

LIDAR ACQUISITION and CONTROL SURVEY REPORT

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Task order: 2

Abbeville, Aiken, Barnwell, Calhoun, Edgefield, McCormick

Prepared for



Dewberry

Prepared by



TOWILL | Surveying, Mapping
and GIS Services

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EXECUTIVE SUMMARY

Under contract with Dewberry and Davis (Dewberry), Towill acquired Lidar data (nominal point spacing of 1.0 meters) within the 100-meter buffered boundary of Calhoun, Barnwell, Aiken, Edgefield, McCormick and Abbeville Counties, South Carolina. The data were acquired in 34 missions over the course of 25 days in February and March, 2012.

As part of the campaign, a 3-dimensional primary survey network consisting of local South Carolina Geodetic Survey VRS and semi-permanent base station points was observed to establish the basis of control for the Lidar data. The selected horizontal and vertical datums upon which the Lidar data are processed are NAD83(NSRS2007); epoch of 2007.0 and the North American Vertical Datum of 1988 (NAVD88) as realized by the reported coordinates and ellipsoid heights of the VRS and the application of GEOID09. This primary network satisfied U.S. Federal Geodetic Control Subcommittee (FGCS) standards for Order B geodetic GPS surveys (8mm + 1 part per million).

In addition, 79 check points were surveyed to demonstrate the absolute accuracy of the Lidar data. The root-meant-square (RMS) of the differences between the check point surveyed elevations and the Lidar-derived surface model was 0.079 meters.

Rigorous Lidar sensor calibration and quality control procedures were applied during the course of the campaign. Calibration passes were flown at the beginning and end of each mission and analyzed to verify the performance of the sensor and to make small adjustments to the final processing parameters.

In summary, all of the project's geodetic surveying and mapping goals were achieved. This report provides detailed documentation of all aspects of the work.

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August, 2012

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1. INTRODUCTION

This document provides a comprehensive overview of the Lidar acquisition campaign to acquire Lidar data of 6 counties located in South Carolina. The report describes the field survey associated with establishing base stations to support the airborne GPS (AGPS) component of the campaign, Lidar system calibration, Lidar data post-processing, and QA/QC of the data.

The Lidar acquisition was completed in a total of 34 separate flight missions between February 20th and March 15th, 2012 inclusive. Flight operations were staged out of the Orangeburg Municipal Airport, Daniel Field Airport located in August, GA, and Greenwood County Airport in Greenwood, SC.

All data acquisition field work, data post-processing and quality analysis was completed by Towill personnel. The components of the campaign include:

- Establishing and surveying AGPS base stations, control, and check points;
- Verifying Lidar system calibration and post-processing parameters;
- Airborne GPS (AGPS) and IMU data post-processing;
- Pre and post-mission control surface overflight data analysis;
- Surface check point survey analysis;

1.1 Points of Contact

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2. Control Survey and Datums

2.1 Introduction

The underlying basis of the Lidar survey campaign are the published coordinate and elevation values of the South Carolina Geodetic Survey (SCGS) active VRS network stations. The coordinates and elevations were provided to Towill directly from the SCGS.

Towill observed a primary geodetic network consisting of the local VRS stations and base station points established at the airports of operation to support the airborne GPS component of the Lidar campaign thereby ensuring a consistent horizontal and vertical datum realization across the entire extent of the project area (see Figure 1). The network consists of 8 SCVRS and 6 designated GPS base stations.

Independent VRS observation data were downloaded in the days leading up to the start of the acquisition campaign to establish the relative baseline observations between the stations. The remaining baselines were observed using the data from the base station occupations during acquisition and additional VRS data from those respective days.

Final coordinates and elevations of the base station locations were established via a 3-dimensional network adjustment constrained to the published horizontal coordinates and ellipsoid heights of the SCVRS (as described in section 2.5, below).

In addition, 79 check points were surveyed during the Lidar acquisition. These locations were surveyed with respect to the operating base stations and nearby VRS and base stations.

2.2 Project Survey Datums

The horizontal datum for this project is NAD83(NSRS2007); epoch of 2007.0. The datum is realized by the horizontal coordinates reported by the South Carolina Geodetic Survey of the VRS stations (see Table 2).

The vertical datum for this project is NAVD88. The datum is realized by the ellipsoid heights of the same VRS stations reported from SCGS and the application of the geoid model GEOID09.

2.3 Field Equipment and Procedures

All GPS observations were accomplished using Trimble Navigation R7 dual frequency GPS receivers and accompanying Trimble Zephyr Geodetic antennae. Relative static surveying techniques were used for all baseline observations. Instrument heights were measured twice in units of feet and meters and the values reduced and compared in the field prior to leaving each station.

In general, base station data were logged for the duration of the acquisition on any given day (typically 4 to 12 hours) and check point data were logged for a minimum of 30 minutes and as much as 90 minutes depending on proximity to operating base stations and/or VRS station.

2.4 Primary Survey Network and Adjustment

Observed relative GPS baselines were processed in Trimble Business Center. All processed observations consist of quasi-independent baselines (i.e. in accordance with the “ $n-1$ baselines” rule where n = number of receivers in a given ‘session’). The International GPS Service for Geodynamics (IGS) rapid precise orbits (igr) were used in the processing of all baseline vectors. The ‘igr’ orbits are published with a latency of approximately 30 hours. These orbits are globally accurate to within ~5cm and are particularly important when processing long baselines.

The absolute horizontal and vertical GPS loop misclosures for the primary network are presented in Table 1. The spatial misclosures in parts per million (ppm) are also listed. All loops comprise quasi-independent baselines from at least two ‘sessions’.

The primary survey network, consisting of 15 points and 26 baselines, was designed to provide a basis for the Lidar control (i.e. AGPS base stations) and establishing additional quality control points for this project. A minimally constrained adjustment was executed to verify the internal integrity of the network, establish *a priori* weights for the GPS observations, and judge the absolute fit of the constraints.

The GPS baselines vector components were adjusted using Microsearch™ GEOLAB 2001 (version 2001.9.20.0). *A priori* weights for the observations were based on the scaled variance–covariance sub-matrices estimated by the Trimble Business Center software. In the resulting adjustment, the estimated variance factor ($\hat{\sigma}_o^2 = 1.0004$) passed the χ^2 -test indicating appropriate *a priori* estimates of the accuracy of the GPS baseline vectors. None of the 78 vector component residuals or associated standardized residuals were flagged for possible rejection under the τ -max test at the 95 percent level of confidence. The relative horizontal accuracy of the network can be assessed by reviewing the relative 95 percent confidence regions (ellipses) of the adjustment. All station pairings meet the Federal Geodetic Control Subcommittee (FGCS) relative positioning standard for Order B surveys (8mm + 1ppm).

In a second, fully constrained adjustment, the NAD83 latitude, longitude and ellipsoid height of 7 SCVRS stations were held as *weighted* constraints (see Table 2). The estimated variance factor ($\hat{\sigma}_o^2 = 1.1622$) indicates that the network is not being unduly distorted by the imposition of the constraints and is maintaining its internal integrity. The adjustment yields coordinates on the NAD83 and orthometric elevations relative to NAVD88 via the GEOID09 geoidal model. These coordinates serve as the control for the post-processing of all Lidar data and subsequent products derived from the Lidar data. See Appendix II for the primary constrained adjustment listing.

A third and final adjustment was run to incorporate the check point and bench mark observations. The adjusted coordinate values from the fully constrained adjustment were held as *fixed* constraints to derive final coordinate and elevation values of the check points. Appendix I tabulates the final adjusted coordinate and elevation values of all surveyed points.

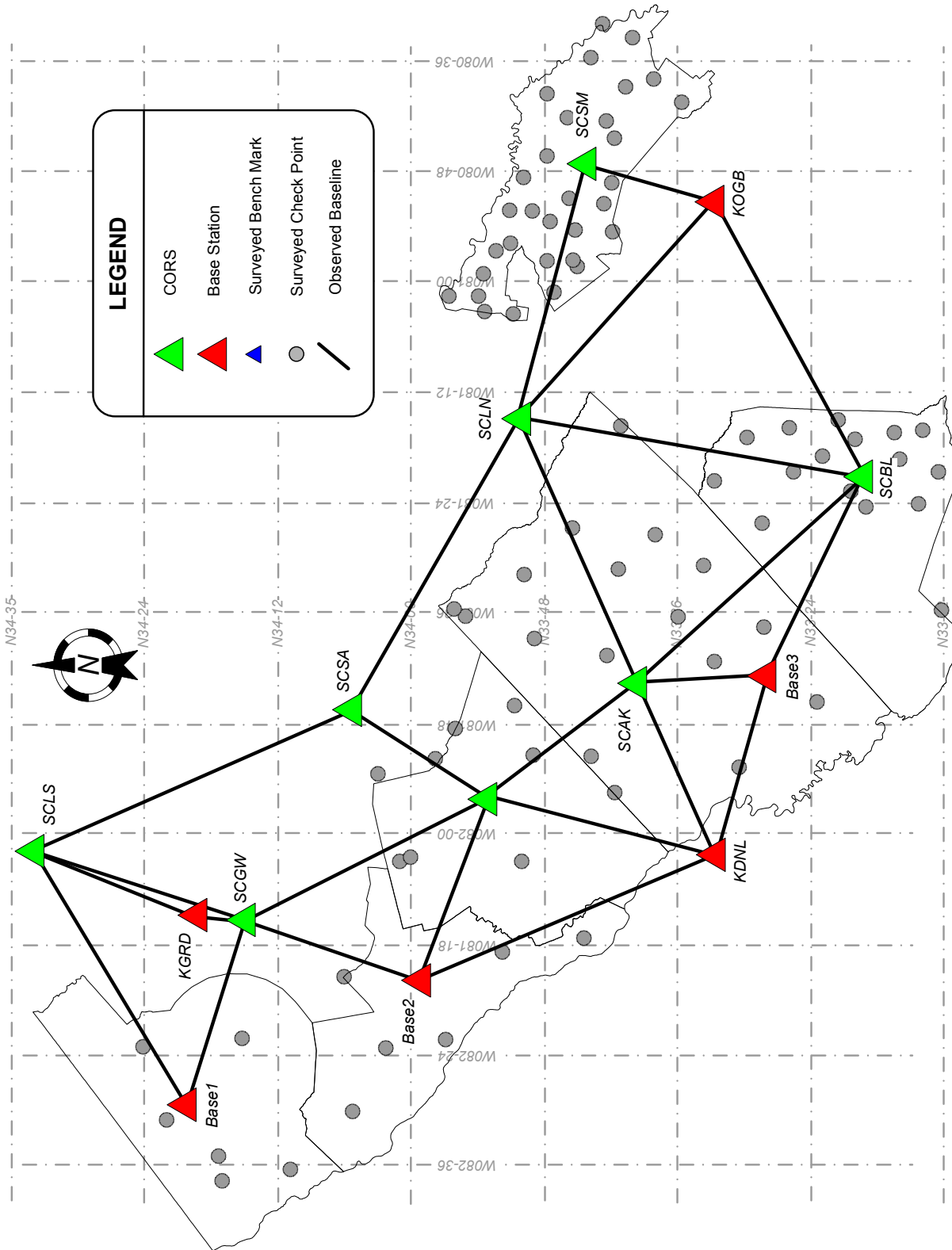


Figure 1. Primary Survey Network Diagram

Table 1.
 Absolute Loop Misclosures

Loop	Horizontal Misclosure [mm]	Vertical Misclosure [mm]	Loop Length [meters]	PPM
Base1 - SCLS - KGRD - SCGW - Base1	11	2	119118	0.10
KGRD - SLCS - SCGW - KGRD	12	12	74542	0.23
SCGW - SLCS - SCSA - SCED - SCGW	1	1	167341	0.01
Base2 - SCGW - SCED - Base2	14	23	109332	0.25
Base2 - SCED - KDNL2 - Base2	13	23	124614	0.21
KDNL2 - SCED - SCAK - KDNL2	15	12	101879	0.19
KDNL - SCAK - Base3 - KDNL	24	2	84983	0.28
SCED - SCSA - SCLN - SCAK - SCED	4	16	162912	0.10
SCAK - SCLN - SCBL - SCAK	1	5	159025	0.03
Base3 - SCAK - SCBL - Base3	8	6	111007	0.09
SCLN - KOGB - SCBL - SCLN	10	6	160671	0.07
SCLN - SCSM - KOGB - SCLN	9	5	115867	0.09

Table 2.
 Primary Network Adjustment Weighted Constraints

Horizontal Datum: NAD83(NSRS2007)
 Epoch: 2007.0
 Linear Unit: International Meter

Point	Source	Latitude				Longitude				Ellipsoid Height	Adjustment Residuals (m)		
		°	'	"	U-T	°	'	"	U-T		Lat.	Lng.	Hgt.
SCAK	SCGS	N	33	35	06.21769	W	81	43	38.21457	132.306	0.004	0.017	0.018
SCLN	SCGS	N	33	45	35.91920	W	81	14	55.69852	95.666	0.005	-0.002	-0.002
SCBL	SCGS	N	33	14	15.52372	W	81	21	16.44240	39.645	-0.005	0.005	-0.037
SCSM	SCGS	N	33	39	43.79289	W	80	47	13.78280	63.859	0.014	-0.005	-0.011
SCLS	SCGS	N	34	29	18.99757	W	82	01	46.82903	181.626	0.000	-0.011	0.024
SCED	SCGS	N	33	48	25.99258	W	81	56	02.81683	139.445	0.004	0.001	0.000
SCSA	USGS	N	34	00	41.44290	W	81	46	45.55861	120.252	-0.023	-0.005	0.009

Notes: Ellipsoid heights are to the Antenna Reference Point (ARP) of the VRS

3. LIDAR DATA ACQUISITION AND PROCESSING

3.1 Introduction

Following is an overview description of the procedures applied in this Lidar campaign from acquisition to final processed data. Figure 2 illustrates the general flow of the data through the multiple processes required to generate the Lidar point cloud in the 'LAS' version 1.2 format.

3.2 Data Acquisition

The Lidar data acquisition was completed within 34 lifts, or missions. The missions originated and/or terminated at the Orangeburg Municipal Airport, Daniel Field Airport and Greenwood County Airport. A GPS base station was operating at the airport during every lift. The South Carolina Geodetic Survey was contacted prior to the start of the Lidar acquisition to arrange for 1 Hertz data logging of several of the VRS stations included in the primary survey network. The data from these stations were downloaded and applied in the post-processing of the kinematic AGPS data.

Figure 3 illustrates the general flight plan. The target flying height of the flight lines was 1,500 meters above mean terrain. Figure 4 summarizes the general acquisition parameters applied project-wide.

Kinematic GPS and Inertial Measurement Unit (IMU) data were acquired by the Applanix POS Inertial Navigation System during the missions. The post-processed POS data results in a 200 Hertz, 6-parameter aircraft trajectory (x, y, z, roll, pitch, yaw).

The Airborne GPS (AGPS) and IMU data were processed immediately following each mission. In addition, a sample of the Lidar data was post-processed at the completion of the missions and the data was reviewed to ensure correct system operation and data coverage.

3.3 Airborne GPS Processing

The quality of the Airborne GPS data represents a significant component of the overall error budget with respect to the accuracy of the Lidar data. It is important to exercise vigilance in the validation of the integrity of the AGPS solution. This effort begins prior to acquisition with careful mission planning to identify periods of the day during which satellite availability and/or geometry may not be conducive to an acceptable solution. Data acquisition is scheduled around these periods where practical (other constraints such as airspace restrictions, daylight conditions and weather notwithstanding).

The kinematic AGPS data was post-processed using Novatel, Inc.'s Grafnav version 8.40 software, the *de facto* kinematic GPS post-processing package in the airborne remote sensing industry. Data is post-processed forward and backward in time exploiting the software's robust Kinematic Ambiguity Resolution and Multi-Baseline features to mitigate ambiguity drift and minimize poor data as a result of satellite loss of lock. Appendix III contains a set of plots for each mission generated from the Grafnav software including forward-reverse solution comparison, number of satellites, PDOP, trajectory, and a processing summary.

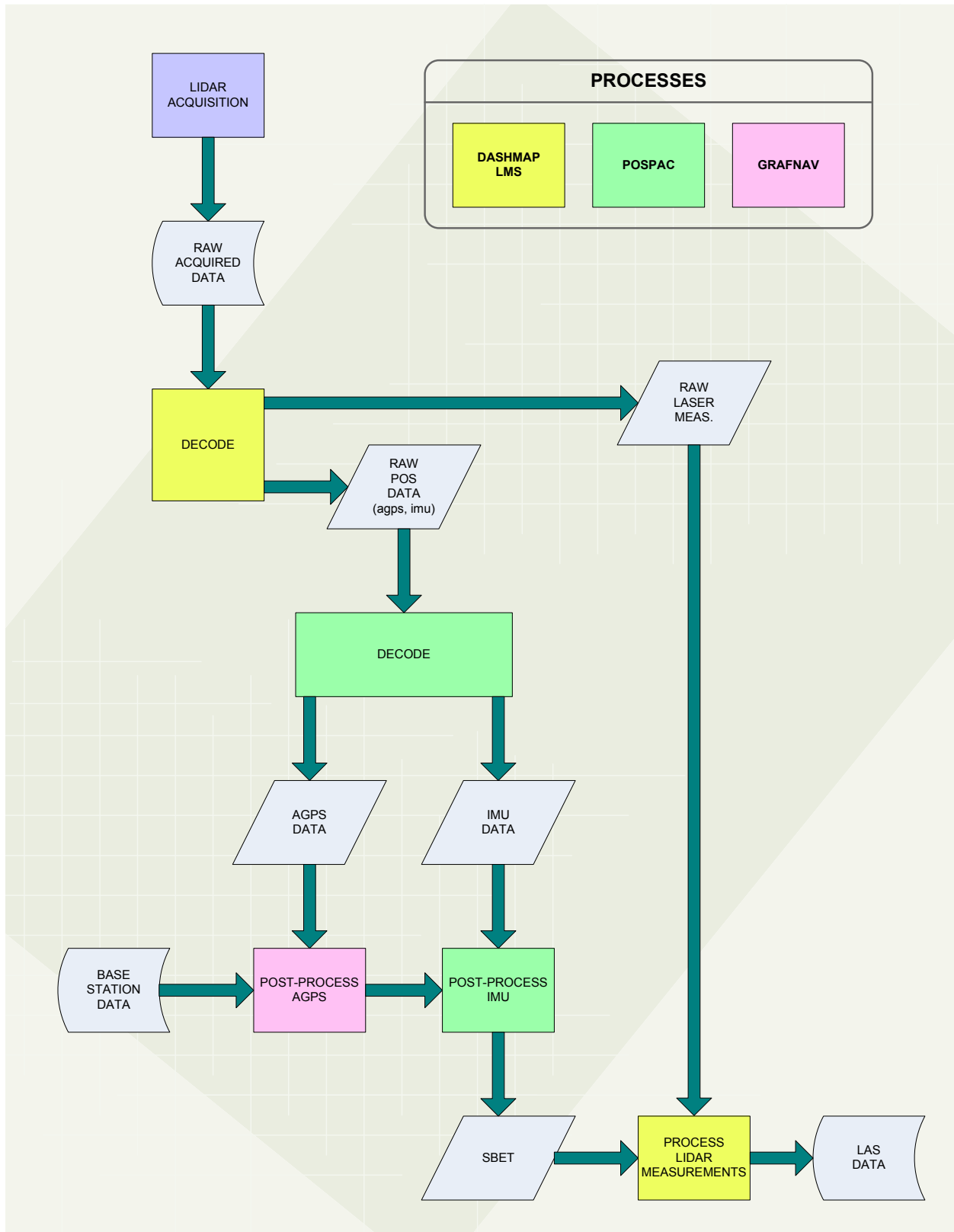


Figure 2. Lidar Data and Post-Processing Data Flow

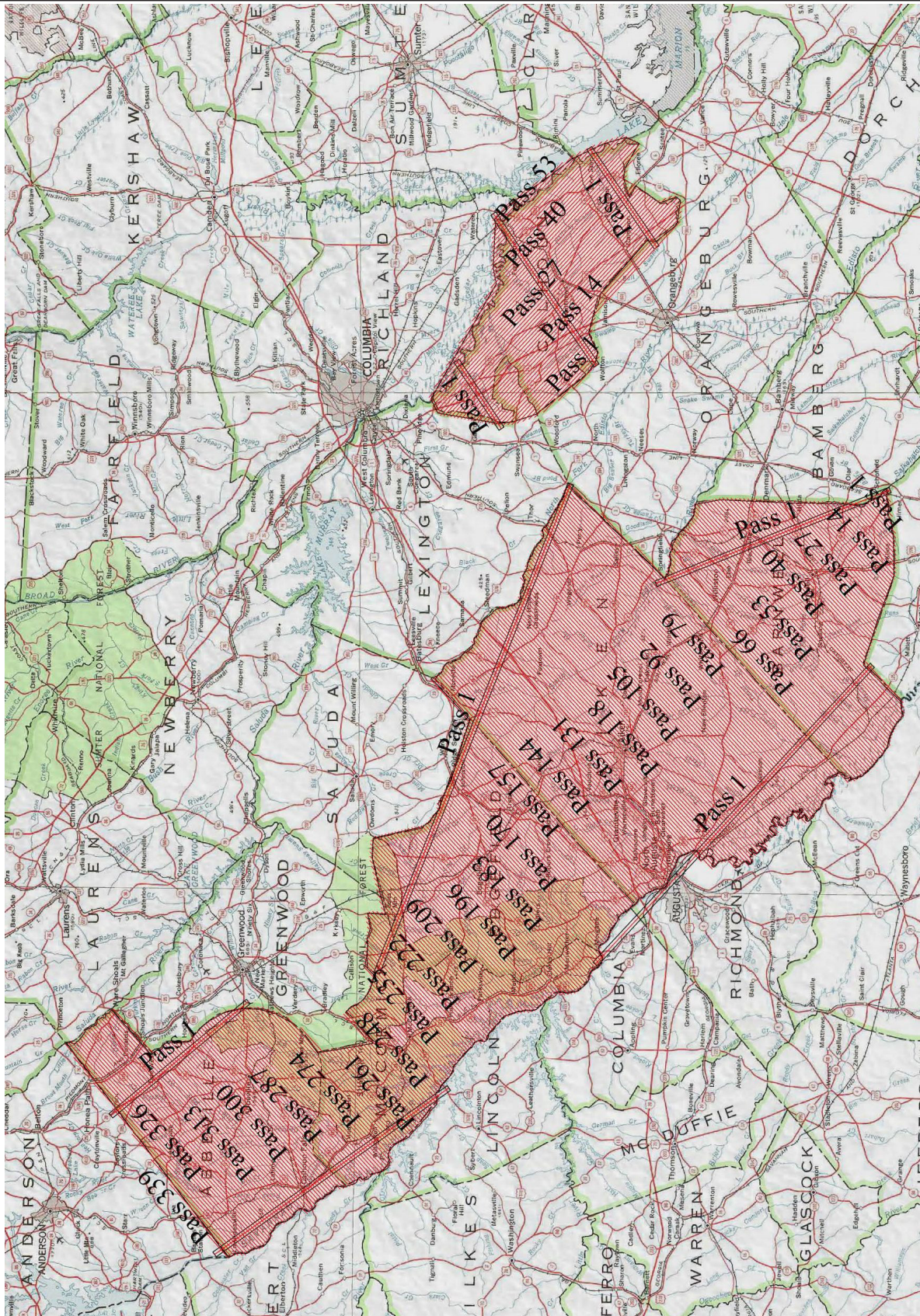


Figure 3. Lidar Flight Layout

Flight Profile		LIDAR Settings	
Altitude (m AGL)	1500	System PRF (kHz)	70
Unaided NOHD (m)	163	Scan Freq (Hz)	38
Pass Heading (deg)	90	Scan Angle +/-	20
Overlap (%)	50	Scan Offset	0
Speed (kts)	150	Desired Res (m)	1.097
Turn Time (min)	5	CT Res	1.186
Passes	72	DT Res	1.015
Pass Spacing (m)	545.36	PPM^2	0.83
Min DEM Altitude	0	Scan Cutoff (deg)	0.02
Max DEM Altitude	0	Swath (m)	1090.72

Figure 4. General Project Lidar Acquisition Parameters

3.4 IMU Processing and Best Estimated Trajectory

The post-processed AGPS trajectory is combined with the raw 200 Hertz IMU observations in a loosely-coupled Kalman filter-based processing algorithm to produce the final high-frequency Smoothed Best Estimated Trajectory (SBET). Applanix's POSPac software, version 4.4, is employed in this process.

Given a good quality AGPS solution and clean, gap-free IMU data, this process generally runs very smoothly. The field procedure includes several minutes of static GPS and IMU data collection prior to departure to allow sufficient time for the IMU to acquire a fine local level. The data is acquired in duplicate in real-time to ensure a high-quality record set. The IMU processing was clean and consistent for all missions during this campaign.

The final, high-frequency SBET is the source of absolute geo-referencing of the post-processed Lidar point cloud. The SBET is introduced into the final phase of the Lidar data processing.

3.5 LIDAR Point Cloud Processing

Final Lidar data processing is accomplished using Optech's LMS (Lidar Mapping Suite) software, version 2.1. The decoded raw laser observations (ranges, intensities, and mirror angles) and the final processed SBET are combined within LMS to compute the final 3-dimensional coordinates of the return(s) of each laser pulse.

LMS employs a block self calibration process. The acquisition missions are sorted into blocks of data and are post-processed and calibrated. The calibration function identifies common planes between overlapping data and analyzes the data to refine parameters such as a roll, pitch, yaw, mirror scan scale and vertical offsets on a strip-wise basis. These adjustments are then applied in a refined post-processing. Cross strips are incorporated to assist in maintaining continuity between the blocks.

The calibrated data is output in LAS format, version 1.2 with "adjusted" GPS times (defined as GPS seconds of the week minus 1×10^9 seconds).

4. LIDAR CALIBRATION AND QC

4.1 Introduction

The Optech Orion M200 Lidar system is subject to a regular maintenance and calibration schedule. The intent of periodic calibration is to monitor and validate components of the overall error budget including IMU boresight and performance, mirror angle readings and pulse gate timing. Several of these parameters can vary during and between missions due to changes in ambient meteorological conditions, different flying heights above ground, and different acquisition variables. As such, regular checks on the calibration were carried out during every mission.

4.2 Calibration Overflights

To assure that the LIDAR system is performing within specifications, on a mission-by-mission basis, a snapshot of data is captured over a known surface, most often one of the runways located at the airport of operations. The runway surface is surveyed by collecting hundreds of topographic points using a post-processed kinematic GPS procedure.

At the beginning and end of each mission, two passes are made in opposite directions at right angles to and over the surveyed runway (see Figure 5, below). On average, approximately 50,000 Lidar points are acquired over the runway surface per pass. The surveyed topographic points that define the “known” surface of the runway are used to develop a surface model and the Lidar points from each pass are draped over this model and residuals computed. The residuals from each pass are graphed versus distance along the runway to provide an effective vertical cross-section of the entire Lidar swath at a short moment in time.

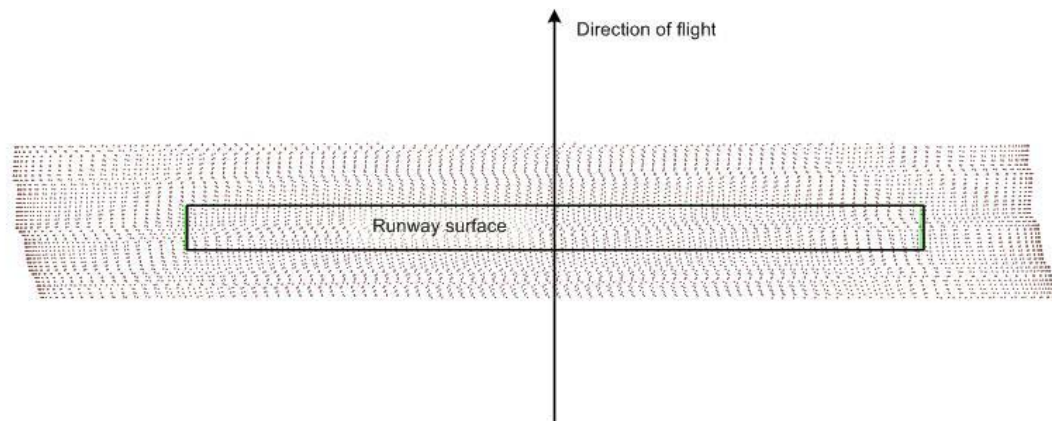


Figure 5. Example of a Calibration Overflight

The graphs from each pass are used to check that the mirror angle offset and scale, IMU solution roll and pitch bias, and elevation bias as adjusted within LMS are within acceptable tolerances. This “snapshot” of the Lidar swath also ensures that the system is operating normally and that there are no anomalies contained in the data.

Figure 6 contains an example of a plot of an unbiased runway overflight computed for a mission during the campaign. The following information may be obtained through careful examination of the graphs:

- The 99-percent noise band of the data is consistent at approximately 10 centimeters or less;

- There is no significant mirror scale error (characterized by a smile or frown);
- There is no significant roll error (characterized by a tilt in the noise band);
- There are no evident data anomalies;

Each plot is accompanied by the average residual and root mean square (RMS) of the residuals for the respective data set. The plots and statistics are reviewed and analyzed to ensure that the system is working well within the specifications.

4.3 Strip-wise Calibration

As described in section 3.3, the Lidar point cloud processing software, Optech's Lidar Mapping Suite (LMS) completes a strip-wise self-calibration and adjustment on blocks of adjacent data. This process computes refined roll, pitch, yaw, scan scale, and vertical offset parameters for each strip in the block and applies the new values in the processing of the point cloud data. Cross strips across the project areas are implemented to improve consistency between the blocks of data.

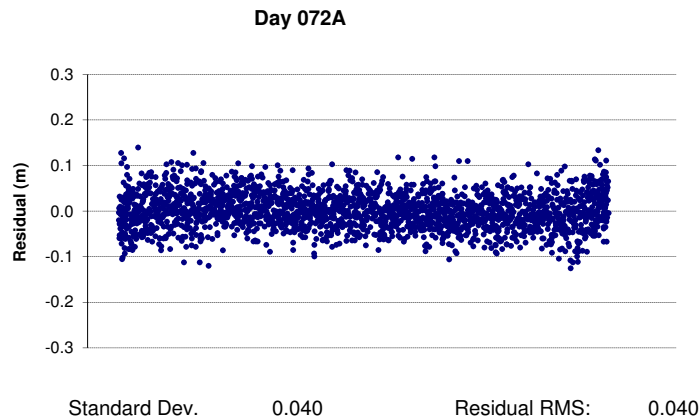


Figure 6. Mission-by-Mission Calibration Pass Analysis Plot

5. LIDAR CHECKPOINT QUALITY ASSURANCE

In a further effort to validate the absolute vertical accuracy of the Lidar-derived elevations, 79 well-distributed check points were established and surveyed with respect to the AGPS base stations and VRS stations that were included in the primary survey network.

In the vicinity of each check point, the post-processed Lidar data is used to generate a surface model upon which the check point is draped. The residual elevation difference is computed at each check point location. Table 3 summarizes the results of the check point analysis in meters. The RMS of all check point differences is 0.079 meters (0.28 foot).

Table 3.

LIDAR CHECK POINT RESIDUALS
Orthometric Elevations (International Foot)

Point	Surveyed Elev.	LIDAR Elev.	Residual
KK01	251.24	251.67	0.43
KK02	145.64	145.34	-0.30
KK03	174.75	175.08	0.33
KK04	258.22	258.27	0.05
KK05	297.65	297.49	-0.16
KK06	348.14	348.28	0.14
KK07	253.92	254.10	0.18
KK08	270.51	270.51	0.00
KK09	213.34	213.37	0.03
KK10	485.56	485.59	0.03
KK11	404.52	404.31	-0.21
KK12	495.77	495.24	-0.53
KK13	298.39	298.87	0.48
KK14	512.01	512.19	0.18
KK15	632.36	632.49	0.13
KK16	406.81	407.34	0.53
KK17	499.35	499.42	0.07
KK18	470.17	470.50	0.33
KK19	423.93	423.65	-0.28
KK20	305.69	305.83	0.14
KK21	278.09	278.27	0.18
KK22	390.82	391.13	0.31
KK24	477.88	478.15	0.27
KK25	524.13	524.07	-0.06
KK26	538.68	539.60	0.92
KK27	593.17	592.72	-0.45
KK28	532.36	532.13	-0.23
MA04	84.23	84.50	0.27
MA05	-20.59	-20.76	-0.17
MA06	45.49	45.42	-0.07
MA07	244.58	244.77	0.19
MA08	153.02	153.23	0.21
MA09	75.73	75.17	-0.56
MA10	175.71	175.58	-0.13
MA11	161.30	161.45	0.15
MA12	209.19	209.40	0.21
MA13	225.46	225.53	0.07
MA14	200.02	200.25	0.23
MA15	291.69	291.92	0.23
MA16	274.93	275.29	0.36



Point	Surveyed Elev.	LIDAR Elev.	Residual
MA17	181.78	182.02	0.24
MA18	205.97	206.07	0.10
MA19	224.53	224.58	0.05
MA20	252.67	252.47	-0.19
MA21	60.46	60.51	0.05
MA22	198.94	199.12	0.18
MA23	217.50	217.88	0.38
MA24	253.81	253.66	-0.15
MA25	262.81	262.88	0.07
MA26	183.95	183.74	-0.21
MA27	51.13	50.80	-0.33
MA28	92.57	92.36	-0.21
MA29	31.60	31.29	-0.31
MA30	254.93	255.13	0.20
MA31	172.76	172.85	0.09
MA32	174.42	174.63	0.21
MA33	70.37	70.42	0.06
MA34	55.48	55.74	0.26
MA35	284.70	284.79	0.09
MA36	254.93	255.07	0.14
MA37	232.12	232.21	0.09
MA38	233.69	233.89	0.20
MA39	218.31	218.74	0.43
MA40	250.69	251.07	0.38
MA41	237.98	238.03	0.05
MA42	188.47	188.34	-0.13
MA43	229.30	229.33	0.04
MA44	275.77	276.08	0.31
MA45	342.32	342.12	-0.20
MA46	538.73	538.63	-0.10
WT01	531.66	531.70	0.04
WT02	619.71	619.93	0.22
WT03	605.19	605.41	0.22
WT04	513.31	513.60	0.29
WT05	426.59	426.94	0.35
WT06	345.45	345.59	0.14
WT07	349.43	349.80	0.37
WT08	623.45	623.99	0.54
WT09	462.32	462.84	0.52
Average			0.10
Standard Deviation			0.26
RMS			0.28

Appendix I

Final Coordinates and Elevations

Dewberry and Davis
 SCDNR - 2012 Campaign Control Survey
FINAL ADJUSTED COORDINATES

Horizontal Datum: NAD83(NSRS2007)
 Epoch: 2007.0
 Linear Unit: International Meter

Point	Latitude				Longitude				Ellipsoid Height	Standard Deviation		
	°	'	''	Value	°	'	''	Value		ρ	λ	h
Base Stations												
Base1	N	34	15	34.42069	W	82	29	37.79943	159.761	0.004	0.005	0.013
Base2	N	33	54	30.71967	W	82	16	03.92162	113.698	0.004	0.005	0.011
Base3	N	33	23	14.85459	W	81	42	43.60545	86.711	0.004	0.005	0.011
KDNL	N	33	27	51.26414	W	82	02	10.88475	95.246	0.005	0.006	0.022
KDNL2	N	33	28	10.60821	W	82	02	30.42734	98.836	0.004	0.005	0.011
KGRD	N	34	14	47.65214	W	82	09	02.52851	157.713	0.005	0.005	0.017
KOGB	N	33	27	55.61964	W	80	51	18.70913	27.495	0.004	0.005	0.012
Lidar Check Points												
MA04	N	33	36	03.67716	W	80	39	01.53444	25.674	0.003	0.002	0.005
MA05	N	33	37	56.11711	W	80	32	37.64212	-6.276	0.002	0.002	0.006
MA06	N	33	35	25.75241	W	80	33	58.28832	13.866	0.002	0.002	0.006
MA07	N	33	36	03.36612	W	80	48	00.89354	74.549	0.007	0.003	0.020
MA08	N	33	37	39.10853	W	80	42	36.39834	46.641	0.004	0.003	0.008
MA09	N	33	38	59.48185	W	80	36	01.67084	23.082	0.002	0.004	0.007
MA10	N	33	42	42.47594	W	80	39	48.36135	53.556	0.005	0.003	0.011
MA11	N	33	40	58.76565	W	80	42	17.29203	49.166	0.002	0.001	0.004
MA12	N	33	39	49.17462	W	80	47	53.07019	63.761	0.002	0.001	0.004
MA13	N	33	40	52.80000	W	80	50	29.05370	68.721	0.002	0.002	0.005
MA14	N	33	40	19.69989	W	80	53	40.49562	60.966	0.003	0.002	0.005
MA15	N	33	40	08.32249	W	80	57	38.31120	88.908	0.002	0.002	0.006
MA16	N	33	42	14.07431	W	81	00	23.10601	83.797	0.002	0.002	0.005
MA17	N	33	42	39.61304	W	80	46	14.55701	55.407	0.002	0.002	0.008
MA18	N	33	44	47.32732	W	80	48	24.34084	62.780	0.004	0.002	0.007
MA19	N	33	43	58.88993	W	80	51	58.39342	68.436	0.003	0.003	0.006
MA20	N	33	47	05.86255	W	80	55	59.51492	77.012	0.005	0.004	0.012
MA21	N	33	51	13.28020	W	81	00	35.44863	18.429	0.003	0.004	0.012
MA22	N	33	48	39.30816	W	81	00	33.87528	60.637	0.002	0.002	0.005
MA23	N	33	48	08.37051	W	81	02	17.98738	66.294	0.004	0.004	0.013
MA24	N	33	45	38.13446	W	81	02	35.40583	77.362	0.002	0.002	0.005
MA25	N	33	42	44.17830	W	80	57	11.24207	80.103	0.002	0.002	0.006
MA26	N	33	37	06.57580	W	80	53	59.14901	56.067	0.002	0.002	0.005
MA27	N	33	48	16.62001	W	80	58	20.43069	15.584	0.006	0.008	0.019
MA28	N	33	45	51.66232	W	80	55	07.86074	28.215	0.003	0.003	0.012

Point	Latitude				Longitude				Ellipsoid Height	Standard Deviation		
	°	'	''	'''	°	'	''	'''		ρ	λ	h
MA29	N	33	45	58.25034	W	80	51	45.66447	9.631	0.007	0.010	0.036
MA30	N	33	42	32.49780	W	80	52	59.66437	77.703	0.002	0.002	0.005
MA31	N	33	37	52.22369	W	80	51	07.99774	52.657	0.003	0.002	0.005
MA32	N	33	36	54.85665	W	80	44	18.96764	53.163	0.003	0.002	0.006
MA33	N	33	33	33.93240	W	80	38	13.63371	21.447	0.003	0.002	0.008
MA34	N	33	31	14.43315	W	80	40	42.24738	16.912	0.002	0.002	0.006
GB01	N	34	10	50.27828	W	82	22	25.93984	133.292	0.004	0.003	0.008
GB02	N	34	19	40.69134	W	82	23	16.57232	176.909	0.004	0.003	0.009
GB03	N	34	17	38.80680	W	82	31	33.00553	173.617	0.003	0.003	0.008
GB04	N	34	13	02.13589	W	82	35	13.96328	162.916	0.032	0.071	0.057
KK01	N	33	07	28.78583	W	81	20	24.14622	45.939	0.004	0.003	0.008
KK02	N	33	07	16.96781	W	81	35	37.08840	13.854	0.003	0.002	0.007
KK03	N	33	14	03.94288	W	81	24	18.33614	22.510	0.003	0.002	0.006
KK04	N	33	16	27.36808	W	81	14	51.52424	47.675	0.002	0.002	0.005
KK05	N	33	24	50.94088	W	81	16	54.27890	59.395	0.003	0.003	0.007
KK06	N	33	23	33.59928	W	81	26	07.81407	75.144	0.003	0.002	0.006
KK07	N	33	23	16.52734	W	81	37	34.86450	46.690	0.003	0.003	0.006
KK08	N	33	25	34.86522	W	81	52	57.66813	52.088	0.004	0.003	0.010
KK09	N	33	18	29.50962	W	81	45	47.43382	34.450	0.003	0.003	0.006
KK10	N	33	27	50.69091	W	81	41	14.34985	117.332	0.003	0.002	0.006
KK11	N	33	36	19.16597	W	81	15	47.10486	92.129	0.004	0.003	0.007
KK12	N	33	40	50.11273	W	81	26	37.90026	120.263	0.007	0.016	0.056
KK13	N	33	33	13.07391	W	81	27	22.52525	59.998	0.003	0.003	0.008
KK14	N	33	45	12.72606	W	81	31	48.88286	125.420	0.011	0.005	0.023
KK15	N	33	50	39.23808	W	81	36	19.98733	162.437	0.004	0.003	0.008
KK16	N	33	44	05.29513	W	81	38	55.89656	93.558	0.003	0.003	0.008
KK17	N	33	37	29.95902	W	81	40	41.47316	121.629	0.003	0.003	0.007
KK18	N	33	31	13.41997	W	81	36	16.10488	112.547	0.003	0.003	0.007
KK19	N	33	36	36.69602	W	81	31	14.89780	98.391	0.004	0.003	0.010
KK20	N	33	27	49.02204	W	81	21	33.71310	61.987	0.003	0.002	0.006
KK21	N	33	20	42.24726	W	81	20	41.37302	53.692	0.003	0.003	0.007
KK22	N	33	28	50.42230	W	81	30	46.20676	88.229	0.003	0.003	0.007
KK23	N	34	01	26.01692	W	82	15	41.03505	147.844	0.014	0.015	0.020
KK24	N	33	56	22.88969	W	82	02	55.11312	116.106	0.005	0.003	0.011
KK25	N	33	58	30.60597	W	81	53	30.38717	130.084	0.035	0.010	0.039
KK26	N	33	53	15.80000	W	81	51	55.42552	134.435	0.018	0.009	0.049
KK27	N	33	45	57.96984	W	81	46	11.00410	150.713	0.004	0.004	0.011
KK28	N	33	38	57.78893	W	81	51	38.30053	132.149	0.003	0.003	0.010



Point	Latitude				Longitude				Ellipsoid Height	Standard Deviation		
	°	'	"	U.S. Feet	°	'	"	U.S. Feet		ρ	λ	h
MA35	N	33	21	07.29501	W	81	15	43.61407	55.550	0.003	0.002	0.008
MA36	N	33	16	53.02554	W	81	15	06.51305	46.657	0.002	0.003	0.007
MA37	N	33	15	03.34597	W	81	17	03.23620	39.826	0.003	0.002	0.005
MA38	N	33	11	31.52559	W	81	16	26.17321	40.406	0.002	0.002	0.004
MA39	N	33	08	54.30898	W	81	15	58.85238	35.733	0.004	0.002	0.008
MA40	N	33	07	39.85739	W	81	20	34.51042	45.777	0.003	0.002	0.008
MA41	N	33	09	23.68124	W	81	24	03.18483	41.952	0.002	0.002	0.005
MA42	N	33	11	07.06152	W	81	19	14.14145	26.723	0.002	0.002	0.005
MA43	N	33	15	33.41631	W	81	22	45.06734	39.061	0.002	0.002	0.005
MA44	N	33	18	02.98588	W	81	19	03.87904	53.051	0.002	0.003	0.006
MA45	N	33	57	47.32496	W	82	23	31.37020	75.157	0.005	0.003	0.010
MA46	N	34	00	44.55191	W	82	30	26.85152	135.066	0.014	0.004	0.014
MA47	N	34	06	25.20525	W	82	36	40.98656	134.871	0.014	0.007	0.036
MA48	N	34	12	37.79536	W	82	37	56.29020	120.666	0.063	0.088	0.071
WT01	N	33	36	58.88148	W	81	55	41.65442	132.061	0.003	0.003	0.007
WT02	N	33	44	15.48084	W	81	51	30.08516	158.929	0.004	0.003	0.009
WT03	N	33	51	26.91606	W	81	48	29.00328	154.571	0.004	0.003	0.009
WT04	N	33	45	20.84270	W	82	03	08.19633	126.821	0.003	0.003	0.009
WT05	N	33	52	15.53546	W	82	22	38.69297	100.857	0.003	0.006	0.017
WT06	N	33	47	06.64818	W	82	13	08.40904	75.944	0.003	0.003	0.007
WT07	N	33	39	45.70154	W	82	11	29.59742	76.996	0.003	0.003	0.009
WT08	N	33	51	32.44143	W	81	35	28.40193	159.714	0.003	0.003	0.010
WT09	N	33	55	30.17903	W	82	02	42.36400	111.353	0.004	0.003	0.010
VRS / CORS Stations												
SCAK	N	33	35	06.21769	W	81	43	38.21457	132.306	-	-	-
SCBL	N	33	14	15.52372	W	81	21	16.44240	39.645	-	-	-
SCED	N	33	48	25.99258	W	81	56	02.81683	139.445	-	-	-
SCGW	N	34	10	19.98517	W	82	09	44.22499	168.771	0.004	0.004	0.008
SCLN	N	33	45	35.91920	W	81	14	55.69852	95.666	-	-	-
SCLS	N	34	29	18.99757	W	82	01	46.82903	181.626	-	-	-
SCSA	N	34	00	41.44290	W	81	46	45.55861	120.252	-	-	-
SCSM	N	33	39	43.79289	W	80	47	13.78280	63.859	-	-	-

NOTES:

- Ellipsoid heights of the VRS and CORS are to the antenna reference point (ARP)

- Shaded records indicate constrained values

Dewberry and Davis
SCDNR - 2012 Campaign Control Survey
FINAL ADJUSTED COORDINATES

Horizontal Datum: NAD83(NSRS2007)
Epoch: 2007.0
Projection: U.S. State Plane South Carolina Zone
Vertical Datum: NAVD88
Geoid Model: GEOID09
Linear Unit: International Foot

Point	Northing (N)	Easting (E)	Elevation (H)	Standard Deviation		
				N	E	H
<i>Base Stations</i>						
Base1	886010.49	1548686.41	524.15	0.01	0.02	0.04
Base2	757382.97	1615417.86	373.03	0.01	0.02	0.04
Base3	566193.80	1782665.96	284.49	0.01	0.02	0.04
KDNL	594963.21	1683990.76	312.49	0.02	0.02	0.07
KDNL2	596934.66	1682355.25	324.27	0.01	0.02	0.04
KGRD	879957.20	1652294.78	517.43	0.02	0.02	0.06
KOGB	593849.84	2044153.91	90.21	0.01	0.02	0.04
<i>Lidar Check Points</i>						
MA04	643322.14	2106426.40	187.18	0.01	0.01	0.02
MA05	654811.93	2138841.21	82.46	0.01	0.01	0.02
MA06	639586.65	2132087.39	148.46	0.01	0.01	0.02
MA07	643169.48	2060813.81	347.35	0.02	0.01	0.07
MA08	652910.31	2088228.71	255.88	0.01	0.01	0.03
MA09	661144.22	2121568.42	178.77	0.01	0.01	0.02
MA10	683612.19	2102335.09	278.74	0.02	0.01	0.04
MA11	673092.55	2089786.37	264.20	0.01	0.00	0.01
MA12	665991.30	2061430.83	311.92	0.01	0.00	0.01
MA13	672398.43	2048239.24	328.16	0.01	0.01	0.02
MA14	669032.59	2032067.74	302.69	0.01	0.01	0.02
MA15	667868.69	2011973.00	394.31	0.01	0.01	0.02

Point	Northing (N)	Easting (E)	Elevation (H)	Standard Deviation		
				N	E	H
MA16	680575.27	1998048.28	377.46	0.01	0.01	0.02
MA17	683233.56	2069717.68	284.60	0.01	0.01	0.03
MA18	696118.35	2058731.90	308.81	0.01	0.01	0.02
MA19	691194.51	2040666.59	327.25	0.01	0.01	0.02
MA20	710070.91	2020294.22	355.31	0.02	0.01	0.04
MA21	735069.77	1997010.92	162.90	0.01	0.01	0.04
MA22	719508.53	1997142.17	301.39	0.01	0.01	0.02
MA23	716383.85	1988357.77	319.86	0.01	0.01	0.04
MA24	701200.94	1986881.80	356.20	0.01	0.01	0.02
MA25	683620.83	2014253.25	365.40	0.01	0.01	0.02
MA26	649513.56	2030510.47	286.64	0.01	0.01	0.02
MA27	717216.55	2008400.61	153.70	0.02	0.03	0.06
MA28	702575.06	2024659.13	195.24	0.01	0.01	0.04
MA29	703258.91	2041725.39	134.38	0.02	0.03	0.12
MA30	682457.19	2035502.77	357.61	0.01	0.01	0.02
MA31	654144.16	2044974.96	275.46	0.01	0.01	0.02
MA32	648415.04	2079568.57	277.23	0.01	0.01	0.02
MA33	628202.86	2110530.41	173.29	0.01	0.01	0.03
MA34	614063.45	2098000.26	158.40	0.01	0.01	0.02
GB01	856790.23	1584544.75	533.87	0.01	0.01	0.03
GB02	910454.85	1581011.90	678.42	0.01	0.01	0.03
GB03	898723.05	1539204.44	667.23	0.01	0.01	0.03
GB04	871040.41	1520240.76	631.36	0.10	0.23	0.19
KK01	470008.31	1895905.70	251.24	0.01	0.01	0.03
KK02	469164.70	1818268.20	145.64	0.01	0.01	0.02
KK03	510013.54	1876148.17	174.75	0.01	0.01	0.02
KK04	524355.75	1924320.30	258.22	0.01	0.01	0.02

Point	Northing (N)	Easting (E)	Elevation (H)	Standard Deviation		
				N	E	H
KK05	575272.59	1914038.67	297.65	0.01	0.01	0.02
KK06	567619.38	1867093.20	348.14	0.01	0.01	0.02
KK07	566193.36	1808840.68	253.92	0.01	0.01	0.02
KK08	580744.28	1730729.73	270.51	0.01	0.01	0.03
KK09	537469.28	1766868.92	213.34	0.01	0.01	0.02
KK10	594017.74	1790418.03	485.56	0.01	0.01	0.02
KK11	644809.40	1919908.79	404.53	0.01	0.01	0.02
KK12	672379.75	1864992.63	495.78	0.02	0.05	0.18
KK13	626207.63	1861018.36	298.39	0.01	0.01	0.03
KK14	699043.73	1838853.95	512.01	0.04	0.02	0.08
KK15	732167.73	1816161.16	632.36	0.01	0.01	0.03
KK16	692434.69	1802763.50	406.81	0.01	0.01	0.03
KK17	652539.17	1793586.86	499.35	0.01	0.01	0.02
KK18	614347.27	1815799.45	470.17	0.01	0.01	0.02
KK19	646878.54	1841460.10	423.93	0.01	0.01	0.03
KK20	593342.68	1890418.95	305.69	0.01	0.01	0.02
KK21	550198.40	1894708.38	278.09	0.01	0.01	0.02
KK22	599745.16	1843652.34	390.82	0.01	0.01	0.02
KK23	799329.69	1617858.61	580.98	0.05	0.05	0.07
KK24	767974.20	1681999.89	477.88	0.02	0.01	0.04
KK25	780435.19	1729680.19	524.13	0.11	0.03	0.13
KK26	748551.66	1737409.51	538.68	0.06	0.03	0.16
KK27	704073.84	1766109.69	593.18	0.01	0.01	0.04
KK28	661828.53	1738130.78	532.36	0.01	0.01	0.03
MA35	552655.52	1919970.26	284.70	0.01	0.01	0.03
MA36	526951.72	1923054.25	254.93	0.01	0.01	0.02
MA37	515893.44	1913116.21	232.12	0.01	0.01	0.02

Point	Northing (N)	Easting (E)	Elevation (H)	Standard Deviation		
				N	E	H
MA38	494478.88	1916206.51	233.69	0.01	0.01	0.01
MA39	478584.89	1918486.97	218.31	0.01	0.01	0.03
MA40	471130.09	1895028.10	250.69	0.01	0.01	0.03
MA41	481686.08	1877325.05	237.98	0.01	0.01	0.02
MA42	492047.66	1901926.91	188.47	0.01	0.01	0.02
MA43	519025.43	1884102.33	229.30	0.01	0.01	0.02
MA44	534077.27	1902928.18	275.77	0.01	0.01	0.02
MA45	777736.79	1577983.10	342.32	0.02	0.01	0.03
MA46	796137.85	1543258.29	538.73	0.05	0.01	0.05
MA47	831038.96	1512309.13	538.28	0.05	0.02	0.12
MA48	868792.77	1506573.63	492.74	0.21	0.29	0.23
WT01	649990.04	1717455.04	531.66	0.01	0.01	0.02
WT02	693928.42	1739091.79	619.71	0.01	0.01	0.03
WT03	737406.64	1754721.85	605.19	0.01	0.01	0.03
WT04	701078.65	1680216.59	513.31	0.01	0.01	0.03
WT05	744147.29	1581971.97	426.59	0.01	0.02	0.06
WT06	712327.79	1629677.50	345.45	0.01	0.01	0.02
WT07	667670.04	1637501.70	349.43	0.01	0.01	0.03
WT08	737519.49	1820542.09	623.46	0.01	0.01	0.03
WT09	762636.25	1683019.91	462.32	0.01	0.01	0.03

Appendix II
Fully Constrained
Primary Network Adjustment
Horizontal Datum: NAD83(NSRS2007), 2007.0
Vertical Datum: NAVD88



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=====
                      SCDNR NAD83; NAVD88 via published SC VRS
Microsearch GeoLab, V2001.9.20.0          GRS 80          UNITS: m,DMS  Page 0001
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Wed Aug 15 08:57:38 2012

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Input file:  \\tsclient\J\13639_SCDNR_2012\Geolab\SCDNR12_rev2_c.iob
Output file: \\tsclient\J\13639_SCDNR_2012\Geolab\SCDNR12_rev2_c.lst
Options file: C:\Program Files\Microsearch\GeoLab\default.gpj

```

Geoid File: C:\ngs\geoid09\g2009u08pc.gsp

PARAMETERS		OBSERVATIONS	
Description	Number	Description	Number
No. of Stations	15	Directions	0
Coord Parameters	45	Distances	0
Free Latitudes	15	Azimuths	0
Free Longitudes	15	Vertical Angles	0
Free Heights	15	Zenithal Angles	0
Fixed Coordinates	0	Angles	0
Astro. Latitudes	0	Heights	7
Astro. Longitudes	0	Height Differences	0
Geoid Records	0	Auxiliary Params.	0
All Aux. Pars.	0	2-D Coords.	14
Direction Pars.	0	2-D Coord. Diffs.	0
Scale Parameters	0	3-D Coords.	0
Constant Pars.	0	3-D Coord. Diffs.	78
Rotation Pars.	0		
Translation Pars.	0		
-----		-----	
Total Parameters	45	Total Observations	99
Degrees of Freedom =		54	

SUMMARY OF SELECTED OPTIONS

OPTION	SELECTION
Computation Mode	Adjustment
Maximum Iterations	10
Convergence Criterion	0.00100
Residual Rejection Criterion	Tau Max
Confidence Region Types	1D 2D Station Relative
Relative Confidence Regions	Connected Only
Variance Factor (VF) Known	Yes
Scale Covariance Matrix With VF	No
Scale Residual Variances With VF	No
Force Convergence in Max Iters	No
Distances Contribute To Heights	No
Compute Full Inverse	Yes



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                          SCDNR NAD83; NAVD88 via published SC VRS
Microsearch GeoLab, V2001.9.20.0          GRS 80          UNITS: m,DMS  Page 0002
=====
Optimize Band Width          | Yes
Generate Initial Coordinates | Yes
Re-Transform Obs After 1st Pass | Yes
Geoid Interpolation Method   | Bi-Quadratic
=====
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 SCDNR NAD83; NAVD88 via published SC VRS
 Microsearch GeoLab, V2001.9.20.0 GRS 80 UNITS: m,DMS Page 0003
 =====

Adjusted PLH Coordinates:

CODE	FFF	STATION	LATITUDE		LONGITUDE		ELIP-HEIGHT		
			STD DEV		STD DEV		STD DEV		
PLH	000	Base1	N 34 15	34.420690	W 82 29	37.799425	159.761	m	0
				0.004		0.005		0.013	
PLH	000	Base2	N 33 54	30.719674	W 82 16	3.921623	113.698	m	0
				0.004		0.005		0.011	
PLH	000	Base3	N 33 23	14.854594	W 81 42	43.605453	86.711	m	0
				0.004		0.005		0.011	
PLH	000	KDNL	N 33 27	51.264142	W 82 2	10.884749	95.246	m	0
				0.005		0.006		0.022	
PLH	000	KDNL2	N 33 28	10.608208	W 82 2	30.427342	98.836	m	0
				0.004		0.005		0.011	
PLH	000	KGRD	N 34 14	47.652143	W 82 9	2.528511	157.713	m	0
				0.005		0.005		0.017	
PLH	000	KOGB	N 33 27	55.619638	W 80 51	18.709126	27.495	m	0
				0.004		0.005		0.012	
PLH	000	SCAK	N 33 35	6.217824	W 81 43	38.213921	132.324	m	0
				0.004		0.004		0.007	
PLH	000	SCBL	N 33 14	15.523556	W 81 21	16.442196	39.608	m	0
				0.004		0.004		0.007	
PLH	000	SCED	N 33 48	25.992694	W 81 56	2.816778	139.445	m	0
				0.004		0.004		0.007	
PLH	000	SCGW	N 34 10	19.985171	W 82 9	44.224987	168.771	m	0
				0.004		0.004		0.008	
PLH	000	SCLN	N 33 45	35.919363	W 81 14	55.698599	95.664	m	0
				0.004		0.004		0.007	
PLH	000	SCLS	N 34 29	18.997584	W 82 1	46.829452	181.650	m	0
				0.004		0.004		0.008	
PLH	000	SCSA	N 34 0	41.442162	W 81 46	45.558807	120.261	m	0
				0.004		0.004		0.008	
PLH	000	SCSM	N 33 39	43.793358	W 80 47	13.783000	63.848	m	0
				0.004		0.005		0.009	

```

=====
                          SCDNR NAD83; NAVD88 via published SC VRS
Microsearch GeoLab, V2001.9.20.0          GRS 80          UNITS: m,DMS  Page 0004
=====

```

Adjusted PLO Coordinates:

CODE	FFF	STATION	LATITUDE		LONGITUDE		O-HEIGHT	
			STD DEV		STD DEV		STD DEV	
PLO	000	Base1	N 34 15	34.420690	W 82 29	37.799425	159.761 m	0
				0.004		0.005	0.013	
PLO	000	Base2	N 33 54	30.719674	W 82 16	3.921623	113.698 m	0
				0.004		0.005	0.011	
PLO	000	Base3	N 33 23	14.854594	W 81 42	43.605453	86.711 m	0
				0.004		0.005	0.011	
PLO	000	KDNL	N 33 27	51.264142	W 82 2	10.884749	95.246 m	0
				0.005		0.006	0.022	
PLO	000	KDNL2	N 33 28	10.608208	W 82 2	30.427342	98.836 m	0
				0.004		0.005	0.011	
PLO	000	KGRD	N 34 14	47.652143	W 82 9	2.528511	157.713 m	0
				0.005		0.005	0.017	
PLO	000	KOGB	N 33 27	55.619638	W 80 51	18.709126	27.495 m	0
				0.004		0.005	0.012	
PLO	000	SCAK	N 33 35	6.217824	W 81 43	38.213921	132.324 m	0
				0.004		0.004	0.007	
PLO	000	SCBL	N 33 14	15.523556	W 81 21	16.442196	39.608 m	0
				0.004		0.004	0.007	
PLO	000	SCED	N 33 48	25.992694	W 81 56	2.816778	139.445 m	0
				0.004		0.004	0.007	
PLO	000	SCGW	N 34 10	19.985171	W 82 9	44.224987	168.771 m	0
				0.004		0.004	0.008	
PLO	000	SCLN	N 33 45	35.919363	W 81 14	55.698599	95.664 m	0
				0.004		0.004	0.007	
PLO	000	SCLS	N 34 29	18.997584	W 82 1	46.829452	181.650 m	0
				0.004		0.004	0.008	
PLO	000	SCSA	N 34 0	41.442162	W 81 46	45.558807	120.261 m	0
				0.004		0.004	0.008	
PLO	000	SCSM	N 33 39	43.793358	W 80 47	13.783000	63.848 m	0
				0.004		0.005	0.009	



=====
SCDNR NAD83; NAVD88 via published SC VRS
Microsearch GeoLab, V2001.9.20.0 GRS 80 UNITS: m,DMS Page 0005
=====

Geoid Values:

CODE	STATION	N/S DEFLECTION		E/W DEFLECTION		UNDULATION
GEOI	Base1	0	0	0.00	0 0	0.000 m
GEOI	Base2	0	0	0.00	0 0	0.000 m
GEOI	Base3	0	0	0.00	0 0	0.000 m
GEOI	KDNL	0	0	0.00	0 0	0.000 m
GEOI	KDNL2	0	0	0.00	0 0	0.000 m
GEOI	KGRD	0	0	0.00	0 0	0.000 m
GEOI	KOGB	0	0	0.00	0 0	0.000 m
GEOI	SCAK	0	0	0.00	0 0	0.000 m
GEOI	SCBL	0	0	0.00	0 0	0.000 m
GEOI	SCED	0	0	0.00	0 0	0.000 m
GEOI	SCGW	0	0	0.00	0 0	0.000 m
GEOI	SCLN	0	0	0.00	0 0	0.000 m
GEOI	SCLS	0	0	0.00	0 0	0.000 m
GEOI	SCSA	0	0	0.00	0 0	0.000 m
GEOI	SCSM	0	0	0.00	0 0	0.000 m


```

=====
                SCDNR NAD83; NAVD88 via published SC VRS
Microsearch GeoLab, V2001.9.20.0          GRS 80          UNITS: m,DMS  Page 0007
=====
Residuals (critical value = 3.487):
NOTE: Observation values shown are reduced to mark-to-mark.

```

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
				0.027	0.027	0.74
DYCT		Base3	KDNL	374.55430	-0.015	-0.303
				0.053	0.050	0.48
DZCT		Base3	KDNL	7112.13510	0.012	0.410
				0.032	0.030	0.39
GROUP: 00001, SCDNR12_rev2.asc						
DXCT		SCLN	SCSM	43204.25820	-0.000	-0.147
				0.003	0.002	0.01
DYCT		SCLN	SCSM	759.68340	-0.003	-0.761
				0.007	0.004	0.06
DZCT		SCLN	SCSM	-9042.57670	0.002	0.614
				0.005	0.002	0.03
GROUP: 00002, SCDNR12_rev2.asc						
DXCT		SCSM	KOGB	-4317.10660	-0.003	-0.719
				0.005	0.004	0.13
DYCT		SCSM	KOGB	-12886.16240	0.007	0.340
				0.023	0.021	0.32
DZCT		SCSM	KOGB	-18200.96730	-0.005	-0.338
				0.015	0.013	0.20
GROUP: 00003, SCDNR12_rev2.asc						
DXCT		SCLN	SCAK	-42287.96840	-0.002	-1.262
				0.003	0.002	0.05
DYCT		SCLN	SCAK	-17236.65680	0.005	1.054
				0.006	0.004	0.09
DZCT		SCLN	SCAK	-16126.01480	-0.003	-1.105
				0.004	0.003	0.07
GROUP: 00004, SCDNR12_rev2.asc						
DXCT		SCAK	KDNL	-27383.84210	-0.000	-0.085
				0.005	0.001	0.00
DYCT		SCAK	KDNL	-11351.07190	-0.019	-1.842
				0.020	0.011	0.61
DZCT		SCAK	KDNL	-11192.12060	0.007	1.075
				0.013	0.006	0.21
GROUP: 00005, SCDNR12_rev2.asc						
DXCT		SCLN	SCBL	-4886.22920	0.000	0.122
				0.004	0.003	0.01
DYCT		SCLN	SCBL	-33047.22790	-0.003	-0.640
				0.007	0.005	0.05
DZCT		SCLN	SCBL	-48341.97410	0.003	0.824
				0.004	0.003	0.04
GROUP: 00006, SCDNR12_rev2.asc						
DXCT		SCBL	Base3	-34270.63820	0.004	1.097
				0.005	0.004	0.11
DYCT		SCBL	Base3	4084.94370	0.005	0.605
				0.011	0.008	0.12
DZCT		SCBL	Base3	13911.69200	0.000	0.036

```

=====
                SCDNR NAD83; NAVD88 via published SC VRS
Microsearch GeoLab, V2001.9.20.0          GRS 80          UNITS: m,DMS  Page 0008
=====
Residuals (critical value = 3.487):
NOTE: Observation values shown are reduced to mark-to-mark.

```

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
				0.007	0.005	0.00
GROUP:	00007,	SCDNR12_rev2.asc				
DXCT		SCAK	SCBL	37401.74070	0.001	0.628
				0.003	0.002	0.02
DYCT		SCAK	SCBL	-15810.57560	-0.003	-0.689
				0.006	0.004	0.06
DZCT		SCAK	SCBL	-32215.95730	0.004	1.361
				0.004	0.003	0.07
GROUP:	00008,	SCDNR12_rev2.asc				
DXCT		SCLN	KOGB	38887.14200	0.006	1.249
				0.006	0.005	0.13
DYCT		SCLN	KOGB	-12126.47530	0.001	0.073
				0.013	0.009	0.01
DZCT		SCLN	KOGB	-27243.54590	-0.001	-0.184
				0.008	0.006	0.02
GROUP:	00009,	SCDNR12_rev2.asc				
DXCT		SCBL	KOGB	43773.37960	-0.002	-0.431
				0.007	0.006	0.04
DYCT		SCBL	KOGB	20920.75750	-0.001	-0.122
				0.014	0.010	0.02
DZCT		SCBL	KOGB	21098.42210	0.002	0.387
				0.009	0.006	0.05
GROUP:	00010,	SCDNR12_rev2.asc				
DXCT		SCAK	Base3	3131.10840	-0.001	-0.242
				0.004	0.003	0.03
DYCT		SCAK	Base3	-11725.63350	0.003	0.387
				0.011	0.008	0.14
DZCT		SCAK	Base3	-18304.25760	-0.004	-0.707
				0.007	0.005	0.17
GROUP:	00011,	SCDNR12_rev2.asc				
DXCT		SCED	SCSA	12378.71510	-0.001	-0.579
				0.003	0.002	0.04
DYCT		SCED	SCSA	14558.05300	0.004	0.794
				0.007	0.005	0.15
DZCT		SCED	SCSA	18795.82660	-0.003	-0.821
				0.005	0.004	0.11
GROUP:	00012,	SCDNR12_rev2.asc				
DXCT		SCED	SCAK	20923.64340	0.002	1.140
				0.003	0.001	0.05
DYCT		SCED	SCAK	-10801.40680	-0.005	-1.368
				0.006	0.004	0.16
DZCT		SCED	SCAK	-20505.70320	0.003	1.442
				0.004	0.002	0.11
GROUP:	00013,	SCDNR12_rev2.asc				
DXCT		SCED	KDNL2	-7005.06370	-0.003	-0.949
				0.004	0.003	0.08

```

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                SCDNR NAD83; NAVD88 via published SC VRS
Microsearch GeoLab, V2001.9.20.0          GRS 80          UNITS: m,DMS  Page 0009
=====
Residuals (critical value = 3.487):
NOTE: Observation values shown are reduced to mark-to-mark.

```

TYPE AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
DYCT	SCED	KDNL2	-21899.86980 0.011	0.001 0.008	0.102 0.02
DZCT	SCED	KDNL2	-31198.65740 0.007	-0.005 0.005	-0.976 0.13
GROUP: 00014, SCDNR12_rev2.asc					
DXCT	SCLN	SCSA	-50832.90290 0.004	0.001 0.003	0.396 0.02
DYCT	SCLN	SCSA	8122.81490 0.009	0.002 0.007	0.248 0.03
DZCT	SCLN	SCSA	23175.50570 0.006	-0.000 0.005	-0.057 0.01
GROUP: 00015, SCDNR12_rev2.asc					
DXCT	SCGW	SCLS	9367.36560 0.003	0.001 0.002	0.359 0.02
DYCT	SCGW	SCLS	21273.51570 0.007	0.001 0.005	0.254 0.03
DZCT	SCGW	SCLS	28991.00080 0.005	-0.001 0.004	-0.385 0.04
GROUP: 00016, SCDNR12_rev2.asc					
DXCT	SCLS	SCSA	27018.74580 0.003	0.000 0.002	0.122 0.00
DYCT	SCLS	SCSA	-26191.35980 0.008	-0.002 0.005	-0.425 0.04
DZCT	SCLS	SCSA	-43781.11360 0.005	0.002 0.003	0.523 0.03
GROUP: 00017, SCDNR12_rev2.asc					
DXCT	SCGW	SCED	24007.39700 0.002	0.001 0.001	0.811 0.03
DYCT	SCGW	SCED	-19475.89870 0.006	-0.003 0.003	-0.968 0.07
DZCT	SCGW	SCED	-33585.93950 0.004	0.003 0.002	1.496 0.07
GROUP: 00018, SCDNR12_rev2.asc					
DXCT	SCED	Base2	-31445.50240 0.004	0.004 0.003	1.598 0.13
DYCT	SCED	Base2	1979.63680 0.010	-0.007 0.007	-1.045 0.22
DZCT	SCED	Base2	9317.80110 0.007	0.012 0.005	2.401 0.35
GROUP: 00019, SCDNR12_rev2.asc					
DXCT	Base2	KDNL2	24440.43060 0.003	0.001 0.002	0.327 0.01
DYCT	Base2	KDNL2	-23879.49520 0.009	-0.003 0.005	-0.596 0.06
DZCT	Base2	KDNL2	-40516.48090 0.006	0.006 0.004	1.528 0.11


```

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                SCDNR NAD83; NAVD88 via published SC VRS
Microsearch GeoLab, V2001.9.20.0          GRS 80          UNITS: m,DMS  Page 0010
=====
Residuals (critical value = 3.487):
NOTE: Observation values shown are reduced to mark-to-mark.

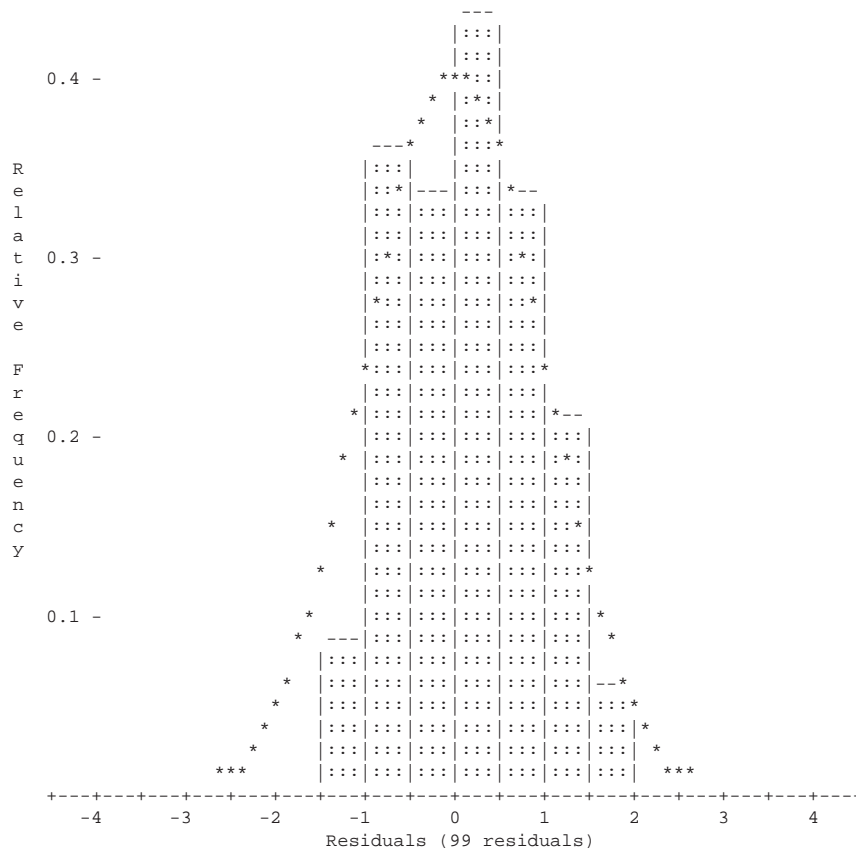
```

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
GROUP: 00020, SCDNR12_rev2.asc						
DXCT		Base2	SCGW	7438.09790 0.003	0.002 0.002	0.823 0.06
DYCT		Base2	SCGW	17496.27330 0.013	-0.001 0.010	-0.087 0.03
DZCT		Base2	SCGW	24268.11490 0.009	0.009 0.007	1.220 0.28
GROUP: 00021, SCDNR12_rev2.asc						
DXCT		SCGW	KGRD	423.38380 0.006	-0.000 0.004	-0.077 0.04
DYCT		SCGW	KGRD	4748.39940 0.018	0.010 0.012	0.830 1.23
DZCT		SCGW	KGRD	6814.60590 0.013	0.001 0.009	0.127 0.14
GROUP: 00022, SCDNR12_rev2.asc						
DXCT		Base1	SCGW	31007.90190 0.004	0.000 0.002	0.140 0.01
DYCT		Base1	SCGW	-1327.92390 0.011	-0.004 0.007	-0.615 0.13
DZCT		Base1	SCGW	-8006.93230 0.008	0.003 0.005	0.575 0.09
GROUP: 00023, SCDNR12_rev2.asc						
DXCT		Base1	SCLS	40375.26870 0.004	-0.000 0.002	-0.097 0.00
DYCT		Base1	SCLS	19945.58330 0.012	0.005 0.009	0.631 0.11
DZCT		Base1	SCLS	20984.07350 0.009	-0.004 0.006	-0.586 0.07
GROUP: 00024, SCDNR12_rev2.asc						
DXCT		SCLS	KGRD	-8943.98310 0.005	0.000 0.003	0.095 0.01
DYCT		SCLS	KGRD	-16525.09960 0.017	-0.008 0.012	-0.661 0.27
DZCT		SCLS	KGRD	-22176.39200 0.013	-0.000 0.009	-0.046 0.01
GROUP: 00025, SCDNR12_rev2.asc						
DXCT		SCAK	KDNL2	-27928.72150 0.009	0.010 0.008	1.215 0.30
DYCT		SCAK	KDNL2	-11098.45810 0.018	0.001 0.016	0.064 0.03
DZCT		SCAK	KDNL2	-10692.96630 0.015	0.003 0.014	0.251 0.11

```

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=====

S T A T I S T I C S S U M M A R Y

Residual Critical Value Type	Tau Max
Residual Critical Value	3.4866
Number of Flagged Residuals	2
Convergence Criterion	0.0010
Final Iteration Counter Value	2
Confidence Level Used	95.0000
Estimated Variance Factor	1.1622
Number of Degrees of Freedom	54

Chi-Square Test on the Variance Factor:

8.2366e-01 < 1.0000 < 1.7635e+00 ?

THE TEST PASSES

NOTE: All confidence regions were computed using the following factors:

Variance factor used	=	1.0000
1-D expansion factor	=	1.9600
2-D expansion factor	=	2.4477

Note that, for relative confidence regions, precisions are computed from the ratio of the major semi-axis and the spatial distance between the two stations.

```

=====
                SCDNR NAD83; NAVD88 via published SC VRS
Microsearch GeoLab, V2001.9.20.0                GRS 80        UNITS: m,DMS  Page 0013
=====
2-D and 1-D Station Confidence Regions (95.000 and 95.000 percent):
STATION          MAJOR SEMI-AXIS  AZ      MINOR SEMI-AXIS  VERTICAL
-----
Base1             0.012  85          0.010             0.025
Base2             0.011  89          0.010             0.021
Base3             0.012  97          0.010             0.022
KDNL              0.015 114          0.012             0.043
KDNL2             0.012  90          0.011             0.021
KGRD              0.014  57          0.012             0.033
KOGB              0.012  86          0.011             0.023
SCAK              0.010  90          0.009             0.013
SCBL              0.010  95          0.010             0.015
SCED              0.010  90          0.009             0.014
SCGW              0.010  90          0.010             0.017
SCLN              0.010  93          0.009             0.013
SCLS              0.010  95          0.010             0.016
SCSA              0.010  95          0.010             0.015
SCSM              0.011  91          0.010             0.018

```



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=====
SCDNR NAD83; NAVD88 via published SC VRS
Microsearch GeoLab, V2001.9.20.0          GRS 80          UNITS: m,DMS Page 0014
=====
2-D and 1-D Relative Station Confidence Regions (95.000 and 95.000 percent):
FROM          TO          MAJ-SEMI    AZ  MIN-SEMI    VERTICAL    DISTANCE    PPM
-----
Base1         SCGW          0.006    82    0.004    0.020    32052.524    0.19
Base1         SCLS          0.006    81    0.004    0.021    49682.190    0.13
Base2         KDNL2         0.006    98    0.005    0.017    53001.414    0.11
Base2         SCED          0.005    89    0.004    0.016    32856.657    0.16
Base2         SCGW          0.005    90    0.005    0.018    30828.342    0.18
Base3         KDNL          0.013   112    0.008    0.043    31335.046    0.41
Base3         SCAK          0.008    98    0.004    0.019    21962.245    0.35
Base3         SCBL          0.008    97    0.004    0.019    37211.535    0.22
KDNL         SCAK          0.011   117    0.008    0.041    31685.730    0.34
KDNL2        SCAK          0.008    89    0.005    0.019    31898.717    0.24
KDNL2        SCED          0.006    91    0.005    0.017    38756.055    0.16
KGRD         SCGW          0.010    53    0.007    0.030     8316.581    1.22
KGRD         SCLS          0.010    52    0.007    0.030    29066.585    0.34
KOGB         SCBL          0.009    87    0.005    0.021    52904.916    0.18
KOGB         SCLN          0.008    86    0.005    0.020    49004.822    0.17
KOGB         SCSM          0.008    85    0.006    0.024    22714.881    0.35
SCAK         SCBL          0.005    96    0.003    0.011    51833.699    0.10
SCAK         SCED          0.005    90    0.003    0.011    31224.240    0.16
SCAK         SCLN          0.005    91    0.003    0.010    48429.569    0.10
SCBL         SCLN          0.006    93    0.003    0.011    58761.730    0.10
SCED         SCGW          0.004    89    0.003    0.011    45647.355    0.09
SCED         SCSA          0.005    91    0.003    0.012    26803.966    0.17
SCGW         SCLS          0.004    88    0.003    0.013    37158.958    0.12
SCLN         SCSA          0.006    95    0.004    0.014    56454.124    0.11
SCLN         SCSM          0.007    90    0.003    0.015    44146.950    0.15
SCLS         SCSA          0.005   100    0.004    0.013    57730.285    0.09

```

Appendix III

Airborne GPS

Processing Summaries

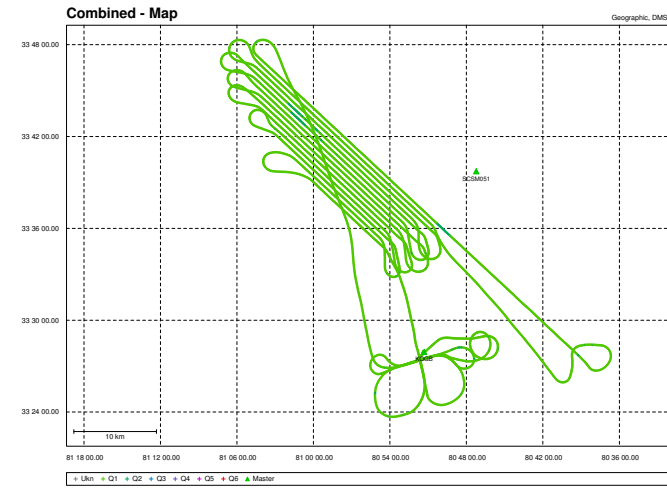


Project: Day051A

GrafNav v8.40.2410

File: Day051A.txt

GrafNav v8.40.2410



04/20/2012

Page 1

Project: Day051A

GrafNav v8.40.2410

Processing Summary Information

Program: GrafNav
 Version: 8.40.2410
 Project: J:\13639_SCDNR_2012\GRAFNAV\Day051A\Day051A.cfg

Solution Type: Combined

Number of Epochs:
 Total in GPB file: 47390
 No processed position: 37913
 Missing Fwd or Rev: 6
 With bad C/A code: 0
 With bad L1 Phase: 0

Measurement RMS Values:
 L1 Phase: 0.0134 (m)
 C/A Code: 0.58 (m)
 L1 Doppler: 1.149 (m/s)

Fwd/Rev Separation RMS Values:
 East: 0.007 (m)
 North: 0.012 (m)
 Height: 0.032 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (9471 occurrences):
 East: 0.007 (m)
 North: 0.012 (m)
 Height: 0.032 (m)

Quality Number Percentages:

Q 1: 98.2 %
 Q 2: 1.8 %
 Q 3: 0.0 %
 Q 4: 0.0 %
 Q 5: 0.0 %
 Q 6: 0.0 %

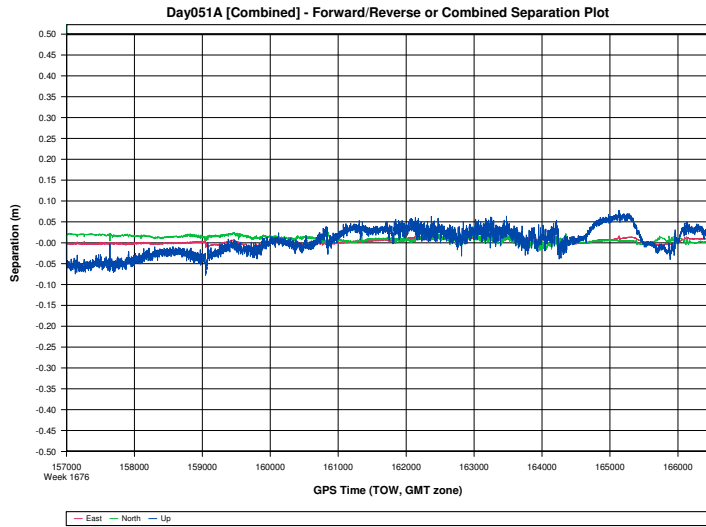
Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
 0.10 - 0.30 m: 0.0 %
 0.30 - 1.00 m: 0.0 %
 1.00 - 5.00 m: 0.0 %
 5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
 DOP over Tol: 0.0 %

Baseline Distances:

Maximum: 43.360 (km)
 Minimum: 0.108 (km)
 Average: 16.884 (km)
 First Epoch: 11.320 (km)
 Last Epoch: 10.696 (km)



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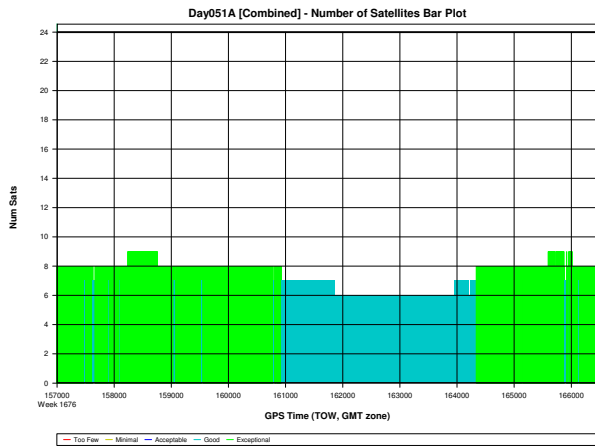
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Project: Day051A

GrafNav v8.40.2410

Project: Day051A

GrafNav v8.40.2410

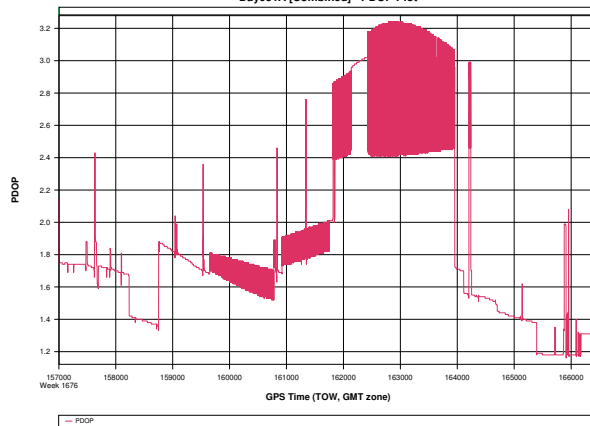


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Day051A [Combined] - PDOP Plot



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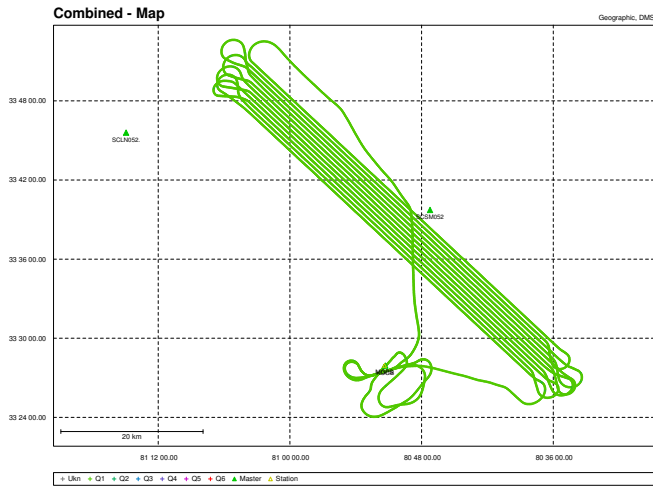


Project: Day052A

GrafNav v8.40.2410

File: Day052A.txt

GrafNav v8



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Project: Day052A

GrafNav v8.40.2410

Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day052A\Day052A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 71816
No processed position: 57453
Missing Fwd or Rev: 7
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0178 (m)
C/A Code: 0.60 (m)
L1 Doppler: 1.162 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.014 (m)
North: 0.007 (m)
Height: 0.033 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (14356 occurrences):
East: 0.014 (m)
North: 0.007 (m)
Height: 0.033 (m)

Quality Number Percentages:

Q 1: 99.8 %
Q 2: 0.2 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

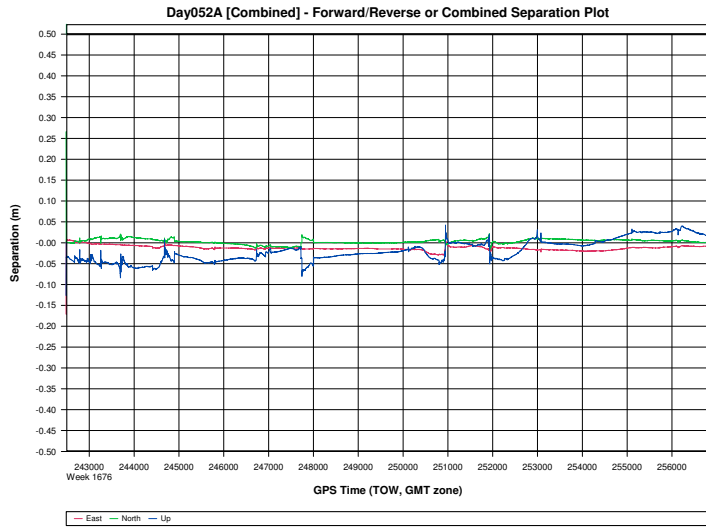
Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.0 %

Baseline Distances:

Maximum: 44.107 (km)
Minimum: 0.095 (km)
Average: 21.670 (km)
First Epoch: 20.731 (km)
Last Epoch: 20.153 (km)



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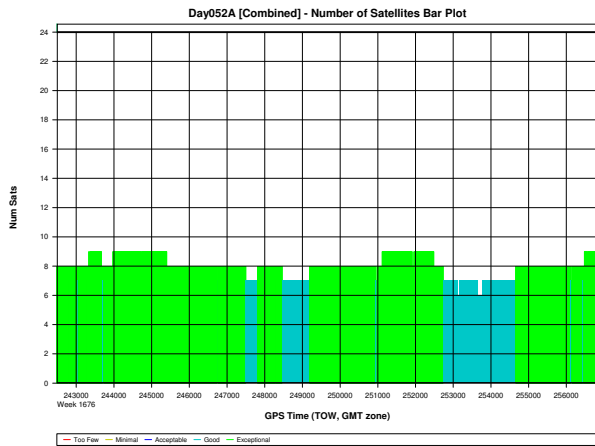
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Project: Day052A

GrafNav v8.40.2410

Project: Day052A

GrafNav v8.40.2410



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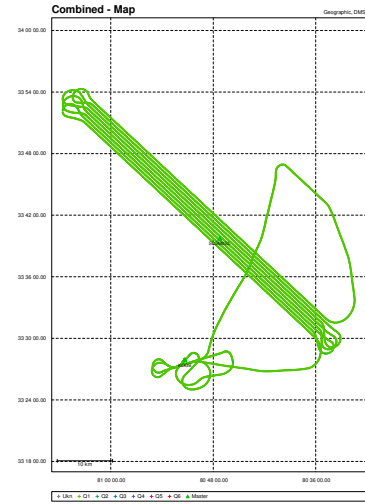
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Project: Day053AA GrafNav v8.40.2410

File: Day053AA.txt

GrafNav v8



Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day053A\Day053AA.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 57169
No processed position: 45737
Missing Fwd or Rev: 6
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0168 (m)
C/A Code: 0.63 (m)
L1 Doppler: 1.099 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.008 (m)
North: 0.014 (m)
Height: 0.048 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (11425 occurrences):
East: 0.007 (m)
North: 0.014 (m)
Height: 0.047 (m)

Quality Number Percentages:

Q 1: 99.7 %
Q 2: 0.3 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m: 99.7 %
0.10 - 0.30 m: 0.3 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

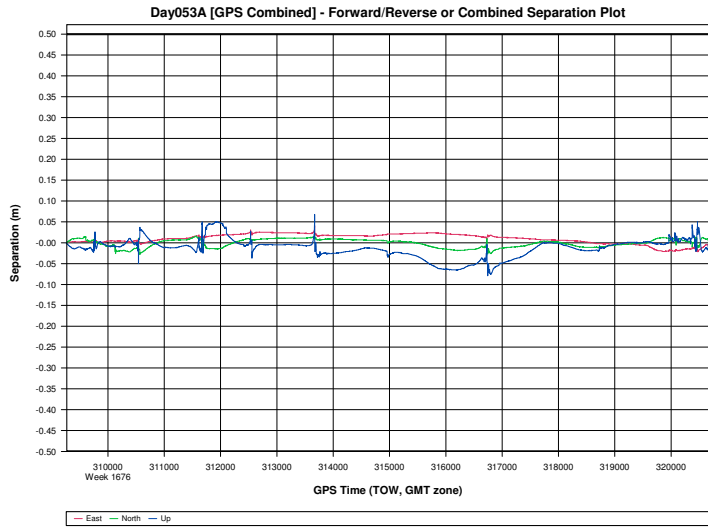
Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.2 %

Baseline Distances:

Maximum: 47.575 (km)
Minimum: 2.223 (km)
Average: 21.686 (km)
First Epoch: 10.671 (km)
Last Epoch: 3.653 (km)

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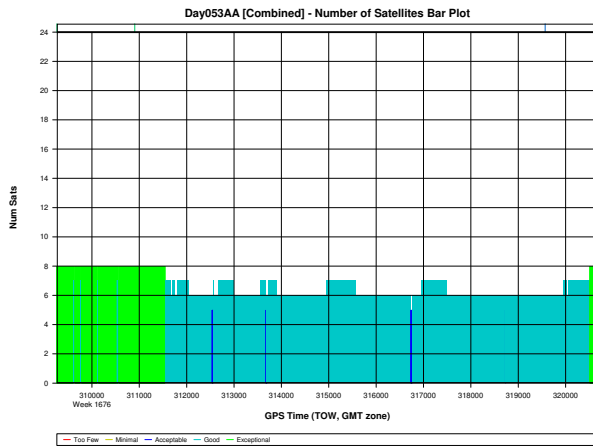
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Project: Day053AA

GrafNav v8.40.2410

Project: Day053AA

GrafNav v8.40.2410

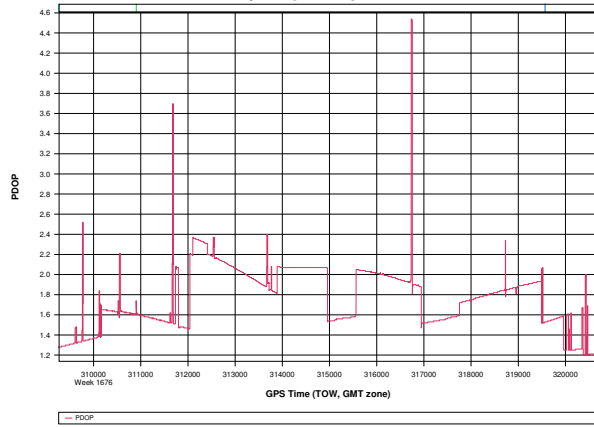


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Day053AA [Combined] - PDOP Plot

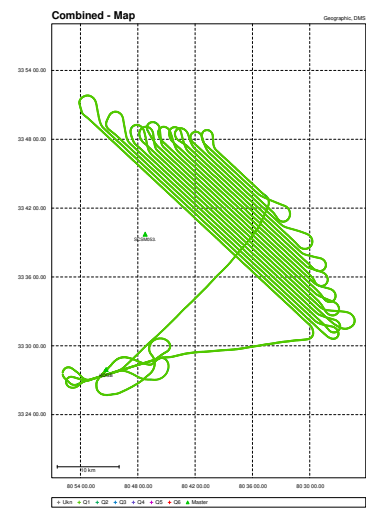


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Project: Day053B GrafNav v8.40.2410

File: Day053B.txt

GrafNav v8



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 Project: Day053B GrafNav v8.40.2410

Processing Summary Information

Program: GrafNav
 Version: 8.40.2410
 Project: J:\13639_SCDNR_2012\GRAFNAV\Day053B\Day053B.cfg

Solution Type: Combined

Number of Epochs:
 Total in GPB file: 76619
 No processed position: 61296
 Missing Fwd or Rev: 6
 With bad C/A code: 0
 With bad L1 Phase: 0

Measurement RMS Values:
 L1 Phase: 0.0163 (m)
 C/A Code: 0.60 (m)
 L1 Doppler: 1.202 (m/s)

Fwd/Rev Separation RMS Values:
 East: 0.007 (m)
 North: 0.006 (m)
 Height: 0.025 (m)

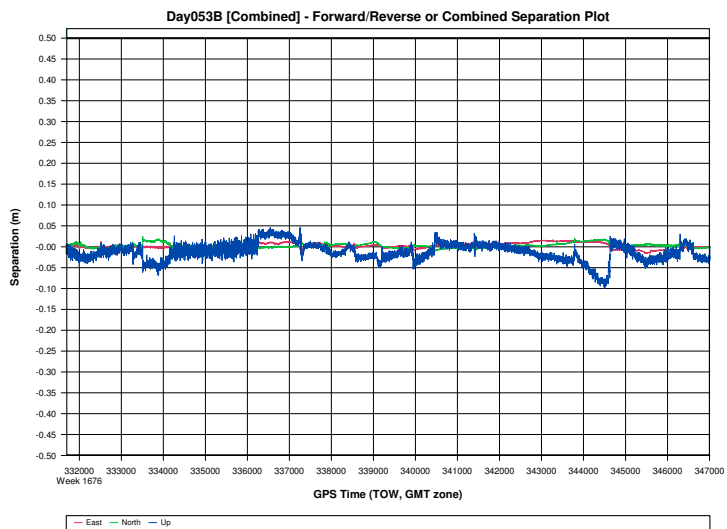
Fwd/Rev Sep. RMS for dual FWD/REV fixes (15317 occurrences):
 East: 0.007 (m)
 North: 0.006 (m)
 Height: 0.025 (m)

Quality Number Percentages:
 Q 1: 99.8 %
 Q 2: 0.2 %
 Q 3: 0.0 %
 Q 4: 0.0 %
 Q 5: 0.0 %
 Q 6: 0.0 %

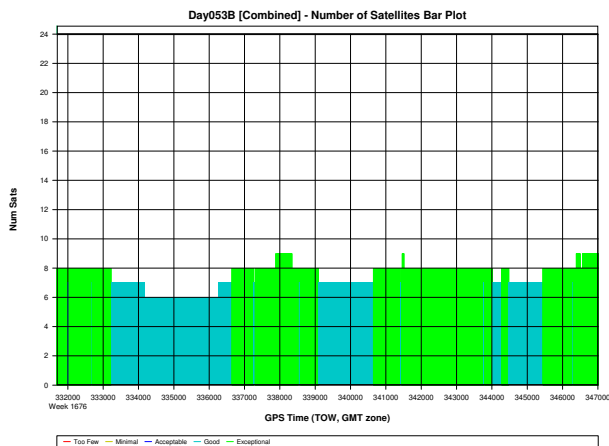
Position Standard Deviation Percentages:
 0.00 - 0.10 m: 100.0 %
 0.10 - 0.30 m: 0.0 %
 0.30 - 1.00 m: 0.0 %
 1.00 - 5.00 m: 0.0 %
 5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
 DOP over Tol: 0.0 %

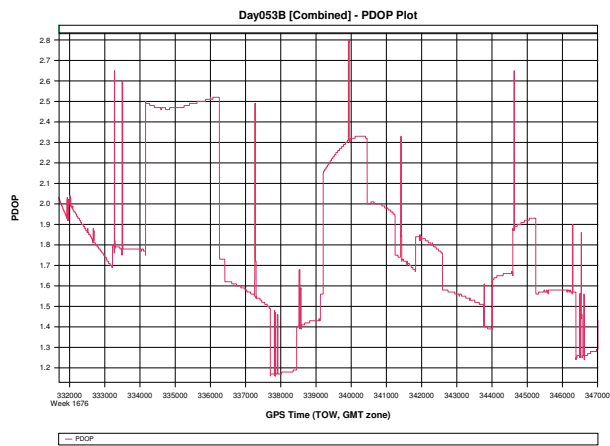
Baseline Distances:
 Maximum: 37.549 (km)
 Minimum: 0.084 (km)
 Average: 23.156 (km)
 First Epoch: 11.315 (km)
 Last Epoch: 0.096 (km)



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 Project: Day053B GrafNav v8.40.2410 Project: Day053B GrafNav v8.40.2410



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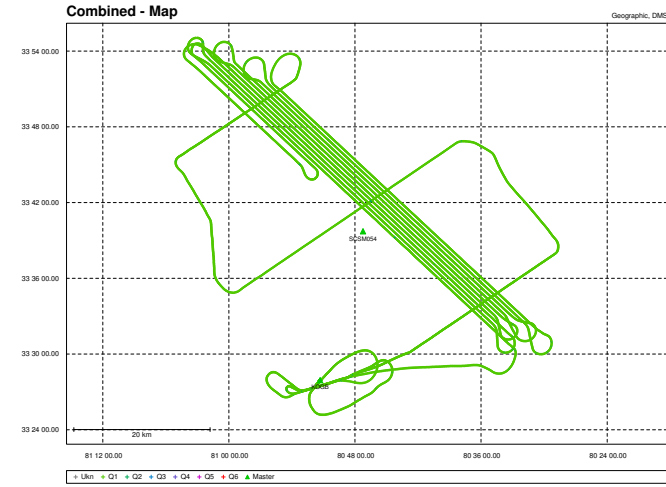


Project: Day054A

GrafNav v8.40.2410

File: Day054A.txt

GrafNav v8.40.2410

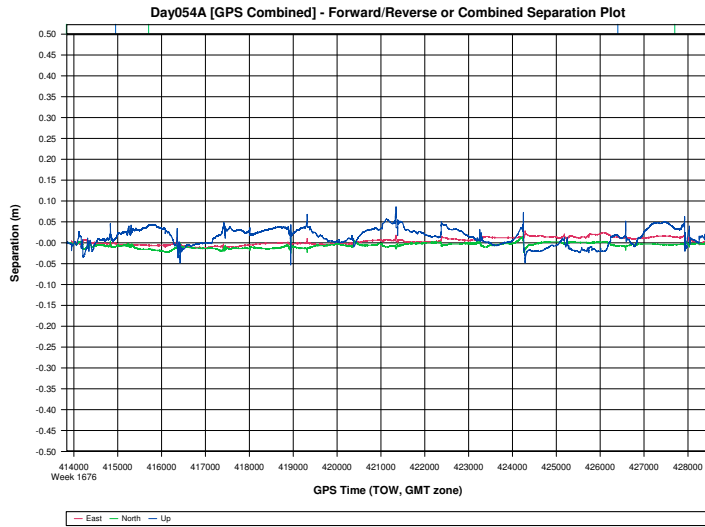


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Project: Day054A

GrafNav v8.40.2410



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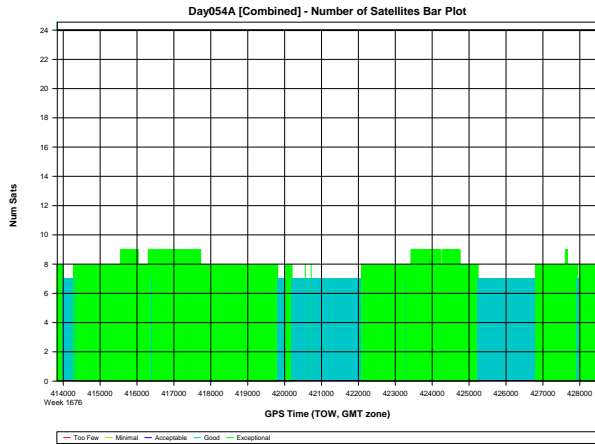
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Project: Day054A

GrafNav v8.40.2410

Project: Day054A

GrafNav v8.40.2410



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Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day054A\Day054A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 73397
No processed position: 58720
Missing Fwd or Rev: 5
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0185 (m)
C/A Code: 0.60 (m)
L1 Doppler: 1.216 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.009 (m)
North: 0.008 (m)
Height: 0.039 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (14671 occurrences):
East: 0.009 (m)
North: 0.007 (m)
Height: 0.039 (m)

Quality Number Percentages:

Q 1: 99.7 %
Q 2: 0.3 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

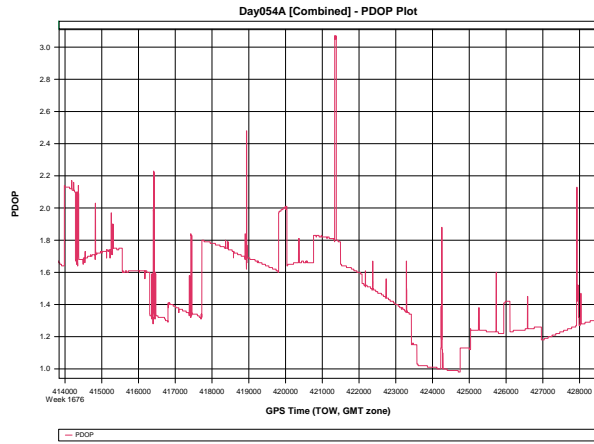
0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:

DOP over Tol: 0.0 %

Baseline Distances:

Maximum: 46.746 (km)
Minimum: 0.094 (km)
Average: 23.422 (km)
First Epoch: 10,049 (km)
Last Epoch: 9,993 (km)



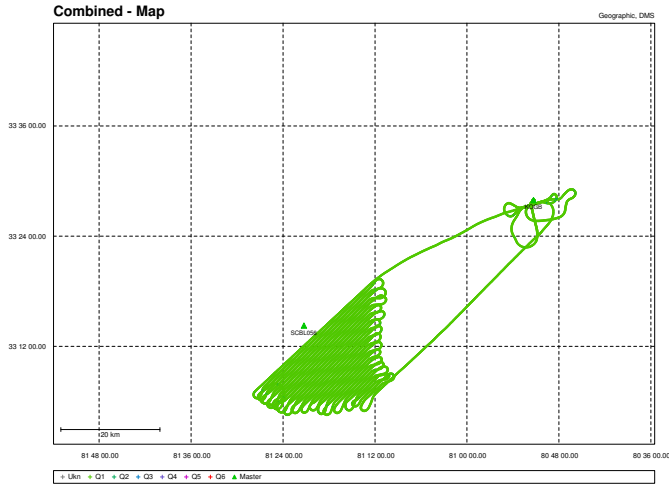


Project: Day056A

GrafNav v8.40.2410

File: Day056A.txt

GrafNav v8



Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day056A\Day056A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 74968
No processed position: 59976
Missing Fwd or Rev: 6
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0159 (m)
C/A Code: 0.64 (m)
L1 Doppler: 1.237 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.013 (m)
North: 0.012 (m)
Height: 0.033 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (14986 occurrences):
East: 0.013 (m)
North: 0.012 (m)
Height: 0.033 (m)

Quality Number Percentages:

Q 1: 99.5 %
Q 2: 0.5 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m: 99.8 %
0.10 - 0.30 m: 0.2 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.0 %

Baseline Distances:

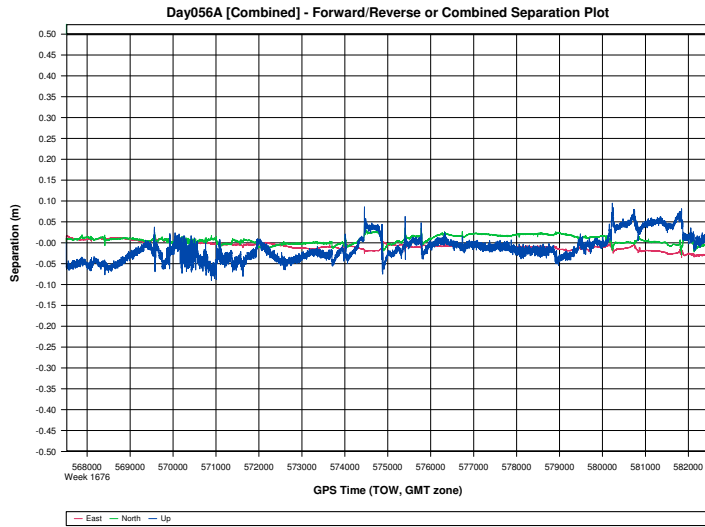
Maximum: 60.282 (km)
Minimum: 0.107 (km)
Average: 25.655 (km)
First Epoch: 25.716 (km)
Last Epoch: 25.809 (km)

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Project: Day056A

GrafNav v8.40.2410



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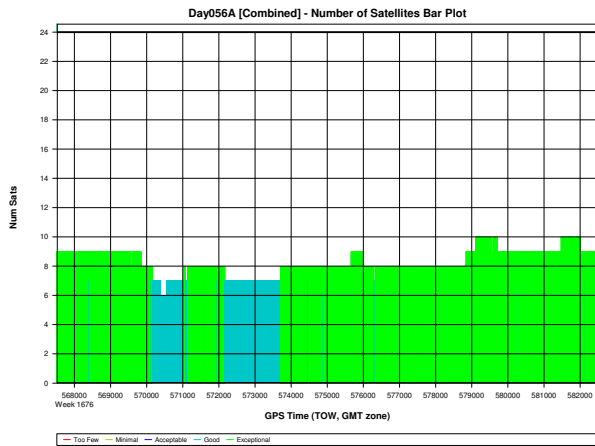
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Project: Day056A

GrafNav v8.40.2410

Project: Day056A

GrafNav v8.40.2410



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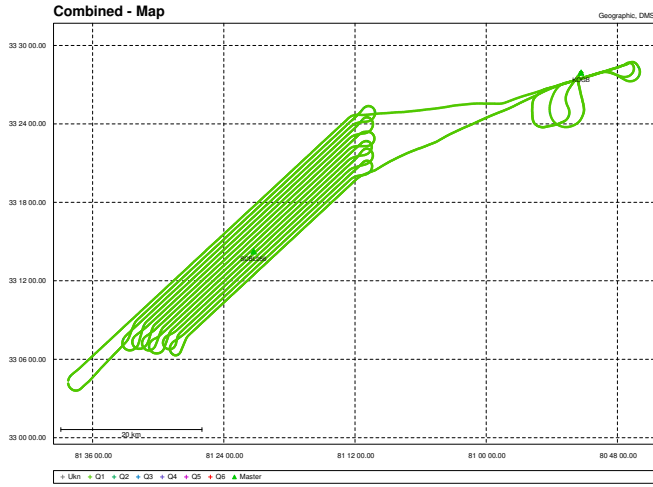


Project: Day056B

GrafNav v8.40.2410

File: Day056B.txt

GrafNav v8.40.2410



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Project: Day056B

GrafNav v8.40.2410

Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day056B\Day056B.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 62714
No processed position: 50173
Missing Fwd or Rev: 5
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0152 (m)
C/A Code: 0.64 (m)
L1 Doppler: 1.176 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.020 (m)
North: 0.017 (m)
Height: 0.037 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (12535 occurrences):
East: 0.019 (m)
North: 0.017 (m)
Height: 0.036 (m)

Quality Number Percentages:

Q 1: 99.7 %
Q 2: 0.3 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

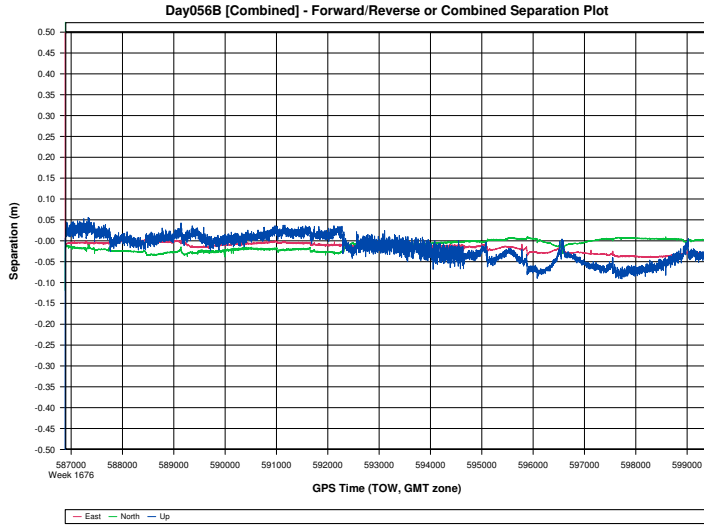
0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:

DOP over Tol: 0.0 %

Baseline Distances:

Maximum: 69.554 (km)
Minimum: 0.094 (km)
Average: 25.587 (km)
First Epoch: 25.712 (km)
Last Epoch: 25.141 (km)



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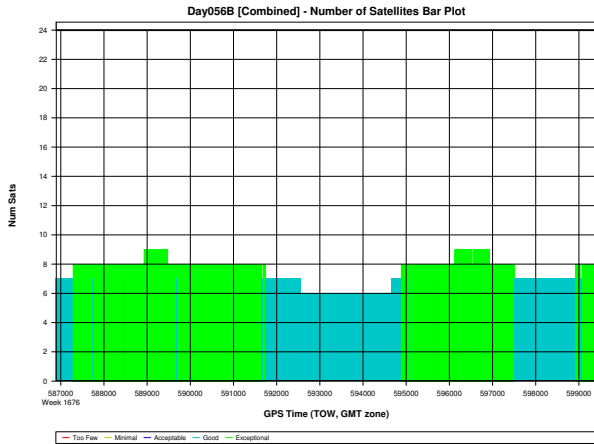
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Project: Day056B

GrafNav v8.40.2410

Project: Day056B

GrafNav v8.40.2410



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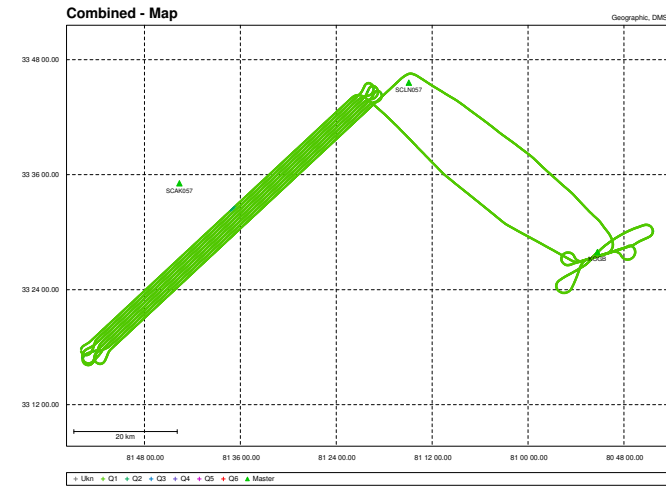


Project: Day057A

GrafNav v8.40.2410

File: Day057A.txt

GrafNav v8.40.2410

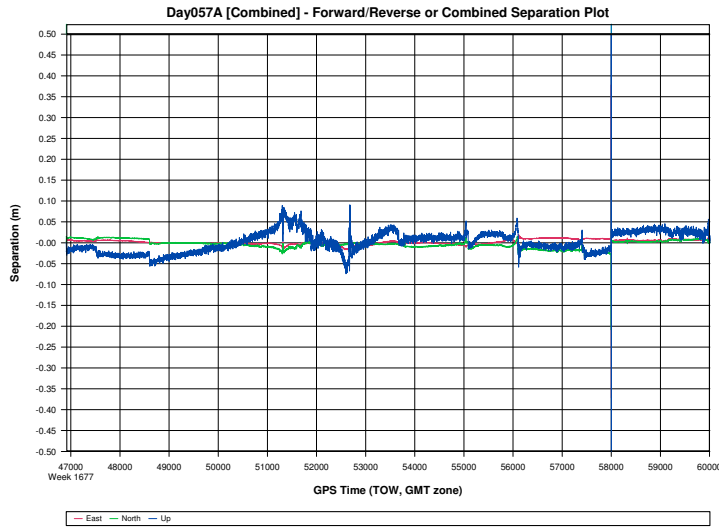


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Project: Day057A

GrafNav v8.40.2410



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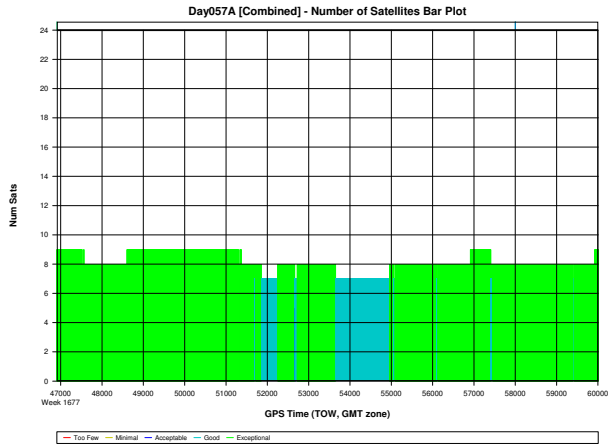
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Project: Day057A

GrafNav v8.40.2410

Project: Day057A

GrafNav v8.40.2410



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Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day057A\Day057A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 65530
No processed position: 52426
Missing Fwd or Rev: 6
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0169 (m)
C/A Code: 0.58 (m)
L1 Doppler: 1.163 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.007 (m)
North: 0.011 (m)
Height: 0.030 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (13096 occurrences):
East: 0.006 (m)
North: 0.010 (m)
Height: 0.025 (m)

Quality Number Percentages:

Q 1: 99.7 %
Q 2: 0.3 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

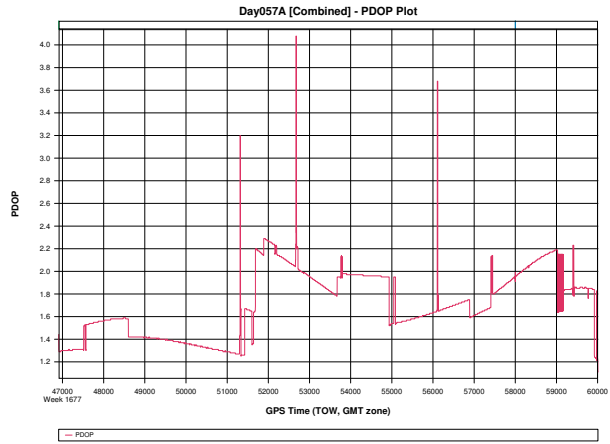
Position Standard Deviation Percentages:

0.00 - 0.10 m: 99.8 %
0.10 - 0.30 m: 0.2 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.1 %

Baseline Distances:

Maximum: 70.154 (km)
Minimum: 6.456 (km)
Average: 34.368 (km)
First Epoch: 40.598 (km)
Last Epoch: 40.688 (km)



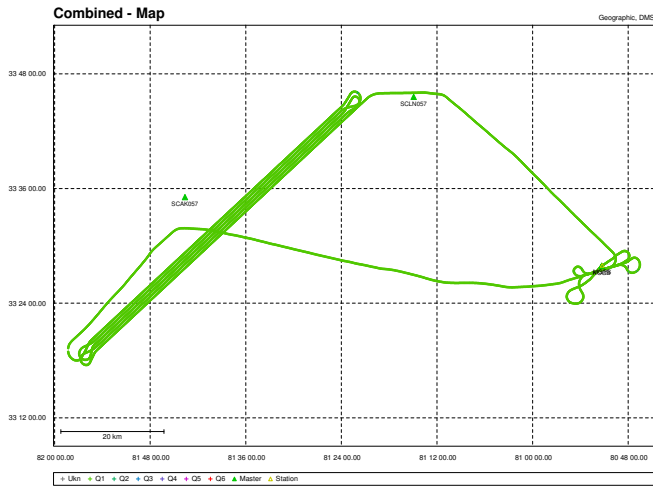


Project: Day057B

GrafNav v8.40.2410

File: Day057B.txt

GrafNav v8.40.2410



Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day057B\Day057B.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 49792
No processed position: 39836
Missing Fwd or Rev: 7
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0146 (m)
C/A Code: 0.58 (m)
L1 Doppler: 1.082 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.020 (m)
North: 0.010 (m)
Height: 0.033 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (9949 occurrences):
East: 0.020 (m)
North: 0.010 (m)
Height: 0.033 (m)

Quality Number Percentages:

Q 1: 99.8 %
Q 2: 0.2 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.0 %

Baseline Distances:

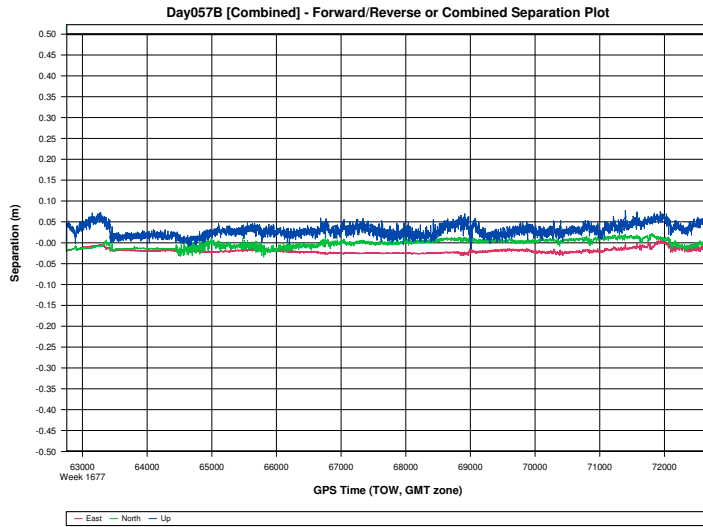
Maximum: 73.300 (km)
Minimum: 14.573 (km)
Average: 36.521 (km)
First Epoch: 40.581 (km)
Last Epoch: 40.604 (km)

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Project: Day057B

GrafNav v8.40.2410



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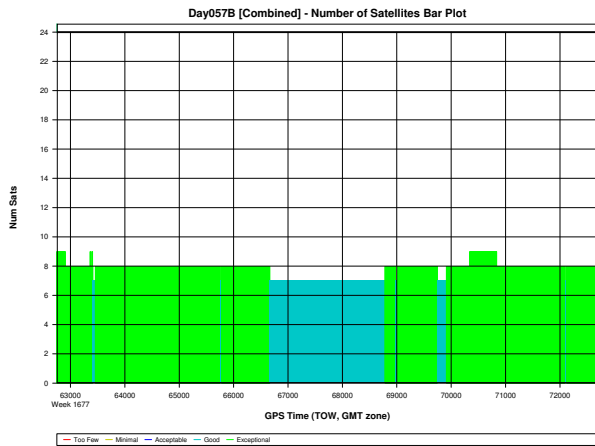
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Project: Day057B

GrafNav v8.40.2410

Project: Day057B

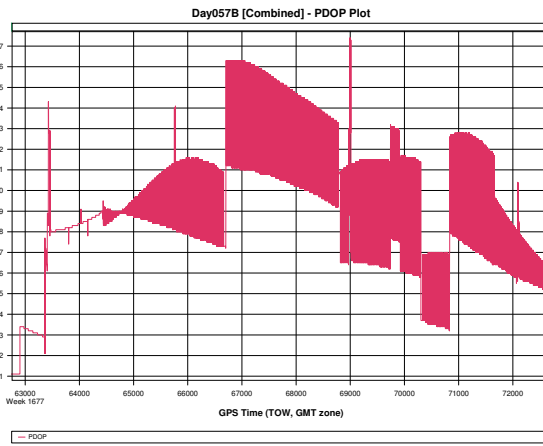
GrafNav v8.40.2410



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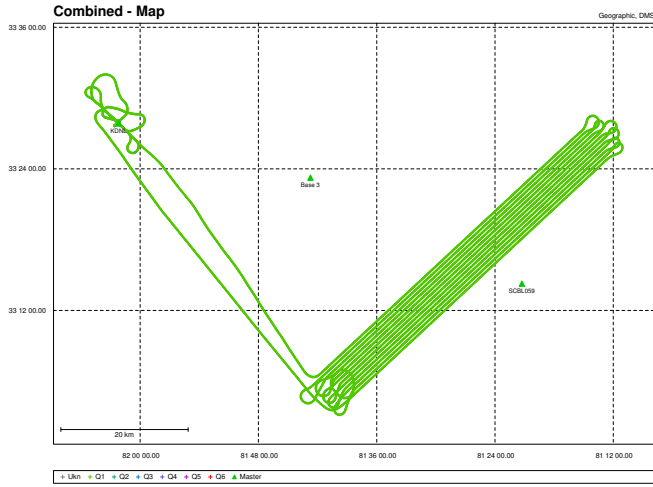


Project: Day059B

GrafNav v8.40.2410

File: Day059B.txt

GrafNav v8

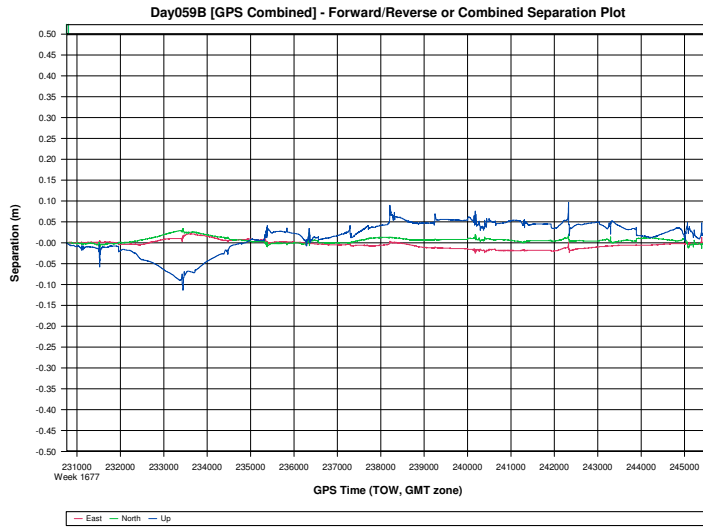


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Project: Day059B

GrafNav v8.40.2410



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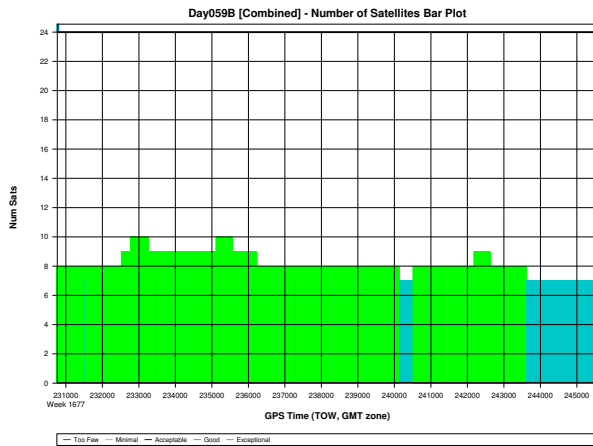
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Project: Day059B

GrafNav v8.40.2410

Project: Day059B

GrafNav v8.40.2410



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Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day059B\Day059B.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 74187
No processed position: 59352
Missing Fwd or Rev: 7
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0168 (m)
C/A Code: 0.62 (m)
L1 Doppler: 1.181 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.013 (m)
North: 0.022 (m)
Height: 0.048 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (14827 occurrences):
East: 0.012 (m)
North: 0.021 (m)
Height: 0.047 (m)

Quality Number Percentages:

Q 1: 99.4 %
Q 2: 0.6 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

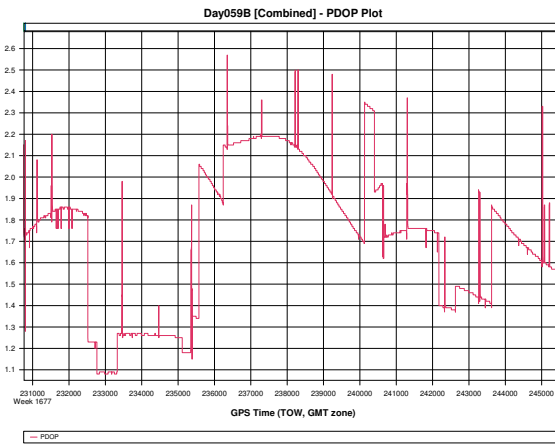
0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:

DOP over Tol: 0.0 %

Baseline Distances:

Maximum: 59.358 (km)
Minimum: 12.541 (km)
Average: 30.161 (km)
First Epoch: 32.099 (km)
Last Epoch: 32.341 (km)



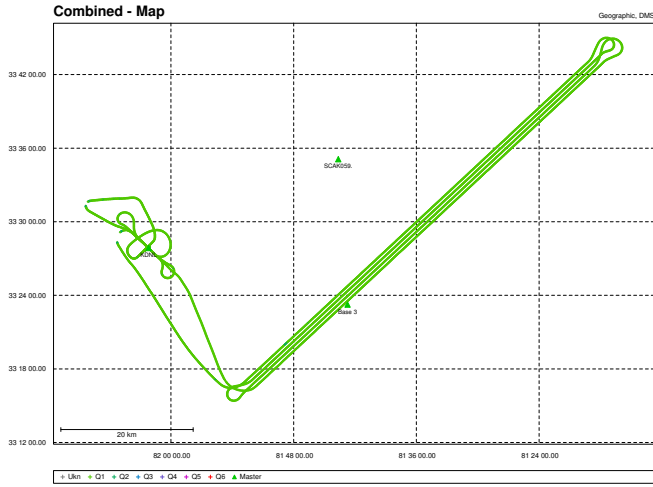


Project: Day059C

GrafNav v8.40.2410

File: Day059C.txt

GrafNav v8



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Project: Day059C

GrafNav v8.40.2410

Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day059C\Day059C.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 33841
No processed position: 27112
Missing Fwd or Rev: 4
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0122 (m)
C/A Code: 0.56 (m)
L1 Doppler: 1.004 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.022 (m)
North: 0.012 (m)
Height: 0.058 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (6705 occurrences):
East: 0.009 (m)
North: 0.004 (m)
Height: 0.016 (m)

Quality Number Percentages:

Q 1: 98.3 %
Q 2: 1.7 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

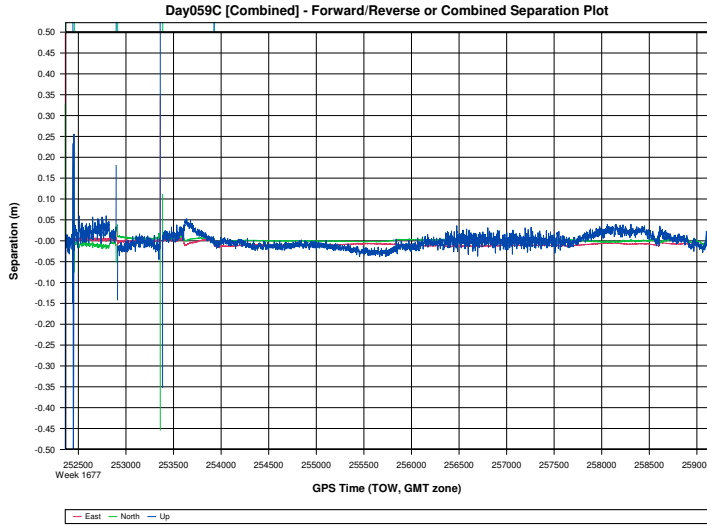
Position Standard Deviation Percentages:

0.00 - 0.10 m: 99.9 %
0.10 - 0.30 m: 0.1 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.1 %

Baseline Distances:

Maximum: 59.194 (km)
Minimum: 0.178 (km)
Average: 26.170 (km)
First Epoch: 19.394 (km)
Last Epoch: 19.500 (km)



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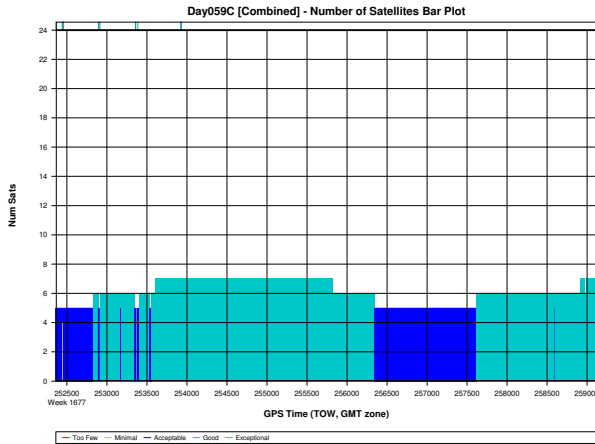
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Project: Day059C

GrafNav v8.40.2410

Project: Day059C

GrafNav v8.40.2410



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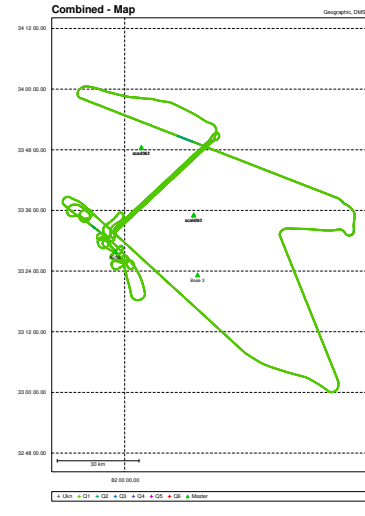
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Project: Day061A GrafNav v8.40.2410

File: Day061A.txt

GrafNav v8



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Project: Day061A GrafNav v8.40.2410

Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day061A\Day061A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 60759
No processed position: 48608
Missing Fwd or Rev: 5
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0178 (m)
C/A Code: 0.59 (m)
L1 Doppler: 1.150 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.026 (m)
North: 0.022 (m)
Height: 0.030 (m)

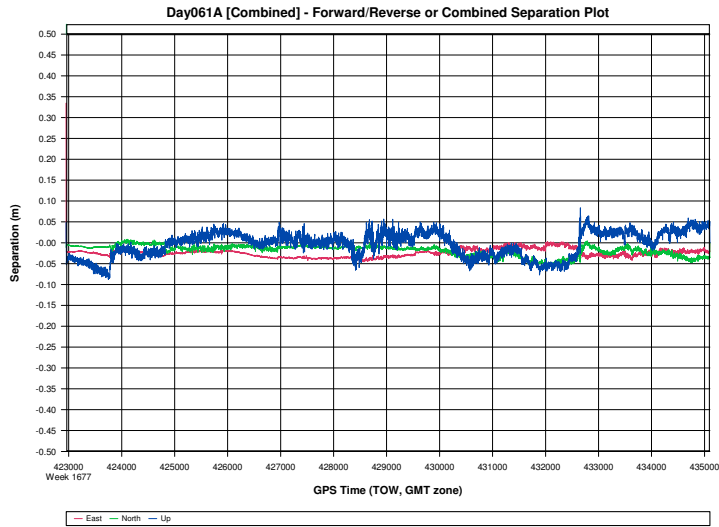
Fwd/Rev Sep. RMS for dual FWD/REV fixes (12145 occurrences):
East: 0.026 (m)
North: 0.022 (m)
Height: 0.030 (m)

Quality Number Percentages:
Q 1: 97.8 %
Q 2: 2.2 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:
0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

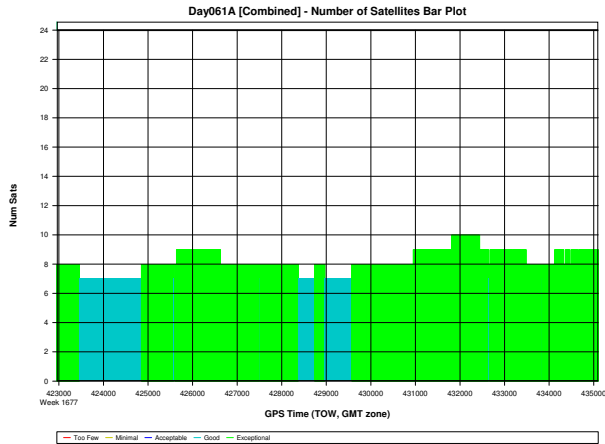
Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.0 %

Baseline Distances:
Maximum: 88.418 (km)
Minimum: 0.165 (km)
Average: 32.380 (km)
First Epoch: 20.537 (km)
Last Epoch: 0.165 (km)

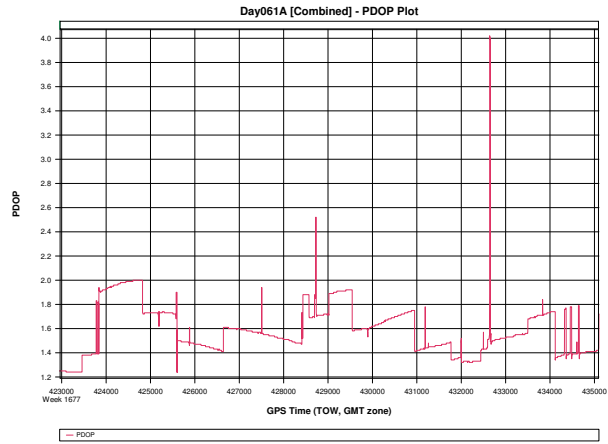


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Project: Day061A GrafNav v8.40.2410

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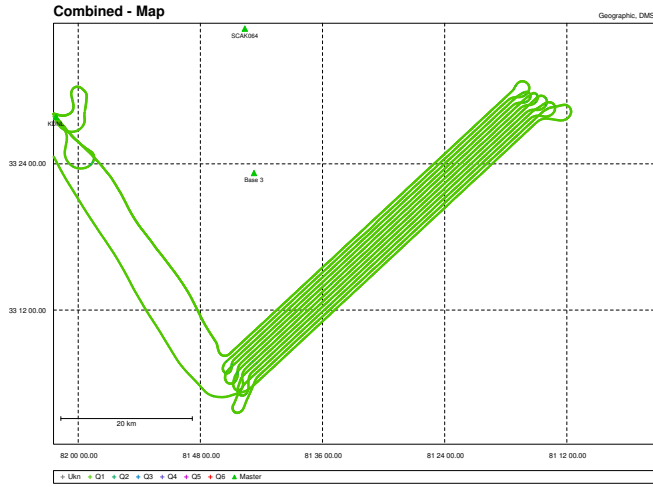


Project: Day064A

GrafNav v8.40.2410

File: Day064A.txt

GrafNav v8



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Project: Day064A

GrafNav v8.40.2410

Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day064A\Day064A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 73071
No processed position: 58462
Missing Fwd or Rev: 5
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0166 (m)
C/A Code: 0.63 (m)
L1 Doppler: 1.213 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.009 (m)
North: 0.011 (m)
Height: 0.033 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (14603 occurrences):
East: 0.009 (m)
North: 0.010 (m)
Height: 0.026 (m)

Quality Number Percentages:

Q 1: 99.6 %
Q 2: 0.4 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

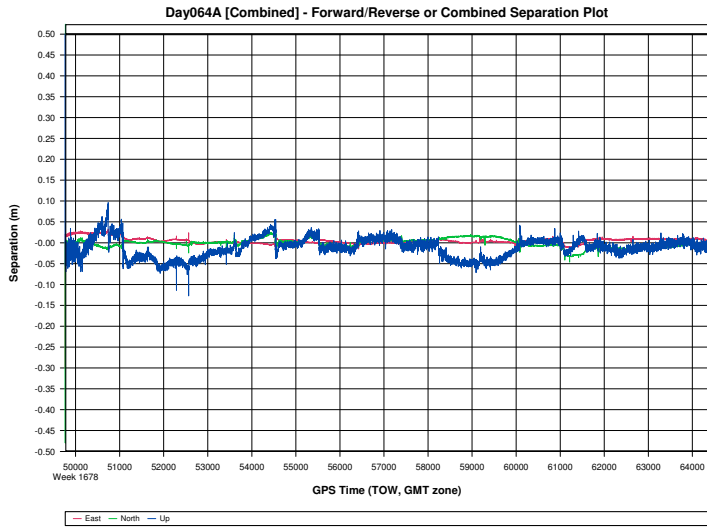
0.00 - 0.10 m: 99.7 %
0.10 - 0.30 m: 0.3 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:

DOP over Tol: 0.2 %

Baseline Distances:

Maximum: 69.569 (km)
Minimum: 7.504 (km)
Average: 35.710 (km)
First Epoch: 19.491 (km)
Last Epoch: 19.503 (km)



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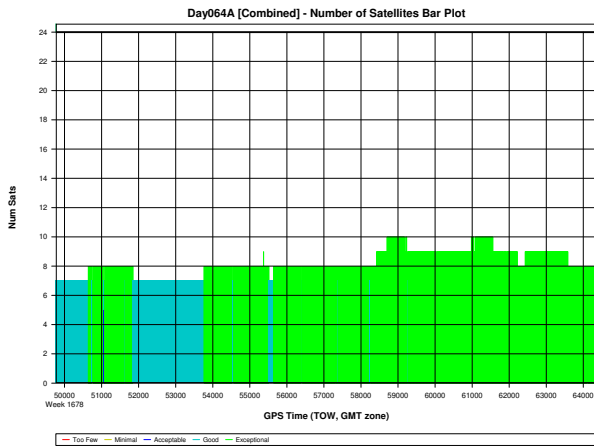
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Project: Day064A

GrafNav v8.40.2410

Project: Day064A

GrafNav v8.40.2410

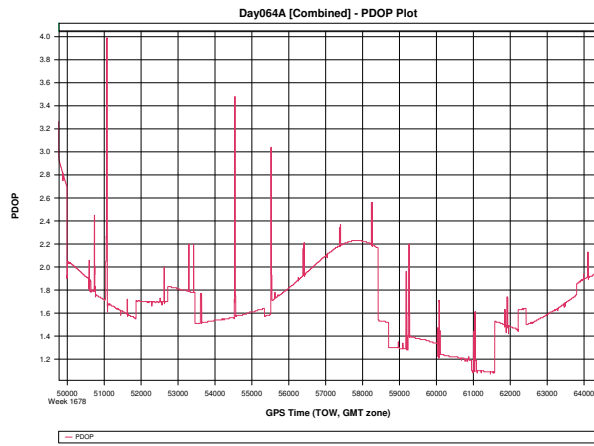


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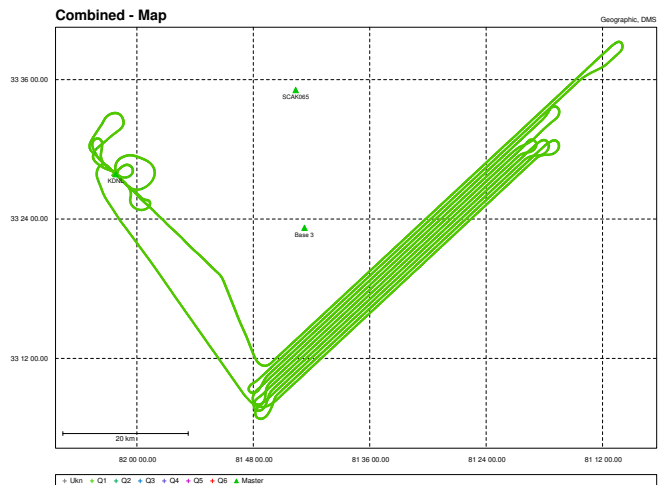


Project: Day064B

GrafNav v8.40.2410

File: Day064B.txt

GrafNav v8.40.2410



Processing Summary Information

Program: GrafNav
 Version: 8.40.2410
 Project: J:\13639_SCDNR_2012\GRAFNAV\Day064B\Day064B.cfg

Solution Type: Combined

Number of Epochs:
 Total in GPB file: 68918
 No processed position: 55136
 Missing Fwd or Rev: 6
 With bad C/A code: 0
 With bad L1 Phase: 0

Measurement RMS Values:
 L1 Phase: 0.0170 (m)
 C/A Code: 0.58 (m)
 L1 Doppler: 1.227 (m/s)

Fwd/Rev Separation RMS Values:
 East: 0.006 (m)
 North: 0.007 (m)
 Height: 0.026 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (13776 occurrences):
 East: 0.006 (m)
 North: 0.007 (m)
 Height: 0.026 (m)

Quality Number Percentages:

Q 1: 99.8 %
 Q 2: 0.2 %
 Q 3: 0.0 %
 Q 4: 0.0 %
 Q 5: 0.0 %
 Q 6: 0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
 0.10 - 0.30 m: 0.0 %
 0.30 - 1.00 m: 0.0 %
 1.00 - 5.00 m: 0.0 %
 5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:

DOP over Tol: 0.1 %

Baseline Distances:

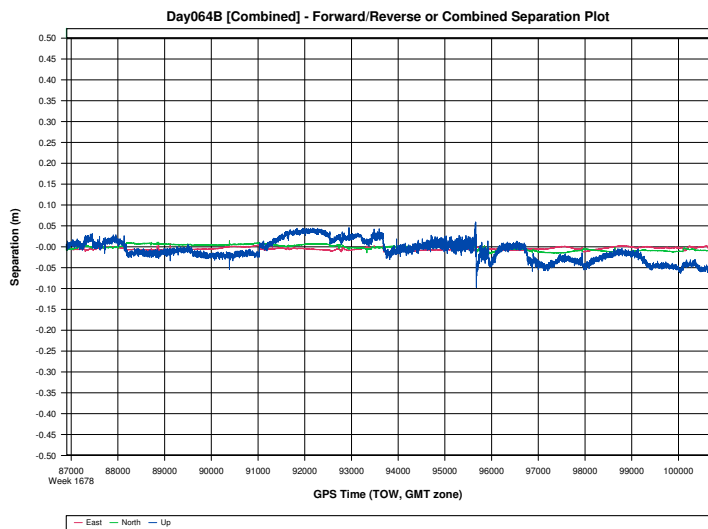
Maximum: 71.445 (km)
 Minimum: 10.019 (km)
 Average: 32.242 (km)
 First Epoch: 20.067 (km)
 Last Epoch: 20.349 (km)

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Project: Day064B

GrafNav v8.40.2410



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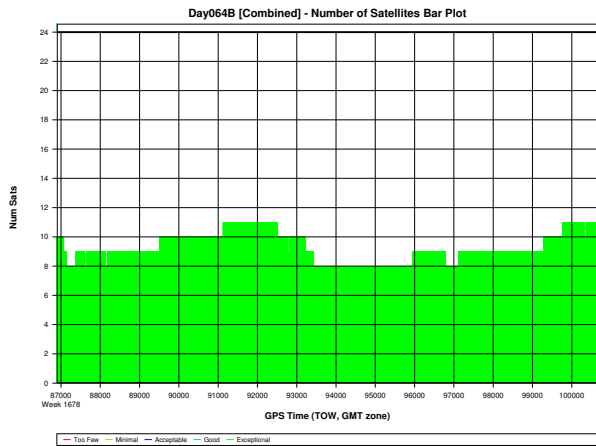
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Project: Day064B

GrafNav v8.40.2410

Project: Day064B

GrafNav v8.40.2410

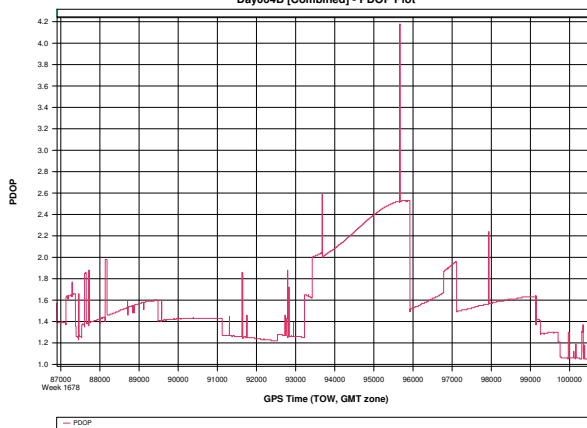


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Day064B [Combined] - PDOP Plot



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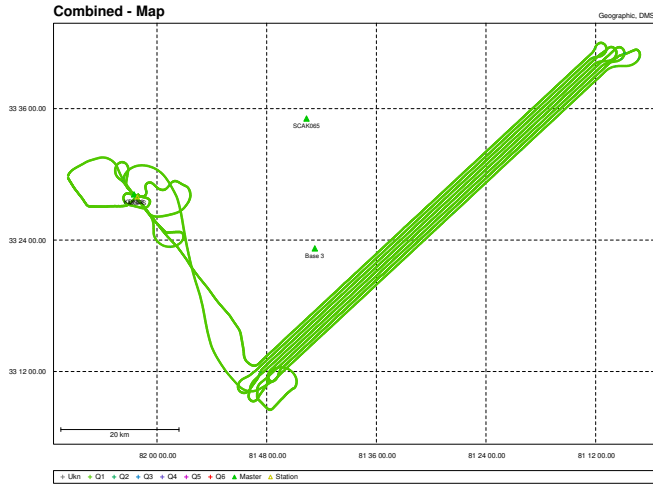


Project: Day065A

GrafNav v8.40.2410

File: Day065A.txt

GrafNav v8

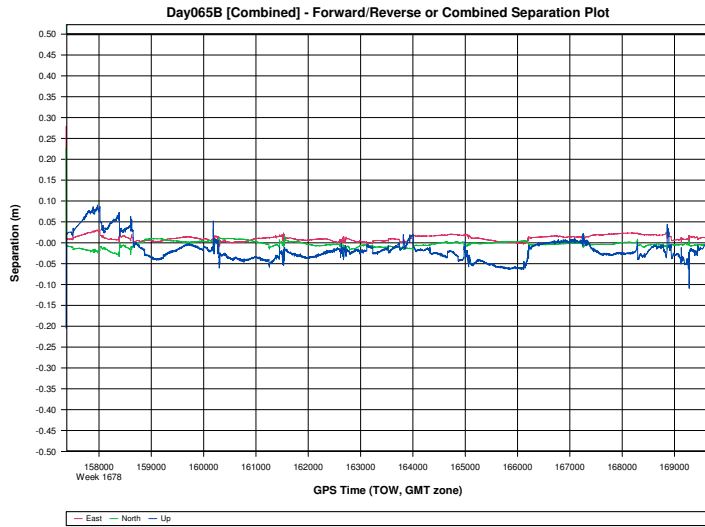


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Project: Day065B

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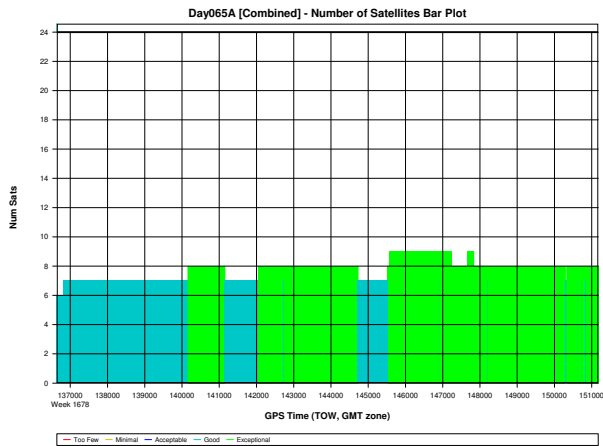
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Project: Day065A

GrafNav v8.40.2410

Project: Day065A

GrafNav v8.40.2410



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Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day065A\Day065A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 72701
No processed position: 58162
Missing Fwd or Rev: 6
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0149 (m)
C/A Code: 0.60 (m)
L1 Doppler: 1.178 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.013 (m)
North: 0.016 (m)
Height: 0.031 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (14532 occurrences):
East: 0.012 (m)
North: 0.016 (m)
Height: 0.031 (m)

Quality Number Percentages:

Q 1: 99.8 %
Q 2: 0.2 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

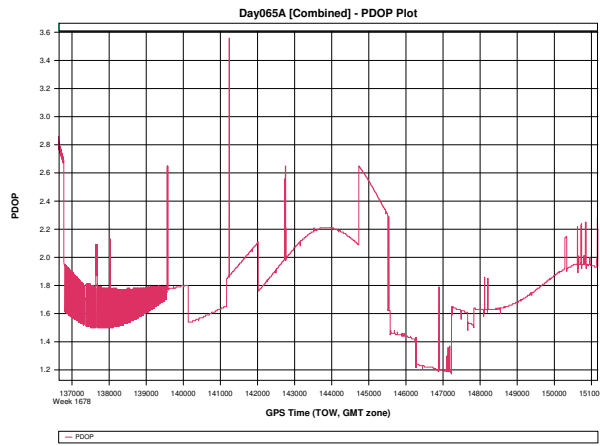
0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:

DOP over Tol: 0.0 %

Baseline Distances:

Maximum: 85.297 (km)
Minimum: 6.356 (km)
Average: 33.321 (km)
First Epoch: 19.298 (km)
Last Epoch: 19.349 (km)



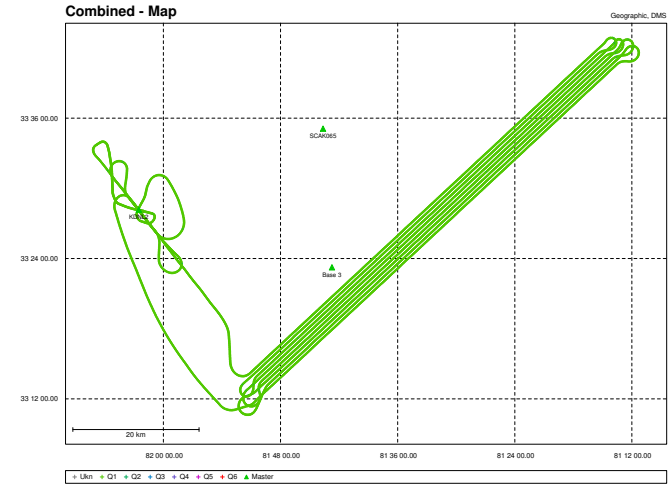


Project: Day065B

GrafNav v8.40.2410

File: Day065B.txt

GrafNav v8

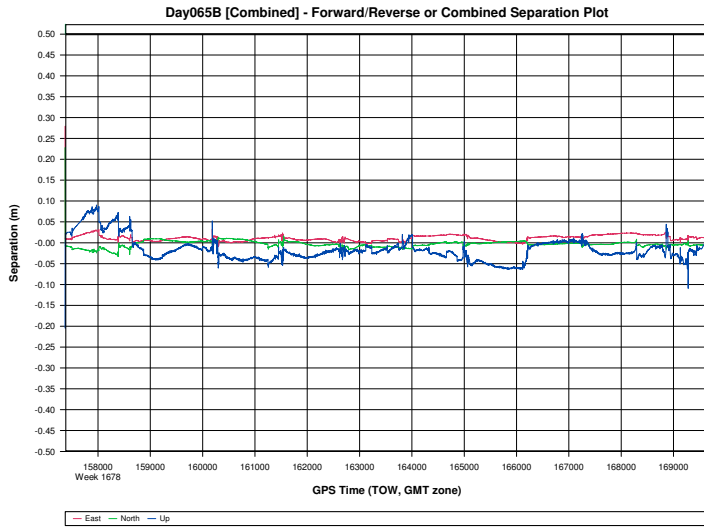


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Project: Day065B

GrafNav v8.40.2410



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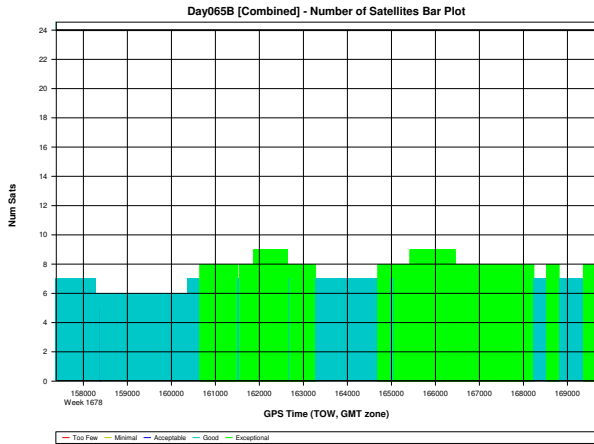
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Project: Day065B

GrafNav v8.40.2410

Project: Day065B

GrafNav v8.40.2410



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Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day065B\Day065B.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 61534
No processed position: 49228
Missing Fwd or Rev: 5
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0143 (m)
C/A Code: 0.58 (m)
L1 Doppler: 1.124 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.006 (m)
North: 0.009 (m)
Height: 0.036 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (12300 occurrences):
East: 0.006 (m)
North: 0.007 (m)
Height: 0.036 (m)

Quality Number Percentages:

Q 1: 99.7 %
Q 2: 0.3 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

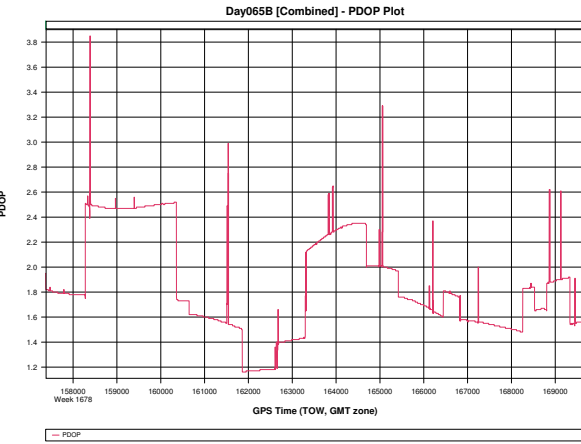
Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.1 %

Baseline Distances:

Maximum: 65.288 (km)
Minimum: 9.663 (km)
Average: 30.634 (km)
First Epoch: 19.366 (km)
Last Epoch: 19.391 (km)



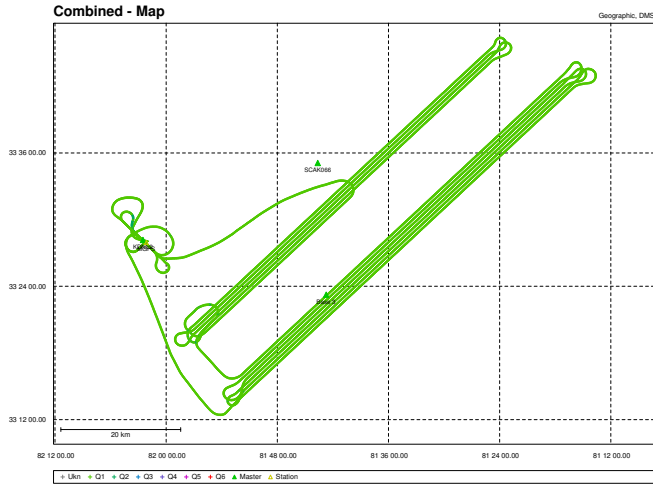


Project: Day065C

GrafNav v8.40.2410

File: Day065C.txt

GrafNav v8.40.2410

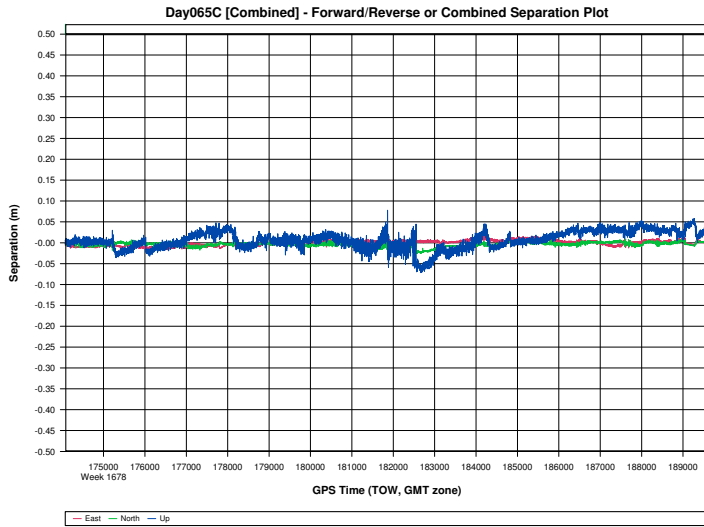


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Project: Day065C

GrafNav v8.40.2410



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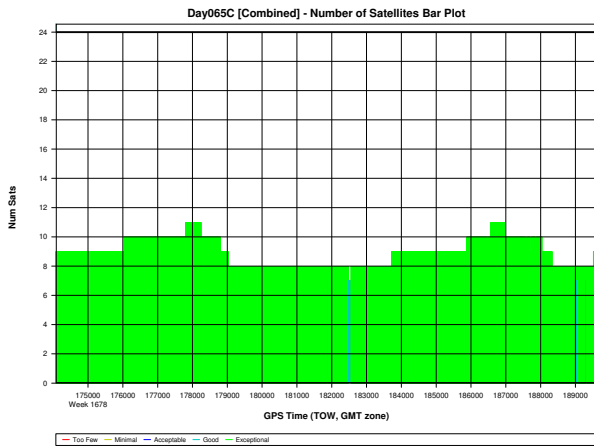
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Project: Day065C

GrafNav v8.40.2410

Project: Day065C

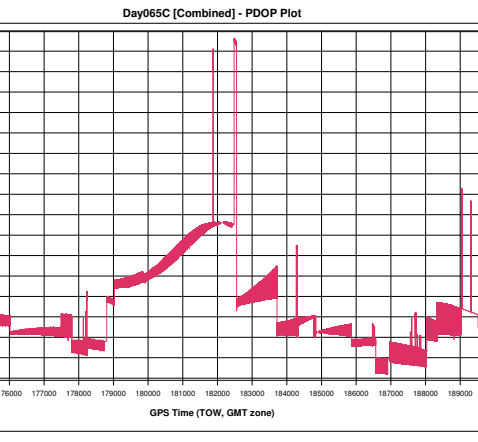
GrafNav v8.40.2410



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Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day065C\Day065C.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 77773
No processed position: 62219
Missing Fwd or Rev: 6
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0137 (m)
C/A Code: 0.55 (m)
L1 Doppler: 1.163 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.007 (m)
North: 0.006 (m)
Height: 0.022 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (15547 occurrences):
East: 0.007 (m)
North: 0.006 (m)
Height: 0.022 (m)

Quality Number Percentages:

Q 1: 99.5 %
Q 2: 0.5 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.6 %

Baseline Distances:

Maximum: 63.020 (km)
Minimum: 3.055 (km)
Average: 25.741 (km)
First Epoch: 19.382 (km)
Last Epoch: 29.449 (km)

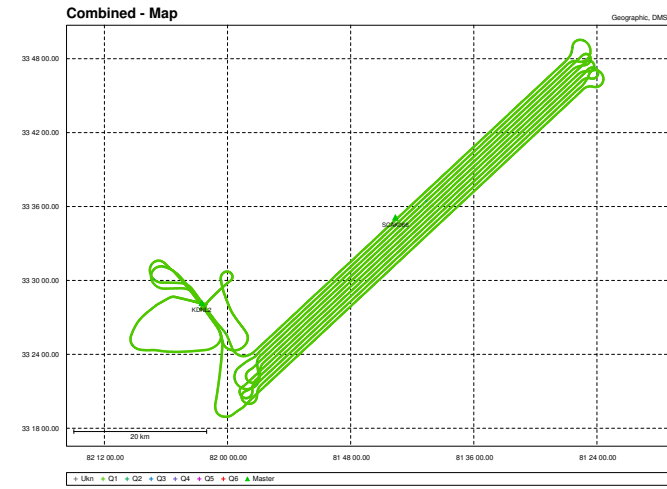


Project: Day066A

GrafNav v8.40.2410

File: Day066A.txt

GrafNav v8



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Project: Day066A

GrafNav v8.40.2410

Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day066A\Day066A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 64802
No processed position: 51842
Missing Fwd or Rev: 17
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0159 (m)
C/A Code: 0.62 (m)
L1 Doppler: 0.000 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.006 (m)
North: 0.009 (m)
Height: 0.028 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (12943 occurrences):
East: 0.006 (m)
North: 0.009 (m)
Height: 0.028 (m)

Quality Number Percentages:

Q 1: 97.5 %
Q 2: 2.4 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

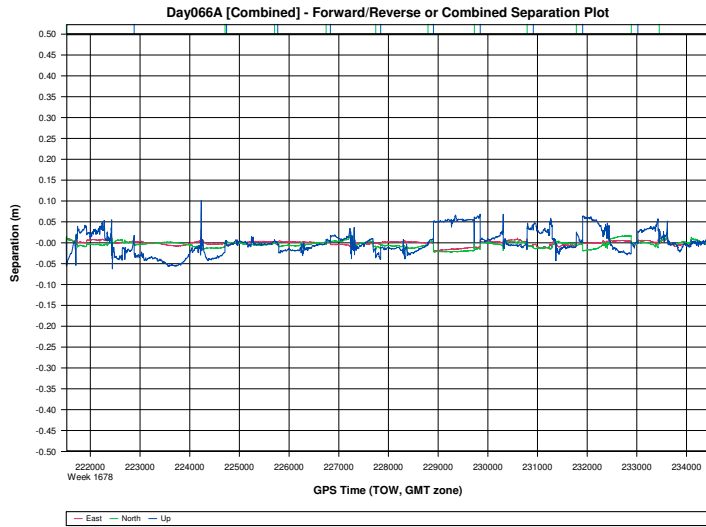
Position Standard Deviation Percentages:

0.00 - 0.10 m: 99.9 %
0.10 - 0.30 m: 0.1 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.1 %

Baseline Distances:

Maximum: 53.976 (km)
Minimum: 4.539 (km)
Average: 23.164 (km)
First Epoch: 19.584 (km)
Last Epoch: 15.525 (km)



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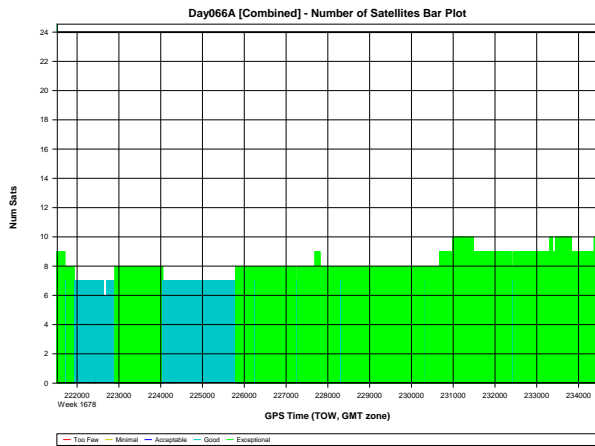
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Project: Day066A

GrafNav v8.40.2410

Project: Day066A

GrafNav v8.40.2410



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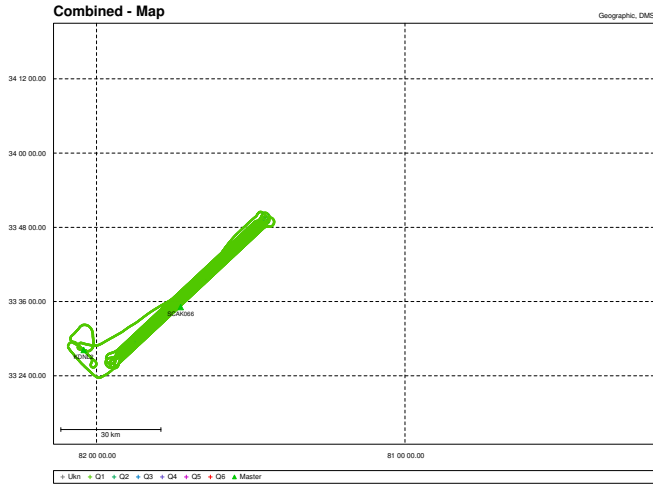


Project: Day066B

GrafNav v8.40.2410

File: Day066B.txt

GrafNav v8



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Project: Day066B

GrafNav v8.40.2410

Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day066B\Day066B.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 49000
No processed position: 39201
Missing Fwd or Rev: 5
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0135 (m)
C/A Code: 0.59 (m)
L1 Doppler: 1.186 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.013 (m)
North: 0.008 (m)
Height: 0.019 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (9793 occurrences):
East: 0.011 (m)
North: 0.008 (m)
Height: 0.019 (m)

Quality Number Percentages:

Q 1: 99.8 %
Q 2: 0.2 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

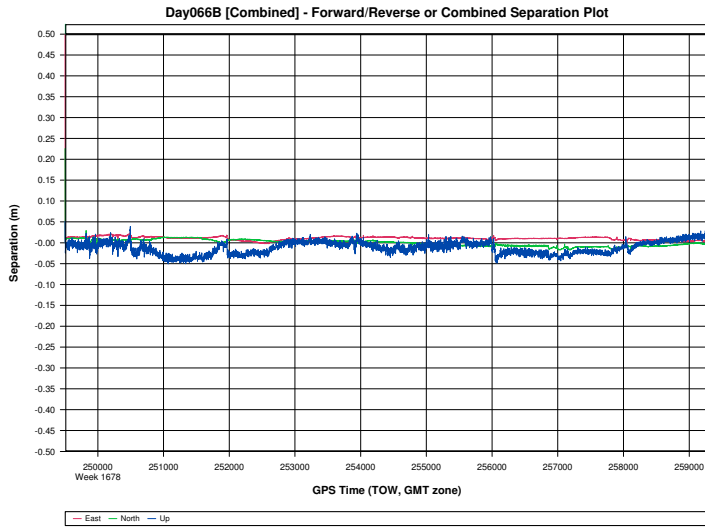
Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.0 %

Baseline Distances:

Maximum: 55.564 (km)
Minimum: 0.080 (km)
Average: 21.904 (km)
First Epoch: 15.472 (km)
Last Epoch: 0.710 (km)



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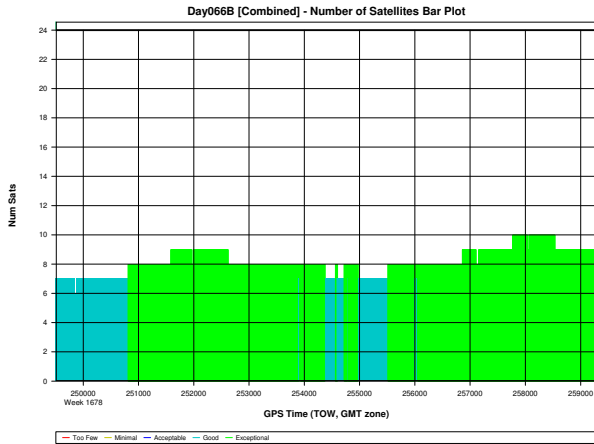
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Project: Day066B

GrafNav v8.40.2410

Project: Day066B

GrafNav v8.40.2410



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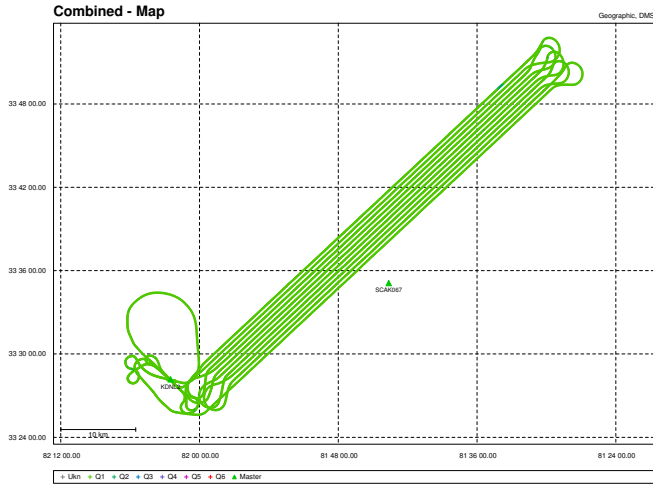


Project: Day066C

GrafNav v8.40.2410

File: Day066C.txt

GrafNav v8



Processing Summary Information

Program: GrafNav
 Version: 8.40.2410
 Project: J:\13639_SCDNR_2012\GRAFNAV\Day066C\Day066C.cfg

Solution Type: Combined

Number of Epochs:
 Total in GPB file: 65003
 No processed position: 52003
 Missing Fwd or Rev: 6
 With bad C/A code: 0
 With bad L1 Phase: 0

Measurement RMS Values:
 L1 Phase: 0.0166 (m)
 C/A Code: 0.61 (m)
 L1 Doppler: 1.271 (m/s)

Fwd/Rev Separation RMS Values:
 East: 0.030 (m)
 North: 0.008 (m)
 Height: 0.029 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (12994 occurrences):
 East: 0.030 (m)
 North: 0.008 (m)
 Height: 0.029 (m)

Quality Number Percentages:

Q 1: 99.5 %
 Q 2: 0.5 %
 Q 3: 0.0 %
 Q 4: 0.0 %
 Q 5: 0.0 %
 Q 6: 0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
 0.10 - 0.30 m: 0.0 %
 0.30 - 1.00 m: 0.0 %
 1.00 - 5.00 m: 0.0 %
 5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
 DOP over Tol: 0.0 %

Baseline Distances:

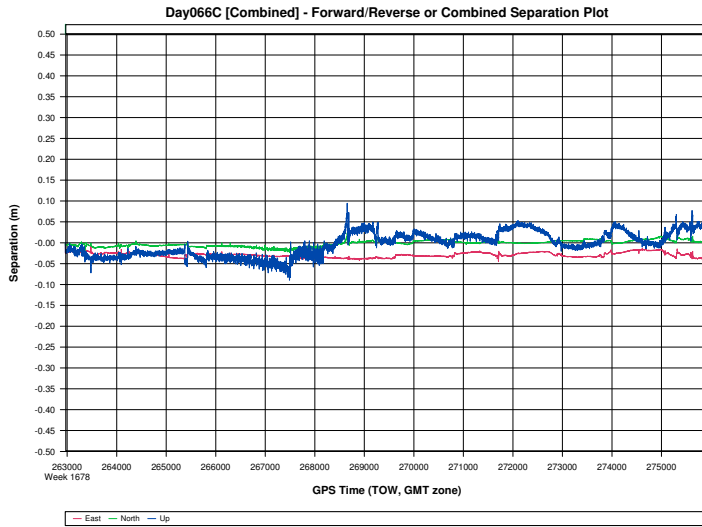
Maximum: 57.719 (km)
 Minimum: 0.710 (km)
 Average: 21.635 (km)
 First Epoch: 0.710 (km)
 Last Epoch: 16.359 (km)

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Project: Day066C

GrafNav v8.40.2410



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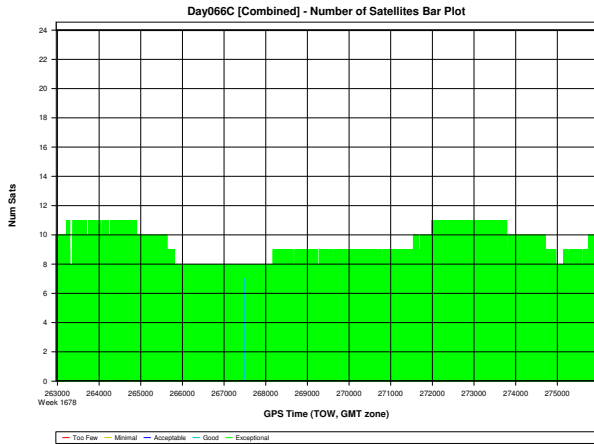
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Project: Day066C

GrafNav v8.40.2410

Project: Day066C

GrafNav v8.40.2410

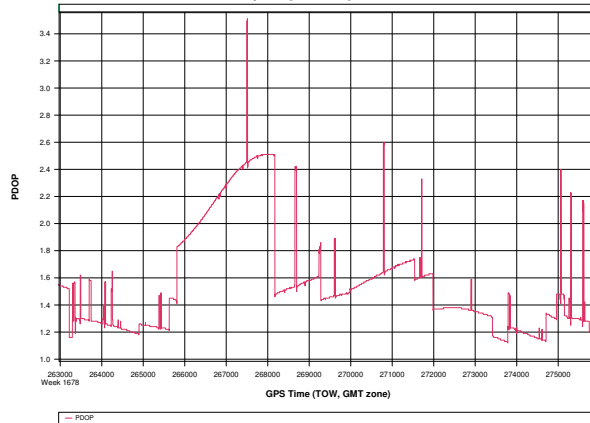


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Day066C [Combined] - PDOP Plot



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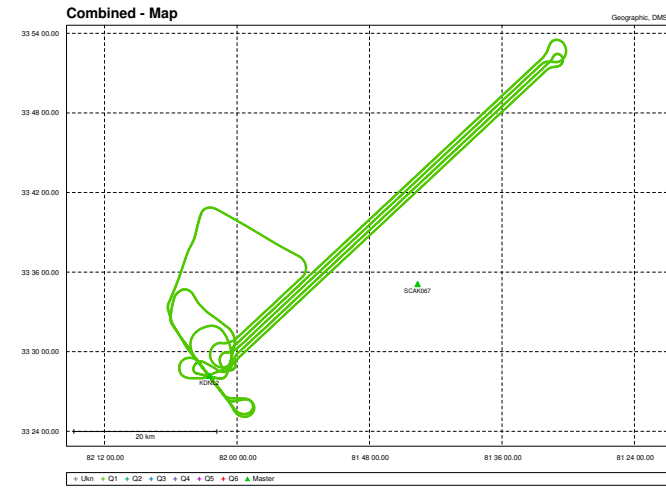


Project: Day067B

GrafNav v8.40.2410

File: Day067B.txt

GrafNav v8.40.2410



Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day067B\Day067B.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 34599
No processed position: 27680
Missing Fwd or Rev: 5
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0147 (m)
C/A Code: 0.60 (m)
L1 Doppler: 1.218 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.010 (m)
North: 0.015 (m)
Height: 0.021 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (6913 occurrences):
East: 0.010 (m)
North: 0.014 (m)
Height: 0.019 (m)

Quality Number Percentages:

Q 1: 99.7 %
Q 2: 0.3 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m: 99.9 %
0.10 - 0.30 m: 0.1 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.0 %

Baseline Distances:

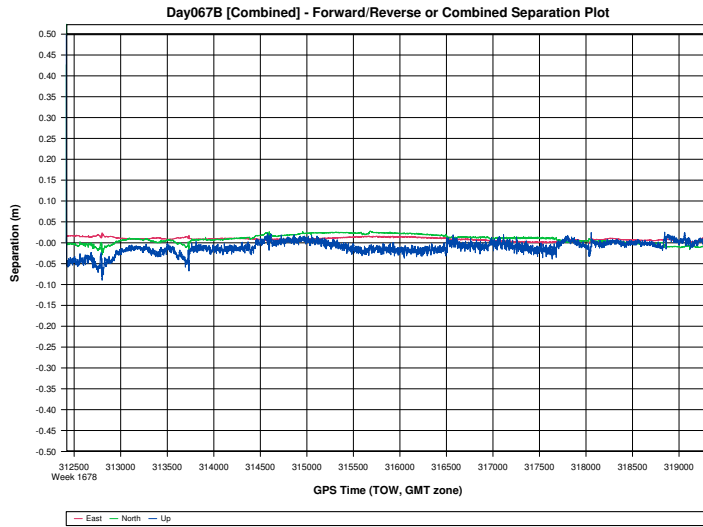
Maximum: 59.053 (km)
Minimum: 0.155 (km)
Average: 20.033 (km)
First Epoch: 15.714 (km)
Last Epoch: 19.138 (km)

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Project: Day067B

GrafNav v8.40.2410



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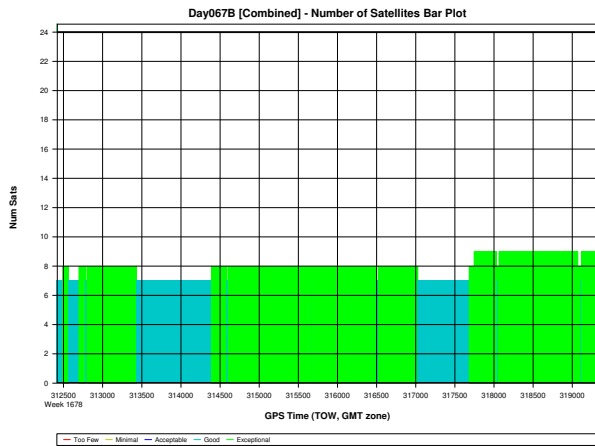
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Project: Day067B

GrafNav v8.40.2410

Project: Day067B

GrafNav v8.40.2410



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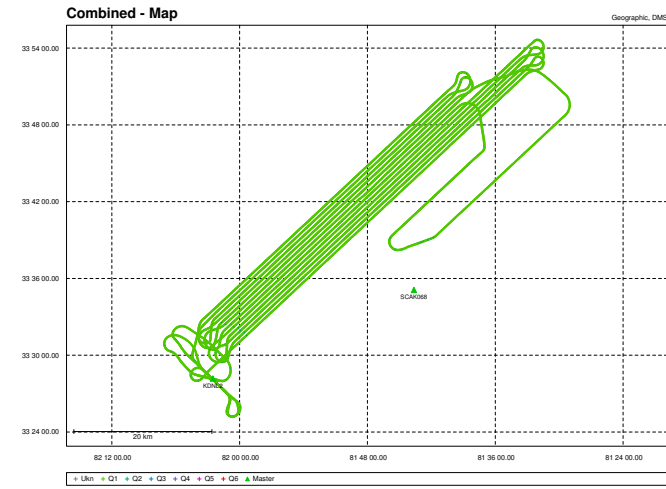


Project: Day067C

GrafNav v8.40.2410

File: Day067C.txt

GrafNav v8.40.2410

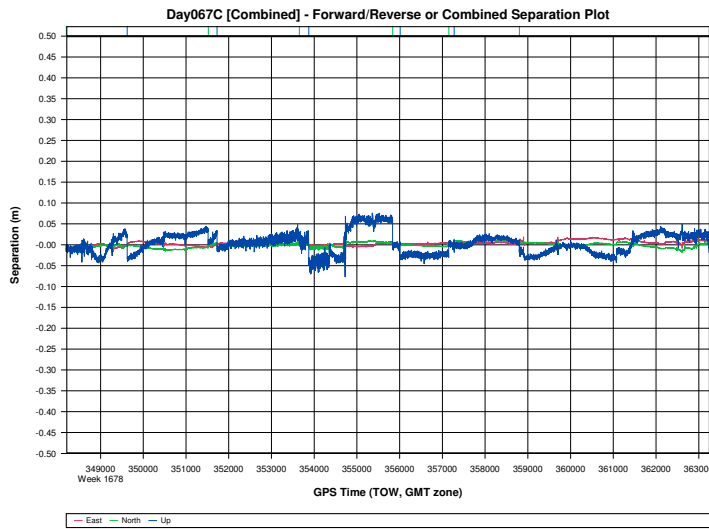


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Project: Day067C

GrafNav v8.40.2410



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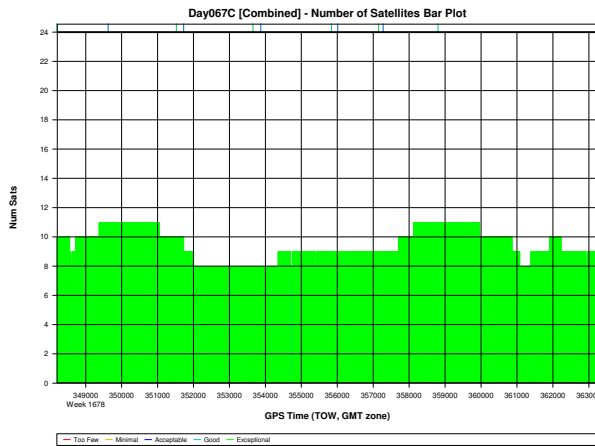
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Project: Day067C

GrafNav v8.40.2410

Project: Day067C

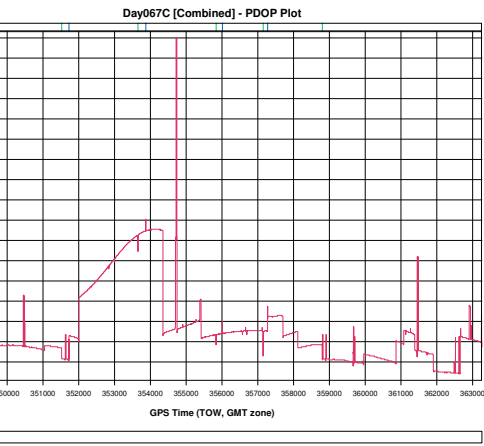
GrafNav v8.40.2410



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Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day067C\Day067C.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 75338
No processed position: 60272
Missing Fwd or Rev: 22
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0165 (m)
C/A Code: 0.61 (m)
L1 Doppler: 1.263 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.006 (m)
North: 0.006 (m)
Height: 0.026 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (15044 occurrences):
East: 0.006 (m)
North: 0.006 (m)
Height: 0.026 (m)

Quality Number Percentages:

Q 1: 99.4 %
Q 2: 0.6 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m: 99.9 %
0.10 - 0.30 m: 0.1 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.1 %

Baseline Distances:

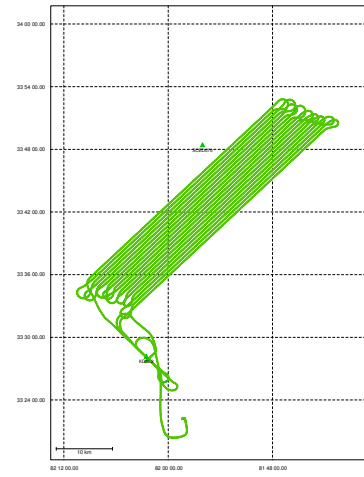
Maximum: 56.817 (km)
Minimum: 6.644 (km)
Average: 23.465 (km)
First Epoch: 15.512 (km)
Last Epoch: 15.480 (km)



Project: Day069A GrafNav v8.40.2410

File: Day069A.txt

GrafNav v8



Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day069A\Day069A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 84279
No processed position: 67425
Missing Fwd or Rev: 7
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0144 (m)
C/A Code: 0.58 (m)
L1 Doppler: 1.176 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.016 (m)
North: 0.008 (m)
Height: 0.026 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (16847 occurrences):
East: 0.016 (m)
North: 0.008 (m)
Height: 0.026 (m)

Quality Number Percentages:

Q 1: 99.6 %
Q 2: 0.4 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 1.0 %

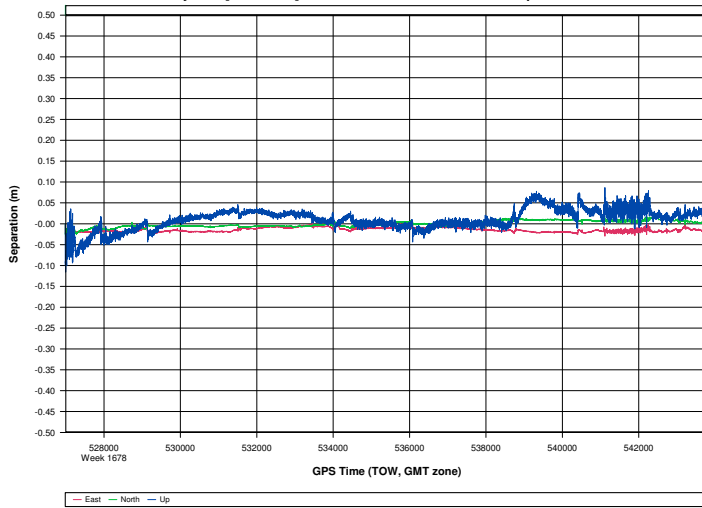
Baseline Distances:

Maximum: 42.715 (km)
Minimum: 1.650 (km)
Average: 16.492 (km)
First Epoch: 26.996 (km)
Last Epoch: 39.061 (km)

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GrafNav v8.40.2410

Day069A [Combined] - Forward/Reverse or Combined Separation Plot



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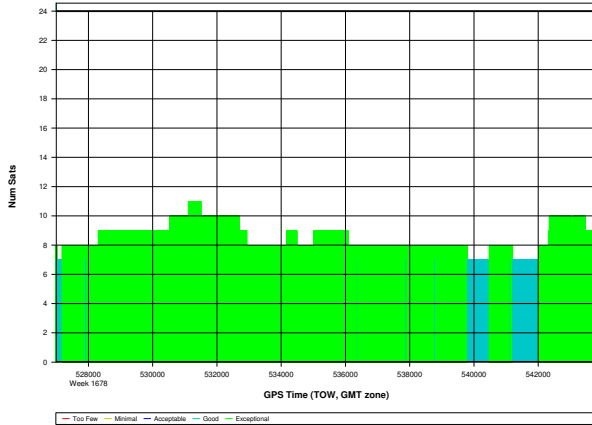
Project: Day069A

GrafNav v8.40.2410

Project: Day069A

GrafNav v8.40.2410

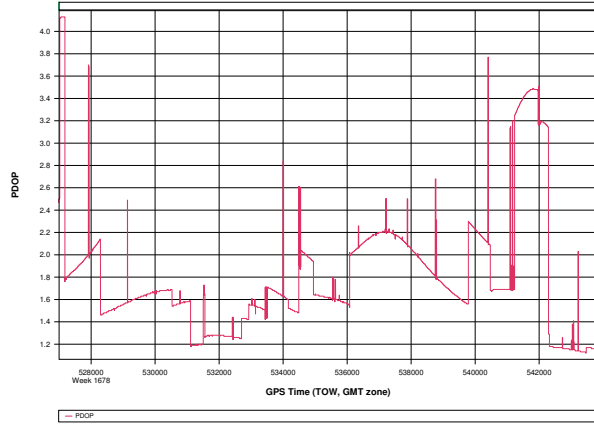
Day069A [Combined] - Number of Satellites Bar Plot



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Day069A [Combined] - PDOP Plot



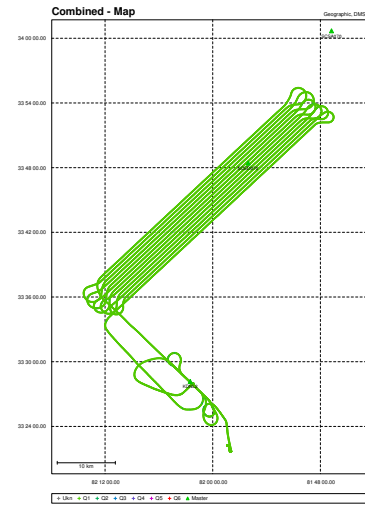
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Project: Day069B GrafNav v8.40.2410

File: Day069B.txt

GrafNav v8



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Project: Day069B GrafNav v8.40.2410

Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day069B\Day069B.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 56178
No processed position: 44947
Missing Fwd or Rev: 15
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0141 (m)
C/A Code: 0.59 (m)
L1 Doppler: 0.000 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.004 (m)
North: 0.008 (m)
Height: 0.017 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (11216 occurrences):
East: 0.004 (m)
North: 0.008 (m)
Height: 0.017 (m)

Quality Number Percentages:

Q 1: 97.0 %
Q 2: 3.0 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

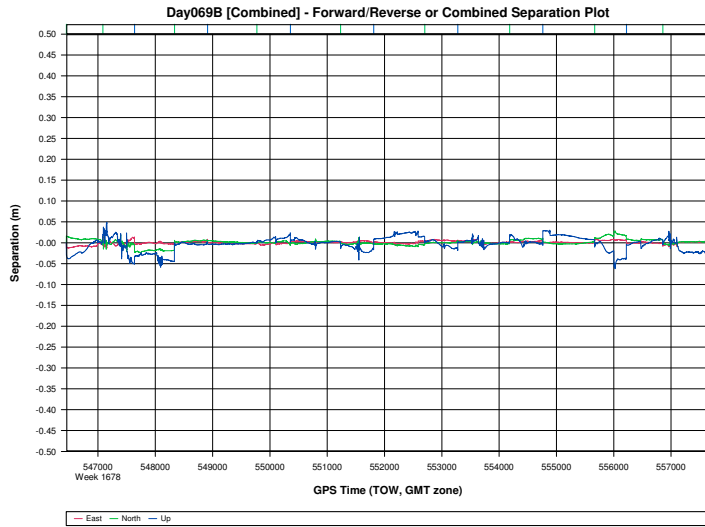
Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.0 %

Baseline Distances:

Maximum: 43.885 (km)
Minimum: 2.111 (km)
Average: 20.074 (km)
First Epoch: 41.788 (km)
Last Epoch: 33.965 (km)

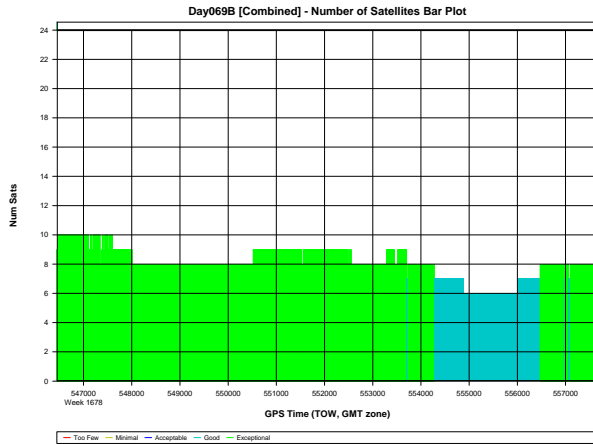


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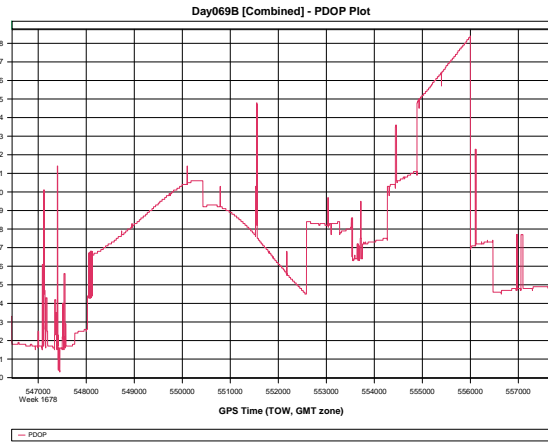
Project: Day069B GrafNav v8.40.2410 Project: Day069B

GrafNav v8.40.2410



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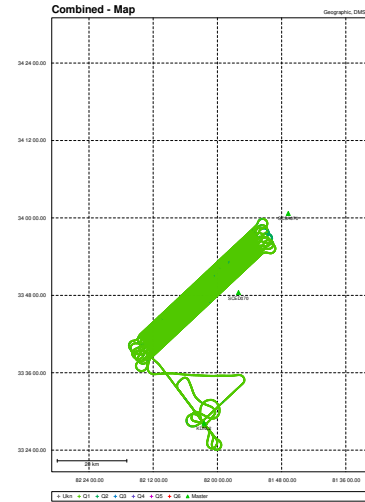
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Project: Day070A GrafNav v8.40.2410

File: Day070A.txt

GrafNav v8



Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day070A\Day070A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 70140
No processed position: 56113
Missing Fwd or Rev: 9
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0142 (m)
C/A Code: 0.60 (m)
L1 Doppler: 1.181 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.007 (m)
North: 0.010 (m)
Height: 0.030 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (14017 occurrences):
East: 0.007 (m)
North: 0.008 (m)
Height: 0.030 (m)

Quality Number Percentages:

Q 1: 98.7 %
Q 2: 1.3 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

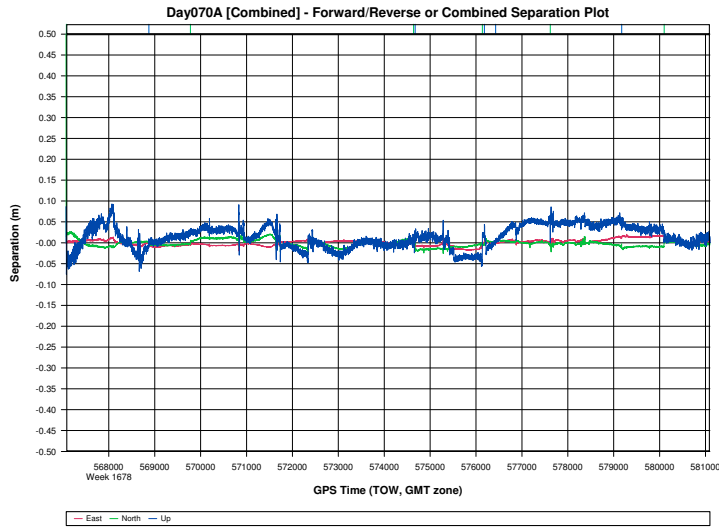
Percentages of epochs with DD_DOP over 10.00:

DOP over Tol: 0.0 %

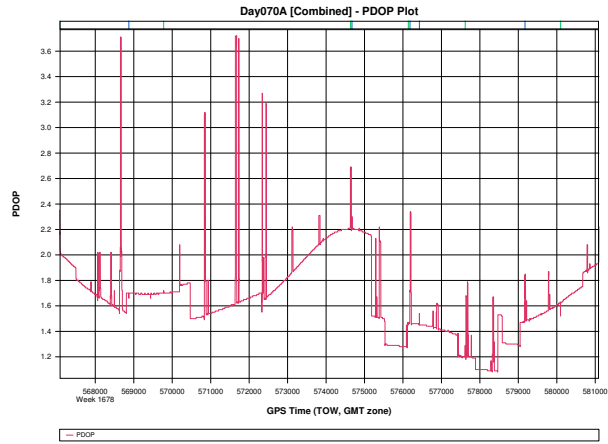
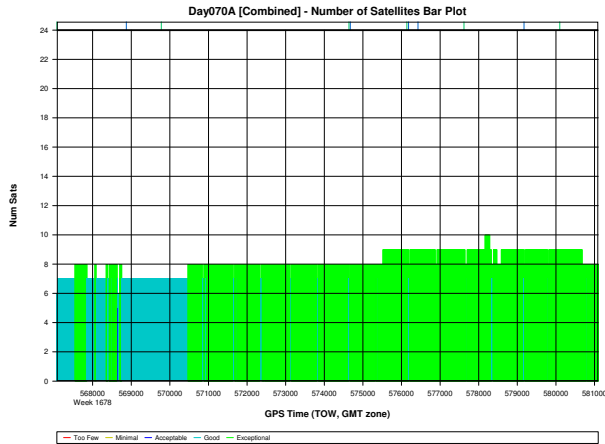
Baseline Distances:

Maximum: 40.077 (km)
Minimum: 0.740 (km)
Average: 21.866 (km)
First Epoch: 29.639 (km)
Last Epoch: 34.054 (km)

Project: Day070A GrafNav v8.40.2410



Project: Day070A GrafNav v8.40.2410 Project: Day070A GrafNav v8.40.2410

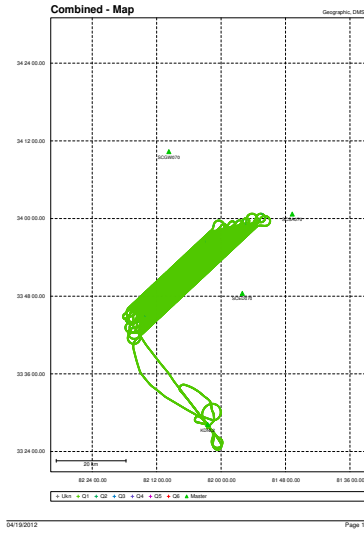




Project: Day070B GrafNav v8.40.2410

File: Day070B.txt

GrafNav v8.40.2410



Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day070B\Day070B.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 66230
No processed position: 52985
Missing Fwd or Rev: 5
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0133 (m)
C/A Code: 0.58 (m)
L1 Doppler: 1.103 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.013 (m)
North: 0.007 (m)
Height: 0.029 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (13239 occurrences):
East: 0.013 (m)
North: 0.005 (m)
Height: 0.029 (m)

Quality Number Percentages:

Q 1: 99.5 %
Q 2: 0.5 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:

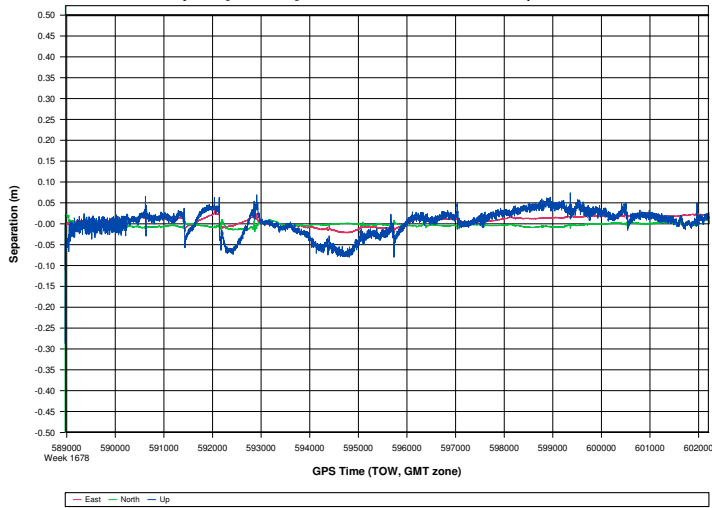
DOP over Tol: 0.0 %

Baseline Distances:

Maximum: 49.970 (km)
Minimum: 3.661 (km)
Average: 21.544 (km)
First Epoch: 43.639 (km)
Last Epoch: 43.297 (km)

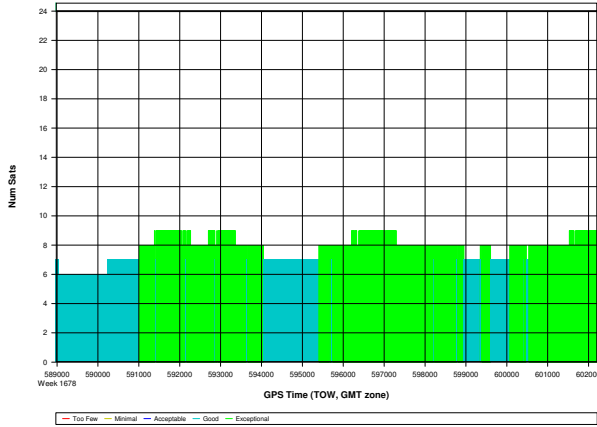
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Day070B [Combined] - Forward/Reverse or Combined Separation Plot

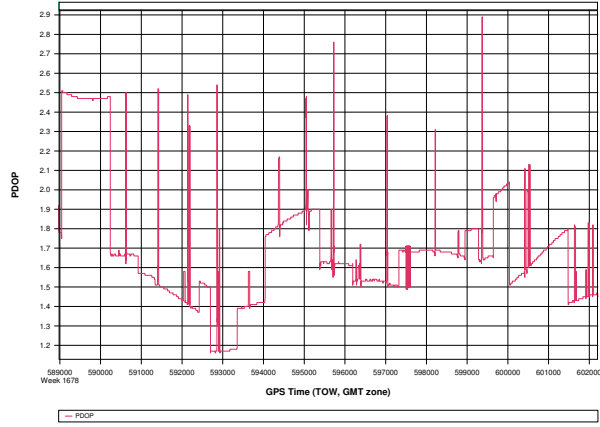


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Day070B [Combined] - Number of Satellites Bar Plot



Day070B [Combined] - PDOP Plot



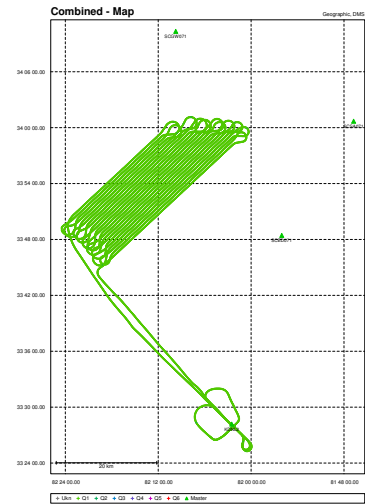
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Project: Day070C GrafNav v8.40.2410

File: Day070C.txt

GrafNav v8.40.2410



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Project: Day070C GrafNav v8.40.2410

Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day070C\Day070C.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 78833
No processed position: 63068
Missing Fwd or Rev: 6
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0149 (m)
C/A Code: 0.56 (m)
L1 Doppler: 1.194 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.019 (m)
North: 0.007 (m)
Height: 0.017 (m)

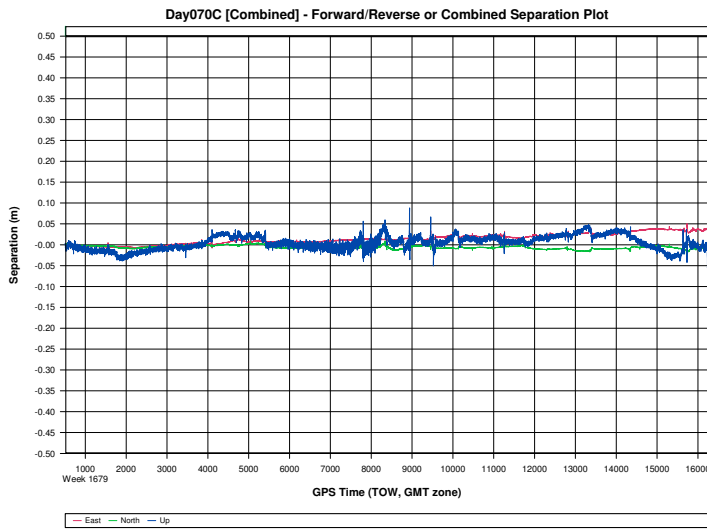
Fwd/Rev Sep. RMS for dual FWD/REV fixes (15759 occurrences):
East: 0.019 (m)
North: 0.007 (m)
Height: 0.017 (m)

Quality Number Percentages:
Q 1: 99.7 %
Q 2: 0.3 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:
0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

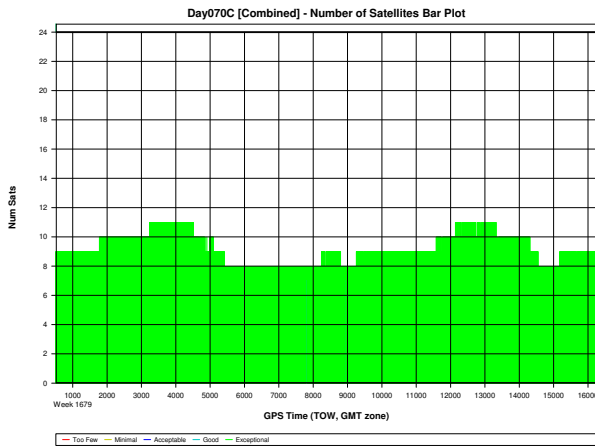
Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.1 %

Baseline Distances:
Maximum: 58.702 (km)
Minimum: 12.107 (km)
Average: 27.145 (km)
First Epoch: 43.556 (km)
Last Epoch: 44.711 (km)

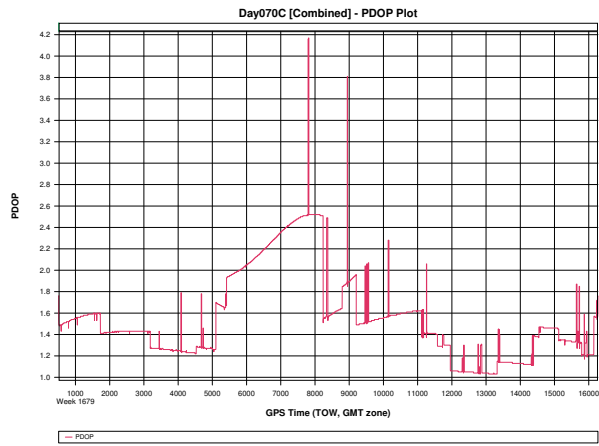


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Project: Day070C GrafNav v8.40.2410 Project: Day070C GrafNav v8.40.2410



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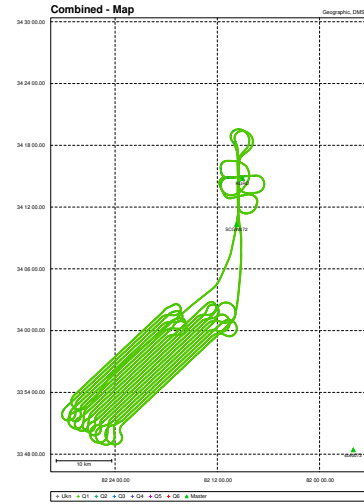
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Project: Day072A GrafNav v8.40.2410

File: Day072A.txt

GrafNav v8



Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day072A\Day072A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 59161
No processed position: 47329
Missing Fwd or Rev: 8
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0147 (m)
C/A Code: 0.60 (m)
L1 Doppler: 0.000 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.015 (m)
North: 0.017 (m)
Height: 0.035 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (11823 occurrences):
East: 0.015 (m)
North: 0.017 (m)
Height: 0.035 (m)

Quality Number Percentages:
Q 1: 98.0 %
Q 2: 2.0 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:
0.00 - 0.10 m: 99.9 %
0.10 - 0.30 m: 0.1 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.1 %

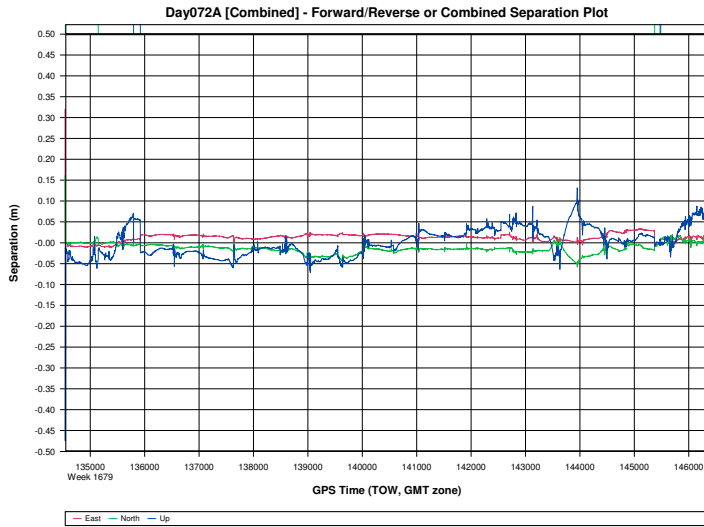
Baseline Distances:
Maximum: 45.670 (km)
Minimum: 7.253 (km)
Average: 26.463 (km)
First Epoch: 23.455 (km)
Last Epoch: 20.504 (km)

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Project: Day072A

GrafNav v8.40.2410



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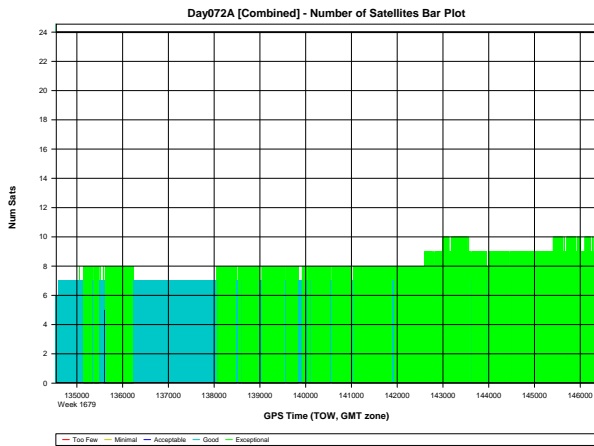
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Project: Day072A

GrafNav v8.40.2410

Project: Day072A

GrafNav v8.40.2410

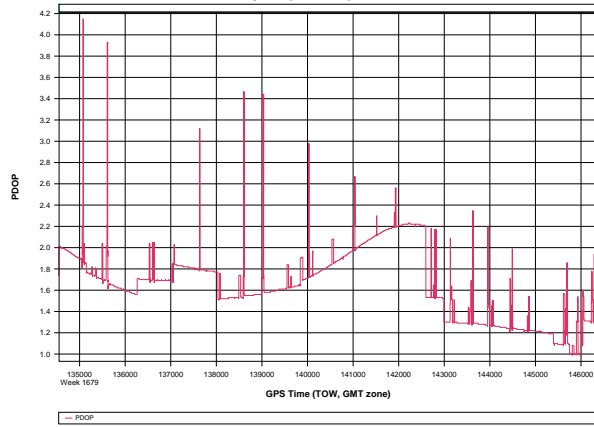


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Day072A [Combined] - PDOP Plot



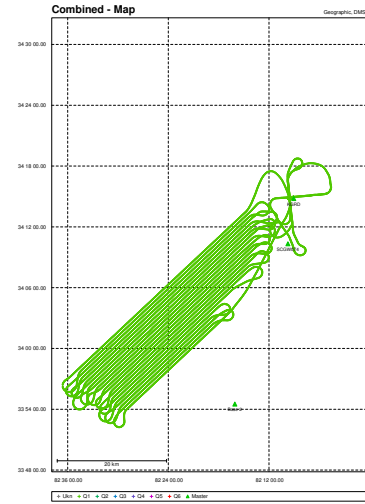
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Project: Day073A GrafNav v8.40.2410

File: Day073A.txt

GrafNav v8



Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day073A\Day073A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 88233
No processed position: 70588
Missing Fwd or Rev: 38
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0147 (m)
C/A Code: 0.54 (m)
L1 Doppler: 0.000 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.008 (m)
North: 0.011 (m)
Height: 0.044 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (17607 occurrences):
East: 0.008 (m)
North: 0.011 (m)
Height: 0.044 (m)

Quality Number Percentages:
Q 1: 98.7 %
Q 2: 1.3 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:
0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 1.7 %

Baseline Distances:
Maximum: 40.919 (km)
Minimum: 2.684 (km)
Average: 19.271 (km)
First Epoch: 12.459 (km)
Last Epoch: 12.451 (km)

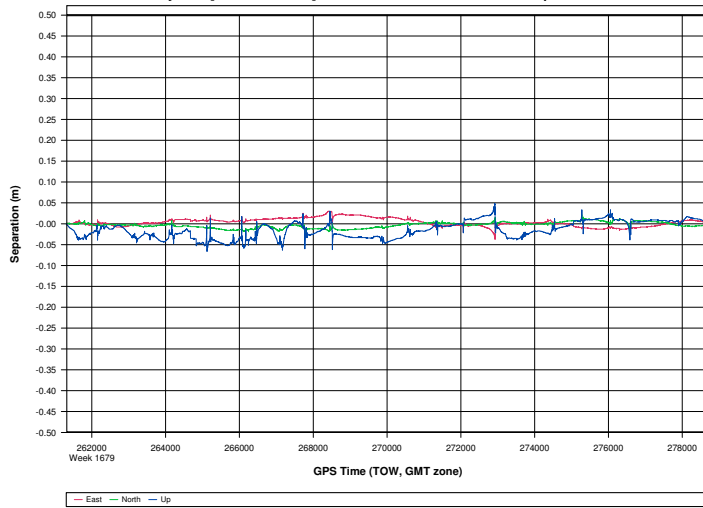
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Project: Day073A

GrafNav v8.40.2410

Day073A [GPS Combined] - Forward/Reverse or Combined Separation Plot



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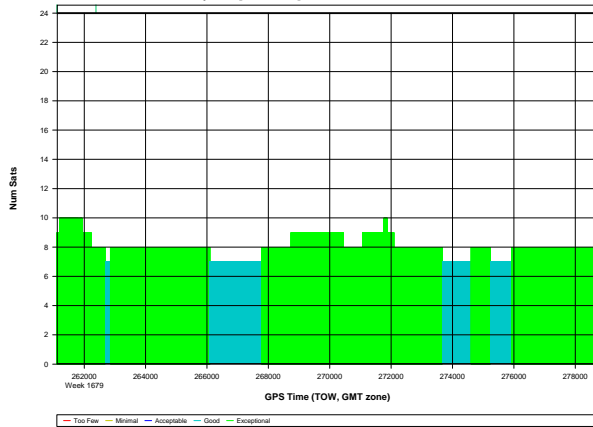
Project: Day073A

GrafNav v8.40.2410

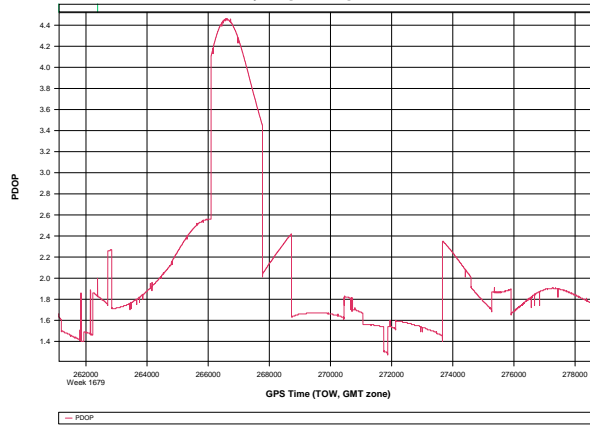
Project: Day073A

GrafNav v8.40.2410

Day073A [Combined] - Number of Satellites Bar Plot



Day073A [Combined] - PDOP Plot



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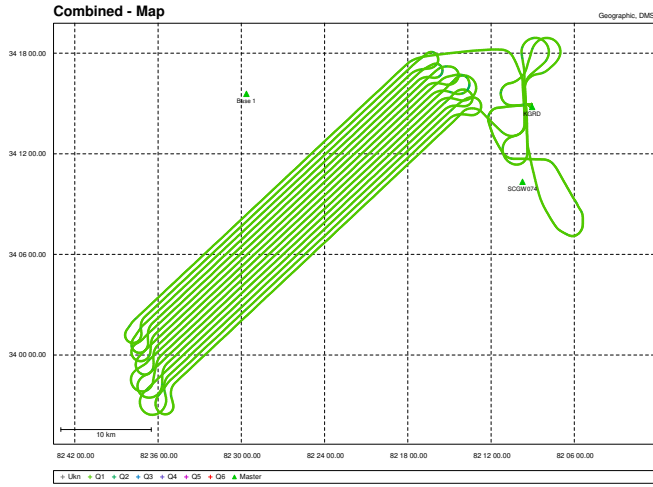


Project: Day073B

GrafNav v8.40.2410

File: Day073B.txt

GrafNav v8.40.2410

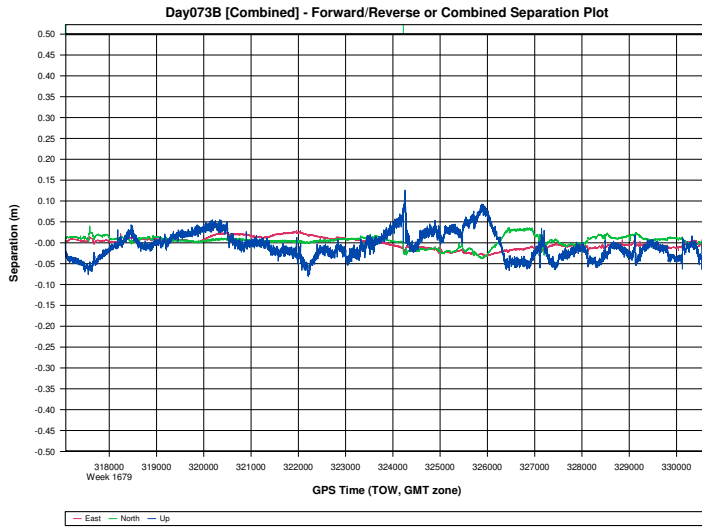


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Project: Day073B

GrafNav v8.40.2410



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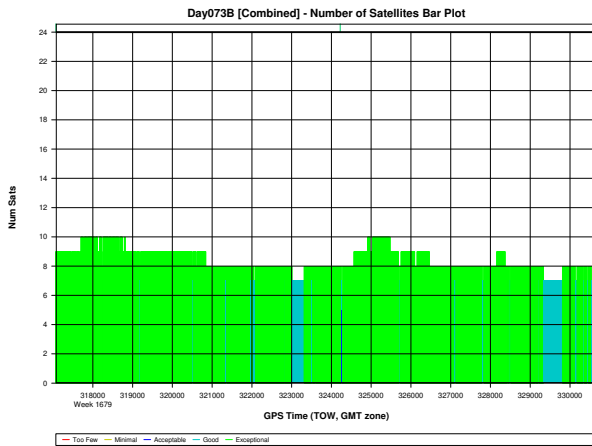
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Project: Day073B

GrafNav v8.40.2410

Project: Day073B

GrafNav v8.40.2410



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Processing Summary Information

Program: GrafNav
 Version: 8.40.2410
 Project: J:\13639_SCDNR_2012\GRAFNAV\Day073B\Day073B.cfg

Solution Type: Combined

Number of Epochs:
 Total in GPB file: 68101
 No processed position: 54481
 Missing Fwd or Rev: 7
 With bad C/A code: 0
 With bad L1 Phase: 0

Measurement RMS Values:
 L1 Phase: 0.0183 (m)
 C/A Code: 0.61 (m)
 L1 Doppler: 1.198 (m/s)

Fwd/Rev Separation RMS Values:
 East: 0.014 (m)
 North: 0.013 (m)
 Height: 0.032 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (13613 occurrences):
 East: 0.014 (m)
 North: 0.013 (m)
 Height: 0.032 (m)

Quality Number Percentages:

Q 1: 99.2 %
 Q 2: 0.8 %
 Q 3: 0.0 %
 Q 4: 0.0 %
 Q 5: 0.0 %
 Q 6: 0.0 %

Position Standard Deviation Percentages:

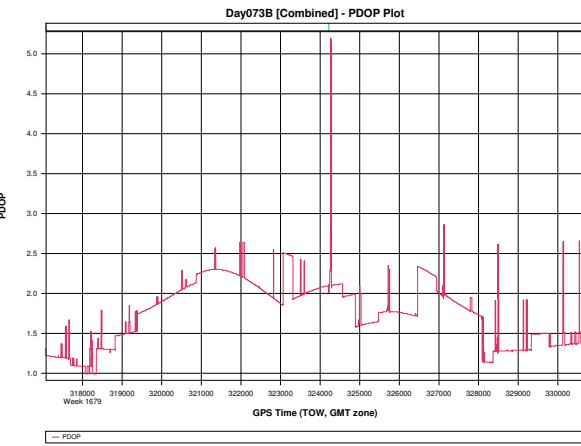
0.00 - 0.10 m: 99.9 %
 0.10 - 0.30 m: 0.1 %
 0.30 - 1.00 m: 0.0 %
 1.00 - 5.00 m: 0.0 %
 5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:

DOP over Tol: 0.1 %

Baseline Distances:

Maximum: 45.030 (km)
 Minimum: 1.480 (km)
 Average: 18.856 (km)
 First Epoch: 10.763 (km)
 Last Epoch: 10.934 (km)



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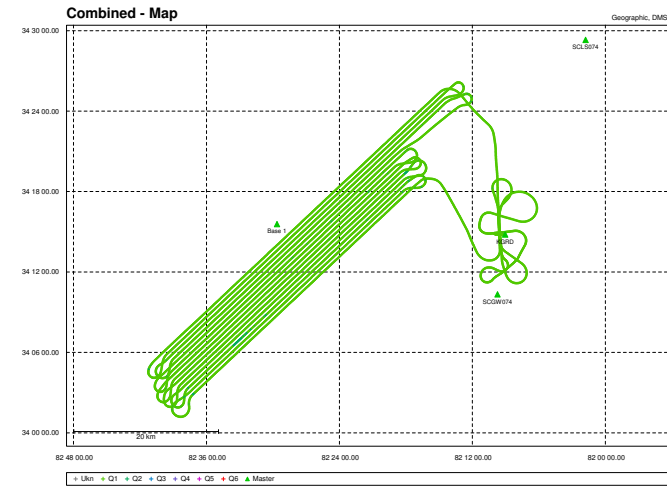


Project: Day074A

GrafNav v8.40.2410

File: Day074A.txt

GrafNav v8.40.2410

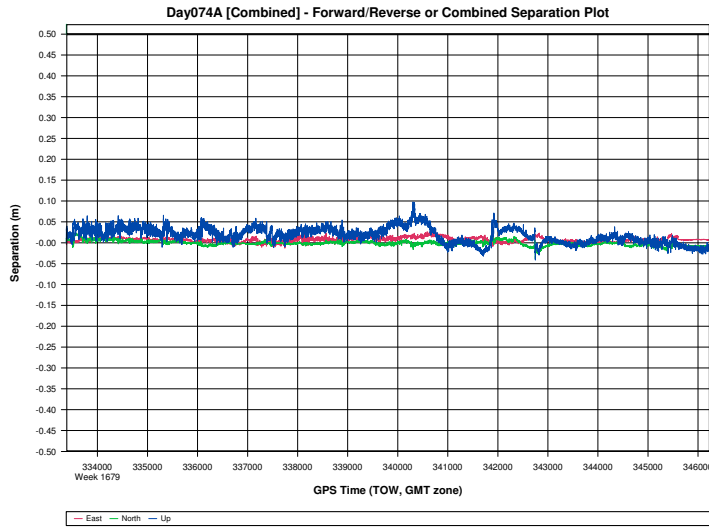


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Project: Day074A

GrafNav v8.40.2410



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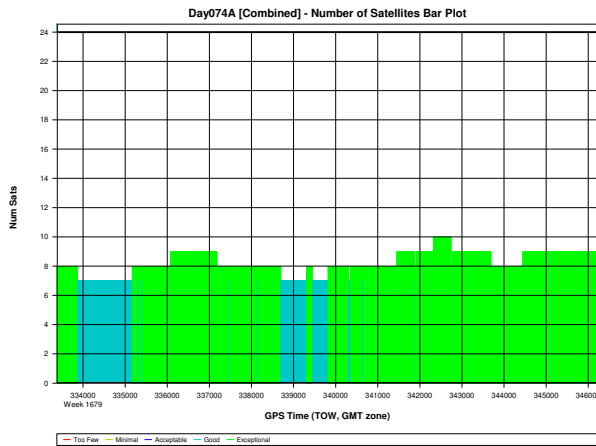
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Project: Day074A

GrafNav v8.40.2410

Project: Day074A

GrafNav v8.40.2410



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Project: Day074A

GrafNav v8.40.2410

Project: Day074A

GrafNav v8.40.2410

Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day074A\Day074A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 64331
No processed position: 51466
Missing Fwd or Rev: 6
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0145 (m)
C/A Code: 0.56 (m)
L1 Doppler: 1.116 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.009 (m)
North: 0.006 (m)
Height: 0.026 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (12859 occurrences):
East: 0.009 (m)
North: 0.006 (m)
Height: 0.026 (m)

Quality Number Percentages:

Q 1: 98.9 %
Q 2: 1.1 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:

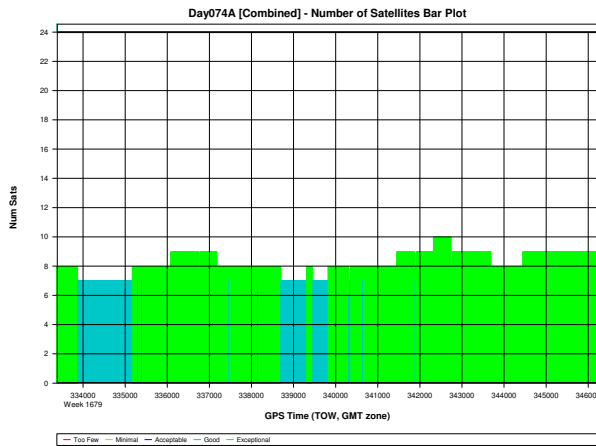
DOP over Tol: 0.0 %

Baseline Distances:

Maximum: 50.627 (km)
Minimum: 2.488 (km)
Average: 23.493 (km)
First Epoch: 7.039 (km)
Last Epoch: 15.521 (km)

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Project: Day074A

GrafNav v8.40.2410

Project: Day074A

GrafNav v8.40.2410

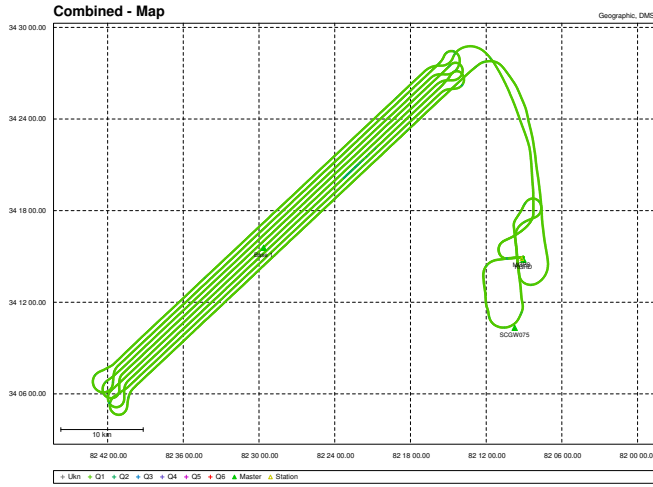


Project: Day074B

GrafNav v8.40.2410

File: Day074B.txt

GrafNav v8

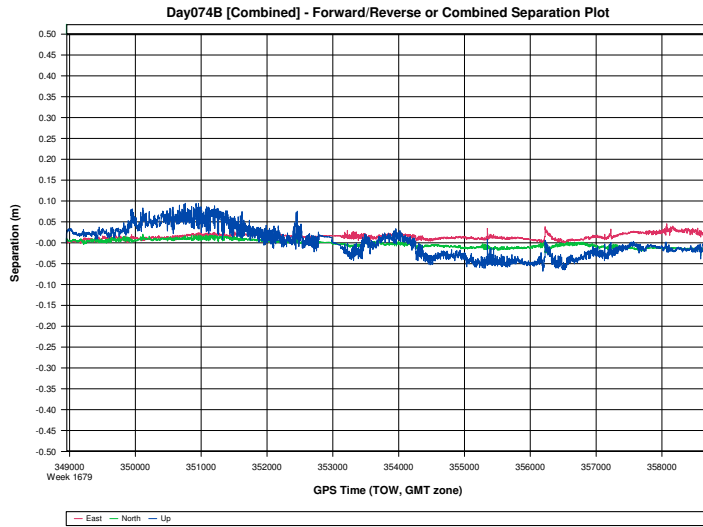


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Project: Day074B

GrafNav v8.40.2410



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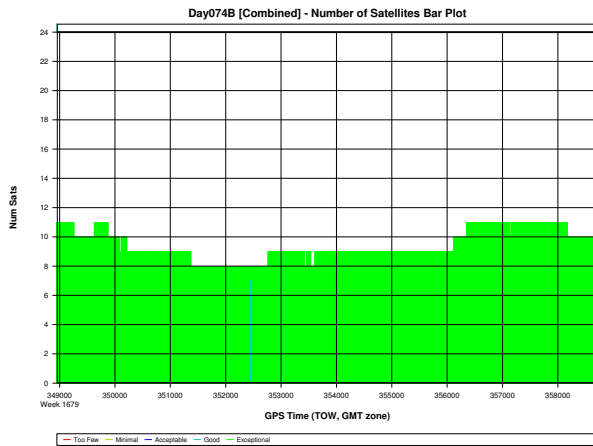
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Project: Day074B

GrafNav v8.40.2410

Project: Day074B

GrafNav v8.40.2410



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Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day074B\Day074B.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 48912
No processed position: 39131
Missing Fwd or Rev: 7
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0165 (m)
C/A Code: 0.55 (m)
L1 Doppler: 1.176 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.016 (m)
North: 0.009 (m)
Height: 0.035 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (9774 occurrences):
East: 0.016 (m)
North: 0.009 (m)
Height: 0.035 (m)

Quality Number Percentages:

Q 1: 99.0 %
Q 2: 1.0 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

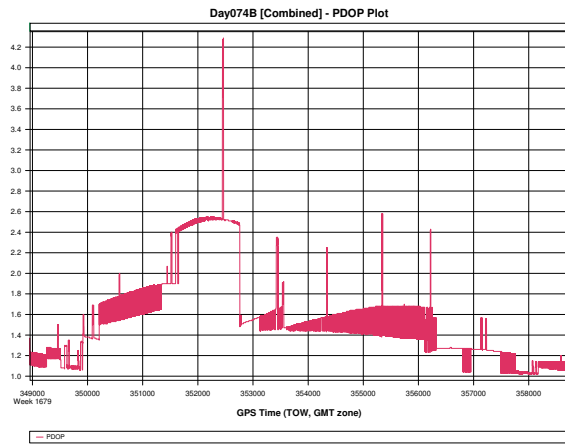
0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:

DOP over Tol: 0.2 %

Baseline Distances:

Maximum: 45.432 (km)
Minimum: 5.990 (km)
Average: 22.492 (km)
First Epoch: 10.798 (km)
Last Epoch: 9.480 (km)



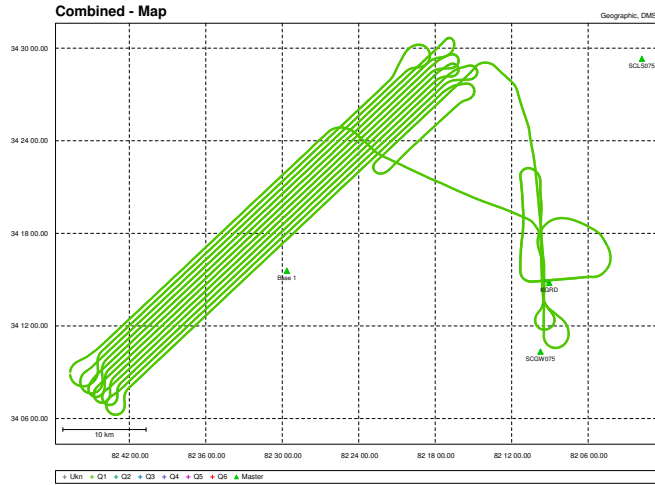


Project: Day075A

GrafNav v8.40.2410

File: Day075A.txt

GrafNav v8.40.2410

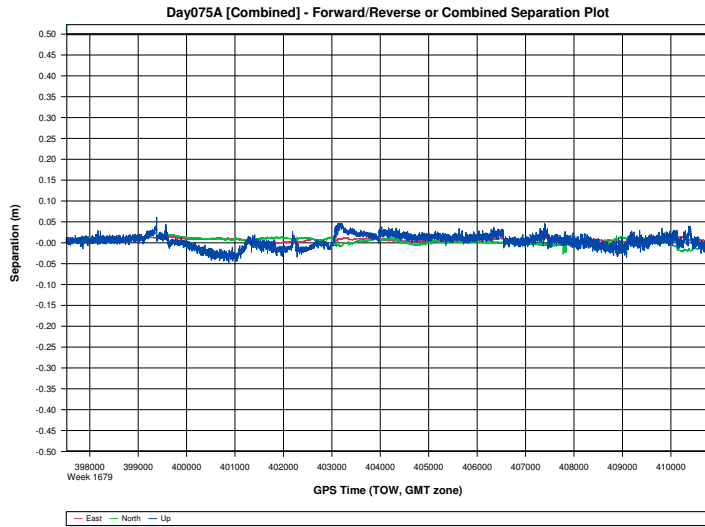


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Project: Day075A

GrafNav v8.40.2410



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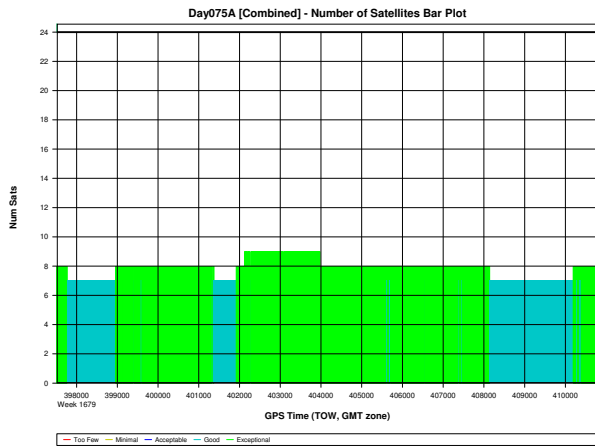
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Project: Day075A

GrafNav v8.40.2410

Project: Day075A

GrafNav v8.40.2410



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Processing Summary Information

Program: GrafNav
Version: 8.40.2410
Project: J:\13639_SCDNR_2012\GRAFNAV\Day075A\Day075A.cfg

Solution Type: Combined

Number of Epochs:
Total in GPB file: 66479
No processed position: 53184
Missing Fwd or Rev: 6
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0167 (m)
C/A Code: 0.56 (m)
L1 Doppler: 1.142 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.008 (m)
North: 0.009 (m)
Height: 0.016 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (13289 occurrences):
East: 0.008 (m)
North: 0.009 (m)
Height: 0.016 (m)

Quality Number Percentages:

Q 1: 99.8 %
Q 2: 0.2 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:

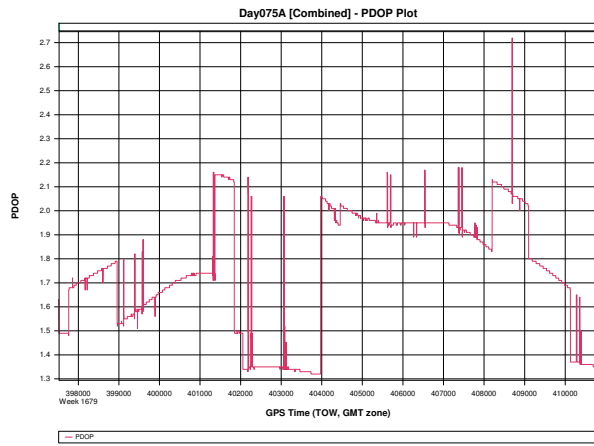
0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:

DOP over Tol: 0.0 %

Baseline Distances:

Maximum: 58.798 (km)
Minimum: 2.074 (km)
Average: 26.538 (km)
First Epoch: 7.036 (km)
Last Epoch: 6.931 (km)

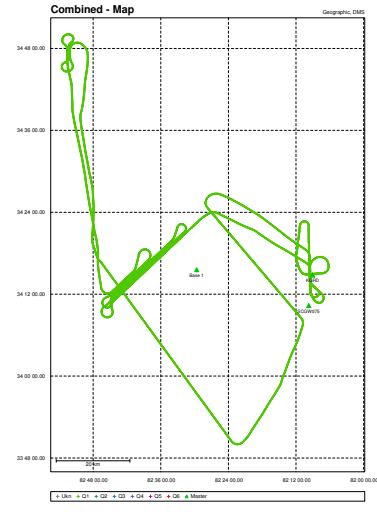




Project: Day075B GrafNav v8.40.2410

File: Day075B.txt

GrafNav v8



Processing Summary Information

Program: GrafNav
 Version: 8.40.2410
 Project: J:\13639_SCDNR_2012\GRAFNAV\Day075B\Day075B.cfg

Solution Type: Combined

Number of Epochs:
 Total in GPB file: 44424
 No processed position: 35540
 Missing Fwd or Rev: 5
 With bad C/A code: 0
 With bad L1 Phase: 0

Measurement RMS Values:
 L1 Phase: 0.0193 (m)
 C/A Code: 0.63 (m)
 L1 Doppler: 1.232 (m/s)

Fwd/Rev Separation RMS Values:
 East: 0.010 (m)
 North: 0.016 (m)
 Height: 0.033 (m)

Fwd/Rev Sep. RMS for dual FWD/REV fixes (8878 occurrences):
 East: 0.010 (m)
 North: 0.016 (m)
 Height: 0.032 (m)

Quality Number Percentages:

Q 1: 99.4 %
 Q 2: 0.6 %
 Q 3: 0.0 %
 Q 4: 0.0 %
 Q 5: 0.0 %
 Q 6: 0.0 %

Position Standard Deviation Percentages:

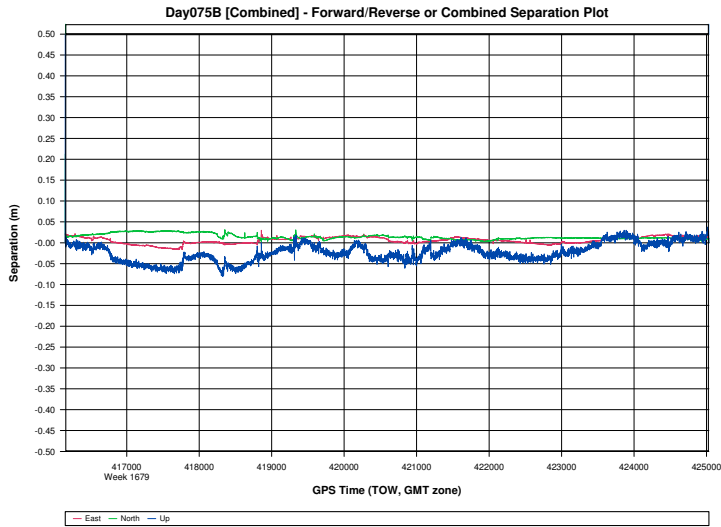
0.00 - 0.10 m: 100.0 %
 0.10 - 0.30 m: 0.0 %
 0.30 - 1.00 m: 0.0 %
 1.00 - 5.00 m: 0.0 %
 5.00 m + over: 0.0 %

Percentages of epochs with DD_DOP over 10.00:
 DOP over Tol: 0.0 %

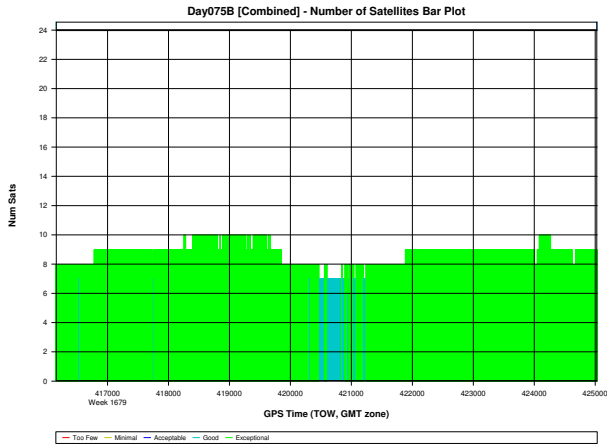
Baseline Distances:

Maximum: 87.440 (km)
 Minimum: 1.026 (km)
 Average: 35.526 (km)
 First Epoch: 10.801 (km)
 Last Epoch: 10.393 (km)

Project: Day075B GrafNav v8.40.2410



Project: Day075B GrafNav v8.40.2410



Project: Day075B GrafNav v8.40.2410

