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Airborne GPS Survey Report For

Data Access & Support Center

Kansas Geological Survey

1930 Constant Avenue

Lawrence, KS 66047-3724

785-864-2000

Contract ID 00036574 - Amendment

Prepared by

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Aerometric Project No. 1121109

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Kansas Department of Administration

Area 1, Eastern Kansas

Lidar Task Order/Contract ID 036574

Aerometric Project No. 1121109

1 INTRODUCTION

This report contains a summary of the LiDAR data acquisition and processing for Area 1 located in **Eastern Kansas under Contract ID 036574 Amendment**.

1.1 Contact Info

Questions regarding the technical aspects of this report should be addressed to:
Aero-Metric, Inc.
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Attention: Jamie Young (Senior Manager – LiDAR Solutions)
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1.2 Purpose

Aero-Metric, Inc. acquired high accuracy Light Detection and Ranging (LiDAR) data in the Area 1 region of eastern Kansas for the Kansas Department of Administration and Kansas Geological Survey in accordance with requirements specified to produce such dataset as outlined in contract ID 036574 and as defined by the National Digital Elevation Program (NDEP) and the American Society for Photogrammetry and Remote Sensing (ASPRS) and Other High Quality Digital Topography, as well as USGS National Geospatial Program Base LiDAR Specification, Version 13 (ILMF).

1.3 Project Locations

The project Area 1 Kansas which includes: Anderson, Allen, Neosho, and Labette counties. Areas were defined and supplied by Kansas Department of Administration and includes approximately 2250 square miles for analysis.

1.4 Time Period

LiDAR data acquisition was performed November 17th, 2012 to November 20th, 2012. Six (6) missions were logged to cover the project area. See Items 3.3 for a sketch of the acquisition passes and Section 7 contains each flight log.

1.5 Project Scope

To collect data over the approximately 2250 square miles of the project, aircraft were operated by; Aerial Surveys International (ASI) utilizing Optech Orion airborne LiDAR system. Data was collected at a nominal altitude of 2900 meters above ground to provide optimal data collection from the project area terrain.

2 GEODETIC CONTROL

QC surveys and control were completed between November 27th and December 4th, 2012.

2.1 Network Scope

Base horizontal control for the check point survey consisted of five NGS CORS stations: **KST6**, **MOBT**, **MOCA**, **MONE**, **ZKC1**: one NGS Order 0 station: **M 55**; one NGS Order B stations: **K 56**; one NGS First Order station: **KINNE**; and one NGS Second Order station: **CHETOPA**.

Horizontal control is referenced to the Universal Transverse Mercator (UTM) Coordinate System – Zone 15, based on the North American Datum of 1983/2007 (NAD83/07). Final coordinates are published in meters.

Base vertical control for the check point survey consisted of five NGS Second Order stations: **801.25, D 274**, **K 56**, **M 55**, **P 277**; one NGS Third Order station: **CHETOPA**. The NGS stations **F 246** and **PARSONS** were also observed, but not used as control due to large vertical misclosure. The NGS Model GEOID09 was applied to the derived ellipsoid heights to approximate the North American Vertical Datum of 1988.

Vertical control is based on the North American Vertical Datum of 1988 (NAVD88).

NGS recovery sheets are located in Section 9 of the Control Survey Report.

2.2 Network Computations

GPS measurements were collected using the RTK survey method. Passive NGS control stations were observed in the field and active NGS CORS stations were added in the office. GPS measurement computations were done in two stages. Initial computations were done with LEICA Geo Office (LGO), version 8.3. LGO permits the conversion of raw satellite data collected by the receivers to a meaningful coordinate difference between points (baseline solutions). Once the baseline solutions were determined, they were input into the GeoSurv-GeoLab2 series of programs (Geolab version 2.4d). A network adjustment was performed for analysis and quality closure holding the position and elevation of station **M 55** fixed as follows:

HORIZONTAL CLOSURES (in meters)

STATION	NORTHING	EASTING	LINEAR	DISTANCE	PROPORTION
CHETOPA	0.019	0.048	0.052	72371.4	1:1401000
K 56	0.045	0.019	0.049	62635.1	1:1282000
KINNE	0.033	0.050	0.060	9340.1	1: 155000
KST6	0.020	0.023	0.030	172485.8	1:5659000
MOBT	0.023	0.018	0.029	96882.1	1:3317000
MOCA	0.016	0.032	0.036	89589.8	1:2504000
MONE	0.017	0.003	0.017	77028.8	1:4531000
ZKC1	0.030	0.037	0.048	141198.2	1:2964000

VERTICAL CLOSURES (in meters)

STATION	ADJUSTED ELEVATION	PUBLISHED ELEVATION	DIFFERENCE	DISTANCE	ALLOWABLE 3rd ORDER CLOSURE

801.25	245.037	244.965	0.072	68255.4	0.099
CHETOPA	252.480	252.430	0.050	72371.4	0.102
D 274	281.172	281.214	0.042	79279.0	0.107
K 56	314.353	314.327	0.026	62635.1	0.095
P 277	319.916	319.950	0.034	49189.9	0.084

The above control was held in the fully constrained scaled least squares base network adjustments to derive the ground control checkpoint values.

3 LiDAR ACQUISITION AND PROCEDURES

3.1 Acquisition Time Period

LiDAR data acquisition and Airborne GPS control surveys were completed between November 17th, 2012 and November 20th, 2012. Six flight missions were required to cover the project areas.

3.2 LiDAR Planning

The LiDAR data for this project was collected with Aerial Surveys International (ASI) Optech Orion H300 airborne LiDAR system. All flight planning and flights were completed using Optech FMS, version 4.4.12 (flight planning and LiDAR control software).

Item 3.2 Acquisition details for the project acquisition flights.

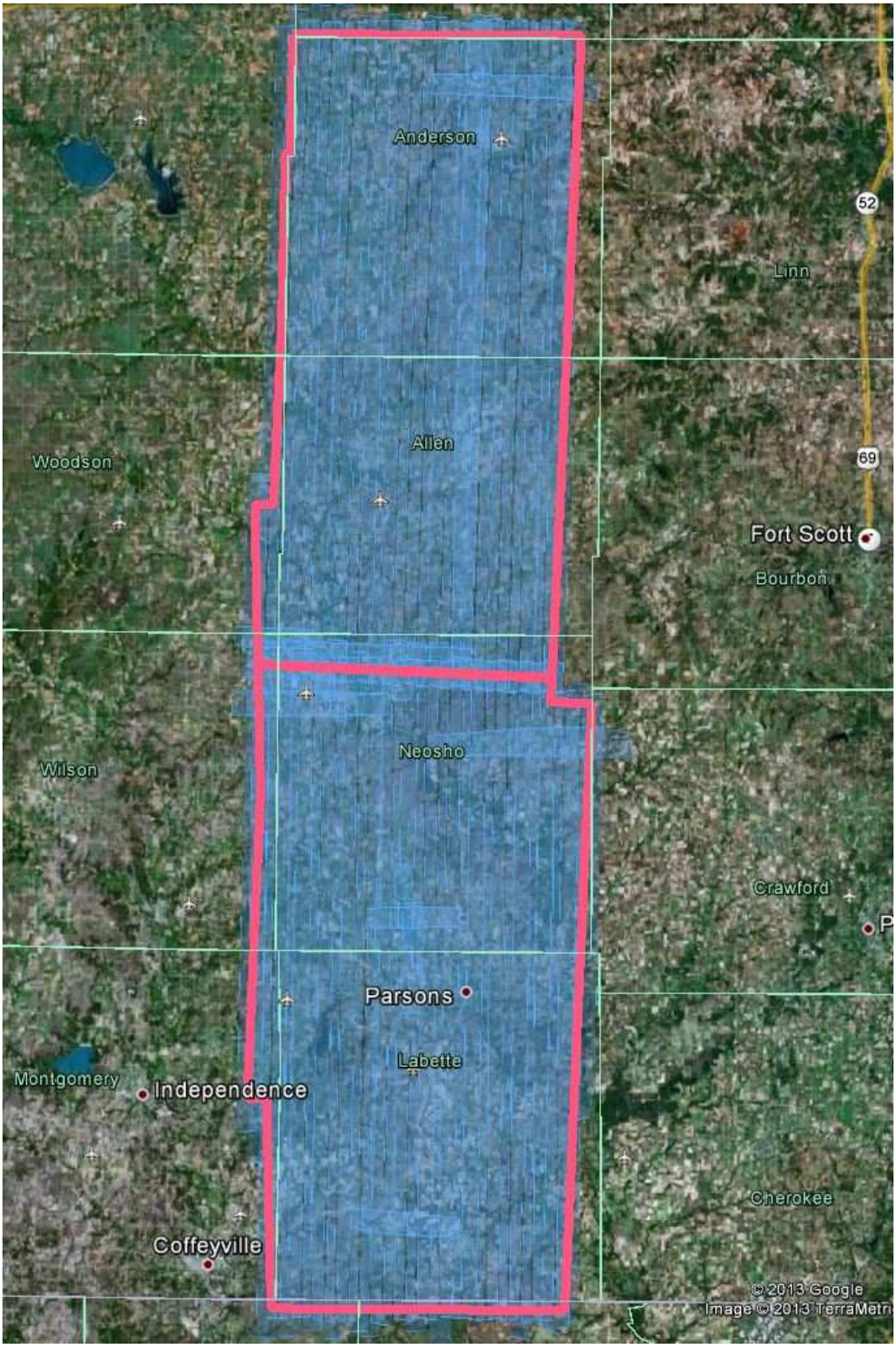
Flying Height (Above Ground)	2900 m
Laser Pulse Rate	125 kHz
Mirror Scan Rate Frequency	33 Hz
Scan Angle (degrees)	20
Side Lap	30%
Ground Speed	160 kts
Nominal Point Spacing/meter	1.25

3.3 LiDAR Acquisition

A total of 6 flight missions were required to cover the project area. The missions were flown using the values in the chart above, Item 3.2. Images of the acquisition missions or flight lines in the three areas follow as Items 3.3. Section 7 contains images of the flight log sheets.

Airborne GPS and IMU position and trajectory data of the LiDAR sensor were also acquired during the time of flight.

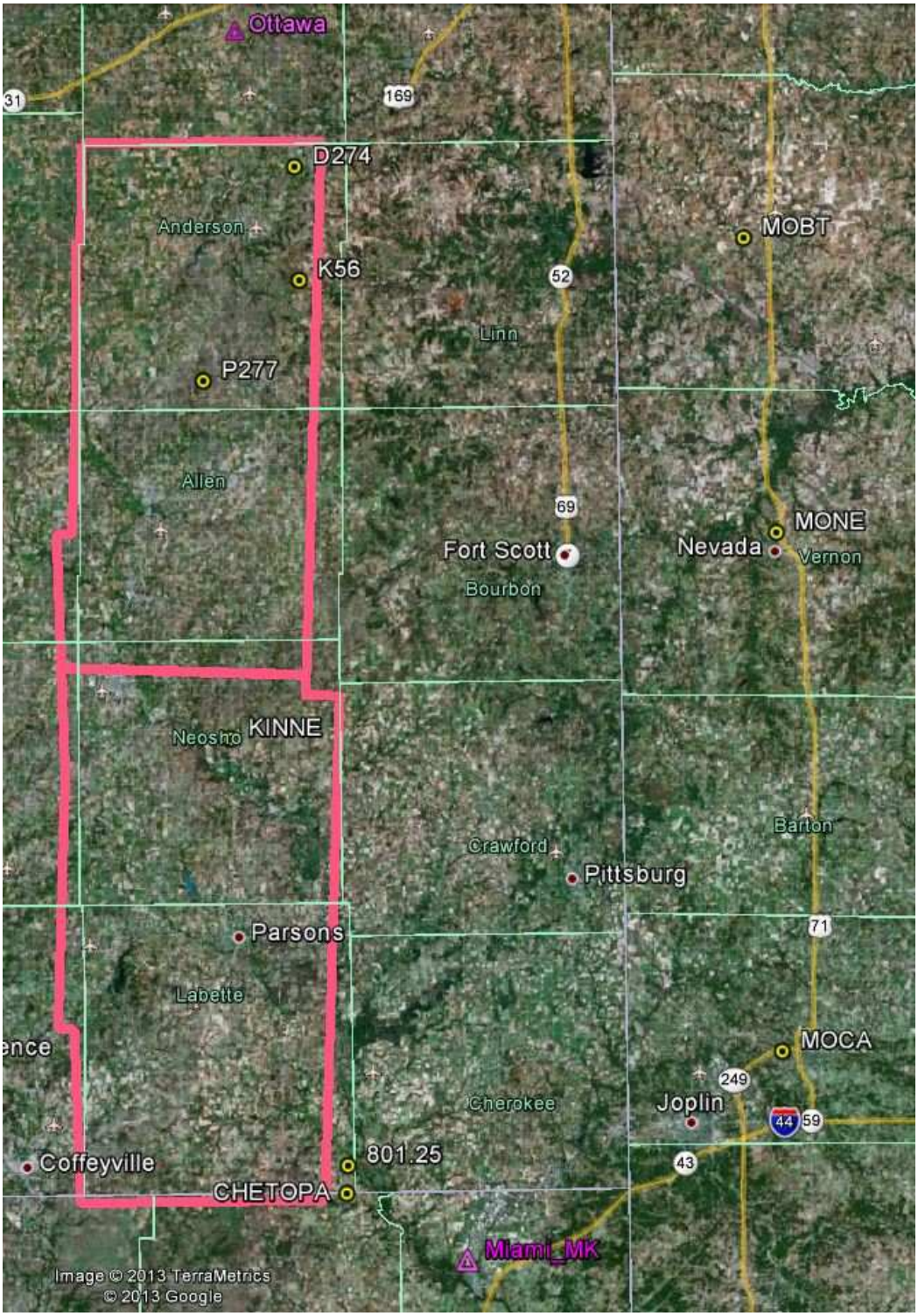
Missions were typically three to four hours long. Before take-off, the LiDAR system and the Airborne GPS and IMU system were initialized for a period of five minutes and in operation after landing for another five minutes. The missions acquired data according to the planned flight lines and included a minimum of one (usually two) cross flights. The cross flights were flown perpendicular to the planned flight lines and their data used in the in-situ calibration of the sensor.



3.3 Acquisition area; missions and flight lines in Kansas, Area 1, Anderson, Allen, Neosho, and Labette counties.

3.4 LiDAR Trajectory Processing

The airborne positioning was based on the following control stations: Base stations were set at Ottawa and Miami_MK. The network computations include 801.25, K56, KST6, MOBT, MOCA, MONE, ZKC1, D274, KINNE, P277, and CHETOPA. See approximate locations in Item 3.4.



3.4 Control Station locations and Project boundary

4 QC SURVEYS

The check point survey was performed between November 27th and December 4th, 2012 using Rapid Static GPS techniques. The project consists of Anderson, Allen, Neosho, and Labette counties. Ground survey personnel collected a total of 110 survey points in these counties. These points were collected in all terrain categories to assess vertical accuracies in each category. A breakdown of the survey points are shown below.

Open Terrain = 20 points
Low Grass Land Category = 22 Points
Tall Grass Land Category = 22 Points
Forest Land Category = 22 Points
Urban Land Category = 24 Points

The control stations mentioned above to support the Airborne GPS acquisition were also used to complete the QC surveys. See Section 8 of the control report for a complete listing.

4.0 Area 1, Ground Survey Check Point Locations.

5 FINAL LiDAR PROCESSING

5.1 ABGPS and IMU Processing

Airborne GPS

Applanix - POSGPS

Utilizing carrier phase ambiguity resolution on the fly (i.e., without initialization). The solution to sub-decimeter kinematic positioning without the operational constraint of static initialization as used in semi-kinematic or stop-and-go positioning was utilized for the airborne GPS post-processing.

TerraTec – TERRAPOS

TERRAPOS represents a state-of-the-art solution to Precise Point Positioning (PPP). TERRAPOS has been implemented to be fully compliant with data and products from leading international organizations, e.g. the International Earth Rotation and Reference Systems Service (IERS) and the International GNSS Service (IGS). TERRAPOS thus allows kinematic positioning with sub decimeter accuracy within the globally consistent and long-term stable reference frames maintained by the IERS.

In the PPP solution the carrier phase biases are estimated as real numbers (a so-called “float solution”). This confirms that the precision of the solution benefits from an increased data rate using an increased number of observations. However, this gain is ultimately limited by the time correlated errors in the observations that include but not limited to multipath and residual satellite clock errors. The data requires both dual-frequency code and carrier phase observations and uses respective ionosphere-free linear combinations. Doppler observations are also included in the computation for all kinematic profiles which assists the algorithm in the pre-processing to aid cycle slip detection and also helps to improve the position estimates.

Inertial Data

The post-processing of inertial and aiding sensor data (i.e. airborne GPS post processed data) is to compute an optimally blended navigation solution. The Kalman filter-based aided inertial navigation algorithm generates an accurate (in the sense of least-square error) navigation solution that will retain the best characteristics of the processed input data. An example of inertial/GPS sensor blending is the following: inertial data is smooth in the short term. However, a free-inertial navigation solution has errors that grow without bound with time. A GPS navigation solution exhibits short-term noise but has errors that are bounded. This optimally blended navigation solution will retain the best features of both, i.e. the blended navigation solution has errors that are smooth and bounded.

The resultant processing generates the following data:

- Position: Latitude, Longitude, Altitude
- Velocity: North, East, and Down components
- 3-axis attitude: roll, pitch, true heading
- Acceleration: x, y, z components
- Angular rates: x, y, z components

These procedures are utilized with the TerraTec TERRAPOS, version 2.0.4 (1851) software to determine the ABGPS trajectory. The blending of inertial data utilized only the Applanix software, version 4.4.

The airborne GPS and blending of inertial and GPS post-processing were completed in multiple steps.

The collected data was transferred by the field data collectors to the main computer. Data was saved under the project number and separated between LiDAR mission dates. Inside each mission date, a sub-directory was created with the aircraft's tail number and an A or B suffix was attached for the time of when the data was collected. Inside the tail number sub-directory, five sub-directories were also created EO, GPS, IMU, PROC, and RAW.

The aircraft raw data (IMU and GPS data combined) was run through a data extractor program. This separated the IMU and GPS data. In addition to the extracting of data, it provided the analyst the first statistics on the overall flight. The program was POSPac (POS post-processing PACkage), version 4.4.

Executing POSGPS program to derive accurate GPS positions for all flights:

TerraTech – TERRAPOS

The Applanix POSPac software requires ground base stations along with the airborne GPS data to compute the position and velocity of the sensor. Given the difficulties due to the ground stations as mentioned in Conditions Affecting Progress, a new processing technique was also employed to achieve the same superior accuracy as found with the traditional Applanix POSPac processing without the need of any base station support. This software used was TERRAPOS

The TERRAPOS procedure is to convert the binary structure of the GPS collected data to a Receiver Exchange format (RINEX) and is ingested into software and subsequently runs its advance and fully automated algorithms.

Once the data has been executed a graphical and a textual log is displayed. These values are inspected and accepted. An accepted accuracy would indicate an accuracy of 0.1m or less at a 95% of the entire mission. This accepted post-processed trajectory is relative to the ITRF, but the user could then relate the accepted trajectory positions to another Global Datum (e.g. NAD83). TERRAPOS has many fixed datums to pick from to relate it to their local reference datum. However, the reference for this project is the same as the processing it was completed in, and the accepted trajectories did not require a translation to another known datum.

When the processed trajectory data was accepted after quality control analysis, the combined solution is stored in a file format acceptable for the IMU post processor (i.e. POSProc).

Execute POSProc.

POSProc comprises a set of individual processing interface tools that execute and provide the following functions:

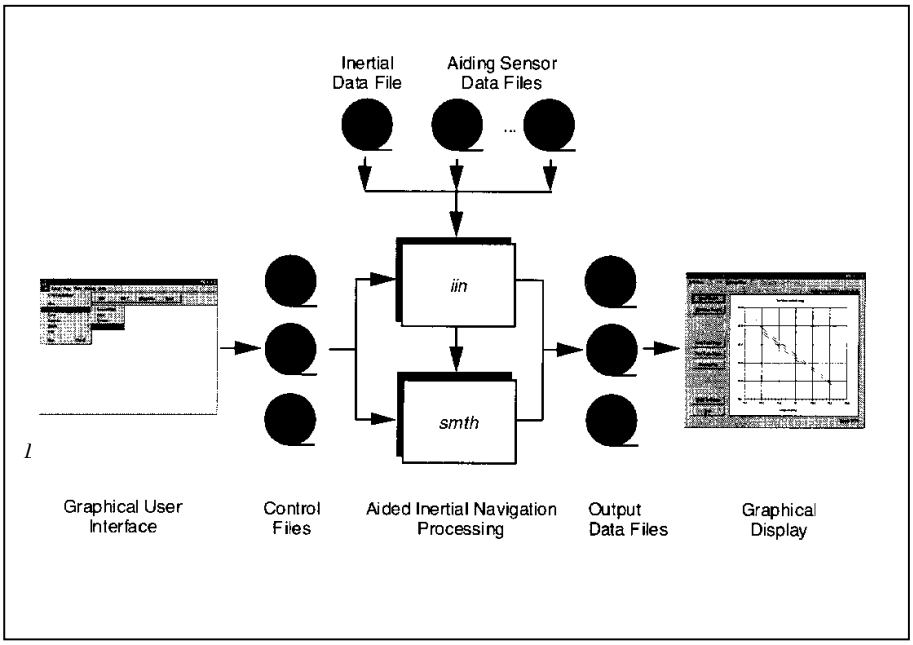


Diagram 3 shows the organization of these tools, and is a function of the POSProc processing components.

Integrated Inertial Navigation (iin) Module.

The name *iin* is a contraction of Integrated Inertial Navigation. *iin* reads inertial data and aiding data from data files specified in a processing environment file and computes the aided inertial navigation solution. The inertial data comes from a strapdown IMU. *iin* outputs the navigation data between start and end times at a data rate as specified in the environment file. *iin* also outputs Kalman filter data for analysis of estimation error statistics and smoother data that the smoothing program *smth* uses to improve the navigation solution accuracy.[3]

iin implements a full strapdown inertial navigator that solves Newton's equation of motion on the earth using inertial data from a strapdown IMU. The inertial navigator implements coning and sculling compensation to handle potential problems caused by vibration of the IMU. [3]

Smoother Module (smth).

smth is a companion processing module to *iin*. *smth* is comprised of two individual functions that run in sequence. *smth* first runs the *smoother function* and then runs the *navigation correction function*.[3]

The *smth* smoother function performs backwards-in-time processing of the forwards-in-time blended navigation solution and Kalman filter data generated by *iin* to compute smoothed error estimates. *smth* implements a modified Bryson-Frazier smoothing algorithm specifically designed for use with the *iin* Kalman filter. The resulting smoothed strapdown navigator error estimates at a given time point are the optimal estimates based on all input data before and after the given time point. In this sense, *smth* makes use of all available information in the input data. *smth* writes the smoothed error estimates and their RMS estimation errors to output data files. [3]

The *smth* navigation correction function implements a feedforward error correction mechanism similar to that in the *iin* strapdown navigation solution using the smoothed strapdown navigation errors. s*mth* reads in the smoothed error estimates and with these, corrects the strapdown navigation data. The resulting navigation solution is called a Best Estimate of Trajectory (BET), and is the best obtainable estimate of vehicle trajectory with the available inertial and aiding sensor data. [3]

The above mentioned modules provide the analyst the following statistics to ensure that the most optimal solution was achieved: a log of the *iin* processing, the Kalman filter Measurement Residuals, Smoothed RMS Estimation Errors, and Smoothed Sensor Errors and RMS.

5.2 LiDAR "Point Cloud" Processing

The ABGPS/IMU post processed data along with the LiDAR raw measurements were processed using Optech Incorporated's ASDA software. This software was used to match the raw LiDAR measurements with the computed ABGPS/IMU positions and attitudes of the LiDAR sensor. The result was a "point cloud" of LiDAR measured points referenced to the ground control system.

5.3 LiDAR CALIBRATION

Introduction

The purpose of the LiDAR system calibration is to refine the system parameters in order for the post-processing software to produce a "point cloud" that best fits the actual ground.

The following report outlines the calibration techniques employed for this project.

Calibration Procedures

All Companies involved in collection routinely performs two types of calibrations on its airborne LiDAR system. The first calibration, system calibration, is performed whenever the LiDAR system is installed in the aircraft. This calibration is performed to define the system parameters affected by the physical misalignment of the system versus aircraft. The second calibration, in-situ calibration, is performed for each mission using that missions data. This calibration is performed to refine the system parameters that are affected by the on site conditions as needed.

System Calibration

The system calibration is performed whenever the LiDAR system is installed in the aircraft. This calibration is performed to define the system parameters affected by the physical misalignment of the system versus aircraft. The main system parameters that are affected are the heading, pitch, roll, and mirror scale.

The system calibration is performed by collecting data over a known test site that incorporates a flat surface and a large, flat roofed building. A ground survey is completed to define the flat surface and the building corners. The processed LiDAR data and ground survey data is input into TerraSolid's TerraMatch software to determine the systematic errors. The system parameters are then corrected according to the determined errors and used in the processing of future LiDAR acquisition missions

In-situ Calibration

The in-situ calibration is performed as needed using the mission's data. This calibration is performed to refine the system parameters that are affected by the on site conditions.

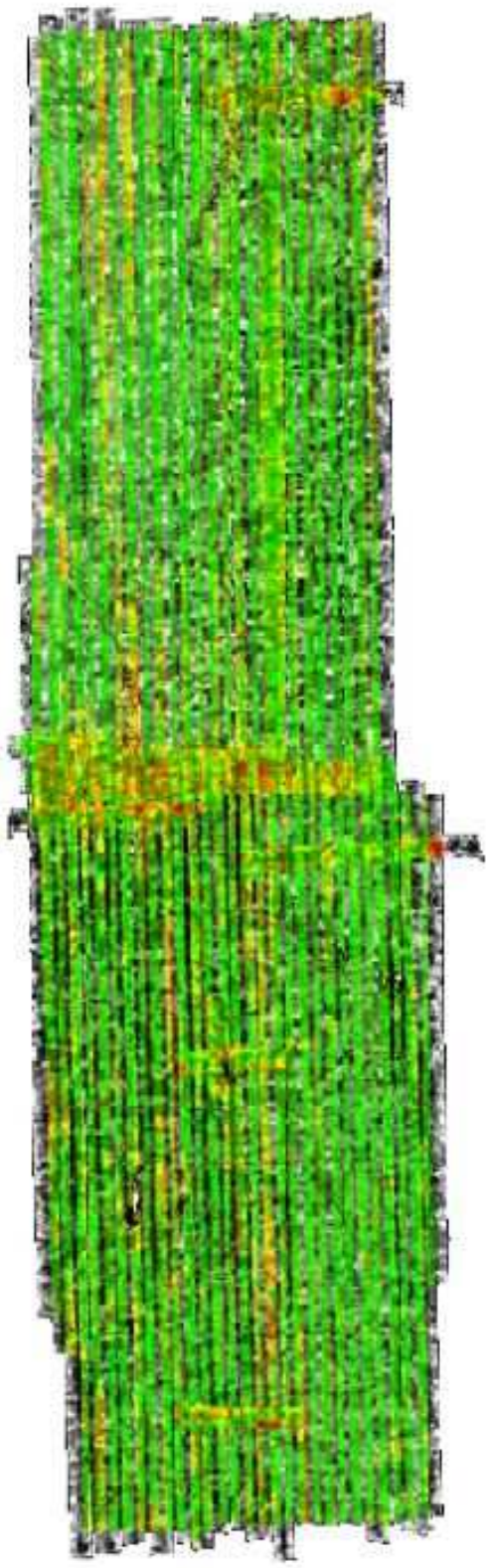
For each mission, LiDAR data for at least one cross flight is acquired over the mission's acquisition site. The processed data of the cross flight is compared to the perpendicular flight lines using either the Optech proprietary software or TerraSolid's TerraMatch software to determine if any systematic errors are present. In this calibration, the data of individual flight lines are compared against each other and their systematic errors are corrected in the final processed data.

5.4 LiDAR Processing

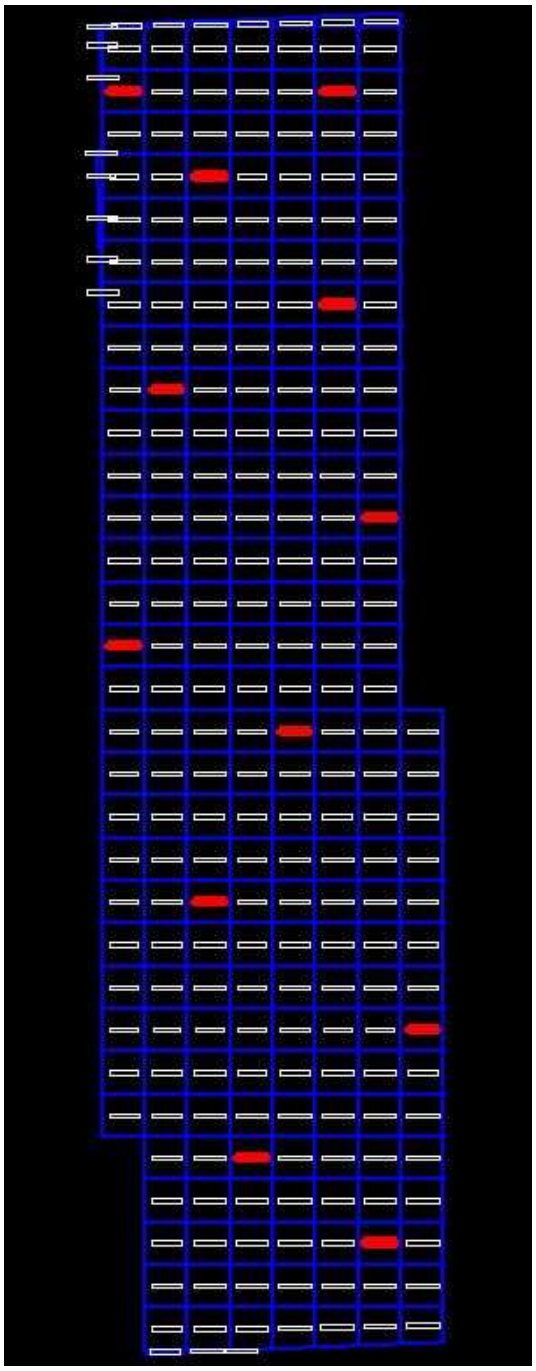
The LAS files were then imported, verified, and parsed into manageable, tiled grids using GeoCue version 2012.1.27.5. GeoCue allows for ease of data management and process tracking.

The first step after the data has been processed and calibrated is to perform a relative accuracy assessment on the flightline to flightline comparisons and also a data density test prior any further processing.

In addition to the relative accuracy assessment, Aerometric also reviews a few tiles to ensure that the desired point density has been met. Aerometric utilizes an in-house proprietary software to complete this task. Initially a grid is placed according to the version 12 specification that is based on the nominal post spacing. Point density is analyzed and the result indicates the density of the sampled tiles. The latest USGS specification, version 13, modifies the requirement allowing up to 2 times the nominal post spacing. Our data evaluation acknowledges this change.



Relative Accuracy assessment



Sample tile location in Area1 for point density analysis

Sampled tiles: (R6C124.las, R8C121.las, R11C125.las, R14C120.las, R18C122.las, R20C118.las, R23C124.las, R26C119.las, R28C123.las, R31C120.las, R33C118.las and R33C123.las)

Run 1 (Version 12 – 1.25 meter) Total number of cells: 192,096,012. Total number of cells with one or more points : 174,561,692. Percentage of tiles with 1 point or more: 90.8%

Run 2 (Version 13 – 2.50 meter) Total number of cells: 48,048,012. Total number of cells with one or more points: 47,692,493. Percentage of tiles with 1 point or more: 99.2%

Once both the accuracy between swaths and data density is accepted an automated classification algorithm is performed using TerraSolid's TerraScan, version 012.020. This will produce the majority of the bare-earth datasets.

The remainder of the data was classified using manual classification techniques. The majority of the manual editing involved changing points initially misclassified as ground (class 2) to unclassified (class 1). Erroneous low points, high points, including clouds are classified to class 7.

5.5 Check Point Validation

The data was then verified against ground control data. TerraScan computes the vertical differences between the surveyed elevation of ground control points and the LiDAR derived elevations at these points.

A report listing the differences and common statistics was created and can be found in Section 9, of this report.

5.6 LiDAR Data Delivery

The processed unclassified point cloud data supplied is in the following format:

- LAS, version 1.2
- GPS times adjusted to GPS Absolute
- Full swaths and delivered as 1 file per swath which did not exceed 2 gigabytes.

Classified point cloud data is also being supplied using the following criteria.

- LAS, version 1.2 in 5000 meter grid
- GPS times adjusted to GPS Absolute
- Classification scheme:
  - 1 – Processed, but unclassified
  - 2 – Bare Earth, Ground
  - 7 – Noise
  - 9 – Water
  - 10 – Ignored Ground (Breakline proximity)
  - 11 – Withheld
  - 17 – Overlap – unclassified
  - 18 – Overlap – Bare-Earth
  - 23 – Overlap – noise
  - 24 – Overlap – water
  - 25 – Overlap – Ignored Ground

Bare earth hydro-flattened 1 meter DEMs were created using TerraModeler (TerraSolid Ltd.). The ASCII grids were then imported into ARC and translated to raster format and placed in a geo-database DEM feature dataset.

First return 1 meter DEM images were created using GeoCue. They are geo-referenced and converted to IMG format.

Break lines polygon are first collected in a Microstation environment using the project specifications. They are checked for QC/QA. Upon acceptance the breaklines, either polygons or lines, are translated into ARC and imported to the final geo-database as separate features.

6 CONCLUSION

Sound procedures and use of new technology ensure this project data will serve the Kansas Department of Administration and Kansas Geological Survey and all users requiring the provided LiDAR derivative products for the project areas in eastern Kansas well into the future. Although this project presented challenges to equipment and personnel, the results are accurate and reliable.

7 FLIGHT LOGS

LIDAR FLIGHT LOG

DATE: 11-20-2012 (B) | MISSION: Kansas-north B/K | Flight (B)

PILOT: Cook | OPERATOR: PETERSEN | POS FILE: 1120B

ALTM

LINE #	LINE NO. & Hdg		GND SPEED (KTS)	GPS ALT	PLAN	PRF	Range ALT (m)	TIME START	TIME STOP	DISTANCE	REMARKS
Cal 1	W	+	138	3221		125	2900	2258	2300		+ > Runway OWI
Cal 2	E	+	157	3202		125	2900	2303	2305		+
5	S		146	3194		125	2900	2313	2330		
4	N		136	3200		125	2900	2333	2353		
3	S		146	3198		125	2900	2355	0013		
2	N		134	3229		125	2900	0016	0035		
1	S		146	3200		125	2900	0046	0052		
Tie	E		144	3212		125	2900	0055	0057		
Cal 3	N	=	140	3200		125	2900	0117	0119		= > Runway OWI
Cal 4	W	+	150	3226		125	2900	0124	0126		+

TOTAL ENGINE TIME ON			TOTAL LINE DISTANCE	STATIC	START:	STOP:	NOTES: Alt: 30.13
							Temp: 41°F
				W			

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LIDAR FLIGHT LOG

DATE: 11/17/12 | MISSION 1117b

PILOT: Mark | OPERATOR: Josh | POS FILE: 1117B

ALTM

LINE #	LINE NO. & Hdg	GND SPEED (KTS)	ALT$_m$ PLAN	PRF	Range ALT (m)	TIME START	TIME STOP	DISTANCE	REMARKS
CAL1	E	158	3149	125	2900	0616			
CAL2	W	129	3149	125	2900	0626			
Cal3	NNW	140	3149	125	2500	634			
18									
18	N	142-156	3149	125	2900	0649	0706		
17	S	146	3149	125	2900	0711	0730		Laser power configuration is inconsistant with mission plan, Laser power configuration, system 90%, Plan 92% PRF 125, power high
16	N	150	3149	125	2900	0736	0754		
15	S	146	3149	125	2900	0759	0817	→	19 miles to North End Blacke Spot Swath
14	N	150	3149	125	2900	0824	0843		
13	S	145	3149	125	2900	0847	0909		
CR	W	146	3149	125	2900	0912	0915		
15	N	159	3149	125	2900	0921	0925		Reflight
16	S	129	3149	125	2900	0928	0930		Reflight
CR	E	134	3149	125	2900	0935	0937		Tie all include RF
Cal 4	E	150	3149	125	2900	0951	0953		40m high
Cal 5		146	3149	125	2900	0959	1000		TEMP = 40
									ALT = 30.28

TOTAL ENGINE TIME ON		TOTAL LINE DISTANCE	STATIC	START:	STOP:
			W		

NOTES: Range meter lidar tab 21800 ?K what represent
What are different colors on Real time Swath
ei, is red bad?

AERIAL SURVEYS INTERNATIONAL AERIALSURVEYS@EARTHLINK.NET 303-261-9990

LIDAR FLIGHT LOG

1-12

DATE: 111812 | MISSION 1118a

PILOT: Cook | OPERATOR: LINK | POS FILE: 1118a

ALTM

LINE #	LINE NO. & Hdg	GND SPEED (KTS)	ALT	PLAN	PRF	ALT (m)	TIME START	TIME STOP	DISTANCE	REMARKS
CAL			2900		125					RMSE@ 11:30
CAL			↓		↓					2.12, 4.63
12	N	158	↓		↓	3158				
11	S	136	↓			3177	17:30	17:49	78 645	RMSE @ 12:45
10	N	134				3122	17:52	18:10	78 590	
9	S	154				3172	18:14	18:37	78.534	
8	N	159				3193	1840	18:57	78479	FIFO-804 ERROR
7	S	130				3168	19:01	19:20	78 423	
6	N	143				3145	19:23	19:40	78 368	SI048 FIFO-804 ERROR
5	S	147				3211	19:44	20:04	78 312	RMSE @ 2:00 2.12, 4.67
4	N	153				3184	20:07	20:24	78 257	
3	S	138				3199	20:27	20:46	78 202	RMSE@ 2:30 2.12 4.69
2	N	157				3187	20:52	21:08	75 154	
1	S	140				3187	21:12	21:30	75 076	
TIE										
CAL										
CAL										
CAL										

TOTAL ENGINE TIME ON		TOTAL LINE DISTANCE	STATIC	START:	STOP:	NOTES:
10:20	ON			10:20		
4:35	OFF		W	4:35		

LIDAR FLIGHT LOG

918-542-0107
7979

N300G ?

ALTM

DATE: 11-19-2012 | MISSION: Kansas_South BIK

PILOT: Cook | OPERATOR: PETERSEN | POS FILE: 1119a

LINE #	LINE NO. & Hdg		GND SPEED (KTS)	GPS ALT	PLAN	PRF	Range ALT (m)	TIME START	TIME STOP	DISTANCE	REMARKS
Cal1	E	+	163	3166		125	2900	1926	1927	Cross Runway MIO	+ > MIO Runway 17-35
Cal2	W	+	140	3160		125	2900	1931	1933	11	+ >
19	N		144	3166		125	2900	1945	2004		
20	S		154	3170		125	2900	2006	2024		
21	N		146	3163		125	2900	2027	2046		
22	S		144	3177		125	2900	2048	2107		22 miles in from 16% drop out (Lake)
23	N		140	3163		125	2900	2109	2138		
24	S		142	3172		125	2900	2130	2148		
25	N		144	3160		125	2900	2151	2210		
26	S		144	3170		125	2900	2213	2231		
27	N		150	3136		125	2900	2233	2252		
28	S		148	3155		125	2900	2254	2309		
29	N		154	3169		125	2900	2312	2325		
Tie	SE		171	3157		125	2900	2327	2331		
Cal3	E	+	169	3193		125	2900	2349	2351		+ > MIO Runway 17-35
Cal4	N	=				125	2900	2355	2357		= >

TOTAL ENGINE TIME ON		TOTAL LINE DISTANCE	STATIC	START:	STOP:	NOTES:
						TEMP. 36° F
			W			ALT: 30.14 (pressure)

AERIAL SURVEYS INTERNATIONAL AERIALSURVEYS@EARTHLINK.NET 303-261-9990

LIDAR FLIGHT LOG

DATE: 11 19 b | MISSION

PILOT: | OPERATOR: LINK | POS FILE:

ALTM

LINE #	LINE NO. & Hdg	GND SPEED (KTS)	RANGE ALT	PLAN	PRF	ALT (m)	TIME START	TIME STOP	m DISTANCE	REMARKS
										POS
CAL	E							03:02		11 19 b
CAL	W									
CAL	N									
27	S	154	2948		125	3187	3:24	3:42	80 047	RMSE 2.13, 4.64
26	N	142	2923		↓	3185	3:46	4:04	79 983	2.12 4.65
25	S	152	2952			3177	4:09	4:26	79 918	RMSE 2 12 4.65
24	N	148	2910			3178	4:31	4:49	79 853	
23	S	142	2899			3183	4:54	5:11	79 788	
22	N	154	2901			3173	5:16	5:34	79 723	
21	S	156	2918			3181	5:38	5:56	79 658	
20	N	152	2922			3204	5:59	6:17	79 593	RMSE 2.12 4.64
* 19	S	146	2917			3188	6:22	6:	79 528	2.12 4.61
18	N	148	2925			3205	6:43	7:01	79463	LAS SN126 LASER FAILED INSPECTION
17	S	154	2906			3184	7:05		79,398	
16	N	152	2950			3199	7:25	7:43	79 333	
TIE	E						746			
CAL	E									
CAL	W									

TOTAL ENGINE TIME ON	TOTAL LINE DISTANCE	STATIC	START:	STOP:	NOTES:
			8:30pm		REFLY S. HALF OF (*) 19 LASER SHUT OFF AFTER 12 mins! (*)

LIDAR FLIGHT LOG

DATE: 11-20-2012 | MISSION: North_Kansas_Blk | Flight (A)

PILOT: Cook | OPERATOR: Petersen | POS FILE: 1120AA

ALTM

LINE #	LINE NO. & Hdg		GND SPEED (KTS)	GPS ALT	PLAN	PRF	Range ALT (m)	TIME START	TIME STOP	DISTANCE	REMARKS
Cal 1	W	+	146	3191		125	2900	1540	1542		+ > Runway OWI
Cal 2	E	+	157	3196		125	2900	1547	1949	49m	+
15	S		160	3188		125	2900	1553	1611	"	
14	N		130	3180		125	2900	1614	1636	"	
13	S		150	3190		125	2900	1638	1655	"	
12	N		130	3200		125	2900	1657	1718	"	
11	S		152	3186		125	2900	1720	1738	"	
10	N		136	3200		125	2900	1740	1800	"	
9	S		148	3184		125	2900	1802	1821	"	
8	N		138	3210		125	2900	1823	1842	"	
7	S		148	3199		125	2900	1844	1902	"	
6	N		140	3200		125	2900	1906	1925	"	
19	S		154	3190		125	2900	1929	1947	"	
Tie	W		144	3200		125	2900	1949	1954	/	
Cal 3	E	+	169	3220		125	2900	2016	2017		+ > Runway OWI
Cal 4	S	=	171	3191		125	2900	2022	2023		=
		=									

TOTAL ENGINE TIME ON		TOTAL LINE DISTANCE	STATIC	START:	STOP:
			W		

NOTES: ALT : 30.18 (pressure)
TEMP: 36°F

AERIAL SURVEYS INTERNATIONAL AERIALSURVEYS@EARTHLINK.NET 303-261-9990

8 (Check point index)QA QC

1121109 KS
HORIZONTAL - NAD 83 UTM ZONE 14
VERTICAL - NAVD88 METER

STATION	EASTING	NORTHING	SURVEY ELEV (m)	LiDAR ELEV (m)	DIFFERENCE (m)	LAND COVER CATEGORY
1	827748.467	4253358.746	310.826	310.75	-0.076	Open Terrain
2	838519.471	4253605.093	273.495	273.56	0.065	Open Terrain
3	811750.667	4247313.523	304.610	304.63	0.020	Open Terrain
4	837178.934	4222346.897	323.809	323.84	0.031	Open Terrain
5	810200.065	4220820.899	314.111	314.10	-0.011	Open Terrain
6	815466.412	4208108.024	294.777	294.78	0.003	Open Terrain
7	826624.941	4211726.780	313.837	313.83	-0.007	Open Terrain
8	836350.646	4203996.460	338.692	338.77	0.078	Open Terrain
9	831653.362	4189313.179	308.074	308.03	-0.044	Open Terrain
10	813690.612	4190748.170	297.587	297.55	-0.037	Open Terrain
11	830536.105	4177081.819	319.050	319.03	-0.020	Open Terrain
12	829597.006	4160107.772	272.544	272.50	-0.044	Open Terrain
13	809632.189	4176048.583	293.575	293.63	0.055	Open Terrain
14	840382.448	4154216.671	261.929	261.88	-0.049	Open Terrain
15	812079.354	4154849.39	319.320	319.33	0.010	Open Terrain
16	835550.737	4139340.328	278.689	278.63	-0.059	Open Terrain
17	817818.478	4138590.039	283.533	283.55	0.017	Open Terrain
18	829618.468	4126074.567	284.301	284.29	-0.011	Open Terrain
19	815732.429	4106335.226	261.404	261.42	0.016	Open Terrain
20	836964.597	4107497.626	272.629	272.61	-0.019	Open Terrain

Average dz -0.005
Minimum dz -0.076
Maximum dz +0.078
Average magnitude -0.009
Root mean square 0.041
Std deviation 0.042

1121109 KS
HORIZONTAL - NAD 83 UTM ZONE 14
VERTICAL - NAVD88 METER

STATION	EASTING	NORTHING	SURVEY ELEV (m)	LiDAR ELEV (m)	DIFFERENCE (m)	LAND COVER CATEGORY
104	834961.150	4249585.063	283.860	283.95	0.090	Forest
108	822824.207	4240833.831	306.126	306.13	0.004	Forest
110	812657.010	4245384.954	298.512	298.57	0.058	Forest
115	829228.807	4234595.224	311.648	311.58	-0.068	Forest
117	819386.013	4235756.984	306.051	306.05	-0.001	Forest
122	810198.649	4220403.301	311.094	311.19	0.096	Forest
124	815281.826	4213759.786	324.918	324.97	0.052	Forest
130	831863.545	4205456.926	323.067	323.22	0.153	Forest
137	809186.774	4203734.974	299.243	299.33	0.087	Forest
141	828691.844	4184402.165	286.048	286.20	0.152	Forest
145	812205.105	4196535.633	304.904	304.88	-0.024	Forest
146	829195.424	4169852.780	274.323	274.42	0.097	Forest
152	825238.645	4167929.175	280.958	280.96	0.002	Forest
158	834691.200	4155139.349	273.529	273.60	0.071	Forest
161	835914.007	4149097.471	278.439	278.48	0.041	Forest
164	815518.484	4148297.916	298.244	298.30	0.056	Forest
167	817893.818	4162885.071	290.949	291.04	0.091	Forest
169	843202.029	4138860.156	256.986	256.96	-0.026	Forest
172	816906.033	4131696.081	292.164	292.33	0.166	Forest
173	825923.844	4129227.893	268.896	268.99	0.094	Forest
185	818672.814	4103079.899	270.102	270.15	0.048	Forest
190	829650.840	4117260.372	277.708	277.62	-0.088	Forest

Average dz 0.053
Minimum dz -0.88
Maximum dz +0.166
Average magnitude 0.057
Root mean square 0.085
Std deviation 0.068

1121109 KS
HORIZONTAL - NAD 83 UTM ZONE 14
VERTICAL - NAVD88 METER

STATION	EASTING	NORTHING	SURVEY ELEV (m)	LiDAR ELEV (m)	DIFFERENCE (m)	LAND COVER CATEGORY
102	834068.238	4253766.373	270.755	270.80	0.045	Low_Grass
105	832320.417	4245229.451	303.490	303.47	-0.020	Low_Grass
109	821520.267	4245889.870	306.981	306.92	-0.061	Low_Grass
112	828377.653	4237664.729	335.935	335.87	-0.065	Low_Grass
114	824555.019	4222995.740	331.764	331.78	0.016	Low_Grass
123	808860.191	4212672.634	310.668	310.56	-0.108	Low_Grass
126	826582.292	4212931.646	313.887	313.84	-0.047	Low_Grass
127	832975.547	4215129.490	326.108	326.13	0.022	Low_Grass
133	822376.774	4197017.970	316.008	315.96	-0.048	Low_Grass
139	831645.285	4189337.134	307.701	307.63	-0.071	Low_Grass
143	817282.388	4187115.076	304.909	304.93	0.021	Low_Grass
147	830544.424	4177120.049	318.461	318.45	-0.011	Low_Grass
151	825241.660	4159955.972	301.191	301.22	0.029	Low_Grass
154	807837.646	4180315.967	302.852	302.80	-0.052	Low_Grass
157	829653.259	4160135.876	270.367	270.33	-0.037	Low_Grass
159	839950.540	4155387.837	262.258	262.29	0.032	Low_Grass
166	810084.492	4164222.427	300.678	300.58	-0.098	Low_Grass
171	809366.817	4138137.743	274.696	274.68	-0.016	Low_Grass
176	840189.751	4144434.245	265.365	265.33	-0.035	Low_Grass
181	823667.728	4110085.320	288.474	288.35	-0.124	Low_Grass
184	810700.937	4112329.622	230.913	230.83	-0.083	Low_Grass
189	833161.786	4118047.863	260.817	260.77	-0.047	Low_Grass

Average dz -0.035
Minimum dz -0.124
Maximum dz +0.045
Average magnitude -0.043
Root mean square 0.058
Std deviation 0.047

1121109 KS
HORIZONTAL - NAD 83 UTM ZONE 14
VERTICAL - NAVD88 METER

STATION	EASTING	NORTHING	SURVEY ELEV (m)	LiDAR ELEV (m)	DIFFERENCE (m)	LAND COVER CATEGORY
101	827732.011	4253348.393	310.153	310.13	-0.023	Tall_Grass
107	822624.691	4241006.258	312.310	312.28	-0.030	Tall_Grass
113	820135.639	4224452.900	333.305	333.26	-0.045	Tall_Grass
118	806947.128	4231995.183	336.591	336.51	-0.081	Tall_Grass
119	834888.624	4228221.577	355.450	355.47	0.020	Tall_Grass
121	811618.906	4227342.299	325.122	325.21	0.088	Tall_Grass
125	821916.720	4208324.731	314.949	314.89	-0.059	Tall_Grass
129	825245.339	4203616.540	313.964	313.96	-0.004	Tall_Grass
132	828811.900	4197264.417	328.305	328.30	-0.005	Tall_Grass
134	821822.904	4192163.621	308.455	308.53	0.075	Tall_Grass
138	813402.215	4197913.396	288.424	288.37	-0.054	Tall_Grass
142	822966.446	4176840.736	301.947	301.91	-0.037	Tall_Grass
149	838961.159	4168577.381	297.912	297.98	0.068	Tall_Grass
155	812623.530	4170763.409	293.976	294.00	0.024	Tall_Grass
156	825725.236	4142196.462	280.699	280.70	0.001	Tall_Grass
162	826847.574	4148730.386	283.966	284.01	0.044	Tall_Grass
168	835534.134	4139360.508	278.365	278.33	-0.035	Tall_Grass
170	817721.592	4141840.246	289.786	289.88	0.094	Tall_Grass
174	827995.091	4125992.469	279.603	279.64	0.037	Tall_Grass
180	828536.173	4109811.808	272.914	272.98	0.066	Tall_Grass
183	815296.796	4117294.979	243.827	243.81	-0.017	Tall_Grass
187	843355.391	4107233.715	263.759	263.69	-0.069	Tall_Grass

Average dz 0.001
Minimum dz -0.81
Maximum dz +0.094
Average magnitude -0.010
Root mean square 0.053
Std deviation 0.054

1121109 KS
HORIZONTAL - NAD 83 UTM ZONE 14
VERTICAL - NAVD88 METER

STATION	EASTING	NORTHING	SURVEY ELEV (m)	LiDAR ELEV (m)	DIFFERENCE (m)	LAND COVER CATEGORY
103	838663.596	4253426.969	274.506	274.53	0.024	Urban
106	827741.242	4244453.921	327.900	327.76	-0.140	Urban
111	811672.987	4247418.566	305.393	305.37	-0.023	Urban
116	837258.981	4236393.995	315.928	315.99	0.062	Urban
120	837255.516	4222350.971	323.438	323.45	0.012	Urban
128	835950.839	4215325.704	325.175	325.25	0.075	Urban
131	836688.576	4203831.091	338.005	338.08	0.075	Urban
135	818906.833	4202813.264	294.504	294.49	-0.014	Urban
136	815747.804	4203667.201	292.630	292.60	-0.030	Urban
140	838869.414	4189687.467	321.873	321.87	-0.003	Urban
144	813994.890	4189741.631	288.908	288.93	0.022	Urban
148	838546.009	4178421.146	309.538	309.52	-0.018	Urban
150	831552.494	4165001.762	273.774	273.72	-0.054	Urban
153	813364.106	4176455.748	279.687	279.64	-0.047	Urban
160	838847.184	4159000.404	273.473	273.54	0.067	Urban
163	822343.961	4153478.619	302.710	302.65	-0.060	Urban
165	811959.389	4154845.422	318.331	318.33	-0.001	Urban
175	838430.582	4127225.027	262.624	262.58	-0.044	Urban
177	833408.514	4139589.658	276.173	276.16	-0.013	Urban
178	829450.890	4137375.222	268.460	268.42	-0.040	Urban
179	828058.379	4122940.009	279.424	279.37	-0.054	Urban
182	819084.536	4123141.988	249.259	249.22	-0.039	Urban
186	836956.477	4107812.328	270.572	270.54	-0.032	Urban
188	844117.456	4120560.564	272.841	272.69	-0.151	Urban

Average dz -0.017
Minimum dz -0.151
Maximum dz +0.075
Average magnitude -0.020
Root mean square 0.057
Std deviation 0.056

9 Ground Control Survey Reports

Coordinate List

Constrained Adjustments

NGS Data Reports

Ground Survey field Logs

TerraPOS Adjustments

1121109 KS
HORIZONTAL - NAD 83 UTM ZONE 15
VERTICAL - NAVD88 METER

STATION	EASTING	NORTHING	ELEVATION	LAND COVER CATEGORY
1	303544.968	4249087.393	310.826	Open Terrain
2	314299.342	4248633.528	273.495	Open Terrain
3	287200.398	4244097.913	304.610	Open Terrain
4	310939.423	4217558.141	323.809	Open Terrain
5	283939.525	4217777.750	314.111	Open Terrain
6	288372.047	4204760.016	294.777	Open Terrain
7	299732.091	4207650.024	313.837	Open Terrain
8	308931.568	4199316.663	338.692	Open Terrain
9	303305.497	4184978.671	308.074	Open Terrain
10	285485.461	4187561.637	297.587	Open Terrain
11	301408.259	4172854.604	319.050	Open Terrain
12	299388.121	4155989.617	272.544	Open Terrain
13	280496.209	4173161.304	293.575	Open Terrain
14	309766.588	4149428.891	261.929	Open Terrain
15	281583.785	4151861.871	319.320	Open Terrain
16	304003.757	4134903.820	278.689	Open Terrain
17	286273.792	4135281.050	283.533	Open Terrain
18	297247.837	4122052.301	284.301	Open Terrain
19	282152.772	4103244.216	261.404	Open Terrain
20	303399.338	4103064.726	272.629	Open Terrain
101	303527.888	4249078.139	310.153	Tall_Grass
102	309872.248	4249083.370	270.755	Low_Grass
103	314431.454	4248446.597	274.506	Urban
104	310491.012	4244856.828	283.860	Forest
105	307575.767	4240685.689	303.490	Low_Grass
106	302959.956	4240209.348	327.900	Urban
107	297634.873	4237103.341	312.310	Tall_Grass
108	297822.643	4236918.484	306.126	Forest
109	296850.198	4242044.503	306.981	Low_Grass
110	287979.136	4242115.856	298.512	Forest
111	287129.747	4244207.708	305.393	Urban
112	303154.646	4233398.952	335.935	Low_Grass
113	294082.148	4220758.239	333.305	Tall_Grass
114	298394.817	4219019.884	331.764	Low_Grass
115	303804.623	4230283.426	311.648	Forest
116	311927.021	4231557.162	315.928	Urban
117	294065.504	4232078.795	306.051	Forest
118	281417.396	4229132.269	336.591	Tall_Grass

STATION	EASTING	NORTHING	ELEVATION	LAND COVER CATEGORY
120	311016.035	4217557.261	323.438	Urban
121	285775.722	4224189.842	325.122	Tall_Grass
122	283911.160	4217361.369	311.094	Forest
123	282077.728	4209737.760	310.668	Low_Grass
124	288552.013	4210408.116	324.918	Forest
125	294818.301	4204560.888	314.949	Tall_Grass
126	299767.181	4208854.146	313.887	Low_Grass
127	306283.253	4210633.571	326.108	Low_Grass
128	309262.257	4210637.450	325.175	Urban
129	297834.507	4199651.963	313.964	Tall_Grass
130	304551.790	4201061.337	323.067	Forest
131	309257.846	4199130.065	338.005	Urban
132	300982.551	4193088.997	328.305	Tall_Grass
133	294550.051	4193256.537	316.008	Low_Grass
134	293686.124	4188451.429	308.455	Tall_Grass
135	291462.279	4199258.558	294.504	Urban
136	288366.911	4200313.292	292.630	Urban
137	281827.991	4200802.904	299.243	Forest
138	285657.854	4194725.972	288.424	Tall_Grass
139	303298.979	4185003.074	307.701	Low_Grass
140	310524.014	4184889.202	321.873	Urban
141	300037.892	4180271.760	286.048	Forest
142	293844.824	4173098.367	301.947	Tall_Grass
143	288834.457	4183708.118	304.909	Low_Grass
144	285724.349	4186538.305	288.908	Urban
145	284375.474	4193428.832	304.904	Forest
146	299609.443	4165732.183	274.323	Forest
147	301418.999	4172892.191	318.461	Low_Grass
148	309480.110	4173677.640	309.538	Urban
149	309264.978	4163836.985	297.912	Tall_Grass
150	301650.037	4160744.753	273.774	Urban
151	295035.505	4156115.858	301.191	Low_Grass
152	295541.133	4164066.732	280.958	Forest
153	284244.242	4173328.660	279.687	Urban
154	278979.480	4177532.321	302.852	Low_Grass
155	283141.722	4167698.907	293.976	Tall_Grass
156	294387.762	4138375.539	280.699	Tall_Grass
157	299446.003	4156014.055	270.367	Low_Grass
158	304151.002	4150711.122	273.529	Forest
159	309410.533	4150624.028	262.258	Low_Grass
160	308540.569	4154296.026	273.473	Urban

STATION	EASTING	NORTHING	ELEVATION	LAND COVER CATEGORY
162	295922.180	4144819.730	283.966	Tall_Grass
163	291733.300	4149841.212	302.710	Urban
164	284596.789	4145108.950	298.2440	Forest
165	281463.885	4151865.554	318.331	Urban
166	280191.734	4161337.380	300.678	Low_Grass
167	287894.820	4159505.363	290.949	Forest
168	303988.483	4134924.994	278.365	Tall_Grass
169	311601.778	4133939.574	256.986	Forest
170	286383.534	4138528.632	289.786	Tall_Grass
171	277815.765	4135366.410	274.696	Low_Grass
172	284926.534	4128463.504	292.164	Forest
173	293763.280	4125430.684	268.896	Forest
174	295623.854	4122073.188	279.603	Tall_Grass
175	306107.250	4122641.642	262.624	Urban
176	308952.445	4139688.100	265.365	Low_Grass
177	301883.606	4135288.377	276.173	Urban
178	297796.848	4133331.441	268.460	Urban
179	295493.816	4119025.318	279.424	Urban
180	295140.956	4105903.824	272.914	Tall_Grass
181	290303.271	4106483.722	288.474	Low_Grass
182	286557.482	4119794.450	249.259	Urban
183	282410.127	4114202.560	243.827	Tall_Grass
184	277512.607	4109540.463	230.913	Low_Grass
185	284880.175	4099812.186	270.102	Forest
186	303411.083	4103379.023	270.572	Urban
187	309754.613	4102398.725	263.759	Tall_Grass
188	311355.581	4115637.375	272.841	Urban
189	300273.417	4113824.445	260.817	Low_Grass
190	296722.727	4113261.034	277.708	Forest
801.25	314751.238	4100986.301	244.965	Control_Point
1001	295042.111	4156117.107	301.231	Control_Point
K 56	312215.144	4231297.003	314.401	Control_Point
KST6	236975.934	4326094.857	334.631	Control_Point
M 55	307748.034	4168881.432	296.200	Control_Point
MOBT	378093.848	4235302.005	262.554	Control_Point
MOCA	379487.320	4115431.282	301.056	Control_Point
MONE	381294.970	4191778.684	253.874	Control_Point
NAIL	295645.668	4122086.329	279.932	Control_Point
ZKC1	344662.784	4305001.211	338.711	Control_Point
D 274	312109.550	4248040.377	281.214	Control_Point
F 246	301846.130	4161162.020	275.573	Control_Point

STATION	EASTING	NORTHING	ELEVATION	LAND COVER CATEGORY
P 277	297528.238	4216997.987	319.950	Control_Point
REBAR	294395.269	4138353.537	281.439	Control_Point
CHETOPA	314423.980	4096891.796	252.499	Control_Point
PARSONS	299543.181	4135599.902	277.066	Control_Point

15:36:13, Thu Dec 06, 2012

INI file: C:\WINNT\GEOLAB.INI
Input file: O:\1121109\G~B!KAL3\SURVEY\GEO\C.IOB
Output file: O:\1121109\G~B!KAL3\SURVEY\GEO\C.LST

Geoid File: C:\GEOLAB2\G2009U06.GEO

PARAMETERS		OBSERVATIONS	
Description	Number	Description	Number
No. of Stations	127	Directions	0
Coord Parameters	359	Distances	0
Free Latitudes	119	Azimuths	0
Free Longitudes	119	Vertical Angles	0
Free Heights	121	Zenithal Angles	0
Fixed Coordinates	22	Angles	0
Astro. Latitudes	0	Heights	0
Astro. Longitudes	0	Height Differences	0
Geoid Records	0	Auxiliary Params.	0
All Aux. Pars.	0	2-D Coords.	0
Direction Pars.	0	2-D Coord. Diffs.	0
Scale Parameters	0	3-D Coords.	0
Constant Pars.	0	3-D Coord. Diffs.	795
Rotation Pars.	0		
Translation Pars.	0		
	---		---
Total Parameters	359	Total Observations	795
Degrees of Freedom = 436			

SUMMARY OF SELECTED OPTIONS

OPTION	SELECTION
Computation Mode	Adjustment
Maximum Iterations	5
Convergence Criterion	0.00100
Confidence Level for Statistics	95.000
Covariance Matrix Computation	Connected Portion Only
Residual Rejection Criterion	Tau Max
Confidence Region Types	3D Station Relative
Relative Confidence Regions	Connected Only
Variance Factor (VF) Known	Yes
CMULT (Multiply Parm Cov With VF)	Yes
RMULT (Multiply Res Cov With VF)	No
Force Convergence in Max Iters	Yes
Distances Affect 3D	No
Full Inverse Computed	No
Normals Reordered	Yes
Coordinates Generated	No
Geoid Interpolation Method	Bi-Linear

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING STD DEV	EASTING STD DEV	O-HEIGHT STD DEV	MAPPROJ
NEO	000	1	4249087.393	303544.968	310.826	UTM 15
			0.012	0.010	0.013	
SFMC		1	1.00007532	-1 23 46.634717	UTM 15	
NEO	000	10	4187561.637	285485.461	297.587	UTM 15
			0.007	0.005	0.018	
SFMC		10	1.00016681	-1 29 40.101486	UTM 15	
NEO	000	1001	4156117.107	295042.111	301.231	UTM 15
			0.005	0.004	0.014	
SFMC		1001	1.00011746	-1 24 48.498856	UTM 15	
NEO	000	101	4249078.139	303527.888	310.153	UTM 15
			0.012	0.010	0.011	
SFMC		101	1.00007541	-1 23 47.056296	UTM 15	
NEO	000	102	4249083.370	309872.248	270.755	UTM 15
			0.012	0.011	0.015	
SFMC		102	1.00004520	-1 21 4.892112	UTM 15	
NEO	000	103	4248446.597	314431.454	274.506	UTM 15
			0.013	0.011	0.016	
SFMC		103	1.00002410	-1 19 7.366266	UTM 15	
NEO	000	104	4244856.828	310491.012	283.860	UTM 15
			0.013	0.011	0.016	
SFMC		104	1.00004231	-1 20 42.468064	UTM 15	
NEO	000	105	4240685.689	307575.767	303.490	UTM 15
			0.013	0.011	0.015	
SFMC		105	1.00005602	-1 21 50.274682	UTM 15	
NEO	000	106	4240209.348	302959.956	327.900	UTM 15
			0.013	0.011	0.017	
SFMC		106	1.00007817	-1 23 47.168247	UTM 15	
NEO	000	107	4237103.341	297634.873	312.310	UTM 15
			0.011	0.009	0.011	
SFMC		107	1.00010437	-1 25 57.710890	UTM 15	
NEO	000	108	4236918.484	297822.643	306.126	UTM 15
			0.013	0.011	0.018	
SFMC		108	1.00010343	-1 25 52.622860	UTM 15	
NEO	000	109	4242044.503	296850.198	306.981	UTM 15
			0.012	0.011	0.015	
SFMC		109	1.00010828	-1 26 25.951622	UTM 15	
NEO	000	11	4172854.604	301408.259	319.050	UTM 15
			0.005	0.004	0.013	
SFMC		11	1.00008580	-1 22 37.480381	UTM 15	
NEO	000	110	4242115.856	287979.136	298.512	UTM 15
			0.020	0.015	0.045	
SFMC		110	1.00015365	-1 30 12.270290	UTM 15	
NEO	000	111	4244207.708	287129.747	305.393	UTM 15
			0.014	0.011	0.022	
SFMC		111	1.00015809	-1 30 37.595324	UTM 15	
NEO	000	112	4233398.952	303154.646	335.935	UTM 15
			0.012	0.010	0.017	
SFMC		112	1.00007723	-1 23 31.177005	UTM 15	
NEO	000	113	4220758.239	294082.148	333.305	UTM 15
			0.010	0.008	0.010	
SFMC		113	1.00012225	-1 27 0.524598	UTM 15	
NEO	000	114	4219019.884	298394.817	331.764	UTM 15

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING / STD DEV	EASTING / STD DEV	O-HEIGHT / STD DEV	MAPPROJ
			0.010	0.009	0.012	
SFMC		114	1.00010060	-1 25 8.434919	UTM 15	
NEO	000	115	4230283.426	303804.623	311.648	UTM 15
			0.011	0.010	0.015	
SFMC		115	1.00007409	-1 23 9.624403	UTM 15	
NEO	000	116	4231557.162	311927.021	315.928	UTM 15
			0.012	0.010	0.016	
SFMC		116	1.00003564	-1 19 45.221548	UTM 15	
NEO	000	117	4232078.795	294065.504	306.051	UTM 15
			0.012	0.010	0.015	
SFMC		117	1.00012232	-1 27 20.075359	UTM 15	
NEO	000	118	4229132.269	281417.396	336.591	UTM 15
			0.012	0.011	0.019	
SFMC		118	1.00018846	-1 32 36.226898	UTM 15	
NEO	000	119	4223562.889	309035.414	355.450	UTM 15
			0.011	0.009	0.015	
SFMC		119	1.00004915	-1 20 46.191760	UTM 15	
NEO	000	12	4155989.617	299388.121	272.544	UTM 15
			0.005	0.004	0.014	
SFMC		12	1.00009575	-1 23 0.507772	UTM 15	
NEO	000	120	4217557.261	311016.035	323.438	UTM 15
			0.015	0.012	0.028	
SFMC		120	1.00003988	-1 19 46.675258	UTM 15	
NEO	000	121	4224189.842	285775.722	325.122	UTM 15
			0.012	0.010	0.018	
SFMC		121	1.00016524	-1 30 36.889051	UTM 15	
NEO	000	122	4217361.369	283911.160	311.094	UTM 15
			0.015	0.014	0.026	
SFMC		122	1.00017513	-1 31 12.062865	UTM 15	
NEO	000	123	4209737.760	282077.728	310.668	UTM 15
			0.013	0.011	0.021	
SFMC		123	1.00018494	-1 31 44.845719	UTM 15	
NEO	000	124	4210408.116	288552.013	324.918	UTM 15
			0.013	0.011	0.021	
SFMC		124	1.00015069	-1 29 2.654866	UTM 15	
NEO	000	125	4204560.888	294818.301	314.949	UTM 15
			0.008	0.006	0.016	
SFMC		125	1.00011854	-1 26 14.703347	UTM 15	
NEO	000	126	4208854.146	299767.181	313.887	UTM 15
			0.012	0.009	0.023	
SFMC		126	1.00009382	-1 24 17.045361	UTM 15	
NEO	000	127	4210633.571	306283.253	326.108	UTM 15
			0.013	0.010	0.028	
SFMC		127	1.00006220	-1 21 35.458821	UTM 15	
NEO	000	128	4210637.450	309262.257	325.175	UTM 15
			0.012	0.010	0.021	
SFMC		128	1.00004809	-1 20 20.254356	UTM 15	
NEO	000	129	4199651.963	297834.507	313.964	UTM 15
			0.009	0.007	0.020	
SFMC		129	1.00010341	-1 24 50.621146	UTM 15	
NEO	000	13	4173161.304	280496.209	293.575	UTM 15
			0.012	0.009	0.028	

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING STD DEV	EASTING STD DEV	O-HEIGHT STD DEV	MAPPROJ
SFMC		13	1.00019350	-1 31 19.433096		UTM 15
NEO	000	130	4201061.337 0.010	304551.790 0.008	323.067 0.022	UTM 15
SFMC		130	1.00007051	-1 22 3.895287		UTM 15
NEO	000	131	4199130.065 0.011	309257.846 0.008	338.005 0.025	UTM 15
SFMC		131	1.00004812	-1 20 2.447114		UTM 15
NEO	000	132	4193088.997 0.009	300982.551 0.007	328.305 0.020	UTM 15
SFMC		132	1.00008786	-1 23 20.794851		UTM 15
NEO	000	133	4193256.537 0.009	294550.051 0.007	316.008 0.019	UTM 15
SFMC		133	1.00011991	-1 26 2.531401		UTM 15
NEO	000	134	4188451.429 0.006	293686.124 0.004	308.455 0.015	UTM 15
SFMC		134	1.00012430	-1 26 16.151547		UTM 15
NEO	000	135	4199258.558 0.010	291462.279 0.008	294.504 0.023	UTM 15
SFMC		135	1.00013565	-1 27 30.227980		UTM 15
NEO	000	136	4200313.292 0.009	288366.911 0.007	292.630 0.020	UTM 15
SFMC		136	1.00015167	-1 28 49.887017		UTM 15
NEO	000	137	4200802.904 0.011	281827.991 0.010	299.243 0.028	UTM 15
SFMC		137	1.00018629	-1 31 35.235379		UTM 15
NEO	000	138	4194725.972 0.008	285657.854 0.006	288.424 0.018	UTM 15
SFMC		138	1.00016589	-1 29 48.274714		UTM 15
NEO	000	139	4185003.074 0.010	303298.979 0.007	307.701 0.021	UTM 15
SFMC		139	1.00007658	-1 22 9.714446		UTM 15
NEO	000	14	4149428.891 0.010	309766.588 0.007	261.929 0.022	UTM 15
SFMC		14	1.00004578	-1 18 33.032869		UTM 15
NEO	000	140	4184889.202 0.011	310524.014 0.009	321.873 0.024	UTM 15
SFMC		140	1.00004221	-1 19 8.638612		UTM 15
NEO	000	141	4180271.760 0.011	300037.892 0.008	286.048 0.026	UTM 15
SFMC		141	1.00009252	-1 23 23.677766		UTM 15
NEO	000	142	4173098.367 0.003	293844.824 0.002	301.947 0.009	UTM 15
SFMC		142	1.00012351	-1 25 46.489663		UTM 15
NEO	000	143	4183708.118 0.007	288834.457 0.006	304.909 0.020	UTM 15
SFMC		143	1.00014925	-1 28 9.595318		UTM 15
NEO	000	144	4186538.305 0.008	285724.349 0.006	288.908 0.022	UTM 15
SFMC		144	1.00016555	-1 29 32.335310		UTM 15
NEO	000	145	4193428.832 0.010	284375.474 0.009	304.904 0.028	UTM 15
SFMC		145	1.00017269	-1 30 18.196116		UTM 15

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING STD DEV	EASTING STD DEV	O-HEIGHT STD DEV	MAPPROJ
NEO	000	146	4165732.183	299609.443	274.323	UTM 15
			0.009	0.009	0.024	
SFMC		146	1.00009464	-1 23 10.786966		UTM 15
NEO	000	147	4172892.191	301418.999	318.461	UTM 15
			0.005	0.004	0.013	
SFMC		147	1.00008574	-1 22 37.273017		UTM 15
NEO	000	148	4173677.640	309480.110	309.538	UTM 15
			0.012	0.006	0.020	
SFMC		148	1.00004710	-1 19 17.446195		UTM 15
NEO	000	149	4163836.985	309264.978	297.912	UTM 15
			0.009	0.006	0.023	
SFMC		149	1.00004812	-1 19 7.623621		UTM 15
NEO	000	15	4151861.871	281583.785	319.320	UTM 15
			0.008	0.006	0.020	
SFMC		15	1.00018766	-1 30 14.735846		UTM 15
NEO	000	150	4160744.753	301650.037	273.774	UTM 15
			0.006	0.005	0.016	
SFMC		150	1.00008463	-1 22 12.023056		UTM 15
NEO	000	151	4156115.858	295035.505	301.191	UTM 15
			0.007	0.005	0.017	
SFMC		151	1.00011749	-1 24 48.660630		UTM 15
NEO	000	152	4164066.732	295541.133	280.958	UTM 15
			0.009	0.006	0.020	
SFMC		152	1.00011494	-1 24 49.247677		UTM 15
NEO	000	153	4173328.660	284244.242	279.687	UTM 15
			0.007	0.005	0.018	
SFMC		153	1.00017341	-1 29 46.278488		UTM 15
NEO	000	154	4177532.321	278979.480	302.852	UTM 15
			0.009	0.007	0.023	
SFMC		154	1.00020173	-1 32 5.075281		UTM 15
NEO	000	155	4167698.907	283141.722	293.976	UTM 15
			0.008	0.006	0.019	
SFMC		155	1.00017929	-1 30 3.887223		UTM 15
NEO	000	156	4138375.539	294387.762	280.699	UTM 15
			0.007	0.006	0.017	
SFMC		156	1.00012079	-1 24 35.361126		UTM 15
NEO	000	157	4156014.055	299446.003	270.367	UTM 15
			0.007	0.005	0.017	
SFMC		157	1.00009546	-1 22 59.111788		UTM 15
NEO	000	158	4150711.122	304151.002	273.529	UTM 15
			0.008	0.006	0.019	
SFMC		158	1.00007249	-1 20 54.045900		UTM 15
NEO	000	159	4150624.028	309410.533	262.258	UTM 15
			0.008	0.006	0.018	
SFMC		159	1.00004745	-1 18 43.680946		UTM 15
NEO	000	16	4134903.820	304003.757	278.689	UTM 15
			0.008	0.007	0.020	
SFMC		16	1.00007322	-1 20 32.775588		UTM 15
NEO	000	160	4154296.026	308540.569	273.473	UTM 15
			0.008	0.006	0.018	
SFMC		160	1.00005154	-1 19 10.889432		UTM 15
NEO	000	161	4144609.215	304985.779	278.439	UTM 15

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING / STD DEV	EASTING / STD DEV	O-HEIGHT / STD DEV	MAPPROJ
			0.014	0.011	0.034	
SFMC		161	1.00006848	-1 20 23.795656		UTM 15
NEO	000	162	4144819.730	295922.180	283.966	UTM 15
			0.007	0.006	0.018	
SFMC		162	1.00011304	-1 24 8.098817		UTM 15
NEO	000	163	4149841.212	291733.300	302.710	UTM 15
			0.006	0.005	0.015	
SFMC		163	1.00013431	-1 26 0.019209		UTM 15
NEO	000	164	4145108.950	284596.789	298.244	UTM 15
			0.011	0.010	0.030	
SFMC		164	1.00017157	-1 28 48.419228		UTM 15
NEO	000	165	4151865.554	281463.885	318.331	UTM 15
			0.008	0.006	0.020	
SFMC		165	1.00018831	-1 30 17.711079		UTM 15
NEO	000	166	4161337.380	280191.734	300.678	UTM 15
			0.012	0.007	0.025	
SFMC		166	1.00019517	-1 31 6.004680		UTM 15
NEO	000	167	4159505.363	287894.820	290.949	UTM 15
			0.010	0.007	0.023	
SFMC		167	1.00015418	-1 27 51.540967		UTM 15
NEO	000	168	4134924.994	303988.483	278.365	UTM 15
			0.009	0.008	0.024	
SFMC		168	1.00007329	-1 20 33.185155		UTM 15
NEO	000	169	4133939.574	311601.778	256.986	UTM 15
			0.009	0.008	0.022	
SFMC		169	1.00003724	-1 17 24.144360		UTM 15
NEO	000	17	4135281.050	286273.792	283.533	UTM 15
			0.008	0.007	0.020	
SFMC		17	1.00016271	-1 27 50.105295		UTM 15
NEO	000	170	4138528.632	286383.534	289.786	UTM 15
			0.008	0.007	0.020	
SFMC		170	1.00016213	-1 27 52.972859		UTM 15
NEO	000	171	4135366.410	277815.765	274.696	UTM 15
			0.011	0.009	0.026	
SFMC		171	1.00020814	-1 31 18.556737		UTM 15
NEO	000	172	4128463.504	284926.534	292.164	UTM 15
			0.014	0.014	0.040	
SFMC		172	1.00016984	-1 28 11.527396		UTM 15
NEO	000	173	4125430.684	293763.280	268.896	UTM 15
			0.009	0.008	0.025	
SFMC		173	1.00012397	-1 24 29.346336		UTM 15
NEO	000	174	4122073.188	295623.854	279.603	UTM 15
			0.008	0.006	0.018	
SFMC		174	1.00011456	-1 23 38.169214		UTM 15
NEO	000	175	4122641.642	306107.250	262.624	UTM 15
			0.011	0.009	0.026	
SFMC		175	1.00006312	-1 19 21.901931		UTM 15
NEO	000	176	4139688.100	308952.445	265.365	UTM 15
			0.008	0.007	0.022	
SFMC		176	1.00004962	-1 18 38.211204		UTM 15
NEO	000	177	4135288.377	301883.606	276.173	UTM 15
			0.009	0.008	0.023	

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING STD DEV	EASTING STD DEV	O-HEIGHT STD DEV	MAPPROJ
SFMC		177	1.00008351	-1 21 25.612118		UTM 15
NEO	000	178	4133331.441	297796.848	268.460	UTM 15
			0.010	0.008	0.023	
SFMC		178	1.00010367	-1 23 3.111910		UTM 15
NEO	000	179	4119025.318	295493.816	279.424	UTM 15
			0.009	0.007	0.020	
SFMC		179	1.00011522	-1 23 36.372724		UTM 15
NEO	000	18	4122052.301	297247.837	284.301	UTM 15
			0.012	0.010	0.030	
SFMC		18	1.00010642	-1 22 58.303057		UTM 15
NEO	000	180	4105903.824	295140.956	272.914	UTM 15
			0.008	0.006	0.018	
SFMC		180	1.00011702	-1 23 23.557491		UTM 15
NEO	000	181	4106483.722	290303.271	288.474	UTM 15
			0.009	0.007	0.019	
SFMC		181	1.00014172	-1 25 22.552812		UTM 15
NEO	000	182	4119794.450	286557.482	249.259	UTM 15
			0.011	0.008	0.025	
SFMC		182	1.00016124	-1 27 16.635272		UTM 15
NEO	000	183	4114202.560	282410.127	243.827	UTM 15
			0.010	0.008	0.023	
SFMC		183	1.00018327	-1 28 48.540958		UTM 15
NEO	000	184	4109540.463	277512.607	230.913	UTM 15
			0.010	0.008	0.023	
SFMC		184	1.00020983	-1 30 40.046368		UTM 15
NEO	000	185	4099812.186	284880.175	270.102	UTM 15
			0.011	0.009	0.025	
SFMC		185	1.00017012	-1 27 23.443011		UTM 15
NEO	000	186	4103379.023	303411.083	270.572	UTM 15
			0.009	0.007	0.020	
SFMC		186	1.00007611	-1 19 57.813120		UTM 15
NEO	000	187	4102398.725	309754.613	263.759	UTM 15
			0.003	0.002	0.006	
SFMC		187	1.00004588	-1 17 21.657375		UTM 15
NEO	000	188	4115637.375	311355.581	272.841	UTM 15
			0.012	0.009	0.027	
SFMC		188	1.00003840	-1 17 2.557977		UTM 15
NEO	000	189	4113824.445	300273.417	260.817	UTM 15
			0.009	0.007	0.019	
SFMC		189	1.00009142	-1 21 30.953115		UTM 15
NEO	000	19	4103244.216	282152.772	261.404	UTM 15
			0.010	0.008	0.022	
SFMC		19	1.00018466	-1 28 35.795121		UTM 15
NEO	000	190	4113261.034	296722.727	277.708	UTM 15
			0.009	0.008	0.021	
SFMC		190	1.00010905	-1 22 56.897229		UTM 15
NEO	000	2	4248633.528	314299.342	273.495	UTM 15
			0.015	0.012	0.023	
SFMC		2	1.00002470	-1 19 11.029413		UTM 15
NEO	000	20	4103064.726	303399.338	272.629	UTM 15
			0.010	0.008	0.024	
SFMC		20	1.00007617	-1 19 57.607167		UTM 15

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING STD DEV	EASTING STD DEV	O-HEIGHT STD DEV	MAPPROJ
NEO	000	3	4244097.913	287200.398	304.610	UTM 15
			0.014	0.011	0.025	
SFMC		3	1.00015772	-1 30 35.600241		UTM 15
NEO	000	4	4217558.141	310939.423	323.809	UTM 15
			0.012	0.010	0.020	
SFMC		4	1.00004024	-1 19 48.615266		UTM 15
NEO	000	5	4217777.750	283939.525	314.111	UTM 15
			0.011	0.009	0.015	
SFMC		5	1.00017497	-1 31 12.081986		UTM 15
NEO	000	6	4204760.016	288372.047	294.777	UTM 15
			0.014	0.012	0.025	
SFMC		6	1.00015164	-1 28 57.434302		UTM 15
NEO	000	7	4207650.024	299732.091	313.837	UTM 15
			0.012	0.009	0.021	
SFMC		7	1.00009400	-1 24 15.960580		UTM 15
NEO	000	8	4199316.663	308931.568	338.692	UTM 15
			0.011	0.008	0.024	
SFMC		8	1.00004966	-1 20 10.944832		UTM 15
NEO	001	801.25	4100986.301	314751.238	244.965	UTM 15
			0.009	0.005	0.000	
SFMC		801.25	1.00002277	-1 15 17.772908		UTM 15
NEO	000	9	4184978.671	303305.497	308.074	UTM 15
			0.011	0.008	0.023	
SFMC		9	1.00007655	-1 22 9.512264		UTM 15
NEO	111	CHETOPA	4096891.796	314423.980	252.499	UTM 15
			0.000	0.000	0.000	
SFMC		CHETOPA	1.00002427	-1 15 19.698677		UTM 15
NEO	001	D 274	4248040.377	312109.550	281.214	UTM 15
			0.013	0.011	0.000	
SFMC		D 274	1.00003478	-1 20 6.082075		UTM 15
NEO	000	F 246	4161162.020	301846.130	275.573	UTM 15
			0.008	0.006	0.019	
SFMC		F 246	1.00008367	-1 22 7.819968		UTM 15
NEO	001	K 56	4231297.003	312215.144	314.401	UTM 15
			0.015	0.014	0.000	
SFMC		K 56	1.00003431	-1 19 37.496117		UTM 15
NEO	110	KINNE	4164345.750	299592.745	306.789	UTM 15
			0.000	0.000	0.014	
SFMC		KINNE	1.00009473	-1 23 8.956064		UTM 15
NEO	110	KST6	4326094.857	236975.934	334.631	UTM 15
			0.000	0.000	0.050	
SFMC		KST6	1.00045195	-1 54 55.816427		UTM 15
NEO	111	M 55	4168881.432	307748.034	296.200	UTM 15
			0.000	0.000	0.000	
SFMC		M 55	1.00005528	-1 19 53.189709		UTM 15
NEO	110	MOBT	4235302.005	378093.848	262.554	UTM 15
			0.000	0.000	0.028	
SFMC		MOBT	0.99978302	0-51 46.306084		UTM 15
NEO	110	MOCA	4115431.282	379487.320	301.056	UTM 15
			0.000	0.000	0.033	
SFMC		MOCA	0.99977891	0-49 13.652987		UTM 15
NEO	110	MONE	4191778.684	381294.970	253.874	UTM 15

Adjusted NEO Coordinates:

CODE	FFF	STATION	NORTHING / STD DEV	EASTING / STD DEV	O-HEIGHT / STD DEV	MAPPROJ
			0.000	0.000	0.030	
SFMC		MONE	0.99977355	0-49 42.480800		UTM 15
NEO	000	NAIL	4122086.329	295645.668	279.932	UTM 15
			0.009	0.007	0.021	
SFMC		NAIL	1.00011445	-1 23 37.655682		UTM 15
NEO	001	P 277	4216997.987	297528.238	319.950	UTM 15
			0.011	0.009	0.000	
SFMC		P 277	1.00010492	-1 25 27.017011		UTM 15
NEO	000	PARSONS	4135599.902	299543.181	277.066	UTM 15
			0.009	0.007	0.022	
SFMC		PARSONS	1.00009500	-1 22 23.769536		UTM 15
NEO	000	REBAR	4138353.537	294395.269	281.439	UTM 15
			0.007	0.006	0.018	
SFMC		REBAR	1.00012075	-1 24 35.139682		UTM 15
NEO	110	ZKC1	4305001.211	344662.784	338.711	UTM 15
			0.000	0.000	0.048	
SFMC		ZKC1	0.99989713	-1 7 27.525553		UTM 15

Adjusted PLH Coordinates:

CODE	FFF	STATION	LATITUDE	STD DEV	LONGITUDE	STD DEV	ELIP-HEIGHT	STD DEV
PLH	000	1	N 38 22 6.32534	0.012	W 95 14 55.53835	0.010	279.229	0.013
PLH	000	10	N 37 48 36.96173	0.007	W 95 26 12.63383	0.005	266.560	0.018
PLH	000	1001	N 37 31 45.38599	0.005	W 95 19 10.30612	0.004	270.589	0.014
PLH	000	101	N 38 22 6.01187	0.012	W 95 14 56.23241	0.010	278.557	0.011
PLH	000	102	N 38 22 11.11447	0.012	W 95 10 34.97621	0.011	239.071	0.015
PLH	000	103	N 38 21 53.91417	0.013	W 95 07 26.61306	0.011	242.772	0.016
PLH	000	104	N 38 19 54.55736	0.013	W 95 10 5.40571	0.011	252.201	0.016
PLH	000	105	N 38 17 37.08968	0.013	W 95 12 1.30664	0.011	271.894	0.015
PLH	000	106	N 38 17 18.04106	0.013	W 95 15 10.70851	0.011	296.365	0.017
PLH	000	107	N 38 15 33.08405	0.011	W 95 18 46.54438	0.009	280.847	0.011
PLH	000	108	N 38 15 27.24342	0.013	W 95 18 38.63426	0.011	274.661	0.018
PLH	000	109	N 38 18 12.62998	0.012	W 95 19 23.91256	0.011	275.504	0.015
PLH	000	11	N 37 40 53.08894	0.005	W 95 15 7.47838	0.004	288.119	0.013
PLH	000	110	N 38 18 7.55344	0.020	W 95 25 28.92551	0.015	267.113	0.045
PLH	000	111	N 38 19 14.63748	0.014	W 95 26 6.13432	0.011	273.999	0.022
PLH	000	112	N 38 13 37.40222	0.012	W 95 14 55.88847	0.010	304.427	0.017
PLH	000	113	N 38 06 40.30221	0.010	W 95 20 55.57250	0.008	301.948	0.010
PLH	000	114	N 38 05 47.44765	0.010	W 95 17 56.84772	0.009	300.364	0.012
PLH	000	115	N 38 11 56.90687	0.011	W 95 14 26.07597	0.010	280.138	0.015
PLH	000	116	N 38 12 44.44423	0.012	W 95 08 53.57965	0.010	284.316	0.016
PLH	000	117	N 38 12 47.28027	0.012	W 95 21 8.04485	0.010	274.639	0.015
PLH	000	118	N 38 11 1.03224	0.012	W 95 29 44.43092	0.011	305.318	0.019
PLH	000	119	N 38 08 23.06243	0.011	W 95 10 44.67809	0.009	323.899	0.015
PLH	000	12	N 37 31 44.69239	0.005	W 95 16 13.24618	0.004	241.880	0.014
PLH	000	120	N 38 05 9.84442	0.015	W 95 09 17.64321	0.012	291.918	0.028
PLH	000	121	N 38 08 24.58751	0.012	W 95 26 40.08802	0.010	293.836	0.018

Adjusted PLH Coordinates:

CODE	FFF	STATION	LATITUDE	STD DEV	LONGITUDE	STD DEV	ELIP-HEIGHT	STD DEV
PLH	000	122	N 38 04 41.63701	0.015	W 95 27 49.17486	0.014	279.873	0.026
PLH	000	123	N 38 00 32.92903	0.013	W 95 28 56.00956	0.011	279.517	0.021
PLH	000	124	N 38 01 0.17976	0.013	W 95 24 31.45924	0.011	293.713	0.021
PLH	000	125	N 37 57 55.80094	0.008	W 95 20 8.66327	0.006	283.745	0.016
PLH	000	126	N 38 00 18.96914	0.012	W 95 16 50.30970	0.009	282.585	0.023
PLH	000	127	N 38 01 21.75841	0.013	W 95 12 25.04201	0.010	294.711	0.028
PLH	000	128	N 38 01 24.15938	0.012	W 95 10 22.94733	0.010	293.745	0.021
PLH	000	129	N 37 55 19.08673	0.009	W 95 18 0.18212	0.007	282.776	0.020
PLH	000	13	N 37 40 45.87593	0.012	W 95 29 20.83817	0.009	262.723	0.028
PLH	000	130	N 37 56 10.06867	0.010	W 95 13 26.63045	0.008	291.797	0.022
PLH	000	131	N 37 55 11.04938	0.011	W 95 10 12.13193	0.008	306.710	0.025
PLH	000	132	N 37 51 48.80436	0.009	W 95 15 44.82167	0.007	297.135	0.020
PLH	000	133	N 37 51 49.09723	0.009	W 95 20 8.04632	0.007	284.891	0.019
PLH	000	134	N 37 49 12.61260	0.006	W 95 20 38.44091	0.004	277.375	0.015
PLH	000	135	N 37 55 1.15303	0.010	W 95 22 20.55965	0.008	263.372	0.023
PLH	000	136	N 37 55 32.77181	0.009	W 95 24 28.34207	0.007	261.510	0.020
PLH	000	137	N 37 55 43.08004	0.011	W 95 28 56.47769	0.010	268.158	0.028
PLH	000	138	N 37 52 29.36026	0.008	W 95 26 13.23320	0.006	257.344	0.018
PLH	000	139	N 37 47 28.44796	0.010	W 95 14 2.17681	0.007	276.588	0.021
PLH	000	14	N 37 28 19.86985	0.010	W 95 09 4.58285	0.007	231.356	0.022
PLH	000	140	N 37 47 30.25286	0.011	W 95 09 6.86716	0.009	290.713	0.024
PLH	000	141	N 37 44 52.50004	0.011	W 95 16 10.71953	0.008	255.014	0.026
PLH	000	142	N 37 40 54.98486	0.003	W 95 20 16.27115	0.002	271.043	0.009
PLH	000	143	N 37 46 34.84460	0.007	W 95 23 51.74624	0.006	273.902	0.020
PLH	000	144	N 37 48 3.98913	0.008	W 95 26 1.78306	0.006	257.888	0.022
PLH	000	145	N 37 51 46.22090	0.010	W 95 27 4.28424	0.009	273.836	0.028

Adjusted PLH Coordinates:

CODE	FFF	STATION	LATITUDE	STD DEV	LONGITUDE	STD DEV	ELIP-HEIGHT	STD DEV
PLH	000	146	N 37 37 0.75162	0.009	W 95 16 13.82513	0.009	243.504	0.024
PLH	000	147	N 37 40 54.31599	0.005	W 95 15 7.07710	0.004	287.529	0.013
PLH	000	148	N 37 41 25.93972	0.012	W 95 09 38.94035	0.006	278.547	0.020
PLH	000	149	N 37 36 6.69312	0.009	W 95 09 38.46545	0.006	267.080	0.023
PLH	000	15	N 37 29 16.31641	0.008	W 95 28 13.61660	0.006	288.788	0.020
PLH	000	150	N 37 34 20.63389	0.006	W 95 14 45.78503	0.005	243.019	0.016
PLH	000	151	N 37 31 45.34021	0.007	W 95 19 10.57381	0.005	270.550	0.017
PLH	000	152	N 37 36 3.52977	0.009	W 95 18 57.97079	0.006	250.180	0.020
PLH	000	153	N 37 40 54.50234	0.007	W 95 26 48.13904	0.005	248.814	0.018
PLH	000	154	N 37 43 6.26007	0.009	W 95 30 27.47619	0.007	271.959	0.023
PLH	000	155	N 37 37 51.05883	0.008	W 95 27 27.08997	0.006	263.184	0.019
PLH	000	156	N 37 22 9.63199	0.007	W 95 19 19.13688	0.006	250.344	0.017
PLH	000	157	N 37 31 45.53010	0.007	W 95 16 10.91367	0.005	239.701	0.017
PLH	000	158	N 37 28 57.22349	0.008	W 95 12 54.27226	0.006	242.937	0.019
PLH	000	159	N 37 28 58.35963	0.008	W 95 09 20.18241	0.006	231.665	0.018
PLH	000	16	N 37 20 24.55321	0.008	W 95 12 45.16654	0.007	248.360	0.020
PLH	000	160	N 37 30 56.78006	0.008	W 95 09 59.02215	0.006	242.815	0.018
PLH	000	161	N 37 25 40.00269	0.014	W 95 12 14.49514	0.011	247.947	0.034
PLH	000	162	N 37 25 39.79455	0.007	W 95 18 23.20580	0.006	253.507	0.018
PLH	000	163	N 37 28 19.24243	0.006	W 95 21 18.61175	0.005	272.190	0.015
PLH	000	164	N 37 25 39.93358	0.011	W 95 26 3.92933	0.010	267.812	0.030
PLH	000	165	N 37 29 16.33373	0.008	W 95 28 18.49854	0.006	287.799	0.020
PLH	000	166	N 37 34 22.30828	0.012	W 95 29 20.45841	0.007	269.992	0.025
PLH	000	167	N 37 33 29.41723	0.010	W 95 24 4.79247	0.007	260.274	0.023
PLH	000	168	N 37 20 25.22817	0.009	W 95 12 45.80701	0.008	248.037	0.024
PLH	000	169	N 37 19 58.94680	0.009	W 95 07 35.70394	0.008	226.659	0.022

Adjusted PLH Coordinates:

CODE	FFF	STATION	LATITUDE	STD DEV	LONGITUDE	STD DEV	ELIP-HEIGHT	STD DEV
PLH	000	17	N 37 20 22.70296	0.008	W 95 24 45.53338	0.007	253.243	0.020
PLH	000	170	N 37 22 8.08430	0.008	W 95 24 44.44797	0.007	259.446	0.020
PLH	000	171	N 37 20 18.32402	0.011	W 95 30 29.05265	0.009	244.411	0.026
PLH	000	172	N 37 16 40.55103	0.014	W 95 25 33.13101	0.014	261.990	0.040
PLH	000	173	N 37 15 9.41666	0.009	W 95 19 31.56176	0.008	238.754	0.025
PLH	000	174	N 37 13 22.02833	0.008	W 95 18 12.77822	0.006	249.522	0.018
PLH	000	175	N 37 13 48.52135	0.011	W 95 11 8.22555	0.009	232.548	0.026
PLH	000	176	N 37 23 3.40555	0.008	W 95 09 28.63005	0.007	234.942	0.022
PLH	000	177	N 37 20 35.40283	0.009	W 95 14 11.63850	0.008	245.843	0.023
PLH	000	178	N 37 19 28.77890	0.010	W 95 16 55.68826	0.008	238.173	0.023
PLH	000	179	N 37 11 43.10011	0.009	W 95 18 15.04378	0.007	249.404	0.020
PLH	000	18	N 37 13 22.62734	0.012	W 95 17 6.91100	0.010	254.219	0.030
PLH	000	180	N 37 04 37.35919	0.008	W 95 18 16.42438	0.006	243.175	0.018
PLH	000	181	N 37 04 52.31101	0.009	W 95 21 32.77534	0.007	258.719	0.019
PLH	000	182	N 37 12 0.83516	0.011	W 95 24 18.01978	0.008	219.248	0.025
PLH	000	183	N 37 08 56.09158	0.010	W 95 27 0.25326	0.008	213.937	0.023
PLH	000	184	N 37 06 20.79666	0.010	W 95 30 13.62533	0.008	201.116	0.023
PLH	000	185	N 37 01 11.57783	0.011	W 95 25 5.36677	0.009	240.409	0.025
PLH	000	186	N 37 03 21.86184	0.009	W 95 12 39.35321	0.007	240.859	0.020
PLH	000	187	N 37 02 54.78039	0.003	W 95 08 21.79375	0.002	234.041	0.006
PLH	000	188	N 37 10 5.26039	0.012	W 95 07 29.01070	0.009	242.925	0.027
PLH	000	189	N 37 08 58.18285	0.009	W 95 14 56.31243	0.007	230.915	0.019
PLH	000	19	N 37 03 0.58853	0.010	W 95 26 59.22264	0.008	231.676	0.022
PLH	000	190	N 37 08 37.15932	0.009	W 95 17 19.59211	0.008	247.816	0.021
PLH	000	2	N 38 21 59.87622	0.015	W 95 07 32.23079	0.012	241.761	0.023
PLH	000	20	N 37 03 11.66117	0.010	W 95 12 39.53255	0.008	242.921	0.024

Adjusted PLH Coordinates:

CODE	FFF	STATION	LATITUDE	STD DEV	LONGITUDE	STD DEV	ELIP-HEIGHT	STD DEV
PLH	000	3	N 38 19 11.13883	0.014	W 95 26 3.10823	0.011	273.216	0.025
PLH	000	4	N 38 05 9.81530	0.012	W 95 09 20.78687	0.010	292.290	0.020
PLH	000	5	N 38 04 55.15879	0.011	W 95 27 48.46474	0.009	282.886	0.015
PLH	000	6	N 37 57 56.93003	0.014	W 95 24 32.84001	0.012	263.621	0.025
PLH	000	7	N 37 59 39.90280	0.012	W 95 16 50.53771	0.009	282.549	0.021
PLH	000	8	N 37 55 16.85297	0.011	W 95 10 25.66445	0.008	307.398	0.024
PLH	001	801.25	N 37 02 12.57434	0.009	W 95 04 58.38436	0.005	215.249	0.000
PLH	000	9	N 37 47 27.66180	0.011	W 95 14 1.88667	0.008	276.961	0.023
PLH	111	CHETOPA	N 36 59 59.55570	0.000	W 95 05 7.99141	0.000	222.838	0.000
PLH	001	D 274	N 38 21 39.00013	0.013	W 95 09 1.83856	0.011	249.510	0.000
PLH	000	F 246	N 37 34 34.31528	0.008	W 95 14 38.20305	0.006	244.810	0.019
PLH	001	K 56	N 38 12 36.22583	0.015	W 95 08 41.49200	0.014	282.787	0.000
PLH	110	KINNE	N 37 36 15.78612	0.000	W 95 16 13.13846	0.000	275.990	0.014
PLH	110	KST6	N 39 02 39.66718	0.000	W 96 02 20.83172	0.000	303.897	0.050
PLH	111	M 55	N 37 38 49.12249	0.000	W 95 10 45.06369	0.000	265.292	0.000
PLH	110	MOBT	N 38 15 26.94381	0.000	W 94 23 36.05494	0.000	230.473	0.028
PLH	110	MOCA	N 37 10 39.16622	0.000	W 94 21 27.24398	0.000	271.142	0.033
PLH	110	MONE	N 37 51 56.71994	0.000	W 94 20 58.36961	0.000	222.428	0.030
PLH	000	NAIL	N 37 13 22.47164	0.009	W 95 18 11.90674	0.007	249.851	0.021
PLH	001	P 277	N 38 04 41.20122	0.011	W 95 18 30.33572	0.009	288.580	0.000
PLH	000	PARSONS	N 37 20 43.69549	0.009	W 95 15 46.99146	0.007	246.737	0.022
PLH	000	REBAR	N 37 22 8.92459	0.007	W 95 19 18.80991	0.006	251.084	0.018
PLH	110	ZKC1	N 38 52 48.55019	0.000	W 94 47 26.96407	0.000	306.572	0.048

Geoid Values:

CODE	NAME	N/S DEFLECTION	E/W DEFLECTION	UNDULATION
GEOI	1	+ 0 0 1.6	+ 0 0 2.1	-31.596
GEOI	10	+ 0 0 1.8	+ 0 0 1.0	-31.028
GEOI	1001	+ 0 0 3.6	+ 0 0 0.8	-30.641
GEOI	101	+ 0 0 1.6	+ 0 0 2.1	-31.596
GEOI	102	+ 0 0 1.8	+ 0 0 2.1	-31.684
GEOI	103	+ 0 0 1.7	+ 0 0 1.4	-31.734
GEOI	104	+ 0 0 1.7	+ 0 0 2.0	-31.658
GEOI	105	+ 0 0 1.1	+ 0 0 2.0	-31.596
GEOI	106	+ 0 0 0.9	+ 0 0 2.1	-31.534
GEOI	107	+ 0 0 0.9	+ 0 0 1.4	-31.464
GEOI	108	+ 0 0 0.9	+ 0 0 1.4	-31.465
GEOI	109	+ 0 0 0.9	+ 0 0 1.5	-31.477
GEOI	11	+ 0 0 3.2	+ 0 0 0.9	-30.931
GEOI	110	+ 0 0 0.3	+ 0 0 1.5	-31.399
GEOI	111	+ 0 0 0.7	+ 0 0 1.6	-31.393
GEOI	112	+ 0 0 0.9	+ 0 0 1.9	-31.508
GEOI	113	+ 0 0 1.3	+ 0 0 2.1	-31.357
GEOI	114	+ 0 0 1.6	+ 0 0 2.0	-31.399
GEOI	115	+ 0 0 0.5	+ 0 0 2.0	-31.510
GEOI	116	+ 0 0 0.8	+ 0 0 1.9	-31.612
GEOI	117	+ 0 0 0.9	+ 0 0 1.4	-31.411
GEOI	118	+ 0 0 1.4	+ 0 0 1.6	-31.273
GEOI	119	+ 0 0 1.1	+ 0 0 1.3	-31.550
GEOI	12	+ 0 0 3.5	+ 0 0 0.8	-30.665
GEOI	120	+ 0 0 2.0	+ 0 0 1.1	-31.519
GEOI	121	+ 0 0 1.4	+ 0 0 1.5	-31.285
GEOI	122	+ 0 0 1.5	+ 0 0 1.4	-31.221
GEOI	123	+ 0 0 1.6	+ 0 0 1.2	-31.151
GEOI	124	+ 0 0 1.9	+ 0 0 1.3	-31.205
GEOI	125	+ 0 0 2.0	+ 0 0 1.5	-31.205
GEOI	126	+ 0 0 2.3	+ 0 0 1.8	-31.302
GEOI	127	+ 0 0 2.3	+ 0 0 1.9	-31.397
GEOI	128	+ 0 0 2.1	+ 0 0 1.7	-31.430
GEOI	129	+ 0 0 1.9	+ 0 0 1.5	-31.188
GEOI	13	+ 0 0 2.3	+ 0 0 0.8	-30.852
GEOI	130	+ 0 0 2.3	+ 0 0 1.7	-31.269
GEOI	131	+ 0 0 2.5	+ 0 0 1.6	-31.296
GEOI	132	+ 0 0 1.5	+ 0 0 1.5	-31.170
GEOI	133	+ 0 0 1.4	+ 0 0 1.3	-31.117
GEOI	134	+ 0 0 1.6	+ 0 0 0.9	-31.080
GEOI	135	+ 0 0 1.6	+ 0 0 1.2	-31.132
GEOI	136	+ 0 0 1.6	+ 0 0 1.0	-31.120
GEOI	137	+ 0 0 1.4	+ 0 0 0.9	-31.085
GEOI	138	+ 0 0 1.1	+ 0 0 0.7	-31.080
GEOI	139	+ 0 0 2.5	+ 0 0 1.1	-31.113
GEOI	14	+ 0 0 3.2	- 0 0 0.4	-30.573
GEOI	140	+ 0 0 2.6	+ 0 0 1.3	-31.160
GEOI	141	+ 0 0 2.7	+ 0 0 0.8	-31.034
GEOI	142	+ 0 0 2.6	+ 0 0 0.6	-30.904
GEOI	143	+ 0 0 2.3	+ 0 0 0.8	-31.006
GEOI	144	+ 0 0 1.9	+ 0 0 0.9	-31.020
GEOI	145	+ 0 0 1.0	+ 0 0 0.6	-31.068
GEOI	146	+ 0 0 3.0	+ 0 0 0.7	-30.819

Geoid Values:

CODE	NAME	N/S DEFLECTION	E/W DEFLECTION	UNDULATION
GEOI	147	+ 0 0 3.2	+ 0 0 0.9	-30.932
GEOI	148	+ 0 0 3.2	+ 0 0 0.8	-30.991
GEOI	149	+ 0 0 3.6	+ 0 0 0.3	-30.832
GEOI	15	+ 0 0 3.4	- 0 0 0.0	-30.532
GEOI	150	+ 0 0 3.2	+ 0 0 0.7	-30.755
GEOI	151	+ 0 0 3.6	+ 0 0 0.8	-30.641
GEOI	152	+ 0 0 3.2	+ 0 0 0.6	-30.778
GEOI	153	+ 0 0 2.2	+ 0 0 0.6	-30.873
GEOI	154	+ 0 0 2.1	+ 0 0 0.8	-30.892
GEOI	155	+ 0 0 2.9	+ 0 0 0.6	-30.792
GEOI	156	+ 0 0 3.2	+ 0 0 0.5	-30.356
GEOI	157	+ 0 0 3.5	+ 0 0 0.8	-30.666
GEOI	158	+ 0 0 3.7	+ 0 0 0.3	-30.592
GEOI	159	+ 0 0 3.5	- 0 0 0.4	-30.593
GEOI	16	+ 0 0 3.6	+ 0 0 0.3	-30.329
GEOI	160	+ 0 0 3.7	- 0 0 0.4	-30.659
GEOI	161	+ 0 0 3.4	+ 0 0 0.3	-30.492
GEOI	162	+ 0 0 3.2	+ 0 0 0.7	-30.459
GEOI	163	+ 0 0 3.1	+ 0 0 0.6	-30.521
GEOI	164	+ 0 0 2.9	+ 0 0 0.3	-30.432
GEOI	165	+ 0 0 3.4	- 0 0 0.0	-30.532
GEOI	166	+ 0 0 3.4	+ 0 0 0.4	-30.686
GEOI	167	+ 0 0 3.8	+ 0 0 0.3	-30.675
GEOI	168	+ 0 0 3.6	+ 0 0 0.3	-30.329
GEOI	169	+ 0 0 3.9	+ 0 0 0.2	-30.328
GEOI	17	+ 0 0 3.3	+ 0 0 0.1	-30.290
GEOI	170	+ 0 0 3.1	+ 0 0 0.1	-30.340
GEOI	171	+ 0 0 3.2	+ 0 0 0.0	-30.285
GEOI	172	+ 0 0 3.6	+ 0 0 0.1	-30.174
GEOI	173	+ 0 0 3.6	+ 0 0 0.2	-30.142
GEOI	174	+ 0 0 4.0	+ 0 0 0.0	-30.081
GEOI	175	+ 0 0 4.7	- 0 0 0.8	-30.076
GEOI	176	+ 0 0 3.1	+ 0 0 0.2	-30.423
GEOI	177	+ 0 0 3.5	+ 0 0 0.3	-30.330
GEOI	178	+ 0 0 3.4	+ 0 0 0.4	-30.287
GEOI	179	+ 0 0 4.2	- 0 0 0.1	-30.020
GEOI	18	+ 0 0 4.2	- 0 0 0.1	-30.082
GEOI	180	+ 0 0 3.6	+ 0 0 0.0	-29.738
GEOI	181	+ 0 0 3.3	- 0 0 0.5	-29.755
GEOI	182	+ 0 0 4.2	+ 0 0 0.5	-30.012
GEOI	183	+ 0 0 4.1	+ 0 0 0.2	-29.890
GEOI	184	+ 0 0 3.5	+ 0 0 0.2	-29.797
GEOI	185	+ 0 0 2.1	- 0 0 0.6	-29.693
GEOI	186	+ 0 0 3.2	+ 0 0 0.5	-29.712
GEOI	187	+ 0 0 3.1	+ 0 0 0.6	-29.718
GEOI	188	+ 0 0 3.8	+ 0 0 0.8	-29.916
GEOI	189	+ 0 0 4.6	- 0 0 0.5	-29.902
GEOI	19	+ 0 0 2.1	+ 0 0 0.1	-29.729
GEOI	190	+ 0 0 4.8	+ 0 0 0.0	-29.891
GEOI	2	+ 0 0 1.8	+ 0 0 1.6	-31.734
GEOI	20	+ 0 0 3.2	+ 0 0 0.5	-29.707
GEOI	3	+ 0 0 0.7	+ 0 0 1.6	-31.394
GEOI	4	+ 0 0 2.0	+ 0 0 1.1	-31.519

Geoid Values:

CODE	NAME	N/S DEFLECTION	E/W DEFLECTION	UNDULATION
GEOI	5	+ 0 0 1.5	+ 0 0 1.4	-31.225
GEOI	6	+ 0 0 1.8	+ 0 0 1.1	-31.156
GEOI	7	+ 0 0 2.3	+ 0 0 1.7	-31.288
GEOI	8	+ 0 0 2.5	+ 0 0 1.6	-31.294
GEOI	801.25	+ 0 0 3.0	+ 0 0 0.3	-29.716
GEOI	9	+ 0 0 2.5	+ 0 0 1.1	-31.113
GEOI	CHETOPA	+ 0 0 2.7	- 0 0 0.0	-29.661
GEOI	D 274	+ 0 0 1.9	+ 0 0 1.9	-31.704
GEOI	F 246	+ 0 0 3.0	+ 0 0 0.8	-30.763
GEOI	K 56	+ 0 0 0.8	+ 0 0 1.9	-31.614
GEOI	KINNE	+ 0 0 3.0	+ 0 0 0.7	-30.799
GEOI	KST6	+ 0 0 0.0	+ 0 0 2.5	-30.734
GEOI	M 55	+ 0 0 3.2	+ 0 0 0.7	-30.908
GEOI	MOBT	+ 0 0 1.4	+ 0 0 0.7	-32.081
GEOI	MOCA	+ 0 0 5.4	+ 0 0 0.0	-29.915
GEOI	MONE	+ 0 0 3.4	+ 0 0 0.1	-31.446
GEOI	NAIL	+ 0 0 4.0	+ 0 0 0.0	-30.081
GEOI	P 277	+ 0 0 1.9	+ 0 0 1.9	-31.370
GEOI	PARSONS	+ 0 0 3.4	+ 0 0 0.5	-30.329
GEOI	REBAR	+ 0 0 3.2	+ 0 0 0.5	-30.355
GEOI	ZKC1	+ 0 0 2.2	+ 0 0 1.7	-32.139

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
GROUP: 1~#GPAL3.ASC,obs#:		1				
DXCT		ZKC1	113	-53179.79260	-0.014	-0.296
				0.049	0.048	0.15
DYCT		ZKC1	113	-48620.75220	0.011	0.368
				0.049	0.030	0.11
DZCT		ZKC1	113	-66812.10910	0.012	0.330
				0.049	0.037	0.13
GROUP: 1~#GPAL3.ASC,obs#:		2				
DXCT		MOBT	113	-84263.81420	-0.002	-0.041
				0.043	0.042	0.02
DYCT		MOBT	113	-2950.05290	0.002	0.052
				0.043	0.035	0.02
DZCT		MOBT	113	-12719.93270	0.012	0.310
				0.043	0.038	0.14
GROUP: 1~#GPAL3.ASC,obs#:		3				
DXCT		MONE	113	-86053.88990	0.000	0.007
				0.046	0.045	0.00
DYCT		MONE	113	24065.92230	0.029	0.762
				0.046	0.038	0.32
DZCT		MONE	113	21520.87070	-0.011	-0.271
				0.046	0.041	0.12
GROUP: 112712.ASC ,obs#:		4				
DXCT		101	1	17.27630	0.003	0.940
				0.004	0.003	150.39
DYCT		101	1	3.90820	0.000	0.062
				0.010	0.007	22.50
DZCT		101	1	7.99510	0.001	0.120
				0.009	0.006	38.67
GROUP: 112712.ASC ,obs#:		5				
DXCT		101	1	17.28170	-0.002	-0.944
				0.004	0.003	127.44
DYCT		101	1	3.90900	-0.000	-0.061
				0.009	0.006	18.66
DZCT		101	1	7.99650	-0.001	-0.123
				0.008	0.005	33.36
GROUP: 112712.ASC ,obs#:		6				
DXCT		101	2	10726.71620	-0.003	-0.505
				0.010	0.007	0.32
DYCT		101	2	-1062.75320	-0.003	-0.165
				0.030	0.021	0.32
DZCT		101	2	-171.18250	0.005	0.468
				0.014	0.010	0.44
GROUP: 112712.ASC ,obs#:		7				
DXCT		101	2	10726.70920	0.004	0.503
				0.010	0.007	0.33
DYCT		101	2	-1062.76010	0.003	0.162
				0.030	0.021	0.32
DZCT		101	2	-171.17290	-0.005	-0.466
				0.015	0.010	0.45
GROUP: 112712.ASC ,obs#:		8				
DXCT		101	3	-16435.46600	0.004	0.760
				0.008	0.005	0.21

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
DYCT		101	3	-1818.95470	-0.008	-0.658
				0.021	0.013	0.50
DZCT		101	3	-4232.50280	0.012	0.807
				0.024	0.015	0.69
GROUP: 112712.ASC ,obs#: 9						
DXCT		101	3	-16435.45610	-0.006	-0.782
				0.010	0.008	0.37
DYCT		101	3	-1818.97820	0.015	0.678
				0.028	0.022	0.88
DZCT		101	3	-4232.47050	-0.021	-0.827
				0.031	0.025	1.20
GROUP: 112712.ASC ,obs#: 10						
DXCT		KST6	101	63786.15410	-0.002	-0.035
				0.051	0.050	0.02
DYCT		KST6	101	-53440.73710	0.003	0.092
				0.051	0.031	0.03
DZCT		KST6	101	-58579.91250	0.003	0.087
				0.051	0.038	0.03
GROUP: 112712.ASC ,obs#: 11						
DXCT		MOBT	101	-73928.95930	0.007	0.190
				0.038	0.036	0.09
DYCT		MOBT	101	13853.25460	0.007	0.227
				0.038	0.030	0.09
DZCT		MOBT	101	9685.04230	0.002	0.050
				0.038	0.032	0.02
GROUP: 112712.ASC ,obs#: 12						
DXCT		101	102	6327.73940	0.003	0.581
				0.006	0.004	0.40
DYCT		101	102	-448.11670	-0.005	-0.488
				0.014	0.011	0.82
DZCT		101	102	98.85300	-0.003	-0.358
				0.010	0.008	0.43
GROUP: 112712.ASC ,obs#: 13						
DXCT		101	102	6327.74400	-0.002	-0.579
				0.005	0.004	0.33
DYCT		101	102	-448.12630	0.004	0.498
				0.013	0.009	0.70
DZCT		101	102	98.84810	0.002	0.353
				0.009	0.006	0.35
GROUP: 112712.ASC ,obs#: 14						
DXCT		101	103	10852.28080	0.006	1.384
				0.006	0.004	0.52
DYCT		101	103	-1189.38550	0.006	0.501
				0.017	0.012	0.57
DZCT		101	103	-314.69450	-0.000	-0.053
				0.008	0.006	0.03
GROUP: 112712.ASC ,obs#: 15						
DXCT		101	103	10852.29170	-0.005	-1.385
				0.005	0.004	0.48
DYCT		101	103	-1189.37350	-0.006	-0.500
				0.017	0.012	0.53
DZCT		101	103	-314.69510	0.000	0.050

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION	STD DEV	RESIDUAL	STD DEV	STD RES	PPM
					0.008		0.006		0.03
GROUP: 112712.ASC ,obs#: 16									
DXCT		101	104	6806.38870	0.001		0.252		
					0.007		0.005		0.15
DYCT		101	104	-3125.15440	-0.004		-0.352		
					0.018		0.013		0.54
DZCT		101	104	-3195.22490	0.007		0.889		
					0.011		0.008		0.83
GROUP: 112712.ASC ,obs#: 17									
DXCT		101	104	6806.39110	-0.001		-0.254		
					0.007		0.005		0.15
DYCT		101	104	-3125.16320	0.004		0.351		
					0.018		0.012		0.54
DZCT		101	104	-3195.21150	-0.007		-0.889		
					0.011		0.008		0.82
GROUP: 112712.ASC ,obs#: 18									
DXCT		101	105	3763.25340	0.000		0.070		
					0.006		0.004		0.03
DYCT		101	105	-5503.25290	-0.002		-0.233		
					0.014		0.010		0.24
DZCT		101	105	-6508.97110	-0.006		-1.106		
					0.008		0.006		0.67
GROUP: 112712.ASC ,obs#: 19									
DXCT		101	105	3763.25400	-0.000		-0.068		
					0.006		0.005		0.04
DYCT		101	105	-5503.25790	0.003		0.228		
					0.016		0.012		0.30
DZCT		101	105	-6508.98520	0.008		1.109		
					0.010		0.007		0.85
GROUP: 112712.ASC ,obs#: 20									
DXCT		101	106	-855.40090	-0.007		-1.167		
					0.008		0.006		0.80
DYCT		101	106	-5465.53100	0.002		0.121		
					0.019		0.014		0.19
DZCT		101	106	-6954.82420	-0.000		-0.028		
					0.013		0.009		0.03
GROUP: 112712.ASC ,obs#: 21									
DXCT		101	106	-855.41430	0.006		1.167		
					0.008		0.005		0.71
DYCT		101	106	-5465.52780	-0.002		-0.120		
					0.018		0.013		0.17
DZCT		101	106	-6954.82470	0.000		0.029		
					0.012		0.008		0.03
GROUP: 112712.ASC ,obs#: 22									
DXCT		101	107	-6263.12480	0.003		0.386		
					0.010		0.008		0.24
DYCT		101	107	-6966.48600	0.005		0.233		
					0.023		0.020		0.35
DZCT		101	107	-9505.17490	-0.007		-0.434		
					0.018		0.016		0.52
GROUP: 112712.ASC ,obs#: 23									
DXCT		101	107	-6263.12110	-0.000		-0.065		

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
				0.009	0.007	0.03
DYCT		101	107	-6966.49670	0.015	0.916
				0.020	0.017	1.15
DZCT		101	107	-9505.18550	0.004	0.289
				0.015	0.013	0.27
GROUP: 112712.ASC ,obs#: 24						
DXCT		101	108	-6081.52070	0.019	1.070
				0.018	0.018	1.40
DYCT		101	108	-7090.49940	0.012	0.293
				0.041	0.039	0.86
DZCT		101	108	-9650.42590	-0.002	-0.049
				0.043	0.042	0.15
GROUP: 112712.ASC ,obs#: 25						
DXCT		101	108	-6081.50060	-0.001	-1.165
				0.005	0.001	0.10
DYCT		101	108	-7090.48790	0.000	0.019
				0.012	0.004	0.01
DZCT		101	108	-9650.42660	-0.001	-0.364
				0.012	0.004	0.10
GROUP: 112712.ASC ,obs#: 26						
DXCT		101	109	-6884.57870	-0.006	-1.589
				0.005	0.004	0.63
DYCT		101	109	-3843.41870	0.000	0.038
				0.013	0.009	0.04
DZCT		101	109	-5646.68840	-0.003	-0.332
				0.013	0.009	0.32
GROUP: 112712.ASC ,obs#: 27						
DXCT		101	109	-6884.59010	0.005	1.586
				0.005	0.003	0.54
DYCT		101	109	-3843.41800	-0.000	-0.042
				0.012	0.008	0.04
DZCT		101	109	-5646.69420	0.003	0.330
				0.012	0.008	0.28
GROUP: 112712.ASC ,obs#: 28						
DXCT		101	110	-15723.26020	0.005	0.406
				0.016	0.012	0.28
DYCT		101	110	-3102.79990	-0.002	-0.056
				0.045	0.032	0.10
DZCT		101	110	-5774.73550	0.001	0.039
				0.051	0.036	0.08
GROUP: 112712.ASC ,obs#: 29						
DXCT		101	110	-15723.25090	-0.005	-0.406
				0.016	0.011	0.27
DYCT		101	110	-3102.80350	0.002	0.058
				0.045	0.032	0.11
DZCT		101	110	-5774.73260	-0.001	-0.041
				0.051	0.036	0.09
GROUP: 112712.ASC ,obs#: 30						
DXCT		101	111	-16502.39140	0.025	3.096
				0.010	0.008	1.49
DYCT		101	111	-1746.03720	0.017	0.738
				0.027	0.023	0.97

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DZCT		101	111	-4147.35330	-0.012	-0.489
				0.030	0.025	0.72
GROUP: 112712.ASC ,obs#: 31						
DXCT		101	111	-16502.35530	-0.011	-3.098
				0.006	0.003	0.62
DYCT		101	111	-1746.01370	-0.007	-0.726
				0.017	0.009	0.40
DZCT		101	111	-4147.37060	0.005	0.480
				0.019	0.010	0.29
GROUP: 112712.ASC ,obs#: 32						
DXCT		101	112	-882.71430	0.006	0.562
				0.013	0.011	0.41
DYCT		101	112	-9699.80600	-0.008	-0.291
				0.030	0.027	0.51
DZCT		101	112	-12292.11740	-0.002	-0.096
				0.027	0.024	0.15
GROUP: 112712.ASC ,obs#: 33						
DXCT		101	112	-882.70470	-0.003	-0.303
				0.012	0.011	0.20
DYCT		101	112	-9699.80710	-0.007	-0.271
				0.029	0.025	0.44
DZCT		101	112	-12292.11270	-0.007	-0.317
				0.025	0.022	0.45
GROUP: 112712.ASC ,obs#: 34						
DXCT		101	D 274	8523.65340	-0.007	-1.355
				0.007	0.005	0.77
DYCT		101	D 274	-1271.89100	-0.012	-0.799
				0.019	0.015	1.41
DZCT		101	D 274	-671.10040	-0.003	-0.365
				0.010	0.008	0.35
GROUP: 112712.ASC ,obs#: 35						
DXCT		101	D 274	8523.64080	0.006	1.353
				0.006	0.004	0.69
DYCT		101	D 274	-1271.91070	0.008	0.569
				0.017	0.013	0.87
DZCT		101	D 274	-671.10820	0.005	0.663
				0.010	0.007	0.55
GROUP: 112812.ASC ,obs#: 36						
DXCT		107	112	5380.41350	0.000	0.070
				0.005	0.002	0.02
DYCT		107	112	-2733.33550	0.003	0.388
				0.014	0.007	0.43
DZCT		107	112	-2786.93940	0.002	0.240
				0.012	0.006	0.23
GROUP: 112812.ASC ,obs#: 37						
DXCT		107	113	-4071.75510	0.013	2.084
				0.007	0.006	0.78
DYCT		107	113	-9836.83250	0.001	0.094
				0.017	0.015	0.09
DZCT		107	113	-12899.77320	-0.010	-0.596
				0.018	0.017	0.59
GROUP: 112812.ASC ,obs#: 38						

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DXCT		107	113	-4071.74580	0.004	0.727
				0.006	0.005	0.23
DYCT		107	113	-9836.84110	0.010	0.773
				0.015	0.013	0.60
DZCT		107	113	-12899.77520	-0.008	-0.563
				0.016	0.014	0.47
GROUP: 112812.ASC ,obs#: 39						
DXCT		107	114	170.83770	-0.006	-1.480
				0.005	0.004	0.32
DYCT		107	114	-11240.98840	-0.000	-0.061
				0.011	0.008	0.03
DZCT		107	114	-14183.19530	0.006	0.594
				0.013	0.010	0.32
GROUP: 112812.ASC ,obs#: 40						
DXCT		107	114	170.85040	-0.018	-1.522
				0.013	0.012	1.02
DYCT		107	114	-11240.98330	-0.006	-0.214
				0.027	0.026	0.31
DZCT		107	114	-14183.18790	-0.002	-0.055
				0.030	0.029	0.09
GROUP: 112812.ASC ,obs#: 41						
DXCT		107	115	5929.19110	-0.003	-0.708
				0.006	0.005	0.35
DYCT		107	115	-4689.45770	-0.002	-0.195
				0.012	0.009	0.19
DZCT		107	115	-5236.70530	-0.003	-0.350
				0.012	0.010	0.38
GROUP: 112812.ASC ,obs#: 42						
DXCT		107	115	5929.18470	0.003	0.963
				0.005	0.003	0.34
DYCT		107	115	-4689.46140	0.002	0.294
				0.010	0.007	0.21
DZCT		107	115	-5236.71170	0.003	0.523
				0.009	0.006	0.32
GROUP: 112812.ASC ,obs#: 43						
DXCT		107	116	14067.58970	0.009	1.390
				0.008	0.007	0.62
DYCT		107	116	-4522.28610	-0.001	-0.082
				0.020	0.016	0.09
DZCT		107	116	-4082.30220	-0.000	-0.024
				0.011	0.009	0.01
GROUP: 112812.ASC ,obs#: 44						
DXCT		107	116	14067.60410	-0.005	-1.381
				0.006	0.004	0.32
DYCT		107	116	-4522.28750	0.000	0.011
				0.013	0.008	0.01
DZCT		107	116	-4082.30270	0.000	0.066
				0.008	0.004	0.02
GROUP: 112812.ASC ,obs#: 45						
DXCT		107	117	-3720.09280	0.007	1.975
				0.005	0.004	1.20
DYCT		107	117	-2825.79180	-0.008	-0.624

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
				0.017	0.014	1.38
DZCT		107	117	-4019.58580	0.008	1.406
				0.007	0.005	1.24
GROUP: 112812.ASC ,obs#: 46						
DXCT		107	117	-3720.07860	-0.007	-1.822
				0.005	0.004	1.10
DYCT		107	117	-2825.80070	0.000	0.045
				0.014	0.009	0.06
DZCT		107	117	-4019.57260	-0.006	-1.188
				0.007	0.005	0.90
GROUP: 112812.ASC ,obs#: 47						
DXCT		107	118	-16422.90030	0.006	1.002
				0.009	0.006	0.36
DYCT		107	118	-3678.92680	0.008	0.580
				0.020	0.014	0.45
DZCT		107	118	-6575.24450	0.005	0.531
				0.013	0.009	0.28
GROUP: 112812.ASC ,obs#: 48						
DXCT		107	118	-16422.88760	-0.006	-0.967
				0.009	0.006	0.35
DYCT		107	118	-3678.90950	-0.009	-0.658
				0.020	0.014	0.51
DZCT		107	118	-6575.23520	-0.004	-0.476
				0.013	0.009	0.24
GROUP: 112812.ASC ,obs#: 49						
DXCT		107	K 56	14346.54910	-0.010	-0.714
				0.018	0.014	0.65
DYCT		107	K 56	-4703.57220	-0.018	-0.433
				0.043	0.041	1.13
DZCT		107	K 56	-4282.38700	0.023	0.813
				0.030	0.028	1.45
GROUP: 112812.ASC ,obs#: 50						
DXCT		107	K 56	14346.53160	0.007	0.788
				0.015	0.009	0.46
DYCT		107	K 56	-4703.58440	-0.006	-0.180
				0.033	0.031	0.35
DZCT		107	K 56	-4282.36040	-0.004	-0.186
				0.023	0.021	0.24
GROUP: 112912.ASC ,obs#: 51						
DXCT		113	4	16701.38080	0.008	0.656
				0.014	0.012	0.45
DYCT		113	4	-3256.45800	-0.016	-0.627
				0.029	0.025	0.93
DZCT		113	4	-2201.62170	-0.008	-0.290
				0.030	0.026	0.44
GROUP: 112912.ASC ,obs#: 52						
DXCT		113	4	16701.39110	-0.003	-0.688
				0.008	0.004	0.15
DYCT		113	4	-3256.47800	0.004	0.570
				0.015	0.007	0.24
DZCT		113	4	-2201.63220	0.003	0.374
				0.016	0.008	0.17

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
GROUP: 112912.ASC ,obs#: 53						
DXCT		113	5	-10203.23020	0.002	0.300
				0.007	0.006	0.16
DYCT		113	5	-1028.57390	0.002	0.169
				0.016	0.013	0.21
DZCT		113	5	-2563.14880	0.008	0.821
				0.013	0.010	0.79
GROUP: 112912.ASC ,obs#: 54						
DXCT		113	5	-10203.22750	-0.001	-0.308
				0.005	0.003	0.10
DYCT		113	5	-1028.57030	-0.001	-0.183
				0.013	0.008	0.13
DZCT		113	5	-2563.13560	-0.005	-0.819
				0.010	0.006	0.46
GROUP: 112912.ASC ,obs#: 55						
DXCT		113	6	-6204.31920	-0.011	-1.111
				0.014	0.009	0.62
DYCT		113	6	-9373.32800	-0.003	-0.140
				0.030	0.021	0.17
DZCT		113	6	-12733.55290	0.001	0.073
				0.022	0.016	0.07
GROUP: 112912.ASC ,obs#: 56						
DXCT		113	6	-6204.34070	0.011	1.111
				0.014	0.010	0.65
DYCT		113	6	-9373.33390	0.003	0.138
				0.030	0.022	0.18
DZCT		113	6	-12733.55060	-0.001	-0.070
				0.023	0.016	0.07
GROUP: 112912.ASC ,obs#: 57						
DXCT		113	7	5209.96070	-0.000	-0.070
				0.006	0.004	0.02
DYCT		113	7	-8493.80920	-0.004	-0.274
				0.019	0.013	0.26
DZCT		113	7	-10219.27240	-0.004	-0.291
				0.022	0.015	0.31
GROUP: 112912.ASC ,obs#: 58						
DXCT		113	7	5209.96010	0.000	0.066
				0.006	0.004	0.02
DYCT		113	7	-8493.81650	0.004	0.269
				0.019	0.014	0.25
DZCT		113	7	-10219.28140	0.005	0.293
				0.022	0.016	0.32
GROUP: 112912.ASC ,obs#: 59						
DXCT		113	114	4242.57340	0.001	0.156
				0.004	0.003	0.11
DYCT		113	114	-1404.15610	-0.002	-0.207
				0.011	0.008	0.38
DZCT		113	114	-1283.40450	-0.002	-0.267
				0.009	0.007	0.41
GROUP: 112912.ASC ,obs#: 60						
DXCT		113	114	4242.56810	0.006	1.637
				0.005	0.004	1.25

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DYCT		113	114	-1404.15950	0.002	0.188
				0.011	0.009	0.36
DZCT		113	114	-1283.40720	0.001	0.103
				0.010	0.008	0.17
GROUP: 112912.ASC ,obs#: 61						
DXCT		113	119	14994.97540	-0.004	-1.094
				0.006	0.004	0.26
DYCT		113	119	565.64680	0.001	0.131
				0.013	0.009	0.08
DZCT		113	119	2506.12750	0.009	0.965
				0.013	0.009	0.59
GROUP: 112912.ASC ,obs#: 62						
DXCT		113	119	14994.96670	0.005	0.674
				0.009	0.007	0.31
DYCT		113	119	565.64480	0.003	0.311
				0.014	0.010	0.21
DZCT		113	119	2506.14660	-0.010	-1.050
				0.013	0.010	0.66
GROUP: 112912.ASC ,obs#: 63						
DXCT		113	120	16777.75920	0.008	0.976
				0.013	0.008	0.46
DYCT		113	120	-3262.51200	-0.003	-0.166
				0.027	0.018	0.17
DZCT		113	120	-2201.13440	-0.017	-0.984
				0.028	0.018	1.01
GROUP: 112912.ASC ,obs#: 64						
DXCT		113	120	16777.77940	-0.012	-1.013
				0.016	0.012	0.71
DYCT		113	120	-3262.51720	0.002	0.091
				0.032	0.025	0.13
DZCT		113	120	-2201.18000	0.028	1.112
				0.033	0.025	1.64
GROUP: 112912.ASC ,obs#: 65						
DXCT		113	121	-8166.97910	0.005	0.938
				0.008	0.006	0.58
DYCT		113	121	2772.02590	0.005	0.359
				0.020	0.014	0.55
DZCT		113	121	2524.56180	-0.006	-0.664
				0.013	0.009	0.68
GROUP: 112912.ASC ,obs#: 66						
DXCT		113	121	-8166.96900	-0.005	-0.904
				0.008	0.005	0.54
DYCT		113	121	2772.03620	-0.005	-0.340
				0.022	0.016	0.60
DZCT		113	121	2524.55050	0.005	0.606
				0.012	0.009	0.58
GROUP: 112912.ASC ,obs#: 67						
DXCT		113	122	-10244.70470	-0.010	-0.873
				0.017	0.012	0.98
DYCT		113	122	-1280.54000	-0.003	-0.127
				0.029	0.021	0.24
DZCT		113	122	-2893.18910	0.002	0.127

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION	STD DEV	RESIDUAL	STD DEV	STD RES PPM
					0.024	0.015		0.18
GROUP: 112912.ASC ,obs#: 68								
DXCT		113	122	-10244.73700	0.022			1.248
					0.021	0.017		2.04
DYCT		113	122	-1280.54430	0.002			0.079
					0.030	0.021		0.16
DZCT		113	122	-2893.20780	0.021			0.740
					0.033	0.028		1.93
GROUP: 112912.ASC ,obs#: 69								
DXCT		113	123	-12317.72540	0.001			0.236
					0.008	0.003		0.05
DYCT		113	123	-5829.18730	0.007			0.798
					0.020	0.009		0.43
DZCT		113	123	-8932.78110	0.001			0.178
					0.012	0.004		0.05
GROUP: 112912.ASC ,obs#: 70								
DXCT		113	123	-12317.72210	-0.003			-0.143
					0.019	0.018		0.16
DYCT		113	123	-5829.15940	-0.021			-0.562
					0.041	0.037		1.29
DZCT		113	123	-8932.77050	-0.010			-0.322
					0.033	0.031		0.60
GROUP: 112912.ASC ,obs#: 71								
DXCT		113	124	-5845.18050	0.004			0.571
					0.010	0.007		0.34
DYCT		113	124	-5937.62230	-0.012			-0.773
					0.023	0.016		1.05
DZCT		113	124	-8262.04350	0.010			0.648
					0.020	0.015		0.84
GROUP: 112912.ASC ,obs#: 72								
DXCT		113	124	-5845.17340	-0.003			-0.442
					0.010	0.007		0.27
DYCT		113	124	-5937.64540	0.011			0.650
					0.023	0.017		0.92
DZCT		113	124	-8262.02730	-0.006			-0.583
					0.017	0.011		0.54
GROUP: 112912.ASC ,obs#: 73								
DXCT		113	125	212.49250	-0.001			-0.166
					0.010	0.008		0.08
DYCT		113	125	-10014.24680	0.016			0.810
					0.024	0.020		1.01
DZCT		113	125	-12748.60290	-0.016			-0.814
					0.023	0.019		0.96
GROUP: 112912.ASC ,obs#: 74								
DXCT		113	125	212.48760	0.004			0.539
					0.009	0.007		0.23
DYCT		113	125	-10014.24870	0.018			0.978
					0.023	0.019		1.13
DZCT		113	125	-12748.60630	-0.012			-0.684
					0.022	0.018		0.75
GROUP: 112912.ASC ,obs#: 75								
DXCT		113	126	5283.75150	-0.001			-0.246

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
				0.007	0.005	0.09
DYCT		113	126	-7755.90830	0.007	0.445
				0.021	0.015	0.50
DZCT		113	126	-9270.04590	0.000	0.007
				0.024	0.017	0.01
GROUP: 112912.ASC ,obs#: 76						
DXCT		113	126	5283.74910	0.001	0.248
				0.007	0.005	0.09
DYCT		113	126	-7755.89480	-0.007	-0.447
				0.022	0.015	0.52
DZCT		113	126	-9270.04570	-0.000	-0.005
				0.025	0.018	0.01
GROUP: 112912.ASC ,obs#: 77						
DXCT		113	127	11835.80610	-0.003	-0.457
				0.009	0.006	0.18
DYCT		113	127	-7169.51040	0.006	0.324
				0.026	0.018	0.37
DZCT		113	127	-7737.24970	-0.004	-0.208
				0.030	0.021	0.27
GROUP: 112912.ASC ,obs#: 78						
DXCT		113	127	11835.80010	0.003	0.460
				0.009	0.007	0.20
DYCT		113	127	-7169.49810	-0.006	-0.328
				0.027	0.019	0.40
DZCT		113	127	-7737.25860	0.005	0.211
				0.030	0.022	0.29
GROUP: 112912.ASC ,obs#: 79						
DXCT		113	128	14805.84650	0.000	0.105
				0.007	0.004	0.02
DYCT		113	128	-7392.71100	-0.012	-1.159
				0.018	0.011	0.68
DZCT		113	128	-7679.54510	0.015	1.326
				0.019	0.011	0.83
GROUP: 112912.ASC ,obs#: 80						
DXCT		113	128	14805.84770	-0.001	-0.115
				0.009	0.007	0.04
DYCT		113	128	-7392.74430	0.021	1.152
				0.023	0.018	1.14
DZCT		113	128	-7679.50500	-0.025	-1.328
				0.024	0.019	1.37
GROUP: 112912.ASC ,obs#: 81						
DXCT		113	P 277	3314.34450	0.003	0.477
				0.007	0.006	0.56
DYCT		113	P 277	-2574.13440	0.007	0.482
				0.016	0.014	1.31
DZCT		113	P 277	-2898.37350	-0.021	-1.458
				0.016	0.014	4.05
GROUP: 112912.ASC ,obs#: 82						
DXCT		113	P 277	3314.34920	-0.002	-0.446
				0.006	0.004	0.36
DYCT		113	P 277	-2574.12250	-0.005	-0.496
				0.013	0.010	1.02

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
DZCT		113	P 277	-2898.40930	0.015	1.476
				0.013	0.010	2.97
GROUP: 113012.ASC ,obs#: 83						
DXCT		125	8	13898.00110	-0.002	-0.372
				0.007	0.005	0.12
DYCT		125	8	-4323.15640	0.003	0.185
				0.022	0.015	0.18
DZCT		125	8	-3850.40820	-0.004	-0.392
				0.013	0.009	0.23
GROUP: 113012.ASC ,obs#: 84						
DXCT		125	8	13897.99720	0.002	0.374
				0.008	0.006	0.14
DYCT		125	8	-4323.15030	-0.003	-0.184
				0.025	0.018	0.22
DZCT		125	8	-3850.41600	0.004	0.393
				0.015	0.011	0.28
GROUP: 113012.ASC ,obs#: 85						
DXCT		134	9	9476.88620	-0.002	-0.233
				0.011	0.008	0.18
DYCT		134	9	-2869.01110	-0.002	-0.128
				0.025	0.018	0.22
DZCT		134	9	-2556.93310	-0.001	-0.100
				0.017	0.012	0.12
GROUP: 113012.ASC ,obs#: 86						
DXCT		134	9	9476.88270	0.002	0.230
				0.010	0.007	0.16
DYCT		134	9	-2869.01550	0.002	0.120
				0.025	0.018	0.21
DZCT		134	9	-2556.93540	0.001	0.097
				0.016	0.011	0.11
GROUP: 113012.ASC ,obs#: 87						
DXCT		134	10	-8200.72910	-0.001	-0.279
				0.005	0.003	0.12
DYCT		134	10	105.45480	0.003	0.344
				0.012	0.009	0.36
DZCT		134	10	-874.99900	-0.002	-0.225
				0.012	0.008	0.23
GROUP: 113012.ASC ,obs#: 88						
DXCT		134	10	-8200.73100	0.001	0.281
				0.005	0.003	0.11
DYCT		134	10	105.46070	-0.003	-0.346
				0.012	0.008	0.36
DZCT		134	10	-875.00270	0.002	0.226
				0.012	0.008	0.22
GROUP: 113012.ASC ,obs#: 89						
DXCT		125	129	2848.39800	0.001	0.403
				0.005	0.004	0.26
DYCT		125	129	-3248.37180	0.002	0.156
				0.015	0.011	0.31
DZCT		125	129	-3811.21380	0.001	0.180
				0.011	0.008	0.25
GROUP: 113012.ASC ,obs#: 90						

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION STD DEV	RESIDUAL STD DEV	STD RES PPM
DXCT		125	129	2848.40080	-0.001	-0.388
				0.005	0.003	0.23
DYCT		125	129	-3248.36850	-0.002	-0.155
				0.014	0.010	0.27
DZCT		125	129	-3811.21110	-0.001	-0.178
				0.010	0.007	0.22
GROUP: 113012.ASC ,obs#: 91						
DXCT		125	130	9589.02130	-0.001	-0.157
				0.007	0.005	0.07
DYCT		125	130	-2905.98290	0.001	0.064
				0.021	0.015	0.09
DZCT		125	130	-2565.75470	-0.005	-0.461
				0.014	0.011	0.47
GROUP: 113012.ASC ,obs#: 92						
DXCT		125	130	9589.01980	0.001	0.173
				0.006	0.004	0.07
DYCT		125	130	-2905.98120	-0.001	-0.054
				0.019	0.013	0.07
DZCT		125	130	-2565.76350	0.004	0.451
				0.013	0.009	0.38
GROUP: 113012.ASC ,obs#: 93						
DXCT		125	131	14217.32470	0.001	0.205
				0.008	0.005	0.07
DYCT		125	131	-4461.93930	0.004	0.258
				0.025	0.017	0.29
DZCT		125	131	-3991.99750	0.000	0.022
				0.015	0.010	0.01
GROUP: 113012.ASC ,obs#: 94						
DXCT		125	131	14217.32710	-0.001	-0.202
				0.009	0.006	0.08
DYCT		125	131	-4461.92960	-0.005	-0.258
				0.028	0.020	0.34
DZCT		125	131	-3991.99690	-0.000	-0.032
				0.016	0.012	0.02
GROUP: 113012.ASC ,obs#: 95						
DXCT		125	132	5774.24530	-0.004	-0.882
				0.006	0.004	0.29
DYCT		125	132	-7529.37050	0.006	0.554
				0.016	0.011	0.48
DZCT		125	132	-8919.06020	-0.002	-0.328
				0.011	0.007	0.19
GROUP: 113012.ASC ,obs#: 96						
DXCT		125	132	5774.23780	0.004	0.914
				0.006	0.004	0.28
DYCT		125	132	-7529.35760	-0.007	-0.600
				0.016	0.011	0.51
DZCT		125	132	-8919.06570	0.003	0.398
				0.011	0.008	0.24
GROUP: 113012.ASC ,obs#: 97						
DXCT		125	133	-631.15170	-0.004	-1.189
				0.005	0.003	0.35
DYCT		125	133	-6919.99550	0.004	0.485

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
				0.012	0.008	0.36
DZCT		125	133	-8919.45090	0.002	0.340
				0.009	0.006	0.19
GROUP: 113012.ASC ,obs#: 98						
DXCT		125	133	-631.15990	0.004	1.194
				0.005	0.004	0.38
DYCT		125	133	-6919.98700	-0.004	-0.481
				0.013	0.009	0.39
DZCT		125	133	-8919.44640	-0.002	-0.343
				0.009	0.007	0.21
GROUP: 113012.ASC ,obs#: 99						
DXCT		125	134	-1646.01840	-0.008	-0.910
				0.011	0.009	0.52
DYCT		125	134	-9792.07360	0.014	0.610
				0.026	0.023	0.87
DZCT		125	134	-12734.27670	-0.017	-0.904
				0.021	0.018	1.03
GROUP: 113012.ASC ,obs#: 100						
DXCT		125	134	-1646.02820	0.001	0.183
				0.010	0.008	0.09
DYCT		125	134	-9792.08360	0.024	1.173
				0.023	0.020	1.49
DZCT		125	134	-12734.28920	-0.004	-0.249
				0.019	0.016	0.25
GROUP: 113012.ASC ,obs#: 101						
DXCT		125	135	-3514.09690	0.002	0.829
				0.006	0.002	0.29
DYCT		125	135	-2980.00070	-0.008	-1.068
				0.015	0.007	1.23
DZCT		125	135	-4259.35340	0.004	0.711
				0.015	0.006	0.71
GROUP: 113012.ASC ,obs#: 102						
DXCT		125	135	-3514.08590	-0.009	-0.575
				0.017	0.016	1.46
DYCT		125	135	-2980.02560	0.017	0.664
				0.029	0.026	2.74
DZCT		125	135	-4259.34570	-0.003	-0.100
				0.035	0.032	0.52
GROUP: 113012.ASC ,obs#: 103						
DXCT		125	136	-6564.95030	-0.000	-0.006
				0.012	0.011	0.01
DYCT		125	136	-2088.86810	0.016	0.755
				0.023	0.021	2.07
DZCT		125	136	-3491.42120	-0.011	-0.492
				0.024	0.022	1.41
GROUP: 113012.ASC ,obs#: 104						
DXCT		125	136	-6564.95060	0.000	0.137
				0.005	0.002	0.03
DYCT		125	136	-2088.84910	-0.003	-0.807
				0.010	0.004	0.39
DZCT		125	136	-3491.43420	0.002	0.540
				0.010	0.004	0.27

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
GROUP: 113012.ASC ,obs#: 105						
DXCT		125	137	-13066.05600	0.016	1.575
				0.013	0.010	1.21
DYCT		125	137	-1278.16670	-0.008	-0.446
				0.024	0.018	0.58
DZCT		125	137	-3236.61810	-0.021	-1.510
				0.023	0.014	1.53
GROUP: 113012.ASC ,obs#: 106						
DXCT		125	137	-13066.02420	-0.015	-1.722
				0.012	0.009	1.14
DYCT		125	137	-1278.15390	-0.021	-1.067
				0.026	0.019	1.53
DZCT		125	137	-3236.68940	0.051	1.930
				0.032	0.026	3.74
GROUP: 113012.ASC ,obs#: 107						
DXCT		125	138	-9444.13660	-0.001	-0.148
				0.007	0.005	0.06
DYCT		125	138	-5301.76050	0.001	0.091
				0.014	0.010	0.07
DZCT		125	138	-7956.35030	-0.007	-0.615
				0.015	0.011	0.52
GROUP: 113012.ASC ,obs#: 108						
DXCT		125	138	-9444.14310	0.006	1.073
				0.007	0.005	0.43
DYCT		125	138	-5301.76050	0.001	0.085
				0.014	0.011	0.07
DZCT		125	138	-7956.35830	0.001	0.078
				0.015	0.012	0.07
GROUP: 113012.ASC ,obs#: 109						
DXCT		134	138	-7798.10570	-0.005	-1.087
				0.007	0.005	0.48
DYCT		134	138	4490.29710	0.003	0.250
				0.017	0.012	0.29
DZCT		134	138	4777.93410	0.002	0.186
				0.015	0.010	0.18
GROUP: 113012.ASC ,obs#: 110						
DXCT		134	139	9471.19800	-0.001	-0.223
				0.009	0.006	0.12
DYCT		134	139	-2853.28020	-0.001	-0.056
				0.019	0.012	0.07
DZCT		134	139	-2538.00530	-0.002	-0.293
				0.013	0.008	0.24
GROUP: 113012.ASC ,obs#: 111						
DXCT		134	139	9471.19500	0.002	0.223
				0.010	0.008	0.17
DYCT		134	139	-2853.28190	0.001	0.055
				0.024	0.018	0.10
DZCT		134	139	-2538.01120	0.003	0.284
				0.016	0.012	0.34
GROUP: 113012.ASC ,obs#: 112						
DXCT		134	140	16669.22450	0.001	0.198
				0.010	0.006	0.07

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DYCT		134	140	-3484.42270	0.000	0.011
				0.022	0.014	0.01
DZCT		134	140	-2485.37390	-0.001	-0.100
				0.017	0.010	0.06
GROUP: 113012.ASC ,obs#: 113						
DXCT		134	140	16669.22780	-0.002	-0.198
				0.013	0.010	0.12
DYCT		134	140	-3484.42230	-0.000	-0.012
				0.028	0.022	0.01
DZCT		134	140	-2485.37660	0.002	0.100
				0.021	0.017	0.10
GROUP: 113012.ASC ,obs#: 114						
DXCT		134	141	6070.30990	-0.000	-0.028
				0.008	0.004	0.01
DYCT		134	141	-5480.95970	-0.001	-0.060
				0.020	0.010	0.06
DZCT		134	141	-6352.05060	-0.001	-0.062
				0.020	0.011	0.06
GROUP: 113012.ASC ,obs#: 115						
DXCT		134	141	6070.30950	0.000	0.024
				0.013	0.011	0.03
DYCT		134	141	-5480.96400	0.004	0.120
				0.035	0.031	0.36
DZCT		134	141	-6352.05360	0.002	0.087
				0.032	0.027	0.23
GROUP: 113012.ASC ,obs#: 116						
DXCT		134	142	-333.51440	0.001	0.246
				0.007	0.006	0.09
DYCT		134	142	-9398.26630	0.015	0.962
				0.019	0.016	1.00
DZCT		134	142	-12135.27330	-0.014	-0.832
				0.020	0.017	0.94
GROUP: 113012.ASC ,obs#: 117						
DXCT		134	142	-333.51390	0.001	0.310
				0.005	0.003	0.06
DYCT		134	142	-9398.25470	0.004	0.422
				0.013	0.009	0.24
DZCT		134	142	-12135.28380	-0.004	-0.408
				0.014	0.010	0.26
GROUP: 113012.ASC ,obs#: 118						
DXCT		134	143	-4987.37910	0.003	0.789
				0.006	0.004	0.48
DYCT		134	143	-2522.81450	0.002	0.150
				0.015	0.011	0.23
DZCT		134	143	-3845.84910	-0.002	-0.209
				0.015	0.011	0.34
GROUP: 113012.ASC ,obs#: 119						
DXCT		134	143	-4987.37290	-0.003	-0.789
				0.005	0.004	0.44
DYCT		134	143	-2522.81150	-0.001	-0.146
				0.014	0.010	0.21
DZCT		134	143	-3845.85350	0.002	0.207

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
				0.015	0.010	0.31
GROUP: 113012.ASC ,obs#: 120						
DXCT		134	144	-7994.85540	-0.004	-0.897
				0.007	0.005	0.54
DYCT		134	144	-533.24230	-0.001	-0.100
				0.018	0.013	0.15
DZCT		134	144	-1683.55000	-0.001	-0.047
				0.018	0.013	0.07
GROUP: 113012.ASC ,obs#: 121						
DXCT		134	144	-7994.86430	0.004	0.899
				0.007	0.005	0.55
DYCT		134	144	-533.24480	0.001	0.098
				0.018	0.013	0.15
DZCT		134	144	-1683.55120	0.001	0.049
				0.018	0.013	0.08
GROUP: 113012.ASC ,obs#: 122						
DXCT		134	145	-9118.98540	-0.002	-0.306
				0.011	0.007	0.20
DYCT		134	145	3782.90690	0.003	0.165
				0.029	0.020	0.31
DZCT		134	145	3738.04920	-0.006	-0.450
				0.021	0.013	0.56
GROUP: 113012.ASC ,obs#: 123						
DXCT		134	145	-9118.98970	0.002	0.212
				0.013	0.010	0.20
DYCT		134	145	3782.91520	-0.005	-0.226
				0.031	0.022	0.48
DZCT		134	145	3738.03380	0.010	0.467
				0.026	0.020	0.90
GROUP: 120112.ASC ,obs#: 124						
DXCT		142	11	7529.84040	0.003	0.824
				0.005	0.004	0.38
DYCT		142	11	-747.31350	0.001	0.076
				0.012	0.009	0.09
DZCT		142	11	-35.82780	0.004	0.562
				0.009	0.006	0.48
GROUP: 120112.ASC ,obs#: 125						
DXCT		142	11	7529.84610	-0.003	-0.823
				0.005	0.003	0.37
DYCT		142	11	-747.31220	-0.001	-0.076
				0.012	0.008	0.08
DZCT		142	11	-35.82070	-0.003	-0.562
				0.009	0.006	0.46
GROUP: 120112.ASC ,obs#: 126						
DXCT		142	12	4980.68050	0.014	2.531
				0.007	0.005	0.76
DYCT		142	12	-10836.94570	-0.007	-0.507
				0.017	0.014	0.39
DZCT		142	12	-13459.07130	0.006	0.508
				0.013	0.011	0.31
GROUP: 120112.ASC ,obs#: 127						
DXCT		142	12	4980.69180	0.002	0.457

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
				0.006	0.005	0.13
DYCT		142	12	-10836.97130	0.019	1.532
				0.015	0.012	1.03
DZCT		142	12	-13459.06240	-0.003	-0.324
				0.013	0.010	0.18
GROUP: 120112.ASC ,obs#: 128						
DXCT		142	13	-13300.29810	-0.011	-0.895
				0.016	0.013	0.84
DYCT		142	13	1094.58920	-0.006	-0.199
				0.038	0.030	0.45
DZCT		142	13	-227.31870	-0.037	-1.142
				0.037	0.032	2.78
GROUP: 120112.ASC ,obs#: 129						
DXCT		142	13	-13300.31470	0.005	0.790
				0.012	0.007	0.41
DYCT		142	13	1094.57700	0.006	0.358
				0.029	0.017	0.46
DZCT		142	13	-227.36220	0.006	0.565
				0.022	0.011	0.48
GROUP: 120112.ASC ,obs#: 130						
DXCT		142	146	5512.25720	-0.023	-1.656
				0.016	0.014	2.49
DYCT		142	146	-4920.15040	0.026	0.822
				0.037	0.031	2.75
DZCT		142	146	-5734.78840	-0.007	-0.312
				0.027	0.023	0.76
GROUP: 120112.ASC ,obs#: 131						
DXCT		142	146	5512.21540	0.019	2.695
				0.011	0.007	1.98
DYCT		142	146	-4920.14340	0.019	0.878
				0.030	0.021	2.00
DZCT		142	146	-5734.77140	-0.024	-1.768
				0.020	0.014	2.57
GROUP: 120112.ASC ,obs#: 132						
DXCT		142	147	7541.79620	-0.002	-0.444
				0.005	0.004	0.21
DYCT		142	147	-724.72060	0.001	0.167
				0.012	0.009	0.19
DZCT		142	147	-6.24040	-0.003	-0.460
				0.009	0.006	0.39
GROUP: 120112.ASC ,obs#: 133						
DXCT		142	147	7541.79330	0.001	0.444
				0.004	0.003	0.18
DYCT		142	147	-724.71790	-0.001	-0.167
				0.011	0.007	0.16
DZCT		142	147	-6.24590	0.003	0.460
				0.008	0.006	0.34
GROUP: 120112.ASC ,obs#: 134						
DXCT		142	148	15603.56760	-0.006	-0.577
				0.013	0.011	0.39
DYCT		142	148	-853.62330	-0.006	-0.300
				0.029	0.020	0.39

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DZCT		142	148	759.87250	0.000	0.016
				0.020	0.018	0.02
GROUP: 120112.ASC ,obs#: 135						
DXCT		142	148	15603.55590	0.006	0.805
				0.010	0.007	0.35
DYCT		142	148	-853.64950	0.020	0.604
				0.039	0.033	1.28
DZCT		142	148	759.87130	0.002	0.330
				0.010	0.005	0.10
GROUP: 120112.ASC ,obs#: 136						
DXCT		142	149	15075.20050	-0.001	-0.168
				0.009	0.006	0.06
DYCT		142	149	-6833.18260	0.003	0.169
				0.026	0.018	0.17
DZCT		142	149	-7040.74710	-0.008	-0.707
				0.018	0.012	0.47
GROUP: 120112.ASC ,obs#: 137						
DXCT		142	149	15075.19870	0.001	0.107
				0.010	0.007	0.04
DYCT		142	149	-6833.17440	-0.005	-0.242
				0.029	0.021	0.29
DZCT		142	149	-7040.76700	0.012	0.719
				0.021	0.016	0.64
GROUP: 120112.ASC ,obs#: 138						
DXCT		142	150	7387.01400	0.002	0.431
				0.006	0.005	0.13
DYCT		142	150	-8116.73050	0.013	1.013
				0.017	0.012	0.86
DZCT		142	150	-9646.63200	-0.002	-0.177
				0.012	0.009	0.11
GROUP: 120112.ASC ,obs#: 139						
DXCT		142	150	7387.01790	-0.002	-0.448
				0.006	0.004	0.13
DYCT		142	150	-8116.70700	-0.011	-1.001
				0.016	0.011	0.75
DZCT		142	150	-9646.63460	0.001	0.123
				0.012	0.008	0.07
GROUP: 120112.ASC ,obs#: 140						
DXCT		142	151	644.19670	-0.010	-0.976
				0.011	0.010	0.56
DYCT		142	151	-10445.65590	-0.010	-0.428
				0.026	0.024	0.59
DZCT		142	151	-13425.77510	0.014	0.634
				0.025	0.022	0.82
GROUP: 120112.ASC ,obs#: 141						
DXCT		142	151	644.19730	-0.010	-1.408
				0.009	0.007	0.60
DYCT		142	151	-10445.66570	-0.000	-0.019
				0.019	0.016	0.02
DZCT		142	151	-13425.76570	0.005	0.298
				0.019	0.015	0.27
GROUP: 120112.ASC ,obs#: 142						

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DXCT		1001	151	-6.62780	0.006	2.127
				0.005	0.003	923.09
DYCT		1001	151	-0.21930	0.004	0.442
				0.014	0.008	541.21
DZCT		1001	151	-1.13520	-0.008	-0.789
				0.015	0.010	1198.81
GROUP: 120112.ASC ,obs#: 143						
DXCT		142	152	1403.44280	0.007	1.077
				0.009	0.007	0.80
DYCT		142	152	-5626.02940	0.001	0.061
				0.019	0.014	0.10
DZCT		142	152	-7128.33070	-0.008	-0.468
				0.024	0.018	0.91
GROUP: 120112.ASC ,obs#: 144						
DXCT		142	152	1403.45650	-0.006	-1.074
				0.009	0.006	0.69
DYCT		142	152	-5626.02730	-0.001	-0.103
				0.018	0.012	0.13
DZCT		142	152	-7128.34680	0.008	0.523
				0.022	0.015	0.85
GROUP: 120112.ASC ,obs#: 145						
DXCT		142	153	-9559.00420	-0.002	-0.424
				0.008	0.006	0.25
DYCT		142	153	910.83010	-0.002	-0.149
				0.017	0.012	0.19
DZCT		142	153	-25.35070	-0.011	-0.860
				0.018	0.013	1.16
GROUP: 120112.ASC ,obs#: 146						
DXCT		142	153	-9559.00890	0.002	0.432
				0.008	0.005	0.24
DYCT		142	153	910.82640	0.002	0.160
				0.017	0.012	0.20
DZCT		142	153	-25.37230	0.010	0.856
				0.018	0.012	1.09
GROUP: 120112.ASC ,obs#: 147						
DXCT		142	154	-14672.41530	0.008	1.273
				0.009	0.007	0.54
DYCT		142	154	3878.35460	0.028	1.604
				0.027	0.017	1.79
DZCT		142	154	3203.02000	0.002	0.217
				0.015	0.011	0.15
GROUP: 120112.ASC ,obs#: 148						
DXCT		142	154	-14672.39520	-0.012	-1.738
				0.009	0.007	0.76
DYCT		142	154	3878.43300	-0.051	-1.958
				0.033	0.026	3.27
DZCT		142	154	3203.01570	0.007	0.576
				0.016	0.012	0.43
GROUP: 120112.ASC ,obs#: 149						
DXCT		142	155	-10838.84440	-0.004	-0.731
				0.008	0.005	0.31
DYCT		142	155	-2449.45760	-0.009	-0.594

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
				0.022	0.015	0.75
DZCT		142	155	-4494.29910	0.007	0.881
				0.011	0.008	0.56
GROUP: 120112.ASC ,obs#: 150						
DXCT		142	155	-10838.85270	0.005	0.728
				0.008	0.006	0.38
DYCT		142	155	-2449.47730	0.011	0.595
				0.024	0.018	0.90
DZCT		142	155	-4494.28440	-0.008	-0.879
				0.012	0.009	0.67
GROUP: 120112.ASC ,obs#: 151						
DXCT		1001	156	-1215.52900	-0.012	-0.690
				0.018	0.018	0.68
DYCT		1001	156	-10710.95530	-0.011	-0.305
				0.037	0.035	0.60
DZCT		1001	156	-14104.61350	0.004	0.129
				0.032	0.030	0.22
GROUP: 120112.ASC ,obs#: 152						
DXCT		1001	156	-1215.54540	0.004	0.329
				0.014	0.013	0.24
DYCT		1001	156	-10710.95930	-0.007	-0.221
				0.033	0.030	0.38
DZCT		1001	156	-14104.61590	0.006	0.260
				0.026	0.024	0.35
GROUP: 120112.ASC ,obs#: 153						
DXCT		1001	156	-1215.54910	0.008	0.621
				0.014	0.013	0.45
DYCT		1001	156	-10710.99830	0.032	1.092
				0.032	0.030	1.82
DZCT		1001	156	-14104.60290	-0.007	-0.290
				0.025	0.023	0.38
GROUP: 120112.ASC ,obs#: 154						
DXCT		142	1001	650.80840	0.000	0.034
				0.010	0.009	0.02
DYCT		142	1001	-10445.44460	-0.006	-0.269
				0.023	0.021	0.34
DZCT		142	1001	-13424.61950	0.002	0.082
				0.022	0.020	0.10
GROUP: 120112.ASC ,obs#: 155						
DXCT		142	1001	650.81160	-0.003	-0.387
				0.008	0.007	0.17
DYCT		142	1001	-10445.44130	-0.009	-0.502
				0.020	0.018	0.53
DZCT		142	1001	-13424.61580	-0.002	-0.122
				0.019	0.017	0.12
GROUP: 120112.ASC ,obs#: 156						
DXCT		142	F 246	7595.67210	0.004	0.815
				0.008	0.005	0.31
DYCT		142	F 246	-7878.99510	-0.003	-0.281
				0.017	0.011	0.22
DZCT		142	F 246	-9311.22340	-0.003	-0.221
				0.020	0.014	0.21

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
GROUP: 120112.ASC ,obs#: 157						
DXCT		142	F 246	7595.68150	-0.005	-0.817
				0.008	0.006	0.35
DYCT		142	F 246	-7879.00180	0.004	0.276
				0.018	0.013	0.25
DZCT		142	F 246	-9311.23000	0.004	0.228
				0.021	0.016	0.25
GROUP: 120112.ASC ,obs#: 158						
DXCT		142	KINNE	5448.89670	0.026	6.304
				0.005	0.004	2.51
					^^^^^^^^^^^^^^^^	
DYCT		142	KINNE	-5789.78360	-0.020	-2.243
				0.013	0.009	1.95
DZCT		142	KINNE	-6813.19470	-0.014	-2.217
				0.009	0.006	1.29
GROUP: 120112.ASC ,obs#: 159						
DXCT		142	KINNE	5448.89860	0.024	3.932
				0.007	0.006	2.32
DYCT		142	KINNE	-5789.77800	-0.026	-1.927
				0.016	0.014	2.49
DZCT		142	KINNE	-6813.20650	-0.002	-0.197
				0.011	0.009	0.17
GROUP: 120112.ASC ,obs#: 160						
DXCT		142	M 55	13724.30490	-0.020	-4.939
				0.005	0.004	1.35
					^^^^^^^^^^^^^^^^	
DYCT		142	M 55	-3639.77700	0.015	1.486
				0.013	0.010	1.03
DZCT		142	M 55	-3075.39700	0.009	1.349
				0.009	0.007	0.64
GROUP: 120112.ASC ,obs#: 161						
DXCT		142	M 55	13724.30540	-0.020	-4.737
				0.005	0.004	1.39
					^^^^^^^^^^^^^^^^	
DYCT		142	M 55	-3639.77820	0.016	1.480
				0.014	0.011	1.11
DZCT		142	M 55	-3075.39520	0.008	0.967
				0.010	0.008	0.52
GROUP: 120112.ASC ,obs#: 162						
DXCT		1001	REBAR	-1208.81680	0.004	0.323
				0.014	0.013	0.23
DYCT		1001	REBAR	-10725.49230	0.014	0.469
				0.032	0.029	0.78
DZCT		1001	REBAR	-14121.48370	-0.009	-0.398
				0.025	0.023	0.51
GROUP: 120112.ASC ,obs#: 163						
DXCT		1001	REBAR	-1208.81860	0.006	0.612
				0.011	0.010	0.33
DYCT		1001	REBAR	-10725.47190	-0.007	-0.298
				0.026	0.022	0.37
DZCT		1001	REBAR	-14121.50230	0.009	0.560
				0.020	0.017	0.53

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
GROUP: 120212.ASC ,obs#: 164						
DXCT		1001	12	4329.89520	-0.010	-3.171
				0.005	0.003	2.25
DYCT		1001	12	-391.48310	-0.019	-2.217
				0.013	0.009	4.45
DZCT		1001	12	-34.45180	0.004	0.778
				0.009	0.005	0.91
GROUP: 120212.ASC ,obs#: 165						
DXCT		1001	14	14467.37320	0.009	0.918
				0.011	0.009	0.53
DYCT		1001	14	-5167.86580	-0.015	-0.581
				0.031	0.027	0.95
DZCT		1001	14	-5050.73790	0.011	0.660
				0.020	0.017	0.69
GROUP: 120212.ASC ,obs#: 166						
DXCT		1001	14	14467.38530	-0.004	-0.922
				0.007	0.004	0.22
DYCT		1001	14	-5167.88750	0.006	0.583
				0.020	0.011	0.39
DZCT		1001	14	-5050.72210	-0.005	-0.662
				0.013	0.007	0.28
GROUP: 120212.ASC ,obs#: 167						
DXCT		1001	15	-13549.54110	0.002	0.339
				0.007	0.005	0.12
DYCT		1001	15	-1545.74270	0.003	0.213
				0.018	0.013	0.19
DZCT		1001	15	-3634.73970	-0.000	-0.011
				0.012	0.008	0.01
GROUP: 120212.ASC ,obs#: 168						
DXCT		1001	15	-13549.53760	-0.002	-0.340
				0.007	0.005	0.13
DYCT		1001	15	-1545.73700	-0.003	-0.215
				0.019	0.014	0.21
DZCT		1001	15	-3634.73990	0.000	0.012
				0.012	0.009	0.01
GROUP: 120212.ASC ,obs#: 169						
DXCT		156	16	9474.78930	0.000	0.081
				0.005	0.004	0.03
DYCT		156	16	-2845.85350	-0.008	-0.890
				0.013	0.009	0.78
DZCT		156	16	-2576.34610	0.005	0.632
				0.012	0.009	0.53
GROUP: 120212.ASC ,obs#: 170						
DXCT		156	16	9474.78990	-0.000	-0.085
				0.005	0.004	0.03
DYCT		156	16	-2845.86910	0.008	0.890
				0.012	0.009	0.74
DZCT		156	16	-2576.33560	-0.005	-0.673
				0.011	0.008	0.50
GROUP: 120212.ASC ,obs#: 171						
DXCT		1001	157	4388.52270	-0.003	-0.890
				0.005	0.004	0.76

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DYCT		1001	157	-379.38000	0.004	0.395
				0.013	0.010	0.89
DZCT		1001	157	-15.29240	-0.000	-0.006
				0.009	0.007	0.01
GROUP: 120212.ASC ,obs#: 172						
DXCT		1001	157	4388.51670	0.003	0.889
				0.005	0.003	0.61
DYCT		1001	157	-379.37290	-0.003	-0.396
				0.012	0.008	0.72
DZCT		1001	157	-15.29250	0.000	0.010
				0.008	0.006	0.01
GROUP: 120212.ASC ,obs#: 173						
DXCT		1001	158	8909.24920	-0.004	-0.543
				0.008	0.007	0.35
DYCT		1001	158	-3969.34470	0.010	0.513
				0.023	0.019	0.93
DZCT		1001	158	-4129.74560	0.001	0.074
				0.016	0.013	0.09
GROUP: 120212.ASC ,obs#: 174						
DXCT		1001	158	8909.24380	0.002	0.585
				0.005	0.003	0.16
DYCT		1001	158	-3969.32970	-0.005	-0.581
				0.016	0.009	0.48
DZCT		1001	158	-4129.74440	-0.000	-0.038
				0.011	0.006	0.02
GROUP: 120212.ASC ,obs#: 175						
DXCT		1001	159	14150.46760	0.002	0.392
				0.006	0.004	0.11
DYCT		1001	159	-4414.57520	-0.011	-0.987
				0.016	0.012	0.75
DZCT		1001	159	-4108.81210	0.004	0.534
				0.011	0.008	0.26
GROUP: 120212.ASC ,obs#: 176						
DXCT		1001	159	14150.47120	-0.002	-0.496
				0.006	0.004	0.13
DYCT		1001	159	-4414.59730	0.011	1.035
				0.015	0.010	0.69
DZCT		1001	159	-4108.80440	-0.004	-0.507
				0.010	0.007	0.24
GROUP: 120212.ASC ,obs#: 177						
DXCT		1001	160	13399.41900	0.002	0.577
				0.005	0.004	0.16
DYCT		1001	160	-2124.02260	-0.006	-0.553
				0.015	0.010	0.42
DZCT		1001	160	-1205.45550	-0.001	-0.184
				0.010	0.007	0.10
GROUP: 120212.ASC ,obs#: 178						
DXCT		1001	160	13399.42360	-0.002	-0.575
				0.006	0.004	0.18
DYCT		1001	160	-2124.03460	0.006	0.539
				0.016	0.012	0.46
DZCT		1001	160	-1205.45850	0.002	0.206

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
				0.011	0.008	0.12
GROUP: 120212.ASC ,obs#: 179						
DXCT		1001	161	9546.74430	0.001	0.172
				0.013	0.007	0.08
DYCT		1001	161	-7744.56670	0.007	0.413
				0.032	0.018	0.48
DZCT		1001	161	-8953.53740	-0.003	-0.226
				0.026	0.014	0.20
GROUP: 120212.ASC ,obs#: 180						
DXCT		1001	161	9546.74770	-0.002	-0.134
				0.019	0.016	0.14
DYCT		1001	161	-7744.54320	-0.016	-0.384
				0.050	0.042	1.07
DZCT		1001	161	-8953.54850	0.008	0.212
				0.044	0.038	0.53
GROUP: 120212.ASC ,obs#: 181						
DXCT		1001	162	518.51160	0.004	1.038
				0.006	0.004	0.37
DYCT		1001	162	-6922.50370	0.004	0.389
				0.014	0.009	0.33
DZCT		1001	162	-8955.25610	-0.001	-0.162
				0.012	0.008	0.12
GROUP: 120212.ASC ,obs#: 182						
DXCT		1001	162	518.52020	-0.004	-1.037
				0.006	0.004	0.39
DYCT		1001	162	-6922.49610	-0.004	-0.387
				0.014	0.010	0.35
DZCT		1001	162	-8955.25890	0.001	0.162
				0.012	0.009	0.13
GROUP: 120212.ASC ,obs#: 183						
DXCT		1001	163	-3497.98500	-0.002	-0.430
				0.005	0.004	0.23
DYCT		1001	163	-3560.43820	-0.001	-0.159
				0.010	0.009	0.19
DZCT		1001	163	-5041.23230	-0.004	-0.509
				0.010	0.008	0.60
GROUP: 120212.ASC ,obs#: 184						
DXCT		1001	163	-3497.98440	-0.002	-0.624
				0.004	0.004	0.31
DYCT		1001	163	-3560.44590	0.006	0.774
				0.010	0.008	0.89
DZCT		1001	163	-5041.23710	0.001	0.073
				0.010	0.008	0.08
GROUP: 120212.ASC ,obs#: 185						
DXCT		1001	163	-3497.99030	0.004	1.038
				0.004	0.004	0.52
DYCT		1001	163	-3560.43460	-0.005	-0.617
				0.010	0.008	0.70
DZCT		1001	163	-5041.23980	0.003	0.421
				0.010	0.008	0.46
GROUP: 120212.ASC ,obs#: 186						
DXCT		1001	164	-10760.50900	-0.004	-0.364

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
				0.015	0.011	0.26
DYCT		1001	164	-5870.98280	-0.000	-0.010
				0.034	0.025	0.02
DZCT		1001	164	-8943.15680	-0.003	-0.128
				0.029	0.021	0.18
GROUP: 120212.ASC ,obs#: 187						
DXCT		1001	164	-10760.51630	0.003	0.366
				0.013	0.009	0.22
DYCT		1001	164	-5870.98330	0.000	0.011
				0.031	0.021	0.02
DZCT		1001	164	-8943.16180	0.002	0.129
				0.026	0.018	0.15
GROUP: 120212.ASC ,obs#: 188						
DXCT		1001	165	-13668.82680	0.002	0.441
				0.006	0.004	0.11
DYCT		1001	165	-1533.19760	-0.002	-0.197
				0.017	0.010	0.14
DZCT		1001	165	-3634.92290	0.005	0.733
				0.011	0.006	0.33
GROUP: 120212.ASC ,obs#: 189						
DXCT		1001	165	-13668.82190	-0.003	-0.445
				0.009	0.007	0.23
DYCT		1001	165	-1533.20260	0.003	0.153
				0.024	0.020	0.21
DZCT		1001	165	-3634.90950	-0.009	-0.719
				0.015	0.012	0.61
GROUP: 120212.ASC ,obs#: 190						
DXCT		1001	166	-14633.02450	0.003	0.540
				0.008	0.005	0.16
DYCT		1001	166	4346.62840	0.019	1.042
				0.030	0.018	1.21
DZCT		1001	166	3835.35280	-0.005	-0.745
				0.011	0.007	0.33
GROUP: 120212.ASC ,obs#: 191						
DXCT		1001	166	-14633.01780	-0.004	-0.533
				0.010	0.008	0.26
DYCT		1001	166	4346.67810	-0.031	-1.043
				0.037	0.029	1.95
DZCT		1001	166	3835.33910	0.008	0.735
				0.015	0.012	0.54
GROUP: 120212.ASC ,obs#: 192						
DXCT		1001	167	-7014.45890	-0.008	-1.421
				0.008	0.006	1.02
DYCT		1001	167	2629.46250	0.002	0.094
				0.029	0.021	0.25
DZCT		1001	167	2536.84370	-0.008	-0.974
				0.012	0.009	1.06
GROUP: 120212.ASC ,obs#: 193						
DXCT		1001	167	-7014.47700	0.010	1.491
				0.009	0.007	1.27
DYCT		1001	167	2629.46690	-0.002	-0.134
				0.026	0.018	0.30

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DZCT		1001	167	2536.82470	0.011	1.129
				0.013	0.009	1.34
GROUP: 120212.ASC ,obs#: 194						
DXCT		156	168	9460.25850	0.001	0.128
				0.008	0.006	0.07
DYCT		156	168	-2831.60000	-0.004	-0.260
				0.020	0.014	0.35
DZCT		156	168	-2559.99940	0.007	0.562
				0.017	0.012	0.68
GROUP: 120212.ASC ,obs#: 195						
DXCT		156	168	9460.26000	-0.001	-0.129
				0.008	0.006	0.07
DYCT		156	168	-2831.60720	0.004	0.257
				0.020	0.014	0.35
DZCT		156	168	-2559.98550	-0.007	-0.561
				0.018	0.012	0.68
GROUP: 120212.ASC ,obs#: 196						
DXCT		156	169	17020.23290	0.012	1.402
				0.010	0.008	0.66
DYCT		156	169	-3991.94120	0.004	0.234
				0.021	0.016	0.21
DZCT		156	169	-3217.18160	0.001	0.088
				0.017	0.013	0.06
GROUP: 120212.ASC ,obs#: 197						
DXCT		156	169	17020.25000	-0.005	-1.353
				0.007	0.004	0.30
DYCT		156	169	-3991.93470	-0.003	-0.278
				0.016	0.010	0.15
DZCT		156	169	-3217.18050	0.000	0.007
				0.013	0.008	0.00
GROUP: 120212.ASC ,obs#: 198						
DXCT		156	PARSONS	5050.65980	0.000	0.087
				0.006	0.004	0.06
DYCT		156	PARSONS	-2079.51620	0.002	0.172
				0.015	0.011	0.32
DZCT		156	PARSONS	-2108.13100	-0.006	-0.556
				0.015	0.011	1.06
GROUP: 120212.ASC ,obs#: 199						
DXCT		156	PARSONS	5050.66050	-0.000	-0.085
				0.006	0.004	0.06
DYCT		156	PARSONS	-2079.51270	-0.002	-0.169
				0.014	0.010	0.28
DZCT		156	PARSONS	-2108.14260	0.005	0.555
				0.014	0.010	0.92
GROUP: 120212.ASC ,obs#: 200						
DXCT		156	REBAR	6.73060	-0.002	-0.712
				0.004	0.003	92.18
DYCT		156	REBAR	-14.51120	-0.001	-0.152
				0.011	0.009	56.83
DZCT		156	REBAR	-16.88120	-0.002	-0.190
				0.012	0.010	84.83
GROUP: 120312.ASC ,obs#: 201						

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
DXCT		156	17	-8185.08110	-0.016	-4.372
				0.005	0.004	1.85
					^^^^^^^^^^^^^^^^	
DYCT		156	17	-1242.33690	0.003	0.272
				0.014	0.010	0.33
DZCT		156	17	-2618.73150	-0.000	-0.005
				0.010	0.007	0.00
GROUP: 120312.ASC ,obs#: 202						
DXCT		156	17	-8185.11040	0.013	4.353
				0.005	0.003	1.52
					^^^^^^^^^^^^^^^^	
DYCT		156	17	-1242.33220	-0.002	-0.224
				0.012	0.008	0.21
DZCT		156	17	-2618.73080	-0.001	-0.126
				0.009	0.006	0.08
GROUP: 120312.ASC ,obs#: 203						
DXCT		156	18	2332.51640	0.005	0.490
				0.014	0.010	0.30
DYCT		156	18	-10106.87530	-0.001	-0.048
				0.028	0.021	0.06
DZCT		156	18	-12922.76760	0.005	0.256
				0.028	0.021	0.32
GROUP: 120312.ASC ,obs#: 204						
DXCT		156	18	2332.52570	-0.004	-0.516
				0.012	0.008	0.26
DYCT		156	18	-10106.87770	0.001	0.079
				0.026	0.018	0.09
DZCT		156	18	-12922.75680	-0.005	-0.307
				0.026	0.018	0.33
GROUP: 120312.ASC ,obs#: 205						
DXCT		MOCA	156	-84144.17510	0.046	1.066
				0.044	0.044	0.53
DYCT		MOCA	156	20078.69800	-0.032	-0.877
				0.044	0.036	0.36
DZCT		MOCA	156	16926.54380	0.018	0.459
				0.044	0.039	0.20
GROUP: 120312.ASC ,obs#: 206						
DXCT		MONE	156	-88385.70670	0.036	0.717
				0.051	0.051	0.36
DYCT		MONE	156	-26295.00030	-0.005	-0.120
				0.051	0.045	0.05
DZCT		MONE	156	-43626.57120	0.004	0.080
				0.051	0.047	0.04
GROUP: 120312.ASC ,obs#: 207						
DXCT		156	170	-7973.02760	-0.000	-0.107
				0.005	0.004	0.05
DYCT		156	170	712.70590	0.003	0.311
				0.013	0.010	0.37
DZCT		156	170	-32.39990	0.003	0.425
				0.010	0.007	0.37
GROUP: 120312.ASC ,obs#: 208						
DXCT		156	170	-7973.02830	0.000	0.106

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
				0.004	0.003	0.04
DYCT		156	170	712.71140	-0.003	-0.311
				0.012	0.008	0.32
DZCT		156	170	-32.39440	-0.003	-0.423
				0.009	0.006	0.32
GROUP: 120312.ASC ,obs#: 209						
DXCT		156	171	-16609.99400	0.003	0.415
				0.009	0.006	0.15
DYCT		156	171	-512.19250	-0.002	-0.101
				0.026	0.017	0.10
DZCT		156	171	-2731.41770	-0.006	-0.600
				0.016	0.011	0.38
GROUP: 120312.ASC ,obs#: 210						
DXCT		156	171	-16609.98820	-0.003	-0.412
				0.010	0.008	0.19
DYCT		156	171	-512.19650	0.002	0.103
				0.029	0.022	0.13
DZCT		156	171	-2731.43210	0.008	0.598
				0.018	0.013	0.47
GROUP: 120312.ASC ,obs#: 211						
DXCT		156	172	-9744.70830	-0.004	-0.472
				0.017	0.009	0.30
DYCT		156	172	-5271.21270	-0.005	-0.269
				0.039	0.020	0.39
DZCT		156	172	-8060.94160	-0.002	-0.123
				0.025	0.013	0.11
GROUP: 120312.ASC ,obs#: 212						
DXCT		156	172	-9744.72380	0.011	0.459
				0.029	0.025	0.83
DYCT		156	172	-5271.23390	0.016	0.283
				0.065	0.056	1.16
DZCT		156	172	-8060.94660	0.003	0.098
				0.041	0.035	0.25
GROUP: 120312.ASC ,obs#: 213						
DXCT		156	173	-1032.39020	0.006	1.157
				0.008	0.005	0.49
DYCT		156	173	-7781.24320	0.003	0.138
				0.027	0.021	0.23
DZCT		156	173	-10311.05350	0.010	0.752
				0.017	0.013	0.74
GROUP: 120312.ASC ,obs#: 214						
DXCT		156	173	-1032.37550	-0.008	-1.432
				0.008	0.006	0.64
DYCT		156	173	-7781.23740	-0.003	-0.228
				0.020	0.012	0.22
DZCT		156	173	-10311.03010	-0.014	-1.235
				0.016	0.011	1.06
GROUP: 120312.ASC ,obs#: 215						
DXCT		156	174	714.87050	-0.003	-0.646
				0.006	0.004	0.17
DYCT		156	174	-9964.42790	-0.005	-0.421
				0.016	0.012	0.32

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION	RESIDUAL	STD RES
				STD DEV	STD DEV	PPM
DZCT		156	174	-12940.31310	0.004	0.382
				0.015	0.011	0.26
GROUP: 120312.ASC ,obs#: 216						
DXCT		156	174	714.85080	0.017	1.392
				0.013	0.012	1.03
DYCT		156	174	-9964.40550	-0.028	-0.851
				0.034	0.032	1.69
DZCT		156	174	-12940.31890	0.010	0.341
				0.031	0.030	0.62
GROUP: 120312.ASC ,obs#: 217						
DXCT		156	174	714.87090	-0.003	-0.293
				0.012	0.011	0.20
DYCT		156	174	-9964.42550	-0.008	-0.291
				0.028	0.026	0.47
DZCT		156	174	-12940.31990	0.011	0.429
				0.028	0.026	0.68
GROUP: 120312.ASC ,obs#: 218						
DXCT		MOCA	174	-83429.33590	0.075	1.803
				0.042	0.042	0.89
DYCT		MOCA	174	10114.20500	0.028	0.834
				0.042	0.034	0.33
DZCT		MOCA	174	3986.25890	-0.006	-0.158
				0.042	0.037	0.07
GROUP: 120312.ASC ,obs#: 219						
DXCT		MONE	174	-87670.84280	0.040	0.730
				0.055	0.055	0.36
DYCT		MONE	174	-36259.41100	-0.028	-0.565
				0.055	0.049	0.25
DZCT		MONE	174	-56566.90630	0.030	0.583
				0.055	0.052	0.27
GROUP: 120312.ASC ,obs#: 220						
DXCT		156	175	11183.89390	-0.001	-0.134
				0.010	0.006	0.04
DYCT		156	175	-10415.63460	-0.003	-0.232
				0.020	0.013	0.16
DZCT		156	175	-12300.23000	0.003	0.206
				0.021	0.014	0.15
GROUP: 120312.ASC ,obs#: 221						
DXCT		156	175	11183.89190	0.001	0.135
				0.011	0.008	0.06
DYCT		156	175	-10415.64180	0.004	0.232
				0.023	0.018	0.21
DZCT		156	175	-12300.22340	-0.004	-0.206
				0.024	0.018	0.19
GROUP: 120312.ASC ,obs#: 222						
DXCT		156	176	14561.05670	-0.005	-0.906
				0.007	0.006	0.35
DYCT		156	176	-312.47270	-0.010	-0.788
				0.016	0.012	0.66
DZCT		156	176	1308.07210	0.009	0.715
				0.016	0.012	0.60
GROUP: 120312.ASC ,obs#: 223						

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION	RESIDUAL	STD RES
				STD DEV	STD DEV	PPM
DXCT		156	176	14561.04810	0.004	0.889
				0.006	0.004	0.24
DYCT		156	176	-312.48900	0.007	0.762
				0.014	0.009	0.46
DZCT		156	176	1308.08680	-0.006	-0.694
				0.013	0.008	0.40
GROUP: 120312.ASC ,obs#: 224						
DXCT		156	177	7373.75190	0.001	0.196
				0.008	0.005	0.13
DYCT		156	177	-2448.00810	0.013	0.998
				0.019	0.013	1.64
DZCT		156	177	-2311.93280	-0.000	-0.020
				0.015	0.011	0.03
GROUP: 120312.ASC ,obs#: 225						
DXCT		156	177	7373.75410	-0.001	-0.198
				0.008	0.006	0.14
DYCT		156	177	-2447.98030	-0.014	-1.066
				0.019	0.014	1.79
DZCT		156	177	-2311.93350	0.000	0.049
				0.014	0.010	0.06
GROUP: 120312.ASC ,obs#: 226						
DXCT		156	178	3238.58190	-0.005	-0.896
				0.007	0.005	0.79
DYCT		156	178	-3312.16080	-0.004	-0.267
				0.023	0.016	0.71
DZCT		156	178	-3949.77050	0.006	0.723
				0.011	0.008	0.93
GROUP: 120312.ASC ,obs#: 227						
DXCT		156	178	3238.57290	0.004	0.885
				0.007	0.005	0.69
DYCT		156	178	-3312.16840	0.003	0.207
				0.022	0.016	0.54
DZCT		156	178	-3949.76010	-0.005	-0.667
				0.010	0.007	0.78
GROUP: 120312.ASC ,obs#: 228						
DXCT		174	179	-226.10790	0.003	0.552
				0.006	0.005	0.86
DYCT		174	179	-1831.19760	0.001	0.130
				0.014	0.011	0.46
DZCT		174	179	-2429.11570	-0.001	-0.079
				0.010	0.007	0.18
GROUP: 120312.ASC ,obs#: 229						
DXCT		174	179	-226.10320	-0.002	-0.551
				0.006	0.004	0.68
DYCT		174	179	-1831.19510	-0.001	-0.130
				0.013	0.009	0.36
DZCT		174	179	-2429.11670	0.000	0.077
				0.009	0.006	0.14
GROUP: 120312.ASC ,obs#: 230						
DXCT		174	180	-992.09820	-0.008	-0.667
				0.013	0.012	0.50
DYCT		174	180	-9713.01490	0.027	0.925

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
				0.031	0.029	1.67
DZCT		174	180	-12896.32120	0.016	0.750
				0.023	0.021	0.99
GROUP: 120312.ASC ,obs#: 231						
DXCT		174	180	-992.11440	0.008	1.032
				0.009	0.008	0.50
DYCT		174	180	-9712.99200	0.004	0.221
				0.021	0.019	0.25
DZCT		174	180	-12896.30550	0.000	0.018
				0.016	0.014	0.02
GROUP: 120312.ASC ,obs#: 232						
DXCT		174	180	-992.11200	0.006	0.707
				0.009	0.008	0.36
DYCT		174	180	-9712.99470	0.007	0.344
				0.023	0.020	0.42
DZCT		174	180	-12896.30070	-0.005	-0.312
				0.017	0.015	0.28
GROUP: 120312.ASC ,obs#: 233						
DXCT		174	181	-5796.47980	0.007	0.805
				0.010	0.008	0.41
DYCT		174	181	-8997.94900	0.006	0.303
				0.023	0.020	0.37
DZCT		174	181	-12519.19980	0.011	0.636
				0.019	0.017	0.66
GROUP: 120312.ASC ,obs#: 234						
DXCT		174	181	-5796.47820	0.005	0.532
				0.011	0.010	0.31
DYCT		174	181	-8997.93460	-0.008	-0.354
				0.026	0.023	0.50
DZCT		174	181	-12519.20330	0.014	0.728
				0.022	0.020	0.87
GROUP: 120312.ASC ,obs#: 235						
DXCT		156	NAIL	736.98200	0.019	1.613
				0.013	0.012	1.18
DYCT		156	NAIL	-9958.48160	0.034	1.197
				0.031	0.028	2.06
DZCT		156	NAIL	-12929.23540	0.009	0.303
				0.031	0.028	0.52
GROUP: 120312.ASC ,obs#: 236						
DXCT		174	NAIL	22.13490	-0.001	-1.527
				0.003	0.001	51.38
DYCT		174	NAIL	5.98770	-0.002	-0.977
				0.009	0.003	96.70
DZCT		174	NAIL	11.08230	-0.000	-0.117
				0.010	0.003	13.61
GROUP: 120312.ASC ,obs#: 237						
DXCT		156	REBAR	6.72700	0.001	0.522
				0.004	0.003	62.61
DYCT		156	REBAR	-14.51600	0.003	0.467
				0.010	0.007	149.55
DZCT		156	REBAR	-16.88310	-0.000	-0.018
				0.007	0.004	3.13

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION / STD DEV	RESIDUAL / STD DEV	STD RES / PPM
GROUP: 120412.ASC ,obs#: 238						
DXCT		180	19	-13026.92600	-0.004	-0.680
				0.007	0.005	0.27
DYCT		180	19	-570.60220	0.003	0.297
				0.015	0.011	0.24
DZCT		180	19	-2387.50820	-0.001	-0.068
				0.015	0.011	0.06
GROUP: 120412.ASC ,obs#: 239						
DXCT		180	19	-13026.93260	0.003	0.680
				0.007	0.004	0.23
DYCT		180	19	-570.59630	-0.003	-0.295
				0.013	0.009	0.20
DZCT		180	19	-2387.50960	0.001	0.065
				0.014	0.010	0.05
GROUP: 120412.ASC ,obs#: 240						
DXCT		180	20	8142.09100	0.001	0.140
				0.008	0.006	0.10
DYCT		180	20	-2348.15930	0.003	0.200
				0.020	0.014	0.33
DZCT		180	20	-2108.29830	-0.003	-0.289
				0.016	0.012	0.39
GROUP: 120412.ASC ,obs#: 241						
DXCT		180	20	8142.09260	-0.001	-0.138
				0.008	0.005	0.09
DYCT		180	20	-2348.15390	-0.003	-0.198
				0.019	0.013	0.29
DZCT		180	20	-2108.30460	0.003	0.288
				0.015	0.010	0.34
GROUP: 120412.ASC ,obs#: 242						
DXCT		180	181	-4804.36510	-0.002	-1.065
				0.004	0.002	0.35
DYCT		180	181	715.04400	0.001	0.213
				0.011	0.005	0.21
DZCT		180	181	377.11880	-0.002	-0.899
				0.007	0.003	0.50
GROUP: 120412.ASC ,obs#: 243						
DXCT		180	182	-8113.62830	0.002	0.242
				0.009	0.006	0.09
DYCT		180	182	9070.18520	0.007	0.410
				0.023	0.017	0.42
DZCT		180	182	10884.47730	0.003	0.229
				0.017	0.012	0.17
GROUP: 120412.ASC ,obs#: 244						
DXCT		180	182	-8113.62540	-0.001	-0.234
				0.008	0.006	0.08
DYCT		180	182	9070.19810	-0.006	-0.403
				0.022	0.015	0.37
DZCT		180	182	10884.48270	-0.003	-0.231
				0.016	0.011	0.16
GROUP: 120412.ASC ,obs#: 245						
DXCT		180	183	-12423.04550	0.001	0.243
				0.007	0.004	0.07

Residuals (critical value = 4.129):

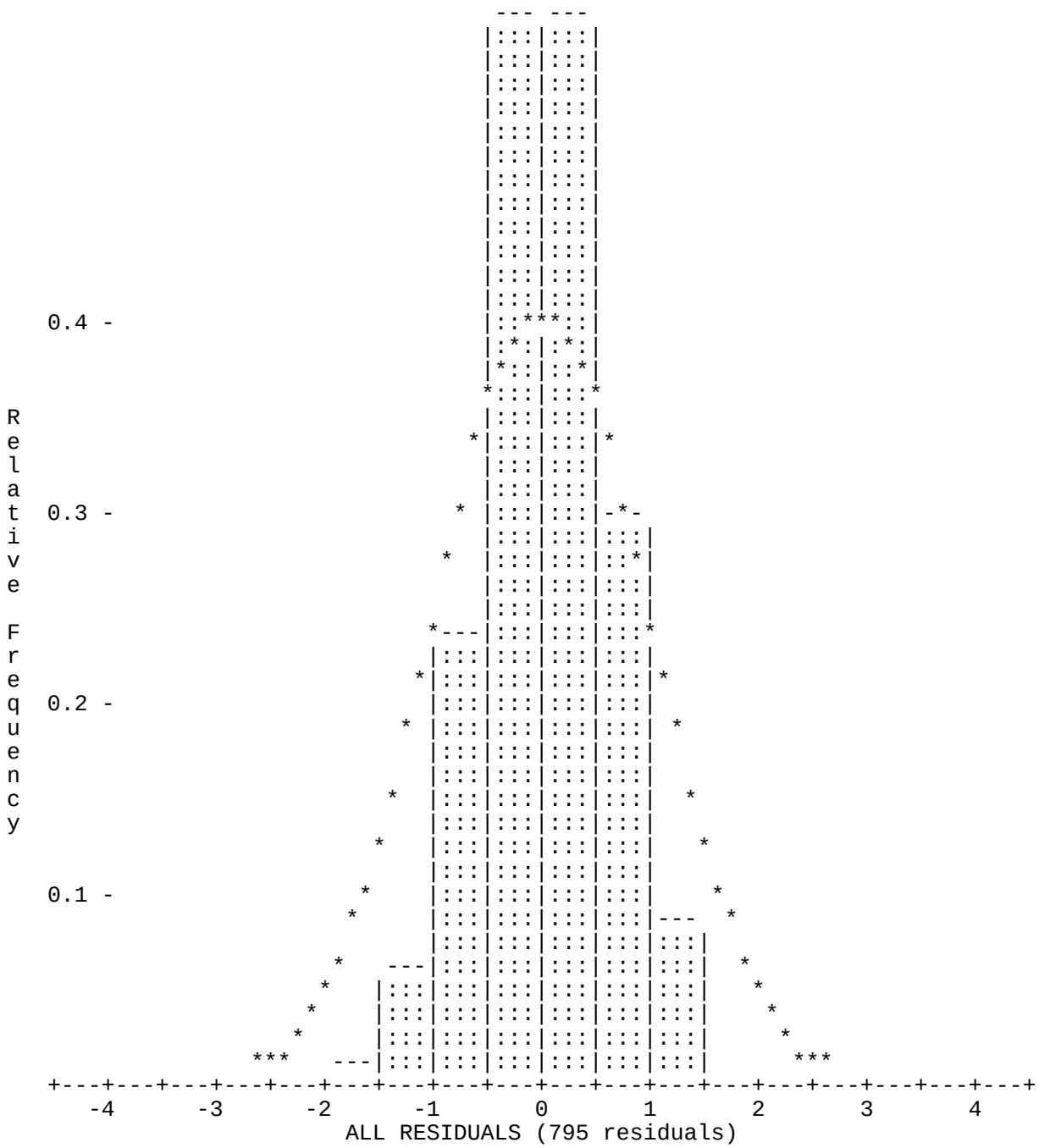
TYPE	AT	FROM	TO	OBSERVATION	RESIDUAL	STD RES
				STD DEV	STD DEV	PPM
DYCT		180	183	6026.92690	0.001	0.123
				0.016	0.011	0.09
DZCT		180	183	6343.12830	-0.001	-0.108
				0.015	0.010	0.07
GROUP: 120412.ASC ,obs#: 246						
DXCT		180	183	-12423.04300	-0.001	-0.243
				0.008	0.006	0.09
DYCT		180	183	6026.93000	-0.002	-0.123
				0.019	0.014	0.12
DZCT		180	183	6343.12580	0.001	0.108
				0.018	0.013	0.09
GROUP: 120412.ASC ,obs#: 247						
DXCT		180	184	-17449.46990	0.001	0.203
				0.008	0.006	0.07
DYCT		180	184	3616.17140	0.007	0.567
				0.017	0.012	0.37
DZCT		180	184	2518.29130	-0.000	-0.041
				0.015	0.010	0.02
GROUP: 120412.ASC ,obs#: 248						
DXCT		180	184	-17449.46660	-0.002	-0.359
				0.008	0.006	0.12
DYCT		180	184	3616.18520	-0.007	-0.564
				0.018	0.013	0.40
DZCT		180	184	2518.29050	0.000	0.030
				0.017	0.013	0.02
GROUP: 120412.ASC ,obs#: 249						
DXCT		180	185	-10417.96320	-0.002	-0.218
				0.012	0.010	0.18
DYCT		180	185	-2859.05790	0.019	0.846
				0.026	0.023	1.61
DZCT		180	185	-5064.91520	-0.016	-0.528
				0.033	0.030	1.31
GROUP: 120412.ASC ,obs#: 250						
DXCT		180	185	-10417.96680	0.001	0.322
				0.008	0.004	0.12
DYCT		180	185	-2859.03170	-0.007	-0.845
				0.016	0.008	0.59
DZCT		180	185	-5064.93560	0.005	0.598
				0.017	0.008	0.40
GROUP: 120412.ASC ,obs#: 251						
DXCT		180	186	8163.86710	-0.002	-0.713
				0.005	0.003	0.28
DYCT		180	186	-2158.20870	-0.001	-0.115
				0.011	0.008	0.10
DZCT		180	186	-1858.57860	0.002	0.359
				0.009	0.007	0.28
GROUP: 120412.ASC ,obs#: 252						
DXCT		180	186	8163.86240	0.002	0.712
				0.005	0.003	0.26
DYCT		180	186	-2158.21040	0.001	0.109
				0.011	0.007	0.09
DZCT		180	186	-1858.57400	-0.002	-0.356

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION	RESIDUAL	STD RES
				STD DEV	STD DEV	PPM
				0.009	0.006	0.25
GROUP: 120412.ASC ,obs#: 253						
DXCT		180	187	14457.16560	0.019	1.470
				0.015	0.013	1.29
DYCT		180	187	-3227.86440	0.021	0.564
				0.041	0.037	1.40
DZCT		180	187	-2528.98230	-0.009	-0.468
				0.023	0.020	0.62
GROUP: 120412.ASC ,obs#: 254						
DXCT		180	187	14457.17460	0.010	1.271
				0.010	0.008	0.69
DYCT		180	187	-3227.85540	0.012	0.497
				0.030	0.024	0.80
DZCT		180	187	-2529.00020	0.009	0.770
				0.015	0.011	0.57
GROUP: 120412.ASC ,obs#: 255						
DXCT		180	188	16470.82600	0.004	0.368
				0.013	0.010	0.20
DYCT		180	188	4623.25760	-0.003	-0.113
				0.035	0.028	0.17
DZCT		180	188	8060.10060	-0.003	-0.217
				0.018	0.015	0.17
GROUP: 120412.ASC ,obs#: 256						
DXCT		180	188	16470.82690	0.003	0.238
				0.014	0.012	0.15
DYCT		180	188	4623.25210	0.002	0.071
				0.039	0.033	0.12
DZCT		180	188	8060.09420	0.003	0.188
				0.020	0.017	0.17
GROUP: 120412.ASC ,obs#: 257						
DXCT		180	188	16470.83550	-0.006	-0.582
				0.012	0.010	0.30
DYCT		180	188	4623.25330	0.001	0.044
				0.033	0.026	0.06
DZCT		180	188	8060.09690	0.001	0.039
				0.017	0.014	0.03
GROUP: 120412.ASC ,obs#: 258						
DXCT		180	189	5366.86050	0.001	0.248
				0.005	0.004	0.10
DYCT		180	189	4386.60900	0.002	0.256
				0.011	0.008	0.23
DZCT		180	189	6404.76940	-0.001	-0.212
				0.008	0.006	0.13
GROUP: 120412.ASC ,obs#: 259						
DXCT		180	189	5366.86220	-0.001	-0.260
				0.005	0.003	0.08
DYCT		180	189	4386.61300	-0.002	-0.263
				0.010	0.007	0.19
DZCT		180	189	6404.76720	0.001	0.223
				0.007	0.005	0.11
GROUP: 120412.ASC ,obs#: 260						
DXCT		180	190	1808.64460	0.002	0.303

Residuals (critical value = 4.129):

TYPE	AT	FROM	TO	OBSERVATION	STD DEV	RESIDUAL	STD DEV	STD RES	PPM
					0.009	0.008			0.31
DYCT		180	190	4308.17500	0.002				0.126
					0.018	0.016			0.26
DZCT		180	190	5898.36350	0.017	-0.014	0.015	-0.903	1.80
GROUP: 120412.ASC ,obs#: 261									
DXCT		180	190	1808.64880	0.005	-0.002	0.003	-0.684	0.25
DYCT		180	190	4308.17570	0.012	0.001	0.006	0.193	0.17
DZCT		180	190	5898.34580	0.010	0.004	0.005	0.887	0.55
GROUP: 120412.ASC ,obs#: 262									
DXCT		187	801.25	4938.27130	0.006	0.003	0.005	0.765	0.67
DYCT		187	801.25	-1213.62600	0.016	0.036	0.014	2.486	6.87
DZCT		187	801.25	-1049.82360	0.023	-0.055	0.022	-2.544	10.57
GROUP: 120412.ASC ,obs#: 263									
DXCT		187	801.25	4938.27330	0.006	0.001	0.004	0.340	0.29
DYCT		187	801.25	-1213.64060	0.015	0.050	0.014	3.642	9.68
DZCT		187	801.25	-1049.80010	0.023	-0.078	0.021	-3.719	15.10
GROUP: 120412.ASC ,obs#: 264									
DXCT		187	CHETOPA	4482.38650	0.004	-0.001	0.003	-0.264	0.10
DYCT		187	CHETOPA	-3657.78850	0.009	-0.010	0.007	-1.439	1.38
DZCT		187	CHETOPA	-4319.52030	0.007	0.008	0.006	1.410	1.13
GROUP: 120412.ASC ,obs#: 265									
DXCT		187	CHETOPA	4482.38350	0.004	0.002	0.002	0.920	0.31
DYCT		187	CHETOPA	-3657.78470	0.008	-0.014	0.006	-2.217	1.91
DZCT		187	CHETOPA	-4319.52410	0.007	0.012	0.005	2.336	1.66


0.4
0.3
0.2
0.1
Relative Frequency
-4
-3
-2
-1
0
1
2
3
4
ALL RESIDUALS (795 residuals)

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	4.1287
Number of Flagged Residuals	5
Convergence Criterion	0.0010
Final Iteration Counter Value	2
Confidence Level Used	95.0000
Estimated Variance Factor	0.9157
Number of Degrees of Freedom	436

Chi-Square Test on the Variance Factor:

8.0538e-01 < 1.0000 < 1.0506e+00 ?

THE TEST PASSES

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

Variance factor used	=	0.9157
3-D expansion factor	=	2.7955

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.

3D Station Confidence Regions (95.000 percent):

STATION	MAJ-SEMI	(AZ,VANG)	MED-SEMI	(AZ,VANG)	MIN-SEMI	(AZ,VANG)
1	0.037	(337, 79)	0.034	(176, 10)	0.029	(86, 4)
10	0.051	(350, 84)	0.019	(168, 6)	0.015	(258, 0)
1001	0.038	(222, 89)	0.015	(0, 1)	0.012	(90, 1)
101	0.033	(358, 7)	0.029	(180, 83)	0.028	(88, 0)
102	0.042	(180, 83)	0.035	(353, 7)	0.030	(83, 1)
103	0.045	(177, 68)	0.034	(356, 22)	0.030	(86, 0)
104	0.046	(180, 72)	0.036	(358, 18)	0.031	(88, 1)
105	0.043	(180, 72)	0.035	(0, 18)	0.030	(90, 0)
106	0.049	(180, 77)	0.037	(2, 13)	0.032	(271, 0)
107	0.032	(353, 66)	0.029	(177, 24)	0.025	(87, 2)
108	0.052	(5, 80)	0.035	(183, 10)	0.030	(273, 0)
109	0.043	(355, 79)	0.035	(179, 11)	0.029	(88, 1)
11	0.036	(188, 85)	0.015	(353, 5)	0.011	(83, 1)
110	0.127	(357, 79)	0.050	(176, 11)	0.041	(266, 0)
111	0.063	(351, 79)	0.037	(175, 11)	0.031	(85, 1)
112	0.048	(355, 85)	0.032	(177, 5)	0.027	(87, 0)
113	0.029	(357, 55)	0.027	(180, 35)	0.023	(89, 1)
114	0.034	(352, 80)	0.029	(178, 10)	0.024	(87, 1)
115	0.042	(337, 79)	0.031	(175, 10)	0.027	(84, 3)
116	0.045	(184, 81)	0.032	(355, 9)	0.028	(85, 1)
117	0.043	(180, 78)	0.032	(356, 12)	0.027	(86, 1)
118	0.052	(210, 82)	0.034	(3, 7)	0.030	(93, 3)
119	0.043	(330, 79)	0.030	(184, 9)	0.026	(93, 6)
12	0.039	(188, 88)	0.015	(0, 2)	0.012	(90, 0)
120	0.079	(352, 82)	0.041	(174, 8)	0.035	(84, 0)
121	0.051	(170, 78)	0.033	(347, 12)	0.027	(77, 1)
122	0.072	(43, 90)	0.043	(182, 0)	0.039	(272, 0)
123	0.059	(183, 79)	0.035	(2, 11)	0.030	(92, 0)
124	0.058	(170, 89)	0.035	(6, 1)	0.029	(276, 0)
125	0.046	(348, 86)	0.021	(171, 4)	0.018	(81, 0)
126	0.066	(356, 78)	0.031	(175, 12)	0.026	(265, 0)
127	0.078	(2, 79)	0.035	(173, 11)	0.029	(263, 2)
128	0.059	(10, 80)	0.032	(173, 9)	0.027	(263, 3)
129	0.056	(294, 89)	0.025	(174, 1)	0.020	(84, 1)
13	0.077	(226, 88)	0.033	(346, 1)	0.024	(76, 2)
130	0.062	(216, 88)	0.028	(357, 2)	0.021	(87, 1)
131	0.071	(189, 84)	0.031	(0, 6)	0.023	(90, 1)
132	0.057	(246, 89)	0.026	(360, 0)	0.021	(90, 1)
133	0.053	(348, 88)	0.024	(177, 2)	0.020	(87, 0)
134	0.041	(340, 84)	0.015	(173, 6)	0.012	(83, 1)
135	0.065	(345, 84)	0.028	(172, 6)	0.023	(82, 1)
136	0.056	(343, 84)	0.025	(170, 6)	0.021	(80, 1)
137	0.079	(325, 79)	0.031	(150, 11)	0.025	(59, 1)
138	0.051	(351, 85)	0.022	(165, 5)	0.018	(256, 1)
139	0.059	(205, 87)	0.028	(4, 3)	0.021	(94, 1)
14	0.062	(192, 82)	0.027	(3, 7)	0.019	(93, 1)
140	0.067	(234, 87)	0.031	(6, 2)	0.024	(96, 2)
141	0.072	(349, 84)	0.029	(183, 6)	0.022	(92, 1)
142	0.026	(193, 86)	0.009	(0, 3)	0.006	(90, 1)
143	0.056	(347, 83)	0.020	(169, 7)	0.015	(79, 0)
144	0.061	(353, 84)	0.022	(166, 6)	0.017	(256, 1)
145	0.078	(96, 89)	0.029	(335, 1)	0.025	(245, 1)
146	0.069	(107, 76)	0.025	(344, 8)	0.021	(252, 11)

3D Station Confidence Regions (95.000 percent):

STATION	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)
147	0.035 (188, 85)	0.015 (353, 5)	0.011 (83, 1)
148	0.061 (188, 65)	0.026 (7, 25)	0.017 (97, 0)
149	0.065 (202, 84)	0.025 (359, 6)	0.017 (89, 3)
15	0.055 (180, 85)	0.022 (344, 5)	0.017 (74, 1)
150	0.044 (174, 86)	0.017 (10, 4)	0.013 (280, 1)
151	0.047 (345, 86)	0.018 (176, 4)	0.014 (86, 1)
152	0.058 (341, 78)	0.023 (167, 12)	0.017 (77, 1)
153	0.051 (317, 82)	0.019 (160, 7)	0.014 (70, 3)
154	0.066 (179, 77)	0.022 (341, 13)	0.018 (72, 4)
155	0.053 (182, 76)	0.019 (354, 14)	0.016 (85, 2)
156	0.048 (159, 87)	0.019 (350, 3)	0.017 (260, 1)
157	0.047 (209, 86)	0.019 (0, 3)	0.014 (90, 2)
158	0.055 (197, 86)	0.023 (0, 4)	0.016 (90, 1)
159	0.050 (190, 85)	0.021 (3, 5)	0.016 (93, 1)
16	0.056 (120, 89)	0.023 (346, 1)	0.019 (256, 1)
160	0.050 (184, 86)	0.021 (3, 4)	0.015 (93, 0)
161	0.095 (337, 90)	0.038 (173, 0)	0.030 (83, 0)
162	0.050 (300, 89)	0.020 (173, 1)	0.016 (83, 1)
163	0.043 (309, 89)	0.017 (174, 1)	0.013 (84, 1)
164	0.085 (283, 87)	0.033 (152, 2)	0.026 (62, 2)
165	0.056 (176, 84)	0.022 (345, 6)	0.018 (75, 1)
166	0.074 (181, 73)	0.026 (358, 17)	0.019 (89, 1)
167	0.066 (167, 77)	0.024 (351, 13)	0.020 (261, 1)
168	0.067 (82, 88)	0.027 (343, 0)	0.023 (253, 2)
169	0.063 (180, 88)	0.026 (340, 2)	0.022 (70, 1)
17	0.056 (177, 86)	0.023 (351, 4)	0.019 (81, 0)
170	0.055 (175, 87)	0.023 (350, 3)	0.018 (80, 0)
171	0.075 (181, 82)	0.030 (0, 8)	0.024 (90, 0)
172	0.114 (225, 80)	0.038 (46, 10)	0.035 (316, 0)
173	0.069 (141, 86)	0.026 (349, 4)	0.022 (259, 2)
174	0.049 (164, 85)	0.021 (351, 5)	0.017 (261, 1)
175	0.073 (330, 86)	0.030 (158, 4)	0.024 (68, 1)
176	0.061 (296, 88)	0.024 (156, 2)	0.019 (66, 2)
177	0.064 (180, 87)	0.026 (337, 3)	0.021 (67, 1)
178	0.065 (171, 80)	0.026 (348, 10)	0.021 (78, 0)
179	0.057 (166, 84)	0.025 (0, 6)	0.021 (270, 2)
18	0.083 (334, 85)	0.034 (169, 4)	0.029 (79, 1)
180	0.050 (173, 80)	0.021 (350, 10)	0.017 (80, 0)
181	0.055 (175, 81)	0.023 (356, 9)	0.019 (266, 0)
182	0.070 (171, 83)	0.029 (5, 7)	0.024 (275, 2)
183	0.065 (172, 87)	0.027 (352, 3)	0.022 (262, 0)
184	0.064 (175, 87)	0.028 (344, 3)	0.023 (74, 1)
185	0.071 (317, 87)	0.031 (161, 3)	0.023 (71, 1)
186	0.056 (178, 83)	0.023 (344, 7)	0.019 (74, 2)
187	0.018 (90, 87)	0.008 (328, 2)	0.006 (238, 3)
188	0.076 (178, 76)	0.030 (352, 14)	0.026 (82, 1)
189	0.055 (175, 80)	0.023 (354, 10)	0.020 (84, 0)
19	0.061 (187, 87)	0.027 (346, 3)	0.021 (76, 1)
190	0.059 (178, 83)	0.025 (0, 7)	0.021 (270, 0)
2	0.066 (177, 70)	0.038 (353, 20)	0.033 (83, 1)
20	0.066 (182, 84)	0.028 (339, 5)	0.022 (69, 2)
3	0.072 (349, 78)	0.038 (175, 12)	0.032 (85, 1)
4	0.057 (336, 79)	0.033 (169, 10)	0.028 (79, 2)

3D Station Confidence Regions (95.000 percent):

STATION	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)
5	0.042 (260, 88)	0.030 (170, 0)	0.026 (80, 2)
6	0.071 (190, 86)	0.040 (8, 4)	0.034 (98, 0)
7	0.060 (353, 78)	0.031 (176, 12)	0.026 (86, 1)
8	0.066 (192, 85)	0.029 (359, 5)	0.022 (89, 1)
801.25	0.026 (171, 0)	0.013 (261, 0)	0.000 (0, 90)
9	0.065 (191, 85)	0.030 (4, 5)	0.023 (94, 1)
D 274	0.036 (173, 0)	0.030 (263, 0)	0.000 (0, 90)
F 246	0.054 (344, 79)	0.022 (171, 11)	0.016 (81, 1)
K 56	0.043 (160, 0)	0.039 (250, 0)	0.000 (0, 90)
KINNE	0.038 (0, 90)	0.000 (0, 0)	0.000 (90, 0)
KST6	0.139 (0, 90)	0.000 (0, 0)	0.000 (90, 0)
MOBT	0.079 (0, 90)	0.000 (0, 0)	0.000 (90, 0)
MOCA	0.093 (0, 90)	0.000 (0, 0)	0.000 (90, 0)
MONE	0.083 (0, 90)	0.000 (0, 0)	0.000 (90, 0)
NAIL	0.058 (22, 90)	0.024 (170, 0)	0.019 (260, 0)
P 277	0.030 (168, 0)	0.026 (258, 0)	0.000 (0, 90)
PARSONS	0.060 (17, 88)	0.024 (167, 1)	0.020 (258, 1)
REBAR	0.050 (161, 88)	0.020 (349, 2)	0.017 (259, 0)
ZKC1	0.134 (0, 90)	0.000 (0, 0)	0.000 (90, 0)

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
1	101	0.022 (297, 85)	0.008 (146, 4)	0.006 (56, 2)	19.437	1129.71
10	134	0.030 (11, 84)	0.011 (154, 5)	0.009 (244, 3)	8247.953	3.64
1001	12	0.031 (213, 85)	0.013 (0, 4)	0.010 (90, 3)	4347.685	7.16
1001	14	0.050 (190, 78)	0.021 (4, 12)	0.015 (94, 1)	16171.641	3.07
1001	142	0.031 (328, 88)	0.012 (180, 2)	0.010 (90, 1)	17022.084	1.81
1001	15	0.040 (176, 81)	0.016 (331, 8)	0.013 (62, 4)	14113.492	2.81
1001	151	0.040 (353, 81)	0.015 (175, 9)	0.011 (85, 0)	6.723	5962.73
1001	156	0.041 (133, 87)	0.016 (334, 2)	0.014 (244, 1)	17752.249	2.28
1001	157	0.027 (205, 81)	0.011 (0, 9)	0.008 (91, 4)	4404.913	6.11
1001	158	0.039 (193, 82)	0.017 (0, 8)	0.011 (90, 2)	10591.745	3.70
1001	159	0.032 (184, 80)	0.015 (7, 10)	0.010 (277, 1)	15382.024	2.09
1001	160	0.033 (180, 82)	0.015 (9, 8)	0.010 (279, 1)	13620.173	2.41
1001	161	0.087 (2, 90)	0.035 (172, 0)	0.028 (262, 0)	15208.039	5.75
1001	162	0.032 (329, 87)	0.013 (168, 3)	0.011 (78, 1)	11330.777	2.86
1001	163	0.020 (344, 84)	0.008 (180, 6)	0.007 (90, 2)	7094.132	2.87
1001	164	0.076 (287, 87)	0.030 (146, 2)	0.023 (56, 2)	15173.569	5.00
1001	165	0.041 (173, 79)	0.017 (333, 10)	0.013 (64, 3)	14226.739	2.91
1001	166	0.064 (180, 67)	0.018 (0, 23)	0.015 (90, 0)	15739.395	4.09
1001	167	0.055 (166, 71)	0.017 (0, 18)	0.017 (269, 4)	7909.005	6.91
1001	REBAR	0.042 (132, 88)	0.017 (334, 2)	0.015 (244, 1)	17773.961	2.35
101	102	0.030 (180, 83)	0.012 (328, 6)	0.010 (59, 4)	6344.360	4.66
101	103	0.034 (176, 71)	0.012 (341, 19)	0.010 (72, 5)	10921.803	3.09
101	104	0.036 (178, 74)	0.016 (0, 16)	0.012 (270, 0)	8142.664	4.38
101	105	0.031 (180, 75)	0.013 (0, 15)	0.011 (90, 0)	9317.440	3.33
101	106	0.039 (180, 78)	0.017 (17, 11)	0.015 (287, 3)	8886.693	4.38
101	107	0.032 (180, 88)	0.017 (0, 2)	0.014 (90, 0)	13345.675	2.38

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
101	108	0.042	0.014	0.011	13430.951	3.14
		(9, 82)	(205, 8)	(115, 2)		
101	109	0.031	0.012	0.009	9698.170	3.19
		(0, 83)	(180, 7)	(90, 0)		
101	110	0.124	0.038	0.029	17035.131	7.26
		(357, 79)	(174, 11)	(265, 0)		
101	111	0.056	0.017	0.013	17104.891	3.27
		(351, 80)	(166, 10)	(256, 1)		
101	112	0.045	0.018	0.016	15683.168	2.86
		(34, 88)	(172, 1)	(262, 1)		
101	2	0.059	0.020	0.018	10780.590	5.52
		(176, 71)	(339, 18)	(70, 5)		
101	3	0.066	0.019	0.015	17068.891	3.84
		(349, 79)	(168, 11)	(258, 0)		
101	D 274	0.030	0.014	0.012	8644.112	3.52
		(169, 73)	(330, 16)	(62, 5)		
101	KST6	0.136	0.033	0.028	101765.373	1.34
		(146, 90)	(358, 0)	(268, 0)		
101	MOBT	0.077	0.033	0.028	75836.686	1.02
		(299, 90)	(178, 0)	(88, 0)		
107	112	0.041	0.014	0.012	6647.329	6.12
		(0, 89)	(180, 1)	(90, 0)		
107	113	0.027	0.011	0.009	16725.631	1.63
		(346, 81)	(180, 9)	(90, 2)		
107	114	0.029	0.011	0.009	18098.394	1.60
		(346, 80)	(159, 10)	(249, 1)		
107	115	0.027	0.010	0.009	9196.163	2.94
		(318, 83)	(129, 7)	(219, 1)		
107	116	0.032	0.013	0.012	15330.154	2.08
		(180, 75)	(90, 0)	(0, 15)		
107	117	0.030	0.010	0.009	6162.888	4.94
		(180, 71)	(90, 0)	(0, 19)		
107	118	0.042	0.017	0.016	18068.748	2.32
		(203, 79)	(31, 11)	(300, 1)		
107	K 56	0.034	0.029	0.029	15693.488	2.17
		(129, 45)	(270, 38)	(17, 20)		
11	142	0.026	0.012	0.009	7566.921	3.41
		(180, 84)	(351, 6)	(81, 1)		
113	114	0.023	0.009	0.007	4649.540	4.94
		(344, 86)	(180, 4)	(90, 1)		
113	119	0.033	0.013	0.011	15213.476	2.17
		(318, 80)	(214, 2)	(124, 9)		
113	120	0.073	0.031	0.026	17233.182	4.26
		(351, 83)	(172, 7)	(82, 0)		
113	121	0.043	0.018	0.013	8986.490	4.76
		(169, 77)	(329, 12)	(60, 4)		
113	122	0.066	0.033	0.032	10722.150	6.16
		(140, 90)	(19, 0)	(289, 0)		
113	123	0.052	0.022	0.019	16294.178	3.16
		(183, 78)	(11, 12)	(281, 2)		
113	124	0.050	0.022	0.018	11733.831	4.29
		(173, 88)	(17, 2)	(287, 1)		

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
113	125	0.045 (0, 85)	0.021 (184, 5)	0.017 (94, 0)	16212.873	2.75
113	126	0.060 (357, 79)	0.016 (169, 11)	0.012 (260, 1)	13191.125	4.53
113	127	0.073 (2, 79)	0.021 (166, 11)	0.017 (256, 3)	15854.120	4.61
113	128	0.052 (13, 81)	0.016 (161, 8)	0.014 (252, 5)	18243.921	2.83
113	4	0.050 (332, 80)	0.019 (154, 10)	0.016 (64, 0)	17157.744	2.90
113	5	0.032 (212, 87)	0.013 (324, 1)	0.010 (54, 3)	10570.408	2.99
113	6	0.065 (188, 85)	0.029 (16, 5)	0.025 (286, 1)	16985.181	3.84
113	7	0.053 (353, 79)	0.014 (172, 11)	0.011 (262, 0)	14273.127	3.72
113	MOBT	0.078 (331, 90)	0.028 (178, 0)	0.023 (88, 0)	85269.513	0.92
113	MONE	0.084 (0, 90)	0.028 (178, 0)	0.023 (268, 0)	91910.768	0.91
113	P 277	0.028 (315, 79)	0.013 (144, 10)	0.010 (53, 2)	5100.169	5.59
113	ZKC1	0.132 (180, 90)	0.028 (358, 0)	0.023 (88, 0)	98264.564	1.34
12	142	0.030 (180, 89)	0.012 (0, 1)	0.010 (90, 0)	17983.140	1.69
125	129	0.033 (199, 83)	0.013 (0, 6)	0.009 (90, 2)	5761.131	5.64
125	130	0.043 (192, 82)	0.016 (0, 8)	0.011 (90, 2)	10342.977	4.16
125	131	0.055 (185, 77)	0.020 (6, 13)	0.015 (276, 0)	15426.512	3.55
125	132	0.034 (184, 82)	0.014 (18, 8)	0.010 (288, 2)	13022.399	2.58
125	133	0.027 (180, 86)	0.011 (18, 4)	0.009 (288, 1)	11306.688	2.42
125	134	0.038 (24, 88)	0.016 (170, 2)	0.014 (260, 1)	16147.943	2.33
125	135	0.047 (344, 82)	0.018 (174, 8)	0.015 (84, 1)	6274.661	7.46
125	136	0.032 (338, 81)	0.012 (169, 9)	0.011 (79, 2)	7723.469	4.15
125	137	0.065 (322, 76)	0.022 (140, 14)	0.016 (230, 0)	13521.500	4.82
125	138	0.032 (335, 81)	0.012 (148, 9)	0.010 (238, 1)	13438.899	2.39
125	8	0.048 (186, 78)	0.018 (5, 12)	0.013 (95, 0)	15055.554	3.21
13	142	0.073 (232, 88)	0.032 (345, 1)	0.023 (75, 2)	13347.211	5.44
134	138	0.040 (25, 87)	0.016 (157, 2)	0.014 (247, 2)	10188.326	3.93

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
134	139	0.044 (185, 78)	0.022 (13, 12)	0.017 (283, 2)	10212.065	4.26
134	140	0.053 (200, 83)	0.026 (12, 7)	0.020 (102, 1)	17209.921	3.07
134	141	0.060 (353, 84)	0.025 (186, 6)	0.018 (96, 1)	10355.585	5.75
134	142	0.037 (344, 80)	0.012 (172, 10)	0.010 (81, 1)	15352.640	2.38
134	143	0.037 (353, 81)	0.012 (159, 8)	0.010 (249, 2)	6784.473	5.50
134	144	0.045 (0, 83)	0.016 (156, 6)	0.013 (246, 3)	8187.581	5.52
134	145	0.066 (134, 87)	0.025 (323, 3)	0.021 (233, 1)	10556.482	6.29
134	9	0.051 (182, 78)	0.025 (13, 12)	0.019 (282, 2)	10226.460	5.02
142	146	0.064 (105, 74)	0.023 (345, 8)	0.019 (253, 14)	9353.087	6.87
142	147	0.024 (180, 84)	0.011 (351, 6)	0.008 (81, 1)	7576.538	3.21
142	148	0.057 (188, 61)	0.022 (9, 29)	0.016 (279, 1)	15645.358	3.61
142	149	0.060 (203, 83)	0.023 (0, 6)	0.016 (90, 3)	17986.835	3.33
142	150	0.036 (165, 85)	0.014 (17, 4)	0.011 (287, 2)	14611.867	2.47
142	151	0.041 (349, 83)	0.016 (180, 7)	0.012 (90, 1)	17022.866	2.41
142	152	0.053 (343, 74)	0.020 (164, 16)	0.015 (74, 0)	9188.857	5.71
142	153	0.044 (320, 79)	0.016 (156, 11)	0.012 (66, 3)	9602.336	4.63
142	154	0.060 (178, 75)	0.020 (334, 14)	0.016 (65, 6)	15510.665	3.90
142	155	0.047 (182, 73)	0.016 (350, 17)	0.014 (81, 3)	11986.625	3.92
142	F 246	0.048 (346, 75)	0.018 (169, 15)	0.014 (79, 1)	14369.128	3.31
142	KINNE	0.029 (180, 87)	0.009 (0, 3)	0.006 (90, 0)	10470.549	2.80
142	M 55	0.026 (193, 86)	0.009 (0, 3)	0.006 (90, 1)	14527.969	1.77
156	16	0.030 (22, 85)	0.012 (153, 3)	0.009 (244, 4)	10222.920	2.91
156	168	0.047 (36, 86)	0.018 (152, 2)	0.015 (242, 4)	10201.375	4.58
156	169	0.040 (235, 88)	0.017 (327, 0)	0.014 (57, 2)	17775.673	2.25
156	17	0.028 (198, 82)	0.012 (352, 7)	0.008 (82, 3)	8683.143	3.24
156	170	0.027 (200, 84)	0.012 (349, 5)	0.008 (80, 3)	8004.885	3.36

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
156	171	0.057 (186, 79)	0.022 (5, 11)	0.018 (95, 0)	16840.868	3.40
156	172	0.104 (227, 78)	0.032 (56, 12)	0.029 (326, 2)	13701.240	7.59
156	173	0.050 (135, 84)	0.017 (351, 5)	0.015 (261, 3)	12958.825	3.87
156	174	0.036 (26, 86)	0.014 (164, 3)	0.012 (254, 3)	16347.861	2.22
156	175	0.056 (332, 80)	0.022 (153, 10)	0.018 (63, 0)	19617.863	2.84
156	176	0.038 (315, 80)	0.013 (144, 10)	0.010 (53, 1)	14623.028	2.57
156	177	0.042 (203, 87)	0.017 (325, 2)	0.013 (55, 3)	8106.167	5.23
156	178	0.045 (172, 71)	0.015 (332, 17)	0.013 (64, 6)	6087.648	7.39
156	18	0.068 (335, 82)	0.027 (171, 8)	0.023 (81, 2)	16570.679	4.11
156	MOCA	0.084 (0, 90)	0.020 (169, 0)	0.017 (259, 0)	88147.012	0.95
156	MONE	0.082 (139, 90)	0.020 (349, 0)	0.017 (259, 0)	102013.389	0.80
156	NAIL	0.047 (0, 83)	0.017 (164, 7)	0.014 (254, 2)	16336.424	2.86
156	PARSONS	0.037 (0, 82)	0.013 (161, 8)	0.010 (251, 3)	5854.724	6.31
156	REBAR	0.022 (323, 87)	0.009 (180, 3)	0.007 (90, 2)	23.258	943.06
174	179	0.028 (169, 78)	0.014 (19, 11)	0.011 (288, 6)	3050.411	9.03
174	180	0.031 (193, 80)	0.018 (8, 10)	0.011 (98, 1)	16175.324	1.92
174	181	0.035 (193, 81)	0.020 (9, 9)	0.012 (99, 1)	16470.949	2.14
174	MOCA	0.083 (80, 90)	0.021 (170, 0)	0.017 (260, 0)	84134.592	0.99
174	MONE	0.083 (158, 89)	0.021 (351, 1)	0.017 (261, 0)	110456.906	0.75
174	NAIL	0.033 (346, 79)	0.010 (170, 11)	0.008 (80, 1)	25.466	1310.85
180	181	0.028 (189, 81)	0.012 (15, 9)	0.009 (284, 1)	4871.904	5.80
180	182	0.049 (166, 86)	0.020 (19, 3)	0.015 (289, 2)	16327.009	3.02
180	183	0.043 (353, 86)	0.016 (180, 4)	0.013 (90, 1)	15195.103	2.80
180	184	0.041 (346, 84)	0.017 (149, 6)	0.014 (239, 2)	17997.291	2.30
180	185	0.052 (336, 77)	0.019 (151, 13)	0.015 (241, 1)	11931.539	4.35
180	186	0.025 (296, 86)	0.010 (145, 3)	0.008 (55, 2)	8646.436	2.90

3D Relative Confidence Regions (95.000 percent):

FROM	TO	MAJ-SEMI (AZ,VANG)	MED-SEMI (AZ,VANG)	MIN-SEMI (AZ,VANG)	DISTANCE	PPM
180	187	0.049 (173, 79)	0.020 (348, 11)	0.017 (78, 1)	15027.474	3.29
180	188	0.058 (179, 73)	0.022 (352, 17)	0.020 (82, 2)	18911.052	3.05
180	189	0.023 (180, 80)	0.010 (0, 10)	0.009 (90, 0)	9437.511	2.40
180	19	0.036 (339, 80)	0.014 (155, 10)	0.012 (245, 1)	13256.194	2.73
180	190	0.032 (273, 88)	0.014 (22, 1)	0.011 (112, 2)	7524.767	4.24
180	20	0.044 (261, 88)	0.018 (146, 1)	0.014 (56, 2)	8732.264	5.00
187	801.25	0.025 (353, 19)	0.017 (148, 69)	0.012 (260, 8)	5192.456	4.90
187	CHETOPA	0.018 (90, 87)	0.008 (328, 2)	0.006 (238, 3)	7220.073	2.46

15:36:51, Thu Dec 06, 2012

ITRF 00

KANSAS CTY WAAS 1 (ZKC1), KANSAS

Retrieved from NGS DataBase on 03/26/07 at 18:57:08.

Antenna Reference Point(ARP): KANSAS CTY WAAS 1 CORS ARP

PID = DF9221

ITRF00 POSITION (EPOCH 1997.0)
Computed in December, 2003 using 22 days of data.

X =	-415247.226 m	latitude =	38 52 48.57516 N
Y =	-4954556.041 m	longitude =	094 47 26.99096 W
Z =	3982160.867 m	ellipsoid height =	305.452 m

ITRF00 VELOCITY
Predicted with HTDP_2.7 November 2003.

VX =	-0.0166 m/yr	northward =	-0.0040 m/yr
VY =	-0.0014 m/yr	eastward =	-0.0164 m/yr
VZ =	-0.0029 m/yr	upward =	0.0003 m/yr

NAD_83 (CORS96) POSITION (EPOCH 2002.0)
Transformed from ITRF00 (epoch 1997.0) position in Dec. 2003.

X =	-415246.691 m	latitude =	38 52 48.55019 N
Y =	-4954557.421 m	longitude =	094 47 26.96407 W
Z =	3982160.951 m	ellipsoid height =	306.542 m

NAD_83 (CORS96) VELOCITY
Transformed from ITRF00 velocity in Dec. 2003.

VX =	0.0000 m/yr	northward =	0.0000 m/yr
VY =	-0.0000 m/yr	eastward =	0.0000 m/yr
VZ =	-0.0000 m/yr	upward =	0.0000 m/yr

L1 Phase Center of the current GPS antenna: KANSAS CTY WAAS 1 CORS L1 PC C

The WAAS L1/L2/L5 antenna
(Antenna Code = MPL_WAAS_2225NW) was installed on 03/21/07.
The L2 phase center is 0.002 m above the L1 phase center.

PID = DI4057

ITRF00 POSITION (EPOCH 1997.0)
Computed in December, 2003 using 22 days of data.

X =	-415247.259 m	latitude =	38 52 48.57517 N
Y =	-4954556.399 m	longitude =	094 47 26.99111 W
Z =	3982161.158 m	ellipsoid height =	305.915 m

The ITRF00 VELOCITY of the L1 PC is the same as that for the ARP.

NAD_83 (CORS96) POSITION (EPOCH 2002.0)
Transformed from ITRF00 (epoch 1997.0) position in Dec. 2003.

X =	-415246.724 m	latitude =	38 52 48.55020 N
Y =	-4954557.780 m	longitude =	094 47 26.96422 W
Z =	3982161.242 m	ellipsoid height =	307.004 m

| The NAD_83 (CORS96) VELOCITY of the L1 PC is the same as that for the ARP. |

* Latitude, longitude and ellipsoid height are computed from their corresponding cartesian coordinates using dimensions for the GRS 80 ellipsoid: semi-major axis = 6,378,137.0 meters
flattening = 1/298.257222101...

* WARNING: Mixing of antenna types can lead to errors of up to 10 cm. in height unless antenna-phase-center variation is properly modeled.

* For additional information about the interpretation and/or derivation of these positions and velocities, consult http://www.ngs.noaa.gov/CORS/Derivation.html.
For additional information on the relation of the GPS antenna to other relevant points at the site and on GPS equipment, consult the link ftp://www.ngs.noaa.gov/cors/.html/zkc1.log.txt

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE = NGSIDB , PROGRAM = datasheet95, VERSION = 7.87.6
1        National Geodetic Survey,   Retrieval Date = FEBRUARY 23, 2012
 HE0446 ***********************************************************************
 HE0446  DESIGNATION -  801.25
 HE0446  PID         -  HE0446
 HE0446  STATE/COUNTY-  KS/LABETTE
 HE0446  USGS QUAD   -  CHETOPA (1974)
 HE0446
 HE0446                        *CURRENT SURVEY CONTROL
 HE0446  ______________________________________________________________________
 HE0446* NAD 83(1986)-  37 02 10.      (N)    095 04 55.      (W)      SCALED
 HE0446* NAVD 88     -       244.965   (meters)     803.69    (feet)   ADJUSTED
 HE0446  ______________________________________________________________________
 HE0446  GEOID HEIGHT-         -29.71  (meters)                        GEOID09
 HE0446  DYNAMIC HT  -         244.769 (meters)     803.05    (feet)   COMP
 HE0446  MODELED GRAV-     979,824.3   (mgal)                          NAVD 88
 HE0446
 HE0446  VERT ORDER  -  SECOND    CLASS 0
 HE0446
 HE0446.The horizontal coordinates were scaled from a topographic map and have
 HE0446.an estimated accuracy of +/- 6 seconds.
 HE0446.
 HE0446.The orthometric height was determined by differential leveling and
 HE0446.adjusted in June 1991.
 HE0446
 HE0446.The geoid height was determined by GEOID09.
 HE0446
 HE0446.The dynamic height is computed by dividing the NAVD 88
 HE0446.geopotential number by the normal gravity value computed on the
 HE0446.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 HE0446.degrees latitude (g = 980.6199 gals.).
 HE0446
 HE0446.The modeled gravity was interpolated from observed gravity values.
 HE0446
 HE0446;                    North         East     Units  Estimated Accuracy
 HE0446;SPC KS S     -   446,580.      704,050.      MT  (+/- 180 meters Scaled)
 HE0446
 HE0446                          SUPERSEDED SURVEY CONTROL
 HE0446
 HE0446  NGVD 29 (??/??/92)  244.851  (m)           803.32    (f) ADJ UNCH    2 0
 HE0446
 HE0446.Superseded values are not recommended for survey control.
 HE0446.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 HE0446.See file dsdata.txt to determine how the superseded data were derived.
 HE0446
 HE0446_U.S. NATIONAL GRID SPATIAL ADDRESS: 15SUB148009(NAD 83)
 HE0446
 HE0446_MARKER: DD = SURVEY DISK
 HE0446_SETTING: 17 = SET INTO TOP OF METAL PIPE DRIVEN INTO GROUND
 HE0446_SP_SET: METAL PIPE DRIVEN INTO GROUND
 HE0446_STAMPING: ELEV 801.25
 HE0446_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
```

HE0446_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
HE0446+SATELLITE: SATELLITE OBSERVATIONS - August 07, 2009
HE0446
HE0446 HISTORY   - Date   Condition   Report By
HE0446 HISTORY   - UNK   MONUMENTED   USDA
HE0446 HISTORY   - 1936   GOOD   CGS
HE0446 HISTORY   - 20090807 GOOD   KSDT
HE0446
HE0446   STATION DESCRIPTION
HE0446
HE0446'DESCRIBED BY COAST AND GEODETIC SURVEY 1936
HE0446'AT CHETOPA.
HE0446'AT CHETOPA, LABETTE COUNTY, ON THE CORNER OF FIRST AND MAIN
HE0446'STREETS, AT THE DIESEL ELECTRIC POWER PLANT, 1 FOOT EAST OF THE
HE0446'NORTHEAST CORNER OF THE BRICK BUILDING, 1 FOOT NORTH OF THE
HE0446'BRICK WALL, AND 12 FEET SOUTH OF THE CURB. A UNITED STATES
HE0446'DEPARTMENT OF AGRICULTURE STANDARD CAP, STAMPED ELEV. 801.25
HE0446'AND MOUNTED ON THE TOP OF AN IRON PIPE.
HE0446
HE0446   STATION RECOVERY (2009)
HE0446
HE0446'RECOVERY NOTE BY KANSAS DEPARTMENT OF TRANSPORTATION 2009 (KH)
HE0446'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:03

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.00
1        National Geodetic Survey,   Retrieval Date = DECEMBER  5, 2012
 GG0744 ***********************************************************************
 GG0744  DESIGNATION -  CHETOPA
 GG0744  PID         -  GG0744
 GG0744  STATE/COUNTY-  KS/LABETTE
 GG0744  COUNTRY     -  US
 GG0744  USGS QUAD   -  WELCH NORTH (1971)
 GG0744
 GG0744                        *CURRENT SURVEY CONTROL
 GG0744  ______________________________________________________________________
 GG0744* NAD 83(1997) POSITION- 36 59 59.55570(N) 095 05 07.99141(W)   ADJUSTED
 GG0744* NAD 83(1997) ELLIP HT-   222.838 (meters)        (10/02/98)   ADJUSTED
 GG0744* NAVD 88 ORTHO HEIGHT -   252.43   (+/-2cm)     828.2   (feet) VERTCON
 GG0744  ______________________________________________________________________
 GG0744  GEOID HEIGHT    -        -29.68  (meters)                     GEOID12A
 GG0744  NAD 83(1997) X  -   -452,095.948 (meters)                     COMP
 GG0744  NAD 83(1997) Y  - -5,080,102.206 (meters)                     COMP
 GG0744  NAD 83(1997) Z  -  3,817,516.329 (meters)                     COMP
 GG0744  LAPLACE CORR    -         -0.27  (seconds)                    DEFLEC12A
 GG0744  HORZ ORDER      -  SECOND
 GG0744  VERT ORDER      -  THIRD ? (See Below)
 GG0744  ELLP ORDER      -  FOURTH    CLASS I
 GG0744
 GG0744.The horizontal coordinates were established by classical geodetic methods
 GG0744.and adjusted by the National Geodetic Survey in October 1998.
 GG0744.
 GG0744.The NAVD 88 height was computed by applying the VERTCON shift value to
 GG0744.the NGVD 29 height (displayed under SUPERSEDED SURVEY CONTROL.)
 GG0744
 GG0744.The vertical order pertains to the NGVD 29 superseded value.
 GG0744
 GG0744.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 GG0744
 GG0744.The Laplace correction was computed from DEFLEC12A derived deflections.
 GG0744
 GG0744.The ellipsoidal height was determined by GPS observations
 GG0744.and is referenced to NAD 83.
 GG0744
 GG0744. The following values were computed from the NAD 83(1997) position.
 GG0744
 GG0744;                   North         East     Units Scale Factor Converg.
 GG0744;SPC KS S     -   442,546.943   703,877.367   MT  1.00006314   +2 05 53.8
 GG0744;SPC KS S     - 1,451,922.76  2,309,304.33   sFT  1.00006314   +2 05 53.8
 GG0744;UTM  15      - 4,096,891.796   314,423.980   MT  1.00002427   -1 15 19.7
 GG0744
 GG0744!             -  Elev Factor  x  Scale Factor =   Combined Factor
 GG0744!SPC KS S     -   0.99996503  x   1.00006314  =   1.00002817
 GG0744!UTM  15      -   0.99996503  x   1.00002427  =   0.99998930
 GG0744
 GG0744:               Primary Azimuth Mark                    Grid Az
 GG0744:SPC KS S     -  CHETOPA AZ MK                          173 09 00.9
```

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GG0744:UTM  15      -  CHETOPA AZ MK                                176 30 14.4
GG0744
GG0744|-----------------------------------------------------------------------|
GG0744| PID    Reference Object                      Distance      Geod. Az   |
GG0744|                                                            dddmmss.s  |
GG0744| CI1435 CHETOPA RM 1                          22.598 METERS 13607      |
GG0744| CI1434 CHETOPA AZ MK                                       1751454.7  |
GG0744| CI1436 CHETOPA RM 2                          36.134 METERS 24435      |
GG0744| HE0748 CHETOPA MUNICIPAL TANK               APPROX. 4.5 KM 3474618.0  |
GG0744| CI1438 CHETOPA RM 4                          20.274 METERS 35243      |
GG0744| CI1437 CHETOPA RM 3                          20.275 METERS 35257      |
GG0744|-----------------------------------------------------------------------|
GG0744
GG0744                          SUPERSEDED SURVEY CONTROL
GG0744
GG0744  NAD 83(1993)-  36 59 59.55993(N)    095 05 07.99141(W) AD(       ) 2
GG0744  NAD 83(1986)-  36 59 59.57394(N)    095 05 07.98129(W) AD(       ) 2
GG0744  NAD 27      -  36 59 59.31974(N)    095 05 07.12678(W) AD(       ) 2
GG0744  NGVD 29 (07/19/86)  252.32   (m)          827.8    (f) LEVELING    3
GG0744
GG0744.Superseded values are not recommended for survey control.
GG0744
GG0744.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
GG0744.See file dsdata.txt to determine how the superseded data were derived.
GG0744
GG0744_U.S. NATIONAL GRID SPATIAL ADDRESS: 15SUA1442396891(NAD 83)
GG0744
GG0744_MARKER: DS = TRIANGULATION STATION DISK
GG0744_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
GG0744_SP_SET: CONCRETE POST
GG0744_STAMPING: CHETOPA 1958
GG0744_MARK LOGO: CGS
GG0744_MAGNETIC: N = NO MAGNETIC MATERIAL
GG0744_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
GG0744+STABILITY: SURFACE MOTION
GG0744_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
GG0744+SATELLITE: SATELLITE OBSERVATIONS - August 07, 2009
GG0744
GG0744  HISTORY     - Date     Condition        Report By
GG0744  HISTORY     - 1958     MONUMENTED       CGS
GG0744  HISTORY     - 1958     GOOD             CGS
GG0744  HISTORY     - 1964     GOOD             CGS
GG0744  HISTORY     - 1967     GOOD             CGS
GG0744  HISTORY     - 1967     GOOD             CGS
GG0744  HISTORY     - 19890301 GOOD             NGS
GG0744  HISTORY     - 19890720 GOOD             NGS
GG0744  HISTORY     - 20090807 GOOD             KSDT
GG0744
GG0744                          STATION DESCRIPTION
GG0744
GG0744'DESCRIBED BY COAST AND GEODETIC SURVEY 1958 (RLE)
GG0744'THE STATION IS LOCATED ABOUT 8 MILES NORTH OF WELCH AND 2-1/2
GG0744'MILES SOUTH OF CHETOPA NEAR THE OKLAHOMA-KANSAS STATE LINE.
GG0744'IT IS 115 FEET NORTH OF THE CENTER OF A GRAVELED ROAD, 76
GG0744'FEET EAST OF THE CENTER OF U.S. HIGHWAY 59 AND 45 FEET NORTHWEST
GG0744'OF A POWER LINE BRACE POLE.  THE MARK PROJECTS 4 INCHES
GG0744'ABOVE THE SURFACE OF THE GROUND AND IS STAMPED CHETOPA 1958.
GG0744'
GG0744'REFERENCE MARK NO. 1 IS 62 FEET NORTH OF THE CENTER OF A
GG0744'GRAVELED ROAD (STATE LINE ROAD), 58 FEET NORTHWEST OF A
GG0744'TELEPHONE POLE AND 31 FEET NORTHEAST OF A POWER LINE BRACE
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GG0744'POLE. THE MARK PROJECTS 4 INCHES ABOVE THE SURFACE OF THE
GG0744'GROUND AND IS STAMPED CHETOPA NO 1 1958.
GG0744'
GG0744'REFERENCE MARK NO. 2 IS 64 FEET NORTH OF THE CENTER OF A
GG0744'GRAVELED ROAD, 32 FEET WEST OF THE CENTER OF U.S. HIGHWAY 59
GG0744'AND 1 FOOT NORTH OF A POWER LINE POLE. THE MARK PROJECTS
GG0744'4 INCHES ABOVE THE SURFACE OF THE GROUND AND IS STAMPED
GG0744'CHETOPA NO 2 1958.
GG0744'
GG0744'THE AZIMUTH MARK IS 72 FEET NORTH OF A FENCE CORNER, 48 FEET
GG0744'EAST OF THE CENTER OF U.S. HIGHWAY 59, 2 FEET NORTH OF A WHITE
GG0744'WITNESS POST AND 1 FOOT WEST OF AN EAST-WEST FENCE LINE.
GG0744'THE MARK PROJECTS 4 INCHES ABOVE THE SURFACE OF THE GROUND
GG0744'AND IS STAMPED CHETOPA 1958.
GG0744'
GG0744'TO REACH THE STATION FROM THE POST OFFICE IN CHETOPA GO EAST
GG0744'ON U.S. HIGHWAYS 166 AND 59 FOR 0.1 MILE TO THE JUNCTION
GG0744'OF THE HIGHWAYS. TURN RIGHT, SOUTH, ON U.S. HIGHWAY 59 AND GO
GG0744'2.5 MILES TO THE STATION ON THE LEFT AS DESCRIBED.
GG0744'
GG0744'TO REACH THE AZIMUTH MARK FROM THE STATION CONTINUE STRAIGHT
GG0744'AHEAD ON U.S. HIGHWAY 59 AND GO 0.35 MILE TO THE AZIMUTH MARK
GG0744'ON THE LEFT AS DESCRIBED.
GG0744'
GG0744'HEIGHT OF LIGHT ABOVE STATION MARK 22.6 METERS.
GG0744
GG0744 STATION RECOVERY (1958)
GG0744
GG0744'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1958
GG0744'RECOVERED IN GOOD CONDITION.
GG0744
GG0744 STATION RECOVERY (1964)
GG0744
GG0744'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1964 (JKW)
GG0744'THE STATION MARK, R.M. 1, R.M. 2 AND THE AZIMUTH MARK WERE
GG0744'RECOVERED IN GOOD CONDITION. THE DISTANCES TO THE R.M.S WERE
GG0744'VERIFIED. THE ORIGINAL DESCRIPTION IS ADEQUATE.
GG0744
GG0744 STATION RECOVERY (1967)
GG0744
GG0744'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1967 (LFS)
GG0744'STATION RECOVERED AS DESCRIBED AND ALL MARKS FOUND IN GOOD
GG0744'CONDITION. R.M. NO. 2 WAS REPORTED TO BE IN THE WAY OF HIGHWAY
GG0744'CONSTRUCTION SO THIS MARK WAS RESET. A NEW REFERENCE MARK
GG0744'WAS ESTABLISHED AND IT WAS STAMPED NO 3.
GG0744'
GG0744'TO REACH THE STATION FROM CHETOPA, FROM THE JUNCTION OF
GG0744'U.S. HIGHWAYS 59 AND 166, GO SOUTH ON U.S. 59 FOR 2.5 MILES
GG0744'TO CROSSROADS AND STATION ON THE LEFT.
GG0744'
GG0744'THE STATION IS IN THE NORTHEAST ANGLE OF CROSSROADS, 115 FEET
GG0744'NORTH OF THE STATE LINE ROAD, 76 FEET EAST OF THE CENTERLINE
GG0744'OF U.S. 59, 45 FEET NORTHWEST OF A POWERLINE BRACE POLE
GG0744'AND 1 FOOT WEST OF A METAL WITNESS POST. THE MARK PROJECTS
GG0744'3 INCHES AND THE DISK IS STAMPED CHETOPA 1958.
GG0744'
GG0744'R.M. NO. 1 IS 62 FEET NORTH OF THE CENTERLINE OF THE STATE
GG0744'LINE ROAD, 58 FEET NORTHWEST OF A TELEPHONE POLE AND 31 FEET
GG0744'NORTHEAST OF A POWERLINE BRACE POLE. THE MARK PROJECTS 4
GG0744'INCHES AND THE DISK IS STAMPED CHETOPA NO 1 1958.
GG0744'

GG0744'R.M. NO. 3 IS ABOUT 180 FEET NORTH OF THE CENTERLINE OF THE
GG0744'STATE LINE ROAD AND ABOUT 69 FEET EAST OF THE CENTERLINE OF
GG0744'U.S. 59. THE MARK PROJECTS 4 INCHES AND THE DISK IS STAMPED
GG0744'CHETOPA 1958 1967 NO 3.
GG0744'
GG0744'THE AZIMUTH MARK IS 72 FEET NORTH OF A FENCE CORNER, 48 FEET
GG0744'EAST OF THE CENTERLINE OF THE HIGHWAY, 1 FOOT WEST OF RIGHT OF
GG0744'WAY FENCE AND 1 FOOT NORTHWEST OF A METAL WITNESS POST.
GG0744'THE MARK PROJECTS 2 INCHES AND THE DISK IS STAMPED CHETOPA 1958.
GG0744'
GG0744'AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN- 2.5 MILES
GG0744'SOUTH CHETOPA.
GG0744
GG0744   STATION RECOVERY (1967)
GG0744
GG0744'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1967 (LFS)
GG0744'STATION MARK, REFERENCE MARK NO. 1, AND THE AZIMUTH MARK
GG0744'WERE RECOVERED AS DESCRIBED AND FOUND IN GOOD CONDITION.
GG0744'REFERENCE MARK NO. 3 WAS FOUND DISPLACED AND THE MARK WAS
GG0744'RESET. THE 1967 DESCRIPTION WAS FOUND ADEQUATE FOR RECOVERY.
GG0744'
GG0744'FOLLOWING IS A DESCRIPTION FOR REFERENCE MARK NO. 4.
GG0744'
GG0744'REFERENCE MARK NO. 4, A STANDARD DISK STAMPED CHETOPA 1958 NO.
GG0744'4 1967, IS SET IN THE TOP OF A SQUARE CONCRETE POST WHICH
GG0744'PROJECTS 5 INCHES. IT IS 180 FEET NORTH OF THE CENTER OF STATE
GG0744'LINE ROAD, 69 FEET EAST OF THE CENTER OF U.S. HIGHWAY 69,
GG0744'AND 37 FEET NORTH OF AN UNDERGROUND TELEPHONE CABLE BOX ON A
GG0744'CRESOTE POST.
GG0744'
GG0744'AIRLINE DISTANCE AND DIRECTION FROM NEAREST TOWN- 2.5 MILES
GG0744'SOUTH OF CHETOPA.
GG0744
GG0744   STATION RECOVERY (1989)
GG0744
GG0744'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1989
GG0744'THE STATION WAS RECOVERED IN GOOD CONDITION, A NEW DESCRIPTION
GG0744'FOLLOWS.
GG0744'THE STATION IS LOCATED ABOUT 14.0 KM (8.70 MI) NORTH OF WELSH, OK, AND
GG0744'4.1 KM (2.55 MI) SOUTH OF CHETOPA. OWNERSHIP--STATE HIGHWAY
GG0744'DEPARTMENT.
GG0744'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAYS 59 AND 166 IN
GG0744'CHETOPA, GO SOUTH ON HIGHWAY 59 FOR 4.1 KM (2.55 MI) TO THE STATION ON
GG0744'THE LEFT, JUST BEFORE REACHING THE OKLAHOMA STATE LINE.
GG0744'THE STATION IS A STANDARD CGS DISK SET IN THE TOP OF A 25 CM SQUARE
GG0744'CONCRETE POST THAT PROJECTS 5 CM ABOVE THE GROUND. LOCATED 32.4 M
GG0744'(106.3 FT) NORTH OF THE CENTER OF STATELINE ROAD, 23.4 M (76.8 FT)
GG0744'EAST OF THE CENTERLINE OF THE HIGHWAY, 13.7 M (44.9 FT) NORTHWEST OF A
GG0744'UTILITY POLE, 9.0 M (29.5 FT) SOUTHEAST OF AN UNDERGROUND CABLE
GG0744'WARNING POST, AND 0.3 M (1.0 FT) WEST OF A METAL WITNESS POST.
GG0744'DESCRIBED BY E.J. HANSMANN, TYPED BY GAM.
GG0744
GG0744   STATION RECOVERY (1989)
GG0744
GG0744'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1989
GG0744'RECOVERED IN GOOD CONDITION.
GG0744
GG0744   STATION RECOVERY (2009)
GG0744
GG0744'RECOVERY NOTE BY KANSAS DEPARTMENT OF TRANSPORTATION 2009 (KH)
GG0744'RECOVERED IN GOOD CONDITION.

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*** retrieval complete.
Elapsed Time = 00:00:04
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The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.00
1         National Geodetic Survey,   Retrieval Date = DECEMBER  4, 2012
 JE1120 ***********************************************************************
 JE1120  DESIGNATION -  D 274
 JE1120  PID         -  JE1120
 JE1120  STATE/COUNTY-  KS/ANDERSON
 JE1120  COUNTRY     -  US
 JE1120  USGS QUAD   -  GARNETT EAST (1983)
 JE1120
 JE1120                        *CURRENT SURVEY CONTROL
 JE1120  ______________________________________________________________________
 JE1120* NAD 83(1986) POSITION- 38 21 38.9     (N) 095 09 02.0     (W)    HD_HELD2
 JE1120* NAVD 88 ORTHO HEIGHT -   281.214   (meters)      922.62   (feet) ADJUSTED
 JE1120  ______________________________________________________________________
 JE1120  GEOID HEIGHT    -        -31.73   (meters)                      GEOID12A
 JE1120  DYNAMIC HEIGHT  -        281.014  (meters)      921.96   (feet) COMP
 JE1120  MODELED GRAVITY -    979,908.9    (mgal)                        NAVD 88
 JE1120
 JE1120  VERT ORDER      -  SECOND    CLASS 0
 JE1120
 JE1120.The horizontal coordinates were established by autonomous hand held GPS
 JE1120.observations and have an estimated accuracy of +/- 10 meters.
 JE1120.
 JE1120.The orthometric height was determined by differential leveling and
 JE1120.adjusted by the NATIONAL GEODETIC SURVEY
 JE1120.in June 1991.
 JE1120
 JE1120.Photographs are available for this station.
 JE1120
 JE1120.The dynamic height is computed by dividing the NAVD 88
 JE1120.geopotential number by the normal gravity value computed on the
 JE1120.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 JE1120.degrees latitude (g = 980.6199 gals.).
 JE1120
 JE1120.The modeled gravity was interpolated from observed gravity values.
 JE1120
 JE1120;                    North         East     Units  Estimated Accuracy
 JE1120;SPC KS S     -   593,285.      692,670.      MT   (+/- 10 meters HH2 GPS)
 JE1120
 JE1120                         SUPERSEDED SURVEY CONTROL
 JE1120
 JE1120  NGVD 29 (??/??/92)  281.082  (m)           922.18   (f) ADJ UNCH    2 0
 JE1120
 JE1120.Superseded values are not recommended for survey control.
 JE1120
 JE1120.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 JE1120.See file dsdata.txt to determine how the superseded data were derived.
 JE1120
 JE1120_U.S. NATIONAL GRID SPATIAL ADDRESS: 15SUC1210548037(NAD 83)
 JE1120
 JE1120_MARKER: DB = BENCH MARK DISK
 JE1120_SETTING: 30 = SET IN A LIGHT STRUCTURE
```

JE1120_SP_SET: DRILL HOLE
JE1120_STAMPING: D 274 1945
JE1120_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
JE1120_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
JE1120+SATELLITE: SATELLITE OBSERVATIONS - September 04, 2010
JE1120
JE1120 HISTORY   - Date   Condition   Report By
JE1120 HISTORY   - 1945   MONUMENTED   CGS
JE1120 HISTORY   - 1950   GOOD   CGS
JE1120 HISTORY   - 20010611 GOOD   SKW
JE1120 HISTORY   - 20100904 GOOD   GEOCAC
JE1120
JE1120   STATION DESCRIPTION
JE1120
JE1120'DESCRIBED BY COAST AND GEODETIC SURVEY 1950
JE1120'1 MI W FROM GREELEY.
JE1120'ALONG THE ROAD TO SCIPIO FROM THE BRIDGE OVER THE SOUTH FORK
JE1120'OF POTTAWATOMIE CREEK ON U.S. HIGHWAY 169 AT GREELEY, 285 FEET
JE1120'EAST OF A TWO-STORY HOUSE, 13 FEET NORTH OF A HEDGE FENCE, 14
JE1120'FEET SOUTH OF THE CENTER OF ROAD AND AT THE NORTHEAST CORNER
JE1120'OF THE WEST BANNISTER POST. THE DISK IS SET IN A DRILL HOLE.
JE1120
JE1120   STATION RECOVERY (2001)
JE1120
JE1120'RECOVERY NOTE BY SHAFER, KLINE AND WARREN INC 2001 (CMC)
JE1120'RECOVERED IN GOOD CONDITION.
JE1120
JE1120   STATION RECOVERY (2010)
JE1120
JE1120'RECOVERY NOTE BY GEOCACHING 2010 (CF)
JE1120'FROM US HWY 169, ABOUT 0.6 MILES WEST ON SCIPIO ROAD, ON THE SOUTH
JE1120'SIDE OF THE ROAD. THE BANNISTER POST HAS BEEN REMOVED FROM THE
JE1120'HEADWALL. A STEEL DISK SET IN THE HEADWALL.

*** retrieval complete.
Elapsed Time = 00:00:05

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

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DATABASE = NGSIDB , PROGRAM = datasheet95, VERSION = 7.87.6
1        National Geodetic Survey,   Retrieval Date = APRIL 14, 2012
 JE1044 ***********************************************************************
 JE1044  FBN          -  This is a Federal Base Network Control Station.
 JE1044  DESIGNATION -  K 56
 JE1044  PID          -  JE1044
 JE1044  STATE/COUNTY-  KS/ANDERSON
 JE1044  USGS QUAD    -  BUSH CITY (1983)
 JE1044
 JE1044                         *CURRENT SURVEY CONTROL
 JE1044  ______________________________________________________________________
 JE1044* NAD 83(2007)-  38 12 36.22504(N)     095 08 41.49224(W)      ADJUSTED
 JE1044* NAVD 88      -       314.327  (meters)    1031.25   (feet)  ADJUSTED
 JE1044  ______________________________________________________________________
 JE1044  EPOCH DATE   -        2002.00
 JE1044  X            -    -450,008.221 (meters)                      COMP
 JE1044  Y            -  -4,998,044.901 (meters)                      COMP
 JE1044  Z            -   3,923,966.228 (meters)                      COMP
 JE1044  LAPLACE CORR-          -1.81  (seconds)                      DEFLEC09
 JE1044  ELLIP HEIGHT-         282.713 (meters)          (02/10/07) ADJUSTED
 JE1044  GEOID HEIGHT-         -31.61  (meters)                      GEOID09
 JE1044  DYNAMIC HT   -         314.095 (meters)    1030.49  (feet)  COMP
 JE1044
 JE1044  ------- Accuracy Estimates (at 95% Confidence Level in cm) --------
 JE1044  Type    PID    Designation                        North   East  Ellip
 JE1044  ----------------------------------------------------------------------
 JE1044  NETWORK JE1044 K 56                                0.45   0.33   1.08
 JE1044  ----------------------------------------------------------------------
 JE1044  MODELED GRAV-     979,884.4   (mgal)                        NAVD 88
 JE1044
 JE1044  VERT ORDER   -  SECOND    CLASS 0
 JE1044
 JE1044.The horizontal coordinates were established by GPS observations
 JE1044.and adjusted by the National Geodetic Survey in February 2007.
 JE1044
 JE1044.The datum tag of NAD 83(2007) is equivalent to NAD 83(NSRS2007).
 JE1044.See National Readjustment for more information.
 JE1044
 JE1044.The horizontal coordinates are valid at the epoch date displayed above
 JE1044.which is a decimal equivalence of Year/Month/Day.
 JE1044
 JE1044.The orthometric height was determined by differential leveling and
 JE1044.adjusted in June 1991.
 JE1044
 JE1044.WARNING-Repeat measurements at this control monument indicate possible
 JE1044.vertical movement.
 JE1044
 JE1044.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 JE1044
 JE1044.The Laplace correction was computed from DEFLEC09 derived deflections.
 JE1044
 JE1044.The ellipsoidal height was determined by GPS observations
```

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JE1044.and is referenced to NAD 83.
JE1044
JE1044.The geoid height was determined by GEOID09.
JE1044
JE1044.The dynamic height is computed by dividing the NAVD 88
JE1044.geopotential number by the normal gravity value computed on the
JE1044.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
JE1044.degrees latitude (g = 980.6199 gals.).
JE1044
JE1044.The modeled gravity was interpolated from observed gravity values.
JE1044
JE1044;                    North         East     Units Scale Factor Converg.
JE1044;SPC KS S     -   576,581.586   693,769.285   MT  0.99994890   +2 03 42.6
JE1044;SPC KS S     - 1,891,668.09  2,276,141.40   sFT  0.99994890   +2 03 42.6
JE1044;UTM  15      - 4,231,296.979   312,215.138   MT  1.00003431   -1 19 37.5
JE1044
JE1044!             -  Elev Factor  x  Scale Factor =   Combined Factor
JE1044!SPC KS S     -   0.99995564  x   0.99994890  =   0.99990454
JE1044!UTM  15      -   0.99995564  x   1.00003431  =   0.99998995
JE1044
JE1044                          SUPERSEDED SURVEY CONTROL
JE1044
JE1044  ELLIP H (08/12/03)  282.724  (m)                        GP(       ) 4 1
JE1044  NAD 83(1997)-  38 12 36.22486(N)    095 08 41.49218(W) AD(       ) B
JE1044  ELLIP H (12/22/97)  282.748  (m)                        GP(       ) 4 1
JE1044  NAVD 88 (12/22/97)  314.33   (m)         1031.3    (f) LEVELING    3
JE1044  NGVD 29 (??/??/92)  314.164  (m)         1030.72   (f) ADJ UNCH    2 0
JE1044
JE1044.Superseded values are not recommended for survey control.
JE1044.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
JE1044.See file dsdata.txt to determine how the superseded data were derived.
JE1044
JE1044_U.S. NATIONAL GRID SPATIAL ADDRESS: 15SUC1221531296(NAD 83)
JE1044
JE1044_MARKER: DB = BENCH MARK DISK
JE1044_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
JE1044_SP_SET: SET IN TOP OF CONCRETE MONUMENT
JE1044_STAMPING: K 56 1934
JE1044_MARK LOGO: CGS
JE1044_MAGNETIC: N = NO MAGNETIC MATERIAL
JE1044_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
JE1044+STABILITY: SURFACE MOTION
JE1044_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
JE1044+SATELLITE: SATELLITE OBSERVATIONS - April 01, 2005
JE1044
JE1044  HISTORY     - Date     Condition        Report By
JE1044  HISTORY     - 1934     MONUMENTED       CGS
JE1044  HISTORY     - 1950     GOOD             CGS
JE1044  HISTORY     - 19970427 GOOD             NGS
JE1044  HISTORY     - 20010611 GOOD             SKW
JE1044  HISTORY     - 20020702 GOOD             NGS
JE1044  HISTORY     - 20030723 GOOD             KSDT
JE1044  HISTORY     - 20050401 GOOD             USGS
JE1044  HISTORY     - 20080111 GOOD
JE1044
JE1044                          STATION DESCRIPTION
JE1044
JE1044'DESCRIBED BY COAST AND GEODETIC SURVEY 1934
JE1044'AT BUSH CITY.
JE1044'AT BUSH CITY, ANDERSON COUNTY, ON THE ABANDONED MISSOURI PACIFIC
JE1044'RAILROAD, 107 FEET SOUTH OF THE SOUTHWEST CORNER OF A BRICK
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JE1044'STORE BUILDING, 80 FEET NORTHEAST OF THE CENTER LINE OF THE OLD
JE1044'ROADBED, 75 FEET EAST OF A POWER-TRANSMISSION LINE POLE, 60 FEET
JE1044'SOUTH OF THE CENTER LINE OF A GRAVEL ROAD, 15 FEET WEST OF THE
JE1044'CENTER OF THE CONCRETE COVER OF AN ABANDONED WELL, AND 9 FEET
JE1044'NORTH OF THE WEST END OF THE FENCE AROUND A BALL FIELD. A
JE1044'STANDARD DISK, STAMPED K 56 1934 AND SET IN THE TOP OF A CONCRETE
JE1044'POST FLUSH WITH THE GROUND.
JE1044
JE1044 STATION RECOVERY (1950)
JE1044
JE1044'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1950
JE1044'RECOVERED IN GOOD CONDITION.
JE1044
JE1044 STATION RECOVERY (1997)
JE1044
JE1044'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1997 (CSM)
JE1044'THE STATION IS LOCATED ABOUT 11.26 KM (7.00 MI) SOUTHEAST OF GARNETT,
JE1044'9.65 KM (6.00 MI) EAST OF U.S. HIGHWAY 59, NEAR THE SOUTH EDGE OF BUSH
JE1044'CITY, NEAR THE NORTH EDGE OF A BALL FIELD, IN THE GRASS JUST
JE1044'NORTH-NORTHEAST OF THE WEST END OF PIPE FENCE OF BALL FIELD. TO REACH
JE1044'THE STATION FROM THE CROSSROADS JUNCTION OF COUNTY ROADS 1156 (TEXAS
JE1044'RD) SOUTH, 1144 EAST AND 1300 RD WEST, NEAR THE NORTHWEST CORNER OF
JE1044'BUSH CITY AND NEAR THE SANDSTONE BUSH CITY SIGN (EAST OF OLD BUSH CITY
JE1044'SITE), GO SOUTH FOR 0.16 KM (0.10 MI) ON TEXAS ROAD TO A PAVED ROAD
JE1044'LEFT. TURN LEFT, EAST FOR 0.32 KM (0.20 MI) ON THE PAVED ROAD TO THE
JE1044'BALL FIELD AND STATION ON THE RIGHT. STATION IS 32.5 M (106.6 FT)
JE1044'SOUTH OF THE SOUTHWEST CORNER OF AN ABANDONED BRICK BUILDING, 18.0 M
JE1044'(59.1 FT) SOUTH OF THE PAVED ROAD CENTER, 9.6 M (31.5 FT)
JE1044'WEST-NORTHWEST OF A METAL MULTIPLE LIGHT POLE FOR THE BALL FIELD, 5.4
JE1044'M (17.7 FT) WEST OF A 7 FT (2.1 M) BY 8 FT (2.4 M) ABANDONED CONCRETE
JE1044'WELL COVER CENTER, 2.8 M (9.2 FT) NORTH-NORTHEAST OF THE WEST END OF
JE1044'THE PIPE BALL FIELD FENCE, ABOUT LEVEL WITH THE PAVED ROAD AND
JE1044'PROJECTING 4 CM ABOVE GROUND.
JE1044
JE1044 STATION RECOVERY (2001)
JE1044
JE1044'RECOVERY NOTE BY SHAFER, KLINE AND WARREN INC 2001 (CMC)
JE1044'RECOVERED IN GOOD CONDITION.
JE1044
JE1044 STATION RECOVERY (2002)
JE1044
JE1044'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2002 (GMR)
JE1044'THE STATION IS LOCATED ABOUT 11.26 KM (7.0 MI) SOUTHEAST OF GARNETT,
JE1044'9.65 KM (6.0 MI) EAST
JE1044'OF U.S. HIGHWAY 59, NEAR THE SOUTH EDGE OF THE SMALL COMMUNITY OF BUSH
JE1044'CITY, AND IN
JE1044'THE GRASS AT THE NORTH EDGE OF THE REMAINS OF AN ABANDONED BALL FIELD.
JE1044'TO REACH THE
JE1044'STATION FROM THE CROSSROADS JUNCTION OF COUNTY ROADS 1156 SOUTH (TEXAS
JE1044'RD), 1144 EAST,
JE1044'AND 1300 RD WEST, AT THE NORTHWEST EDGE OF BUSH CITY AND NEAR THE
JE1044'LIMESTONE BUSH CITY
JE1044'SIGN, GO SOUTH ON COUNTY ROAD 1156 FOR 0.16 KM (0.10 MI) TO A PAVED
JE1044'STREET ON THE LEFT
JE1044'(THIRD ST). TURN LEFT AND GO EAST ON THIRD STREET FOR 0.32 KM (0.20
JE1044'MI) TO THE ABANDONED
JE1044'BALL FIELD AND STATION ON THE RIGHT. LOCATED 32.5 M (106.6 FT) SOUTH
JE1044'FROM THE SOUTHWEST
JE1044'CORNER OF AN ABANDONED BRICK BUILDING, 18.0 M (59.0 FT) SOUTH FROM THE
JE1044'CENTER OF THIRD
JE1044'STREET, 9.6 M (31.5 FT) WEST-NORTHWEST FROM A METAL LIGHT POLE AT THE

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JE1044'EDGE OF THE
JE1044'ABANDONED BALL FIELD, 5.4 M (17.7 FT)  WEST FROM A 7 FT BY 8 FT
JE1044'CONCRETE WELL COVER CENTER,
JE1044'AND 0.52 M (1.7 FT) NORTH FROM A FIBERGLASS WITNESS POST.
JE1044
JE1044                          STATION RECOVERY (2003)
JE1044
JE1044'RECOVERY NOTE BY KANSAS DEPARTMENT OF TRANSPORTATION 2003 (MRD)
JE1044'RECOVERED AS DESCRIBED.
JE1044
JE1044                          STATION RECOVERY (2005)
JE1044
JE1044'RECOVERY NOTE BY US GEOLOGICAL SURVEY 2005 (SES)
JE1044'RECOVERED IN GOOD CONDITION.
JE1044
JE1044                          STATION RECOVERY (2008)
JE1044
JE1044'RECOVERY NOTE BY   2008
JE1044'SITE HAS BEEN FENCED INTO PASTURE, ACCESS GATE IS AVAILABLE.
JE1044'
JE1044'

*** retrieval complete.
Elapsed Time = 00:00:01
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The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

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PROGRAM = datasheet95, VERSION = 8.00
1        National Geodetic Survey,   Retrieval Date = DECEMBER  4, 2012
 HE0689 ***********************************************************************
 HE0689  DESIGNATION -  KINNE
 HE0689  PID         -  HE0689
 HE0689  STATE/COUNTY-  KS/NEOSHO
 HE0689  COUNTRY     -  US
 HE0689  USGS QUAD   -  SHAW (1973)
 HE0689
 HE0689                         *CURRENT SURVEY CONTROL
 HE0689  ______________________________________________________________________
 HE0689* NAD 83(1997) POSITION- 37 36 15.78151(N) 095 16 13.13856(W)   ADJUSTED
 HE0689* NAVD 88 ORTHO HEIGHT -   306.74   (+/-2cm)    1006.4   (feet) VERTCON
 HE0689  ______________________________________________________________________
 HE0689  GEOID HEIGHT    -        -30.82  (meters)                     GEOID12A
 HE0689  LAPLACE CORR    -         -0.73  (seconds)                    DEFLEC12A
 HE0689  HORZ ORDER      -  FIRST
 HE0689  VERT ORDER      -  THIRD ? (See Below)
 HE0689
 HE0689.The horizontal coordinates were established by classical geodetic methods
 HE0689.and adjusted by the National Geodetic Survey in October 1998.
 HE0689.
 HE0689.The NAVD 88 height was computed by applying the VERTCON shift value to
 HE0689.the NGVD 29 height (displayed under SUPERSEDED SURVEY CONTROL.)
 HE0689
 HE0689.The vertical order pertains to the NGVD 29 superseded value.
 HE0689
 HE0689.The Laplace correction was computed from DEFLEC12A derived deflections.
 HE0689
 HE0689. The following values were computed from the NAD 83(1997) position.
 HE0689
 HE0689;                   North         East     Units Scale Factor Converg.
 HE0689;SPC KS S     -   509,010.854   685,117.130   MT  0.99995078   +1 59 05.0
 HE0689;SPC KS S     - 1,669,979.78  2,247,755.12   sFT  0.99995078   +1 59 05.0
 HE0689;UTM  15      - 4,164,345.608   299,592.739   MT  1.00009473   -1 23 09.0
 HE0689
 HE0689!             -  Elev Factor  x  Scale Factor =   Combined Factor
 HE0689!SPC KS S     -   0.99995670  x   0.99995078  =   0.99990749
 HE0689!UTM  15      -   0.99995670  x   1.00009473  =   1.00005143
 HE0689
 HE0689:                Primary Azimuth Mark                    Grid Az
 HE0689:SPC KS S     -  KINNE AZ MK 2                          085 43 51.7
 HE0689:UTM  15      -  KINNE AZ MK 2                          089 06 05.7
 HE0689
 HE0689|-----------------------------------------------------------------------|
 HE0689| PID    Reference Object                    Distance      Geod. Az   |
 HE0689|                                                          dddmmss.s  |
 HE0689| CL4667 KINNE RM 1                        23.058 METERS 03133      |
 HE0689| CL4666 KINNE AZ MK 2                                   0874256.7  |
 HE0689| CL4665 KINNE AZ MK                                     1011529.3  |
 HE0689| HE0685 ERIE MUNICIPAL TANK              APPROX. 5.1 KM 1445016.9  |
 HE0689| CL4668 KINNE RM 2                        26.185 METERS 15353      |
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HE0689| HE0695 CHANUTE KAN HWY COMM RAD MAST       APPROX.17.9 KM 2921935.5 |
HE0689| HE0702 CHANUTE S MUNICIPAL TANK            APPROX.18.9 KM 2943203.9 |
HE0689| HE0697 CHANUTE N MUNICIPAL TANK            APPROX.19.3 KM 2980849.3 |
HE0689| HE0699 CHANUTE GENERAL COM RADIO MAST      APPROX.17.8 KM 2990749.9 |
HE0689| HE0698 CHANUTE ASH GROVE CEMENT W STK      APPROX.19.9 KM 3012131.1 |
HE0689| HE0696 CHANUTE ASH GROVE CEMENT E STK      APPROX.19.7 KM 3021523.5 |
HE0689| HE0694 CHANUTE CABLE TV MAST               APPROX.15.2 KM 3054310.8 |
HE0689|--------------------------------------------------------------------|
HE0689
HE0689                          SUPERSEDED SURVEY CONTROL
HE0689
HE0689  NAD 83(1993)-  37 36 15.78612(N)    095 16 13.13846(W) AD(       ) 1
HE0689  NAD 83(1986)-  37 36 15.79092(N)    095 16 13.12732(W) AD(       ) 1
HE0689  NAD 27      -  37 36 15.61279(N)    095 16 12.19534(W) AD(       ) 1
HE0689  NGVD 29 (07/19/86)  306.61   (m)          1005.9    (f) LEVELING    3
HE0689
HE0689.Superseded values are not recommended for survey control.
HE0689
HE0689.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
HE0689.See file dsdata.txt to determine how the superseded data were derived.
HE0689
HE0689_U.S. NATIONAL GRID SPATIAL ADDRESS: 15STB9959264345(NAD 83)
HE0689
HE0689_MARKER: DS = TRIANGULATION STATION DISK
HE0689_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
HE0689_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
HE0689+SATELLITE: SATELLITE OBSERVATIONS - July 21, 2011
HE0689
HE0689  HISTORY     - Date     Condition        Report By
HE0689  HISTORY     - 1940     MONUMENTED       CGS
HE0689  HISTORY     - 1965     GOOD             CGS
HE0689  HISTORY     - 1966     GOOD             CGS
HE0689  HISTORY     - 20100401 GOOD             KSDT
HE0689  HISTORY     - 20100401 GOOD             KSDT
HE0689  HISTORY     - 20110721 GOOD             KSDT
HE0689
HE0689                          STATION DESCRIPTION
HE0689
HE0689'DESCRIBED BY COAST AND GEODETIC SURVEY 1940 (KBJ)
HE0689'STATION IS 3 MILES NNW OF ERIE, 2.5 MILES E OF SHAW, ON THE
HE0689'W SIDE OF A COUNTY ROAD ON A PROMINENT PRAIRIE HILL IN THE SE 1/4
HE0689'OF SECTION 13, T 28 S, R 17 E.  STATION MARK IS ON HIGHEST
HE0689'POINT OF HILL JUST SE OF AN OLD FARMHOUSE, 59 FEET SE OF SE
HE0689'CORNER OF THE HOUSE, 20 FEET W OF CENTER LINE OF COUNTY ROAD,
HE0689'65 FEET N OF FENCE CORNER, 6 INCHES E OF FENCE LINE, IS STAMPED
HE0689'KINNE 1940, AND FLUSH WITH THE SURFACE.
HE0689'
HE0689'SURFACE, UNDERGROUND AND REFERENCE MARKS ARE STANDARD BRONZE
HE0689'DISKS SET IN CONCRETE.
HE0689'
HE0689'REFERENCE MARK NO. 1 IS NE OF THE STATION ACROSS COUNTY ROAD,
HE0689'19 FEET E OF CENTER LINE OF ROAD, 1 FOOT W OF RIGHT-OF-WAY
HE0689'FENCE LINE, OPPOSITE YARD GATE, IS STAMPED KINNE NO. 1 1940,
HE0689'AND PROJECTS 6 INCHES.
HE0689'
HE0689'REFERENCE MARK NO. 2 IS SSE OF THE STATION ACROSS ROAD, 19 FEET
HE0689'E OF THE CENTER OF ROAD, 1 FOOT W OF RIGHT-OF-WAY FENCE, IS
HE0689'STAMPED KINNE NO. 2 1940, AND PROJECTS 8 INCHES.
HE0689'
HE0689'AZIMUTH MARK IS E BY S OF THE STATION, IN THE SE ANGLE OF
HE0689'A CROSSROADS INTERSECTION, 21-1/2 FEET S OF THE CENTER LINE
```

HE0689'OF U.S. HIGHWAY 59, 12 FEET E OF THE CENTER LINE OF N-S COUNTY
HE0689'ROAD. MARK IS A STANDARD AZIMUTH DISK SET IN A DRILL HOLE IN THE
HE0689'NE WING WALL ON THE E END OF A CONCRETE CULVERT, AND IS
HE0689'STAMPED KINNE 1940.
HE0689'
HE0689'TO REACH THE STATION FROM SHAW (RAILROAD DEPOT) GO E ON U.S.
HE0689'HIGHWAY 59 FOR 2.55 MILES AND TURN LEFT, (N) ON GRAVEL ROAD.
HE0689'(TO REACH THE AZIMUTH MARK CONTINUE E ON HIGHWAY 59 FOR 1.0
HE0689'MILE), GO 0.2 MILE N ON GRAVEL ROAD TO TOP OF HILL AND STATION.
HE0689'
HE0689'HEIGHT OF LIGHT ABOVE STATION MARK - 22 METERS.
HE0689
HE0689 STATION RECOVERY (1965)
HE0689
HE0689'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1965 (JCC)
HE0689'THE STATION, REFERENCE MARKS 1 AND 2 WERE RECOVERED. THE
HE0689'AZIMUTH MARK WAS NOT RECOVERED. THE ERIE MUNICIPAL WATER TANK
HE0689'IS NO LONGER VISIBLE FROM THE GROUND. A NEW AZIMUTH MARK WAS
HE0689'ESTABLISHED. FOLLOWING IS A COMPLETE NEW DESCRIPTION.
HE0689'
HE0689'THE STATION IS ABOUT 3 MILES NORTH-NORTHWEST OF ERIE, 2-1/2
HE0689'MILES EAST OF SHAW, ON THE WEST RIGHT-OF-WAY OF A COUNTY ROAD
HE0689'AND ADJACENT TO PROPERTY OWNED BY KENNITH KINNE.
HE0689'
HE0689'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 59
HE0689'AND STATE HIGHWAY 108 AT THE WEST EDGE OF ERIE, GO NORTH
HE0689'ON HIGHWAY 59 FOR 2.0 MILES TO A CROSSROAD AT A ROAD SIDE
HE0689'PARK, (THE AZIMUTH MARK IS 0.25 MILE NORTH OF THIS POINT ON
HE0689'THE WEST RIGHT-OF-WAY OF HIGHWAY 59.) TURN LEFT AND GO WEST
HE0689'FOR 1.0 MILE TO A CROSSROAD. TURN RIGHT AND GO NORTH FOR
HE0689'0.2 MILE TO THE STATION ON THE LEFT.
HE0689'
HE0689'THE STATION MARK IS A STANDARD DISK, STAMPED KINNE 1940, SET
HE0689'IN THE TOP OF A 14-INCH SQUARE CONCRETE POST FLUSH WITH THE
HE0689'GROUND. IT IS ABOUT 6 INCHES EAST OF THE YARD FENCE, 22.5
HE0689'FEET WEST OF THE CENTERLINE OF THE ROAD, 53.8 FEET NORTH OF A
HE0689'NORTH GATE POST AND 60.2 FEET SOUTHEAST OF THE SOUTHEAST
HE0689'CORNER OF THE HOUSE.
HE0689'
HE0689'REFERENCE MARK 1 IS A STANDARD DISK, STAMPED KINNE NO 1 1940, SET
HE0689'IN THE TOP OF A 12-INCH SQUARE CONCRETE POST PROJECTING
HE0689'6 INCHES. IT IS 1 FOOT WEST OF AN EAST RIGHT-OF-WAY FENCE,
HE0689'18.5 FEET EAST OF THE CENTERLINE OF THE ROAD, 81.0 FEET EAST
HE0689'OF THE NORTHEAST CORNER OF THE HOUSE AND AT ABOUT THE SAME
HE0689'ELEVATION AS THE STATION.
HE0689'
HE0689'REFERENCE MARK 2 IS A STANDARD DISK, STAMPED KINNE NO 2 1940,
HE0689'SET IN THE TOP OF A 12-INCH SQUARE CONCRETE POST PROJECTING
HE0689'4 INCHES. IT IS 1.0 FEET WEST OF THE FENCE, 18.1 FEET EAST
HE0689'OF THE CENTERLINE OF THE ROAD AND ABOUT 3 FEET LOWER IN
HE0689'ELEVATION THAN THE STATION.
HE0689'
HE0689'THE AZIMUTH MARK IS A STANDARD DISK, STAMPED KINNE 1940 RESET
HE0689'1964, SET IN THE TOP OF A 12 INCH SQUARE CONCRETE POST PROJECTING
HE0689'4 INCHES. IT IS 74.2 FEET WEST AND ABOUT 4 FEET LOWER THAN
HE0689'THE CENTERLINE OF HIGHWAY 59, 88.5 FEET SOUTH OF A WEST GATE
HE0689'POST, 2 FEET NORTH-NORTHEAST OF A WITNESS POST AND 1.0 FOOT
HE0689'EAST OF A WEST RIGHT-OF-WAY FENCE.
HE0689'
HE0689'HEIGHT OF LIGHT ABOVE STATION MARK 23 METERS.
HE0689

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HE0689                          STATION RECOVERY (1966)
HE0689
HE0689'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1966 (JC)
HE0689'THE STATION MARK, REFERENCE MARKS 1 AND 2 AND THE AZIMUTH MARK
HE0689'WERE RECOVERED AS DESCRIBED IN 1965 BY JOHN C. CHILDS.
HE0689'
HE0689'EARLTON 1965 AND BM D 246 REQUIRE A 64 FOOT TOWER.
HE0689'
HE0689'ALL OTHER OBJECTS VISIBLE AT 30 FEET.
HE0689
HE0689                          STATION RECOVERY (2010)
HE0689
HE0689'RECOVERY NOTE BY KANSAS DEPARTMENT OF TRANSPORTATION 2010 (KLH)
HE0689'RECOVERED IN GOOD CONDITION.
HE0689
HE0689                          STATION RECOVERY (2010)
HE0689
HE0689'RECOVERY NOTE BY KANSAS DEPARTMENT OF TRANSPORTATION 2010 (BLS)
HE0689'RECOVERED IN GOOD CONDITION.
HE0689
HE0689                          STATION RECOVERY (2011)
HE0689
HE0689'RECOVERY NOTE BY KANSAS DEPARTMENT OF TRANSPORTATION 2011 (KRH)
HE0689'STATION, RM1, RM2, AND AZIMUTH MARK ALL FOUND IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:01
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ITRF 00

TOPEKA 6 (KST6), KANSAS

Retrieved from NGS DataBase on 10/30/07 at 13:45:55.

Antenna Reference Point(ARP): TOPEKA 6 CORS ARP

PID = DJ3673

ITRF00 POSITION (EPOCH 1997.0)
Computed in Oct. 2007 using 20 days of data.

X = -521878.317 m	latitude = 39 02 39.69198 N	
Y = -4932932.705 m	longitude = 096 02 20.85986 W	
Z = 3996333.621 m	ellipsoid height = 302.753 m	

ITRF00 VELOCITY
Predicted with HTDP_2.9 Oct. 2007.

VX = -0.0167 m/yr	northward = -0.0045 m/yr
VY = -0.0014 m/yr	eastward = -0.0165 m/yr
VZ = -0.0032 m/yr	upward = 0.0004 m/yr

NAD_83 (CORS96) POSITION (EPOCH 2002.0)
Transformed from ITRF00 (epoch 1997.0) position in Oct. 2007.

X = -521877.782 m	latitude = 39 02 39.66718 N	
Y = -4932934.078 m	longitude = 096 02 20.83172 W	
Z = 3996333.698 m	ellipsoid height = 303.819 m	

NAD_83 (CORS96) VELOCITY
Transformed from ITRF00 velocity in Oct. 2007.

VX = -0.0000 m/yr	northward = 0.0000 m/yr
VY = -0.0000 m/yr	eastward = 0.0000 m/yr
VZ = 0.0000 m/yr	upward = 0.0000 m/yr

L1 Phase Center of the current GPS antenna: TOPEKA 6 CORS L1 PC C

The Zephyr Geodetic L1/L2 +RD w/ USCG mount antenna
(Antenna Code = TRM41249USCG SCIT) was installed on 10/01/07.
The L2 phase center is 0.012 m below the L1 phase center.

PID = DJ3674

ITRF00 POSITION (EPOCH 1997.0)
Computed in Oct. 2007 using 20 days of data.

X = -521878.326 m	latitude = 39 02 39.69187 N	
Y = -4932932.770 m	longitude = 096 02 20.85994 W	
Z = 3996333.670 m	ellipsoid height = 302.835 m	

The ITRF00 VELOCITY of the L1 PC is the same as that for the ARP.

NAD_83 (CORS96) POSITION (EPOCH 2002.0)
Transformed from ITRF00 (epoch 1997.0) position in Oct. 2007.

X = -521877.791 m	latitude = 39 02 39.66707 N	
Y = -4932934.143 m	longitude = 096 02 20.83180 W	
Z = 3996333.747 m	ellipsoid height = 303.900 m	

| The NAD_83 (CORS96) VELOCITY of the L1 PC is the same as that for the ARP. |

* Latitude, longitude and ellipsoid height are computed from their corresponding cartesian coordinates using dimensions for the GRS 80 ellipsoid: semi-major axis = 6,378,137.0 meters
flattening = 1/298.257222101...

* WARNING: Mixing of antenna types can lead to errors of up to 10 cm. in height unless antenna-phase-center variation is properly modeled.

* For additional information about the interpretation and/or derivation of these positions and velocities, consult http://www.ngs.noaa.gov/CORS/Derivation.html.
For additional information on the relation of the GPS antenna to other relevant points at the site and on GPS equipment, consult the link ftp://www.ngs.noaa.gov/cors/.html/kst6.log.txt

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.00
1        National Geodetic Survey,   Retrieval Date = DECEMBER  4, 2012
 HE0353 ***********************************************************************
 HE0353  CBN          -  This is a Cooperative Base Network Control Station.
 HE0353  DESIGNATION -  M 55
 HE0353  PID          -  HE0353
 HE0353  STATE/COUNTY-  KS/NEOSHO
 HE0353  COUNTRY      -  US
 HE0353  USGS QUAD    -  STARK (1973)
 HE0353
 HE0353                        *CURRENT SURVEY CONTROL
 HE0353  ______________________________________________________________________
 HE0353* NAD 83(2011) POSITION- 37 38 49.12242(N) 095 10 45.06310(W)   ADJUSTED
 HE0353* NAD 83(2011) ELLIP HT-   265.277 (meters)        (06/27/12)   ADJUSTED
 HE0353* NAD 83(2011) EPOCH    -  2010.00
 HE0353* NAVD 88 ORTHO HEIGHT -   296.200  (meters)     971.78  (feet) ADJUSTED
 HE0353  ______________________________________________________________________
 HE0353  NAD 83(2011) X  -   -456,469.247 (meters)                     COMP
 HE0353  NAD 83(2011) Y  - -5,036,022.479 (meters)                     COMP
 HE0353  NAD 83(2011) Z  -  3,874,655.275 (meters)                     COMP
 HE0353  LAPLACE CORR    -         -0.66  (seconds)                    DEFLEC12A
 HE0353  GEOID HEIGHT    -        -30.93  (meters)                     GEOID12A
 HE0353  DYNAMIC HEIGHT  -        295.969 (meters)      971.03  (feet) COMP
 HE0353  MODELED GRAVITY -    979,842.9   (mgal)                      NAVD 88
 HE0353
 HE0353  VERT ORDER      -  SECOND    CLASS 0
 HE0353
 HE0353  FGDC Geospatial Positioning Accuracy Standards (95% confidence, cm)
 HE0353  Type                                          Horiz  Ellip  Dist(km)
 HE0353  ----------------------------------------------------------------------
 HE0353  NETWORK                                        0.71   1.43
 HE0353  ----------------------------------------------------------------------
 HE0353  MEDIAN LOCAL ACCURACY AND DIST (022 points)   0.73   1.46    159.04
 HE0353  ----------------------------------------------------------------------
 HE0353  NOTE: Click here for information on individual local accuracy
 HE0353  values and other accuracy information.
 HE0353
 HE0353
 HE0353.The horizontal coordinates were established by GPS observations
 HE0353.and adjusted by the National Geodetic Survey in June 2012.
 HE0353
 HE0353.NAD 83(2011) refers to NAD 83 coordinates where the reference
 HE0353.frame has been affixed to the stable North American tectonic plate. See
 HE0353.NA2011 for more information. for more information.
 HE0353
 HE0353.The horizontal coordinates are valid at the epoch date displayed above
 HE0353.which is a decimal equivalence of Year/Month/Day.
 HE0353
 HE0353.The orthometric height was determined by differential leveling and
 HE0353.adjusted by the NATIONAL GEODETIC SURVEY
 HE0353.in June 1991.
 HE0353
```

HE0353.The X, Y, and Z were computed from the position and the ellipsoidal ht.
HE0353
HE0353.The Laplace correction was computed from DEFLEC12A derived deflections.
HE0353
HE0353.The ellipsoidal height was determined by GPS observations
HE0353.and is referenced to NAD 83.
HE0353
HE0353.The dynamic height is computed by dividing the NAVD 88
HE0353.geopotential number by the normal gravity value computed on the
HE0353.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
HE0353.degrees latitude (g = 980.6199 gals.).
HE0353
HE0353.The modeled gravity was interpolated from observed gravity values.
HE0353
HE0353. The following values were computed from the NAD 83(2011) position.
HE0353

		North	East	Units	Scale Factor	Converg.
HE0353;SPC KS S	-	514,017.790	692,990.592	MT	0.99994702	+2 02 26.6
HE0353;SPC KS S	-	1,686,406.70	2,273,586.63	sFT	0.99994702	+2 02 26.6
HE0353;UTM 15	-	4,168,881.430	307,748.048	MT	1.00005528	-1 19 53.2

HE0353

		Elev Factor	x	Scale Factor	=	Combined Factor
HE0353!SPC KS S	-	0.99995837	x	0.99994702	=	0.99990540
HE0353!UTM 15	-	0.99995837	x	1.00005528	=	1.00001365

HE0353

HE0353 SUPERSEDED SURVEY CONTROL

HE0353

HE0353 NAD 83(2007)-	37 38 49.12249(N)	095 10 45.06369(W)	AD( )	0			
HE0353 ELLIP H (02/10/07)	265.294 (m)		GP( )				
HE0353 NAD 83(1997)-	37 38 49.12251(N)	095 10 45.06373(W)	AD( )	A			
HE0353 ELLIP H (08/12/03)	265.289 (m)		GP( )	4	1		
HE0353 NAD 83(1997)-	37 38 49.12645(N)	095 10 45.07155(W)	AD( )	3			
HE0353 ELLIP H (10/02/98)	264.668 (m)		GP( )	4	1		
HE0353 NAD 83(1993)-	37 38 49.13263(N)	095 10 45.06952(W)	AD( )	3			
HE0353 NAD 83(1986)-	37 38 49.14476(N)	095 10 45.06932(W)	AD( )	3			
HE0353 NAVD 88 (08/12/03)	296.20 (m)	971.8 (f)	LEVELING	3			
HE0353 NGVD 29 (??/??/92)	296.067 (m)	971.35 (f)	ADJ UNCH	2	0		

HE0353
HE0353.Superseded values are not recommended for survey control.
HE0353
HE0353.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
HE0353.See file dsdata.txt to determine how the superseded data were derived.
HE0353
HE0353_U.S. NATIONAL GRID SPATIAL ADDRESS: 15SUB0774868881(NAD 83)
HE0353
HE0353_MARKER: DB = BENCH MARK DISK
HE0353_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
HE0353_SP_SET: CONCRETE POST
HE0353_STAMPING: M 55 1934
HE0353_MARK LOGO: CGS
HE0353_MAGNETIC: N = NO MAGNETIC MATERIAL
HE0353_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
HE0353+STABILITY: SURFACE MOTION
HE0353_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
HE0353+SATELLITE: SATELLITE OBSERVATIONS - August 02, 2002
HE0353

HE0353 HISTORY	- Date	Condition	Report By
HE0353 HISTORY	- 1934	MONUMENTED	CGS
HE0353 HISTORY	- 1964	GOOD	CGS
HE0353 HISTORY	- 19890701	GOOD	NGS
HE0353 HISTORY	- 20020802	GOOD	NGS

HE0353 HISTORY - 20080111 GOOD
HE0353
HE0353 STATION DESCRIPTION
HE0353
HE0353'DESCRIBED BY COAST AND GEODETIC SURVEY 1934
HE0353'8.9 MI N FROM ERIE.
HE0353'6.9 MILES NORTH ALONG THE MISSOURI-KANSAS-TEXAS RAILROAD FROM
HE0353'ERIE, NEOSHO COUNTY, AT MILEPOST 114, AT A ROAD CROSSING, 48
HE0353'FEET NORTHWEST OF THE CENTER OF THE CROSSING, AND 36 FEET WEST
HE0353'OF THE CENTER LINE OF THE COUNTY ROAD. A STANDARD DISK, STAMPED
HE0353'M 55 1934 AND SET IN THE TOP OF A CONCRETE POST. NOTE-- 1964
HE0353'REPORT, THE BENCH MARK IS 10 FEET NORTHWEST OF MILE POST 74 AND
HE0353'PROJECTS ABOUT 4 INCHES.
HE0353
HE0353 STATION RECOVERY (1964)
HE0353
HE0353'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1964
HE0353'RECOVERED IN GOOD CONDITION.
HE0353
HE0353 STATION RECOVERY (1989)
HE0353
HE0353'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1989
HE0353'THE STATION IS LOCATED ABOUT 24 KM (14.90 MI) EAST OF CHANUTE, 5.6 KM
HE0353'(3.50 MI) SOUTHWEST OF STARK, AT THE JUNCTION OF A GRAVEL ROAD AND A
HE0353'RAILROAD TRACK, IN BELT-HIGH WEEDS ON RAILROAD RIGHT-OF-WAY, IN THE
HE0353'SOUTHWEST 1/4 OF SECTION 35, T 27 S, R 20 E.
HE0353'OWNERSHIP--MISSOURI-KANSAS-TEXAS RAILROAD.
HE0353'TO REACH THE STATION FROM THE JUNCTION OF U.S. HIGHWAY 59 AND STATE
HE0353'HIGHWAYS 39 AND 201, 1.6 KM (1.00 MI) WEST OF STARK, GO EAST ON
HE0353'HIGHWAY 201 FOR 45.8 M (150.3 FT) TO A GRAVEL CROSSROAD. TURN RIGHT
HE0353'AND GO SOUTH FOR 3.25 KM (2.00 MI) TO A RAILROAD TRACK AND ROAD RIGHT
HE0353'AT THE KIMBALL COMMUNITY. TURN RIGHT AND GO WEST THROUGH TOWN FOR 1.6
HE0353'KM (1.00 MI) TO A CROSSROAD. TURN LEFT AND GO SOUTH FOR 1.45 KM
HE0353'(0.90 MI) TO THE RAILROAD TRACK AND THE STATION ON THE RIGHT.
HE0353'THE STATION IS A STANDARD CGS DISK SET IN THE TOP OF A 20 CM SQUARE
HE0353'CONCRETE POST PROJECTING 5 CM ABOVE THE GROUND. LOCATED 13.7 M
HE0353'(44.9 FT) NORTH-NORTHWEST OF THE NORTH RAIL, 11.0 M (36.1 FT) WEST OF
HE0353'THE ROAD CENTER, 5.3 M (17.4 FT) WEST-SOUTHWEST OF A FENCE CORNER, 0.9
HE0353'M (3.0 FT) SOUTH-SOUTHEAST OF FENCE LINE AND 0.5 M (1.6 FT) EAST OF A
HE0353'CARSONITE WITNESS POST.
HE0353'DESCRIBED BY G.R. HEID, TYPED BY HJS.
HE0353
HE0353 STATION RECOVERY (2002)
HE0353
HE0353'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 2002 (GMR)
HE0353'THE STATION IS LOCATED ABOUT 24 KM (14.9 MI) EAST OF CHANUTE, 5.6 KM
HE0353'(3.5 MI) SOUTHWEST
HE0353'OF STARK, AT A GRAVEL ROAD AND RAILROAD CROSSING, AT RAILROAD MILE
HE0353'POST 114, ON
HE0353'RAILROAD RIGHT-OF-WAY, AND IN THE SOUTHWEST 1/4 OF SECTION 35, T 27 S,
HE0353'R 20 E.
HE0353'OWNERSHIP--MISSOURI-KANSAS-TEXAS RAILROAD. TO REACH THE STATION FROM
HE0353'THE JUNCTION OF
HE0353'U.S. HIGHWAY 59 AND STATE HIGHWAYS 39 AND 201 EAST, ABOUT 1.6 KM (1.0
HE0353'MI) WEST OF STARK,
HE0353'GO EAST ON STATE HIGHWAY 201 FOR ABOUT 45.7 M (150 FT) TO A PAVED
HE0353'CROSSROAD. TURN RIGHT
HE0353'AND GO SOUTH ON THE PAVED ROAD FOR 3.22 KM (2.0 MI) TO A RAILROAD
HE0353'CROSSING AT THE SMALL
HE0353'COMMUNITY OF KIMBALL, AND ROAD ON THE RIGHT LEADING WEST THROUGH THE
HE0353'KIMBALL

HE0353'COMMUNITY. TURN RIGHT AND GO WEST ON THE GRAVEL ROAD, THROUGH THE
HE0353'SMALL COMMUNITY,
HE0353'FOR 1.6 KM (1.0 MI) TO A GRAVEL CROSSROAD. TURN LEFT AND GO SOUTH ON
HE0353'THE GRAVEL ROAD FOR
HE0353'1.45 KM (0.90 MI) TO A RAILROAD CROSSING AND THE STATION ON THE
HE0353'RIGHT. THE STATION
HE0353'PROJECTS 5 CM ABOVE GROUND. LOCATED 14.9 M (49.0 FT) NORTHWEST FROM
HE0353'THE CENTER OF THE
HE0353'RAILROAD CROSSING AND GRAVEL ROAD, 13.7 M (44.9 FT) NORTH-NORTHWEST
HE0353'FROM THE NORTH
HE0353'RAIL OF RAILROAD TRACK, 11.0 M (36.0 FT) WEST FROM THE CENTER OF THE
HE0353'GRAVEL ROAD, 5.3 M (17.4
HE0353'FT) WEST-SOUTHWEST FROM A FENCE CORNER, 0.9 M (3.0 FT) SOUTH-SOUTHEAST
HE0353'FROM A FENCE
HE0353'LINE, AND 0.5 M (1.6 FT) EAST FROM A FIBERGLASS WITNESS POST.
HE0353
HE0353   STATION RECOVERY (2008)
HE0353
HE0353'RECOVERY NOTE BY   2008
HE0353'MODIFIED DIRECTIONS TO INCLUDED ROAD NAMES. TO REACH THE STATION FROM
HE0353'THE JUNCTION OF U.S. HIGHWAY 59 AND STATE HIGHWAYS 39 AND 201 EAST,
HE0353'ABOUT 1.6 KM (1.0 MI) WEST OF STARK, GO EAST ON STATE HIGHWAY 201 FOR
HE0353'ABOUT 45.7 M (150 FT) TO UDALL ROAD (THE PAVED CROSSROAD).
HE0353'TURN RIGHT AND GO SOUTH ON UDALL ROAD FOR 3.22 KM (2.0 MI) TO A
HE0353'RAILROAD CROSSING AND 200TH ROAD IN THE SMALL COMMUNITY OF KIMBALL.
HE0353'TURN RIGHT ON 200TH (GRAVEL) ROAD AND GO WEST, THROUGH THE SMALL
HE0353'COMMUNITY, FOR 1.6 KM (1.0 MI) TO TREGO ROAD.
HE0353' TURN LEFT ON TREGO ROAD AND GO SOUTH ON THE GRAVEL ROAD FOR 1.45 KM
HE0353'(0.90 MI) TO A RAILROAD CROSSING AND THE STATION ON THE RIGHT.
HE0353'

*** retrieval complete.
Elapsed Time = 00:00:02

ITRF 00

MODOT BUTLER (MOBT), MISSOURI

Retrieved from NGS DataBase on 04/08/10 at 13:35:58.

Antenna Reference Point(ARP): MODOT BUTLER CORS ARP

PID = DL6888

ITRF00 POSITION (EPOCH 1997.0)
Computed in Apr. 2010 using 30 days of data.

X = -384163.226 m	latitude =	38 15 26.96849 N
Y = -5000226.726 m	longitude =	094 23 36.08161 W
Z = 3928068.689 m	ellipsoid height =	229.338 m

ITRF00 VELOCITY
Predicted with HTDP_3.0 Apr. 2010.

VX = -0.0146 m/yr	northward =	-0.0039 m/yr
VY = -0.0008 m/yr	eastward =	-0.0145 m/yr
VZ = -0.0035 m/yr	upward =	-0.0007 m/yr

NAD_83 (CORS96) POSITION (EPOCH 2002.0)
Transformed from ITRF00 (epoch 1997.0) position in Apr. 2010.

X = -384162.682 m	latitude =	38 15 26.94381 N
Y = -5000228.112 m	longitude =	094 23 36.05494 W
Z = 3928068.777 m	ellipsoid height =	230.445 m

NAD_83 (CORS96) VELOCITY
Transformed from ITRF00 velocity in Apr. 2010.

VX = 0.0018 m/yr	northward =	-0.0001 m/yr
VY = 0.0006 m/yr	eastward =	0.0017 m/yr
VZ = -0.0007 m/yr	upward =	-0.0010 m/yr

L1 Phase Center of the current GPS antenna: MODOT BUTLER CORS L1 PC C

The CONVERTED FROM ABSOLUTE igs05_1480.atx antenna
(Antenna Code = TRM57971.00 NONE) was installed on 08/02/09.
The L2 phase center is 0.020 m below the L1 phase center.

PID = DL6889

ITRF00 POSITION (EPOCH 1997.0)
Computed in Apr. 2010 using 30 days of data.

X = -384163.231 m	latitude =	38 15 26.96851 N
Y = -5000226.793 m	longitude =	094 23 36.08160 W
Z = 3928068.743 m	ellipsoid height =	229.423 m

The ITRF00 VELOCITY of the L1 PC is the same as that for the ARP.

NAD_83 (CORS96) POSITION (EPOCH 2002.0)
Transformed from ITRF00 (epoch 1997.0) position in Apr. 2010.

X = -384162.687 m	latitude =	38 15 26.94383 N
Y = -5000228.179 m	longitude =	094 23 36.05493 W
Z = 3928068.831 m	ellipsoid height =	230.530 m

| The NAD_83 (CORS96) VELOCITY of the L1 PC is the same as that for the ARP. |

* Latitude, longitude and ellipsoid height are computed from their corresponding cartesian coordinates using dimensions for the GRS 80 ellipsoid: semi-major axis = 6,378,137.0 meters
flattening = 1/298.257222101...

* WARNING: Mixing of antenna types can lead to errors of up to 10 cm. in height unless antenna-phase-center variation is properly modeled.

* For additional information about the interpretation and/or derivation of these positions and velocities, consult http://www.ngs.noaa.gov/CORS/Coords.html
For additional information on the relation of the GPS antenna to other relevant points at the site and on GPS equipment, consult the link http://www.ngs.noaa.gov/cors/Logfiles.html

ITRF 00

MODOT CARTHAGE (MOCA), MISSOURI

Retrieved from NGS DataBase on 12/04/09 at 10:40:32.

Antenna Reference Point(ARP): MODOT CARTHAGE CORS ARP

PID = DL6014

ITRF00 POSITION (EPOCH 1997.0)
Computed in Dec. 2009 using 16 days of data.

X =	-386614.691 m	latitude =	37 10 39.19024 N
Y =	-5073616.351 m	longitude =	094 21 27.27027 W
Z =	3833274.743 m	ellipsoid height =	269.931 m

ITRF00 VELOCITY
Predicted with HTDP_3.0 Dec. 2009.

VX =	-0.0143 m/yr	northward =	-0.0040 m/yr
VY =	-0.0008 m/yr	eastward =	-0.0142 m/yr
VZ =	-0.0036 m/yr	upward =	-0.0007 m/yr

NAD_83 (CORS96) POSITION (EPOCH 2002.0)
Transformed from ITRF00 (epoch 1997.0) position in Dec. 2009.

X =	-386614.147 m	latitude =	37 10 39.16622 N
Y =	-5073617.750 m	longitude =	094 21 27.24398 W
Z =	3833274.840 m	ellipsoid height =	271.067 m

NAD_83 (CORS96) VELOCITY
Transformed from ITRF00 velocity in Dec. 2009.

VX =	0.0018 m/yr	northward =	-0.0002 m/yr
VY =	0.0006 m/yr	eastward =	0.0017 m/yr
VZ =	-0.0008 m/yr	upward =	-0.0011 m/yr

L1 Phase Center of the current GPS antenna: MODOT CARTHAGE CORS L1 PC C

The CONVERTED FROM ABSOLUTE igs05_1480.atx antenna
(Antenna Code = TRM57971.00 NONE) was installed on 08/02/09.
The L2 phase center is 0.020 m below the L1 phase center.

PID = DL6015

ITRF00 POSITION (EPOCH 1997.0)
Computed in Dec. 2009 using 16 days of data.

X =	-386614.696 m	latitude =	37 10 39.19026 N
Y =	-5073616.419 m	longitude =	094 21 27.27027 W
Z =	3833274.795 m	ellipsoid height =	270.016 m

The ITRF00 VELOCITY of the L1 PC is the same as that for the ARP.

NAD_83 (CORS96) POSITION (EPOCH 2002.0)
Transformed from ITRF00 (epoch 1997.0) position in Dec. 2009.

X =	-386614.153 m	latitude =	37 10 39.16624 N
Y =	-5073617.818 m	longitude =	094 21 27.24398 W
Z =	3833274.892 m	ellipsoid height =	271.153 m

| The NAD_83 (CORS96) VELOCITY of the L1 PC is the same as that for the ARP. |

* Latitude, longitude and ellipsoid height are computed from their corresponding cartesian coordinates using dimensions for the GRS 80 ellipsoid: semi-major axis = 6,378,137.0 meters
flattening = 1/298.257222101...

* WARNING: Mixing of antenna types can lead to errors of up to 10 cm. in height unless antenna-phase-center variation is properly modeled.

* For additional information about the interpretation and/or derivation of these positions and velocities, consult http://www.ngs.noaa.gov/CORS/Coords.html
For additional information on the relation of the GPS antenna to other relevant points at the site and on GPS equipment, consult the link http://www.ngs.noaa.gov/cors/Logfiles.html

ITRF 00

MODOT NEVADA (MONE), MISSOURI

Retrieved from NGS DataBase on 12/16/10 at 11:23:53.

Antenna Reference Point(ARP): MODOT NEVADA CORS ARP

PID = DM4686

ITRF00 POSITION (EPOCH 1997.0)
Computed in Dec. 2010 using 11 days of data.

X =	-382373.150 m	latitude =	37 51 56.74439 N
Y =	-5027242.692 m	longitude =	094 20 58.39611 W
Z =	3893827.880 m	ellipsoid height =	221.241 m

ITRF00 VELOCITY
Predicted with HTDP_3.0 Dec. 2010.

VX =	-0.0145 m/yr	northward =	-0.0039 m/yr
VY =	-0.0008 m/yr	eastward =	-0.0144 m/yr
VZ =	-0.0035 m/yr	upward =	-0.0007 m/yr

NAD_83 (CORS96) POSITION (EPOCH 2002.0)
Transformed from ITRF00 (epoch 1997.0) position in Dec. 2010.

X =	-382372.606 m	latitude =	37 51 56.71994 N
Y =	-5027244.083 m	longitude =	094 20 58.36961 W
Z =	3893827.972 m	ellipsoid height =	222.360 m

NAD_83 (CORS96) VELOCITY
Transformed from ITRF00 velocity in Dec. 2010.

VX =	0.0018 m/yr	northward =	-0.0001 m/yr
VY =	0.0006 m/yr	eastward =	0.0017 m/yr
VZ =	-0.0007 m/yr	upward =	-0.0010 m/yr

L1 Phase Center of the current GPS antenna: MODOT NEVADA CORS L1 PC C

The CONVERTED FROM ABSOLUTE igs05_1480.atx antenna
(Antenna Code = TRM57971.00 NONE) was installed on 08/02/09.
The L2 phase center is 0.020 m below the L1 phase center.

PID = DM4687

ITRF00 POSITION (EPOCH 1997.0)
Computed in Dec. 2010 using 11 days of data.

X =	-382373.155 m	latitude =	37 51 56.74441 N
Y =	-5027242.759 m	longitude =	094 20 58.39611 W
Z =	3893827.933 m	ellipsoid height =	221.327 m

The ITRF00 VELOCITY of the L1 PC is the same as that for the ARP.

NAD_83 (CORS96) POSITION (EPOCH 2002.0)
Transformed from ITRF00 (epoch 1997.0) position in Dec. 2010.

X =	-382372.611 m	latitude =	37 51 56.71996 N
Y =	-5027244.150 m	longitude =	094 20 58.36960 W
Z =	3893828.025 m	ellipsoid height =	222.445 m

| The NAD_83 (CORS96) VELOCITY of the L1 PC is the same as that for the ARP. |

* Latitude, longitude and ellipsoid height are computed from their corresponding cartesian coordinates using dimensions for the GRS 80 ellipsoid: semi-major axis = 6,378,137.0 meters
flattening = 1/298.257222101...

* WARNING: Mixing of antenna types can lead to errors of up to 10 cm. in height unless antenna-phase-center variation is properly modeled.

* For additional information about the interpretation and/or derivation of these positions and velocities, consult http://www.ngs.noaa.gov/CORS/Coords.html
For additional information on the relation of the GPS antenna to other relevant points at the site and on GPS equipment, consult the link http://www.ngs.noaa.gov/cors/Logfiles.html

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
PROGRAM = datasheet95, VERSION = 8.00
1        National Geodetic Survey,   Retrieval Date = DECEMBER  4, 2012
 JE1083 ***********************************************************************
 JE1083  DESIGNATION -  P 277
 JE1083  PID         -  JE1083
 JE1083  STATE/COUNTY-  KS/ANDERSON
 JE1083  COUNTRY     -  US
 JE1083  USGS QUAD   -  COLONY (1966)
 JE1083
 JE1083                        *CURRENT SURVEY CONTROL
 JE1083  ______________________________________________________________________
 JE1083* NAD 83(1986) POSITION- 38 04 41.2     (N) 095 18 30.3     (W)    HD_HELD2
 JE1083* NAVD 88 ORTHO HEIGHT -   319.950   (meters)    1049.70   (feet) ADJUSTED
 JE1083  ______________________________________________________________________
 JE1083  GEOID HEIGHT    -        -31.39   (meters)                       GEOID12A
 JE1083  DYNAMIC HEIGHT  -        319.709  (meters)     1048.91   (feet) COMP
 JE1083  MODELED GRAVITY -    979,870.3    (mgal)                         NAVD 88
 JE1083
 JE1083  VERT ORDER      -  SECOND    CLASS 0
 JE1083
 JE1083.The horizontal coordinates were established by autonomous hand held GPS
 JE1083.observations and have an estimated accuracy of +/- 10 meters.
 JE1083.
 JE1083.The orthometric height was determined by differential leveling and
 JE1083.adjusted by the NATIONAL GEODETIC SURVEY
 JE1083.in June 1991.
 JE1083
 JE1083.Photographs are available for this station.
 JE1083
 JE1083.The dynamic height is computed by dividing the NAVD 88
 JE1083.geopotential number by the normal gravity value computed on the
 JE1083.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 JE1083.degrees latitude (g = 980.6199 gals.).
 JE1083
 JE1083.The modeled gravity was interpolated from observed gravity values.
 JE1083
 JE1083;                    North         East     Units  Estimated Accuracy
 JE1083;SPC KS S     -   561,442.      679,955.      MT  (+/- 10 meters HH2 GPS)
 JE1083
 JE1083                         SUPERSEDED SURVEY CONTROL
 JE1083
 JE1083  NGVD 29 (??/??/92)  319.788  (m)          1049.17   (f) ADJ UNCH    2 0
 JE1083
 JE1083.Superseded values are not recommended for survey control.
 JE1083
 JE1083.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 JE1083.See file dsdata.txt to determine how the superseded data were derived.
 JE1083
 JE1083_U.S. NATIONAL GRID SPATIAL ADDRESS: 15STC9752916997(NAD 83)
 JE1083
 JE1083_MARKER: DB = BENCH MARK DISK
 JE1083_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
```

JE1083_SP_SET: SET IN TOP OF CONCRETE MONUMENT
JE1083_STAMPING: P 277 1945
JE1083_MARK LOGO: CGS
JE1083_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
JE1083+STABILITY: SURFACE MOTION
JE1083_SATELLITE: THE SITE LOCATION WAS REPORTED AS NOT SUITABLE FOR
JE1083+SATELLITE: SATELLITE OBSERVATIONS - October 16, 2003
JE1083

JE1083 HISTORY	- Date	Condition	Report By
JE1083 HISTORY	- 1945	MONUMENTED	CGS
JE1083 HISTORY	- 1951	GOOD	CGS
JE1083 HISTORY	- 20031016	GOOD	SKW

JE1083
JE1083 STATION DESCRIPTION
JE1083
JE1083'DESCRIBED BY COAST AND GEODETIC SURVEY 1945
JE1083'3.7 MI NE FROM COLONY.
JE1083'0.5 MILE NORTH ALONG THE ATCHISON, TOPEKA AND SANTA FE RAILWAY
JE1083'FROM THE STATION AT COLONY, ANDERSON COUNTY, THENCE 3.2 MILES
JE1083'EAST ALONG AN ABANDONED BRANCH OF THE MISSOURI PACIFIC RAILROAD,
JE1083'AT THE CROSSING OF A NORTH-AND-SOUTH GRAVEL ROAD, 49 FEET NORTH
JE1083'OF THE CENTER LINE OF THE OLD ROADBED, 20 FEET EAST OF THE
JE1083'CENTER LINE OF THE ROAD, 6 FEET EAST OF A FENCE CORNER, 1 FOOT
JE1083'SOUTH OF THE FENCE, 1 FOOT EAST OF A WHITE WOODEN WITNESS POST,
JE1083'AND LEVEL WITH THE ROAD. A STANDARD DISK, STAMPED P 277 1945
JE1083'AND SET IN THE TOP OF A CONCRETE POST PROJECTING 5 INCHES
JE1083'ABOVE GROUND.
JE1083
JE1083 STATION RECOVERY (1951)
JE1083
JE1083'RECOVERY NOTE BY COAST AND GEODETIC SURVEY 1951
JE1083'RECOVERED IN GOOD CONDITION.
JE1083
JE1083 STATION RECOVERY (2003)
JE1083
JE1083'RECOVERY NOTE BY SHAFER, KLINE AND WARREN INC 2003 (CMC)
JE1083'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:02

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

RTK BASE

PROJECT 112109
OPERATOR WJN
DATE 11/27/12

SITE NUMBER 1
SITE NAME 101

TRACKING TIMES (LOCAL) MEASURE CST
START 12 22
STOP 15 03

SENSOR TYPE 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT
299/399 0.441
399E/9500 0.389
500 0.360
GS15

OBSTRUCTIONS: PPL W/

STATION DESCRIPTIONS Set Rebar AND PLASTIC CAP

HEIGHT READINGS MTS FT
1.198
1.558

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
16:22		
21:43		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
River Down @ 9:41
Sensor Down @ 9:43

±6' NE OF CEMETERY SIGN
±30' S. OF ℄ NW 2350 RD
±52' W. OF ℄ HWY 59
±18' E OF PPL # 370945

NW 2350 RD
GRAVEL

West Scipio Cemetery SIGN

59

SKETCH

N

- 0.24 - start RTK

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

PROJECT 1121109
OPERATOR WJN
DATE 11/29/12
JULIAN 333

SITE NUMBER
SITE NAME 107

TRACKING TIMES (LOCAL) MEASURE CDT
START 10:30
STOP 2:13

SENSOR TYPE 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT
299/399 0.441
399E/9500 0.389
500 0.360
GS15

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
1.229
1.589

STATION DESCRIPTIONS Set 1/2" Rebar AND PLASTIC CAP

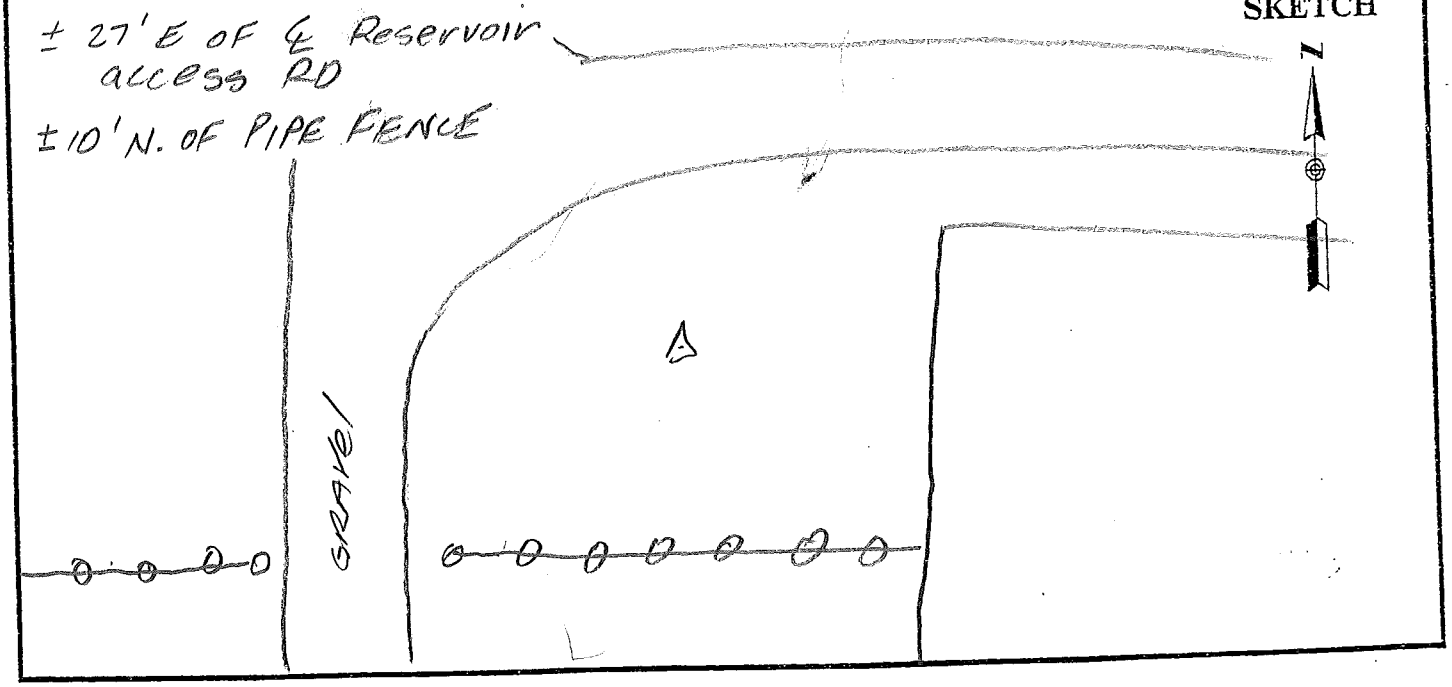
SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
16:30		
20:13		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

HERE Prelim 3d 15 33 13071
95 18 46.61925
276.1173

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

MOST MONK ZKC1

PROJECT 1121109
OPERATOR WIN
DATE 11/28/12
JULIAN 334

SITE NUMBER
SITE NAME 113

TRACKING TIMES (LOCAL) MEASURE CST
START 1051
STOP 1522

SENSOR TYPE 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT
299/399 0.441
399E/9500 0.389
500 (0.360)
GS15

HEIGHT READINGS MTS FT
1.121

1.481

OBSTRUCTIONS: NO

STATION DESCRIPTIONS SET 18" REBAR AND PLASTIC CAP ± 35' S of ℄ SW 600 RD ± 30' E of ℄ OLD RxR BED ± 6' NE of 3RD POST FROM E.

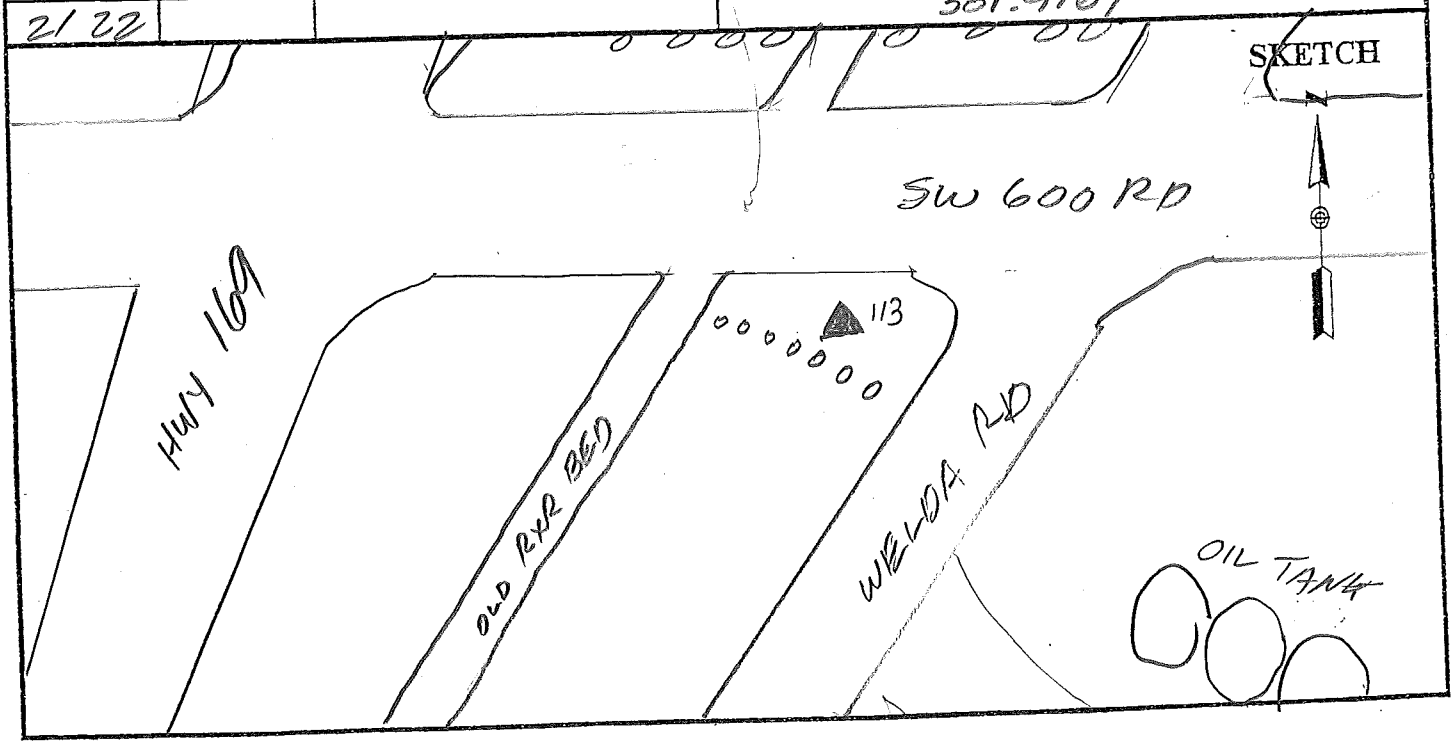
SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1651		
2122		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

38 06 40.30179
95 20 55.57153
301.9169

SKETCH



1.481

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

PROJECT 1121109
OPERATOR WJN
DATE 11/30/12

SITE NUMBER
SITE NAME 125

TRACKING TIMES (LOCAL) MEASURE CST
START 9:16
STOP 12:25

SENSOR TYPE 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

GS15

HEIGHT READINGS MTS FT
1.184

1.544

OBSTRUCTIONS: NO

STATION DESCRIPTIONS SET 18" REBAR W/ PLASTIC CAP
± 30'S OF ℄ RHODE ISLAND RD
± 20' W OF ℄ 2200 ST
3' E. OF 3'MOST BRACE POST

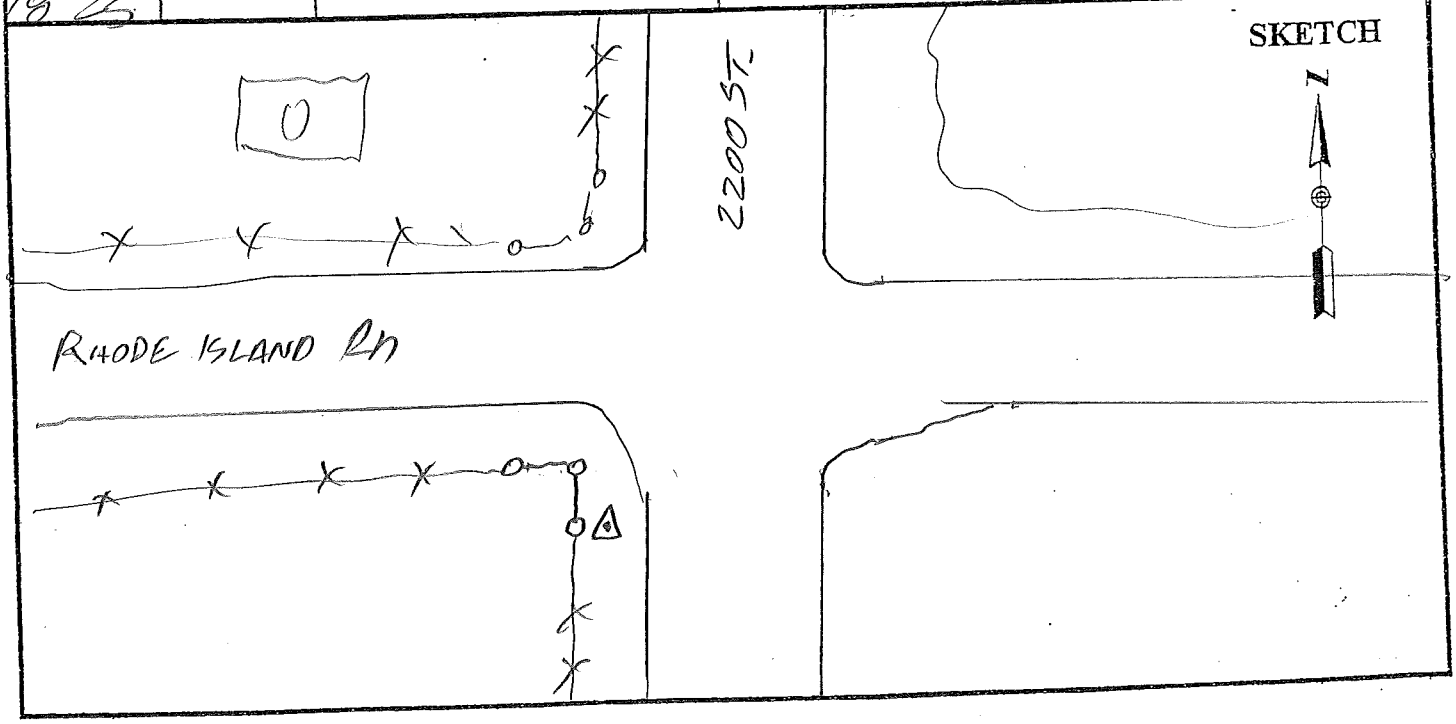
SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
15 16		
19 25		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

37 57 55.30053
95 20 08.66229
283.7355

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

PROJECT 112109
OPERATOR JLN
DATE 11/30/12
JULIAN 335

SITE NUMBER
SITE NAME 134

TRACKING TIMES (LOCAL) MEASURE CST
START 1302
STOP 1544

SENSOR TYPE 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360
GSIS

OBSTRUCTIONS: BRACE POLE S.

HEIGHT READINGS MTS FT
1.191
1.551

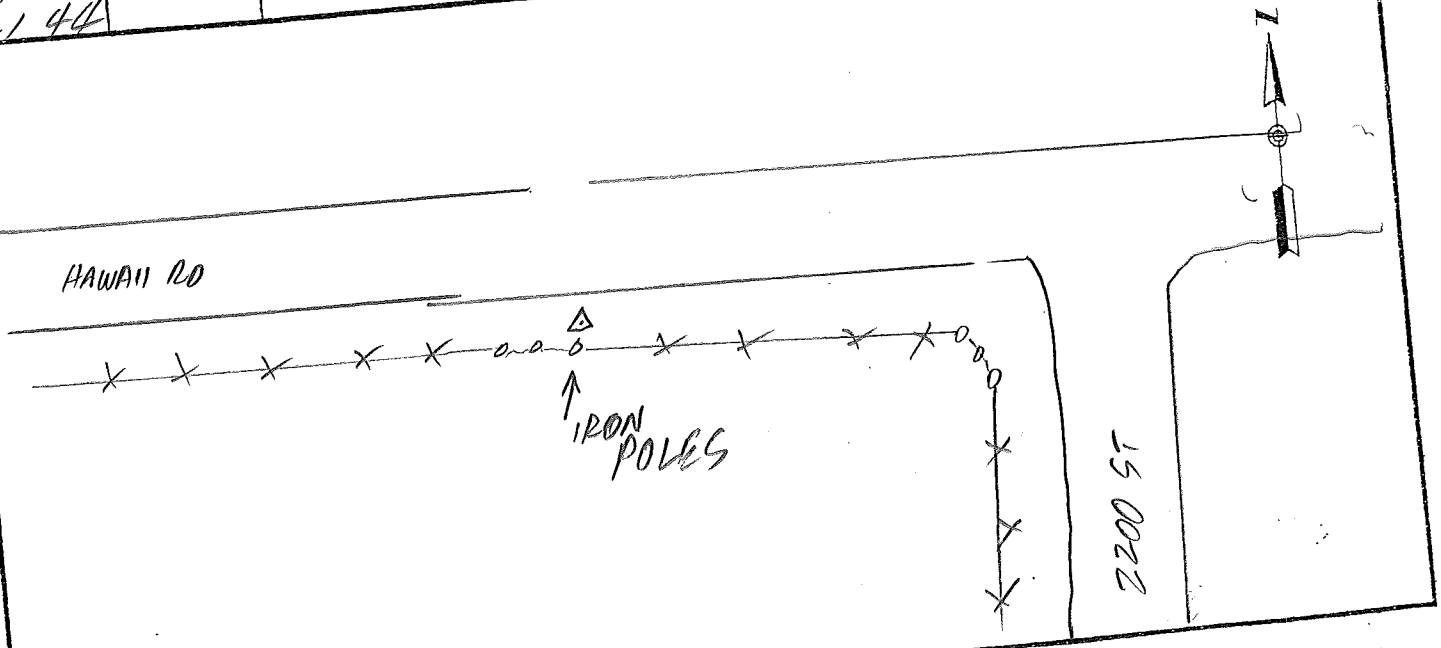
STATION DESCRIPTIONS SET REBAR
AND PLASTIC CAP
±275' W. OF INT HAWAII RD AND 2200 ST
±27'S OF ℄ HAWAII RD
3' N. OF E'MOST BRACE POLE

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
19 02		
21 44		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
37 49 12.61206
95 20 38.43973
277.3873

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

PROJECT 112109
OPERATOR WJN
DATE 12/01/12

SITE NUMBER
SITE NAME 142

TRACKING TIMES (LOCAL) MEASURE CST
START 757
STOP 1329

SENSOR TYPE 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360
GS15

HEIGHT READINGS MTS FT
1.228

1.588

OBSTRUCTIONS: WATER TWR NE

STATION DESCRIPTIONS Set REBAR
AND PLASTIC CAP
± 100' N. OF ℄ HWY 39
± 10' W OF INT FENCES E-W-N
6' S OF N. R/W FEN

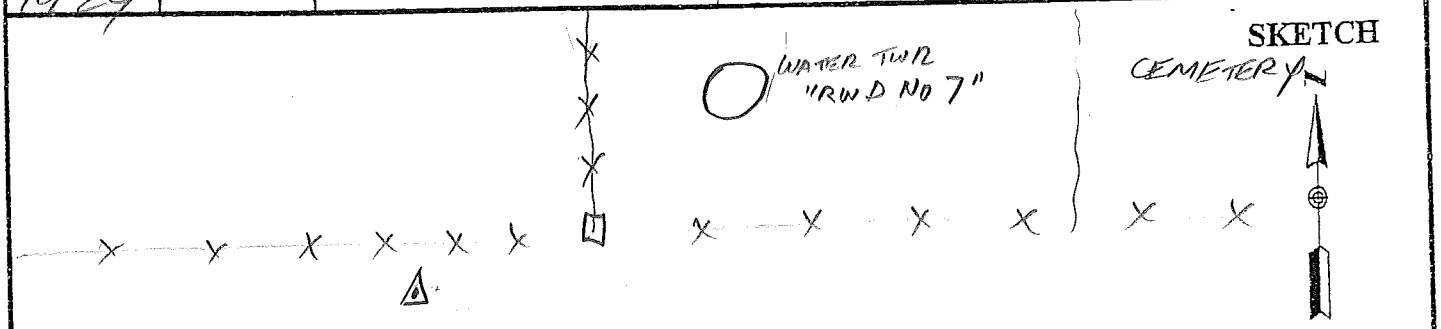
SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1357		
1929		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

37 40 54.93436
95 20 16.26998
271.0653

SKETCH



39

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

PROJECT 121109
OPERATOR WLW
DATE 12/01/12

SITE NUMBER
SITE NAME 1001

TRACKING TIMES (LOCAL) MEASURE CST
START RTK BASE
STOP

SENSOR TYPE 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360
GS15

HEIGHT READINGS MTS FT
1.184
1.544

OBSTRUCTIONS: NO

STATION DESCRIPTIONS SET 18"
REBAR AND PLASTIC CAP
±60' S. OF ℄ HWY 47
±20' E OF ℄ FIELD ACCESS
5.5' ENE OF E. GATE POST

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES

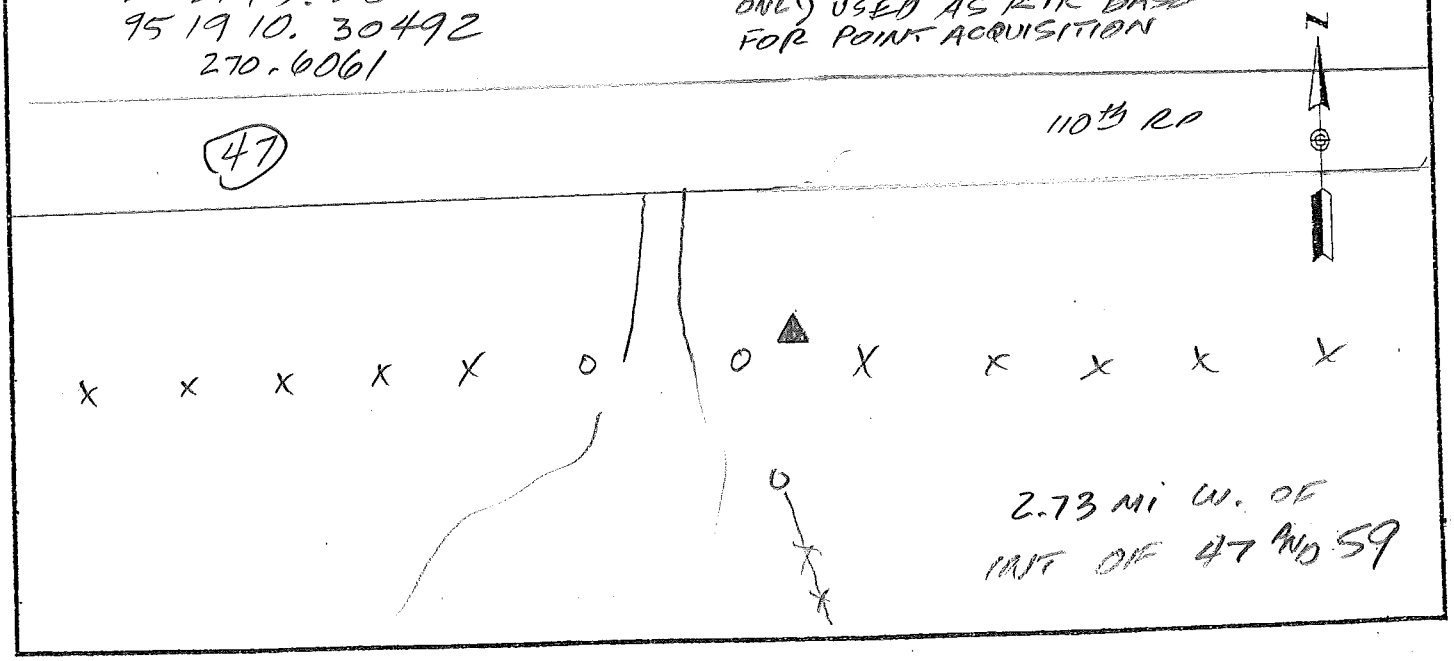
WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

STATIC DATA NOT STORED - MALFUNCTION

NOTE: THIS POINT IS UNUSUALLY NUMBERED BECAUSE IT WILL NOT BE USED FOR TOPO. ONLY USED AS RTK BASE FOR POINT ACQUISITION

37 31 45.38566
95 19 10.30492
270.6061

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083 RTK BASE

PROJECT 1121109
OPERATOR WVN
DATE 12/07/12

SITE NUMBER
SITE NAME 1001

TRACKING TIMES (LOCAL) MEASURE CST
START 9:02
STOP 13:34

SENSOR TYPE 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360
GS15

HEIGHT READINGS MTS FT
1.181
1.541

OBSTRUCTIONS: NO

STATION DESCRIPTIONS Rebar and Cap Set 12/01/12

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
1502		
1934		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

As BEFORE DESC.

SKETCH

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

RT 156

PROJECT 112109
OPERATOR WJN
DATE 12/2/12

SITE NUMBER
SITE NAME 156

TRACKING TIMES (LOCAL) MEASURE CBT
START 1412
STOP 1540

SENSOR TYPE GS15 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT
299/399 0.441
399E/9500 0.389
500 0.360
GS 15

HEIGHT READINGS MTS FT
1.222
1.582

OBSTRUCTIONS: NO

STATION DESCRIPTIONS 5/8 + Rebar AND PLASTIC CAP ± 75' N OF ℄ 26000 RD, ± 30' W OF ℄ LYON RD, ± 30' N OF FENCE COR, 3' E OF R/W FENCE

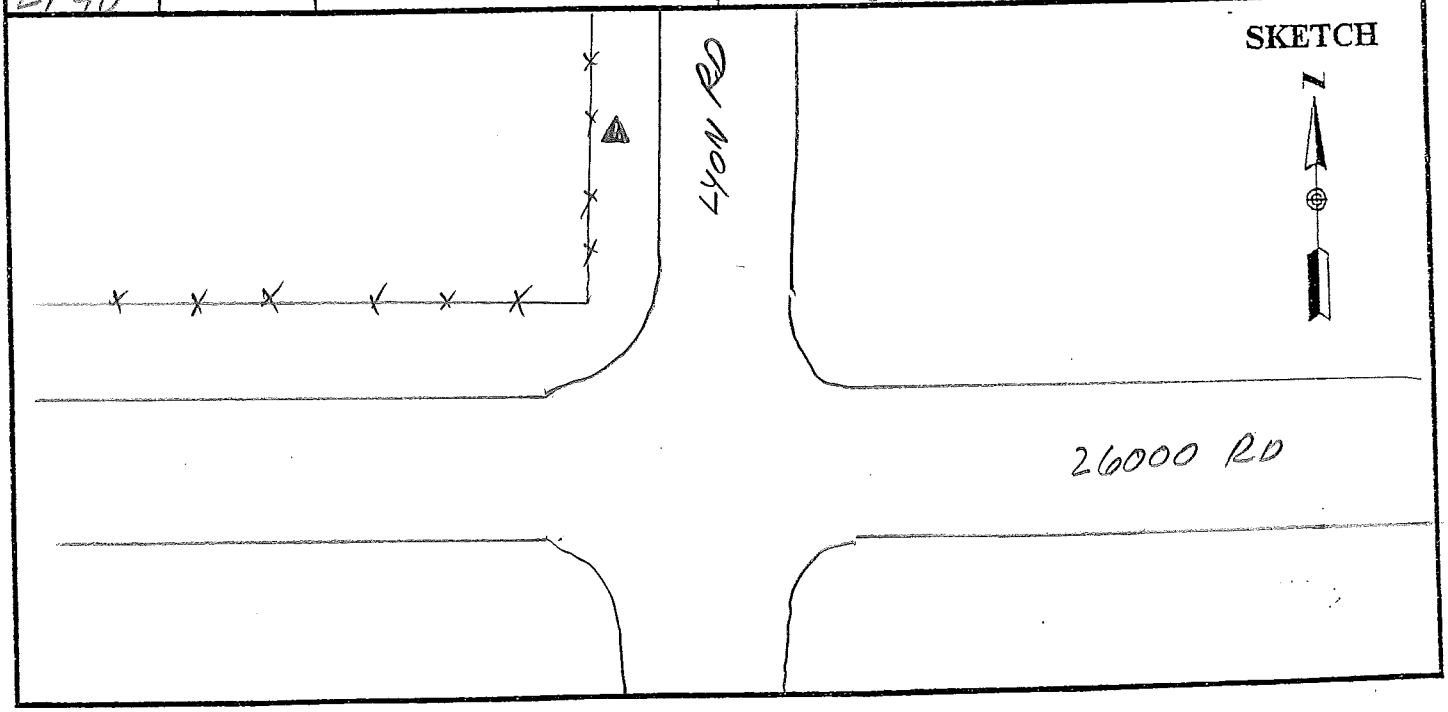
SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
2012		
2140		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

37 22 09.63149
95 19 19.13574
250.3652

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

PROJECT 112109
OPERATOR MJN
DATE 12/3/12

SITE NUMBER
SITE NAME 156

TRACKING TIMES (LOCAL) MEASURE CST
START 8:46
STOP 13:02

SENSOR TYPE 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360
GS15

OBSTRUCTIONS: NO

HEIGHT READINGS MTS FT
1.123
1.493

STATION DESCRIPTIONS SET REBAR (18") AND PLASTIC CAP ON 12/2

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
14 46		
19 02		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

AS BEFORE DESCRIBED

SKETCH

AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

PROJECT 112109
OPERATOR WJN
DATE 12/03/12

SITE NUMBER
SITE NAME 174

TRACKING TIMES (LOCAL) MEASURE CST
START 14:07
STOP 16:49

SENSOR TYPE 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

OBSTRUCTIONS: PPL W

HEIGHT READINGS MTS FT
1.152
1.512

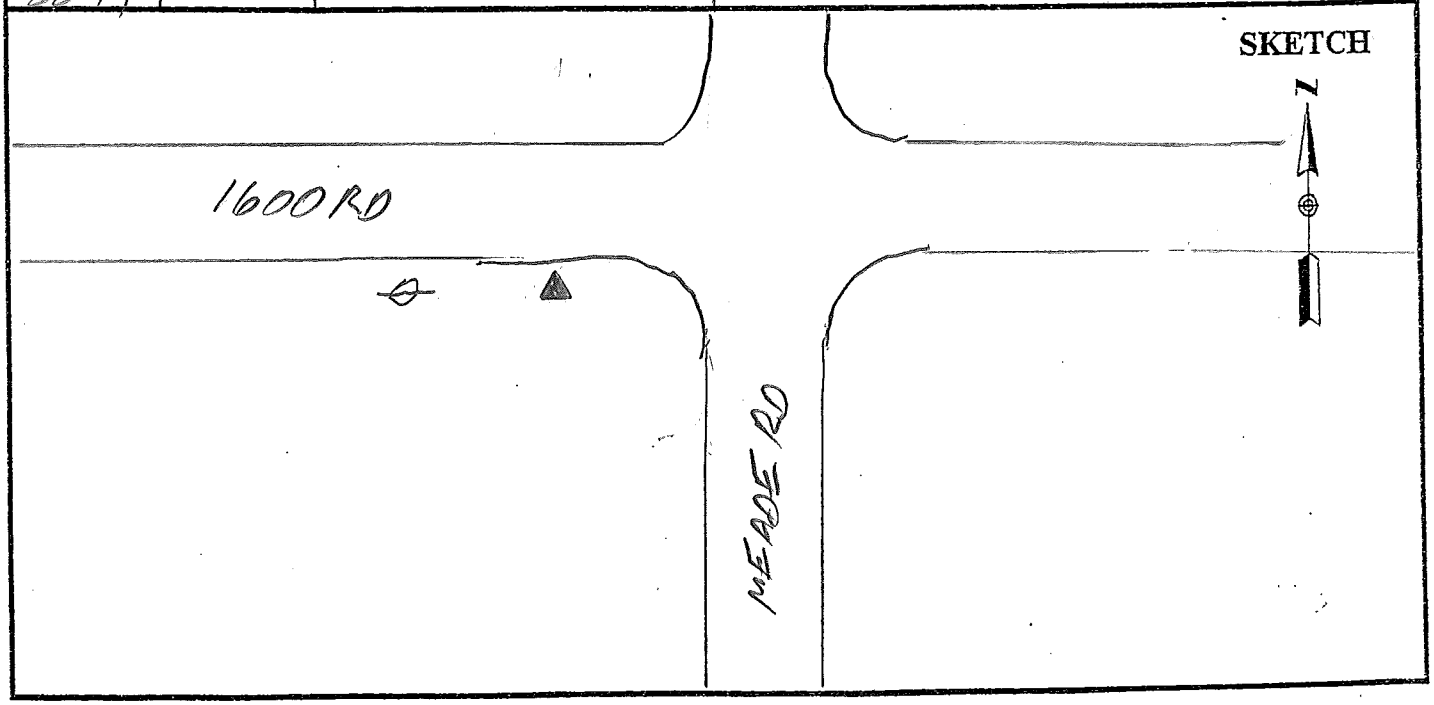
STATION DESCRIPTIONS SET REBAR 18" AND PLASTIC CAP
± 20' S. OF ℄ 1600 RD
± 27' E. OF PPL (No #)
± 39' W. OF ℄ MEADE RD

SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES
20 07		
22 49		

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS
3704 37.35846
9518 16.42344
243.1927

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

RTIC BASE

PROJECT 121109
OPERATOR WJN
DATE 12/04/12

SITE NUMBER
SITE NAME 130

TRACKING TIMES (LOCAL) MEASURE CST
START 939
STOP 1400

SENSOR TYPE 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT 299/399 0.441
399E/9500 0.389
500 0.360

GS 15

HEIGHT READINGS MTS FT
1.234

1.594

OBSTRUCTIONS: NO

STATION DESCRIPTIONS Set Rebar
AND PLASTIC CAP
±20' N. of ℄ 6000 RD.
±21' E. of ℄ MEADE RD
5' SSW OF STREET SIGN

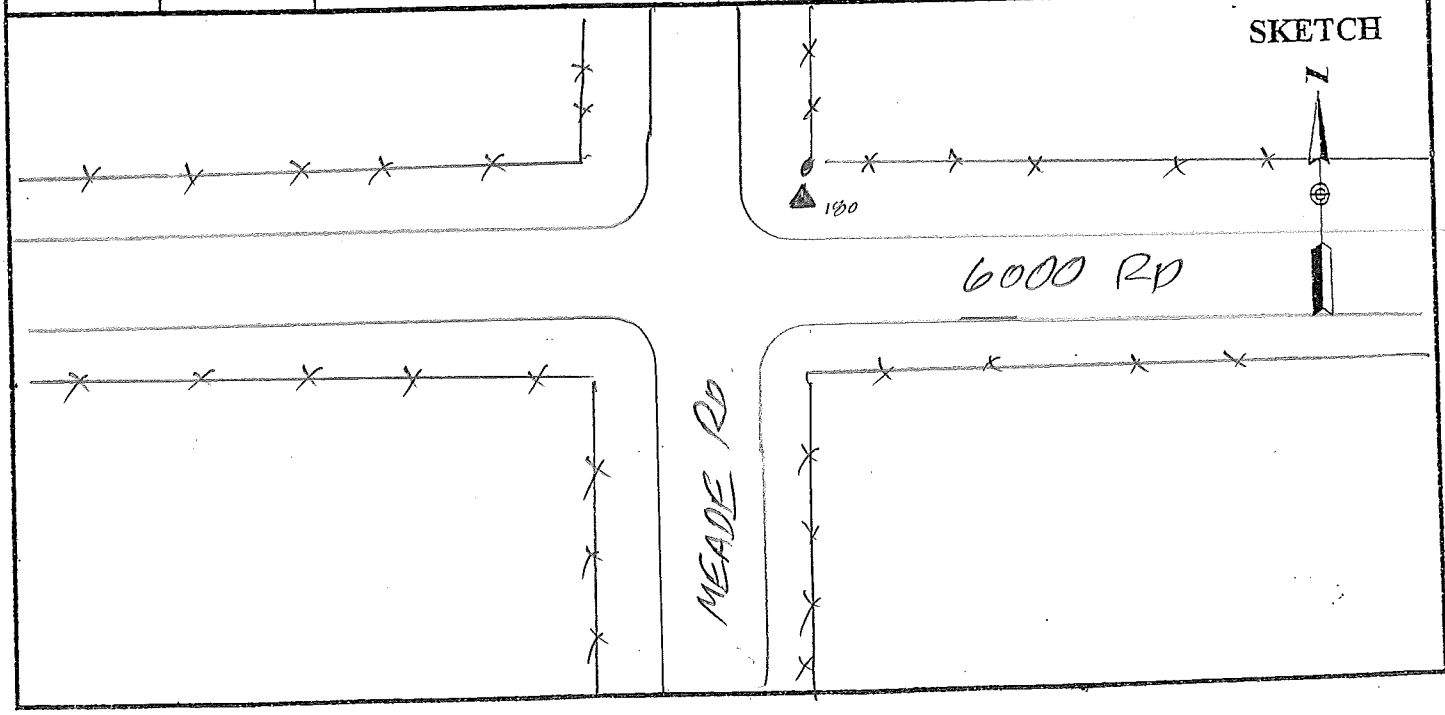
SATELLITE OBSERVATIONS

TIME	GDOP	SATELLITES

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS

370 d 37.359 d 6
95 19 16 d 2341
242.1927

SKETCH



AERO-METRIC, INC.
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

PROJECT 1121109
OPERATOR WJN
DATE 12/4/12

SITE NUMBER
SITE NAME 187

TRACKING TIMES (LOCAL) MEASURE CST
START 1427
STOP 1530

SENSOR TYPE 500 9500 399 299
MEMORY CARD
BATTERY NO.
CONTROLLER NO.
SENSOR NO.

SENSOR CONSTANT
299/399 0.441
399E/9500 0.389
500 0.360

HEIGHT READINGS MTS FT
1.172
1.532

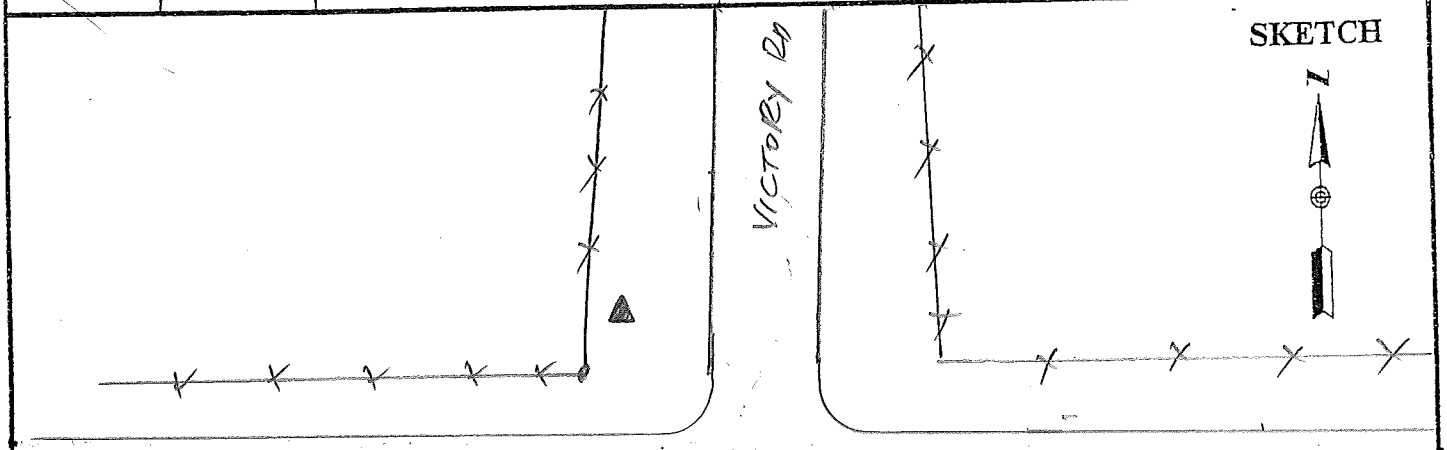
OBSTRUCTIONS:

STATION DESCRIPTIONS Set 12" SPIKE,
± 85' N. of ℄ HWY 166
± 46' W of ℄ VICTORY RD
± 14' N AND ± 8' E OF FENCE COR

SATELLITE OBSERVATIONS

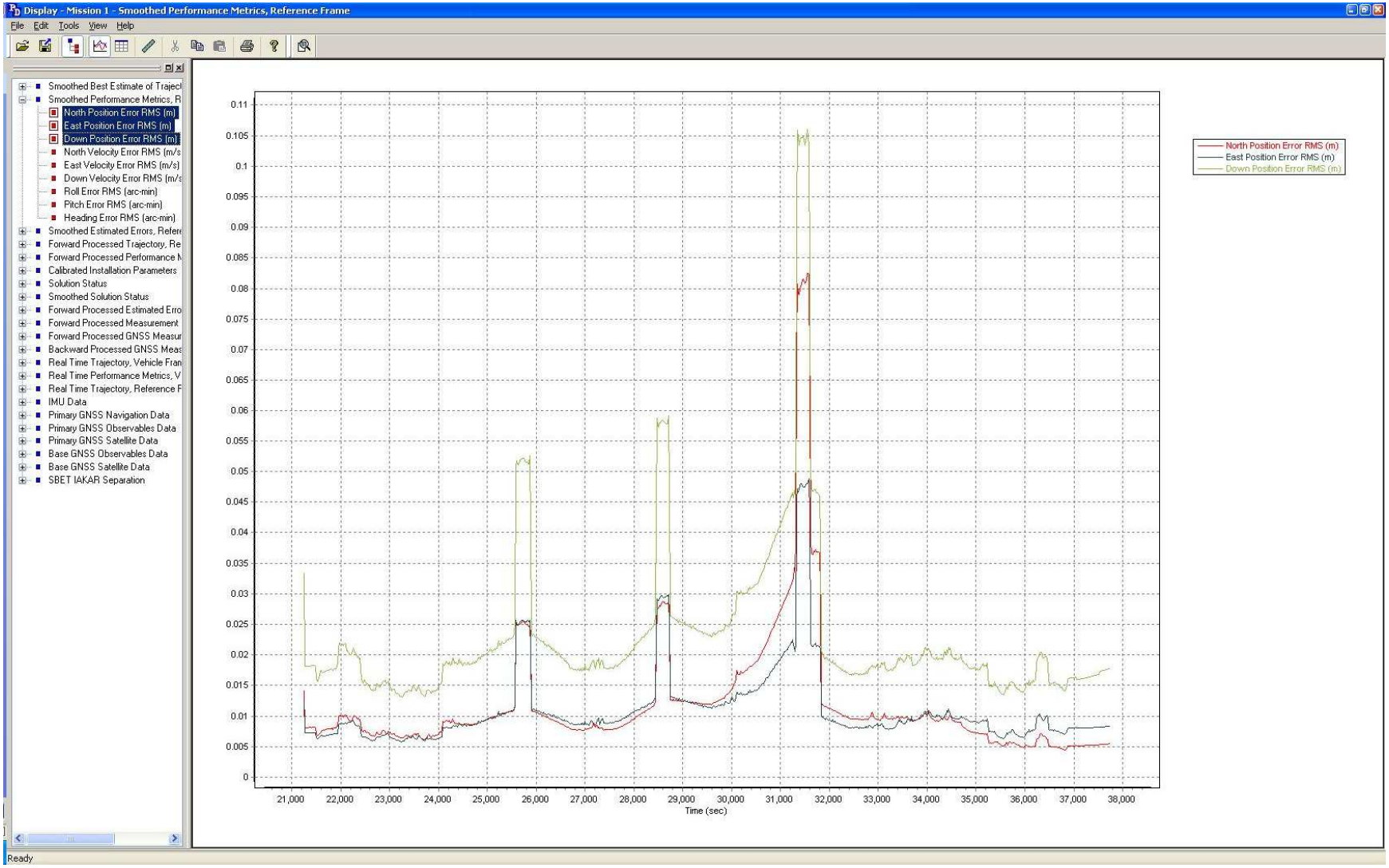
TIME	GDOP	SATELLITES

WEATHER CONDITIONS/IMPORTANT OBSERVATIONS



KS 166

Mission 11172012B



11202012B.txt

S O F T W A R E V E R S I O N

TerraPOS version: 2.0.4 (1851)

N A V I G A T I O N F I L E S U M M A R Y

First record : 2012 11 20 22 37 18.0
Last record : 2012 11 21 01 41 40.0
Average time increment : 1.000 s (1.0 Hz)
No. recs. with valid pos. : 11063
No. recs. with valid vel. : 11063
No. recs. with valid att. : 0

N A V I G A T I O N P E R F O R M A N C E S U M M A R Y

	Min.	1%	5%	50%	95%	99%	Max.
Pos. hor. std. dev. [m]	0.019	0.021	0.023	0.027	0.030	0.031	0.033
Pos. vert. std. dev. [m]	0.030	0.034	0.037	0.046	0.055	0.056	0.064
Vel. hor. std. dev. [m/s]	0.086	0.088	0.088	0.090	0.092	0.092	0.272
Vel. vert. std. dev. [m/s]	0.174	0.176	0.177	0.180	0.185	0.186	0.676

C Y C L E S L I P S A N D D E L E T E D O B S E R V A T I O N S

Observable used: IF Phas

Sat	#obs avbl	%obs del	#L1 slips	#L2 slips
G01	124	0.00	1	1
G03	9213	0.00	0	0
G06	9625	0.07	0	0
G09	11063	0.00	0	0
G11	2242	0.00	1	2
G12	1402	0.00	1	1
G14	11063	0.00	0	0
G15	7337	0.00	0	3
G18	11063	0.00	0	0
G19	8722	0.01	1	1
G21	11063	0.05	0	0
G22	11063	0.00	0	0

G24	11063	0.00	0	0
G25	664	0.00	1	1
G26	1826	0.00	0	0
G29	2383	0.00	0	0
G31	2194	0.00	1	1
R01	1919	0.00	1	2
R05	288	0.00	0	0
R06	8612	0.17	0	0
R07	11063	0.10	0	0
R08	9966	0.23	2	2
R09	9585	0.09	1	1
R10	6075	0.00	1	1
R11	1282	0.00	2	3
R15	3603	0.00	0	0
R16	9512	0.08	0	0
R20	765	0.00	5	10
R21	5527	0.20	0	0
R22	9664	0.08	0	0
R23	29	100.00	13	13
R24	4575	0.00	1	1
TOT	194575	0.07	32	43
Si			0.59	0.80

Observable used: IF Code

Sat	#obs avbl	%obs del
G01	124	0.00
G03	9213	0.00
G06	9625	0.00
G09	11063	0.00
G11	2242	0.00
G12	1402	0.00
G14	11063	0.00
G15	7337	0.00
G18	11063	0.00
G19	8722	0.00
G21	11063	0.00
G22	11063	0.00
G24	11063	0.00
G25	664	0.00
G26	1826	0.00
G29	2383	0.00
G31	2194	0.00
R01	1920	0.00
R05	288	0.00
R06	8612	0.00
R07	11063	0.00
R08	9966	0.00
R09	9585	0.00
R10	6075	0.00
R11	1286	0.00
R15	3603	0.00
R16	9512	0.00
R20	770	0.00
R21	5527	0.00
R22	9664	0.00
R23	18	100.00
R24	4575	0.00
TOT	194574	0.01

11182012A.txt

S O F T W A R E V E R S I O N

TerraPOS version: 2.0.4 (1851)

N A V I G A T I O N F I L E S U M M A R Y

First record : 2012 11 18 16 36 40.0
Last record : 2012 11 18 22 35 02.0
Average time increment : 1.000 s (1.0 Hz)
No. recs. with valid pos. : 21503
No. recs. with valid vel. : 21503
No. recs. with valid att. : 0

N A V I G A T I O N P E R F O R M A N C E S U M M A R Y

	Min.	1%	5%	50%	95%	99%	Max.
Pos. hor. std. dev. [m]	0.013	0.013	0.014	0.016	0.020	0.021	0.022
Pos. vert. std. dev. [m]	0.018	0.019	0.021	0.025	0.035	0.040	0.041
Vel. hor. std. dev. [m/s]	0.082	0.085	0.085	0.085	0.087	0.087	0.258
Vel. vert. std. dev. [m/s]	0.171	0.171	0.172	0.173	0.176	0.178	0.658

C Y C L E S L I P S A N D D E L E T E D O B S E R V A T I O N S

Observable used: IF Phas

Sat	#obs avbl	%obs del	#L1 slips	#L2 slips
G02	17461	0.00	0	0
G03	14	0.00	1	1
G04	9259	0.00	0	0
G05	20873	0.00	1	3
G06	2858	0.00	1	1
G09	5055	0.00	1	1
G10	12106	0.00	0	0
G12	13482	0.00	0	0
G13	907	0.00	4	5
G15	11996	0.00	1	1
G17	5053	0.00	0	0
G18	9206	0.00	1	1

G21	12071	0.00	1	3
G22	2774	0.00	1	1
G24	5403	0.00	1	1
G25	16090	0.00	0	0
G26	14099	0.00	1	2
G29	18140	0.00	1	1
G30	4028	0.00	1	1
R01	8928	0.00	0	0
R02	15526	0.00	0	1
R03	18307	0.00	1	1
R04	12817	0.00	1	1
R05	6547	0.00	1	1
R08	2762	0.00	0	0
R09	1291	0.00	1	1
R13	2497	0.00	1	1
R14	4053	0.00	2	2
R15	6687	0.00	0	0
R16	8321	0.00	1	1
R17	16854	0.00	0	0
R18	19207	0.00	1	1
R19	11197	0.00	1	1
R20	4537	0.00	1	1
R23	1677	0.00	0	0
R24	9812	0.00	0	0
TOT	331895	0.00	27	34
Si			0.29	0.37

Observable used: IF Code

Sat	#obs avbl	%obs del
G02	17461	0.00
G03	14	0.00
G04	9259	0.00
G05	20873	0.00
G06	2858	0.00
G09	5055	0.00
G10	12106	0.00
G12	13482	0.00
G13	907	0.00
G15	11996	0.00
G17	5053	0.00
G18	9206	0.00
G21	12071	0.00
G22	2774	0.00
G24	5403	0.00
G25	16090	0.00
G26	14099	0.00
G29	18140	0.00
G30	4028	0.00
R01	8928	0.00
R02	15528	0.00
R03	18307	0.00
R04	12817	0.00
R05	6547	0.00
R08	2762	0.00
R09	1291	0.00
R13	2497	0.00
R14	4054	0.00
R15	6687	0.00
R16	8321	0.00
R17	16854	0.00
R18	19207	0.00
R19	11197	0.00

R20	4537	0.00
R23	1677	0.00
R24	9812	0.00
TOT	331898	0.00

11192012A.txt

S O F T W A R E V E R S I O N

TerraPOS version: 2.0.4 (1851)

N A V I G A T I O N F I L E S U M M A R Y

First record : 2012 11 19 19 04 45.0
Last record : 2012 11 20 00 13 19.0
Average time increment : 1.000 s (1.0 Hz)
No. recs. with valid pos. : 18515
No. recs. with valid vel. : 18515
No. recs. with valid att. : 0

N A V I G A T I O N P E R F O R M A N C E S U M M A R Y

	Min.	1%	5%	50%	95%	99%	Max.
Pos. hor. std. dev. [m]	0.013	0.013	0.014	0.016	0.021	0.023	0.023
Pos. vert. std. dev. [m]	0.019	0.020	0.021	0.026	0.040	0.043	0.043
Vel. hor. std. dev. [m/s]	0.083	0.085	0.085	0.086	0.087	0.088	0.261
Vel. vert. std. dev. [m/s]	0.171	0.172	0.172	0.173	0.178	0.179	0.662

C Y C L E S L I P S A N D D E L E T E D O B S E R V A T I O N S

Observable used: IF Phas

Sat	#obs avbl	%obs del	#L1 slips	#L2 slips
G02	8270	0.00	0	0
G03	6247	0.00	1	1
G04	170	0.00	0	0
G05	11732	0.00	0	0
G06	8983	0.00	1	1
G09	8563	0.00	1	1
G10	2977	0.00	0	0
G12	4421	0.00	0	0
G14	5821	0.00	1	1
G15	18193	0.00	1	1
G18	15331	0.01	1	1
G19	3061	0.00	1	1

Sat				
G21	18194	0.00	2	3
G22	9001	0.00	1	1
G24	8527	0.00	1	1
G25	7039	0.00	0	0
G26	14639	0.00	0	0
G29	15478	0.00	0	0
G30	4365	0.00	1	1
R03	6094	0.00	0	0
R04	13110	0.00	0	0
R05	18515	0.17	0	0
R06	12564	0.13	1	1
R07	5184	0.19	1	1
R09	474	0.00	1	1
R14	5943	0.00	1	1
R15	6804	0.06	1	1
R16	4134	0.41	1	1
R17	964	0.00	0	0
R18	7755	0.00	0	0
R19	13779	0.00	0	0
R20	17154	0.15	1	1
R21	11064	0.11	1	1
R22	5124	0.23	1	1
TOT	299674	0.04	21	22
Si			0.25	0.26

Observable used: IF Code

Sat	#obs avbl	%obs del
G02	8270	0.00
G03	6247	0.00
G04	170	0.00
G05	11732	0.00
G06	8983	0.00
G09	8563	0.00
G10	2977	0.00
G12	4421	0.00
G14	5821	0.00
G15	18193	0.00
G18	15331	0.00
G19	3061	0.00
G21	18196	0.00
G22	9001	0.00
G24	8527	0.00
G25	7039	0.00
G26	14639	0.00
G29	15478	0.00
G30	4365	0.00
R03	6094	0.00
R04	13110	0.00
R05	18515	0.00
R06	12564	0.00
R07	5184	0.00
R09	474	0.00
R14	5943	0.00
R15	6804	0.00
R16	4134	0.00
R17	964	0.00
R18	7755	0.00
R19	13779	0.00
R20	17154	0.00
R21	11064	0.00
R22	5124	0.00

TOT	299676	0.00

S O F T W A R E V E R S I O N

TerraPOS version: 2.0.4 (1851)

N A V I G A T I O N F I L E S U M M A R Y

First record : 2012 11 20 02 33 05.0
Last record : 2012 11 20 08 30 05.0
Average time increment : 1.000 s (1.0 Hz)
No. recs. with valid pos. : 21135
No. recs. with valid vel. : 21135
No. recs. with valid att. : 0

Data gaps:
2012 11 20 02 44 24.0 : 287.0 s

N A V I G A T I O N P E R F O R M A N C E S U M M A R Y

	Min.	1%	5%	50%	95%	99%	Max.
Pos. hor. std. dev. [m]	0.015	0.015	0.016	0.018	0.023	0.085	0.085
Pos. vert. std. dev. [m]	0.022	0.023	0.024	0.028	0.038	0.073	0.074
Vel. hor. std. dev. [m/s]	0.085	0.085	0.085	0.086	0.088	0.090	0.260
Vel. vert. std. dev. [m/s]	0.172	0.172	0.173	0.174	0.176	0.180	0.659

C Y C L E S L I P S A N D D E L E T E D O B S E R V A T I O N S

Observable used: IF Phas

Sat	#obs avbl	%obs del	#L1 slips	#L2 slips
G01	10354	0.00	1	1
G03	8369	0.00	1	1
G06	9364	0.00	1	2
G07	6677	0.00	1	1
G08	554	0.00	2	2
G10	5357	0.00	1	1
G11	7066	0.00	1	1
G12	4681	0.00	1	1
G13	10193	0.00	1	1

G14	11200	0.00	2	2
G16	15107	0.00	1	1
G18	2511	0.00	1	1
G19	4847	0.00	1	1
G20	18060	0.00	4	3
G22	7852	0.00	1	1
G23	16007	0.00	1	1
G25	9724	0.00	1	1
G30	18857	0.00	1	1
G31	18075	0.00	1	2
G32	18366	0.00	1	1
R01	17728	0.00	1	2
R02	11740	0.00	1	1
R03	5950	0.00	1	1
R06	2588	0.00	1	1
R07	9359	0.00	1	1
R08	15134	0.02	1	2
R09	7582	0.00	1	1
R10	14193	0.00	1	1
R11	20230	0.00	1	1
R12	13870	0.00	1	1
R13	6250	0.00	1	1
R16	1430	0.00	1	1
R20	6212	0.00	1	1
R21	7990	0.00	1	1
R22	5320	0.00	1	1
R23	2522	0.00	5	9
R24	1673	0.00	3	6
TOT	352992	0.00	48	58
Si			0.49	0.59

Observable used: IF Code

Sat	#obs avbl	%obs del
G01	10354	0.00
G03	8369	0.00
G06	9364	0.00
G07	6677	0.00
G08	554	0.00
G10	5357	0.00
G11	7066	0.00
G12	4681	0.00
G13	10193	0.00
G14	11200	0.00
G16	15107	0.00
G18	2511	0.00
G19	4847	0.00
G20	18060	0.00
G22	7852	0.00
G23	16007	0.00
G25	9724	0.00
G30	18857	0.00
G31	18075	0.00
G32	18366	0.00
R01	17729	0.00
R02	11740	0.00
R03	5950	0.00
R06	2588	0.00
R07	9359	0.00
R08	15135	0.00
R09	7582	0.00
R10	14193	0.00
R11	20230	0.00

R12	13870	0.00
R13	6250	0.00
R16	1430	0.00
R20	6212	0.00
R21	7990	0.00
R22	5320	0.00
R23	2499	0.16
R24	1681	0.00
TOT	352979	0.00

11202012A.txt

S O F T W A R E V E R S I O N

TerraPOS version: 2.0.4 (1851)

N A V I G A T I O N F I L E S U M M A R Y

First record : 2012 11 20 15 17 16.0
Last record : 2012 11 20 20 38 42.0
Average time increment : 1.000 s (1.0 Hz)
No. recs. with valid pos. : 19287
No. recs. with valid vel. : 19287
No. recs. with valid att. : 0

N A V I G A T I O N P E R F O R M A N C E S U M M A R Y

	Min.	1%	5%	50%	95%	99%	Max.
Pos. hor. std. dev. [m]	0.015	0.015	0.016	0.018	0.022	0.023	0.024
Pos. vert. std. dev. [m]	0.025	0.026	0.027	0.030	0.044	0.045	0.054
Vel. hor. std. dev. [m/s]	0.084	0.085	0.086	0.086	0.088	0.088	0.259
Vel. vert. std. dev. [m/s]	0.173	0.173	0.173	0.174	0.179	0.180	0.668

C Y C L E S L I P S A N D D E L E T E D O B S E R V A T I O N S

Observable used: IF Phas

Sat	#obs avbl	%obs del	#L1 slips	#L2 slips
G02	19287	0.00	0	0
G05	15932	0.00	1	2
G09	6875	0.00	0	0
G10	16406	0.00	0	2
G12	17635	0.00	0	0
G13	1476	0.00	1	1
G15	5424	0.00	1	1
G17	9264	0.00	0	0
G18	2607	0.00	2	3
G20	2725	0.00	0	2
G21	5634	0.00	1	1
G24	7289	0.00	0	0

G25	15366	0.00	1	1
G26	7410	0.00	1	1
G28	4053	0.00	0	0
G29	11706	0.00	1	1
G30	2098	0.00	1	3
R01	927	0.00	1	2
R02	7387	0.00	0	1
R03	13164	0.00	0	0
R04	16457	0.00	1	1
R05	11687	0.00	1	1
R06	6197	0.00	1	1
R09	10877	0.00	0	0
R10	8896	0.00	1	1
R11	2649	0.00	1	1
R15	3580	0.00	0	0
R16	7536	0.00	0	0
R17	5957	0.00	1	1
R18	14210	0.00	0	0
R19	19287	0.00	0	0
R20	12251	0.00	2	2
R21	5147	0.00	1	1
TOT	297396	0.00	20	30
Si			0.24	0.36

Observable used: IF Code

Sat	#obs avbl	%obs del
G02	19287	0.00
G05	15932	0.00
G09	6875	0.00
G10	16406	0.00
G12	17635	0.00
G13	1476	0.00
G15	5424	0.00
G17	9264	0.00
G18	2607	0.00
G20	2725	0.00
G21	5634	0.00
G24	7289	0.00
G25	15366	0.00
G26	7410	0.00
G28	4053	0.00
G29	11706	0.00
G30	2098	0.00
R01	928	0.00
R02	7388	0.00
R03	13164	0.00
R04	16457	0.00
R05	11687	0.00
R06	6197	0.00
R09	10877	0.00
R10	8896	0.00
R11	2649	0.00
R15	3580	0.00
R16	7536	0.00
R17	5957	0.00
R18	14210	0.00
R19	19287	0.00
R20	12251	0.00
R21	5147	0.00
TOT	297398	0.00