Jefferson County
Iowa

Countywide
G.P.S. Survey
Control Network

2005

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INTRODUCTION

In 2005, The Sidwell Company contracted with DC Inc. to complete a high accuracy GPS control survey in Jefferson County, Iowa for the purpose of establishing a county-wide survey control system and for future use in a county-wide GIS system.

Thirty six (36) new control stations were added within the County along with, five (5) existing Henry County GPS control points, seven (7) existing Wapello County GPS control points, eight (8) Van Buren County GPS control points, three (3) Keokuk County GPS control points, and four (4) Washington County GPS control points were recovered and tied into the GPS network. An additional six (6) control stations consisting of two (2) NGS and USGS first order benchmarks, were included in the network along with four (4) existing HARN positions. A total of sixty nine (69) points were measured.

PROJECT REQUIREMENTS

The purpose of this survey was to establish new state plane control throughout the project area, using a new horizontal and vertical control network with GPS survey equipment and techniques. This network was horizontally referenced to the Iowa High Accuracy Reference Network (HARN) of 1996. Vertically the network was referenced to the North American Vertical Datum of 1988 (NAVD88). Because this control would be utilized for many different purposes, it was important that the network geometry be ideal for a strong GPS survey. All new point locations for control were selected with the needs of future multiple uses and GPS survey requirements in mind. In some instances, it was necessary to adjust locations because of physical obstructions or existing land features. In these instances, the network was constructed with the coverage of the county held as primary and the GPS survey needs satisfied secondly. Because both of these philosophies support good geometry the network structure was not compromised.

MONUMENTATION

To perpetuate the GPS control measurements, 36 new permanent monuments were set for Jefferson County. BERNTSEN driven aluminum rod monuments were selected for the permanent monuments. Each BERNTSEN station monument consists of one three-foot smooth rod section and one three-foot top security fluted rod section with a stamped cap fastened to the top, all constructed of aluminum material. There is a permanent magnet mounted on the underside of the monument cap for future recovery with a magnetic locator. These monuments were driven to approximately 6” below the existing ground surface. For easy access and protection, a 24” long 5” diameter PVC pipe was placed over each rod monument along with a pre-cast aluminum access cover and backfilled with sand to facilitate drainage and to minimize frost movement. A steel fence post with a plastic sleeve was placed as a witness point at each new permanent monument position.

DC Inc. handled the creation of the One Call data with the County Engineer’s office handling the One Call coordination for marking the various underground utility locations for each new permanent monument site.

RECONNAISSANCE

The most important criterion for GPS observations at any given location is a clear view to the sky. In terms of network design, it is desirable that the horizontal control be located near the perimeter and also throughout the project site if possible. With this in mind, existing HARN horizontal stations were recovered in and/or near Jefferson County along with other control that has been adjusted to the HARN. All positions in and near the county were chosen to be included in the network.

Vertical control was selected to provide as much coverage as possible, both at the periphery and in the interior of the project area.

FIELD SURVEY

Two Trimble 24 channel dual frequency Geodetic GPS receivers with Everest multi-path mitigation and high performance low elevation satellite tracking and two single frequency Trimble receivers were used in this survey. GPS observations began Monday, August 15, 2005. GPS observations were made during daylight and evening hours from Monday, August 15, 2005, through Wednesday, August 17, 2005.

Rapid static GPS techniques were utilized to minimize the time and cost of the survey. The satellite "window", where at least six satellites were observable, was open for much of the day with only a few short periods of unacceptable coverage because of the number of satellites or bad geometry. Each measurement period during which all receivers observe satellites simultaneously lasted from 10 minutes to 150 minutes, depending on the distance being measured and the geometry of the satellite constellation.

DATA ADJUSTMENT

A total number of 188 vectors were observed and processed. Based on statistical indicators from the Trimble Geomatics Office processing software, there were 8 vectors flagged as outliers. After the re-measuring of these vectors and the removal of trivial vectors the final network is comprised of 69 stations and 120 baselines. All data adjustment was performed using the Trimble Geomatics Office least squares adjustment software. An initial free adjustment was performed in NAD83 to check the overall quality of the GPS data and the nature of the control. The initial unconstrained (free) adjustment yielded baseline precisions which ranged from 1:242,900 to 1:2,413,600 with the 3 mile baselines falling in the 1:500,000 range or better. Once the horizontal and vertical control was verified, subsequent adjustments were performed to arrive at the optimal solutions for each datum.

NAD83 (1996)

The initial free adjustment was performed holding HARN point T-124 fixed horizontally with the vertical adjustment disabled. Coordinate values on the other HARN control stations were then checked against the published values. The network fit the published HARN values within a few hundredths of a foot. Because all of the horizontal data fit so well, the HARN-referenced stations from other counties were added to the network and a new adjustment performed. After each

adjustment a comparison of adjusted coordinates vs. published values was made. By holding all of the existing HARN stations fixed, and the control that was adjusted to the HARN, the precision of the adjustment degraded very little as compared to the unconstrained adjustment.

Once we were satisfied with the horizontal adjustment, we locked the horizontal positions and concentrated on the vertical adjustment. The Geoid 03 Conus was utilized to provide a model of the height of the Geoid. Adjustments were then performed locking on to the orthometric vertical control stations one at a time beginning with T-124. Vertical control was added station by station with the elevations on the benchmarks being then checked against the published values. Vertical control station G-124 was found to be in very poor condition. The structure that contained the location of the point showed signs of cracking and settlement. When this point was included in the adjustment it caused a vertical depression of over 0.4' in this area. It was felt that the structure is unstable and was not used as control, but a new elevation was created for this point. It should be noted that this point is suspect for vertical stability in the future.

A final adjustment of both horizontal and vertical was then performed. All of the horizontal control points were held fixed in x and y and all vertical control were held fixed in z. This fully constrained adjustment solved for scale and rotation. In the final adjusted network, 100% of the adjusted vectors have an estimated error of x, y and z baseline precision between 1:208,200 to 1:1,108,400, with the 3 mile baselines again falling in the 1:500,000 range or better. All of the processed data and error factors were computed using a 95% confidence level factor.

CONCLUSION

The results are well in excess of Order C class 1 (first-order precision) on short baselines (less than 3 miles) and between Order C class 1 and Order B on longer baselines (3 to 4 miles in length). On long baselines (over 6 miles) the precision is better than Order B. The control point locations are within $\pm$ 0.04 ft horizontal position and within $\pm$ 0.08 ft. vertically for benchmark use.

Network Adjustment Report

Project : JeffersonCoFinal

User name	Gary Brown	**Date & Time**	2:24:28 PM 8/23/2005
Coordinate System	US State Plane 1983	**Zone**	Iowa South 1402
Project Datum	NAD 1983/1996 (Conus)		
Vertical Datum	NAD88	**Geoid Model**	Geoid 03 (Conus)
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

Adjustment Style Settings - 95% Confidence Limits

Residual Tolerances

To End Iterations : 0.000033sft
Final Convergence Cutoff : 0.016404sft

Covariance Display

Horizontal
Propagated Linear Error [E] : U.S.
Constant Term [C] : 0.00000000sft
Scale on Linear Error [S] : 1.96

Three-Dimensional
Propagated Linear Error [E] : U.S.
Constant Term [C] : 0.00000000sft
Scale on Linear Error [S] : 1.96

Elevation Errors were used in the calculations.

Adjustment Controls

Compute Correlations for Geoid : True

Horizontal and Vertical adjustment performed

Set-up Errors

GPS
Error in Height of Antenna : 0.015sft
Centering Error : 0.015sft

Statistical Summary

Successful Adjustment in 1 iteration(s)

Network Reference Factor : 1.00
Chi Square Test (α=95%) : PASS
Degrees of Freedom : 232.00

GPS Observation Statistics

Reference Factor : 1.00
Redundancy Number (r) : 206.36

Geoid Model Statistics

Reference Factor : 1.00
Redundancy Number (r) : 25.64

Weighting Strategies

GPS Observations
User-defined Scalar Applied to All Observations

Scalar : 2.80

Geoid Observations
User-defined Scalar Applied to All Observations

Scalar : 0.64

Adjusted Coordinates

Adjustment performed in NAD 1983/1996 (Conus)

Number of Points : 69
Number of Constrained Points : 32
Horizontal Only : 1
Elevation Only : 6
Horizontal and Elevation Only : 25

Adjusted Grid Coordinates

Errors are reported using 1.96σ.

Point Name	Northing	N error	Easting	E error	Elevation	e error	Fix
316	378466.880sft	0.000sft	2132017.230sft	0.000sft	687.550sft	0.000sft	N E e
322	365560.030sft	0.000sft	2132337.510sft	0.000sft	683.910sft	0.000sft	N E e
536	333389.233sft	0.027sft	2115749.068sft	0.024sft	679.765sft	0.099sft	
152	325213.960sft	0.000sft	2117075.560sft	0.000sft	733.020sft	0.000sft	N E e
522	365013.863sft	0.022sft	2116335.141sft	0.020sft	727.793sft	0.103sft	
521	380615.146sft	0.029sft	2116038.795sft	0.028sft	722.731sft	0.121sft	
162	427581.290sft	0.000sft	2089529.680sft	0.000sft	707.280sft	0.000sft	N E e
506	411717.338sft	0.031sft	2100057.524sft	0.030sft	691.301sft	0.140sft	
520	379229.361sft	0.026sft	2100280.263sft	0.025sft	749.118sft	0.127sft	
523	366150.236sft	0.019sft	2100537.596sft	0.019sft	772.370sft	0.095sft	
534	348626.609sft	0.027sft	2101906.198sft	0.027sft	751.412sft	0.123sft	
533	349318.235sft	0.037sft	2087607.994sft	0.035sft	757.262sft	0.131sft	
145	332495.870sft	0.000sft	2087966.510sft	0.000sft	747.650sft	0.000sft	N E e
509	394145.886sft	0.023sft	2100076.028sft	0.023sft	730.345sft	0.148sft	
524	363917.644sft	0.029sft	2083984.327sft	0.028sft	769.042sft	0.133sft	
510	394997.518sft	0.025sft	2082816.610sft	0.025sft	776.959sft	0.153sft	
164	429061.790sft	0.000sft	2132889.750sft	0.000sft	654.760sft	0.000sft	N E e
303	413358.120sft	0.000sft	2134352.140sft	0.000sft	722.680sft	0.000sft	N E e
507	411723.162sft	0.029sft	2114641.371sft	0.028sft	696.470sft	0.127sft	
150	331926.000sft	0.000sft	2101286.960sft	0.000sft	706.130sft	0.000sft	N E e

519	379949.244sft	0.035sft	2085724.995sft	0.034sft	778.128sft	0.146sft	
310	396982.610sft	0.000sft	2131989.440sft	0.000sft	590.220sft	0.000sft	N E e
71	367793.438sft	0.000sft	2106540.734sft	0.000sft	757.500sft	0.000sft	N E e
508	396392.464sft	0.031sft	2116067.020sft	0.030sft	654.286sft	0.132sft	
163	427947.580sft	0.000sft	2110480.930sft	0.000sft	733.810sft	0.000sft	N E e
505	412048.606sft	0.025sft	2085586.642sft	0.024sft	715.842sft	0.134sft	
70	390549.360sft	0.000sft	2085565.040sft	0.000sft	772.397sft	0.153sft	N E
328	349307.900sft	0.000sft	2132725.210sft	0.000sft	699.090sft	0.000sft	N E e
535	350006.229sft	0.032sft	2115039.075sft	0.028sft	755.005sft	0.125sft	
161	427735.990sft	0.000sft	2068328.170sft	0.000sft	748.910sft	0.000sft	N E e
504	412144.566sft	0.034sft	2068232.422sft	0.033sft	751.580sft	0.135sft	
143	331973.770sft	0.000sft	2069239.120sft	0.000sft	755.920sft	0.000sft	N E e
138	331543.810sft	0.000sft	2053226.840sft	0.000sft	756.880sft	0.000sft	N E e
525	363122.517sft	0.029sft	2071482.769sft	0.028sft	767.985sft	0.119sft	
526	361841.387sft	0.031sft	2056595.422sft	0.030sft	753.515sft	0.124sft	
517	382063.945sft	0.039sft	2051176.760sft	0.038sft	771.850sft	0.144sft	
512	395469.355sft	0.032sft	2052185.089sft	0.031sft	792.068sft	0.154sft	
513	395482.629sft	0.033sft	2036408.833sft	0.032sft	767.266sft	0.158sft	
527	363298.445sft	0.034sft	2038156.226sft	0.032sft	725.325sft	0.149sft	
136	330935.060sft	0.000sft	2035946.900sft	0.000sft	752.990sft	0.000sft	N E e
455	428877.560sft	0.000sft	2035941.680sft	0.000sft	781.820sft	0.000sft	N E e
447	427793.310sft	0.000sft	2020152.550sft	0.000sft	800.420sft	0.000sft	N E e
531	347449.186sft	0.032sft	2052493.672sft	0.030sft	758.855sft	0.129sft	
503	411470.544sft	0.036sft	2052276.976sft	0.035sft	779.745sft	0.142sft	
502	411414.500sft	0.036sft	2036150.811sft	0.034sft	808.650sft	0.141sft	
530	347042.631sft	0.041sft	2037402.866sft	0.038sft	747.892sft	0.135sft	
528	363030.030sft	0.031sft	2021452.613sft	0.030sft	750.813sft	0.131sft	
529	346487.062sft	0.037sft	2022655.490sft	0.036sft	742.934sft	0.114sft	
515	378976.529sft	0.042sft	2020968.999sft	0.041sft	728.728sft	0.146sft	
501	410981.113sft	0.037sft	2020390.671sft	0.037sft	797.205sft	0.130sft	
67	426296.440sft	0.000sft	2003840.000sft	0.000sft	808.030sft	0.000sft	N E e
65	394908.969sft	0.035sft	2004468.507sft	0.034sft	773.350sft	0.000sft	e

514	392908.484sft	0.034sft	2022311.917sft	0.033sft	773.451sft	0.141sft	
518	382500.245sft	0.039sft	2069058.862sft	0.038sft	791.819sft	0.133sft	
511	395578.412sft	0.030sft	2068202.088sft	0.030sft	772.693sft	0.151sft	
66	413217.479sft	0.028sft	2003631.912sft	0.028sft	785.630sft	0.000sft	e
69	371319.313sft	0.042sft	2064667.121sft	0.040sft	777.570sft	0.000sft	e
465	430198.990sft	0.000sft	2052339.490sft	0.000sft	766.430sft	0.000sft	N E e
516	380617.772sft	0.043sft	2037443.225sft	0.041sft	768.785sft	0.161sft	
131	330861.440sft	0.000sft	2022902.230sft	0.000sft	773.300sft	0.000sft	N E e
68	423314.460sft	0.000sft	2014884.480sft	0.000sft	812.690sft	0.000sft	N E e
532	345490.258sft	0.038sft	2068954.824sft	0.035sft	738.112sft	0.125sft	
64	378570.466sft	0.036sft	2004616.725sft	0.035sft	752.940sft	0.000sft	e
313	366115.474sft	0.036sft	2015882.583sft	0.035sft	726.318sft	0.117sft	
311	338774.053sft	0.000sft	2018718.951sft	0.000sft	779.310sft	0.000sft	N E e
62	346415.054sft	0.027sft	2005265.511sft	0.027sft	771.060sft	0.000sft	e
63	361555.153sft	0.029sft	2005031.041sft	0.028sft	762.860sft	0.000sft	e
61	330811.000sft	0.000sft	2005540.130sft	0.000sft	652.150sft	0.000sft	N E e
160	333280.290sft	0.000sft	2132946.960sft	0.000sft	735.110sft	0.000sft	N E e

Adjusted Geodetic Coordinates

Errors are reported using 1.96σ.

Point Name	Latitude	N error	Longitude	E error	Height	h error	Fix
316	41°01'29.92779"N	0.000sft	91°43'05.42559"W	0.000sft	579.596sft	0.306sft	Lat Long e
322	40°59'22.35626"N	0.000sft	91°43'04.69745"W	0.000sft	575.944sft	0.308sft	Lat Long e
536	40°54'07.83586"N	0.027sft	91°46'49.26878"W	0.024sft	571.620sft	0.314sft	
152	40°52'46.81090"N	0.000sft	91°46'34.10694"W	0.000sft	624.830sft	0.327sft	Lat Long e
522	40°59'20.14714"N	0.022sft	91°46'33.47523"W	0.020sft	619.931sft	0.281sft	
521	41°01'54.33218"N	0.029sft	91°46'33.30669"W	0.028sft	614.961sft	0.278sft	
162	41°09'43.36777"N	0.000sft	91°52'07.66525"W	0.000sft	599.945sft	0.291sft	Lat Long e
506	41°07'04.67313"N	0.031sft	91°49'54.02077"W	0.030sft	583.817sft	0.279sft	
520	41°01'43.67672"N	0.026sft	91°49'59.24502"W	0.025sft	641.496sft	0.257sft	
523	40°59'34.41605"N	0.019sft	91°49'59.15814"W	0.019sft	664.646sft	0.260sft	
534	40°56'41.03561"N	0.027sft	91°49'45.70231"W	0.027sft	643.464sft	0.278sft	
533	40°56'50.53983"N	0.037sft	91°52'51.83019"W	0.035sft	649.394sft	0.265sft	

145	40°54'04.27834"N	0.000sft	91°52'51.23931"W	0.000sft	639.534sft	0.288sft	Lat Long e
509	41°04'11.07876"N	0.023sft	91°49'58.17919"W	0.023sft	622.810sft	0.261sft	
524	40°59'15.43730"N	0.029sft	91°53'35.53166"W	0.028sft	661.424sft	0.247sft	
510	41°04'22.69944"N	0.025sft	91°53'43.27999"W	0.025sft	669.594sft	0.247sft	
164	41°09'49.57159"N	0.000sft	91°42'40.46951"W	0.000sft	547.001sft	0.344sft	Lat Long e
303	41°07'14.14081"N	0.000sft	91°42'25.58471"W	0.000sft	614.954sft	0.327sft	Lat Long e
507	41°07'01.92314"N	0.029sft	91°46'43.50581"W	0.028sft	588.846sft	0.294sft	
150	40°53'56.16208"N	0.000sft	91°49'57.94171"W	0.000sft	597.941sft	0.299sft	Lat Long e
519	41°01'53.50100"N	0.035sft	91°53'08.95794"W	0.034sft	670.655sft	0.246sft	
310	41°04'32.84923"N	0.000sft	91°43'00.83614"W	0.000sft	482.413sft	0.310sft	Lat Long e
71	40°59'49.50553"N	0.000sft	91°48'40.46946"W	0.000sft	649.746sft	0.266sft	Lat Long e
508	41°04'30.19187"N	0.031sft	91°46'28.85518"W	0.030sft	546.595sft	0.283sft	
163	41°09'43.01384"N	0.000sft	91°47'33.69396"W	0.000sft	626.220sft	0.310sft	Lat Long e
505	41°07'10.64493"N	0.025sft	91°53'02.98253"W	0.024sft	608.501sft	0.266sft	
70	41°03'38.25226"N	0.000sft	91°53'08.47790"W	0.000sft	664.988sft	0.247sft	Lat Long
328	40°56'41.72238"N	0.000sft	91°43'03.98484"W	0.000sft	591.031sft	0.321sft	Lat Long e
535	40°56'52.13748"N	0.032sft	91°46'54.23871"W	0.028sft	647.024sft	0.292sft	
161	41°09'48.73175"N	0.000sft	91°56'44.78699"W	0.000sft	641.749sft	0.285sft	Lat Long e
504	41°07'14.71613"N	0.034sft	91°56'49.67787"W	0.033sft	644.376sft	0.262sft	
143	40°54'02.49246"N	0.000sft	91°56'55.20787"W	0.000sft	647.928sft	0.283sft	Lat Long e
138	40°54'01.01359"N	0.000sft	92°00'23.79901"W	0.000sft	648.978sft	0.287sft	Lat Long e
525	40°59'09.83146"N	0.029sft	91°56'18.71232"W	0.028sft	660.456sft	0.244sft	
526	40°58'59.76939"N	0.031sft	91°59'33.09967"W	0.030sft	646.013sft	0.248sft	
517	41°02'20.48234"N	0.039sft	92°00'39.23029"W	0.038sft	664.563sft	0.247sft	
512	41°04'32.75101"N	0.032sft	92°00'23.06949"W	0.031sft	684.869sft	0.250sft	
513	41°04'35.50747"N	0.033sft	92°03'49.03702"W	0.032sft	660.091sft	0.264sft	
527	40°59'17.25229"N	0.034sft	92°03'33.18398"W	0.032sft	617.829sft	0.262sft	
136	40°53'57.86926"N	0.000sft	92°04'08.93188"W	0.000sft	645.197sft	0.300sft	Lat Long e
455	41°10'05.51121"N	0.000sft	92°03'47.93411"W	0.000sft	674.834sft	0.304sft	Lat Long e
447	41°09'57.32450"N	0.000sft	92°07'14.58947"W	0.000sft	693.522sft	0.320sft	Lat Long e
531	40°56'38.27823"N	0.032sft	92°00'29.79344"W	0.030sft	651.160sft	0.265sft	
503	41°07'10.81907"N	0.036sft	92°00'18.27918"W	0.035sft	672.615sft	0.267sft	
502	41°07'12.95015"N	0.036sft	92°03'48.97052"W	0.034sft	701.590sft	0.281sft	
530	40°56'36.77188"N	0.041sft	92°03'46.50858"W	0.038sft	640.218sft	0.280sft	
528	40°59'17.27675"N	0.031sft	92°07'11.02954"W	0.030sft	643.307sft	0.282sft	
529	40°56'33.64562"N	0.037sft	92°06'58.77729"W	0.036sft	635.237sft	0.297sft	

515	41°01'54.90111"N	0.042sft	92°07'14.03756"W	0.041sft	621.396sft	0.283sft	
501	41°07'11.18869"N	0.037sft	92°07'14.96169"W	0.037sft	690.186sft	0.301sft	
67	41°09'45.03671"N	0.000sft	92°10'48.15520"W	0.000sft	701.088sft	0.342sft	Lat Long e
65	41°04'34.84108"N	0.035sft	92°10'46.16846"W	0.034sft	666.202sft	0.311sft	e
514	41°04'12.33474"N	0.034sft	92°06'53.62153"W	0.033sft	666.261sft	0.281sft	
518	41°02'21.70217"N	0.039sft	91°56'45.80049"W	0.038sft	684.508sft	0.240sft	
511	41°04'31.05816"N	0.030sft	91°56'53.93538"W	0.030sft	665.442sft	0.244sft	
66	41°07'35.85108"N	0.028sft	92°10'53.46755"W	0.028sft	678.614sft	0.327sft	e
69	41°00'32.01134"N	0.042sft	91°57'45.68371"W	0.040sft	670.222sft	0.246sft	e
465	41°10'15.83465"N	0.000sft	92°00'13.25308"W	0.000sft	659.328sft	0.294sft	Lat Long e
516	41°02'08.47881"N	0.043sft	92°03'38.74361"W	0.041sft	661.474sft	0.260sft	
131	40°53'59.22718"N	0.000sft	92°06'58.80129"W	0.000sft	665.507sft	0.315sft	Lat Long e
68	41°09'13.89467"N	0.000sft	92°08'24.37876"W	0.000sft	705.806sft	0.322sft	Lat Long e
532	40°56'16.07985"N	0.038sft	91°56'55.77076"W	0.035sft	630.301sft	0.265sft	
64	41°01'53.39652"N	0.036sft	92°10'47.47109"W	0.035sft	645.640sft	0.307sft	e
313	40°59'48.62749"N	0.036sft	92°08'23.02545"W	0.035sft	618.856sft	0.289sft	
311	40°55'18.05724"N	0.000sft	92°07'51.65038"W	0.000sft	671.511sft	0.309sft	Lat Long e
62	40°56'35.60531"N	0.027sft	92°10'45.37691"W	0.027sft	663.426sft	0.322sft	e
63	40°59'05.22429"N	0.029sft	92°10'45.43648"W	0.028sft	655.384sft	0.310sft	e
61	40°54'01.39582"N	0.000sft	92°10'44.88636"W	0.000sft	544.442sft	0.340sft	Lat Long e
160	40°54'03.33946"N	0.000sft	91°43'05.37398"W	0.000sft	626.938sft	0.338sft	Lat Long e

Control Coordinate Comparisons

Values shown are control coord minus adjusted coord.

Point Name	ΔNorthing	ΔEasting	ΔElevation	ΔHeight
313	N/A	N/A	-0.418sft	N/A

Adjusted Observations

Adjustment performed in NAD 1983/1996 (Conus)

GPS Observations

GPS Transformation Group: <GPS Default>

Deflection in Longitude : -0°00'00.2453" **(1.96σ)** : 0°00'00.6378"
Deflection in Latitude : -0°00'00.2004" **(1.96σ)** : 0°00'00.6737"
Azimuth Rotation : 0°00'00.0481" **(1.96σ)** : 0°00'00.0565"
Network Scale : 0.99999949 **(1.96σ)** : 0.00000028
Number of Observations : 120
Number of Outliers : 1

Observation Adjustment (Critical Tau = 3.80). Any outliers are in red.

Obs. ID	From Pt.	To Pt.		Observation	A-posteriori Error (1.96σ)	Residual	Stand. Residual
B89	138	136	**Az.**	268°57'57.4721"	0°00'00.0565"	0°00'01.3957"	4.68
			ΔHt.	-3.802sft	0.050sft	-0.040sft	-2.01
			Dist.	17291.306sft	0.005sft	-0.023sft	-1.00
B36	519	524	**Az.**	187°15'36.0417"	0°00'00.4421"	0°00'00.4968"	2.70
			ΔHt.	-9.217sft	0.044sft	0.009sft	0.57
			Dist.	16126.556sft	0.035sft	0.001sft	0.04
B145	447	68	**Az.**	230°32'15.9068"	0°00'00.0565"	-0°00'00.3828"	-0.56
			ΔHt.	12.282sft	0.039sft	0.002sft	0.07
			Dist.	6915.022sft	0.002sft	-0.061sft	-2.68
B63	519	70	**Az.**	0°11'55.5069"	0°00'00.6687"	0°00'00.7350"	2.68
			ΔHt.	-5.677sft	0.043sft	-0.008sft	-0.58
			Dist.	10601.826sft	0.035sft	-0.004sft	-0.27
B49	70	509	**Az.**	77°08'35.6912"	0°00'00.3197"	-0°00'00.0740"	-0.28
			ΔHt.	-42.164sft	0.036sft	-0.003sft	-0.19
			Dist.	14950.765sft	0.023sft	-0.048sft	-2.50
B154	465	161	**Az.**	99°44'34.8973"	0°00'00.0565"	0°00'00.7261"	2.44
			ΔHt.	-17.557sft	0.048sft	0.004sft	0.18

			Dist.	16178.100sft	0.004sft	-0.013sft	-0.59
B77	70	510	**Az.**	329°21'08.0887"	0°00'01.0002"	-0°00'01.6701"	-2.43
			ΔHt.	4.599sft	0.036sft	0.000sft	-0.01
			Dist.	5229.018sft	0.025sft	0.012sft	0.68
B92	455	447	**Az.**	267°01'04.7091"	0°00'00.0565"	-0°00'00.0370"	-0.12
			ΔHt.	18.670sft	0.050sft	0.007sft	0.39
			Dist.	15827.121sft	0.004sft	0.054sft	2.37
B82	143	138	**Az.**	269°29'01.0746"	0°00'00.0565"	-0°00'00.7028"	-2.25
			ΔHt.	1.032sft	0.044sft	-0.004sft	-0.15
			Dist.	16018.651sft	0.004sft	0.024sft	1.06
B35	145	150	**Az.**	93°30'58.7595"	0°00'00.0565"	-0°00'00.2713"	-0.78
			ΔHt.	-41.576sft	0.042sft	0.008sft	0.57
			Dist.	13333.133sft	0.004sft	0.049sft	2.21
B56	508	310	**Az.**	89°00'50.0368"	0°00'00.4045"	0°00'00.0646"	0.29
			ΔHt.	-64.163sft	0.046sft	0.025sft	1.56
			Dist.	15934.129sft	0.030sft	0.037sft	2.19
B140	516	527	**Az.**	178°35'26.2496"	0°00'00.4440"	0°00'00.0933"	0.60
			ΔHt.	-43.628sft	0.051sft	0.032sft	2.11
			Dist.	17334.789sft	0.039sft	0.012sft	0.85
B111	447	67	**Az.**	265°39'56.3325"	0°00'00.0565"	-0°00'00.0106"	-0.04
			ΔHt.	7.548sft	0.040sft	0.001sft	0.05
			Dist.	16381.918sft	0.005sft	-0.046sft	-2.07
B75	150	536	**Az.**	85°19'15.4952"	0°00'00.3822"	0°00'00.2996"	1.17
			ΔHt.	-26.305sft	0.045sft	-0.009sft	-0.68
			Dist.	14536.486sft	0.024sft	-0.038sft	-2.06
B184	131	311	**Az.**	333°02'48.0311"	0°00'00.0565"	-0°00'00.9702"	-1.96
			ΔHt.	5.992sft	0.031sft	0.004sft	0.27
			Dist.	8950.721sft	0.002sft	0.016sft	0.74
B139	513	516	**Az.**	176°57'56.0502"	0°00'00.5103"	0°00'00.0968"	0.56
			ΔHt.	1.400sft	0.058sft	0.043sft	1.95
			Dist.	14901.518sft	0.039sft	0.004sft	0.26

B99	138	531	**Az.**	358°20'40.1653"	0°00'00.4014"	0°00'00.3380"	1.60
			ΔHt.	2.165sft	0.048sft	-0.018sft	-0.84
			Dist.	15922.891sft	0.032sft	0.035sft	1.95
B198	522	322	**Az.**	89°10'51.4159"	0°00'00.2849"	0°00'00.1162"	0.37
			ΔHt.	-43.968sft	0.046sft	-0.056sft	-1.92
			Dist.	16012.397sft	0.021sft	0.017sft	0.77
B51	322	328	**Az.**	179°48'26.2326"	0°00'00.0565"	0°00'00.5434"	1.87
			ΔHt.	15.103sft	0.043sft	-0.017sft	-0.89
			Dist.	16257.450sft	0.005sft	-0.015sft	-0.59
B189	131	136	**Az.**	90°35'17.4243"	0°00'00.0565"	-0°00'00.6523"	-1.74
			ΔHt.	-20.295sft	0.040sft	-0.018sft	-0.88
			Dist.	13045.365sft	0.004sft	-0.025sft	-1.10
B33	509	520	**Az.**	180°18'49.4744"	0°00'00.3839"	0°00'00.3885"	1.72
			ΔHt.	18.701sft	0.037sft	0.003sft	0.18
			Dist.	14918.633sft	0.028sft	-0.002sft	-0.10
B79	161	504	**Az.**	181°22'32.2950"	0°00'00.4464"	-0°00'00.0828"	-0.48
			ΔHt.	2.642sft	0.040sft	0.019sft	1.63
			Dist.	15592.506sft	0.034sft	-0.002sft	-0.17
B131	504	511	**Az.**	181°07'40.0805"	0°00'00.4214"	-0°00'00.0784"	-0.47
			ΔHt.	21.083sft	0.041sft	0.021sft	1.63
			Dist.	16567.002sft	0.034sft	-0.002sft	-0.15
B107	530	136	**Az.**	186°06'41.5696"	0°00'00.4859"	0°00'00.0659"	0.34
			ΔHt.	4.992sft	0.058sft	0.034sft	1.61
			Dist.	16173.875sft	0.042sft	-0.017sft	-0.99
B106	527	530	**Az.**	183°36'08.8981"	0°00'00.4876"	0°00'00.0277"	0.14
			ΔHt.	22.405sft	0.059sft	0.037sft	1.61
			Dist.	16273.957sft	0.042sft	-0.019sft	-1.05
B190	131	61	**Az.**	270°44'41.4867"	0°00'00.0565"	-0°00'00.4290"	-1.60
			ΔHt.	-121.086sft	0.035sft	0.004sft	0.20
			Dist.	17362.823sft	0.005sft	0.009sft	0.39
B59	520	71	**Az.**	152°23'59.9824"	0°00'00.4082"	0°00'00.4612"	1.56

			ΔHt.	8.269sft	0.037sft	0.000sft	0.01
			Dist.	13037.998sft	0.026sft	-0.004sft	-0.23
B3	536	152	**Az.**	171°54'59.2371"	0°00'00.6079"	0°00'00.9766"	1.55
			ΔHt.	53.220sft	0.042sft	-0.024sft	-0.71
			Dist.	8282.493sft	0.027sft	0.049sft	1.49
B159	513	514	**Az.**	260°35'51.8006"	0°00'00.5143"	0°00'00.0403"	0.18
			ΔHt.	6.156sft	0.062sft	-0.054sft	-1.53
			Dist.	14330.709sft	0.035sft	0.009sft	0.57
B138	465	455	**Az.**	266°22'42.0960"	0°00'00.0565"	-0°00'00.1766"	-0.63
			ΔHt.	15.489sft	0.046sft	0.001sft	0.05
			Dist.	16451.807sft	0.005sft	0.033sft	1.53
B191	136	311	**Az.**	295°24'31.2971"	0°00'00.0565"	-0°00'00.4330"	-1.51
			ΔHt.	26.287sft	0.041sft	0.032sft	1.24
			Dist.	18928.273sft	0.005sft	0.010sft	0.42
B38	310	316	**Az.**	181°05'18.7739"	0°00'00.0565"	0°00'00.0077"	0.03
			ΔHt.	97.201sft	0.048sft	0.020sft	1.49
			Dist.	18516.633sft	0.005sft	-0.022sft	-0.93
B2	316	322	**Az.**	179°45'07.9804"	0°00'00.0565"	0°00'00.5302"	1.26
			ΔHt.	-3.638sft	0.066sft	-0.007sft	-0.15
			Dist.	12911.410sft	0.004sft	-0.043sft	-1.47
B102	517	512	**Az.**	5°16'56.8890"	0°00'00.5453"	0°00'00.1524"	0.72
			ΔHt.	20.294sft	0.044sft	0.021sft	1.46
			Dist.	13443.924sft	0.038sft	0.003sft	0.23
B7	162	506	**Az.**	147°30'17.7582"	0°00'00.3368"	-0°00'00.1914"	-0.78
			ΔHt.	-16.099sft	0.052sft	-0.069sft	-1.46
			Dist.	19040.408sft	0.030sft	-0.005sft	-0.27
B52	535	536	**Az.**	178°41'06.9263"	0°00'00.3438"	0°00'00.3616"	1.46
			ΔHt.	-75.388sft	0.040sft	0.029sft	1.14
			Dist.	16632.814sft	0.031sft	-0.012sft	-0.51
B43	521	508	**Az.**	1°14'17.4028"	0°00'00.4288"	0°00'00.2643"	1.37
			ΔHt.	-68.380sft	0.045sft	0.018sft	1.45

			Dist.	15778.097sft	0.034sft	-0.006sft	-0.39
B112	65	514	**Az.**	97°16'00.4784"	0°00'00.4044"	0°00'00.0527"	0.31
			ΔHt.	0.083sft	0.046sft	0.022sft	1.43
			Dist.	17956.074sft	0.034sft	-0.008sft	-0.56
B187	62	61	**Az.**	179°51'42.1967"	0°00'00.3531"	-0°00'00.3327"	-1.42
			ΔHt.	-118.968sft	0.037sft	-0.011sft	-0.53
			Dist.	15607.084sft	0.027sft	0.016sft	0.86
B193	63	311	**Az.**	149°52'14.5190"	0°00'00.2173"	0°00'00.0227"	0.15
			ΔHt.	16.166sft	0.039sft	0.003sft	0.11
			Dist.	26578.119sft	0.028sft	-0.028sft	-1.40
B76	523	524	**Az.**	263°24'59.7923"	0°00'00.3697"	-0°00'00.1067"	-0.55
			ΔHt.	-3.239sft	0.037sft	-0.012sft	-0.81
			Dist.	16703.890sft	0.029sft	-0.022sft	-1.38
B69	71	523	**Az.**	255°48'14.8340"	0°00'00.6264"	-0°00'00.9266"	-1.38
			ΔHt.	14.894sft	0.027sft	0.014sft	0.61
			Dist.	6224.247sft	0.019sft	-0.007sft	-0.36
B34	534	150	**Az.**	183°13'26.1966"	0°00'00.3422"	-0°00'00.3227"	-1.38
			ΔHt.	-45.508sft	0.051sft	-0.009sft	-0.37
			Dist.	16712.742sft	0.028sft	0.005sft	0.28
B110	501	447	**Az.**	0°05'49.2707"	0°00'00.4512"	-0°00'00.2306"	-1.37
			ΔHt.	3.320sft	0.059sft	0.010sft	0.59
			Dist.	16814.734sft	0.038sft	-0.001sft	-0.06
B60	71	534	**Az.**	194°42'20.0629"	0°00'00.2827"	-0°00'00.2459"	-1.37
			ΔHt.	-6.269sft	0.040sft	0.003sft	0.20
			Dist.	19720.034sft	0.027sft	0.003sft	0.18
B192	311	61	**Az.**	239°45'35.9997"	0°00'00.0565"	-0°00'00.3941"	-1.36
			ΔHt.	-127.077sft	0.032sft	-0.004sft	-0.25
			Dist.	15398.368sft	0.004sft	-0.026sft	-1.19
B177	514	501	**Az.**	354°50'39.2230"	0°00'00.4278"	-0°00'00.2346"	-1.35
			ΔHt.	23.906sft	0.067sft	0.018sft	0.57
			Dist.	18175.361sft	0.039sft	0.001sft	0.05

B117	531	526	**Az.**	16°53'24.3258"	0°00'00.3739"	-0°00'00.1036"	-0.39
			ΔHt.	-5.155sft	0.042sft	-0.044sft	-1.33
			Dist.	14965.924sft	0.027sft	0.006sft	0.32
B68	520	523	**Az.**	179°58'15.0024"	0°00'00.3794"	0°00'00.1634"	0.51
			ΔHt.	23.163sft	0.033sft	0.046sft	1.32
			Dist.	13082.254sft	0.025sft	-0.011sft	-0.48
B46	71	523	**Az.**	255°48'14.8340"	0°00'00.6264"	-0°00'00.0759"	-0.12
			ΔHt.	14.894sft	0.027sft	-0.021sft	-1.14
			Dist.	6224.247sft	0.019sft	-0.025sft	-1.32
B57	163	164	**Az.**	88°16'41.2528"	0°00'00.0565"	-0°00'00.2659"	-1.32
			ΔHt.	-79.192sft	0.039sft	0.000sft	0.00
			Dist.	22437.645sft	0.006sft	0.021sft	0.96
B32	506	509	**Az.**	181°02'18.9855"	0°00'00.3681"	-0°00'00.0820"	-0.44
			ΔHt.	39.010sft	0.051sft	-0.030sft	-1.31
			Dist.	17572.329sft	0.032sft	-0.013sft	-0.82
B134	145	138	**Az.**	269°29'47.1781"	0°00'00.0565"	-0°00'00.1620"	-1.07
			ΔHt.	9.404sft	0.045sft	-0.004sft	-0.16
			Dist.	34754.016sft	0.010sft	0.030sft	1.31
B114	518	525	**Az.**	173°53'37.2079"	0°00'00.3753"	0°00'00.0321"	0.24
			ΔHt.	-24.030sft	0.044sft	0.021sft	1.29
			Dist.	19529.632sft	0.037sft	0.015sft	1.08
B162	505	510	**Az.**	190°17'30.2150"	0°00'00.3531"	-0°00'00.2672"	-1.28
			ΔHt.	61.106sft	0.044sft	-0.001sft	-0.04
			Dist.	17275.479sft	0.031sft	-0.015sft	-0.76
B45	162	505	**Az.**	195°19'06.1695"	0°00'00.3097"	-0°00'00.2213"	-0.95
			ΔHt.	8.567sft	0.032sft	0.032sft	1.28
			Dist.	16026.160sft	0.025sft	-0.010sft	-0.56
B149	511	518	**Az.**	177°16'26.1030"	0°00'00.5506"	0°00'00.0346"	0.18
			ΔHt.	19.079sft	0.040sft	0.014sft	1.25
			Dist.	13106.830sft	0.036sft	0.013sft	1.05
B202	322	328	**Az.**	179°48'26.2326"	0°00'00.0565"	0°00'00.4249"	1.23

			ΔHt.	15.103sft	0.043sft	0.022sft	0.57
			Dist.	16257.450sft	0.005sft	0.033sft	1.12
B196	152	536	**Az.**	351°55'09.1623"	0°00'00.6077"	0°00'00.6339"	1.22
			ΔHt.	-53.219sft	0.042sft	-0.009sft	-0.31
			Dist.	8282.493sft	0.027sft	-0.015sft	-0.66
B161	68	66	**Az.**	228°59'38.3620"	0°00'00.3812"	-0°00'00.0011"	0.00
			ΔHt.	-27.195sft	0.037sft	0.018sft	1.22
			Dist.	15119.273sft	0.028sft	0.020sft	1.21
B151	143	145	**Az.**	89°25'30.2805"	0°00'00.0565"	0°00'00.2981"	1.19
			ΔHt.	-8.372sft	0.040sft	0.013sft	0.77
			Dist.	18735.369sft	0.005sft	0.006sft	0.29
B20	509	523	**Az.**	180°09'13.0456"	0°00'00.1858"	0°00'00.1069"	0.80
			ΔHt.	41.863sft	0.036sft	-0.027sft	-1.16
			Dist.	28000.762sft	0.026sft	-0.009sft	-0.52
B178	67	68	**Az.**	105°58'44.0872"	0°00'00.0565"	-0°00'00.4657"	-1.15
			ΔHt.	4.735sft	0.036sft	-0.010sft	-0.48
			Dist.	11440.544sft	0.003sft	0.004sft	0.18
B200	328	160	**Az.**	180°22'52.6867"	0°00'00.0565"	0°00'00.3727"	1.13
			ΔHt.	35.923sft	0.056sft	-0.012sft	-0.58
			Dist.	16029.775sft	0.004sft	-0.022sft	-0.72
B70	508	507	**Az.**	355°49'25.1301"	0°00'00.4689"	-0°00'00.2837"	-1.13
			ΔHt.	42.236sft	0.057sft	-0.010sft	-0.30
			Dist.	15397.604sft	0.037sft	-0.002sft	-0.10
B42	521	71	**Az.**	217°39'57.3248"	0°00'00.3655"	0°00'00.1656"	0.75
			ΔHt.	34.787sft	0.044sft	-0.027sft	-1.11
			Dist.	15957.215sft	0.029sft	0.016sft	0.88
B50	303	310	**Az.**	189°23'27.9938"	0°00'00.0565"	-0°00'00.0174"	-0.06
			ΔHt.	-132.528sft	0.042sft	-0.001sft	-0.06
			Dist.	16545.899sft	0.005sft	-0.025sft	-1.11
B163	511	510	**Az.**	93°17'53.9904"	0°00'00.4522"	-0°00'00.1143"	-0.54
			ΔHt.	4.171sft	0.040sft	0.005sft	0.35

			Dist.	14626.774sft	0.031sft	0.016sft	1.10
B118	526	531	**Az.**	196°54'01.4932"	0°00'00.3741"	0°00'00.3078"	1.08
			ΔHt.	5.155sft	0.042sft	-0.028sft	-0.93
			Dist.	14965.924sft	0.027sft	0.017sft	0.83
B197	160	152	**Az.**	244°13'57.1043"	0°00'00.0565"	-0°00'00.1706"	-0.46
			ΔHt.	-2.119sft	0.058sft	-0.004sft	-0.20
			Dist.	17804.217sft	0.005sft	-0.029sft	-1.06
B88	526	527	**Az.**	275°30'39.5788"	0°00'00.3932"	0°00'00.1816"	1.05
			ΔHt.	-28.208sft	0.048sft	-0.007sft	-0.37
			Dist.	18497.490sft	0.034sft	-0.009sft	-0.60
B130	162	505	**Az.**	195°19'06.1695"	0°00'00.3097"	0°00'00.0358"	0.16
			ΔHt.	8.567sft	0.032sft	-0.016sft	-1.02
			Dist.	16026.160sft	0.025sft	-0.004sft	-0.22
B78	161	162	**Az.**	91°26'30.7048"	0°00'00.0565"	-0°00'00.0237"	-0.11
			ΔHt.	-41.778sft	0.039sft	-0.012sft	-1.02
			Dist.	21203.154sft	0.006sft	0.009sft	0.44
B8	520	523	**Az.**	179°58'15.0024"	0°00'00.3794"	-0°00'00.1197"	-0.41
			ΔHt.	23.163sft	0.033sft	-0.025sft	-1.00
			Dist.	13082.254sft	0.025sft	-0.002sft	-0.09
B128	67	66	**Az.**	181°46'51.5201"	0°00'00.4379"	-0°00'00.0563"	-0.21
			ΔHt.	-22.461sft	0.039sft	-0.010sft	-0.48
			Dist.	13081.278sft	0.028sft	-0.017sft	-0.99
B71	507	163	**Az.**	346°45'04.6585"	0°00'00.3547"	-0°00'00.2336"	-0.99
			ΔHt.	37.354sft	0.043sft	0.011sft	0.47
			Dist.	16750.205sft	0.029sft	-0.015sft	-0.79
B199	536	535	**Az.**	358°41'10.1817"	0°00'00.3436"	-0°00'00.2628"	-0.98
			ΔHt.	75.388sft	0.040sft	0.024sft	0.71
			Dist.	16632.814sft	0.031sft	-0.004sft	-0.15
B53	522	535	**Az.**	186°04'17.2925"	0°00'00.4366"	0°00'00.2689"	0.98
			ΔHt.	27.106sft	0.056sft	0.011sft	0.40
			Dist.	15064.141sft	0.035sft	-0.012sft	-0.54

B136	69	517	**Az.**	309°32'55.5335"	0°00'00.4981"	0°00'00.1071"	0.33
			ΔHt.	-5.685sft	0.055sft	0.033sft	0.95
			Dist.	17247.161sft	0.039sft	-0.001sft	-0.04
B129	66	65	**Az.**	178°15'08.0106"	0°00'00.3940"	0°00'00.1475"	0.90
			ΔHt.	-12.394sft	0.050sft	0.015sft	0.86
			Dist.	18328.523sft	0.036sft	-0.004sft	-0.24
B101	525	531	**Az.**	231°29'33.6014"	0°00'00.2583"	-0°00'00.0719"	-0.41
			ΔHt.	-9.304sft	0.047sft	-0.009sft	-0.25
			Dist.	24622.974sft	0.030sft	0.019sft	0.89
B98	525	524	**Az.**	87°23'21.7727"	0°00'00.5376"	0°00'00.0665"	0.27
			ΔHt.	0.983sft	0.039sft	0.010sft	0.69
			Dist.	12527.372sft	0.032sft	0.013sft	0.89
B87	512	513	**Az.**	271°01'55.2217"	0°00'00.4682"	0°00'00.0178"	0.08
			ΔHt.	-24.797sft	0.051sft	0.019sft	0.85
			Dist.	15777.031sft	0.033sft	0.007sft	0.51
B137	503	465	**Az.**	1°10'33.4860"	0°00'00.3894"	0°00'00.0935"	0.62
			ΔHt.	-13.305sft	0.047sft	0.009sft	0.63
			Dist.	18729.498sft	0.037sft	0.012sft	0.83
B125	528	527	**Az.**	89°59'19.1747"	0°00'00.4532"	-0°00'00.1861"	-0.82
			ΔHt.	-25.458sft	0.057sft	0.006sft	0.20
			Dist.	16706.508sft	0.035sft	-0.005sft	-0.26
B103	512	503	**Az.**	1°18'46.3119"	0°00'00.4571"	0°00'00.1100"	0.61
			ΔHt.	-12.268sft	0.047sft	0.009sft	0.59
			Dist.	16002.245sft	0.037sft	0.012sft	0.82
B25	164	303	**Az.**	175°51'28.7939"	0°00'00.0565"	-0°00'00.1843"	-0.66
			ΔHt.	67.969sft	0.040sft	-0.009sft	-0.80
			Dist.	15772.413sft	0.004sft	0.004sft	0.19
B28	522	322	**Az.**	89°10'51.4159"	0°00'00.2849"	-0°00'00.1108"	-0.33
			ΔHt.	-43.968sft	0.046sft	0.022sft	0.65
			Dist.	16012.397sft	0.021sft	0.019sft	0.79
B188	63	62	**Az.**	179°58'57.7818"	0°00'00.4206"	-0°00'00.1316"	-0.64

			ΔHt.	8.057sft	0.037sft	-0.008sft	-0.56
			Dist.	15142.559sft	0.031sft	0.012sft	0.78
B183	311	62	**Az.**	300°29'47.3060"	0°00'00.3572"	0°00'00.0643"	0.29
			ΔHt.	-8.109sft	0.033sft	0.004sft	0.24
			Dist.	15472.531sft	0.027sft	-0.013sft	-0.77
B142	529	131	**Az.**	180°00'24.3779"	0°00'00.4831"	-0°00'00.1598"	-0.77
			ΔHt.	30.286sft	0.055sft	-0.010sft	-0.39
			Dist.	15628.184sft	0.038sft	0.007sft	0.44
B108	528	529	**Az.**	176°45'01.5036"	0°00'00.4454"	-0°00'00.1296"	-0.76
			ΔHt.	-8.053sft	0.051sft	-0.007sft	-0.39
			Dist.	16587.350sft	0.036sft	0.007sft	0.54
B44	163	162	**Az.**	270°07'22.8029"	0°00'00.0565"	-0°00'00.0721"	-0.31
			ΔHt.	-26.300sft	0.050sft	-0.012sft	-0.70
			Dist.	20955.518sft	0.006sft	0.001sft	0.06
B83	525	526	**Az.**	266°06'36.0313"	0°00'00.3876"	-0°00'00.0184"	-0.08
			ΔHt.	-14.459sft	0.040sft	0.015sft	0.66
			Dist.	14943.027sft	0.028sft	0.001sft	0.08
B165	525	532	**Az.**	189°11'14.8588"	0°00'00.4278"	0°00'00.1310"	0.66
			ΔHt.	-30.142sft	0.057sft	0.003sft	0.10
			Dist.	17813.310sft	0.041sft	-0.004sft	-0.16
B31	507	164	**Az.**	47°35'53.6228"	0°00'00.2290"	-0°00'00.0904"	-0.66
			ΔHt.	-41.839sft	0.040sft	-0.007sft	-0.43
			Dist.	25173.308sft	0.030sft	0.006sft	0.36
B150	532	143	**Az.**	179°49'00.6019"	0°00'00.5382"	0°00'00.1309"	0.64
			ΔHt.	17.641sft	0.048sft	0.002sft	0.16
			Dist.	13520.006sft	0.038sft	-0.004sft	-0.29
B55	71	522	**Az.**	106°57'21.4939"	0°00'00.4441"	0°00'00.0557"	0.14
			ΔHt.	-29.800sft	0.037sft	-0.005sft	-0.21
			Dist.	10181.635sft	0.020sft	0.012sft	0.61
B9	523	534	**Az.**	176°37'56.0945"	0°00'00.3440"	-0°00'00.0138"	-0.06
			ΔHt.	-21.163sft	0.042sft	-0.018sft	-0.58

			Dist.	17577.744sft	0.030sft	-0.004sft	-0.22
B84	526	517	**Az.**	345°59'34.2443"	0°00'00.3318"	0°00'00.0716"	0.45
			ΔHt.	18.524sft	0.043sft	0.011sft	0.58
			Dist.	20936.899sft	0.035sft	-0.003sft	-0.19
B120	512	511	**Az.**	90°35'37.6121"	0°00'00.4434"	0°00'00.1111"	0.53
			ΔHt.	-19.407sft	0.044sft	0.000sft	0.01
			Dist.	16018.151sft	0.033sft	0.009sft	0.55
B29	522	523	**Az.**	275°14'59.8503"	0°00'00.3405"	-0°00'00.0262"	-0.11
			ΔHt.	44.695sft	0.038sft	0.012sft	0.50
			Dist.	15839.068sft	0.025sft	0.001sft	0.04
B135	525	69	**Az.**	321°17'05.8155"	0°00'00.7120"	-0°00'00.0023"	-0.01
			ΔHt.	9.750sft	0.056sft	-0.026sft	-0.47
			Dist.	10660.708sft	0.037sft	0.006sft	0.23
B203	152	535	**Az.**	356°26'22.7984"	0°00'00.2362"	0°00'00.0778"	0.47
			ΔHt.	22.169sft	0.047sft	0.004sft	0.14
			Dist.	24876.728sft	0.032sft	0.001sft	0.04
B105	502	513	**Az.**	180°01'05.9715"	0°00'00.4502"	0°00'00.0602"	0.35
			ΔHt.	-41.483sft	0.056sft	-0.009sft	-0.46
			Dist.	15934.749sft	0.037sft	0.000sft	0.02
B181	65	64	**Az.**	180°21'00.2827"	0°00'00.4357"	0°00'00.0447"	0.28
			ΔHt.	-20.546sft	0.041sft	-0.005sft	-0.43
			Dist.	16339.957sft	0.035sft	-0.006sft	-0.45
B104	455	502	**Az.**	180°15'36.8653"	0°00'00.4098"	0°00'00.0504"	0.32
			ΔHt.	26.772sft	0.052sft	-0.007sft	-0.45
			Dist.	17465.196sft	0.036sft	-0.001sft	-0.04
B10	533	145	**Az.**	179°50'43.8493"	0°00'00.4309"	0°00'00.0019"	0.01
			ΔHt.	-9.844sft	0.050sft	0.006sft	0.29
			Dist.	16826.849sft	0.037sft	0.007sft	0.44
B4	522	521	**Az.**	0°02'50.7766"	0°00'00.3919"	0°00'00.0072"	0.03
			ΔHt.	-4.986sft	0.042sft	0.001sft	0.06
			Dist.	15604.809sft	0.031sft	-0.006sft	-0.41

B23	524	533	**Az.**	167°07'08.2084"	0°00'00.4751"	0°00'00.0190"	0.10
			ΔHt.	-12.011sft	0.045sft	0.003sft	0.22
			Dist.	15043.042sft	0.036sft	0.006sft	0.40
B109	515	528	**Az.**	179°10'17.5970"	0°00'00.4770"	-0°00'00.0576"	-0.36
			ΔHt.	21.926sft	0.062sft	-0.006sft	-0.30
			Dist.	15954.558sft	0.038sft	-0.005sft	-0.40
B143	515	514	**Az.**	6°24'52.0399"	0°00'00.5566"	-0°00'00.0583"	-0.28
			ΔHt.	44.853sft	0.071sft	0.010sft	0.26
			Dist.	13997.196sft	0.040sft	-0.006sft	-0.37
B24	509	510	**Az.**	273°55'22.7476"	0°00'00.3433"	-0°00'00.0230"	-0.12
			ΔHt.	46.763sft	0.034sft	-0.005sft	-0.31
			Dist.	17281.255sft	0.028sft	-0.006sft	-0.35
B180	64	313	**Az.**	138°44'22.1939"	0°00'00.4067"	-0°00'00.0255"	-0.13
			ΔHt.	-26.758sft	0.037sft	0.001sft	0.06
			Dist.	16795.006sft	0.032sft	-0.005sft	-0.35
B58	505	506	**Az.**	92°22'32.8257"	0°00'00.4564"	-0°00'00.0047"	-0.02
			ΔHt.	-24.666sft	0.049sft	0.001sft	0.03
			Dist.	14475.399sft	0.031sft	-0.006sft	-0.35
B194	313	63	**Az.**	248°06'05.6409"	0°00'00.5170"	0°00'00.0936"	0.34
			ΔHt.	36.519sft	0.032sft	0.001sft	0.08
			Dist.	11771.356sft	0.030sft	-0.001sft	-0.05
B185	64	63	**Az.**	179°28'29.0792"	0°00'00.3675"	0°00'00.0152"	0.08
			ΔHt.	9.761sft	0.034sft	-0.004sft	-0.27
			Dist.	17021.131sft	0.031sft	-0.001sft	-0.05
B152	69	526	**Az.**	221°25'52.9016"	0°00'00.5681"	-0°00'00.0296"	-0.10
			ΔHt.	-24.209sft	0.049sft	0.006sft	0.25
			Dist.	12449.790sft	0.035sft	-0.001sft	-0.03
B186	528	63	**Az.**	265°46'37.0375"	0°00'00.3701"	0°00'00.0015"	0.01
			ΔHt.	12.059sft	0.036sft	-0.003sft	-0.13
			Dist.	16488.399sft	0.029sft	0.002sft	0.12
B182	528	313	**Az.**	299°53'34.2445"	0°00'01.0480"	0°00'00.0306"	0.06

			ΔHt.	-24.460sft	0.036sft	0.001sft	0.04
			Dist.	6367.795sft	0.031sft	0.000sft	-0.02

Geoid Observations

Number of Observations : 69
Number of Outliers : 0

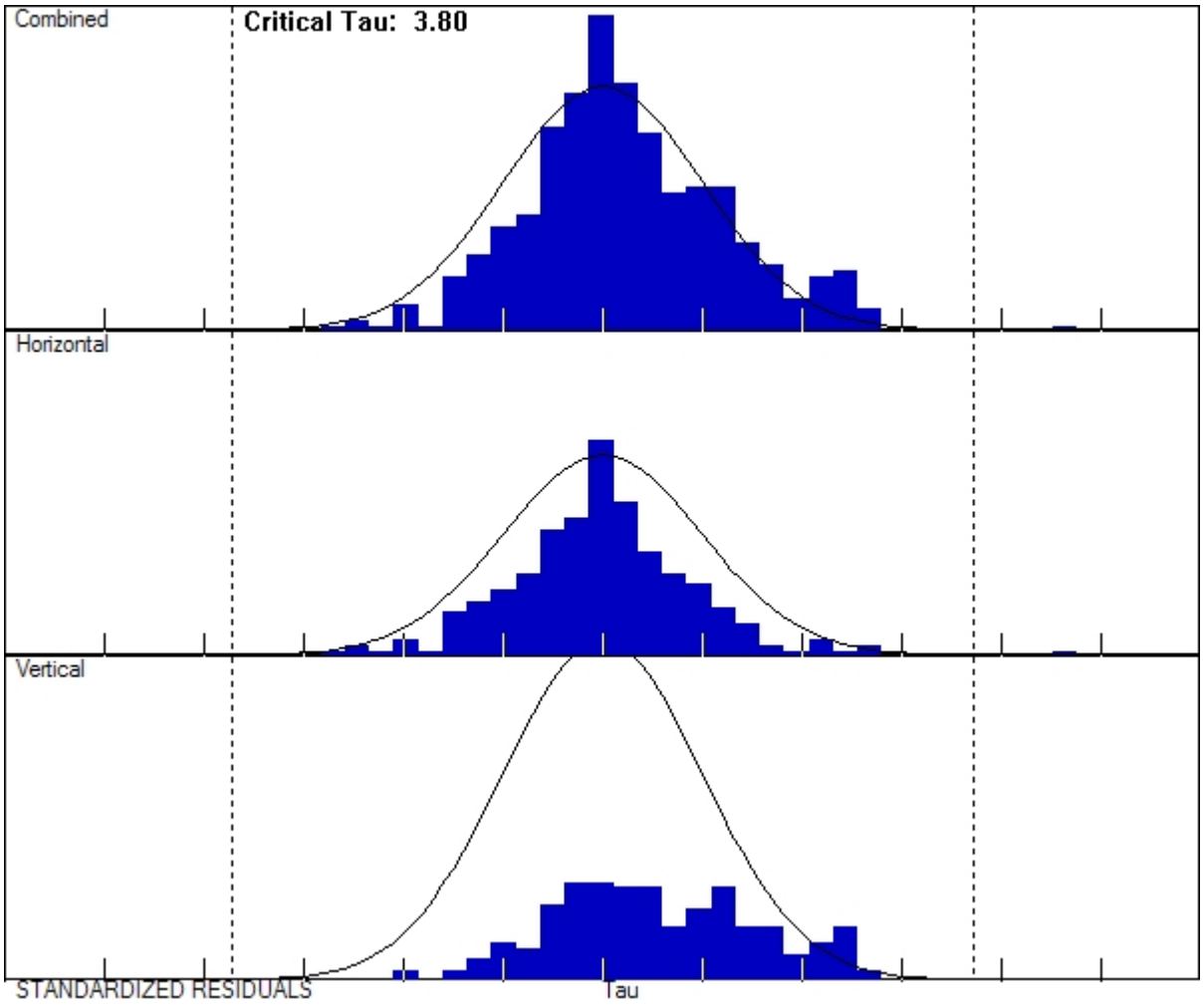
Observation Adjustment (Critical Tau = 3.80). Any outliers are in red.

Observation ID	Point Name	Separation	A-posteriori Error (1.96σ)	Residual	Standardized Residual
G104	512	-107.199sft	0.302sft	0.290sft	2.71
G101	511	-107.251sft	0.294sft	0.300sft	2.66
G114	502	-107.061sft	0.319sft	0.245sft	2.62
G102	503	-107.130sft	0.308sft	0.267sft	2.60
G120	518	-107.312sft	0.275sft	0.323sft	2.59
G105	513	-107.176sft	0.316sft	0.248sft	2.58
G100	517	-107.287sft	0.291sft	0.296sft	2.57
G122	69	-107.348sft	0.246sft	0.356sft	2.55
G95	504	-107.204sft	0.301sft	0.275sft	2.55
G117	501	-107.019sft	0.329sft	0.212sft	2.51
G126	68	-106.884sft	0.322sft	0.219sft	2.39
G85	510	-107.365sft	0.298sft	0.264sft	2.39
G124	516	-107.311sft	0.309sft	0.234sft	2.30
G92	70	-107.409sft	0.295sft	0.257sft	2.29
G91	505	-107.341sft	0.305sft	0.236sft	2.24
G94	161	-107.161sft	0.285sft	0.262sft	2.21
G112	514	-107.190sft	0.322sft	0.200sft	2.21
G110	447	-106.898sft	0.320sft	0.203sft	2.18
G80	519	-107.473sft	0.286sft	0.257sft	2.17
G98	525	-107.529sft	0.273sft	0.265sft	2.11
G99	526	-107.501sft	0.281sft	0.254sft	2.10

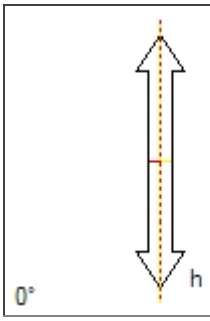
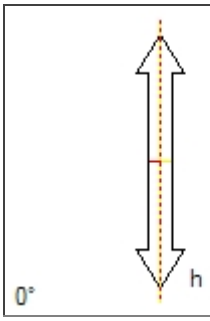
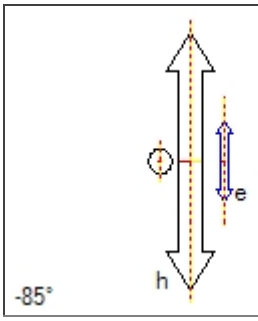
G103	455	-106.986sft	0.304sft	0.217sft	2.05
G123	465	-107.102sft	0.294sft	0.211sft	1.86
G81	509	-107.535sft	0.307sft	0.191sft	1.85
G84	524	-107.617sft	0.283sft	0.218sft	1.82
G72	162	-107.335sft	0.291sft	0.209sft	1.82
G109	515	-107.332sft	0.319sft	0.164sft	1.75
G74	506	-107.483sft	0.315sft	0.169sft	1.74
G106	527	-107.497sft	0.308sft	0.179sft	1.73
G75	520	-107.621sft	0.289sft	0.194sft	1.67
G119	65	-107.148sft	0.311sft	0.146sft	1.46
G86	160	-108.172sft	0.338sft	0.107sft	1.44
G76	523	-107.724sft	0.278sft	0.174sft	1.42
G111	66	-107.016sft	0.327sft	0.117sft	1.36
G113	531	-107.695sft	0.298sft	0.147sft	1.33
G89	508	-107.691sft	0.318sft	0.122sft	1.29
G88	71	-107.754sft	0.266sft	0.167sft	1.29
G82	507	-107.624sft	0.328sft	0.108sft	1.26
G93	328	-108.059sft	0.321sft	0.114sft	1.23
G69	522	-107.862sft	0.302sft	0.130sft	1.21
G70	521	-107.770sft	0.305sft	0.124sft	1.18
G121	532	-107.811sft	0.292sft	0.131sft	1.14
G127	64	-107.300sft	0.307sft	0.117sft	1.13
G87	535	-107.980sft	0.320sft	0.103sft	1.11
G64	303	-107.726sft	0.327sft	0.095sft	1.10
G116	528	-107.506sft	0.319sft	0.103sft	1.10
G66	322	-107.966sft	0.308sft	0.112sft	1.09
G128	313	-107.462sft	0.319sft	0.099sft	1.05
G115	530	-107.674sft	0.310sft	0.106sft	1.05
G118	67	-106.942sft	0.342sft	0.071sft	1.03
G78	533	-107.868sft	0.296sft	0.113sft	1.01
G132	61	-107.708sft	0.340sft	0.072sft	1.00

G68	152	-108.190sft	0.327sft	0.084sft	0.98
G107	136	-107.793sft	0.300sft	0.098sft	0.90
G67	536	-108.145sft	0.332sft	0.072sft	0.88
G77	534	-107.948sft	0.306sft	0.089sft	0.85
G71	310	-107.807sft	0.310sft	0.076sft	0.75
G90	163	-107.590sft	0.310sft	0.063sft	0.62
G131	63	-107.476sft	0.310sft	0.058sft	0.57
G97	138	-107.902sft	0.287sft	0.066sft	0.56
G125	131	-107.793sft	0.315sft	0.045sft	0.46
G96	143	-107.992sft	0.283sft	0.050sft	0.42
G65	316	-107.954sft	0.306sft	0.039sft	0.37
G129	311	-107.799sft	0.309sft	-0.034sft	-0.34
G108	529	-107.697sft	0.317sft	0.025sft	0.26
G83	150	-108.189sft	0.299sft	-0.019sft	-0.17
G73	164	-107.759sft	0.344sft	0.010sft	0.15
G130	62	-107.634sft	0.322sft	0.010sft	0.11
G79	145	-108.116sft	0.288sft	0.002sft	0.02

Histograms of Standardized Residuals



Point Error Ellipses

316	322	536
		
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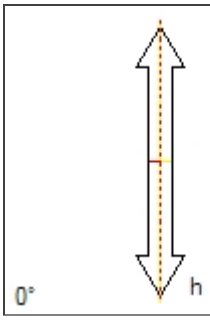
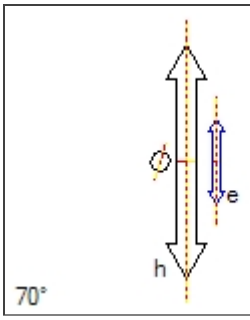
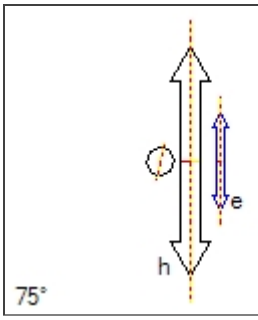
152	**522**	**521**
		
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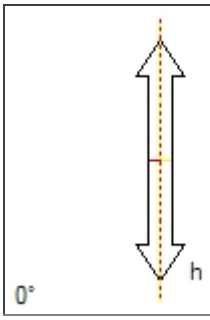	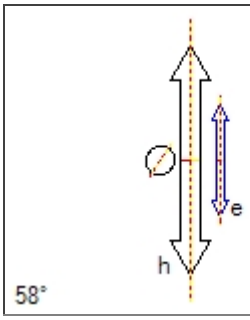	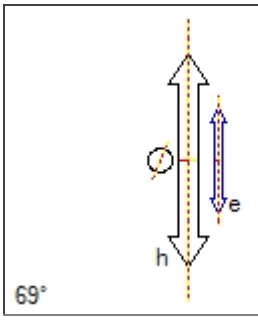
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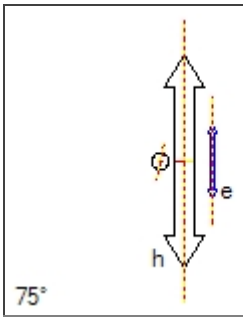	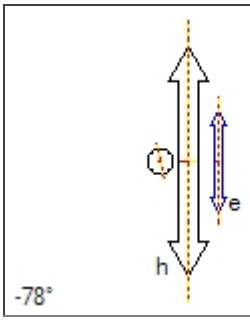	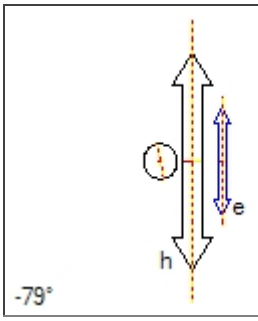
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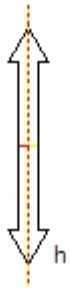	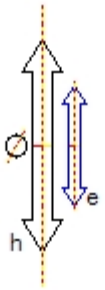	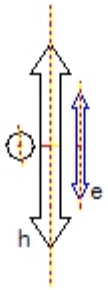
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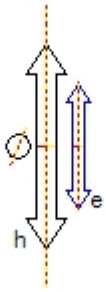	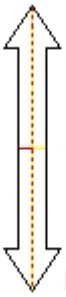	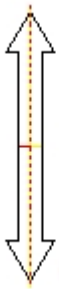
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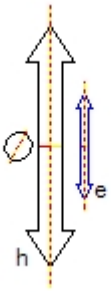	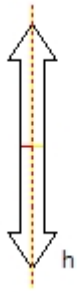	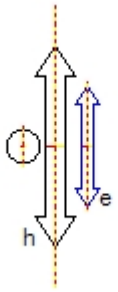
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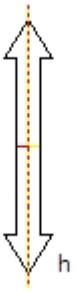	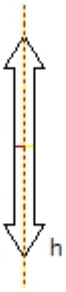	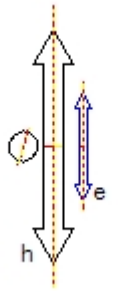
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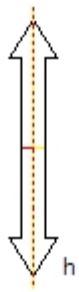	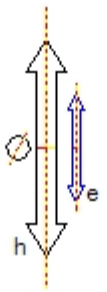	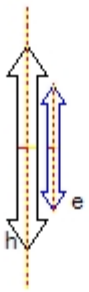
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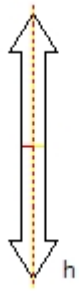	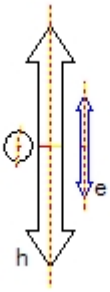	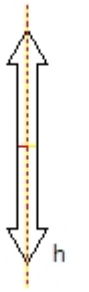
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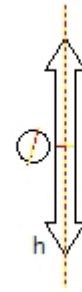	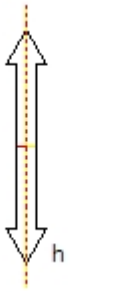	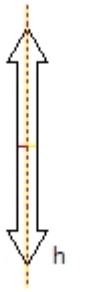
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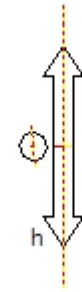	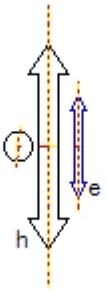	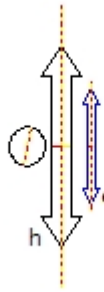
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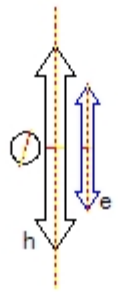	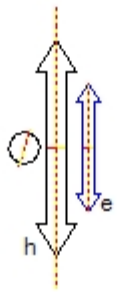	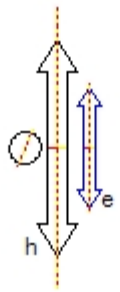
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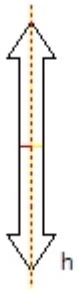	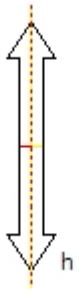	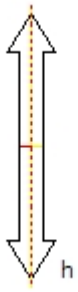
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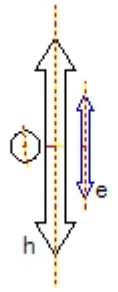	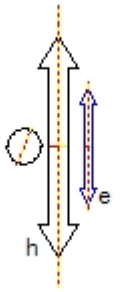	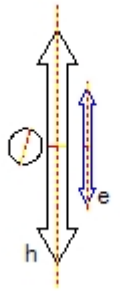
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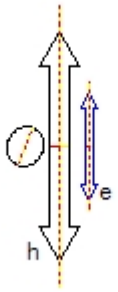	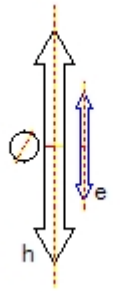	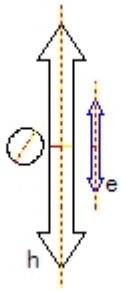
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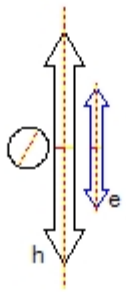	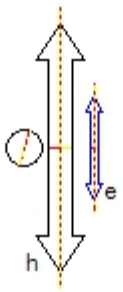	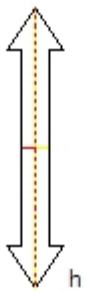
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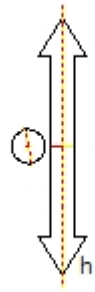
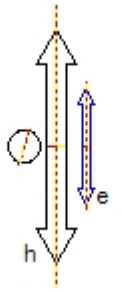
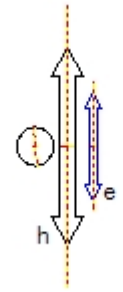
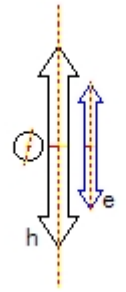
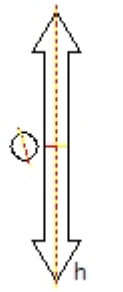
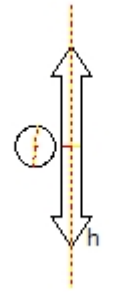
65	**514**	**518**
		
Tick Size: 0.0100sft Horizontal Bivariate Scalar: 2.45σ Vertical Univariate Scalar: 1.96σ		
511	**66**	**69**
		
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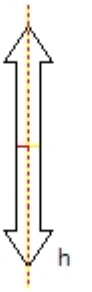
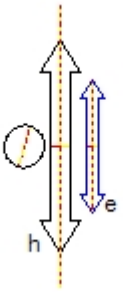
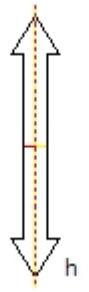
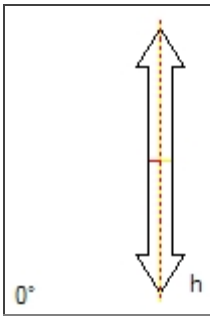
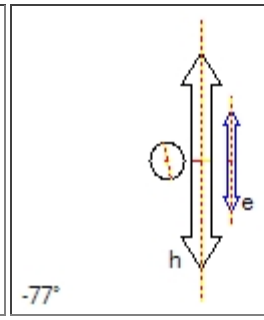
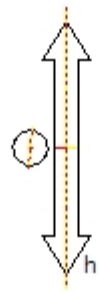
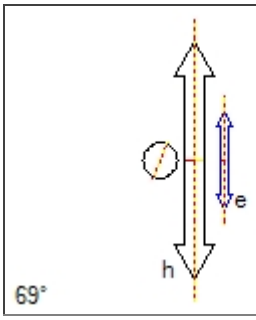
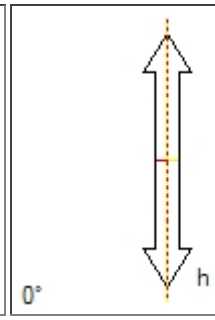
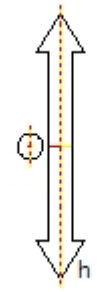
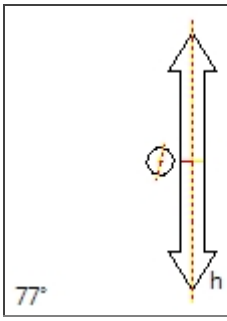
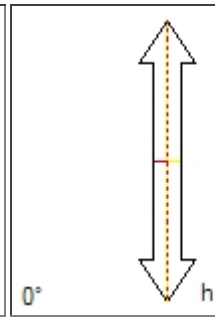
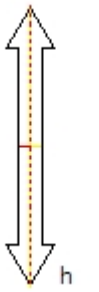
465	**516**	**131**
		
Tick Size: 0.0100sft Horizontal Bivariate Scalar: 2.45σ Vertical Univariate Scalar: 1.96σ		

68	532	64
		
Tick Size: 0.0100sft Horizontal Bivariate Scalar: 2.45σ Vertical Univariate Scalar: 1.96σ		
313	**311**	**62**
		
Tick Size: 0.0100sft Horizontal Bivariate Scalar: 2.45σ Vertical Univariate Scalar: 1.96σ		
63	**61**	**160**
		
Tick Size: 0.0100sft Horizontal Bivariate Scalar: 2.45σ Vertical Univariate Scalar: 1.96σ		

Covariant Terms

Adjustment performed in NAD 1983/1996 (Conus)

From Point	To Point		Components	A-posteriori Error (1.96σ)	Horiz. Precision (Ratio)
316	322	**Az.**	179°45'07.9323"	0°00'00.0000"	1:0
		ΔHt.	-3.651sft	0.077sft	
		ΔElev.	-3.640sft	0.000sft	
		Dist.	12911.416sft	0.000sft	
316	310	**Az.**	1°05'15.7117"	0°00'00.0000"	1:0
		ΔHt.	-97.183sft	0.076sft	
		ΔElev.	-97.330sft	0.000sft	
		Dist.	18516.643sft	0.000sft	
322	522	**Az.**	269°13'08.3088"	0°00'00.2783"	1:784254
		ΔHt.	43.987sft	0.066sft	
		ΔElev.	43.883sft	0.103sft	
		Dist.	16012.405sft	0.020sft	
322	328	**Az.**	179°48'26.1844"	0°00'00.0000"	1:0
		ΔHt.	15.087sft	0.068sft	
		ΔElev.	15.180sft	0.000sft	
		Dist.	16257.458sft	0.000sft	
536	152	**Az.**	171°54'59.1889"	0°00'00.6057"	1:308966
		ΔHt.	53.210sft	0.049sft	
		ΔElev.	53.255sft	0.099sft	
		Dist.	8282.497sft	0.027sft	
536	150	**Az.**	265°21'18.9804"	0°00'00.3805"	1:598099
		ΔHt.	26.321sft	0.062sft	
		ΔElev.	26.365sft	0.099sft	
		Dist.	14536.494sft	0.024sft	
536	535	**Az.**	358°41'10.1337"	0°00'00.3449"	1:529513
		ΔHt.	75.405sft	0.067sft	

		ΔElev.	75.239sft	0.134sft	
		Dist.	16632.823sft	0.031sft	
152	535	**Az.**	356°26'22.7504"	0°00'00.2358"	1:788558
		ΔHt.	22.194sft	0.092sft	
		ΔElev.	21.985sft	0.125sft	
		Dist.	24876.741sft	0.032sft	
152	160	**Az.**	64°11'40.4168"	0°00'00.0000"	1:0
		ΔHt.	2.108sft	0.078sft	
		ΔElev.	2.090sft	0.000sft	
		Dist.	17804.227sft	0.000sft	
522	521	**Az.**	0°02'50.7286"	0°00'00.3905"	1:507718
		ΔHt.	-4.971sft	0.065sft	
		ΔElev.	-5.063sft	0.142sft	
		Dist.	15604.817sft	0.031sft	
522	523	**Az.**	275°14'59.8021"	0°00'00.3367"	1:642478
		ΔHt.	44.715sft	0.060sft	
		ΔElev.	44.577sft	0.138sft	
		Dist.	15839.076sft	0.025sft	
522	71	**Az.**	286°58'44.7499"	0°00'00.4414"	1:503476
		ΔHt.	29.815sft	0.047sft	
		ΔElev.	29.707sft	0.103sft	
		Dist.	10181.640sft	0.020sft	
522	535	**Az.**	186°04'17.2443"	0°00'00.4269"	1:438595
		ΔHt.	27.093sft	0.073sft	
		ΔElev.	27.211sft	0.138sft	
		Dist.	15064.149sft	0.034sft	
521	71	**Az.**	217°39'57.2766"	0°00'00.3635"	1:548076
		ΔHt.	34.786sft	0.066sft	
		ΔElev.	34.769sft	0.121sft	
		Dist.	15957.223sft	0.029sft	
521	508	**Az.**	1°14'17.3548"	0°00'00.4233"	1:467562

		ΔHt.	-68.366sft	0.068sft	
		ΔElev.	-68.445sft	0.139sft	
		Dist.	15778.105sft	0.034sft	
162	506	**Az.**	147°30'17.7101"	0°00'00.3337"	1:648875
		ΔHt.	-16.127sft	0.080sft	
		ΔElev.	-15.979sft	0.140sft	
		Dist.	19040.418sft	0.029sft	
162	163	**Az.**	90°04'22.4294"	0°00'00.0000"	1:0
		ΔHt.	26.275sft	0.080sft	
		ΔElev.	26.530sft	0.000sft	
		Dist.	20955.529sft	0.000sft	
162	505	**Az.**	195°19'06.1213"	0°00'00.3075"	1:649268
		ΔHt.	8.556sft	0.061sft	
		ΔElev.	8.562sft	0.134sft	
		Dist.	16026.168sft	0.025sft	
162	161	**Az.**	271°29'33.0585"	0°00'00.0000"	1:0
		ΔHt.	41.804sft	0.075sft	
		ΔElev.	41.630sft	0.000sft	
		Dist.	21203.164sft	0.000sft	
506	509	**Az.**	181°02'18.9373"	0°00'00.3619"	1:554252
		ΔHt.	38.993sft	0.076sft	
		ΔElev.	39.044sft	0.150sft	
		Dist.	17572.338sft	0.032sft	
506	505	**Az.**	272°24'37.0432"	0°00'00.4587"	1:463472
		ΔHt.	24.684sft	0.067sft	
		ΔElev.	24.541sft	0.143sft	
		Dist.	14475.406sft	0.031sft	
520	523	**Az.**	179°58'14.9542"	0°00'00.3808"	1:521086
		ΔHt.	23.150sft	0.054sft	
		ΔElev.	23.252sft	0.136sft	
		Dist.	13082.260sft	0.025sft	

520	509	**Az.**	0°18'48.7263"	0°00'00.3802"	1:531984
		ΔHt.	-18.687sft	0.061sft	
		ΔElev.	-18.773sft	0.139sft	
		Dist.	14918.641sft	0.028sft	
520	71	**Az.**	152°23'59.9343"	0°00'00.4067"	1:509950
		ΔHt.	8.250sft	0.056sft	
		ΔElev.	8.382sft	0.127sft	
		Dist.	13038.005sft	0.026sft	
523	534	**Az.**	176°37'56.0463"	0°00'00.3417"	1:596551
		ΔHt.	-21.182sft	0.070sft	
		ΔElev.	-20.958sft	0.137sft	
		Dist.	17577.753sft	0.029sft	
523	509	**Az.**	0°09'12.3547"	0°00'00.1831"	1:1108365
		ΔHt.	-41.836sft	0.097sft	
		ΔElev.	-42.025sft	0.165sft	
		Dist.	28000.776sft	0.025sft	
523	524	**Az.**	263°24'59.7441"	0°00'00.3656"	1:574189
		ΔHt.	-3.222sft	0.063sft	
		ΔElev.	-3.328sft	0.133sft	
		Dist.	16703.899sft	0.029sft	
523	71	**Az.**	75°47'23.1667"	0°00'00.6251"	1:334590
		ΔHt.	-14.900sft	0.033sft	
		ΔElev.	-14.870sft	0.095sft	
		Dist.	6224.250sft	0.019sft	
534	150	**Az.**	183°13'26.1484"	0°00'00.3326"	1:617286
		ΔHt.	-45.523sft	0.073sft	
		ΔElev.	-45.282sft	0.123sft	
		Dist.	16712.751sft	0.027sft	
534	71	**Az.**	14°41'37.2431"	0°00'00.2817"	1:728973
		ΔHt.	6.282sft	0.075sft	
		ΔElev.	6.088sft	0.123sft	

		Dist.	19720.044sft	0.027sft	
533	145	**Az.**	179°50'43.8011"	0°00'00.4271"	1:457447
		ΔHt.	-9.860sft	0.074sft	
		ΔElev.	-9.612sft	0.131sft	
		Dist.	16826.858sft	0.037sft	
533	524	**Az.**	347°07'36.8123"	0°00'00.4712"	1:417024
		ΔHt.	12.030sft	0.066sft	
		ΔElev.	11.780sft	0.140sft	
		Dist.	15043.050sft	0.036sft	
145	150	**Az.**	93°30'58.7114"	0°00'00.0000"	1:0
		ΔHt.	-41.593sft	0.058sft	
		ΔElev.	-41.520sft	0.000sft	
		Dist.	13333.140sft	0.000sft	
145	143	**Az.**	269°28'09.9717"	0°00'00.0000"	1:0
		ΔHt.	8.394sft	0.070sft	
		ΔElev.	8.270sft	0.000sft	
		Dist.	18735.378sft	0.000sft	
145	138	**Az.**	269°29'47.1298"	0°00'00.0000"	1:0
		ΔHt.	9.444sft	0.115sft	
		ΔElev.	9.230sft	0.000sft	
		Dist.	34754.034sft	0.000sft	
509	510	**Az.**	273°55'22.6994"	0°00'00.3434"	1:607946
		ΔHt.	46.784sft	0.063sft	
		ΔElev.	46.614sft	0.151sft	
		Dist.	17281.264sft	0.028sft	
509	70	**Az.**	257°10'40.6537"	0°00'00.3207"	1:645065
		ΔHt.	42.178sft	0.059sft	
		ΔElev.	42.052sft	0.144sft	
		Dist.	14950.772sft	0.023sft	
524	519	**Az.**	7°15'18.5562"	0°00'00.4397"	1:458249
		ΔHt.	9.230sft	0.068sft	

		ΔElev.	9.086sft	0.152sft	
		Dist.	16126.564sft	0.035sft	
524	525	**Az.**	267°25'08.7525"	0°00'00.5321"	1:399962
		ΔHt.	-0.968sft	0.054sft	
		ΔElev.	-1.057sft	0.128sft	
		Dist.	12527.378sft	0.031sft	
510	505	**Az.**	10°17'03.6782"	0°00'00.3472"	1:571433
		ΔHt.	-61.093sft	0.070sft	
		ΔElev.	-61.117sft	0.147sft	
		Dist.	17275.488sft	0.030sft	
510	70	**Az.**	149°20'45.1778"	0°00'00.9982"	1:208216
		ΔHt.	-4.606sft	0.039sft	
		ΔElev.	-4.562sft	0.095sft	
		Dist.	5229.020sft	0.025sft	
510	511	**Az.**	273°19'59.2096"	0°00'00.4489"	1:468594
		ΔHt.	-4.152sft	0.059sft	
		ΔElev.	-4.266sft	0.145sft	
		Dist.	14626.782sft	0.031sft	
164	303	**Az.**	175°51'28.7457"	0°00'00.0000"	1:0
		ΔHt.	67.952sft	0.064sft	
		ΔElev.	67.920sft	0.000sft	
		Dist.	15772.421sft	0.000sft	
164	507	**Az.**	227°38'33.4703"	0°00'00.2282"	1:851827
		ΔHt.	41.845sft	0.088sft	
		ΔElev.	41.710sft	0.127sft	
		Dist.	25173.320sft	0.030sft	
164	163	**Az.**	268°19'54.2056"	0°00'00.0000"	1:0
		ΔHt.	79.219sft	0.078sft	
		ΔElev.	79.050sft	0.000sft	
		Dist.	22437.657sft	0.000sft	
303	310	**Az.**	189°23'27.9455"	0°00'00.0000"	1:0

		ΔHt.	-132.541sft	0.067sft	
		ΔElev.	-132.460sft	0.000sft	
		Dist.	16545.908sft	0.000sft	
507	508	**Az.**	175°49'15.4519"	0°00'00.4622"	1:424513
		ΔHt.	-42.251sft	0.075sft	
		ΔElev.	-42.185sft	0.141sft	
		Dist.	15397.612sft	0.036sft	
507	163	**Az.**	346°45'04.6104"	0°00'00.3529"	1:582548
		ΔHt.	37.374sft	0.069sft	
		ΔElev.	37.340sft	0.127sft	
		Dist.	16750.214sft	0.029sft	
519	70	**Az.**	0°11'55.4589"	0°00'00.6654"	1:304505
		ΔHt.	-5.667sft	0.055sft	
		ΔElev.	-5.731sft	0.128sft	
		Dist.	10601.831sft	0.035sft	
310	508	**Az.**	269°03'06.6681"	0°00'00.4041"	1:533785
		ΔHt.	64.182sft	0.066sft	
		ΔElev.	64.066sft	0.132sft	
		Dist.	15934.137sft	0.030sft	
328	160	**Az.**	180°22'52.6385"	0°00'00.0000"	1:0
		ΔHt.	35.907sft	0.075sft	
		ΔElev.	36.020sft	0.000sft	
		Dist.	16029.784sft	0.000sft	
161	504	**Az.**	181°22'32.2468"	0°00'00.4427"	1:460609
		ΔHt.	2.627sft	0.064sft	
		ΔElev.	2.670sft	0.135sft	
		Dist.	15592.514sft	0.034sft	
161	465	**Az.**	279°46'52.0742"	0°00'00.0000"	1:0
		ΔHt.	17.579sft	0.068sft	
		ΔElev.	17.520sft	0.000sft	
		Dist.	16178.108sft	0.000sft	

504	511	**Az.**	181°07'40.0323"	0°00'00.4179"	1:487159
		ΔHt.	21.066sft	0.067sft	
		ΔElev.	21.113sft	0.143sft	
		Dist.	16567.010sft	0.034sft	
143	138	**Az.**	269°29'01.0264"	0°00'00.0000"	1:0
		ΔHt.	1.051sft	0.065sft	
		ΔElev.	0.960sft	0.000sft	
		Dist.	16018.660sft	0.000sft	
143	532	**Az.**	359°49'00.9224"	0°00'00.5347"	1:355771
		ΔHt.	-17.627sft	0.065sft	
		ΔElev.	-17.808sft	0.125sft	
		Dist.	13520.013sft	0.038sft	
138	136	**Az.**	268°57'57.4239"	0°00'00.0000"	1:0
		ΔHt.	-3.782sft	0.071sft	
		ΔElev.	-3.890sft	0.000sft	
		Dist.	17291.315sft	0.000sft	
138	531	**Az.**	358°20'40.1173"	0°00'00.3941"	1:500975
		ΔHt.	2.181sft	0.070sft	
		ΔElev.	1.975sft	0.129sft	
		Dist.	15922.899sft	0.032sft	
525	526	**Az.**	266°06'35.9831"	0°00'00.3864"	1:533501
		ΔHt.	-14.443sft	0.060sft	
		ΔElev.	-14.470sft	0.146sft	
		Dist.	14943.035sft	0.028sft	
525	531	**Az.**	231°29'33.5531"	0°00'00.2582"	1:811773
		ΔHt.	-9.297sft	0.090sft	
		ΔElev.	-9.130sft	0.158sft	
		Dist.	24622.987sft	0.030sft	
525	518	**Az.**	353°53'54.9356"	0°00'00.3720"	1:536586
		ΔHt.	24.051sft	0.077sft	
		ΔElev.	23.834sft	0.163sft	

		Dist.	19529.642sft	0.036sft	
525	69	**Az.**	321°17'05.7674"	0°00'00.7115"	1:288419
		ΔHt.	9.766sft	0.066sft	
		ΔElev.	9.585sft	0.119sft	
		Dist.	10660.714sft	0.037sft	
525	532	**Az.**	189°11'14.8106"	0°00'00.4244"	1:442528
		ΔHt.	-30.156sft	0.081sft	
		ΔElev.	-29.873sft	0.141sft	
		Dist.	17813.319sft	0.040sft	
526	517	**Az.**	345°59'34.1962"	0°00'00.3305"	1:607511
		ΔHt.	18.550sft	0.080sft	
		ΔElev.	18.335sft	0.166sft	
		Dist.	20936.910sft	0.034sft	
526	527	**Az.**	275°30'39.5306"	0°00'00.3903"	1:552928
		ΔHt.	-28.185sft	0.073sft	
		ΔElev.	-28.189sft	0.152sft	
		Dist.	18497.500sft	0.033sft	
526	531	**Az.**	196°54'01.4450"	0°00'00.3737"	1:557369
		ΔHt.	5.146sft	0.064sft	
		ΔElev.	5.340sft	0.132sft	
		Dist.	14965.932sft	0.027sft	
526	69	**Az.**	41°24'42.3878"	0°00'00.5683"	1:357791
		ΔHt.	24.209sft	0.063sft	
		ΔElev.	24.055sft	0.124sft	
		Dist.	12449.797sft	0.035sft	
517	512	**Az.**	5°16'56.8410"	0°00'00.5402"	1:360877
		ΔHt.	20.306sft	0.061sft	
		ΔElev.	20.218sft	0.138sft	
		Dist.	13443.931sft	0.037sft	
517	69	**Az.**	129°31'01.5739"	0°00'00.4980"	1:440340
		ΔHt.	5.659sft	0.077sft	

		ΔElev.	5.720sft	0.144sft	
		Dist.	17247.170sft	0.039sft	
512	513	**Az.**	271°01'55.1735"	0°00'00.4651"	1:475584
		ΔHt.	-24.778sft	0.070sft	
		ΔElev.	-24.802sft	0.150sft	
		Dist.	15777.039sft	0.033sft	
512	503	**Az.**	1°18'46.2639"	0°00'00.4529"	1:438473
		ΔHt.	-12.254sft	0.070sft	
		ΔElev.	-12.323sft	0.145sft	
		Dist.	16002.253sft	0.036sft	
512	511	**Az.**	90°35'37.5641"	0°00'00.4405"	1:485958
		ΔHt.	-19.427sft	0.065sft	
		ΔElev.	-19.375sft	0.152sft	
		Dist.	16018.159sft	0.033sft	
513	502	**Az.**	0°01'05.8796"	0°00'00.4459"	1:436454
		ΔHt.	41.499sft	0.075sft	
		ΔElev.	41.384sft	0.149sft	
		Dist.	15934.757sft	0.037sft	
513	514	**Az.**	260°35'51.7524"	0°00'00.5119"	1:411140
		ΔHt.	6.170sft	0.075sft	
		ΔElev.	6.185sft	0.146sft	
		Dist.	14330.717sft	0.035sft	
513	516	**Az.**	176°57'56.0020"	0°00'00.5068"	1:380062
		ΔHt.	1.384sft	0.075sft	
		ΔElev.	1.519sft	0.150sft	
		Dist.	14901.525sft	0.039sft	
527	530	**Az.**	183°36'08.8499"	0°00'00.4842"	1:389468
		ΔHt.	22.390sft	0.079sft	
		ΔElev.	22.567sft	0.150sft	
		Dist.	16273.965sft	0.042sft	
527	528	**Az.**	270°01'42.0121"	0°00'00.4504"	1:477711

		ΔHt.	25.478sft	0.075sft	
		ΔElev.	25.488sft	0.147sft	
		Dist.	16706.517sft	0.035sft	
527	516	**Az.**	358°35'29.8497"	0°00'00.4404"	1:446141
		ΔHt.	43.646sft	0.076sft	
		ΔElev.	43.460sft	0.157sft	
		Dist.	17334.797sft	0.039sft	
136	530	**Az.**	6°06'26.8335"	0°00'00.4824"	1:390298
		ΔHt.	-4.978sft	0.078sft	
		ΔElev.	-5.098sft	0.135sft	
		Dist.	16173.883sft	0.041sft	
136	131	**Az.**	270°37'08.5958"	0°00'00.0000"	1:0
		ΔHt.	20.311sft	0.056sft	
		ΔElev.	20.310sft	0.000sft	
		Dist.	13045.372sft	0.000sft	
136	311	**Az.**	295°24'31.2489"	0°00'00.0000"	1:0
		ΔHt.	26.315sft	0.071sft	
		ΔElev.	26.320sft	0.000sft	
		Dist.	18928.283sft	0.000sft	
455	447	**Az.**	267°01'04.6609"	0°00'00.0000"	1:0
		ΔHt.	18.687sft	0.068sft	
		ΔElev.	18.600sft	0.000sft	
		Dist.	15827.129sft	0.000sft	
455	502	**Az.**	180°15'36.8170"	0°00'00.4062"	1:486498
		ΔHt.	26.755sft	0.077sft	
		ΔElev.	26.830sft	0.141sft	
		Dist.	17465.205sft	0.036sft	
455	465	**Az.**	86°20'20.7253"	0°00'00.0000"	1:0
		ΔHt.	-15.507sft	0.067sft	
		ΔElev.	-15.390sft	0.000sft	
		Dist.	16451.815sft	0.000sft	

447	501	**Az.**	180°05'49.4676"	0°00'00.4482"	1:449707
		ΔHt.	-3.336sft	0.080sft	
		ΔElev.	-3.215sft	0.130sft	
		Dist.	16814.742sft	0.037sft	
447	67	**Az.**	265°39'56.2844"	0°00'00.0000"	1:0
		ΔHt.	7.566sft	0.063sft	
		ΔElev.	7.610sft	0.000sft	
		Dist.	16381.926sft	0.000sft	
447	68	**Az.**	230°32'15.8587"	0°00'00.0000"	1:0
		ΔHt.	12.284sft	0.044sft	
		ΔElev.	12.270sft	0.000sft	
		Dist.	6915.025sft	0.000sft	
503	465	**Az.**	1°10'33.4380"	0°00'00.3859"	1:515635
		ΔHt.	-13.288sft	0.076sft	
		ΔElev.	-13.315sft	0.142sft	
		Dist.	18729.508sft	0.036sft	
528	529	**Az.**	176°45'01.4554"	0°00'00.4430"	1:456874
		ΔHt.	-8.070sft	0.074sft	
		ΔElev.	-7.879sft	0.140sft	
		Dist.	16587.359sft	0.036sft	
528	515	**Az.**	359°10'19.5226"	0°00'00.4735"	1:424767
		ΔHt.	-21.910sft	0.080sft	
		ΔElev.	-22.085sft	0.150sft	
		Dist.	15954.566sft	0.038sft	
528	313	**Az.**	299°53'34.1963"	0°00'01.0477"	1:204476
		ΔHt.	-24.450sft	0.041sft	
		ΔElev.	-24.495sft	0.101sft	
		Dist.	6367.798sft	0.031sft	
528	63	**Az.**	265°46'36.9893"	0°00'00.3709"	1:572822
		ΔHt.	12.077sft	0.062sft	
		ΔElev.	12.047sft	0.131sft	

		Dist.	16488.408sft	0.029sft	
529	131	**Az.**	180°00'24.3297"	0°00'00.4798"	1:416949
		ΔHt.	30.271sft	0.075sft	
		ΔElev.	30.366sft	0.114sft	
		Dist.	15628.192sft	0.037sft	
515	514	**Az.**	6°24'51.9919"	0°00'00.5523"	1:355047
		ΔHt.	44.865sft	0.084sft	
		ΔElev.	44.723sft	0.148sft	
		Dist.	13997.203sft	0.039sft	
501	514	**Az.**	174°50'25.1479"	0°00'00.4243"	1:474502
		ΔHt.	-23.925sft	0.089sft	
		ΔElev.	-23.754sft	0.153sft	
		Dist.	18175.370sft	0.038sft	
67	66	**Az.**	181°46'51.4719"	0°00'00.4349"	1:467852
		ΔHt.	-22.473sft	0.057sft	
		ΔElev.	-22.400sft	0.000sft	
		Dist.	13081.285sft	0.028sft	
67	68	**Az.**	105°58'44.0391"	0°00'00.0000"	1:0
		ΔHt.	4.718sft	0.050sft	
		ΔElev.	4.660sft	0.000sft	
		Dist.	11440.550sft	0.000sft	
65	514	**Az.**	97°16'00.4304"	0°00'00.4053"	1:523139
		ΔHt.	0.059sft	0.071sft	
		ΔElev.	0.101sft	0.141sft	
		Dist.	17956.083sft	0.034sft	
65	66	**Az.**	358°15'12.7608"	0°00'00.3874"	1:511140
		ΔHt.	12.412sft	0.076sft	
		ΔElev.	12.280sft	0.000sft	
		Dist.	18328.532sft	0.036sft	
65	64	**Az.**	180°21'00.2345"	0°00'00.4294"	1:469419
		ΔHt.	-20.562sft	0.066sft	

		ΔElev.	-20.410sft	0.000sft	
		Dist.	16339.965sft	0.035sft	
518	511	**Az.**	357°16'31.3979"	0°00'00.5463"	1:370535
		ΔHt.	-19.066sft	0.058sft	
		ΔElev.	-19.127sft	0.134sft	
		Dist.	13106.836sft	0.035sft	
66	68	**Az.**	48°58'00.2276"	0°00'00.3812"	1:547951
		ΔHt.	27.192sft	0.060sft	
		ΔElev.	27.060sft	0.000sft	
		Dist.	15119.281sft	0.028sft	
131	311	**Az.**	333°02'47.9830"	0°00'00.0000"	1:0
		ΔHt.	6.004sft	0.042sft	
		ΔElev.	6.010sft	0.000sft	
		Dist.	8950.726sft	0.000sft	
131	61	**Az.**	270°44'41.4386"	0°00'00.0000"	1:0
		ΔHt.	-121.065sft	0.063sft	
		ΔElev.	-121.150sft	0.000sft	
		Dist.	17362.832sft	0.000sft	
64	313	**Az.**	138°44'22.1458"	0°00'00.4072"	1:520854
		ΔHt.	-26.784sft	0.065sft	
		ΔElev.	-26.622sft	0.117sft	
		Dist.	16795.015sft	0.032sft	
64	63	**Az.**	179°28'29.0310"	0°00'00.3644"	1:555121
		ΔHt.	9.744sft	0.064sft	
		ΔElev.	9.920sft	0.000sft	
		Dist.	17021.140sft	0.031sft	
313	63	**Az.**	248°06'05.5927"	0°00'00.5177"	1:398223
		ΔHt.	36.527sft	0.049sft	
		ΔElev.	36.542sft	0.117sft	
		Dist.	11771.362sft	0.030sft	
311	62	**Az.**	300°29'47.2578"	0°00'00.3593"	1:578568

		ΔHt.	-8.086sft	0.058sft	
		ΔElev.	-8.250sft	0.000sft	
		Dist.	15472.538sft	0.027sft	
311	63	**Az.**	329°54'08.3777"	0°00'00.2176"	1:945585
		ΔHt.	-16.128sft	0.093sft	
		ΔElev.	-16.450sft	0.000sft	
		Dist.	26578.133sft	0.028sft	
311	61	**Az.**	239°45'35.9515"	0°00'00.0000"	1:0
		ΔHt.	-127.069sft	0.057sft	
		ΔElev.	-127.160sft	0.000sft	
		Dist.	15398.376sft	0.000sft	
62	63	**Az.**	359°58'57.7727"	0°00'00.4176"	1:483916
		ΔHt.	-8.042sft	0.061sft	
		ΔElev.	-8.200sft	0.000sft	
		Dist.	15142.567sft	0.031sft	
62	61	**Az.**	179°51'42.1485"	0°00'00.3514"	1:575457
		ΔHt.	-118.984sft	0.062sft	
		ΔElev.	-118.910sft	0.000sft	
		Dist.	15607.092sft	0.027sft	