LiDAR SYSTEM CALIBRATION REPORT

La Crosse County, Wisconsin

Services provided by:

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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 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.

Prior to the calibration process, the GPS base stations, which are correlated to NGS 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	40.00
Terrain Elevation AMSL (minimum in survey area)	meters	175.00
Terrain Elevation AMSL (maximum in survey area)	meters	450.00
Nominal Flying Height Above Minimum Terrain Elevation	meters	2100.00
Nominal Flying Altitude AMSL	meters	2275.00
Airspeed	knots	120.00
Range/Intensity Mode (1, 2, 3, 4)		3.00
Laser Pulse Rate	Hz	34000.00
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	21.00
Max Scan Rate (ALS50 Phase II only - SUBJECT TO CHANGE)	Hz	50.49
Max Scan Rate (ALS40/ALS50, 45-degree/3000 m mirror, gen 1c driver)	Hz	36.83
Max Scan Rate (ALS40, 45-degree/3000 m mirror, gen 1b driver)	Hz	27.58
Max Scan Rate (ALS40, 67-degree/6100 m mirror, all drivers)	Hz	13.79
Max Scan Rate (ALS40, 75-degree/6100 m mirror, all drivers)	Hz	12.05

Resulting Scan Pattern

Total Swath Width (nominal, at lowest terrain elev'n)	meters	1528.67
Max Cross Track Spacing (occurs @ nadir)	meters	2.91
Max Along Track Spacing (occurs @ FOV edge)	meters	2.94
Illuminated Footprint Diameter (@ 1.e^2 energy)	meters	0.72
Point Density (average)	pts/meter^2	0.36
Area / Point (average)	meters^2	2.78

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
Bo

Project #	06004.12.007.551
Project Description	La Crosse Lidar
Location	LaCrosse,WI
Aircraft	N918AA

Lever Arm	x	y	z
GPS	-0.0715	0.0318	-1.06645
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	LSE1	
Base 2		3/3
Base3		
Aero 2		

IMU Information	
Start Time	14:28:39
Stop Time	17:30:00

Meteorological Conditions	Elevation	Temp		Pressure	
Airport	654	6.0°c	279.15°k	30.08 inHg	101863 Pa
@ Altitude	6,889			30.08 inHg	101863 Pa
@ Altitude					

GPS Base Station Information	File Name	RNX File	Ant Hgt	Ant Type
Base 1	LSE11081.dat		1.8	Trimble
Base 2				
Base 3				

Flight Date (UTC)	Pilot	Operator	Sensor
4/18/2007	Holmse	Bo Arnold	ALS 05

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
bs01	S	14:54:08	14:54:53	0:00:00	6889	40°	21°	2100	6889	0	3+3	34000	106 kts	122 mph	0.00	Y	Boresite off line
bs01	N	15:08:59	15:09:58	0:00:59	6889	40°	21°	2100	6889	0	3+3	34000	112 kts	129 mph	0.00		Boresite Good
bs02	E	15:16:41	15:17:48	0:01:07	6889	40°	21°	2100	6889	0	3+3	34000	106 kts	122 mph	2.03		Boresite Good
bs01	S	15:23:48	15:24:46	0:00:58	6889	40°	21°	2100	6889	0	3+3	34000	119 kts	137 mph	0.00		Boresite Good
bs02	W	15:31:42	15:32:38	0:00:56	6889	40°	21°	2100	6889	0	3+3	34000	124 kts	143 mph	0.00		Boresite Good
42	E	15:51:46	16:01:08	0:09:22	6889	40°	21°	2100	6889	0	3+3	34000	120 kts	138 mph	20.71		Good
41	W	16:06:02	16:15:22	0:09:20	6889	40°	21°	2100	6889	0	3+3	34000	125 kts	144 mph	21.58		Good
40	E	16:21:54	16:31:25	0:09:31	6889	40°	21°	2100	6889	0	3+3	34000	120 kts	138 mph	20.71		Good
39	W	16:45:03	16:53:58	0:08:55	6889	40°	21°	2100	6889	0	3+3	34000	118 kts	136 mph	18.11		Good

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	3:01:21	Hobbs Time	
Laser Collection Time:	0:41:08	Start	132.2
Miles Flown on Flights:	83.14	Stop	136.6
		Total	4.4

Data Collection	
Percent Complete	9.3%
Total Flight Lines	54
Lines Complete	5
Lines Completed Today	5

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

Comments

cloud cover moved in at 5000ft.

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 #	Project Description	Location	Aircraft
Jason Imm	06004.12.007.551	LaCrosse,WI Lidar	LaCrosse,WI	N918AA

Lever Arm

	x	y	z
GPS	-0.0715	0.0318	-1.06645
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	LSE1	
Base 2		3/3
Base3		
Aero 2		

IMU Information	
Start Time	19:08:59
Stop Time	23:23:34

Meteorological Conditions

	Elevation	Temp		Pressure	
Airport	654	20.0°c	293.15°k	30.20 inHg	102269 Pa
@ Altitude	7,463	6.0°c	279.15°k	30.20 inHg	102269 Pa
@ Altitude					

GPS Base Station Information

	File Name	RNX File	Ant Hgt	Ant Type
Base 1	LSE11101.dat		1.8	Trimble
Base 2				
Base 3				

Flight Date (UTC)	Pilot	Operator	Sensor
4/20/2007	Holmse	Bo Arnold	ALS 05

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
bs01	N	19:36:06	19:37:07	0:01:01	7463	40°	21°	2275	7463	0	3+3	34000	115 kts	132 mph	2.21		Boresite Good
bs02	E	19:41:47	19:42:47	0:01:00	7463	40°	21°	2275	7463	0	3+3	34000	122 kts	140 mph	2.34		Boresite Good
bs01	S	19:46:51	19:47:49	0:00:58	7463	40°	21°	2275	7463	0	3+3	34000	117 kts	135 mph	0.00		Boresite Good
bs02	W	19:52:18	19:53:18	0:01:00	7463	40°	21°	2275	7463	0	3+3	34000	113 kts	130 mph	2.17		Boresite Good
42	E	20:05:20	20:14:13	0:08:53	7463	40°	21°	2275	7463	0	3+3	34000	117 kts	135 mph	17.95		Good
41	W	20:18:44	20:27:36	0:08:52	7463	40°	21°	2275	7463	0	3+3	34000	119 kts	137 mph	18.26		Good
40	E	20:31:43	20:40:28	0:08:45	7463	40°	21°	2275	7463	0	3+3	34000	126 kts	145 mph	19.33		Good
39	W	20:44:46	20:54:12	0:09:26	7463	40°	21°	2275	7463	0	3+3	34000	116 kts	133 mph	20.02		Good
38	E	20:58:13	21:06:59	0:08:46	7463	40°	21°	2275	7463	0	3+3	34000	129 kts	148 mph	19.79		Good
37	W	21:10:45	21:20:15	0:09:30	7463	40°	21°	2275	7463	0	3+3	34000	119 kts	137 mph	20.54		Good
36	E	21:24:14	21:33:14	0:09:00	7463	40°	21°	2275	7463	0	3+3	34000	123 kts	142 mph	21.23		Good
35	W	21:37:00	21:46:59	0:09:59	7463	40°	21°	2275	7463	0	3+3	34000	117 kts	135 mph	20.20		Good
34	E	21:50:32	22:00:00	0:09:28	7463	40°	21°	2275	7463	0	3+3	34000	126 kts	145 mph	21.75		Good
33	W	22:03:26	22:13:20	0:09:54	7463	40°	21°	2275	7463	0	3+3	34000	115 kts	132 mph	19.85		Good
32	E	22:17:22	22:27:25	0:10:03	7463	40°	21°	2275	7463	0	3+3	34000	116 kts	133 mph	22.25		Good
31	W	22:30:49	22:40:21	0:09:32	7463	40°	21°	2275	7463	0	3+3	34000	123 kts	142 mph	21.23		Good
30	E	22:44:07	22:54:06	0:09:59	7463	40°	21°	2275	7463	0	3+3	34000	116 kts	133 mph	20.02		Good
29	W	22:57:44	23:07:25	0:09:41	7463	40°	21°	2275	7463	0	3+3	34000	126 kts	145 mph	21.75		Good

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	4:14:35	Hobbs Time	
Laser Collection Time:	2:15:47	Start	136.3
Miles Flown on Flights:	290.90	Stop	141.3
		Total	5

Data Collection		Survey	
Percent Complete	25.9%	Percent Complete	
Total Flight Lines	54	Total Check Sites	
Lines Complete	14	Check Sites Complete	
Lines Completed Today	14	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 #	Project Description	Location	Aircraft
Bo Arnold	06004.12.007.551	LaCrosse,WI Lidar	LaCrosse,WI	N918AA

Lever Arm

	x	y	z
GPS	-0.0715	0.0318	-1.06645
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	LSE1	
Base 2		3/3
Base3		
Aero 2		

IMU Information	
Start Time	14:35:37
Stop Time	17:37:37

Meteorological Conditions

	Elevation	Temp		Pressure	
Airport	654	14.0°c	287.15°k	30.11 inHg	101964 Pa
@ Altitude	7,463	0.0°c	273.15°k	30.11 inHg	101964 Pa
@ Altitude					

GPS Base Station Information

	File Name	RNX File	Ant Hgt	Ant Type
Base 1	06651110.O00		1.8	LIECA AT530
Base 2				
Base 3				

Flight Date (UTC)	Pilot	Operator	Sensor
4/21/2007	Holmse	Bo Arnold	ALS 05

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
bs02	E	15:13:13	15:13:52	0:00:00	7463	40°	21°	2275	7463	0	3+3	34000	148 kts	170 mph	0.00	y	Boresite Bad
bs01	N	15:23:19	15:24:17	0:00:58	7463	40°	21°	2275	7463	0	3+3	34000	128 kts	147 mph	0.00		Boresite Good
bs02	E	15:29:45	15:30:40	0:00:55	7463	40°	21°	2275	7463	0	3+3	34000	122 kts	140 mph	0.00		Boresite Good
bs01	S	15:36:23	15:37:21	0:00:58	7463	40°	21°	2275	7463	0	3+3	34000	117 kts	135 mph	0.00		Boresite Good
bs02	W	15:41:47	15:42:54	0:01:07	7463	40°	21°	2275	7463	0	3+3	34000	105 kts	121 mph	2.01		Boresite Good
28	E	15:52:43	16:03:05	0:10:22	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	23.02		Good
27	W	16:07:48	16:18:30	0:10:42	7463	40°	21°	2275	7463	0	3+3	34000	119 kts	137 mph	22.82		Good
26	E	16:22:42	16:32:46	0:10:04	7463	40°	21°	2275	7463	0	3+3	34000	123 kts	142 mph	23.59		Good
25	W	16:37:40	16:49:19	0:11:39	7463	40°	21°	2275	7463	0	3+3	34000	115 kts	132 mph	24.26		Good
24	E	16:53:44	17:04:31	0:10:47	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	23.02		Good
23	W	17:09:31	17:20:46	0:00:00	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	0.00	y	Off Line

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	3:02:00	Hobbs Time	
Laser Collection Time:	0:57:32	Start	141.3
Miles Flown on Flights:	118.72	Stop	144.5
		Total	3.2

Data Collection		Survey	
Percent Complete	35.2%	Percent Complete	
Total Flight Lines	54	Total Check Sites	
Lines Complete	19	Check Sites Complete	
Lines Completed Today	5	Sites Completed Today	

Comments

weather/clouds moved in from the NW.

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 #	Project Description	Location	Aircraft
Bo Arnold	06004.12.007.551	LaCrosse,WI Lidar	LaCrosse,WI	N918AA

Lever Arm

	x	y	z
GPS	-0.0715	0.0318	-1.06645
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	LSE1	
Base 2		3/3
Base3		
Aero 2		

IMU Information	
Start Time	15:11:50
Stop Time	18:45:00

Meteorological Conditions

	Elevation	Temp		Pressure	
Airport	654	22.0°c	295.15°k	29.84 inHg	101050 Pa
@ Altitude	7,463	14.0°c	287.15°k	29.84 inHg	101050 Pa
@ Altitude					

GPS Base Station Information

	File Name	RNX File	Ant Hgt	Ant Type
Base 1	06651120.O00		1.8	LIECA AT530
Base 2				
Base 3				

Flight Date (UTC)	Pilot	Operator	Sensor
4/22/2007	Holmse	Bo Arnold	ALS 05

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
bs01	S	15:45:20	15:46:24	0:01:04	7463	40°	21°	2275	7463	0	3+3	34000	109 kts	125 mph	2.09		Boresite Good
bs02	W	15:51:18	15:52:18	0:01:00	7463	40°	21°	2275	7463	0	3+3	34000	127 kts	146 mph	2.44		Boresite Good
bs01	N	16:03:46	16:04:31	0:00:45	7463	40°	21°	2275	7463	0	3+3	34000	133 kts	153 mph	0.00		Boresite Good
bs02	E	16:12:28	16:13:28	0:01:00	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	2.30		Boresite Good
23	W	16:20:14	16:30:59	0:10:45	7463	40°	21°	2275	7463	0	3+3	34000	127 kts	146 mph	24.36		Good
22	E	16:36:31	16:41:53	0:05:22	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	11.51		Good
21	W	16:46:52	16:52:15	0:05:23	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	11.51		Good
20	E	16:56:34	17:02:30	0:05:56	7463	40°	21°	2275	7463	0	3+3	34000	124 kts	143 mph	11.89		Good
19	W	17:06:27	17:12:35	0:06:08	7463	40°	21°	2275	7463	0	3+3	34000	114 kts	131 mph	13.12		Good
18	E	17:17:39	17:24:42	0:07:03	7463	40°	21°	2275	7463	0	3+3	34000	127 kts	146 mph	17.05		Good
48	E	17:32:42	17:39:48	0:07:06	7463	40°	21°	2275	7463	0	3+3	34000	123 kts	142 mph	16.51		Good
47	W	17:44:24	17:51:53	0:07:29	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	16.11		Good
46	E	17:56:43	17:56:50	0:00:00	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	0.00	y	off line
46	E	18:08:59	18:15:45	0:06:46	7463	40°	21°	2275	7463	0	3+3	34000	122 kts	140 mph	14.04		Good
45	W	18:20:00	18:26:59	0:06:59	7463	40°	21°	2275	7463	0	3+3	34000	110 kts	127 mph	12.66		Good

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	3:33:10	Hobbs Time	
Laser Collection Time:	1:12:46	Start	144.5
Miles Flown on Flights:	155.59	Stop	148.2
		Total	3.7

Data Collection		Survey	
Percent Complete	53.7%	Percent Complete	
Total Flight Lines	54	Total Check Sites	
Lines Complete	29	Check Sites Complete	
Lines Completed Today	10	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	Project #	Project Description	Location	Aircraft
Bo Arnold	06004.12.007.551	LaCrosse,WI Lidar	LaCrosse,WI	N918AA

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	LES1	
Base 2		3/3
Base3		
Aero 2		

IMU Information	
Start Time	12:58:20
Stop Time	17:24:09

Meteorological Conditions

	Elevation	Temp		Pressure	
Airport	654	10.0°c	283.15°k	30.12 inHg	101998 Pa
@ Altitude	7,463	-4.0°c	269.15°k	30.12 inHg	101998 Pa
@ Altitude					

GPS Base Station Information

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

Flight Date (UTC)	Pilot	Operator	Sensor
4/24/2007	Holmse	Bo Arnold	ALS 05

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
bs01	S	13:20:38	13:21:40	0:01:02	7463	40°	21°	2275	7463	0	3+3	34000	116 kts	133 mph	2.22		Boresite Good
bs02	W	13:26:04	13:27:04	0:01:00	7463	40°	21°	2275	7463	0	3+3	34000	114 kts	131 mph	2.19		Boresite Good
bs01	N	13:31:13	13:32:19	0:01:06	7463	40°	21°	2275	7463	0	3+3	34000	111 kts	128 mph	2.13		Boresite Good
bs02	E	13:36:22	13:37:20	0:00:58	7463	40°	21°	2275	7463	0	3+3	34000	119 kts	137 mph	0.00		Boresite Good
17	W	13:43:35	13:50:29	0:06:54	7463	40°	21°	2275	7463	0	3+3	34000	116 kts	133 mph	13.35		Good
16	E	13:54:43	14:01:47	0:07:04	7463	40°	21°	2275	7463	0	3+3	34000	117 kts	135 mph	15.71		Good
15	W	14:05:52	14:12:32	0:06:40	7463	40°	21°	2275	7463	0	3+3	34000	119 kts	137 mph	13.69		Good
14	E	14:16:44	14:23:20	0:06:36	7463	40°	21°	2275	7463	0	3+3	34000	125 kts	144 mph	14.38		Good
13	W	14:27:08	14:33:48	0:06:40	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	13.81		Good
12	E	14:39:20	14:50:16	0:10:56	7463	40°	21°	2275	7463	0	3+3	34000	123 kts	142 mph	23.59		Good
11	W	14:53:45	15:04:59	0:11:14	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	25.32		Good
10	E	15:09:32	15:20:45	0:11:13	7463	40°	21°	2275	7463	0	3+3	34000	119 kts	137 mph	25.11		Good
9	W	15:24:08	15:34:59	0:10:51	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	23.02		Good
8	E	15:38:54	15:49:59	0:11:05	7463	40°	21°	2275	7463	0	3+3	34000	119 kts	137 mph	25.11		Good
7	W	15:53:33	16:04:44	0:11:11	7463	40°	21°	2275	7463	0	3+3	34000	125 kts	144 mph	26.37		Good
6	E	16:09:00	16:20:42	0:11:42	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	25.32		Good
49	W	16:25:41	16:32:30	0:06:49	7463	40°	21°	2275	7463	0	3+3	34000	118 kts	136 mph	13.58		Good
50	E	16:36:05	16:43:07	0:07:02	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	16.11		Good
51	W	16:46:52	16:53:42	0:06:50	7463	40°	21°	2275	7463	0	3+3	34000	122 kts	140 mph	14.04		Good
52	E	16:57:18	17:04:13	0:06:55	7463	40°	21°	2275	7463	0	3+3	34000	117 kts	135 mph	13.46		Good

LIDAR FLIGHT SUMMARY

Aircraft Flight Time:	4:25:49	Hobbs Time	
Laser Collection Time:	2:23:48	Start	148.2
Miles Flown on Flights:	308.50	Stop	153.2
		Total	5

Data Collection		Survey	
Percent Complete	83.3%	Percent Complete	
Total Flight Lines	54	Total Check Sites	
Lines Complete	45	Check Sites Complete	
Lines Completed Today	16	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	
Bo Arnold	

Project #	06004.12.007.551
Project Description	LaCrosse,WI Lidar
Location	LaCrosse,WI
Aircraft	N918AA

Flight Date (UTC)	Pilot	Operator	Sensor
4/25/2007	Holmse	Jason Ellard	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		AGC
Base 1	LES1	
Base 2		3/3
Base3		
Aero 2		

IMU Information	
Start Time	13:58:58
Stop Time	16:53:00

Meteorological Conditions	Elevation	Temp		Pressure	
Airport	654	11.0°c	284.15°k	30.03 inHg	101693 Pa
@ Altitude	7,463	0.0°c	273.15°k	30.03 inHg	101693 Pa
@ Altitude					

GPS Base Station Information	File Name	RNX File	Ant Hgt	Ant Type
Base 1			1.8	LIECA
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
BS01	S	14:25:12	14:26:10	0:00:58	7463	40°	21°	2275	7463	0	3+3	34000	116 kts	133 mph	0.00		Boresite Good
BS02	W	14:31:35	14:32:32	0:00:57	7463	40°	21°	2275	7463	0	3+3	34000	126 kts	145 mph	0.00		Boresite Good
BS01	N	14:36:29	14:37:39	0:01:10	7463	40°	21°	2275	7463	0	3+3	34000	95 kts	109 mph	1.82		Boresite Good
BS02	E	14:42:12	14:43:20	0:01:08	7463	40°	21°	2275	7463	0	3+3	34000	90 kts	104 mph	1.73		Boresite Good
43	W	14:50:58	14:57:36	0:06:38	7463	40°	21°	2275	7463	0	3+3	34000	125 kts	144 mph	14.38		Good
44	E	15:02:20	15:09:04	0:06:44	7463	40°	21°	2275	7463	0	3+3	34000	123 kts	142 mph	14.15		Good
5	W	15:12:39	15:23:16	0:10:37	7463	40°	21°	2275	7463	0	3+3	34000	124 kts	143 mph	23.78		Good
4	E	15:27:02	15:37:19	0:10:17	7463	40°	21°	2275	7463	0	3+3	34000	125 kts	144 mph	23.97		Good
3	W	15:40:54	15:51:39	0:10:45	7463	40°	21°	2275	7463	0	3+3	34000	121 kts	139 mph	23.21		Good
2	E	15:55:41	15:59:38	0:03:57	7463	40°	21°	2275	7463	0	3+3	34000	122 kts	140 mph	7.02		Good
1	W	16:02:36	16:06:30	0:03:54	7463	40°	21°	2275	7463	0	3+3	34000	122 kts	140 mph	7.02		Good
53	S	16:12:54	16:20:17	0:07:23	7463	40°	21°	2275	7463	0	3+3	34000	114 kts	131 mph	15.31		Good
54	S	16:28:38	16:37:27	0:08:49	7463	40°	21°	2275	7463	0	3+3	34000	120 kts	138 mph	18.41		Good

LIDAR FLIGHT SUMMARY

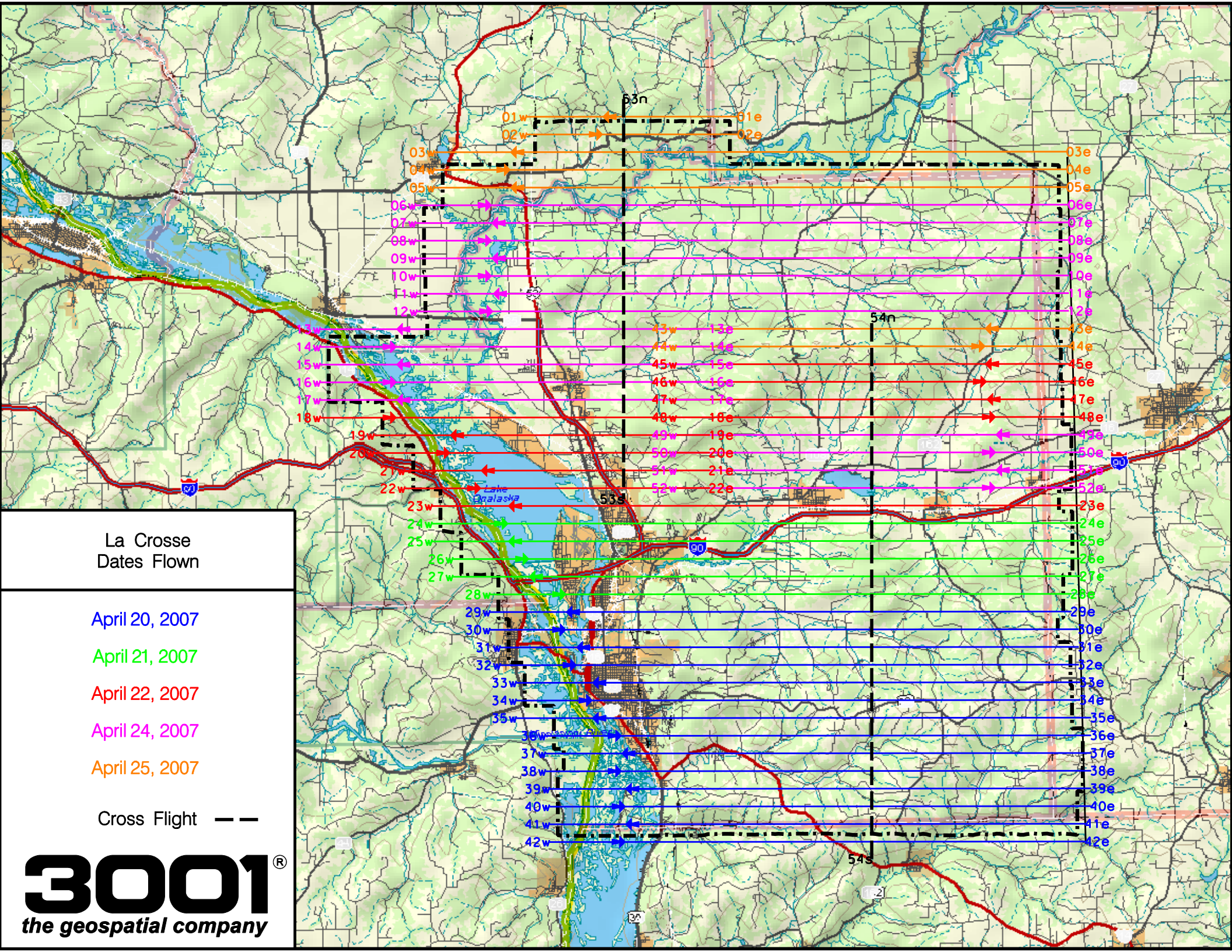
Aircraft Flight Time:	2:54:02	Hobbs Time	
Laser Collection Time:	1:13:17	Start	153.7
Miles Flown on Flights:	150.81	Stop	156.7
		Total	3

Data Collection	
Percent Complete	100.0%
Total Flight Lines	54
Lines Complete	54
Lines Completed Today	9

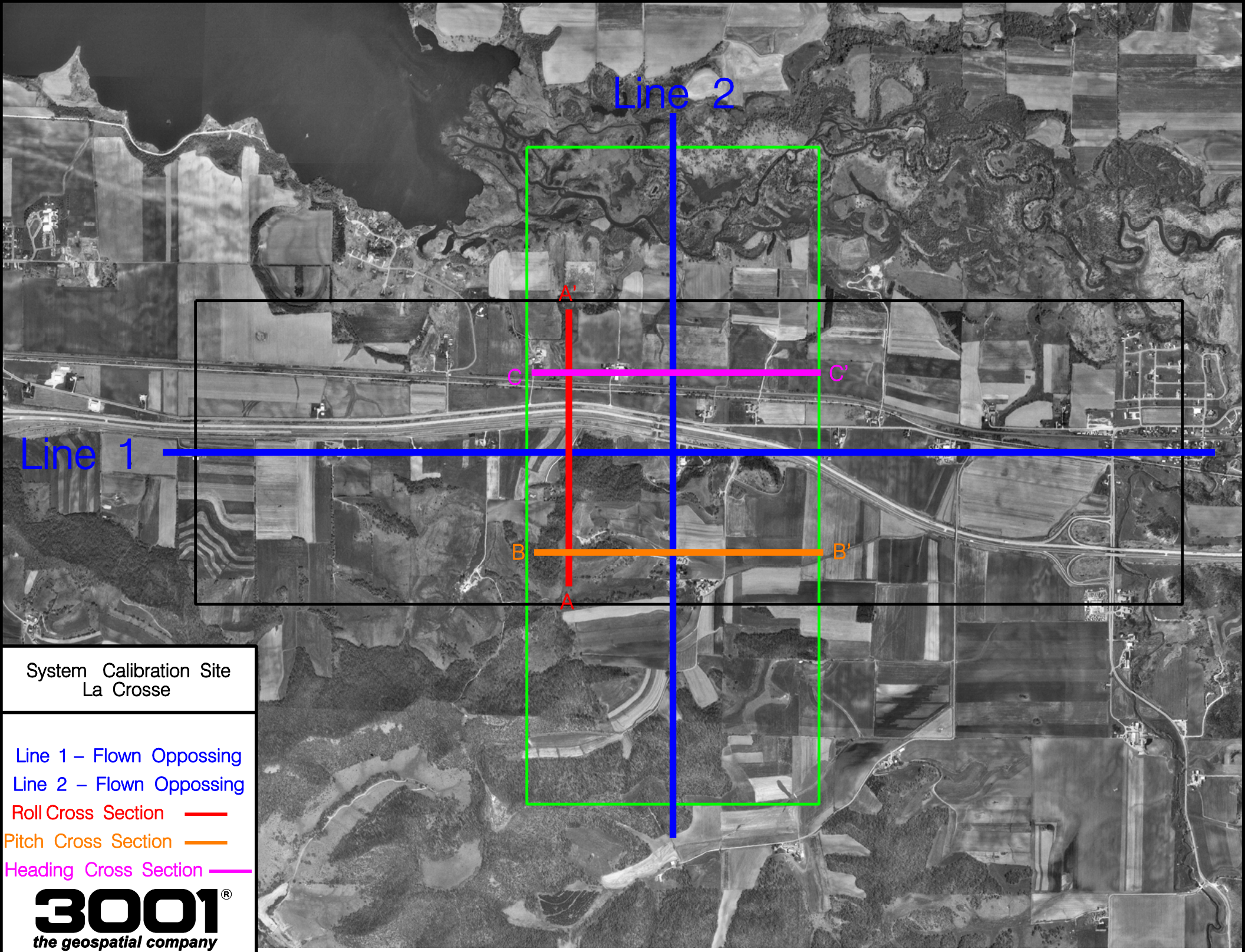
Survey	
Percent Complete	
Total Check Sites	
Check Sites Complete	
Sites Completed Today	

Comments

Weather


La Crosse
Dates Flown
April 20, 2007
April 21, 2007
April 22, 2007
April 24, 2007
April 25, 2007
Cross Flight
3001®
the geospatial company
53n
53s
54n
54s
Lake Onalaska

Section 3



System Calibration Site
La Crosse

Line 1 – Flown Oppossing
Line 2 – Flown Oppossing
Roll Cross Section
Pitch Cross Section
Heading Cross Section

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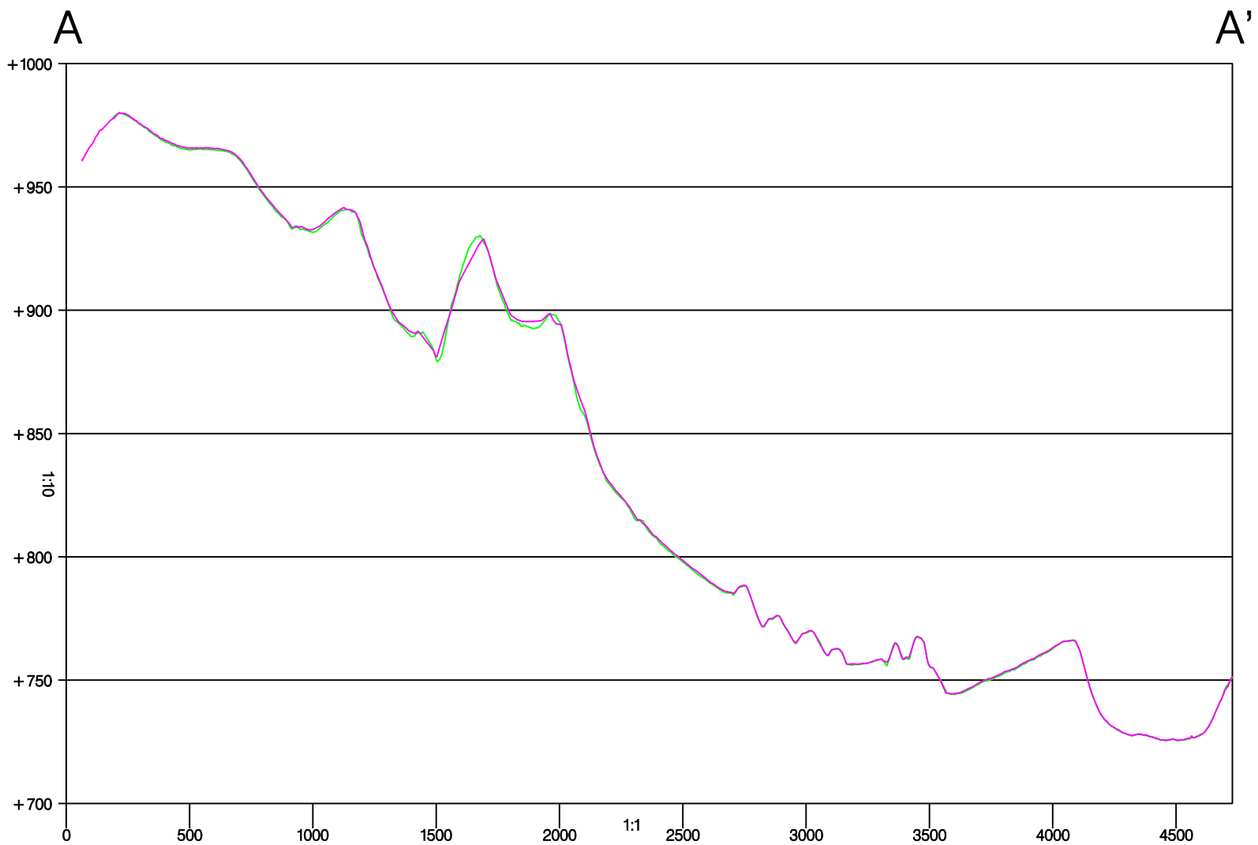
Roll



System Calibration Site
La Crosse

Pre–Project Calibration

X–section generated from two opposing flight lines

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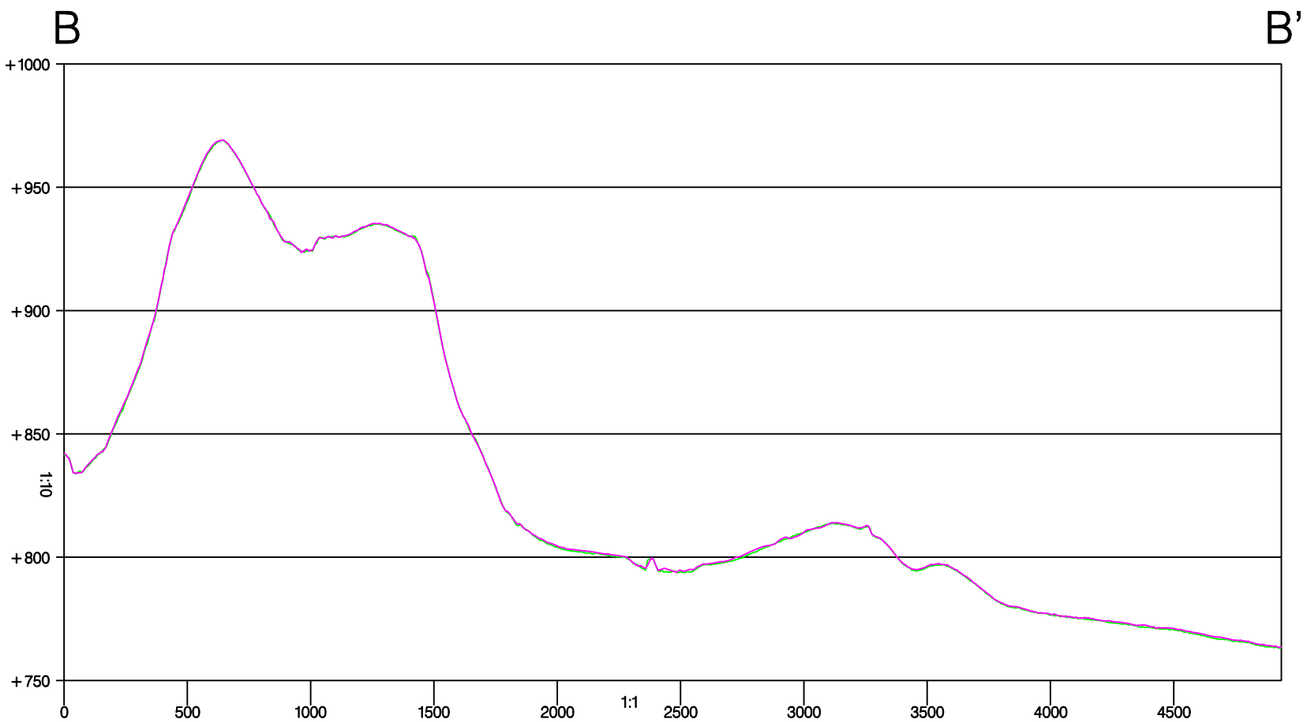
Pitch



System Calibration Site
La Crosse

Pre–Project Calibration

X–section generated from two opposing flight lines

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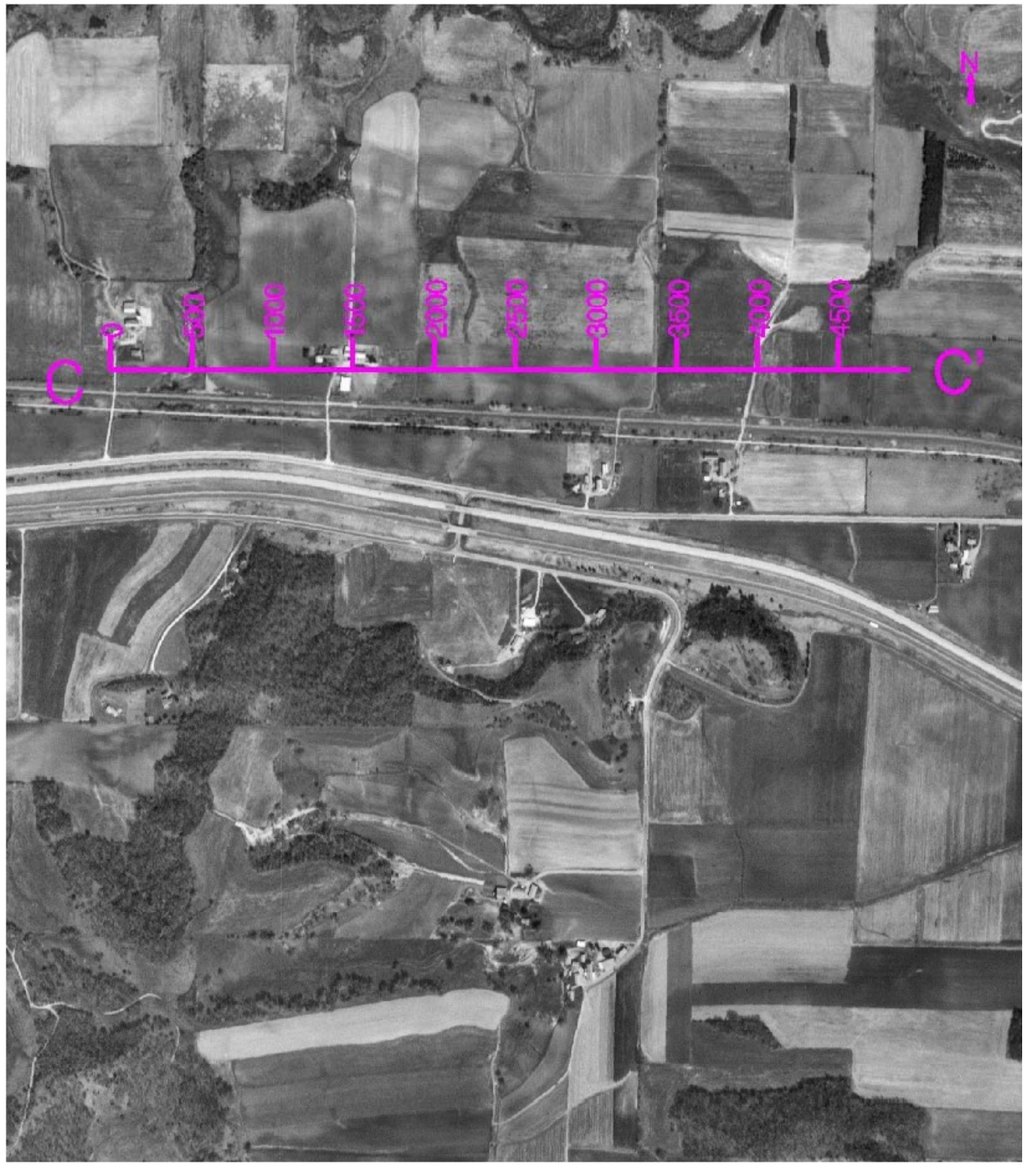
Heading



System Calibration Site
La Crosse

Pre–Project Calibration

X–sections generated in overlap of perpendicular flight lines

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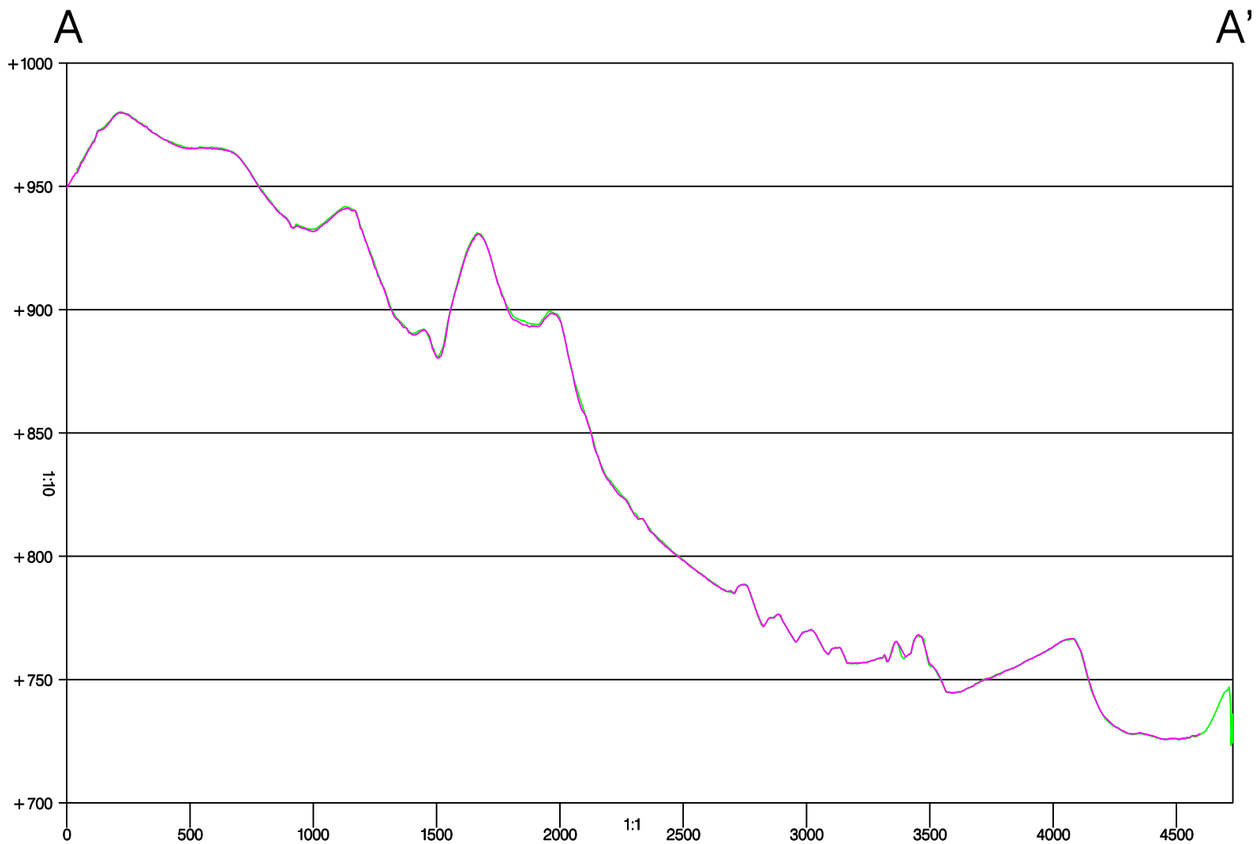
Roll



System Calibration Site
La Crosse

Post–Project Calibration

X–section generated from two opposing flight lines

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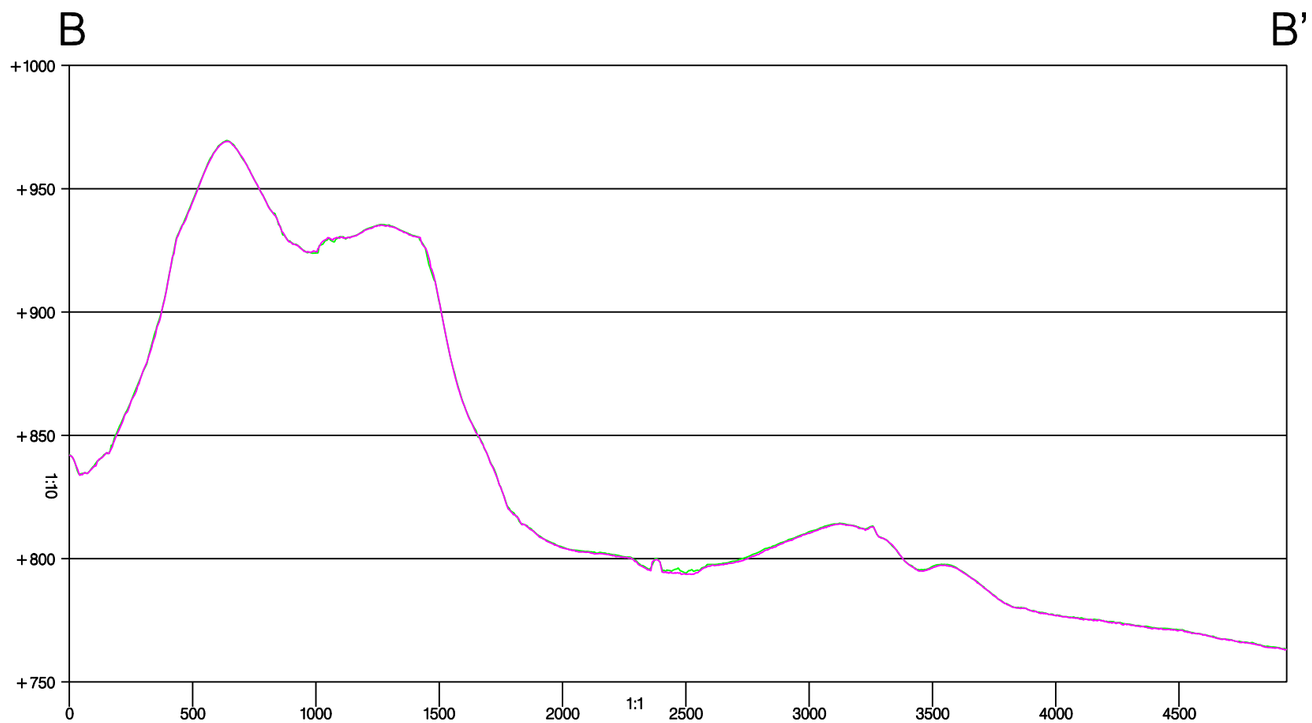
Pitch



System Calibration Site
La Crosse

Post–Project Calibration

X–section generated from two opposing flight lines

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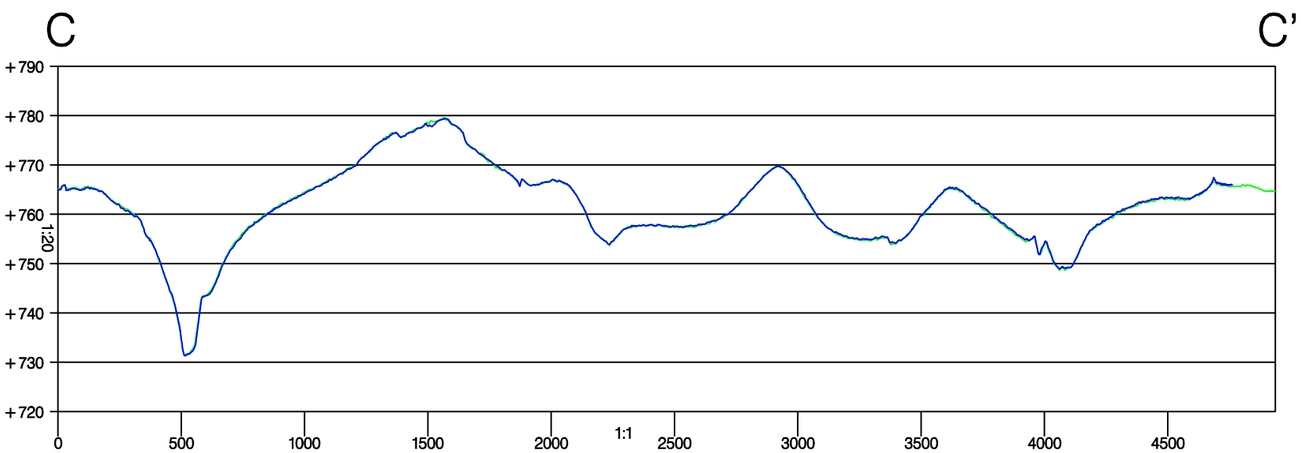
Heading



System Calibration Site
La Crosse

Post–Project Calibration

X–sections generated in overlap of perpendicular flight lines

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