0.052	-0.334	-1.220
IMU	-0.269	-0.139	-0.017

Attenuator POS #	
0.0	Open (Full Red) (High Altitude)
0.5	POS 1 (Half Red/Half Black) (Medium Altitude)
1.0	POS 2 (1/4 Red/ 3/4 Black) (Low Altitude)

GPS Information		AGC
Base 1	Homeport	
Base 2	?	12/3
Base3		
Aero 2		

IMU Information	
Start Time	20:40:12
Stop Time	0:26:19

Meteorological Conditions	Elevation	Temp		Pressure	
Airport	7	25.0°c	298.15°k	30.13 inHg	102
@ Altitude	675	24.0°c	297.15°k	30.13 inHg	102
@ Altitude	688	23.0°c	296.15°k	30.13 inHg	102

GPS Base Station Information	File Name	RNX File	Ant Hgt	Ant Type
Base 1	?.dat		1.8	GPS=702
Base 2	?			
Base 3				

Flight Date (UTC)	Pilot	Operator	Sensor
1/31/2008	matt boone	Travis Pullen	ALS20

Line/Dir		Start	Stop	Total Time	Altitude Meters	Altitude Feet	Scan Angle/Rate		AGL (m)	AGL ft)	AMSL (ft)	Attenuator	RCC	Pulse Rate	Speed		Miles Flwn	Void "Y"	Conditions/Comments
BT	Ground	20:43:02	20:44:22	0:01:20		0				0									
						0				0									
F4501	S	20:53:51	20:54:37	0:00:46	498	1634	32°	22°	701	2300	2300	1	14°	112600°	118 kts	136 mph	0.00		Good Boresite
F4502	W	20:57:23	20:58:12	0:00:49	493	1617	32°	22°	701	2300	2300	1	14°	112600°	118 kts	136 mph	0.00		Good Boresite
F4501	N	21:03:54	21:04:41	0:00:47	998	3274	32°	43°	701	2300	2300	1	28°	145500°	118 kts	136 mph	0.00		Good Boresite
F4502	E	21:08:42	21:09:32	0:00:50	999	3278	32°	43°	701	2300	2300	1	28°	145500°	120 kts	138 mph	0.00		Good Boresite
						0				0									
160	E	21:16:20	21:25:03	0:08:43	695	2280	26°	49°	701	2300	2300	1	19°	11800°	116 kts	133 mph	17.80		TO_03
161	W	21:28:36	21:37:13	0:08:37	695	2280	26°	49°	701	2300	2300	1	19°	11800°	118 kts	136 mph	18.11		TO_03
162	E	21:41:36	21:50:22	0:08:46	699	2293	26°	49°	701	2300	2300	1	19°	11800°	120 kts	138 mph	18.41		TO_03
163	W	21:53:43	22:02:05	0:08:22	699	2293	26°	49°	701	2300	2300	1	19°	11800°	113 kts	130 mph	17.34		TO_03
164	W	22:06:24	22:16:01	0:09:37	696	2283	26°	49°	701	2300	2300	1	19°	11800°	116 kts	133 mph	20.02		TO_03
193	W	22:18:54	22:28:17	0:09:23	690	2264	26°	49°	701	2300	2300	1	19°	11800°	116 kts	133 mph	20.02		TO_03
202	E	22:32:08	22:41:44	0:09:36	695	2280	26°	49°	701	2300	2300	1	19°	11800°	122 kts	140 mph	21.06		TO_03
201	W	22:47:42	22:57:29	0:09:47	692	2270	26°	49°	701	2300	2300	1	19°	11800°	120 kts	138 mph	20.71		TO_03
144	E	23:04:32	23:11:58	0:07:26	692	2270	26°	49°	701	2300	2300	1	19°	11800°	119 kts	137 mph	15.98		TO_03, Scanner error
143	W	23:16:21	23:23:16	0:06:55	691	2267	26°	49°	701	2300	2300	1	19°	11800°	120 kts	138 mph	13.81		TO_03
4	E	23:30:00	23:39:39	0:09:39	698	2290	26°	49°	701	2300	2300	1	19°	11800°	120 kts	138 mph	20.71		TO_04
5	W	23:46:24	23:55:15	0:08:51	702	2303	26°	49°	701	2300	2300	1	19°	11800°	117 kts	135 mph	17.95		TO_04
6	E	23:59:16	0:08:32	0:09:16	692	2270	26°	49°	701	2300	2300	1	19°	11800°	118 kts	136 mph	20.37		TO_04
						0				0									
BT	Ground	0:22:10	0:23:46	0:01:36		0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									
						0				0									

LIDAR FLIGHT SUMMARY

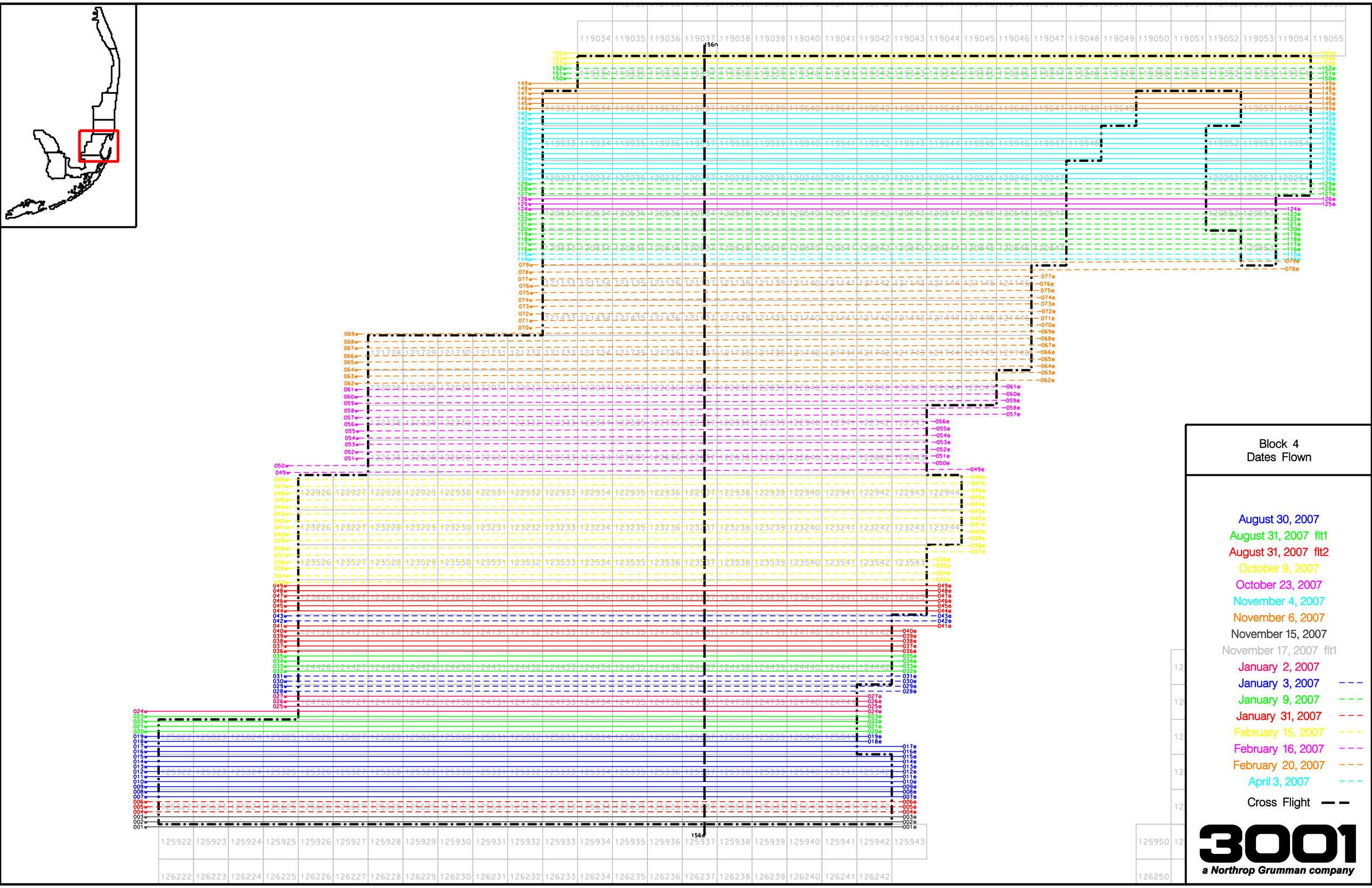
Aircraft Flight Time:	3:46:07	Hobbs Time	
Laser Collection Time:	2:01:06	Start	1554.1
Miles Flown on Flights:	242.30	Stop	1558.1
		Total	4

Data Collection			Survey	
Percent Complete			Percent Complete	
Total Flight Lines			Total Check Sites	
Lines Complete			Check Sites Complete	
Lines Completed Today	13		Sites Completed Today	

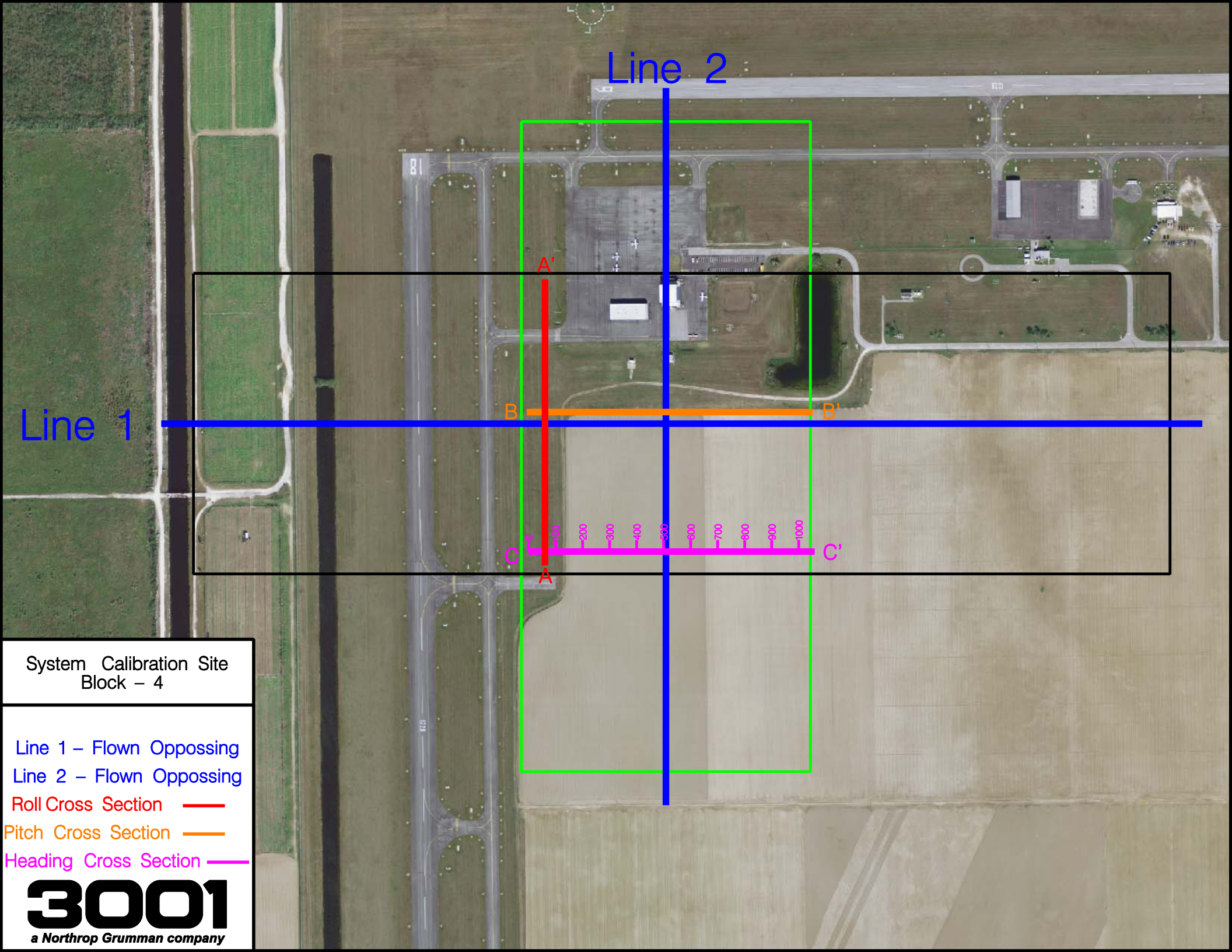
Comments

HOBBS TIME= 1553.9-1554.1 must be ferry time boca2homestead.

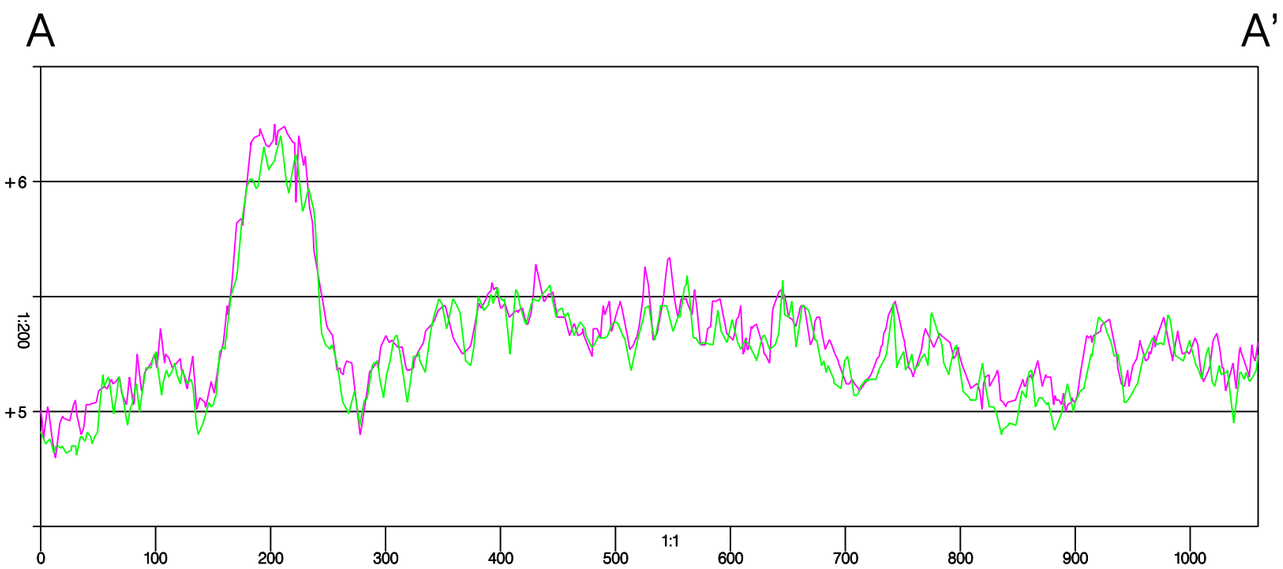
Weather


Block 4
Dates Flown
August 30, 2007
August 31, 2007 flt1
August 31, 2007 flt2
October 9, 2007
October 23, 2007
November 4, 2007
November 6, 2007
November 15, 2007
November 17, 2007 flt1
January 2, 2007
January 3, 2007
January 9, 2007
January 31, 2007
February 15, 2007
February 16, 2007
February 20, 2007
April 3, 2007
Cross Flight
3001
a Northrop Grumman company

Section 3


Line 2
Line 1
A'
A
B
B'
C
C'
0
100
200
300
400
500
600
700
800
900
1000
System Calibration Site
Block – 4
Line 1 – Flown Oppossing
Line 2 – Flown Oppossing
Roll Cross Section
Pitch Cross Section
Heading Cross Section
3001
a Northrop Grumman company

Roll



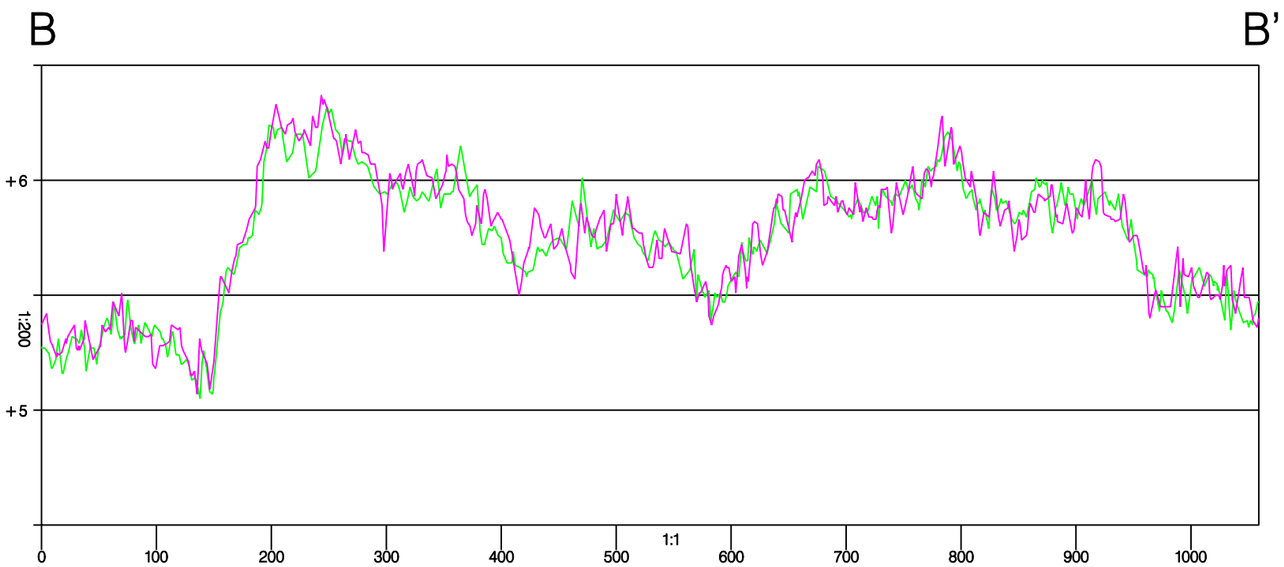
System Calibration Site
Block – 4

Pre–Project Calibration

X–section generated from two opposing flight lines

3001
a Northrop Grumman company

Pitch



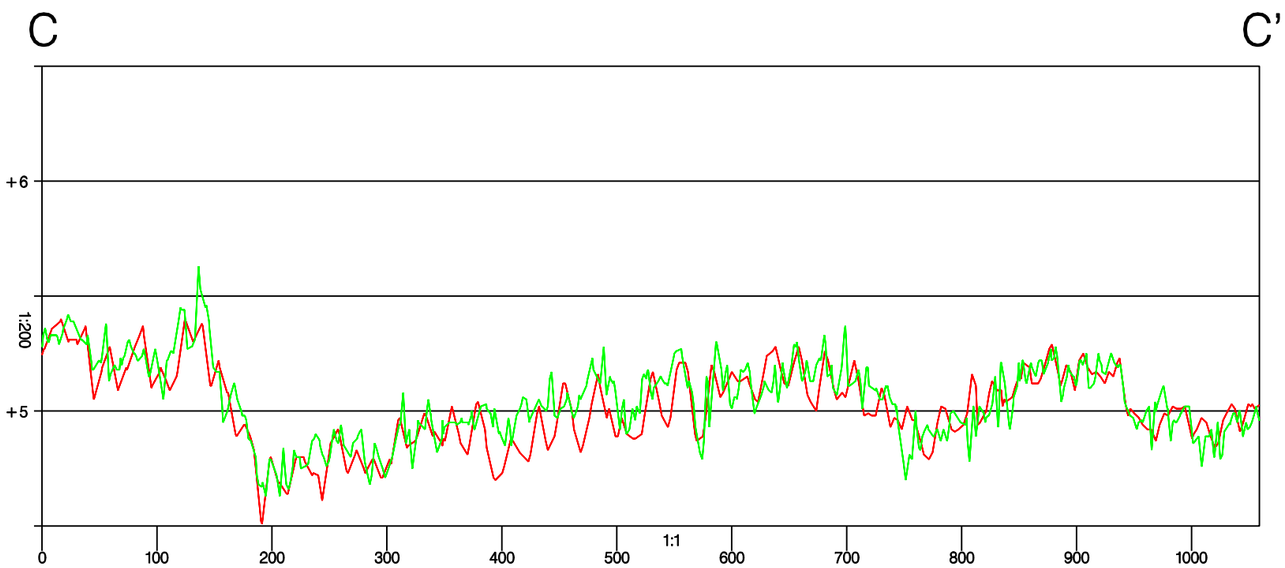
System Calibration Site
Block – 4

Pre–Project Calibration

X–section generated from two opposing flight lines

3001
a Northrop Grumman company

Heading



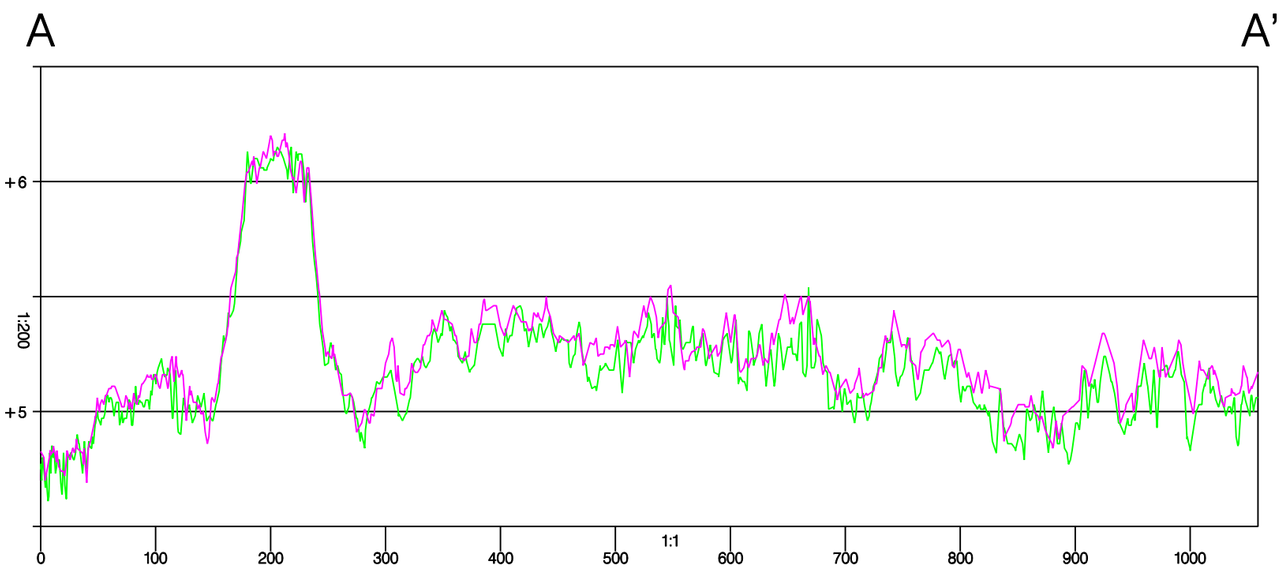
System Calibration Site
Block – 4

Pre–Project Calibration

X–sections generated in overlap of perpendicular flight lines

3001
a Northrop Grumman company

Roll



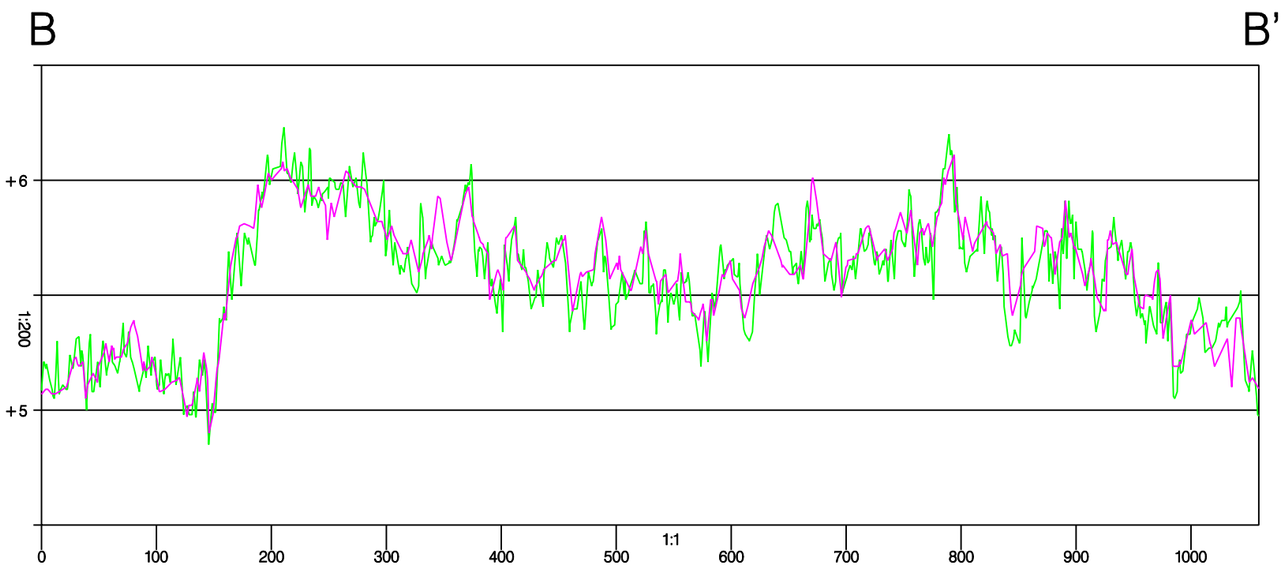
System Calibration Site
Block – 4

Post–Project Calibration

X–section generated from two opposing flight lines

3001
a Northrop Grumman company

Pitch



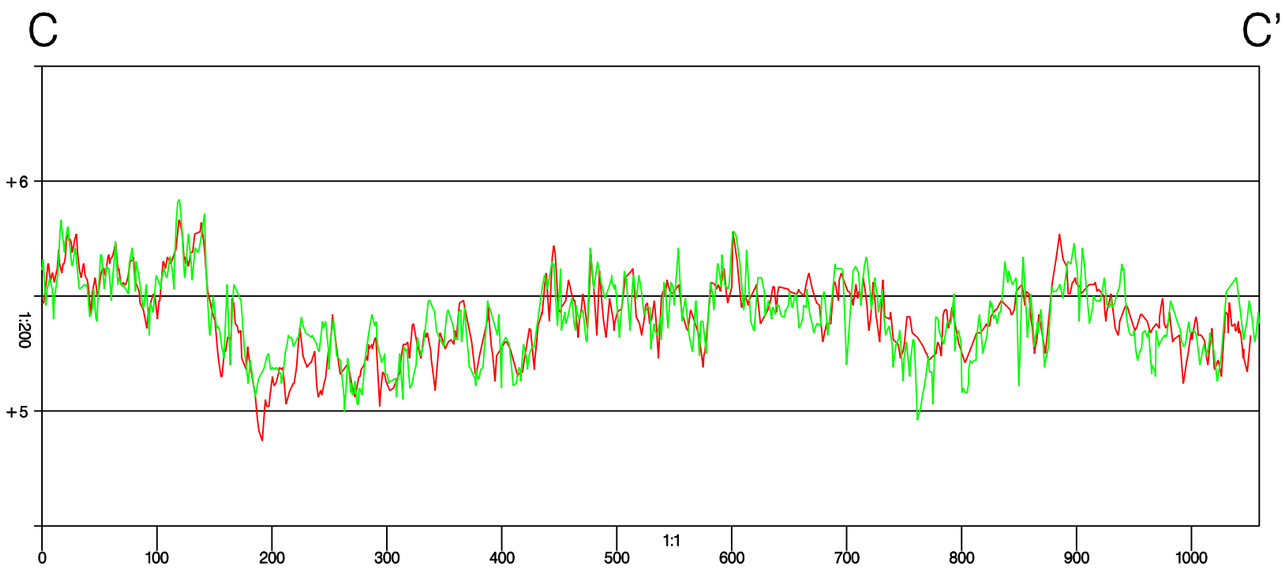
System Calibration Site
Block – 4

Post–Project Calibration

X–section generated from two opposing flight lines

3001
a Northrop Grumman company

Heading



System Calibration Site
Block – 4

Post–Project Calibration

X–sections generated in overlap of perpendicular flight lines

3001
a Northrop Grumman company

Glossary

3D	Three Dimensional
Alt	Altitude
ALTM	Airborne Laser Terrain Mapping
DGPS	Differential Global Positioning System
GPS	Global Positioning System
GRS80	Geodetic Reference System 1980
HARN	High Accuracy Reference Network
Hdg	Heading
IMU	Inertial Measurement Unit
NAD83	North American Datum of 1983
NAVD88	North American Vertical Datum of 1988
NGS OPUS	The National Geodetic Survey's On-line Positioning User Service
PDOP	Positional Dilution of Precision
POS	Position and Orientation System
PRF	Pulse Rate Frequency
RINEX	Receiver Independent Exchange Format
SBET	Smoothed Best Estimation of Trajectory
SVs	Space Vehicles
UTC	Coordinated Universal Time
UTM	Universal Transverse Mercator