

**Story County
Iowa**

**G.P.S.
Countywide Survey**
Engineer's Copy

**Control Network
in
Support of
Geographical
Information
System**

1998

**Aerial Services, Inc.
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SECTION 1

Project Report

INTRODUCTION

Story County, Iowa, chose to update their existing 1988 parcel mapping system with a new county-wide high accuracy geographical information system. This project was designed around two phases. Phase I consists of the GPS control and acquisition of the aerial photography. Phase II consists of the production of the digital orthophotography. Aerial Services, Inc. of Cedar Falls, Iowa, was selected from a field of eight other professional mapping firms to complete both Phase I and Phase II.

To complete the new survey, specific products and map accuracies were selected to support the project. The final line cadastral overlays were to be based on accurate, fully rectified orthophoto base maps. To accomplish this task as accurately as possible, photo flights were designed for coverage of rural and urban areas to produce 1" = 400' scale and 1" = 100' scale orthophoto maps, respectively. For the best control, a Global Positioning System Survey was selected to densify the existing GPS control. Fifteen new control stations were added within the County. The fifteen new stations plus the 52 existing stations yielded a total of 67 control stations.

PROJECT REQUIREMENTS

The purpose of this survey was to establish throughout Story County, Iowa, a new horizontal control network using GPS survey equipment and techniques. This network was to be referenced to the new Iowa High Accuracy Reference Network (HARN) of 1996. It was also the intent of the County to obtain elevations on each new and existing monument which would be referenced to NAVD 1988. Because this control would be utilized to control the analytical triangulation of the aerial photography, the network geometry was ideal for a strong GPS survey. All new point locations for control were selected with the needs of both the analytical triangulation and GPS survey requirements in mind. In some instances, all of the needs could not be met due to physical obstructions or existing land features. In these instances, the needs of analytical triangulation were held primary and the GPS survey needs were satisfied second.

MONUMENTATION

NEW: To perpetuate the GPS control measurements, 15 new permanent monuments were set. BERNTSEN driven aluminum rod monuments were selected for these monuments. Each station monument consisted of one three foot smooth rod section and one three foot top security fluted rod section with a stamped cap. These were driven to approximately 6" below the existing ground surface. For easy access and protection, a two foot long 5" 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.

EXISTING: The Story County Engineers Office performed a thorough field reconnaissance of the survey monuments set in 1988. Of the existing 52 monuments, 26 were BERNTSEN Top Security rod monuments and 26 were 5/8" rebars. Eight of the existing monuments were either unrecoverable or unusable and had to be reset by Aerial Services, Inc. The coordination of marking the various underground utility locations at each site was handled by the Story County Engineers Office.

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 of the project site. With this in mind, seven existing HARN horizontal stations were recovered in and/or near Story County. All seven 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 job area. Eight existing NGS and USGS benchmarks were recovered and included in this survey. Six of the benchmarks were occupied directly. Two benchmarks which were not suitable for GPS were referenced to temporary points by direct third-order closed level loops.

FIELD SURVEY

Three Ashtech Z-12 dual frequency receivers were used in this survey. GPS observations began Monday afternoon, May 18, 1998. Three and one half days of GPS observations were made from Monday, May 18, through Thursday, May 21, 1998.

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. Each measurement period during which all receivers observe satellites simultaneously lasted from six minutes to 15 minutes, depending on the distance being measured and the geometry of the satellite constellation.

DATA ADJUSTMENT

The total number of lines observed and processed was 179. Based on statistical indicators from the ASHTECH PRISM processing utility and analysis of loop closures, 24 lines were rejected and moved prior to data adjustment. It should be noted that the unusually high number of rejected baselines is attributed to the severe electrical storms which moved through the County on Tuesday afternoon. Because of this, these baselines were re-measured to complete the network. The final network is comprised of 78 stations and 155 baselines. All data adjustment was performed using the STARNET 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 1:100,000 to 1:2,000,000. 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 point #310 fixed horizontally with the vertical adjustment disabled. Coordinate values on the other horizontal control stations were then checked against the published values. One at a time, each of the seven remaining horizontal control points 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 seven of the existing horizontal control stations fixed, the precisions of the "free" adjustment degraded very little.

Once we were satisfied with the horizontal adjustment, we locked the horizontal positions and concentrated on the vertical adjustment. The Geoid 96 Central zone was utilized to provide a model of the height of the Geoid. Adjustments were then performed locking on to the vertical control stations one at a time. Elevations on the benchmarks were then checked against the published values. The vertical control points fit very well. Therefore, a final adjustment was performed, held to all eight benchmarks.

A final adjustment of both horizontal and vertical was then performed. Because the control was so reliable, the final adjustment in NAD83 (1996) was very straightforward. All horizontal control 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 1:100,000 or less. The results are well in excess of the first-order precision. The error ellipses for each point are listed in Section VI. The units of measure for the error ellipses are US survey feet.

UNITS

It should be noted that the 1988 final network coordinates were listed in the International Foot. The conversion for meters to the International Foot is 3.280839895 feet per meter. At the direction of the County, the **final adjusted coordinates of the 1998 survey** are listed in the **US Survey Foot**. The conversion for meters to the US Survey Foot is 3.280833333 feet per meter.

CONCLUSION

The initial control accuracy specification for the project was established as 0.2 ft. $\pm$ in x, y and 0.3 ft. in z. Because of existing control point strength, geometric network layout and vertical datum stability, it was possible to well exceed this specification. All measured points will be usable for better than first-order control in horizontal position and with $\pm$ 0.1 ft. vertically for benchmark use.

SECTION 2

Monument Records

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **101**

Northing: **3539778.13(Ft)** Easting: **4867472.06(Ft)**

Northing: **1078926.533(M)** Easting: **1483608.452(M)**

Elev: **1063.77(Ft)** NAVD_88

Elev: **324.240(M)** NAVD_88 Ellip Ht: **296.597(M)** 96C Geoid Ht: **-27.643(M)**

Latitude: **42-12-37.400050 N** Longitude: **93-41-54.615180 W**

Theta: **-0-08-04.33** Combination Factor: **0.99993048**

Designation: **36-86-25**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **102 Reset**

Northing: **3539340.34(Ft)**

Easting: **4878344.32 (Ft)**

Northing: **1078793.094(M)**

Easting: **1486922.321(M)**

Elev: **1020.01(Ft) NAVD_88**

Elev: **310.901(M) NAVD_88**

Ellip Ht: **283.027(M)**

96C Geoid Ht: **-27.874(M)**

Latitude: **42-12-33.301951 N**

Longitude: **93-39-30.131328 W**

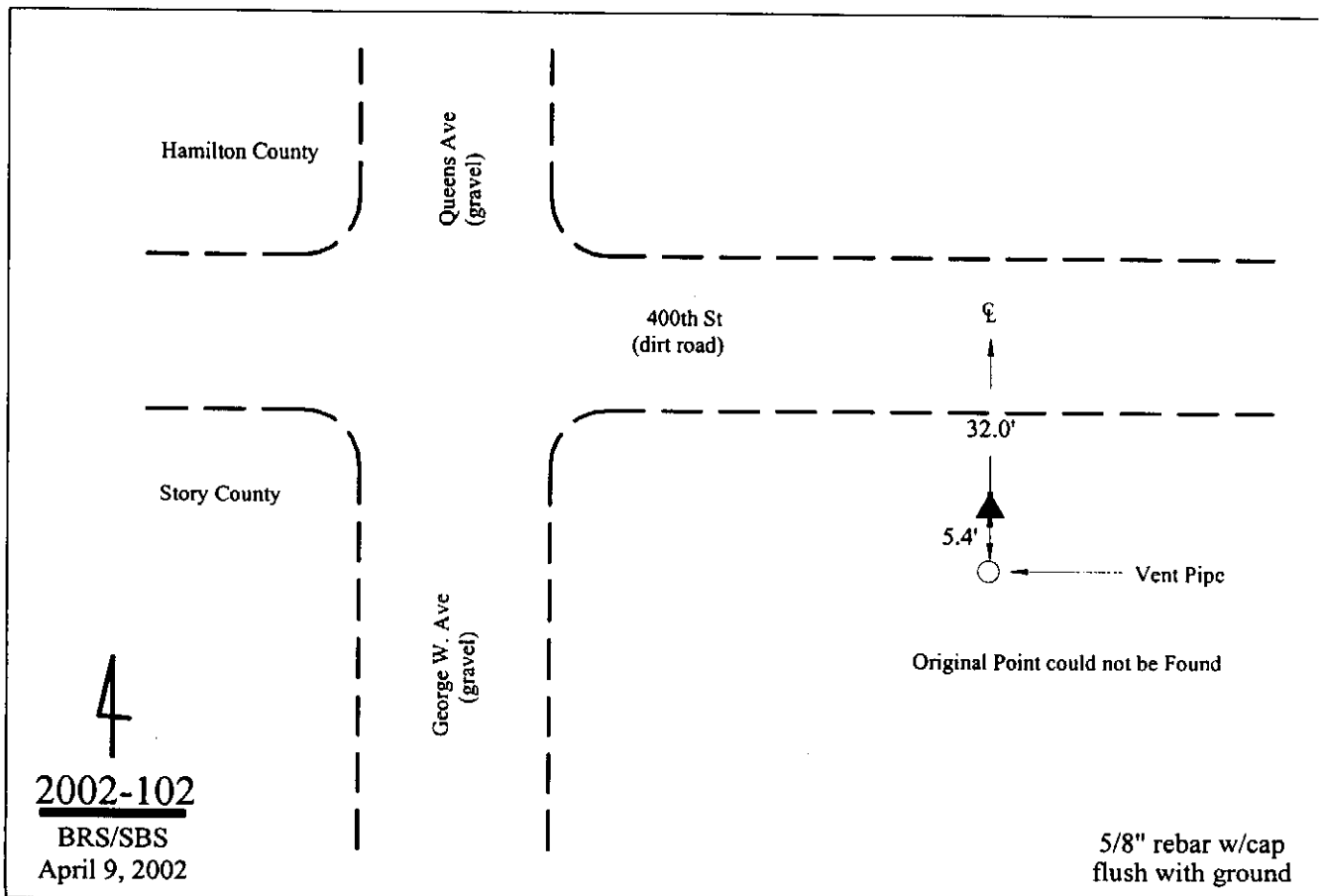
Theta: **0-06-26.40**

Combination Factor: **0.99993279**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: 5/8" x 30" deformed rebar with red plastic cap

Remarks: Near the SE corner of Section 32, T86N, R24W



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **103**

Northing: **3539237.81(Ft)** Easting: **4888725.05(Ft)**

Northing: **1078761.842(M)** Easting: **1490086.376(M)**

Elev: **1029.81(Ft)** NAVD_88

Elev: **313.887(M)** NAVD_88 Ellip Ht: **285.863(M)** 96C Geoid Ht: **-28.024(M)**

Latitude: **42-12-32.457895 N** Longitude: **93-37-12.190256 W**

Theta: **-0-04-52.91** Combination Factor: **0.99993235**

Designation: **2-85-24**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: 104 Reset

Northing: 3542457.297(Ft)

Easting: 4899090.527(Ft)

Northing: 1079743.145(M)

Easting: 1493245.781(M)

Elev: 987.722(Ft) NAVD_88

Elev: 301.058(M) NAVD_88

Ellip Ht: 272.872 (M)

96C Geoid Ht: -28.186(M)

Latitude: 42-13-04.38470 N

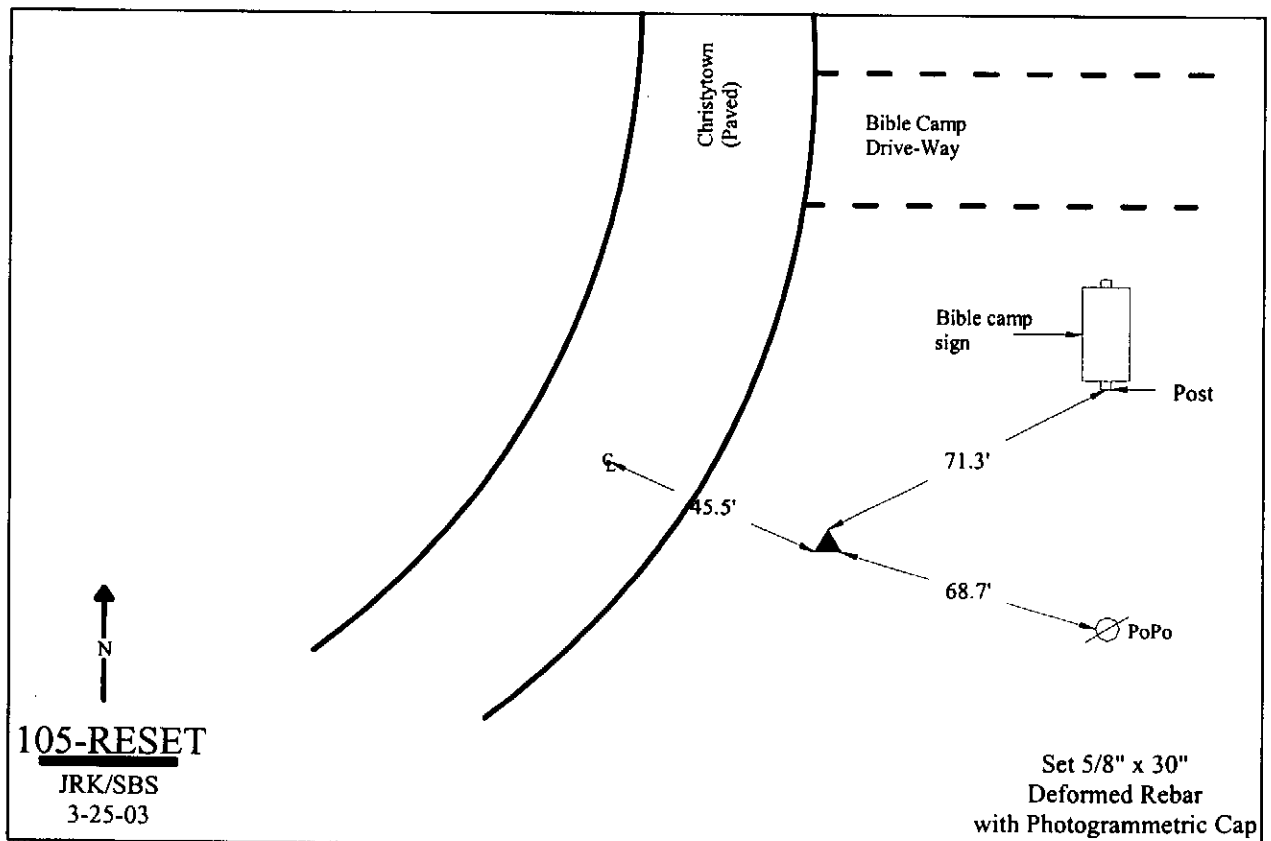
Longitude: 93-34-54.49572 W

Theta: -0-03-19.593

Combination Factor: 0.99993320

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: 5/8" x 30" deformed rebar with red plastic cap



2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **105 Reset**

Northing: **3539251.09 (Ft)**

Easting: **4910214.859 (Ft)**

Northing: **1078765.891(M)**

Easting: **1496636.484(M)**

Elev: **1005.106(Ft) NAVD_88**

Elev: **306.357(M) NAVD_88**

Ellip Ht: **277.881(M)**

96C Geoid Ht: **-28.476(M)**

Latitude: **42 12 32.79098 N**

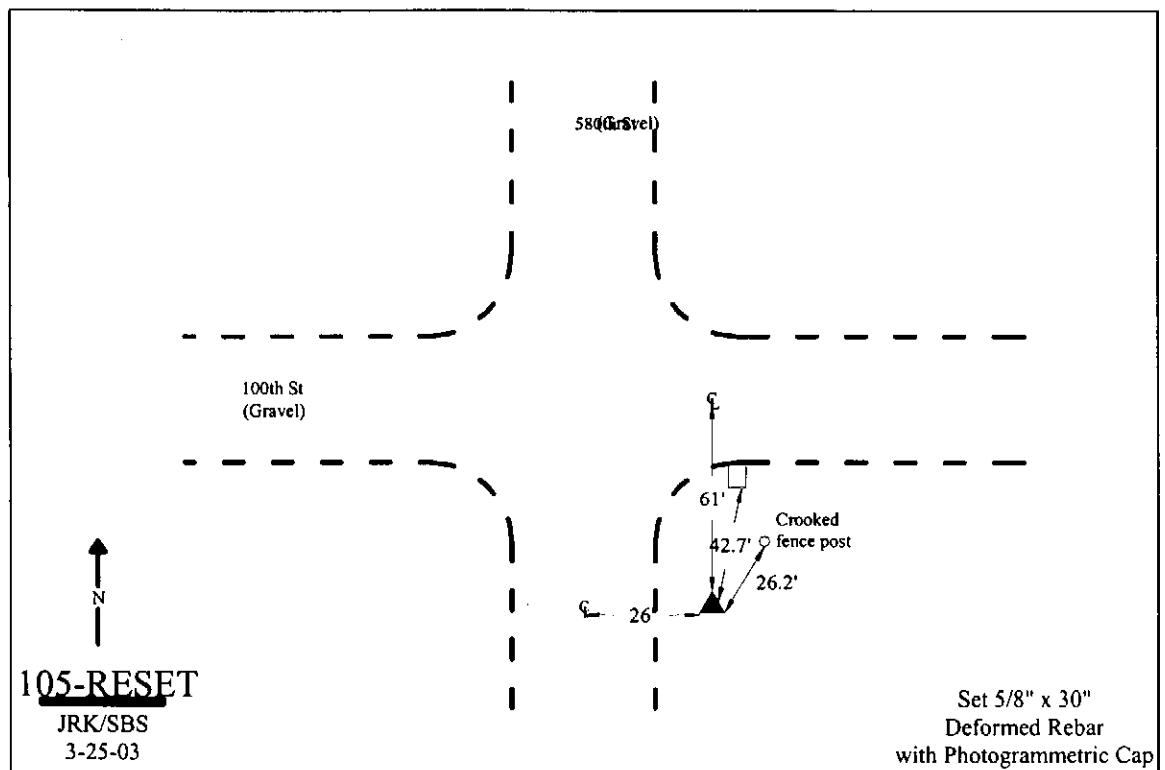
Longitude: **93 32 26.63469 W**

Theta: **-0-01-39.381**

Combination Factor: **0.99993362**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: 5/8" x 30" deformed rebar with red plastic cap



2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **106 Reset**

Northing: **3539275.06(Ft)**

Easting: **4921188.71(Ft)**

Northing: **1078773.197(M)**

Easting: **1499981.318(M)**

Elev: **1056.71(Ft) NAVD_88**

Elev: **322.085(M) NAVD_88**

Ellip Ht: **293.309(M)**

96C Geoid Ht: **-28.776(M)**

Latitude: **42-12-33.054062 N**

Longitude: **93-39-00.814465 W**

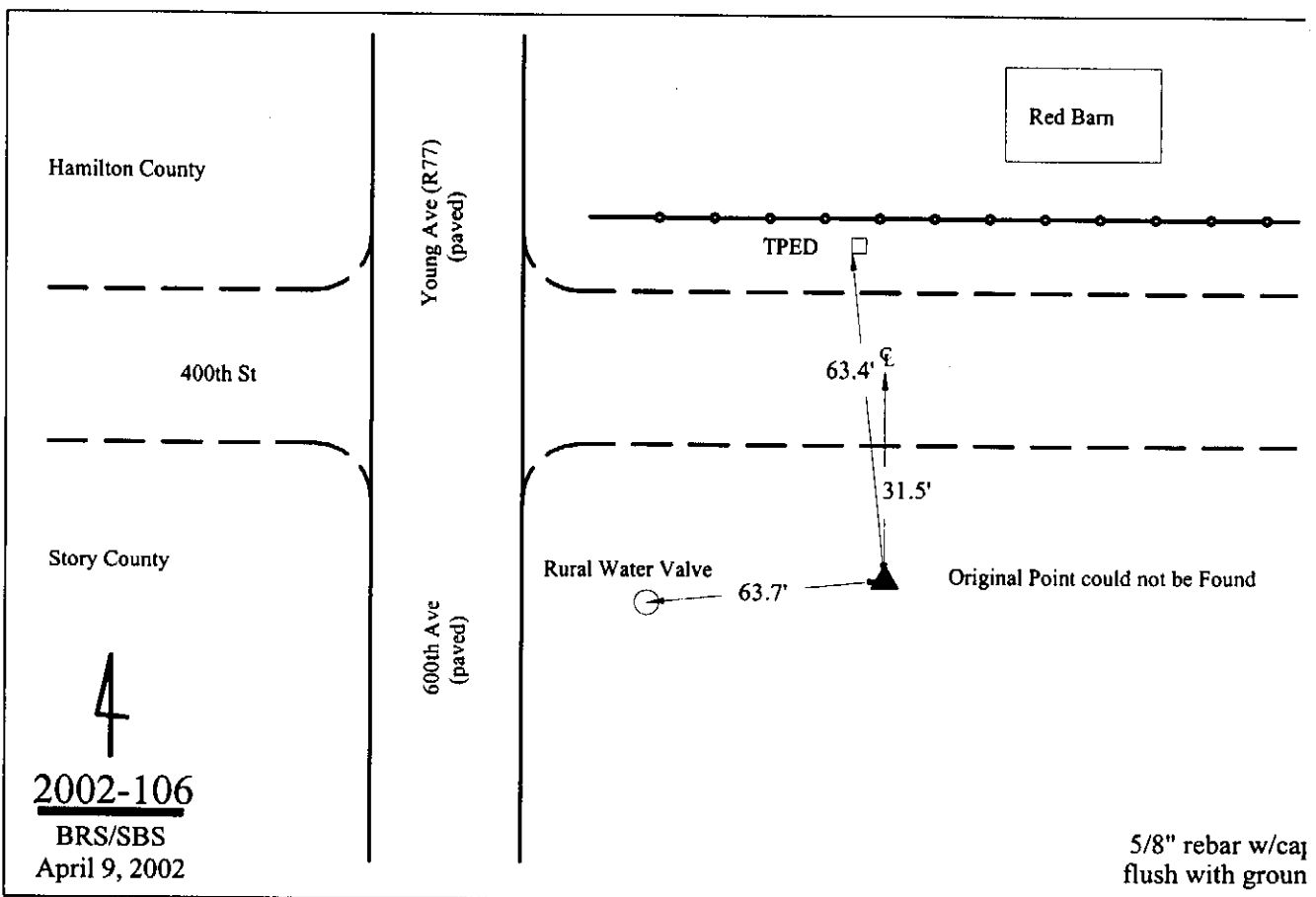
Theta: **0-00-00.55**

Combination Factor: **0.99993118**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: **5/8" x 30" deformed rebar with red plastic cap**

Remarks: **Near the SE corner of Section 34, T86N, R23W**



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **107**

Northing: **3539349.59(Ft)** Easting: **4931224.35(Ft)**

Northing: **1078795.913(M)** Easting: **1503040.188(M)**

Elev: **1114.59(Ft)** NAVD_88

Elev: **339.728(M)** NAVD_88 Ellip Ht: **310.746(M)** 96C Geoid Ht: **-28.982(M)**

Latitude: **42-12-33.768846 N** Longitude: **93-27-47.460483 W**

Theta: **0-01-29.83** Combination Factor: **0.99992840**

Designation: **36-86-23**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **108 Reset**

Northing: **3539354.374(Ft)**

Easting: **4941748.328(Ft)**

Northing: **1078797.372(M)**

Easting: **1506247.904(M)**

Elev: **1127.089(Ft) NAVD_88**

Elev: **343.537(M) NAVD_88**

Ellip Ht: **314.283(M)**

96C Geoid Ht: **-29.254(M)**

Latitude: **42 12 33.74694 N**

Longitude: **93 25 27.61752 W**

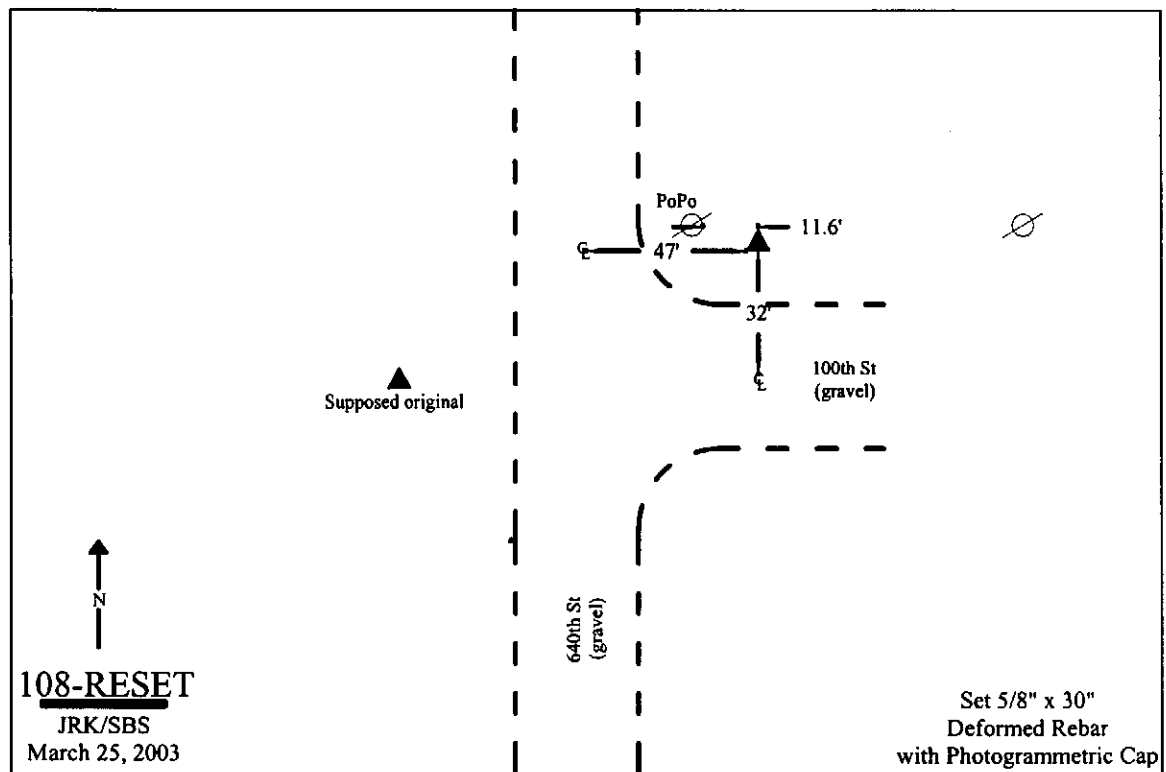
Theta: **0 03 04.606**

Combination Factor: **0.99992787**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: 5/8" x 30" deformed rebar with red plastic cap

Remarks: Near the NW corner of section 4 T85N R22W



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **109**

Northing: **3539327.20(Ft)** Easting: **4952299.98(Ft)**

Northing: **1078789.089(M)** Easting: **1509464.051(M)**

Elev: **1146.96(Ft)** NAVD_88

Elev: **349.596(M)** NAVD_88 Ellip Ht: **320.061(M)** 96C Geoid Ht: **-29.535(M)**

Latitude: **42-12-33.361236 N** Longitude: **93-23-07.407502 W**

Theta: **0-04-39.63** Combination Factor: **0.99992695**

Designation: **2-85-22**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **110**

Northing: **3539295.36(Ft)** Easting: **4962769.50(Ft)**

Northing: **1078779.384(M)** Easting: **1512655.169(M)**

Elev: **1148.65(Ft)** NAVD_88

Elev: **350.110(M)** NAVD_88 Ellip Ht: **320.296(M)** 96C Geoid Ht: **-29.815(M)**

Latitude: **42-12-32.882839 N** Longitude: **93-20-48.289336 W**

Theta: **0-06-13.92** Combination Factor: **0.99992693**

Designation: **1-85-22**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **111**

Northing: **3539376.59(Ft)** Easting: **4972870.07(Ft)**

Northing: **1078804.141(M)** Easting: **1515733.828(M)**

Elev: **1125.07(Ft)** NAVD_88

Elev: **342.923(M)** NAVD_88 Ellip Ht: **312.848(M)** 96C Geoid Ht: **-30.075(M)**

Latitude: **42-12-33.482334 N** Longitude: **93-18-34.071121 W**

Theta: **0-07-44.88** Combination Factor: **0.99992808**

Designation: **TRAVERSE POINT**

Monument Type: 5/8" rebar with yellow cap

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **112 Reset**

Northing: **3539287.821(Ft)**

Easting: **4982054.669(Ft)**

Northing: **1078777.086(M)**

Easting: **1518533.302(M)**

Elev: **1049.509(Ft)** NAVD_88

Elev: **319.891(M)** NAVD_88

Ellip Ht: **289.594(M)**

96C Geoid Ht: **-30.297(M)**

Latitude: **42 12 32.38276 N**

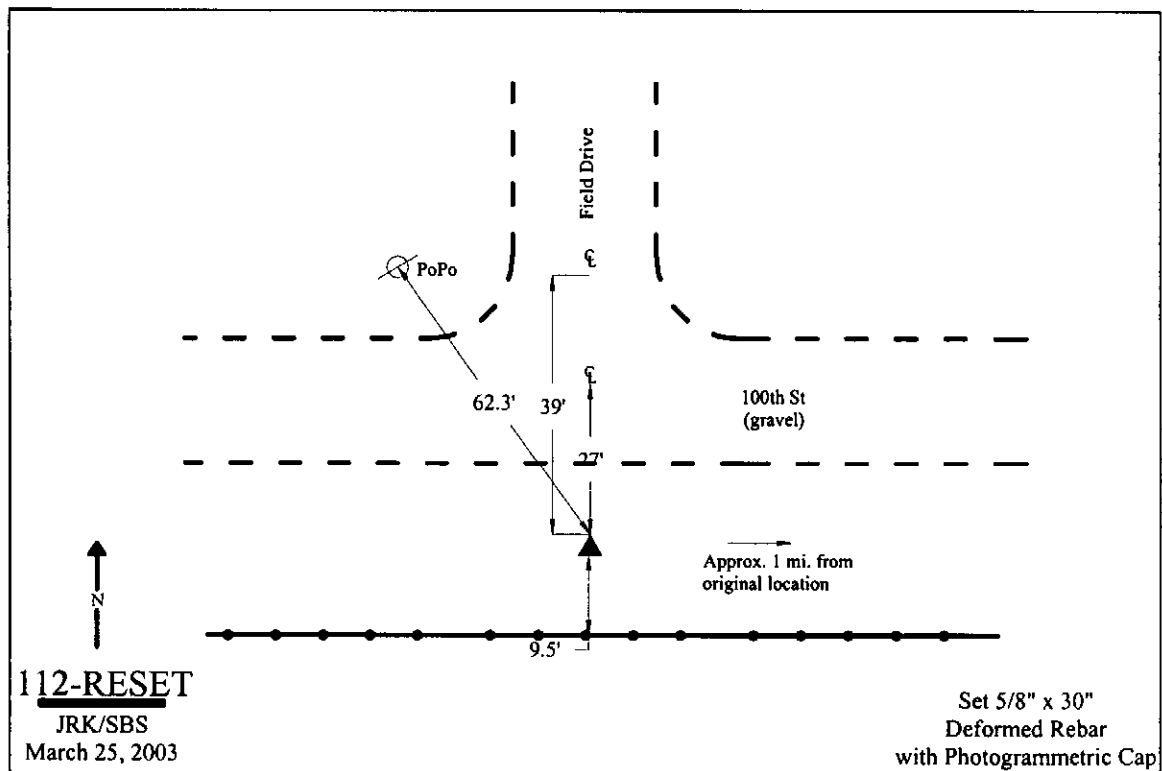
Longitude: **93 16 32.02951 W**

Theta: **0 09 07.598**

Combination Factor: **0.99993179**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: 5/8" x 30" deformed rebar with red plastic cap



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **113**

Northing: **3539307.25(Ft)** Easting: **4993971.76(Ft)**

Northing: **1078783.008(M)** Easting: **1522165.635(M)**

Elev: **1106.53(Ft)** NAVD_88

Elev: **337.272(M)** NAVD_88 Ellip Ht: **306.713(M)** 96C Geoid Ht: **-30.559(M)**

Latitude: **42-12-32.231553 N** Longitude: **93-13-53.675817 W**

Theta: **0-10-54.92** Combination Factor: **0.99992909**

Designation: **1-85-21**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **201**

Northing: **3496887.15(Ft)** Easting: **4867416.76(Ft)**

Northing: **1065853.334(M)** Easting: **1483591.595(M)**

Elev: **984.34(Ft)** NAVD_88

Elev: **300.028(M)** NAVD_88 Ellip Ht: **271.674(M)** 96C Geoid Ht: **-28.354(M)**

Latitude: **42-05-33.689281 N** Longitude: **93-41-54.012917 W**

Theta: **-0-08-03.92** Combination Factor: **0.99995275**

Designation: **7-84-24**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **202**

Northing: **3496691.52(Ft)** Easting: **4878086.27(Ft)**

Northing: **1065793.706(M)** Easting: **1486843.670(M)**

Elev: **949.80(Ft)** NAVD_88

Elev: **289.501(M)** NAVD_88 Ellip Ht: **260.947(M)** 96C Geoid Ht: **-28.554(M)**

Latitude: **42-05-31.979495 N** Longitude: **93-39-32.494154 W**

Theta: **-0-06-28.00** Combination Factor: **0.99995451**

Designation: **TRAVERSE POINT**

Monument Type: 5/8" rebar with yellow cap

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **203 Reset**

Northing: **3496682.638(Ft)**

Easting: **4888504.678(Ft)**

Northing: **1065791.001(M)**

Easting: **1490019.207(M)**

Elev: **990.829(Ft)** NAVD_88

Elev: **302.005(M)** NAVD_88

Ellip Ht: **273.252(M)**

96C Geoid Ht: **-28.753(M)**

Latitude: **42 05 32.06201 N**

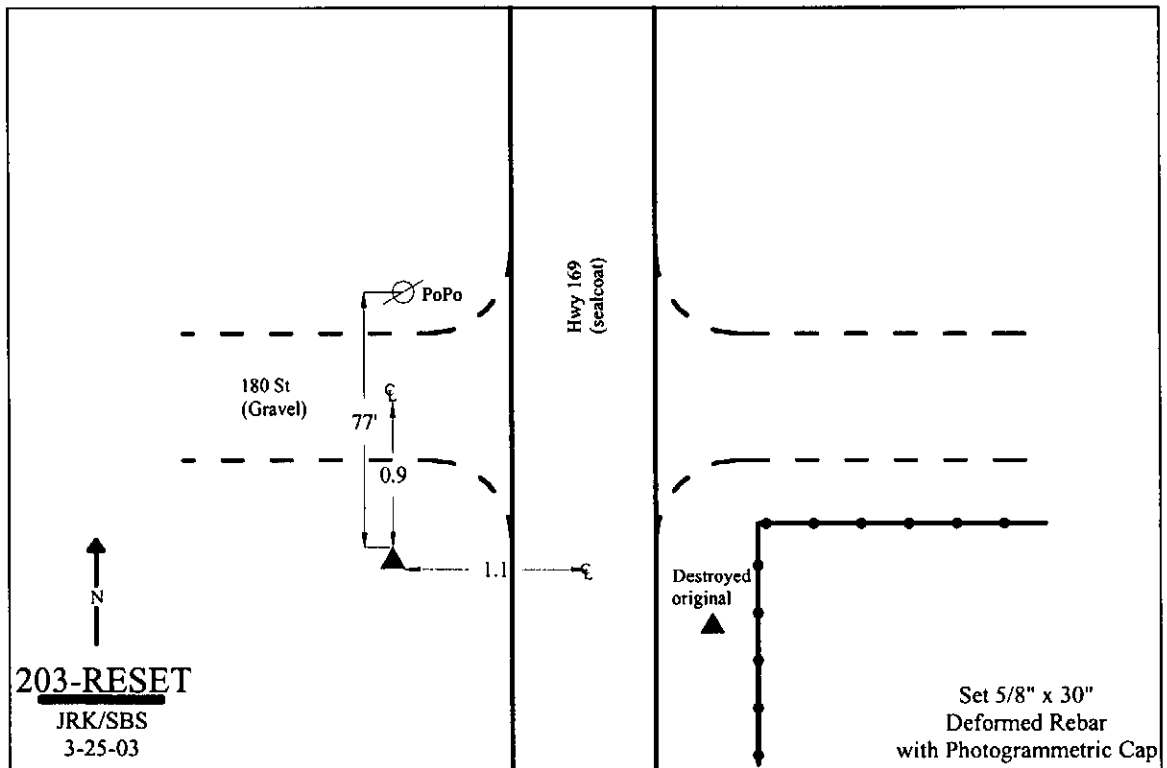
Longitude: **93 37 14.31160 W**

Theta: **-0 04 54.352**

Combination Factor: **0.99995260**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: 5/8" x 30" deformed rebar with red plastic cap



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **204**

Northing: **3496550.77(Ft)** Easting: **4899087.47(Ft)**

Northing: **1065750.807(M)** Easting: **1493244.848(M)**

Elev: **936.77(Ft)** NAVD_88

Elev: **285.528(M)** NAVD_88 Ellip Ht: **256.558(M)** 96C Geoid Ht: **-28.970(M)**

Latitude: **42-05-30.884411 N** Longitude: **93-34-53.947055 W**

Theta: **-0-03-19.22** Combination Factor: **0.99995525**

Designation: **13-84-24**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **205**

Northing: **3496286.46(Ft)** Easting: **4910094.35(Ft)**

Northing: **1065670.243(M)** Easting: **1496599.751(M)**

Elev: **1016.65(Ft)** NAVD_88

Elev: **309.876(M)** NAVD_88 Ellip Ht: **280.676(M)** 96C Geoid Ht: **-29.200(M)**

Latitude: **42-05-28.352234 N** Longitude: **93-32-27.958451 W**

Theta: **-0-01-40.28** Combination Factor: **0.99995159**

Designation: **17-84-23**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **206**

Northing: **3496870.05(Ft)** Easting: **4920817.58(Ft)**

Northing: **1065848.123(M)** Easting: **1499868.199(M)**

Elev: **1008.11(Ft)** NAVD_88

Elev: **307.274(M)** NAVD_88 Ellip Ht: **277.863(M)** 96C Geoid Ht: **-29.412(M)**

Latitude: **42-05-34.144197 N** Longitude: **93-30-05.735325 W**

Theta: **-0-00-03.89** Combination Factor: **0.99995175**

Designation: **TRAVERSE POINT**

Monument Type: 5/8" rebar with yellow cap

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **207**

Northing: **3496752.71(Ft)** Easting: **4931411.70(Ft)**

Northing: **1065812.356(M)** Easting: **1503097.291(M)**

Elev: **1023.12(Ft)** NAVD_88

Elev: **311.849(M)** NAVD_88 Ellip Ht: **282.213(M)** 96C Geoid Ht: **-29.636(M)**

Latitude: **42-05-32.962777 N** Longitude: **93-27-45.221707 W**

Theta: **0-01-31.35** Combination Factor: **0.99995113**

Designation: **7-84-22**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **208**

Northing: **3496879.27(Ft)** Easting: **4941521.19(Ft)**

Northing: **1065850.933(M)** Easting: **1506178.672(M)**

Elev: **1035.32(Ft)** NAVD_88

Elev: **315.567(M)** NAVD_88 Ellip Ht: **285.722(M)** 96C Geoid Ht: **-29.845(M)**

Latitude: **42-05-34.146856 N** Longitude: **93-25-31.134299 W**

Theta: **0-03-02.22** Combination Factor: **0.99995052**

Designation: **TRAVERSE POINT**

Monument Type: Open pipe

To Reach: ***** See the 1988 Field Notes and Station Descriptions *****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **209**

Northing: **3496781.49(Ft)** Easting: **4952137.37(Ft)**

Northing: **1065821.130(M)** Easting: **1509414.489(M)**

Elev: **1042.55(Ft)** NAVD_88

Elev: **317.771(M)** NAVD_88 Ellip Ht: **287.713(M)** 96C Geoid Ht: **-30.058(M)**

Latitude: **42-05-33.064001 N** Longitude: **93-23-10.329243 W**

Theta: **0-04-37.65** Combination Factor: **0.99995026**

Designation: **TRAVERSE POINT**

Monument Type: **5/8" rebar with yellow cap**

To Reach: ****** See the 1988 Field Notes and Station Descriptions ******

Date Printed **6-25-98**

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **210**

Northing: **3496655.54(Ft)** Easting: **4962705.46(Ft)**

Northing: **1065782.741(M)** Easting: **1512635.649(M)**

Elev: **1071.41(Ft)** NAVD_88

Elev: **326.567(M)** NAVD_88 Ellip Ht: **296.312(M)** 96C Geoid Ht: **-30.255(M)**

Latitude: **42-05-31.655221 N** Longitude: **93-20-50.163979 W**

Theta: **0-06-12.65** Combination Factor: **0.99994898**

Designation: **13-84-22**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **211**

Northing: **3496864.47(Ft)** Easting: **4972946.82(Ft)**

Northing: **1065846.423(M)** Easting: **1515757.223(M)**

Elev: **1100.20(Ft)** NAVD_88

Elev: **335.341(M)** NAVD_88 Ellip Ht: **304.908(M)** 96C Geoid Ht: **-30.433(M)**

Latitude: **42-05-33.513809 N** Longitude: **93-18-34.323897 W**

Theta: **0-07-44.71** Combination Factor: **0.99994754**

Designation: **TRAVERSE POINT**

Monument Type: 5/8" rebar with yellow cap

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **212**

Northing: **3496735.22(Ft)** Easting: **4983533.62(Ft)**

Northing: **1065807.025(M)** Easting: **1518984.085(M)**

Elev: **1131.77(Ft)** NAVD_88

Elev: **344.965(M)** NAVD_88 Ellip Ht: **314.353(M)** 96C Geoid Ht: **-30.612(M)**

Latitude: **42-05-31.977171 N** Longitude: **93-16-13.912168 W**

Theta: **0-09-19.88** Combination Factor: **0.99994613**

Designation: **TRAVERSE POINT**

Monument Type: 5/8" rebar with yellow cap

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **213**

Northing: **3496778.06(Ft)** Easting: **4994196.80(Ft)**

Northing: **1065820.085(M)** Easting: **1522234.229(M)**

Elev: **1060.27(Ft)** NAVD_88

Elev: **323.171(M)** NAVD_88 Ellip Ht: **292.390(M)** 96C Geoid Ht: **-30.782(M)**

Latitude: **42-05-32.090042 N** Longitude: **93-13-52.482017 W**

Theta: **0-10-55.73** Combination Factor: **0.99994957**

Designation: **7-84-20**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **301**

Northing: **3460848.61**(Ft) Easting: **4867520.05**(Ft)

Northing: **1054868.766**(M) Easting: **1483623.077**(M)

Elev: **1031.22**(Ft) NAVD_88

Elev: **314.316**(M) NAVD_88 Ellip Ht: **285.176**(M) 96C Geoid Ht: **-29.140**(M)

Latitude: **41-59-37.675731** N Longitude: **93-41-51.525458** W

Theta: **-0-08-02.23** Combination Factor: **0.99996927**

Designation: **NGS Station "1370" of Ames Calibration Base Line**

Monument Type: Brass disk set in the top of a concrete post.

To Reach: **** See the current NGS Data Sheet for complete station description ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **302**

Northing: **3455646.67(Ft)** Easting: **4878162.65(Ft)**

Northing: **1053283.213(M)** Easting: **1486866.948(M)**

Elev: **1012.03(Ft)** NAVD_88

Elev: **308.467(M)** NAVD_88 Ellip Ht: **279.004(M)** 96C Geoid Ht: **-29.463(M)**

Latitude: **41-58-46.508527 N** Longitude: **93-39-30.460771 W**

Theta: **-0-06-26.63** Combination Factor: **0.99997316**

Designation: **TRAVERSE POINT**

Monument Type: 5/8" rebar with yellow cap

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: 303

Northing: 3452904.91(Ft) Easting: 4888495.67(Ft)

Northing: 1052447.522(M) Easting: 1490016.460(M)

Elev: 968.58(Ft) NAVD_88

Elev: 295.225(M) NAVD_88 Ellip Ht: 265.507(M) 96C Geoid Ht: -29.718(M)

Latitude: 41-58-19.591689 N Longitude: 93-37-13.603817 W

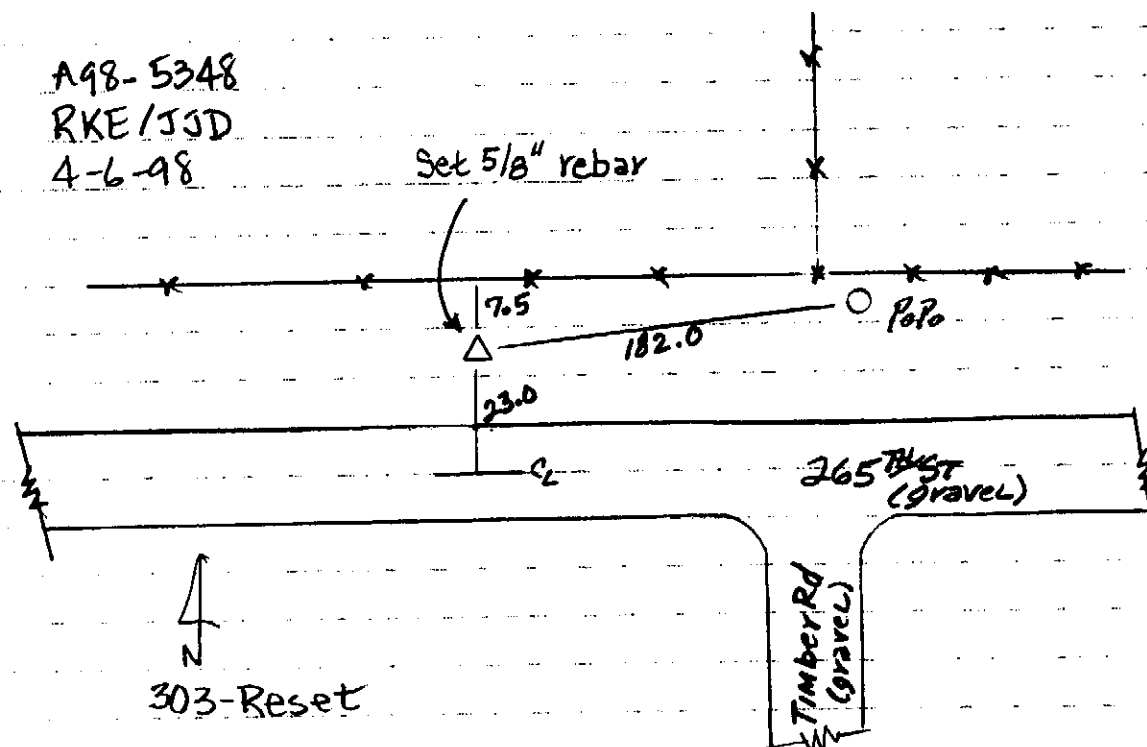
Theta: -0-04-53.87 Combination Factor: 0.99997684

Designation: RESET by ASI

Monument Type: 5/8" rebar with red plastic cap stamped "PHOTOGRAMMETRIC SURVEY MARKER"

To Reach: Near the E 1/4 Cor of Sec 27 T83N R24W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **304**

Northing: **3455599.10(Ft)** Easting: **4900875.04(Ft)**

Northing: **1053268.712(M)** Easting: **1493789.700(M)**

Elev: **868.42(Ft)** NAVD_88

Elev: **264.696(M)** NAVD_88 Ellip Ht: **234.812(M)** 96C Geoid Ht: **-29.883(M)**

Latitude: **41-58-46.348271 N** Longitude: **93-34-29.756671 W**

Theta: **-0-03-02.83** Combination Factor: **0.99998011**

Designation: **19-83-23**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **305**

Northing: **3455453.19(Ft)** Easting: **4910109.66(Ft)**

Northing: **1053224.239(M)** Easting: **1496604.417(M)**

Elev: **916.05(Ft)** NAVD_88

Elev: **279.214(M)** NAVD_88 Ellip Ht: **249.184(M)** 96C Geoid Ht: **-30.030(M)**

Latitude: **41-58-44.969402 N** Longitude: **93-32-27.492979 W**

Theta: **-0-01-39.96** Combination Factor: **0.99997793**

Designation: **RESET by ASI**

Monument Type: 5/8" rebar with red plastic cap stamped "PHOTOGRAMMETRIC SURVEY
MARKER"

To Reach: Near the NE Cor of Sec 29 T83N R23W.

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **306**

Northing: **3455522.52(Ft)** Easting: **4920722.40(Ft)**

Northing: **1053245.371(M)** Easting: **1499839.188(M)**

Elev: **958.54(Ft)** NAVD_88

Elev: **292.164(M)** NAVD_88 Ellip Ht: **261.978(M)** 96C Geoid Ht: **-30.186(M)**

Latitude: **41-58-45.680904 N** Longitude: **93-30-06.985160 W**

Theta: **-0-00-04.73** Combination Factor: **0.99997588**

Designation: **27-83-23**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **307**

Northing: **3455552.70(Ft)** Easting: **4931040.69(Ft)**

Northing: **1053254.569(M)** Easting: **1502984.208(M)**

Elev: **985.38(Ft)** NAVD_88

Elev: **300.345(M)** NAVD_88 Ellip Ht: **270.013(M)** 96C Geoid Ht: **-30.332(M)**

Latitude: **41-58-45.958496 N** Longitude: **93-27-50.375268 W**

Theta: **0-01-27.85** Combination Factor: **0.99997461**

Designation: **24-83-23**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **308 Reset**

Northing: **3455521.729(Ft)**

Easting: **4941577.303(Ft)**

Northing: **1053245.131(M)**

Easting: **1506195.776(M)**

Elev: **990.829(Ft)** NAVD_88

Elev: **307.241(M)** NAVD_88

Ellip Ht: **276.768(M)**

96C Geoid Ht: **-30.473(M)**

Latitude: **41 58 45.58435 N**

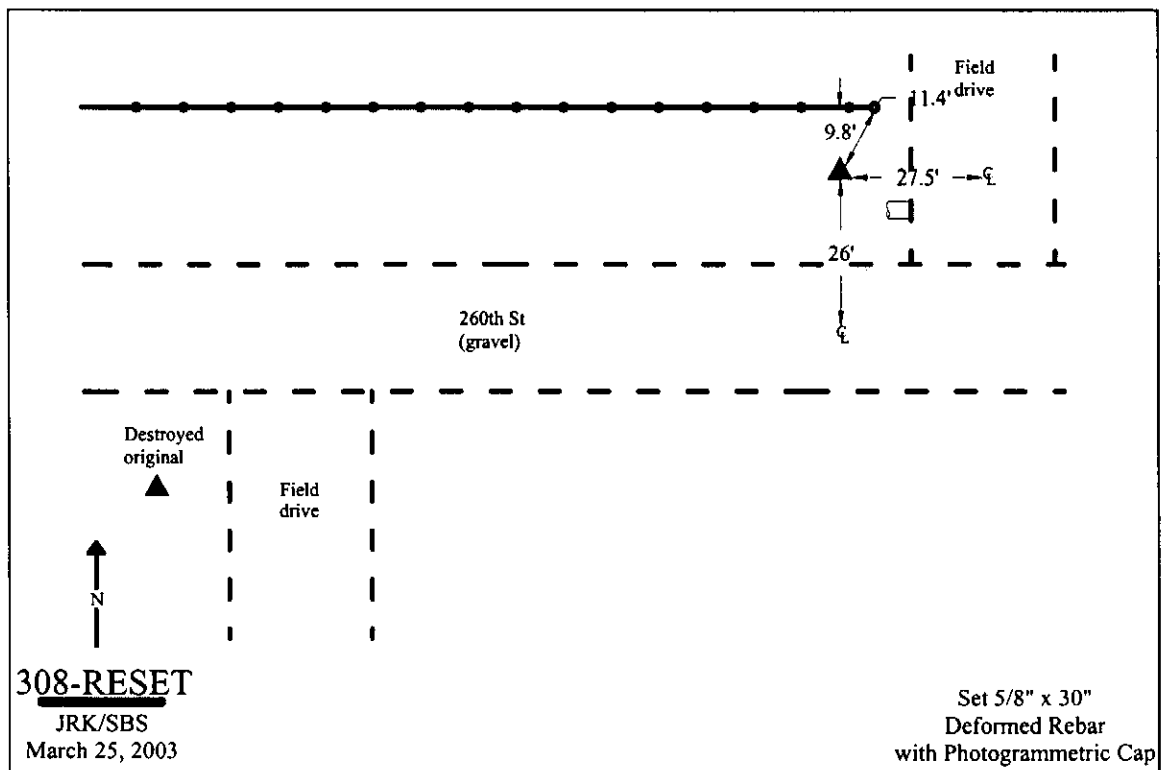
Longitude: **93 25 30.87518 W**

Theta: **0 03 02.398**

Combination Factor: **0.99997359**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: 5/8" x 30" deformed rebar with red plastic cap



2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **309 Reset**

Northing: **3454120.404(Ft)**

Easting: **4951577.314(Ft)**

Northing: **1052818.006(M)**

Easting: **1509243.785(M)**

Elev: **921.6(Ft) NAVD_88**

Elev: **280.904(M) NAVD_88**

Ellip Ht: **250.284(M)**

96C Geoid Ht: **-30.620(M)**

Latitude: **41 58 31.63216 N**

Longitude: **93 23 18.50390 W**

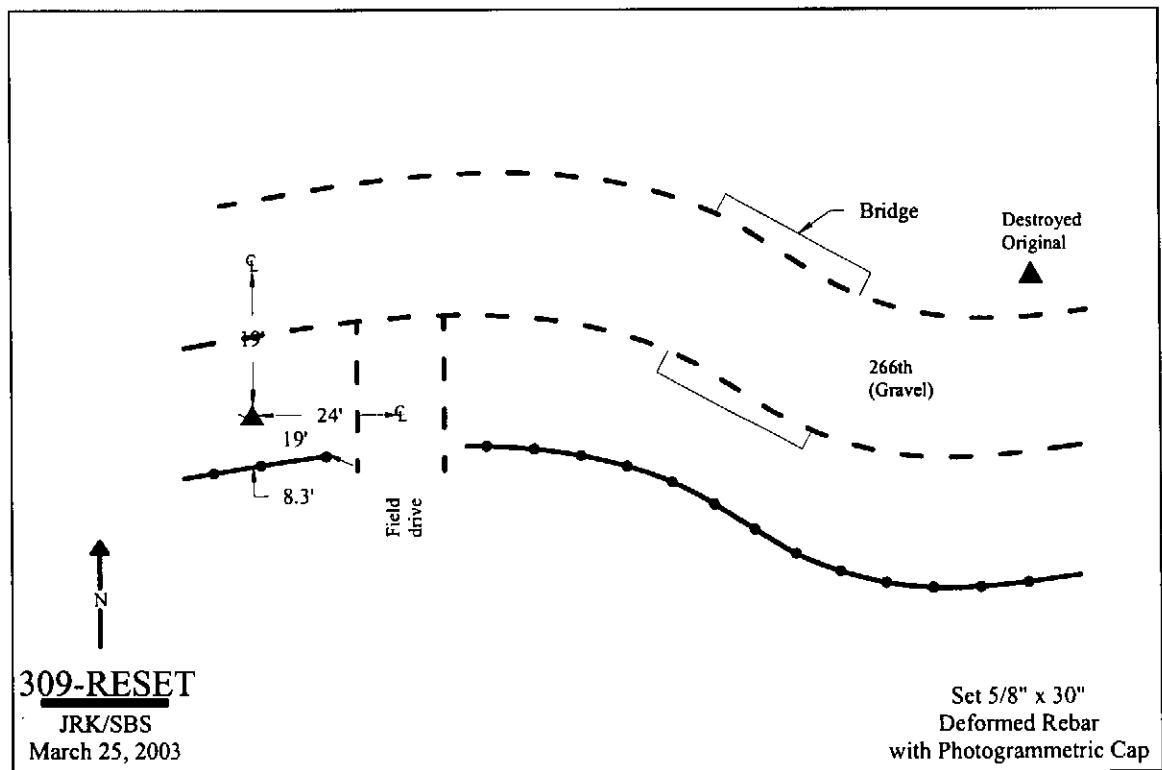
Theta: **0 04 32.112**

Combination Factor: **0.99997856**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: **5/8" x 30" deformed rebar with red plastic cap**

Remarks: **North of the W ¼ corner of section 26 T83N R22W**



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **310**

Northing: **3454158.95(Ft)** Easting: **4962651.80(Ft)**

Northing: **1052829.754(M)** Easting: **1512619.294(M)**

Elev: **1013.85(Ft)** NAVD_88

Elev: **309.021(M)** NAVD_88 Ellip Ht: **278.272(M)** 96C Geoid Ht: **-30.749(M)**

Latitude: **41-58-31.842280 N** Longitude: **93-20-51.890750 W**

Theta: **0-06-11.48** Combination Factor: **0.99997413**

Designation: **25-83-22**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **311**

Northing: **3455380.07**(Ft) Easting: **4973089.61**(Ft)

Northing: **1053201.951**(M) Easting: **1515800.744**(M)

Elev: **1061.94**(Ft) NAVD_88

Elev: **323.681**(M) NAVD_88 Ellip Ht: **292.829**(M) 96C Geoid Ht: **-30.852**(M)

Latitude: **41-58-43.696253** N Longitude: **93-18-33.670940** W

Theta: **0-07-45.16** Combination Factor: **0.99997116**

Designation: **TRAVERSE POINT**

Monument Type: Open pipe

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **312 Reset**

Northing: **3455432.387(Ft)**

Easting: **4983613.347(Ft)**

Northing: **1053217.899(M)**

Easting: **1519008.388(M)**

Elev: **1041.963(Ft) NAVD_88**

Elev: **317.591(M) NAVD_88**

Ellip Ht: **286.628(M)**

96C Geoid Ht: **-30.963(M)**

Latitude: **41 58 43.95486 N**

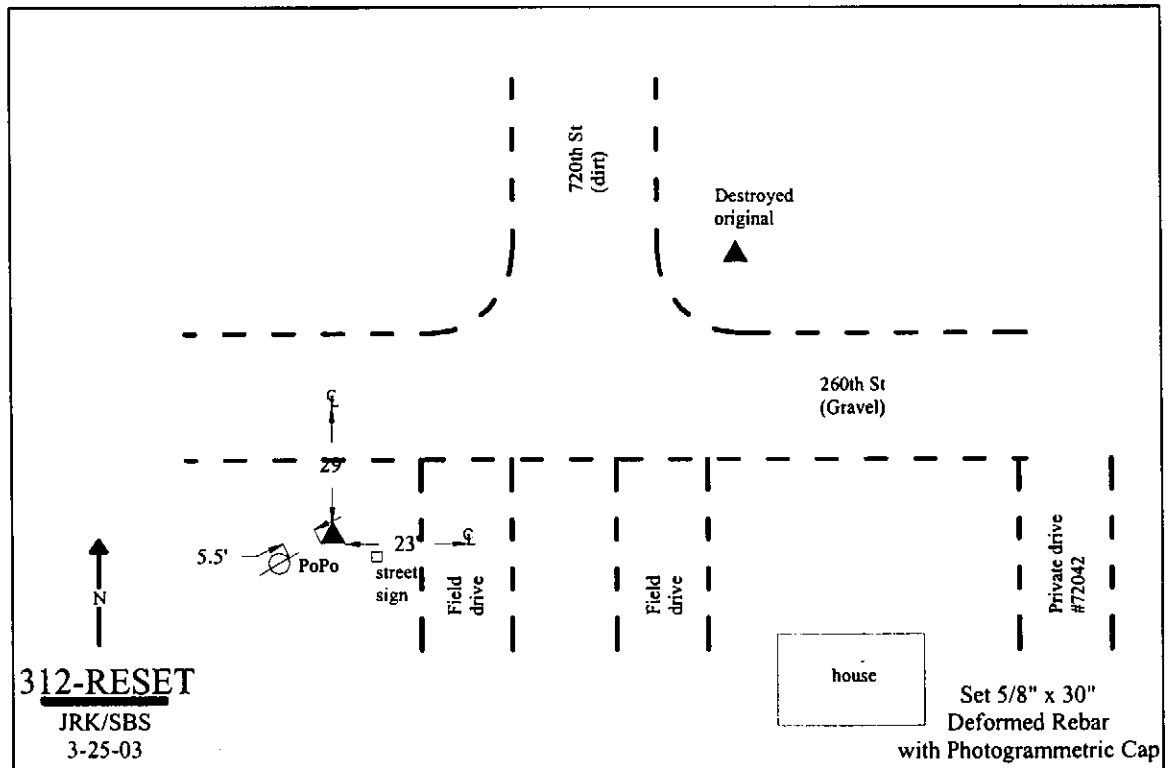
Longitude: **93 16 14.34090 W**

Theta: **0 09 19.586**

Combination Factor: **0.99997214**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: 5/8" x 30" deformed rebar with red plastic cap



2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **401 Reset**

Northing: **3413333.953(Ft)**

Easting: **4867334.042(Ft)**

Northing: **1040386.271(M)**

Easting: **1483566.385(M)**

Elev: **1033.668(Ft) NAVD_88**

Elev: **315.063(M) NAVD_88**

Ellip Ht: **284.942(M)**

96C Geoid Ht: **-30.121(M)**

Latitude: **41 51 48.28736 N**

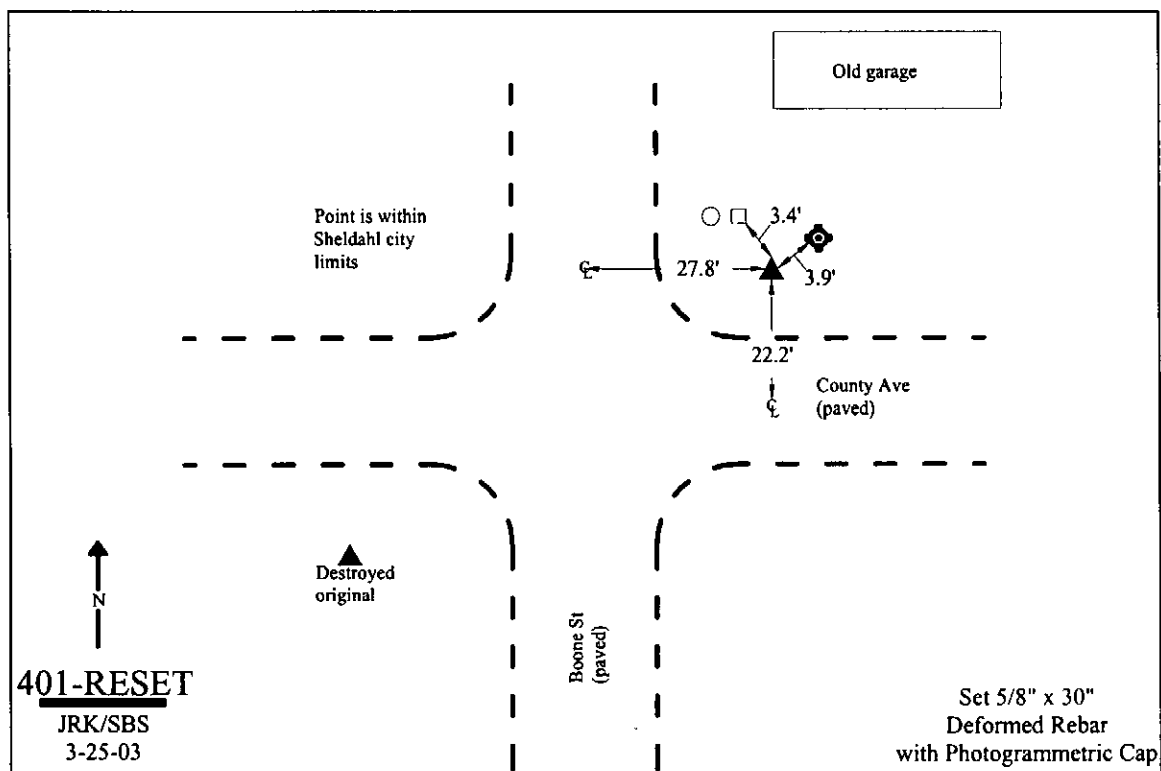
Longitude: **93 41 52.51551 W**

Theta: **-0 08 02.904**

Combination Factor: **0.99999841**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: **5/8" x 30" deformed rebar with red plastic cap**



2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **402 Reset**

Northing: **3413313.427(Ft)**

Easting: **4877931.342(Ft)**

Northing: **1040380.014(M)**

Easting: **1486796.448(M)**

Elev: **1020.358(Ft)** NAVD_88

Elev: **311.006(M)** NAVD_88

Ellip Ht: **280.744(M)**

96C Geoid Ht: **-30.262(M)**

Latitude: **41 51 48.30561 N**

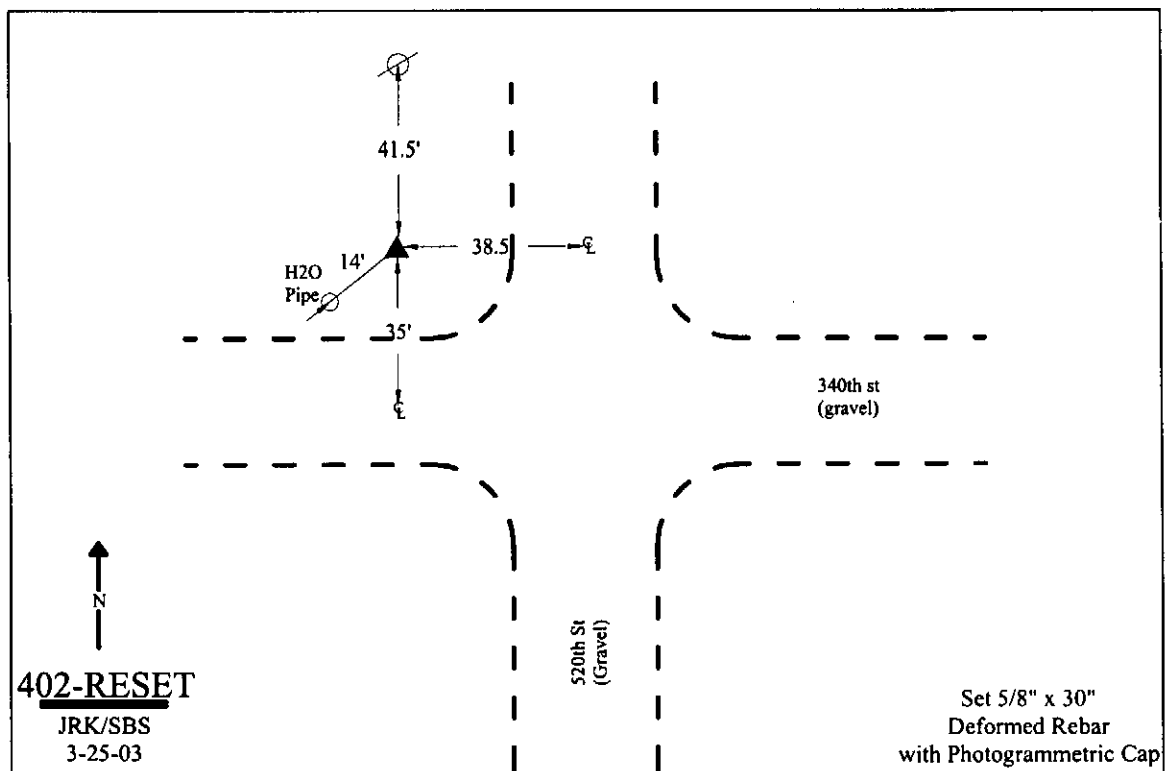
Longitude: **93 39 32.46887 W**

Theta: **-0 06 27.988**

Combination Factor: **0.99999907**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: 5/8" x 30" deformed rebar with red plastic cap



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **403**

Northing: **3413257.35(Ft)** Easting: **4888574.95(Ft)**

Northing: **1040362.921(M)** Easting: **1490040.624(M)**

Elev: **1018.19(Ft)** NAVD_88

Elev: **310.344(M)** NAVD_88 Ellip Ht: **279.944(M)** 96C Geoid Ht: **-30.400(M)**

Latitude: **41-51-47.925100 N** Longitude: **93-37-11.809660 W**

Theta: **-0-04-52.66** Combination Factor: **0.99999919**

Designation: **35-82-24**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **404**

Northing: **3413247.93(Ft)** Easting: **4899254.18(Ft)**

Northing: **1040360.049(M)** Easting: **1493295.659(M)**

Elev: **1011.10(Ft)** NAVD_88

Elev: **308.183(M)** NAVD_88 Ellip Ht: **277.651(M)** 96C Geoid Ht: **-30.532(M)**

Latitude: **41-51-47.957239 N** Longitude: **93-34-50.680756 W**

Theta: **-0-03-17.01** Combination Factor: **0.99999955**

Designation: **31-82-23**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **405**

Northing: **3413160.57(Ft)** Easting: **4909973.83(Ft)**

Northing: **1040333.423(M)** Easting: **1496563.015(M)**

Elev: **930.54(Ft)** NAVD_88

Elev: **283.629(M)** NAVD_88 Ellip Ht: **252.969(M)** 96C Geoid Ht: **-30.660(M)**

Latitude: **41-51-47.170803 N** Longitude: **93-32-29.017157 W**

Theta: **-0-01-41.00** Combination Factor: **1.00000348**

Designation: **4-81-23**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **406**

Northing: **3418395.37(Ft)** Easting: **4920638.83(Ft)**

Northing: **1041928.994(M)** Easting: **1499813.716(M)**

Elev: **841.97(Ft)** NAVD_88

Elev: **256.634(M)** NAVD_88 Ellip Ht: **225.922(M)** 96C Geoid Ht: **-30.713(M)**

Latitude: **41-52-38.911115 N** Longitude: **93-30-08.078563 W**

Theta: **-0-00-05.48** Combination Factor: **1.00000426**

Designation: **TRAVERSE POINT**

Monument Type: 5/8" rebar with yellow cap

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **407**

Northing: **3413238.47(Ft)** Easting: **4931238.29(Ft)**

Northing: **1040357.166(M)** Easting: **1503044.438(M)**

Elev: **962.48(Ft)** NAVD_88

Elev: **293.365(M)** NAVD_88 Ellip Ht: **262.498(M)** 96C Geoid Ht: **-30.867(M)**

Latitude: **41-51-47.946192 N** Longitude: **93-27-48.002045 W**

Theta: **0-01-29.46** Combination Factor: **1.00000193**

Designation: **31-82-22**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **408**

Northing: **3413223.21**(Ft) Easting: **4941551.63**(Ft)

Northing: **1040352.514**(M) Easting: **1506187.950**(M)

Elev: **955.18**(Ft) NAVD_88

Elev: **291.139**(M) NAVD_88 Ellip Ht: **260.181**(M) 96C Geoid Ht: **-30.958**(M)

Latitude: **41-51-47.728428** N Longitude: **93-25-31.708709** W

Theta: **0-03-01.83** Combination Factor: **1.00000231**

Designation: **TRAVERSE POINT**

Monument Type: 5/8" rebar with yellow cap

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **409**

Northing: **3413590.93(Ft)** Easting: **4953425.65(Ft)**

Northing: **1040464.595(M)** Easting: **1509807.157(M)**

Elev: **896.38(Ft)** NAVD_88

Elev: **273.218(M)** NAVD_88 Ellip Ht: **242.162(M)** 96C Geoid Ht: **-31.056(M)**

Latitude: **41-51-51.227354 N** Longitude: **93-22-54.783948 W**

Theta: **0-04-48.19** Combination Factor: **1.00000490**

Designation: **35-82-22**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: ***** See the 1988 Field Notes and Station Descriptions *****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **410**

Northing: **3413223.45(Ft)** Easting: **4963012.58(Ft)**

Northing: **1040352.590(M)** Easting: **1512729.259(M)**

Elev: **955.00(Ft)** NAVD_88

Elev: **291.086(M)** NAVD_88 Ellip Ht: **259.953(M)** 96C Geoid Ht: **-31.133(M)**

Latitude: **41-51-47.445189 N** Longitude: **93-20-48.097306 W**

Theta: **0-06-14.05** Combination Factor: **1.00000236**

Designation: **31-82-21**

Monument Type: 3/4" aluminum rod with Story County aluminum cap set flush with ground.

To Reach: ***** See the 1988 Field Notes and Station Descriptions *****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **411**

Northing: **3413206.39**(Ft) Easting: **4973155.06**(Ft)

Northing: **1040347.388**(M) Easting: **1515820.693**(M)

Elev: **957.44**(Ft) NAVD_88

Elev: **291.829**(M) NAVD_88 Ellip Ht: **260.620**(M) 96C Geoid Ht: **-31.208**(M)

Latitude: **41-51-47.072833** N Longitude: **93-18-34.062845** W

Theta: **0-07-44.89** Combination Factor: **1.00000228**

Designation: **TRAVERSE POINT**

Monument Type: 5/8" rebar with yellow cap

To Reach: **** See the 1988 Field Notes and Station Descriptions ****

Date Printed 6-25-98

2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **412 Reset**

Northing: **3413213.297(Ft)**

Easting: **4983761.036(Ft)**

Northing: **1040349.495(M)**

Easting: **1519053.403(M)**

Elev: **945.973(Ft)** NAVD_88

Elev: **288.333(M)** NAVD_88

Ellip Ht: **257.053(M)**

96C Geoid Ht: **-31.280(M)**

Latitude: **41 51 46.88081 N**

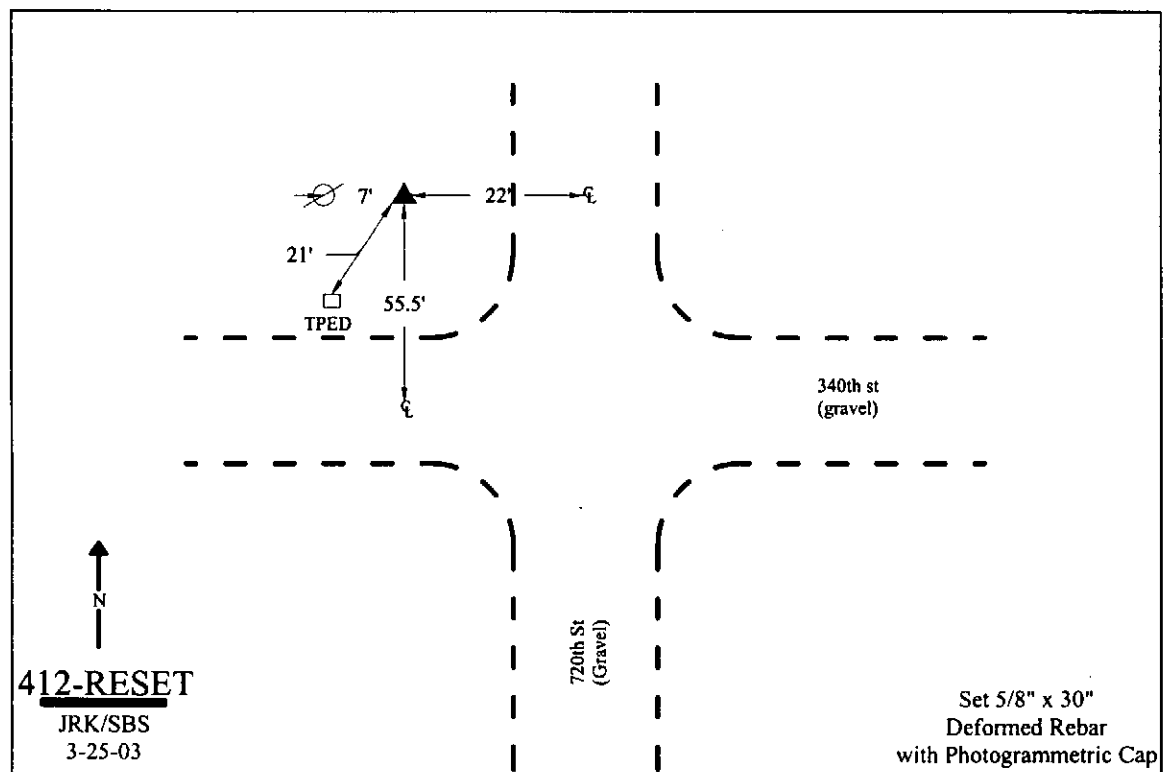
Longitude: **93 16 13.90282 W**

Theta: **0 09 19.883**

Combination Factor: **1.00000287**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: 5/8" x 30" deformed rebar with red plastic cap



2003
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **413 Reset**

Northing: **3413823.114(Ft)**

Easting: **4994361.194(Ft)**

Northing: **1040535.367(M)**

Easting: **1522284.338(M)**

Elev: **998.565(Ft)** NAVD_88

Elev: **304.363(M)** NAVD_88

Ellip Ht: **273.018(M)**

96C Geoid Ht: **-31.345(M)**

Latitude: **41 51 52.29665 N**

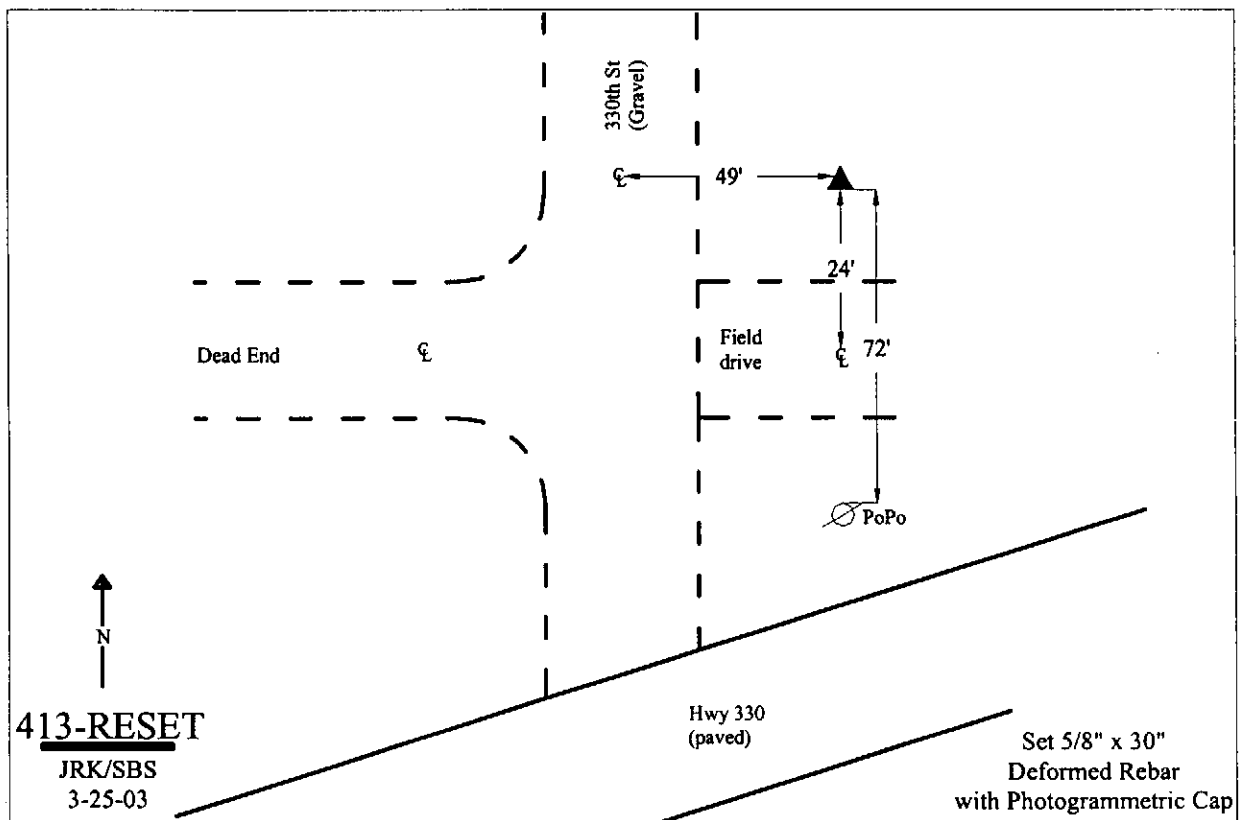
Longitude: **93 13 53.79466 W**

Theta: **0 10 54.840**

Combination Factor: **0.99999999**

Designation: **PHOTOGRAPHIC SURVEY MARKER**

Monument Type: 5/8" x 30" deformed rebar with red plastic cap



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **501**

Northing: **3518482.39(Ft)** Easting: **4867358.83(Ft)**

Northing: **1072435.577(M)** Easting: **1483573.938(M)**

Elev: **1002.01(Ft)** NAVD_88

Elev: **305.413(M)** NAVD_88 Ellip Ht: **277.453(M)** 96C Geoid Ht: **-27.960(M)**

Latitude: **42-09-07.022128 N** Longitude: **93-41-55.454600 W**

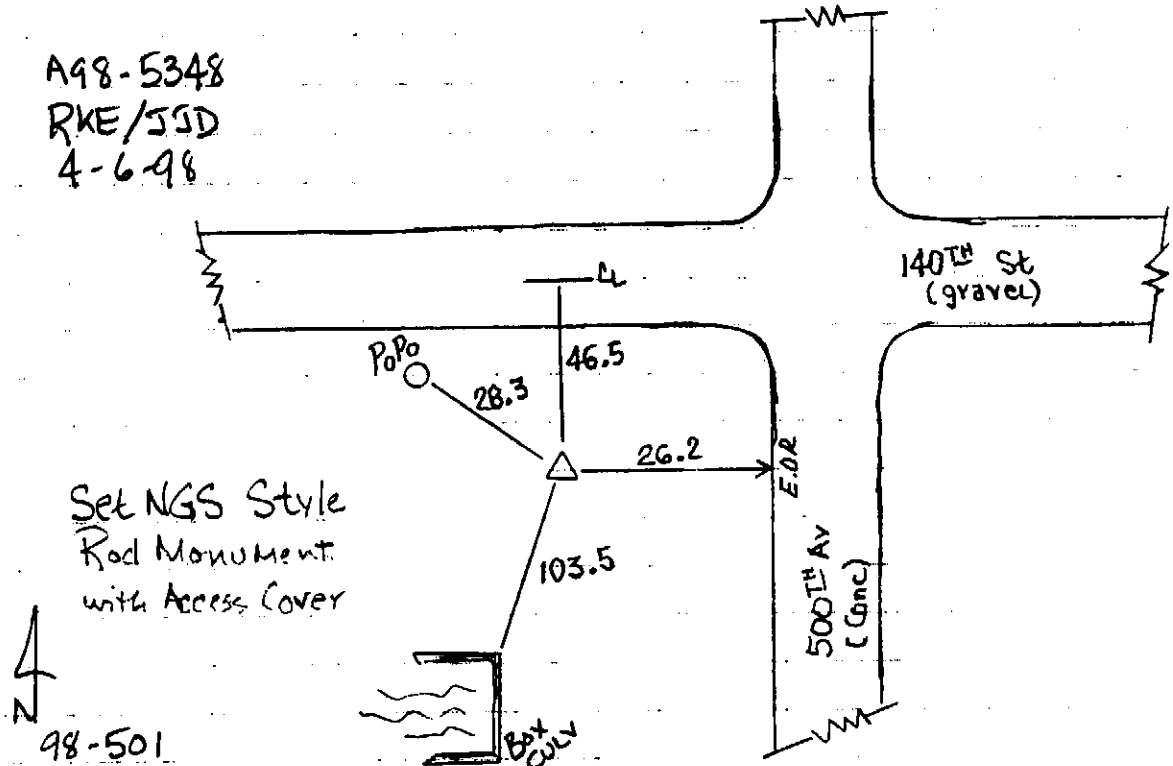
Theta: **-0-08-04.90** Combination Factor: **0.99994207**

Designation: **98-501 STORY CO GPS CONTROL PT**

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 35ft west of 500th Av and 45ft south of 140th St. Near the NE Cor of Sec 25 T85N, R25W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **502**

Northing: **3518226.91(Ft)** Easting: **4899115.01(Ft)**

Northing: **1072357.706(M)** Easting: **1493253.243(M)**

Elev: **971.98(Ft)** NAVD_88

Elev: **296.259(M)** NAVD_88 Ellip Ht: **267.696(M)** 96C Geoid Ht: **-28.563(M)**

Latitude: **42-09-05.018482 N** Longitude: **93-34-53.859355 W**

Theta: **-0-03-19.16** Combination Factor: **0.99994369**

Designation: **98-502 STORY CO GPS CONTROL PT**

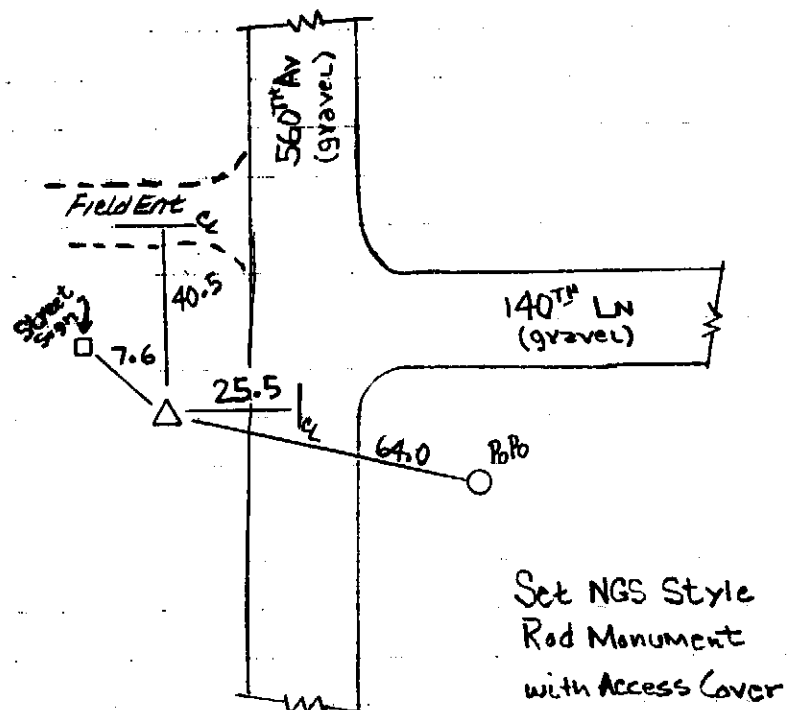
Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 15ft south of 140th Lane and 25ft west of 560th Av. Near the NE Cor of Sec 25 T85N, R24W.

Date Printed 6-25-98

A98-5348
RKE/JSD
4-6-98

N
98-502



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **503**

Northing: **3518449.81(Ft)** Easting: **4931109.61(Ft)**

Northing: **1072425.648(M)** Easting: **1503005.215(M)**

Elev: **1060.05(Ft) NAVD_88**

Elev: **323.106(M) NAVD_88** Ellip Ht: **293.834(M)** 96C Geoid Ht: **-29.271(M)**

Latitude: **42-09-07.305157 N** Longitude: **93-27-49.104609 W**

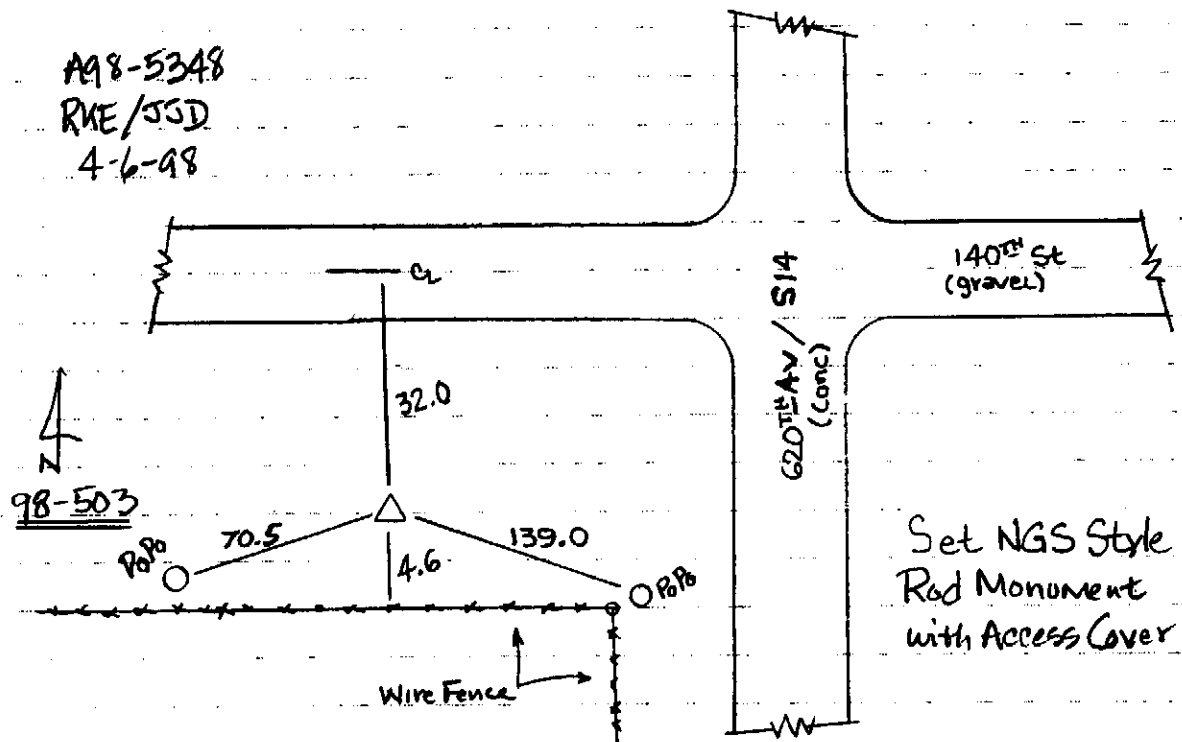
Theta: **0-01-28.71** Combination Factor: **0.99993949**

Designation: **98-503 STORY CO GPS CONTROL PT**

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 30ft south of 140th St and 160ft west of 620th Av. Near the NE Cor of Sec 25 T85N, R23W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **504**

Northing: **3518498.22(Ft)** Easting: **4962782.07(Ft)**

Northing: **1072440.401(M)** Easting: **1512658.999(M)**

Elev: **1081.29(Ft)** NAVD_88

Elev: **329.579(M)** NAVD_88 Ellip Ht: **299.563(M)** 96C Geoid Ht: **-30.016(M)**

Latitude: **42-09-07.432603 N** Longitude: **93-20-48.623040 W**

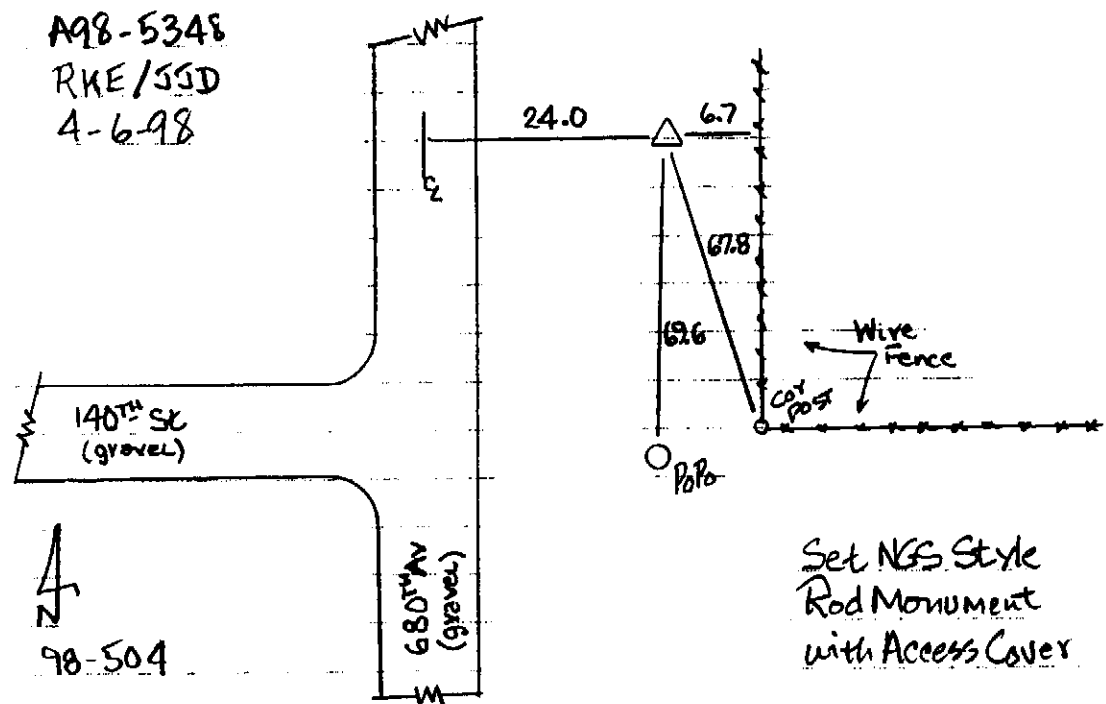
Theta: **0-06-13.69** Combination Factor: **0.99993859**

Designation: **98-504 STORY CO GPS CONTROL PT**

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 20ft east of 680th Av and 60ft north of 140th St. Near the SE Cor of Sec 24 T85N, R22W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **505**

Northing: **3518514.68(Ft)** Easting: **4993994.29(Ft)**

Northing: **1072445.419(M)** Easting: **1522172.503(M)**

Elev: **1045.12(Ft)** NAVD_88

Elev: **318.554(M)** NAVD_88 Ellip Ht: **287.898(M)** 96C Geoid Ht: **-30.656(M)**

Latitude: **42-09-06.826690 N** Longitude: **93-13-54.253165 W**

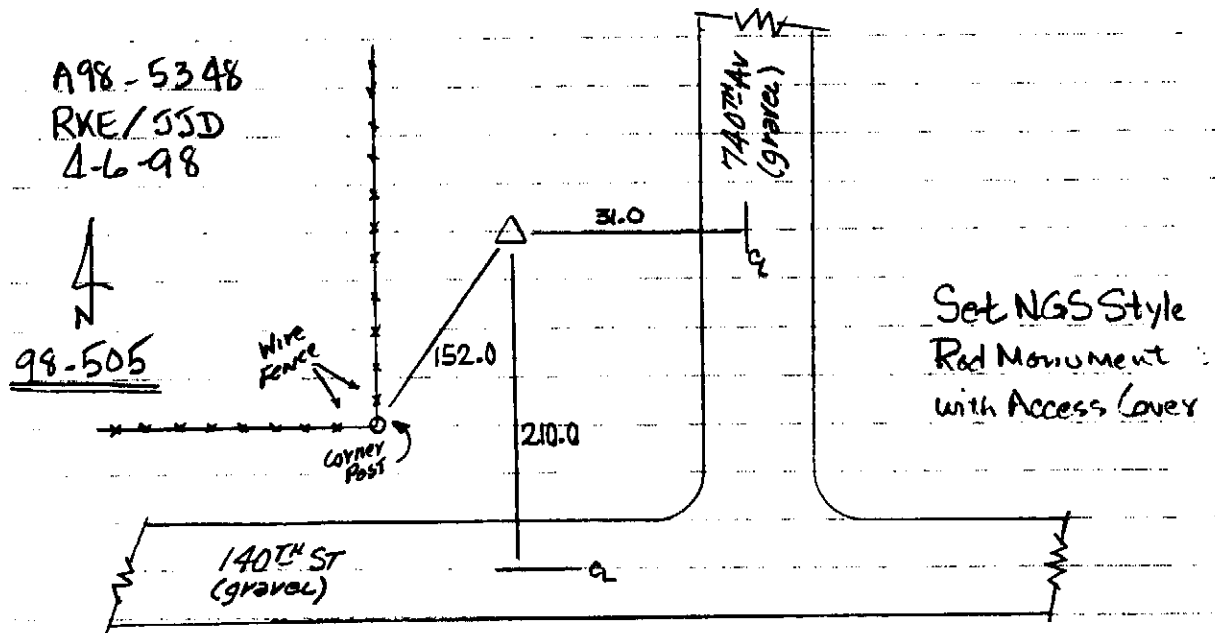
Theta: **0-10-54.53** Combination Factor: **0.99994044**

Designation: **98-505 STORY CO GPS CONTROL PT**

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 30ft west of 740th Av and 210ft north of 140th St. Near the SE Cor of Sec 24 T85N, R21W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: 507

Northing: 3476342.06(Ft) Easting: 4899124.35(Ft)

Northing: 1059591.180(M) Easting: 1493256.089(M)

Elev: 952.15(Ft) NAVD_88

Elev: 290.217(M) NAVD_88 Ellip Ht: 260.810(M) 96C Geoid Ht: -29.407(M)

Latitude: 42-02-11.247308 N Longitude: 93-34-53.199716 W

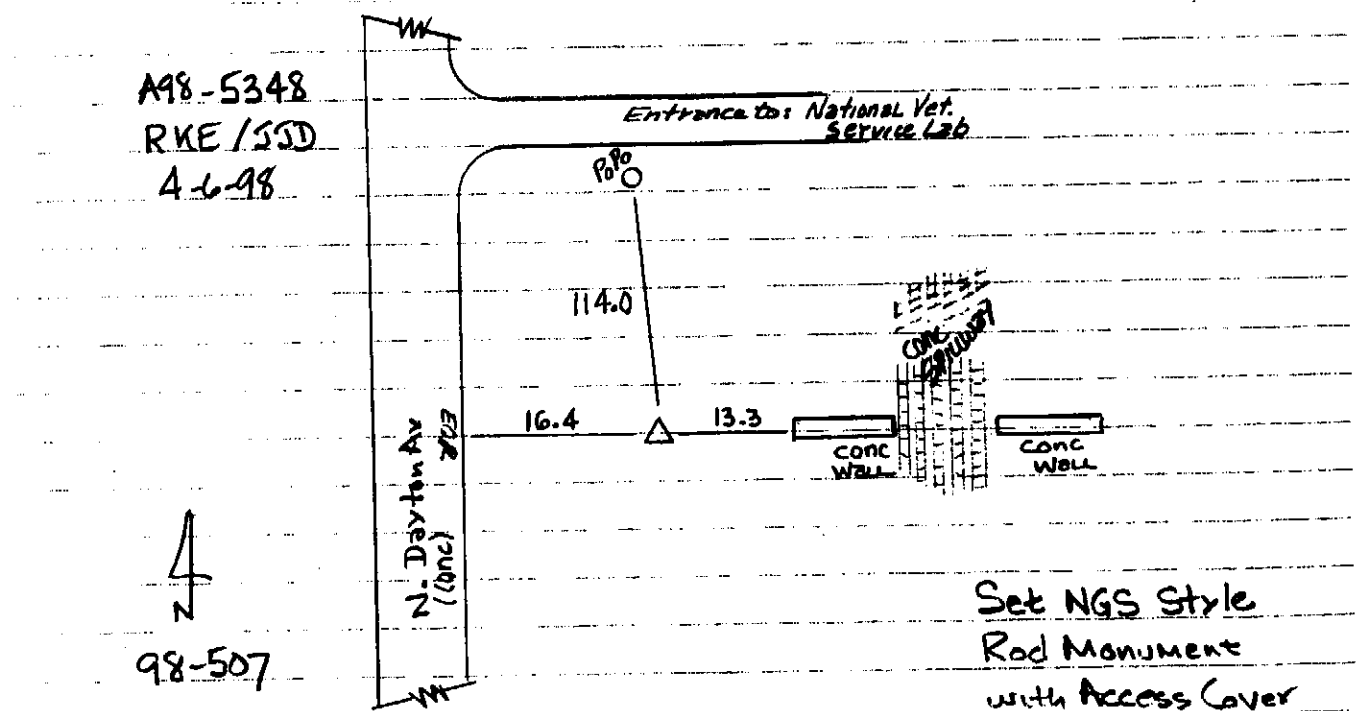
Theta: -0-03-18.71 Combination Factor: 0.99996469

Designation: 98-507 STORY CO GPS CONTROL PT

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 30ft east of North Dayton Av and 500ft north of 13th St(Ames) Near the SW Cor of Sec 31 T84N, R23W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **508**

Northing: **3475669.23(Ft)** Easting: **4931534.36(Ft)**

Northing: **1059386.099(M)** Easting: **1503134.680(M)**

Elev: **992.60(Ft)** NAVD_88

Elev: **302.546(M)** NAVD_88 Ellip Ht: **272.538(M)** 96C Geoid Ht: **-30.008(M)**

Latitude: **42-02-04.683051 N** Longitude: **93-27-43.719938 W**

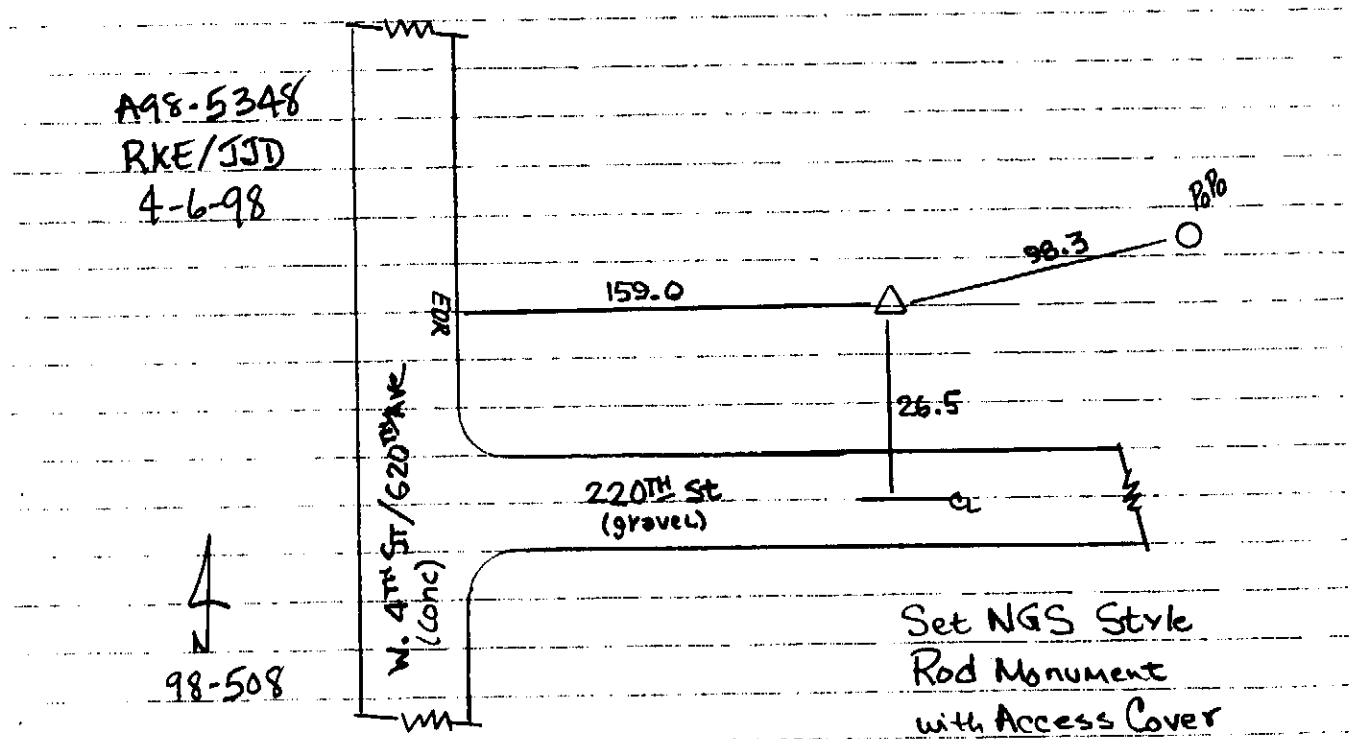
Theta: **0-01-32.36** Combination Factor: **0.99996320**

Designation: **98-508 STORY CO GPS CONTROL PT**

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 25ft north of "V" Av and 150ft east of West 4th St (Neveda) Near the SW Cor of Sec 31 T84N, R22W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: 509

Northing: 3475549.66(Ft) Easting: 4962563.59(Ft)

Northing: 1059349.656(M) Easting: 1512592.407(M)

Elev: 1023.56(Ft) NAVD_88

Elev: 311.982(M) NAVD_88 Ellip Ht: 281.477(M) 96C Geoid Ht: -30.505(M)

Latitude: 42-02-03.157592 N Longitude: 93-20-52.549186 W

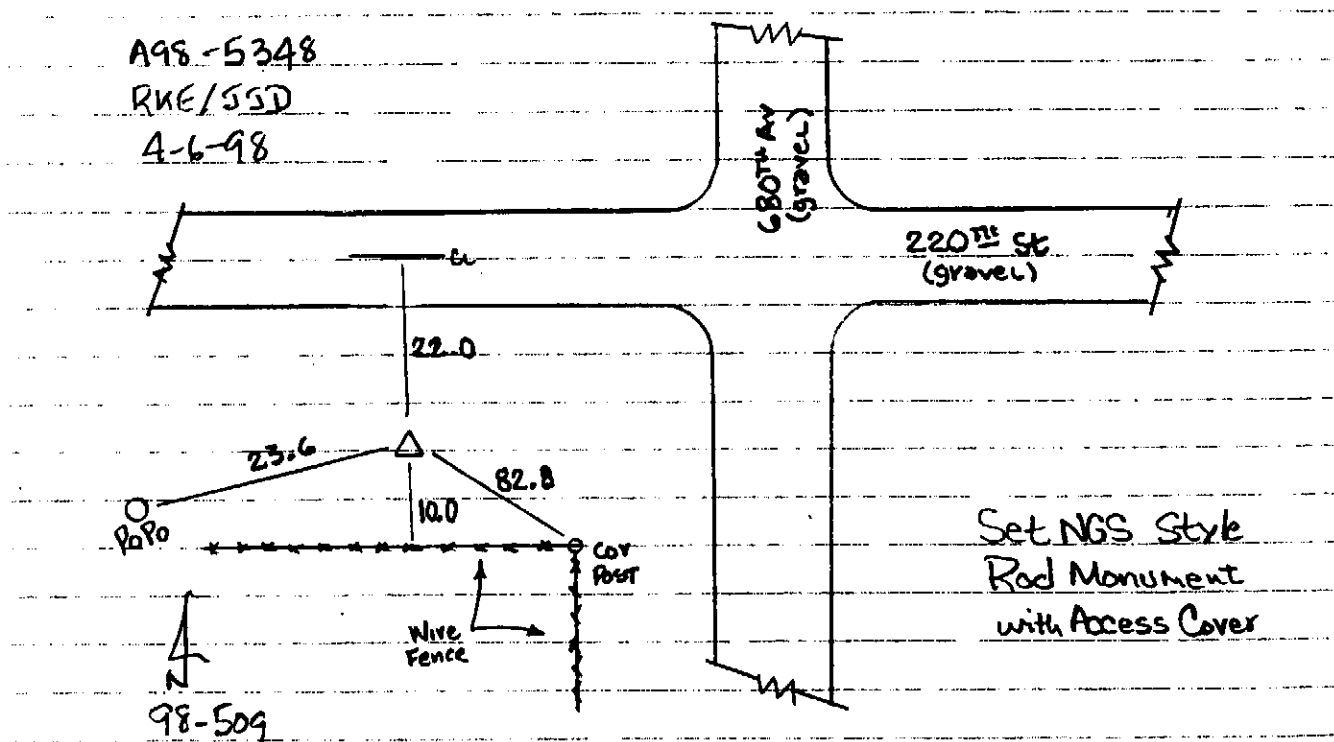
Theta: 0-06-11.03 Combination Factor: 0.99996188

Designation: 98-509 STORY CO GPS CONTROL PT

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 25ft south of 220th St and 100ft west of 680th Av. Near the NE Cor of Sec 1 T83N R22W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: 510

Northing: 3475599.27(Ft) Easting: 4993977.77(Ft)

Northing: 1059364.777(M) Easting: 1522167.467(M)

Elev: 1105.69(Ft) NAVD_88

Elev: 337.016(M) NAVD_88 Ellip Ht: 306.097(M) 96C Geoid Ht: -30.919(M)

Latitude: 42-02-02.877204 N Longitude: 93-13-56.276620 W

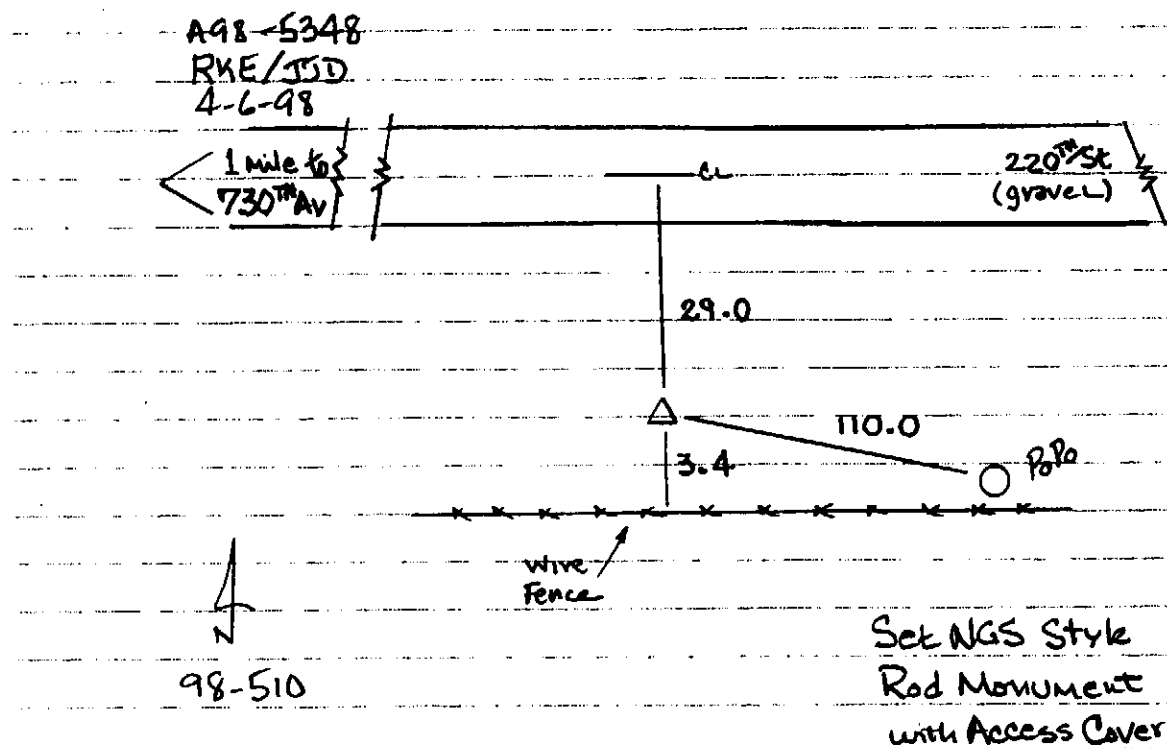
Theta: 0-10-53.16 Combination Factor: 0.99995803

Designation: 98-510 STORY CO GPS CONTROL PT

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 25ft south of 220th St and 200ft west of westerly Story Co line. Near the NE Cor of Sec 1 T83N, R21W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: 511

Northing: 3434568.56(Ft) Easting: 4867360.03(Ft)

Northing: 1046858.591(M) Easting: 1483574.303(M)

Elev: 1039.11(Ft) NAVD_88

Elev: 316.722(M) NAVD_88 Ellip Ht: 286.999(M) 96C Geoid Ht: -29.724(M)

Latitude: 41-55-18.058359 N Longitude: 93-41-52.829398 W

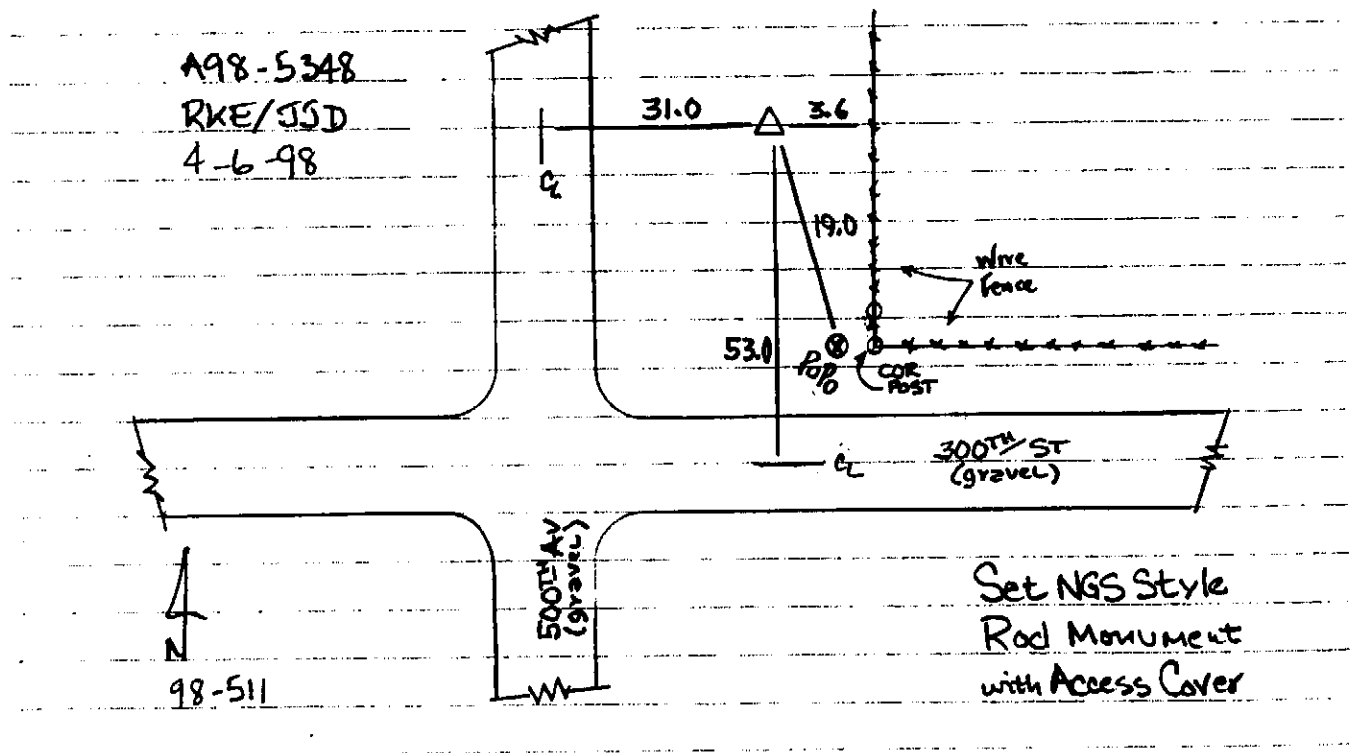
Theta: -0-08-03.12 Combination Factor: 0.99998444

Designation: 98-511 STORY CO GPS CONTROL PT

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 30ft east of 500th Av and 45ft north of 300th St. Near the SW Cor of Sec 7 T82N, R24W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: 512

Northing: 3434538.91(Ft) Easting: 4899203.44(Ft)

Northing: 1046849.553(M) Easting: 1493280.195(M)

Elev: 953.19(Ft) NAVD_88

Elev: 290.533(M) NAVD_88 Ellip Ht: 260.304(M) 96C Geoid Ht: -30.228(M)

Latitude: 41-55-18.284565 N Longitude: 93-34-51.620832 W

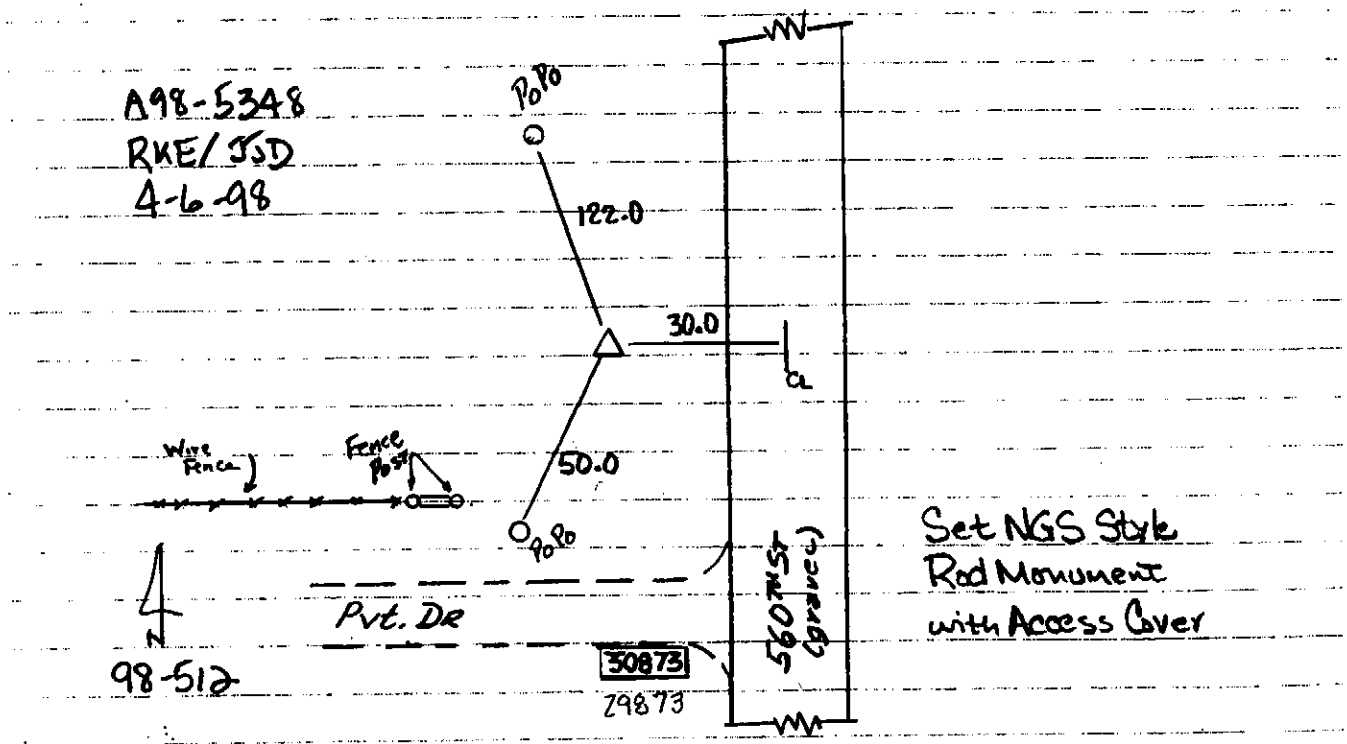
Theta: -0-03-17.64 Combination Factor: 0.99998861

Designation: 98-512 STORY CO GPS CONTROL PT

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 25ft west of 560th St and 190ft north of the Section line. Near the SE Cor of Sec 12 T82N, R24W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: 513

Northing: 3434314.93(Ft) Easting: 4931266.41(Ft)

Northing: 1046781.285(M) Easting: 1503053.007(M)

Elev: 936.90(Ft) NAVD_88

Elev: 285.567(M) NAVD_88 Ellip Ht: 254.937(M) 96C Geoid Ht: -30.630(M)

Latitude: 41-55-16.154765 N Longitude: 93-27-47.509243 W

Theta: 0-01-29.79 Combination Factor: 0.99998959

Designation: 98-513 STORY CO GPS CONTROL PT

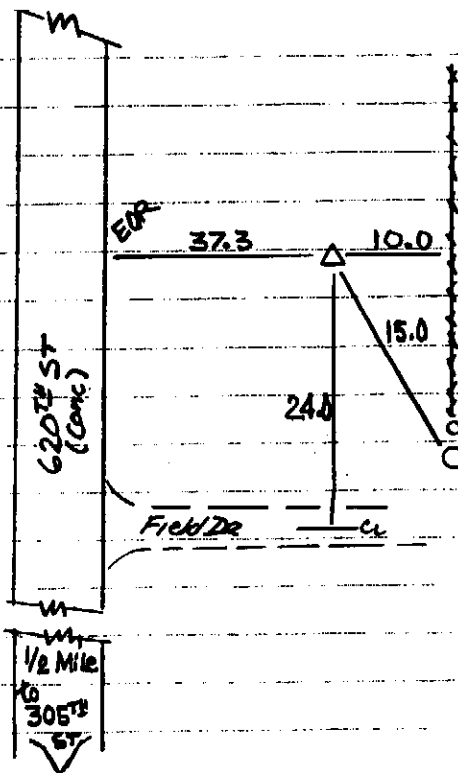
Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 15ft north of the Section line and 45ft east of 620th Av. Near the SW Cor of Sec 7 T82N, R22W.

Date Printed 6-25-98

A98-5348
RKE/JSD
4-6-98

N
98-513



Set NGS Style
Rod Monument
with Access Cover

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **514**

Northing: **3434178.58(Ft)** Easting: **4962630.41(Ft)**

Northing: **1046739.724(M)** Easting: **1512612.774(M)**

Elev: **999.50(Ft)** NAVD_88

Elev: **304.647(M)** NAVD_88 Ellip Ht: **273.697(M)** 96C Geoid Ht: **-30.950(M)**

Latitude: **41-55-14.461675 N** Longitude: **93-20-52.649686 W**

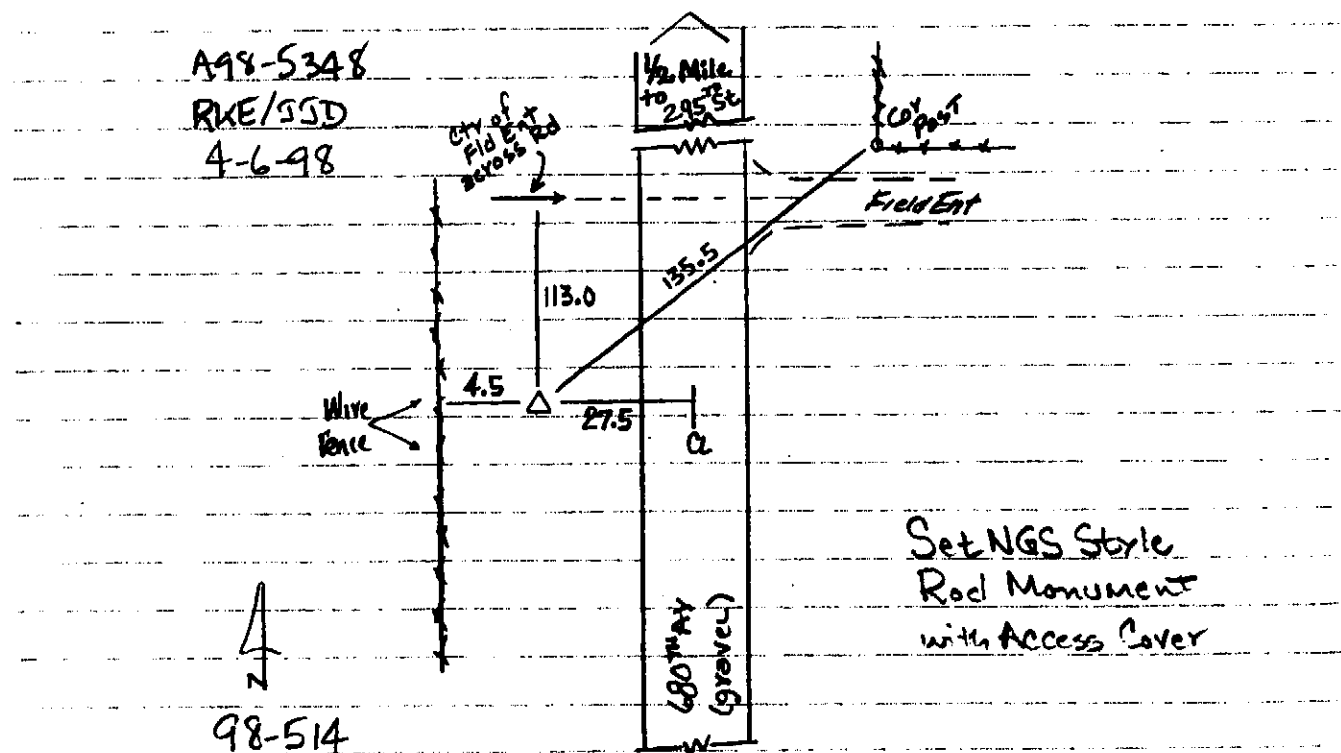
Theta: **0-06-10.96** Combination Factor: **0.99998675**

Designation: **98-514 STORY CO GPS CONTROL PT**

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 25ft west of 680th Av and 115ft south of the Section line. Near the NE Cor of Sec 13 T82N, R22W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: 515

Northing: 3434040.11(Ft)

Easting: 4994219.32(Ft)

Northing: 1046697.519(M)

Easting: 1522241.093(M)

Elev: 1055.70(Ft) NAVD_88

Elev: 321.777(M) NAVD_88

Ellip Ht: 290.558(M) 96C Geoid Ht: -31.220(M)

Latitude: 41-55-12.318348 N

Longitude: 93-13-54.822276 W

Theta: 0-10-54.14

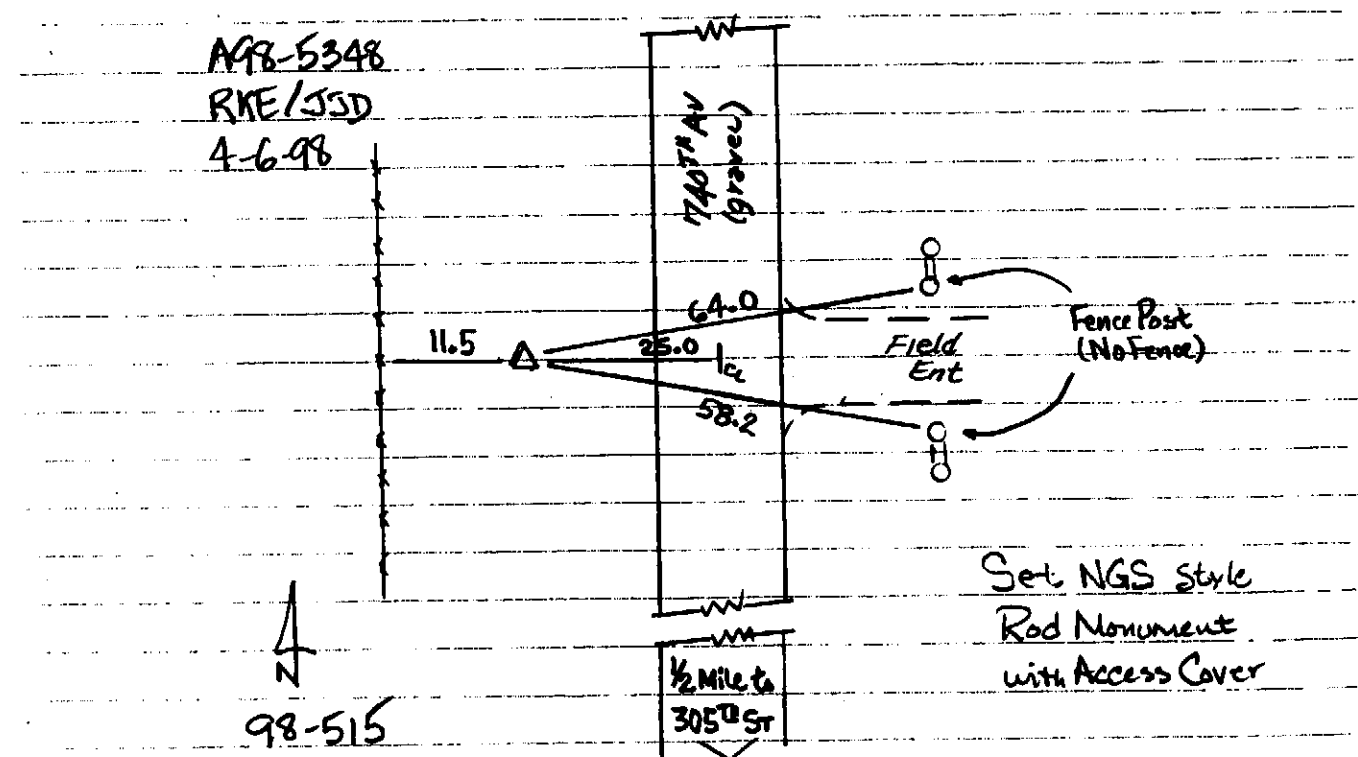
Combination Factor: 0.99998424

Designation: 98-515 STORY CO GPS CONTROL PT

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 25ft west of 740th Av and 1/2 mile north of 305th St. Near the NE Cor of Sec 13 T82N, R21W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **516**

Northing: **3455488.54(Ft)** Easting: **4994257.97(Ft)**

Northing: **1053235.012(M)** Easting: **1522252.873(M)**

Elev: **1047.86(Ft) NAVD_88**

Elev: **319.390(M) NAVD_88** Ellip Ht: **288.321(M)** 96C Geoid Ht: **-31.069(M)**

Latitude: **41-58-44.199913 N** Longitude: **93-13-53.410028 W**

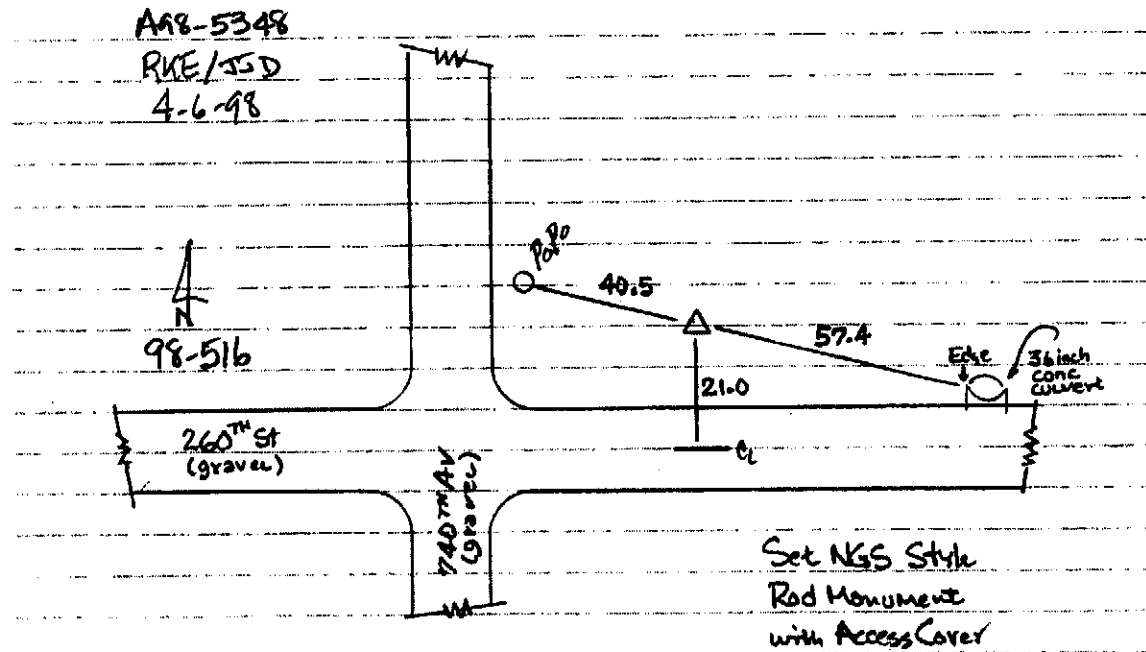
Theta: **0-10-55.10** Combination Factor: **0.99997183**

Designation: **98-516 STORY CO GPS CONTROL PT**

Monument Type: 5/8" dia driven aluminum rod with a 2-1/2" dia aluminum cap and permanent magnet encased in a 5" dia PVC pipe with an aluminum access cover.

To Reach: 20ft north of 260th St and 60ft east of 740th Av. Near the SW Cor of Sec 19 T83N, R20W.

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **600**

Northing: **3547255.03(Ft)** Easting: **4972728.27(Ft)**

Northing: **1081205.496(M)** Easting: **1515690.607(M)**

Elev: **1115.60(Ft)** NAVD_88

Elev: **340.036(M)** NAVD_88 Ellip Ht: **310.025(M)** 96C Geoid Ht: **-30.011(M)**

Latitude: **42-13-51.314563 N** Longitude: **93-18-35.719966 W**

Theta: **0-07-43.77** Combination Factor: **0.99992559**

Designation: **42 112 NGS 1st order vertical control station**

Monument Type: Brass disk set in the top of a concrete post. 3ft above ground.

To Reach: **** See the current NGS Data Sheet for complete station description ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **601**

Northing: **3523622.96(Ft)** Easting: **4962806.24(Ft)**

Northing: **1074002.427(M)** Easting: **1512666.367(M)**

Elev: **1081.24(Ft)** NAVD_88

Elev: **329.563(M)** NAVD_88 Ellip Ht: **299.598(M)** 96C Geoid Ht: **-29.965(M)**

Latitude: **42-09-58.058325 N** Longitude: **93-20-48.178743 W**

Theta: **0-06-13.99** Combination Factor: **0.99993642**

Designation: **H 34 NGS 2nd order vertical control station**

Monument Type: Brass disk set in the top of a concrete post.

To Reach: **** See the current NGS Data Sheet for complete station description ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **602**

Northing: **3545493.89(Ft)** Easting: **4772847.01(Ft)**

Northing: **1080668.698(M)** Easting: **1454766.678(M)**

Elev: **1134.22(Ft)** NAVD_88

Elev: **345.712(M)** NAVD_88 Ellip Ht: **318.853(M)** 96C Geoid Ht: **-26.859(M)**

Latitude: **42-13-29.737490 N** Longitude: **94-02-52.485680 W**

Theta: **-0-22-16.84** Combination Factor: **0.99992501**

Designation: **CBN control station Designation D 3 PID NL0066**

Monument Type: Brass disk set in the top of a concrete post.

To Reach: **** See the current NGS Data Sheet for complete station description ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **603**

Northing: **3382261.71**(Ft) Easting: **4771655.01**(Ft)

Northing: **1030915.430**(M) Easting: **1454403.357**(M)

Elev: **1026.36**(Ft) NAVD_88

Elev: **312.835**(M) NAVD_88 Ellip Ht: **283.643**(M) 96C Geoid Ht: **-29.192**(M)

Latitude: **41-46-37.164790** N Longitude: **94-02-54.254610** W

Theta: **-0-22-18.04** Combination Factor: **1.00002067**

Designation: **CBN control station Designation X 3 PID MJ0074**

Monument Type: Brass disk set in the top of a concrete post.

To Reach: **** See the current NGS Data Sheet for complete station description ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: 604

Northing: 3472832.52(Ft) Easting: 4881053.17(Ft)

Northing: 1058521.470(M) Easting: 1487747.981(M)

Elev: 957.11(Ft) NAVD_88

Elev: 291.728(M) NAVD_88 Ellip Ht: 262.600(M) 96C Geoid Ht: -29.128(M)

Latitude: 42-01-36.335178 N Longitude: 93-38-52.589574 W

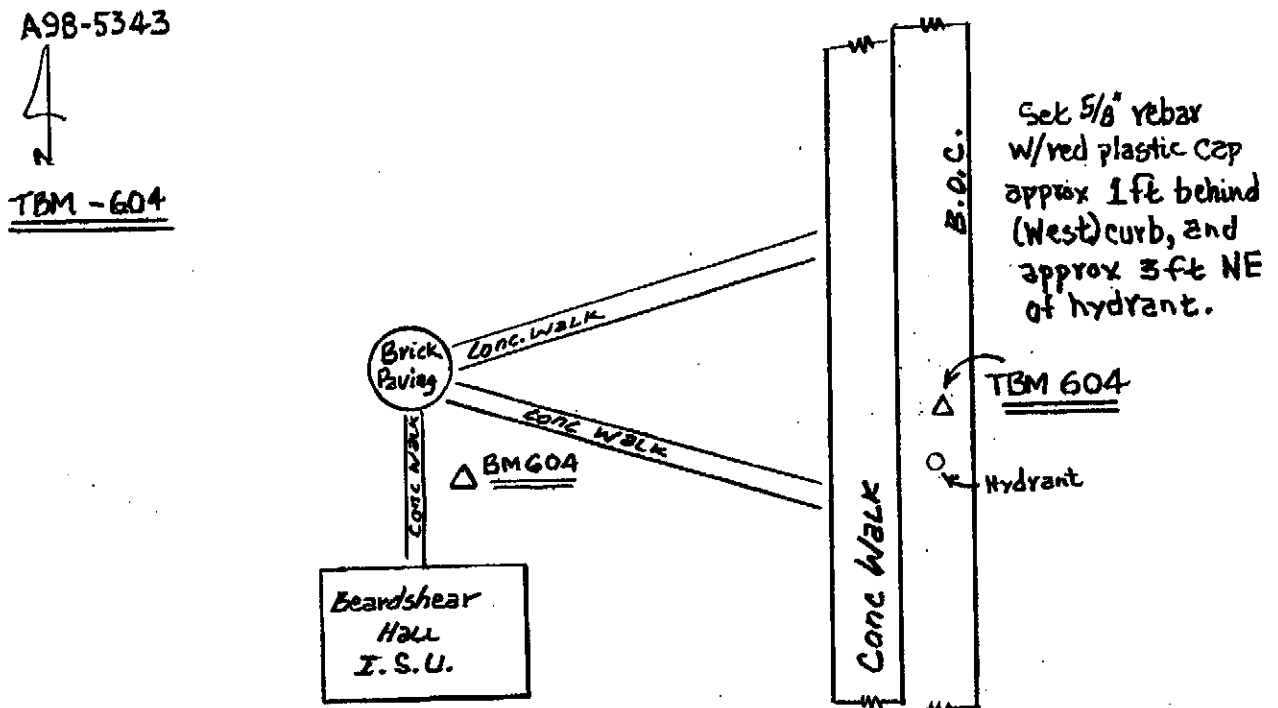
Theta: -0-06-00.96 Combination Factor: 0.99996627

Designation: TBM near "IOWA STATE COLLEGE" NGS 1st order vertical

Monument Type: 5/8" rebar with red plastic cap stamped "PHOTOGRAMMETRIC SURVEY MARKER"

To Reach: **** See the current NGS Data Sheet for complete station description ****

Date Printed 6-25-98



1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **605**

Northing: **3425975.27(Ft)** Easting: **4913414.83(Ft)**

Northing: **1044239.350(M)** Easting: **1497611.835(M)**

Elev: **867.35(Ft)** NAVD_88

Elev: **264.369(M)** NAVD_88 Ellip Ht: **233.827(M)** 96C Geoid Ht: **-30.542(M)**

Latitude: **41-53-53.777723 N** Longitude: **93-31-43.601192 W**

Theta: **-0-01-10.22** Combination Factor: **0.99999813**

Designation: **TBM near "872" NGS 2nd order vertical control station**

Monument Type: MAG nail set at back of walks at Veterans Memorial in Cambridge, IA.

To Reach: **** See the current NGS Data Sheet for complete station description ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **606**

Northing: **3419354.95(Ft)** Easting: **4946853.31(Ft)**

Northing: **1042221.473(M)** Easting: **1507803.905(M)**

Elev: **871.21(Ft)** NAVD_88

Elev: **265.547(M)** NAVD_88 Ellip Ht: **234.597(M)** 96C Geoid Ht: **-30.950(M)**

Latitude: **41-52-48.249953 N** Longitude: **93-24-21.555625 W**

Theta: **0-03-49.38** Combination Factor: **1.00000229**

Designation: **USGS BM 1KEO 3rd order vertical control station**

Monument Type: Brass disk set in SW cor of bridge on Ia. 210 over Indian Creek 1/2 mile west of Maxwell.

To Reach: **** See the current NGS Data Sheet for complete station description ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **607**

Northing: **3378873.15(Ft)** Easting: **4980291.71(Ft)**

Northing: **1029882.596(M)** Easting: **1517995.949(M)**

Elev: **827.43(Ft)** NAVD_88

Elev: **252.200(M)** NAVD_88 Ellip Ht: **220.747(M)** 96C Geoid Ht: **-31.453(M)**

Latitude: **41-46-07.737160 N** Longitude: **93-17-00.912251 W**

Theta: **0-08-48.02** Combination Factor: **1.00003274**

Designation: **G 10 NGS 1st order vertical control station**

Monument Type: Brass disk set in the top of a concrete post.

To Reach: **** See the current NGS Data Sheet for complete station description ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **700**

Northing: **3531702.06**(Ft) Easting: **4957510.27**(Ft)

Northing: **1076464.941**(M) Easting: **1511052.151**(M)

Elev: **1149.26**(Ft) NAVD_88

Elev: **350.295**(M) NAVD_88 Ellip Ht: **320.542**(M) 96C Geoid Ht: **-29.753**(M)

Latitude: **42-11-17.958670** N Longitude: **93-21-58.333550** W

Theta: **0-05-26.45** Combination Factor: **0.99992984**

Designation: **CBN control station HUBBARD WEST BASE PID NK0704**

Monument Type: Brass disk set in the top of a concrete post.

To Reach: **** See the current NGS Data Sheet for complete station description ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **701**

Northing: **3560602.31(Ft)** Easting: **4851669.36(Ft)**

Northing: **1085273.756(M)** Easting: **1478791.777(M)**

Elev: **1114.08(Ft)** NAVD_88

Elev: **339.572(M)** NAVD_88 Ellip Ht: **312.369(M)** 96C Geoid Ht: **-27.203(M)**

Latitude: **42-16-02.695660 N** Longitude: **93-45-25.445920 W**

Theta: **-0-10-27.22** Combination Factor: **0.99992061**

Designation: **CBN control station ET 7 JA PID NK0735**

Monument Type: Brass disk set in the top of a concrete post.

To Reach: **** See the current NGS Data Sheet for complete station description ****

Date Printed 6-25-98

1998
Story County, Iowa
Iowa North Zone (1401)
NAD_83(1996)

Point Number: **702**

Northing: **3461115.08(Ft)** Easting: **4851374.76(Ft)**

Northing: **1054949.986(M)** Easting: **1478701.983(M)**

Elev: **1060.13(Ft)** NAVD_88

Elev: **323.128(M)** NAVD_88 Ellip Ht: **294.301(M)** 96C Geoid Ht: **-28.828(M)**

Latitude: **41-59-39.879170 N** Longitude: **93-45-25.340990 W**

Theta: **-0-10-27.14** Combination Factor: **0.99996772**

Designation: **CBN control station ET 9 JA PID MH0688**

Monument Type: Brass disk set in the top of a concrete post.

To Reach: ***** See the current NGS Data Sheet for complete station description *****

Date Printed 6-25-98

SECTION 3

Summary of Fixed Coordinates

Summary of Controlling Stations

Fixed Stations	N	E	Elev	Description
0602	3545493.8850	4772847.0079	1134.2200	D 3 (HARN)
0603	3382261.7070	4771655.0136	1026.3600	X 3 (HARN)
Partially Fixed	N	E	Elev	Description
	StdErr	StdErr	StdErr	
0310	3454158.9518	4962651.8014	1014.0000	STORY 5 (HARN)
	FIXED	FIXED	FREE	
0403	3413257.3483	4888574.9470	1018.0000	STORY 11 (HARN)
	FIXED	FIXED	FREE	
0600	3547254.9353	4972728.2068	1115.6000	42 112 (1ST)
	FREE	FREE	FIXED	
0601	3523622.9932	4962806.2270	1081.2400	H 34 (2ND)
	FREE	FREE	FIXED	
0604	3472833.0757	4881053.0049	957.1100	TBM NEAR IA ST COLLEGE (1ST)
	FREE	FREE	FIXED	
0605	3425975.4543	4913415.0642	867.3500	TBM NEAR 872 (2ND)
	FREE	FREE	FIXED	
0606	3419355.1601	4946853.3559	871.2100	USGS 1KEO (3RD)
	FREE	FREE	FIXED	
0607	3378873.5714	4980291.6349	827.4300	G 10 (1ST)
	FREE	FREE	FIXED	
0700	3531702.0621	4957510.2664	1149.0000	HUBBARD WEST (HARN)
	FIXED	FIXED	FREE	
0701	3560602.3136	4851669.3563	1114.0000	ET 7 JA (HARN)
	FIXED	FIXED	FREE	
0702	3461115.0779	4851374.7553	1060.0000	ET 9 JA (HARN)
	FIXED	FIXED	FREE	

SECTION 4

Adjusted Observations and Residuals

Adjusted Observations and Residuals

Adjusted GPS Vector Observations Sorted by Names (US Feet)

Datum Transformations		StdDev
Scale Factor 0.999999236243 :	0.763757 PPM	0.1325 (Solved)
Rotation Around North Axis :	0.105333 Sec	0.0348 (Solved)
Rotation Around East Axis :	0.033237 Sec	0.0387 (Solved)
Rotation Around Vert Axis :	0.003867 Sec	0.0282 (Solved)

From To	Component	Adj Value	Residual	StdErr	StdRes
(V3 Day138(H) 22:16 O101102H.138)					
0101	Delta-N	-410.4560	-0.0046	0.0333	0.1
0102	Delta-E	10874.1586	0.0082	0.0296	0.3
	Delta-U	-46.8497	0.0291	0.0285	1.0
	Length	10882.0033			
(V4 Day138(H) 22:16 O101103H.138)					
0101	Delta-N	-490.5369	0.0055	0.0362	0.2
0103	Delta-E	21255.6154	0.0169	0.0303	0.6
	Delta-U	-46.0131	0.0446	0.0321	1.4
	Length	21261.3248			
(V5 Day138(I) 22:43 O101501I.138)					
0101	Delta-N	-21297.2595	-0.0186	0.0369	0.5
0501	Delta-E	-63.2321	-0.0007	0.0315	0.0
	Delta-U	-73.6738	-0.0437	0.0328	1.3
	Length	21297.4808			
(V6 Day138(H) 22:14 O102103H.138)					
0102	Delta-N	-84.9665	-0.0044	0.0332	0.1
0103	Delta-E	10381.4161	0.0081	0.0295	0.3
	Delta-U	6.2245	0.0287	0.0283	1.0
	Length	10381.7657			
(V8 Day138(G) 21:40 O103104G.138)					
0103	Delta-N	2951.9683	0.0092	0.0444	0.2
0104	Delta-E	10554.4934	0.0032	0.0339	0.1
	Delta-U	-45.6002	0.0484	0.0413	1.2
	Length	10959.6317			
(V7 Day138(G) 21:40 O103502G.138)					
0103	Delta-N	-20997.4011	-0.0135	0.0389	0.3
0502	Delta-E	10420.3680	0.0272	0.0325	0.8
	Delta-U	-72.7580	0.0640	0.0354	1.8
	Length	23440.9944			
(V31 Day138(F) 21:08 O105104F.138)					
0105	Delta-N	2983.5676	0.0120	0.0376	0.3
0104	Delta-E	-10935.2428	0.0041	0.0321	0.1
	Delta-U	-18.6300	-0.0083	0.0333	0.3
	Length	11334.9706			
(V30 Day138(F) 21:08 O106104F.138)					
0106	Delta-N	2893.7311	0.0157	0.0388	0.4
0104	Delta-E	-21908.9125	0.0057	0.0327	0.2
	Delta-U	-77.4015	-0.0322	0.0346	0.9
	Length	22099.3239			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V29 Day138(F) 20:38 O106105F.138)					
0106	Delta-N	-95.0303	0.0099	0.0343	0.3
0105	Delta-E	-10975.0992	0.0038	0.0307	0.1
	Delta-U	-53.0594	-0.0064	0.0294	0.2
	Length	10975.6389			
(V28 Day138(E) 20:13 O106107E.138)					
0106	Delta-N	68.6781	-0.0062	0.0355	0.2
0107	Delta-E	10034.5632	-0.0043	0.0307	0.1
	Delta-U	56.1969	0.0054	0.0301	0.2
	Length	10034.9556			
(V68 Day139(A) 11:46 O108107A.139)					
0108	Delta-N	190.0410	0.0000	0.0389	0.0
0107	Delta-E	-10500.6779	0.0042	0.0329	0.1
	Delta-U	-11.6440	-0.0139	0.0343	0.4
	Length	10502.4039			
(V41 Day139(A) 11:48 O109107A.139)					
0109	Delta-N	50.8768	0.0167	0.0424	0.4
0107	Delta-E	-21077.0616	0.0076	0.0314	0.2
	Delta-U	-41.1513	0.0285	0.0377	0.8
	Length	21077.1632			
(V42 Day139(A) 11:48 O109108A.139)					
0109	Delta-N	-143.9708	-0.0012	0.0394	0.0
0108	Delta-E	-10576.4790	0.0038	0.0314	0.1
	Delta-U	-24.2096	-0.0141	0.0346	0.4
	Length	10577.4865			
(V43 Day139(B) 12:14 O109110B.139)					
0109	Delta-N	-46.0579	-0.0093	0.0362	0.3
0110	Delta-E	10470.2281	-0.0078	0.0324	0.2
	Delta-U	-1.8508	-0.0130	0.0315	0.4
	Length	10470.3295			
(V44 Day139(D) 13:03 O110111D.139)					
0110	Delta-N	62.8977	-0.0153	0.0399	0.4
0111	Delta-E	10101.4127	-0.0165	0.0331	0.5
	Delta-U	-26.8758	0.0273	0.0367	0.7
	Length	10101.6443			
(V46 Day139(E) 13:34 O111112E.139)					
0111	Delta-N	-59.5569	-0.0085	0.0336	0.3
0112	Delta-E	10083.7673	-0.0091	0.0299	0.3
	Delta-U	-85.9328	0.0127	0.0286	0.4
	Length	10084.3093			
(V45 Day139(E) 13:24 O111600E.139)					
0111	Delta-N	7879.3119	0.0012	0.0339	0.0
0600	Delta-E	-124.0517	-0.0070	0.0310	0.2
	Delta-U	-10.7475	0.0152	0.0288	0.5
	Length	7880.2957			
(V48 Day139(F) 14:14 O112113F.139)					
0112	Delta-N	-62.2367	-0.0044	0.0389	0.1
0113	Delta-E	11019.1327	-0.0135	0.0338	0.4
	Delta-U	60.4711	-0.0220	0.0344	0.6
	Length	11019.4744			
(V49 Day139(F) 14:14 O112505F.139)					
0112	Delta-N	-20856.1067	-0.0024	0.0384	0.1
0505	Delta-E	10985.5204	-0.0062	0.0329	0.2
	Delta-U	-11.6590	0.0386	0.0337	1.1
	Length	23572.4199			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V47 Day139(E) 13:34 O112600E.139)					
0112	Delta-N	7943.3231	-0.0012	0.0327	0.0
0600	Delta-E	-10204.3884	0.0067	0.0300	0.2
	Delta-U	70.2513	-0.0005	0.0276	0.0
	Length	12931.7771			
(V11 Day138(A) 18:11 O201202A.138)					
0201	Delta-N	-170.6303	-0.0097	0.0313	0.3
0202	Delta-E	10670.4200	-0.0003	0.0297	0.0
	Delta-U	-37.9159	-0.0221	0.0257	0.9
	Length	10671.8515			
(V12 Day138(A) 18:06 O201203A.138)					
0201	Delta-N	-177.3058	-0.0202	0.0326	0.6
0203	Delta-E	21170.9267	-0.0014	0.0302	0.0
	Delta-U	-7.7944	-0.0376	0.0272	1.4
	Length	21171.6706			
(V177 Day141(A) 16:07 O201501A.141)					
0201	Delta-N	21596.1745	0.0185	0.0319	0.6
0501	Delta-E	-108.6006	-0.0057	0.0306	0.2
	Delta-U	7.7930	0.0073	0.0265	0.3
	Length	21596.4490			
(V14 Day138(K) 23:48 O201506K.138)					
0201	Delta-N	-21043.1252	-0.0107	0.0346	0.3
0506	Delta-E	-54.2215	-0.0144	0.0313	0.5
	Delta-U	8.3701	0.0720	0.0296	2.4
	Length	21043.1967			
(V178 Day141(A) 16:04 O201602A.141)					
0201	Delta-N	48385.6746	-0.0199	0.0381	0.5
0602	Delta-E	-94690.2266	0.0053	0.0346	0.2
	Delta-U	-115.1281	-0.0321	0.0337	1.0
	Length	106336.3803			
(V15 Day138(A) 18:11 O202203A.138)					
0202	Delta-N	-11.5046	-0.0101	0.0320	0.3
0203	Delta-E	10500.4859	-0.0003	0.0299	0.0
	Delta-U	35.4677	-0.0235	0.0265	0.9
	Length	10500.5521			
(V16 Day138(B) 18:40 O203204B.138)					
0203	Delta-N	-94.5990	-0.0099	0.0322	0.3
0204	Delta-E	10501.8473	0.0094	0.0309	0.3
	Delta-U	-55.1403	-0.0283	0.0269	1.1
	Length	10502.4181			
(V17 Day138(B) 18:44 O203502B.138)					
0203	Delta-N	21582.6498	-0.0164	0.0344	0.5
0502	Delta-E	10498.6539	-0.0123	0.0322	0.4
	Delta-U	-29.7478	-0.0376	0.0296	1.3
	Length	24000.6957			
(V143 Day141(B) 12:23 O204201B.141)					
0204	Delta-N	305.5597	-0.0018	0.0341	0.1
0201	Delta-E	-31672.4823	0.0021	0.0313	0.1
	Delta-U	25.6751	-0.0068	0.0291	0.2
	Length	31673.9666			
(V18 Day138(C) 19:10 O204205C.138)					
0204	Delta-N	-253.7255	0.0089	0.0359	0.2
0205	Delta-E	11007.6512	0.0024	0.0330	0.1
	Delta-U	76.2290	-0.0191	0.0313	0.6
	Length	11010.8389			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V19 Day138(C) 19:13 O204206C.138)					
0204	Delta-N	340.1714	0.0134	0.0337	0.4
0206	Delta-E	21730.8185	0.0177	0.0313	0.6
	Delta-U	58.6168	-0.0006	0.0287	0.0
	Length	21733.5598			
(V146 Day141(A) 11:54 O204304A.141)					
0204	Delta-N	-40951.1374	-0.0082	0.0401	0.2
0304	Delta-E	1827.1568	0.0047	0.0325	0.1
	Delta-U	-111.5881	0.0364	0.0356	1.0
	Length	40992.0311			
(V20 Day138(B) 18:44 O204502B.138)					
0204	Delta-N	21677.2482	-0.0136	0.0343	0.4
0502	Delta-E	6.6060	-0.0263	0.0327	0.8
	Delta-U	25.2927	-0.0021	0.0294	0.1
	Length	21677.2639			
(V145 Day141(B) 12:26 O204506B.141)					
0204	Delta-N	-20737.4718	0.0052	0.0351	0.1
0506	Delta-E	-31755.4435	0.0095	0.0317	0.3
	Delta-U	34.2277	-0.0158	0.0302	0.5
	Length	37926.9310			
(V144 Day141(A) 11:54 O204507A.141)					
0204	Delta-N	-20209.4645	-0.0139	0.0333	0.4
0507	Delta-E	56.3986	-0.0015	0.0307	0.1
	Delta-U	4.1666	-0.0171	0.0281	0.6
	Length	20209.5437			
(V21 Day138(C) 19:13 O206205C.138)					
0206	Delta-N	-583.8530	-0.0082	0.0344	0.2
0205	Delta-E	-10723.7313	-0.0023	0.0317	0.1
	Delta-U	6.4840	0.0170	0.0296	0.6
	Length	10739.6154			
(V22 Day138(D) 19:36 O206207D.138)					
0206	Delta-N	-117.1781	0.0126	0.0337	0.4
0207	Delta-E	10594.6226	0.0190	0.0312	0.6
	Delta-U	11.5897	0.0072	0.0285	0.3
	Length	10595.2769			
(V23 Day138(D) 19:36 O206503D.138)					
0206	Delta-N	21581.1148	0.0073	0.0336	0.2
0503	Delta-E	10292.2327	0.0008	0.0308	0.0
	Delta-U	38.7188	-0.0220	0.0284	0.8
	Length	23909.7484			
(V63 Day139(M) 18:10 O207508M.139)					
0207	Delta-N	-21084.4021	0.0118	0.0380	0.3
0508	Delta-E	113.3354	0.0208	0.0333	0.6
	Delta-U	-42.3907	0.0465	0.0334	1.4
	Length	21084.7493			
(V61 Day139(K) 17:29 O208207K.139)					
0208	Delta-N	-117.6639	0.0010	0.0354	0.0
0207	Delta-E	-10110.0912	-0.0032	0.0311	0.1
	Delta-U	-13.9453	0.0183	0.0302	0.6
	Length	10110.7855			
(V60 Day139(J) 16:42 O208209J.139)					
0208	Delta-N	-107.1903	-0.0036	0.0380	0.1
0209	Delta-E	10616.6012	0.0047	0.0338	0.1
	Delta-U	3.8394	-0.0386	0.0337	1.1
	Length	10617.1430			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V62 Day139(L) 17:48 O208508L.139)					
0208	Delta-N	-21202.1131	0.0093	0.0359	0.3
0508	Delta-E	-10005.9232	-0.0149	0.0307	0.5
	Delta-U	-56.4045	0.0621	0.0309	2.0
	Length	23444.6429			
(V58 Day139(J) 16:42 O210208J.139)					
0210	Delta-N	261.9046	-0.0041	0.0351	0.1
0208	Delta-E	-21184.8511	-0.0146	0.0314	0.5
	Delta-U	-45.4417	0.0470	0.0304	1.5
	Length	21186.5187			
(V57 Day139(J) 16:31 O210209J.139)					
0210	Delta-N	145.0203	0.0031	0.0353	0.1
0209	Delta-E	-10568.3614	-0.0044	0.0322	0.1
	Delta-U	-30.8695	0.0319	0.0307	1.0
	Length	10569.4015			
(V142 Day140(B) 14:08 O210504B.140)					
0210	Delta-N	21843.7153	-0.0149	0.0325	0.5
0504	Delta-E	116.0768	0.0094	0.0302	0.3
	Delta-U	-0.7571	0.0334	0.0270	1.2
	Length	21844.0237			
(V56 Day139(H) 15:12 O211210H.139)					
0211	Delta-N	-185.8881	-0.0130	0.0352	0.4
0210	Delta-E	-10242.3225	0.0080	0.0338	0.2
	Delta-U	-30.7014	0.0161	0.0305	0.5
	Length	10244.0552			
(V54 Day139(H) 15:09 O212210H.139)					
0212	Delta-N	-23.2420	0.0072	0.0357	0.2
0210	Delta-E	-20829.3418	-0.0101	0.0338	0.3
	Delta-U	-69.5304	-0.0527	0.0311	1.7
	Length	20829.4708			
(V53 Day139(H) 15:12 O212211H.139)					
0212	Delta-N	157.9725	-0.0133	0.0346	0.4
0211	Delta-E	-10586.9523	0.0075	0.0326	0.2
	Delta-U	-33.6565	0.0159	0.0300	0.5
	Length	10588.1843			
(V55 Day139(G) 14:44 O212213G.139)					
0212	Delta-N	13.8770	0.0006	0.0328	0.0
0213	Delta-E	10663.7861	-0.0063	0.0313	0.2
	Delta-U	-74.7766	0.0275	0.0275	1.0
	Length	10664.0573			
(V157 Day141(E) 14:02 O301302E.141)					
0301	Delta-N	-5177.2151	0.0202	0.0315	0.6
0302	Delta-E	10655.0097	-0.0009	0.0297	0.0
	Delta-U	-23.6082	0.0205	0.0259	0.8
	Length	11846.2376			
(V154 Day141(E) 13:58 O506301E.141)					
0301	Delta-N	14996.4486	-0.0077	0.0318	0.2
0506	Delta-E	-241.9441	0.0056	0.0299	0.2
	Delta-U	-30.7067	0.0104	0.0263	0.4
	Length	14998.4316			
(V169 Day141(A) 17:05 O301511A.141)					
0301	Delta-N	-26280.9437	-0.0320	0.0341	0.9
0511	Delta-E	-98.5791	-0.0018	0.0307	0.1
	Delta-U	-10.5649	0.0436	0.0290	1.5
	Length	26281.1307			

From To	Component	Adj Value	Residual	StdErr	StdRes
V156 Day141(D) 13:38 O301702D.141)					
0301	Delta-N	228.6536	0.0129	0.0320	0.4
0702	Delta-E	-16146.3746	-0.0091	0.0300	0.3
	Delta-U	23.7220	-0.0058	0.0264	0.2
	Length	16148.0109			
(V158 Day141(F) 14:36 O302303F.141)					
0302	Delta-N	-2722.4846	0.0050	0.0316	0.2
0303	Delta-E	10338.3751	-0.0008	0.0303	0.0
	Delta-U	-47.0132	0.0146	0.0262	0.6
	Length	10690.9369			
(V159 Day141(F) 14:38 O302304F.141)					
0302	Delta-N	-5.1483	0.0093	0.0325	0.3
0304	Delta-E	22712.8724	-0.0058	0.0310	0.2
	Delta-U	-157.3039	0.0320	0.0273	1.2
	Length	22713.4177			
(V160 Day141(F) 14:38 O303304F.141)					
0303	Delta-N	2711.8307	0.0051	0.0318	0.2
0304	Delta-E	12375.7550	-0.0008	0.0304	0.0
	Delta-U	-104.5408	0.0149	0.0265	0.6
	Length	12669.8171			
(V123 Day140(K) 19:46 O304404K.140)					
0304	Delta-N	-42353.1239	0.0112	0.0354	0.3
0404	Delta-E	-1583.3251	-0.0008	0.0314	0.0
	Delta-U	97.5277	0.0811	0.0301	2.7
	Length	42382.8213			
(V122 Day140(K) 19:44 O304512K.140)					
0304	Delta-N	-21062.0196	0.0086	0.0331	0.3
0512	Delta-E	-1652.9496	-0.0007	0.0302	0.0
	Delta-U	72.9447	0.0406	0.0275	1.5
	Length	21126.9078			
(V121 Day140(J) 19:17 O305304J.140)					
0305	Delta-N	141.4122	-0.0013	0.0308	0.0
0304	Delta-E	-9234.8607	0.0011	0.0294	0.0
	Delta-U	-49.1809	0.0048	0.0251	0.2
	Length	9236.0743			
(V119 Day140(J) 19:11 O306304J.140)					
0306	Delta-N	76.0128	-0.0021	0.0318	0.1
0304	Delta-E	-19847.7385	0.0029	0.0300	0.1
	Delta-U	-98.5135	0.0044	0.0263	0.2
	Length	19848.1285			
(V118 Day140(J) 19:17 O306305J.140)					
0306	Delta-N	-69.6072	-0.0014	0.0309	0.0
0305	Delta-E	-10612.9693	0.0011	0.0295	0.0
	Delta-U	-44.6566	0.0049	0.0253	0.2
	Length	10613.2915			
(V120 Day140(I) 18:45 O306513I.140)					
0306	Delta-N	-21207.7146	0.0076	0.0320	0.2
0513	Delta-E	10544.5915	0.0003	0.0301	0.0
	Delta-U	-36.5313	0.0171	0.0266	0.6
	Length	23684.5287			
(V116 Day140(I) 18:45 O307306I.140)					
0307	Delta-N	-25.8153	0.0037	0.0308	0.1
0306	Delta-E	-10318.5362	0.0041	0.0294	0.1
	Delta-U	-28.8970	0.0242	0.0251	1.0
	Length	10318.6089			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V115 Day140(H) 18:15 O307508H.140)					
0307	Delta-N	20116.9280	-0.0075	0.0342	0.2
0508	Delta-E	502.2617	-0.0180	0.0306	0.6
	Delta-U	-1.4093	-0.0140	0.0290	0.5
	Length	20123.1971			
(V117 Day140(I) 18:37 O307513I.140)					
0307	Delta-N	-21238.1989	0.0110	0.0317	0.3
0513	Delta-E	216.6762	0.0027	0.0300	0.1
	Delta-U	-60.2675	0.0453	0.0263	1.7
	Length	21239.3896			
(V114 Day140(H) 18:07 O308307H.140)					
0308	Delta-N	91.4495	-0.0045	0.0320	0.1
0307	Delta-E	-10396.6605	0.0131	0.0297	0.4
	Delta-U	-28.4403	0.0229	0.0265	0.9
	Length	10397.1016			
(V112 Day140(G) 17:40 O308309G.140)					
0308	Delta-N	-1545.2041	0.0336	0.0316	1.1
0309	Delta-E	10932.8814	-0.0263	0.0294	0.9
	Delta-U	-101.0137	-0.0071	0.0259	0.3
	Length	11041.9996			
(V113 Day140(H) 18:15 O308508H.140)					
0308	Delta-N	20208.1514	-0.0200	0.0319	0.6
0508	Delta-E	-9885.4191	-0.0029	0.0299	0.1
	Delta-U	-29.6841	0.0077	0.0265	0.3
	Length	22496.4836			
(V70 Day139(O) 19:15 O309307O.139)					
0309	Delta-N	1646.6686	0.0197	0.0367	0.5
0307	Delta-E	-21328.8064	-0.0282	0.0329	0.9
	Delta-U	61.3255	0.0565	0.0323	1.7
	Length	21392.3645			
(V69 Day139(O) 19:16 O309308O.139)					
0309	Delta-N	1550.3421	0.0749	0.0380	2.0
0308	Delta-E	-10932.2062	-0.0270	0.0338	0.8
	Delta-U	95.1961	-0.0363	0.0337	1.1
	Length	11041.9996			
(V71 Day139(P) 19:52 O309310P.139)					
0309	Delta-N	210.1944	-0.0719	0.0438	1.6
0310	Delta-E	10281.1676	-0.0085	0.0347	0.2
	Delta-U	96.8023	0.0050	0.0393	0.1
	Length	10283.7717			
(V97 Day140(G) 17:34 O310308G.140)					
0310	Delta-N	1349.5096	-0.0432	0.0335	1.3
0308	Delta-E	-21212.7770	0.0037	0.0304	0.1
	Delta-U	-11.9992	0.0457	0.0281	1.6
	Length	21255.6635			
(V96 Day140(G) 17:40 O310309G.140)					
0310	Delta-N	-205.6561	-0.0035	0.0335	0.1
0309	Delta-E	-10281.2107	-0.0240	0.0303	0.8
	Delta-U	-101.8479	0.0376	0.0282	1.3
	Length	10283.7717			
(V92 Day140(E) 16:36 O310311E.140)					
0310	Delta-N	1202.3173	-0.0044	0.0337	0.1
0311	Delta-E	10440.2783	-0.0062	0.0316	0.2
	Delta-U	45.1179	0.0018	0.0285	0.1
	Length	10509.3774			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V93 Day140(E) 16:36 O310312E.140)					
0310	Delta-N	1306.9157	-0.0067	0.0318	0.2
0312	Delta-E	21009.8376	-0.0088	0.0304	0.3
	Delta-U	14.7997	0.0005	0.0263	0.0
	Length	21050.4518			
(V94 Day140(F) 17:07 O310509F.140)					
0310	Delta-N	21391.5088	-0.0090	0.0332	0.3
0509	Delta-E	-49.6914	0.0256	0.0303	0.8
	Delta-U	-0.4403	-0.0104	0.0280	0.4
	Length	21391.5665			
(V95 Day140(F) 17:02 O310514F.140)					
0310	Delta-N	-19980.6720	-0.0300	0.0330	0.9
0514	Delta-E	-57.3769	0.0159	0.0304	0.5
	Delta-U	-24.5736	-0.0682	0.0276	2.5
	Length	19980.7695			
(V99 Day140(E) 16:35 O312311E.140)					
0312	Delta-N	-95.0668	0.0037	0.0307	0.1
0311	Delta-E	-10569.6744	0.0054	0.0296	0.2
	Delta-U	19.7159	-0.0014	0.0250	0.1
	Length	10570.1203			
(V100 Day140(D) 16:04 O312515D.140)					
0312	Delta-N	-21492.7672	0.0043	0.0319	0.1
0515	Delta-E	10502.4767	-0.0249	0.0309	0.8
	Delta-U	1.2221	-0.0008	0.0265	0.0
	Length	23921.5606			
(V98 Day140(D) 16:04 O312516D.140)					
0312	Delta-N	-44.0673	-0.0141	0.0309	0.5
0516	Delta-E	10599.4886	0.0098	0.0307	0.3
	Delta-U	4.8996	0.0027	0.0252	0.1
	Length	10599.5813			
(V166 Day141(C) 18:47 O401402C.141)					
0401	Delta-N	363.4716	0.0038	0.0341	0.1
0402	Delta-E	10502.2080	0.0038	0.0315	0.1
	Delta-U	-16.1691	0.0067	0.0293	0.2
	Length	10508.5082			
(V167 Day141(B) 18:15 O401511B.141)					
0401	Delta-N	21644.7586	-0.0203	0.0395	0.5
0511	Delta-E	40.2104	-0.0137	0.0349	0.4
	Delta-U	-4.7752	-0.0382	0.0350	1.1
	Length	21644.7965			
(V164 Day141(D) 19:21 O403301D.141)					
0403	Delta-N	47561.9075	0.0297	0.0398	0.7
0301	Delta-E	-21123.0327	-0.0232	0.0334	0.7
	Delta-U	-47.6311	0.0878	0.0350	2.5
	Length	52041.5202			
(V165 Day141(C) 18:53 O403401C.141)					
0403	Delta-N	-363.6052	-0.0077	0.0330	0.2
0401	Delta-E	-21305.3776	-0.0069	0.0306	0.2
	Delta-U	5.8822	-0.0172	0.0279	0.6
	Length	21308.4809			
(V163 Day141(C) 18:53 O403402C.141)					
0403	Delta-N	-9.7003	-0.0037	0.0331	0.1
0402	Delta-E	-10802.8319	-0.0037	0.0312	0.1
	Delta-U	0.3959	-0.0062	0.0280	0.2
	Length	10802.8363			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V162 Day141(D) 19:19 0404403D.141)					
0404	Delta-N	-0.8154	0.0057	0.0324	0.2
0403	Delta-E	-10679.2315	-0.0191	0.0296	0.6
	Delta-U	4.8075	0.0377	0.0267	1.4
	Length	10679.2326			
(V128 Day140(L) 20:25 0404405L.140)					
0404	Delta-N	-77.1520	0.0025	0.0318	0.1
0405	Delta-E	10719.6815	0.0111	0.0295	0.4
	Delta-U	-83.7252	0.0459	0.0261	1.8
	Length	10720.2861			
(V129 Day140(L) 20:25 0404406L.140)					
0404	Delta-N	5167.6844	0.0051	0.0330	0.2
0406	Delta-E	21379.6168	0.0066	0.0301	0.2
	Delta-U	-181.2714	0.0172	0.0276	0.6
	Length	21996.0414			
(V131 Day140(L) 20:25 0405406L.140)					
0405	Delta-N	5239.9496	0.0033	0.0319	0.1
0406	Delta-E	10662.3866	-0.0055	0.0295	0.2
	Delta-U	-92.1132	-0.0267	0.0263	1.0
	Length	11880.7426			
(V132 Day140(M) 20:52 0405406M.140)					
0405	Delta-N	5239.9496	-0.0076	0.0322	0.2
0406	Delta-E	10662.3866	0.0127	0.0296	0.4
	Delta-U	-92.1132	-0.0102	0.0269	0.4
	Length	11880.7426			
(V130 Day140(M) 20:51 0405605M.140)					
0405	Delta-N	12816.3340	0.0015	0.0349	0.0
0605	Delta-E	3434.7310	0.0053	0.0316	0.2
	Delta-U	-67.0164	0.1090	0.0301	3.6 *
	Length	13268.7711			
(V134 Day140(N) 21:20 0406407N.140)					
0406	Delta-N	-5156.6550	0.0167	0.0326	0.5
0407	Delta-E	10599.5677	0.0109	0.0298	0.4
	Delta-U	116.6776	-0.0544	0.0275	2.0
	Length	11787.9404			
(V133 Day140(M) 20:52 0406605M.140)					
0406	Delta-N	7579.6738	-0.0056	0.0323	0.2
0605	Delta-E	-7224.2119	-0.0024	0.0296	0.1
	Delta-U	23.3210	0.0860	0.0269	3.2 *
	Length	10470.9711			
(V136 Day140(O) 21:45 0407408O.140)					
0407	Delta-N	-19.7695	0.0105	0.0322	0.3
0408	Delta-E	10313.3007	0.0112	0.0295	0.4
	Delta-U	-10.1462	-0.0136	0.0272	0.5
	Length	10313.3246			
(V135 Day140(O) 21:54 0407409O.140)					
0407	Delta-N	342.6677	0.0251	0.0348	0.7
0409	Delta-E	22187.3744	0.0071	0.0303	0.2
	Delta-U	-78.4771	-0.0407	0.0304	1.3
	Length	22190.1592			
(V137 Day140(O) 21:54 0408409O.140)					
0408	Delta-N	357.2010	0.0146	0.0333	0.4
0409	Delta-E	11874.2646	-0.0054	0.0297	0.2
	Delta-U	-62.4880	-0.0265	0.0285	0.9
	Length	11879.8004			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V138 Day140(Q) 23:09 O408410Q.140)					
0408	Delta-N	-18.8249	0.0034	0.0351	0.1
0410	Delta-E	21460.8619	0.0130	0.0310	0.4
	Delta-U	-11.7455	0.0429	0.0300	1.4
	Length	21460.8734			
(V139 Day140(Q) 23:16 O408606Q.140)					
0408	Delta-N	6127.0263	-0.0046	0.0325	0.1
0606	Delta-E	5307.0637	0.0049	0.0300	0.2
	Delta-U	-85.5119	-0.0245	0.0268	0.9
	Length	8106.3363			
(V141 Day140(P) 22:34 O409410P.140)					
0409	Delta-N	-380.8941	0.0227	0.0406	0.6
0410	Delta-E	9586.3749	0.0001	0.0346	0.0
	Delta-U	56.1676	-0.0412	0.0367	1.1
	Length	9594.1033			
(V79 Day139(R) 20:57 O410411R.139)					
0410	Delta-N	-35.4933	0.0483	0.0386	1.3
0411	Delta-E	10142.4014	-0.0378	0.0328	1.2
	Delta-U	-0.2685	0.0496	0.0344	1.4
	Length	10142.4635			
(V173 Day141(C) 21:39 O410411C.141)					
0410	Delta-N	-35.4933	-0.0216	0.0326	0.7
0411	Delta-E	10142.4014	0.0268	0.0297	0.9
	Delta-U	-0.2685	-0.0085	0.0277	0.3
	Length	10142.4635			
(V174 Day141(D) 22:31 O410411D.141)					
0410	Delta-N	-35.4933	-0.0178	0.0364	0.5
0411	Delta-E	10142.4014	0.0297	0.0327	0.9
	Delta-U	-0.2685	-0.0119	0.0320	0.4
	Length	10142.4635			
(V80 Day139(R) 20:54 O410412R.139)					
0410	Delta-N	-165.2436	-0.0113	0.0400	0.3
0412	Delta-E	20792.7111	-0.0146	0.0332	0.4
	Delta-U	-17.7857	0.0586	0.0358	1.6
	Length	20793.3753			
(V172 Day141(A) 20:41 O410514A.141)					
0410	Delta-N	20955.9007	0.0337	0.0337	1.0
0514	Delta-E	-344.1708	-0.0144	0.0305	0.5
	Delta-U	34.5770	0.0398	0.0286	1.4
	Length	20958.7553			
(V171 Day141(D) 22:31 O410607D.141)					
0410	Delta-N	-34380.9397	-0.0036	0.0374	0.1
0607	Delta-E	17216.2326	0.0193	0.0328	0.6
	Delta-U	-164.0144	-0.0214	0.0332	0.6
	Length	38450.9373			
(V176 Day141(B) 21:08 O411514B.141)					
0411	Delta-N	20995.9397	0.0155	0.0334	0.5
0514	Delta-E	-10477.4837	-0.0018	0.0309	0.1
	Delta-U	29.7348	0.0629	0.0285	2.2
	Length	23465.0386			
(V175 Day141(D) 22:29 O411607D.141)					
0411	Delta-N	-34348.5111	0.0121	0.0353	0.3
0607	Delta-E	7059.0148	-0.0191	0.0310	0.6
	Delta-U	-160.2641	-0.0883	0.0307	2.9
	Length	35066.7305			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V85 Day139(R) 20:57 O412411R.139)					
0412	Delta-N	139.2187	0.0330	0.0358	0.9
0411	Delta-E	-10650.2023	-0.0411	0.0305	1.3
	Delta-U	6.9497	-0.0303	0.0311	1.0
	Length	10651.1145			
(V84 Day139(S) 21:25 O412413S.139)					
0412	Delta-N	33.5614	-0.0183	0.0379	0.5
0413	Delta-E	10451.6871	0.0096	0.0328	0.3
	Delta-U	40.5538	0.0394	0.0339	1.2
	Length	10451.8197			
(V86 Day139(S) 21:26 O412515S.139)					
0412	Delta-N	20915.8205	-0.0726	0.0469	1.6
0515	Delta-E	10470.6939	0.0286	0.0341	0.8
	Delta-U	94.7753	0.0991	0.0447	2.2
	Length	23390.5101			
(V10 Day138(J) 23:11 O501201J.138)					
0501	Delta-N	-21596.1544	-0.0331	0.0346	1.0
0201	Delta-E	108.7017	-0.0106	0.0310	0.3
	Delta-U	-30.1297	-0.0197	0.0293	0.7
	Length	21596.4490			
(V179 Day141(A) 16:07 O501602A.141)					
0501	Delta-N	26789.1692	0.0007	0.0382	0.0
0602	Delta-E	-94581.7522	0.0328	0.0352	0.9
	Delta-U	-94.7234	-0.0568	0.0338	1.7
	Length	98302.4741			
(V27 Day138(G) 21:37 O502104G.138)					
0502	Delta-N	23949.3219	-0.0452	0.0415	1.1
0104	Delta-E	144.9026	-0.0119	0.0327	0.4
	Delta-U	3.1414	0.0092	0.0379	0.2
	Length	23949.7604			
(V26 Day138(E) 20:12 O503106E.138)					
0503	Delta-N	20836.6821	0.0105	0.0353	0.3
0106	Delta-E	-9910.8258	0.0052	0.0308	0.2
	Delta-U	-15.8530	-0.0222	0.0300	0.7
	Length	23073.6221			
(V25 Day138(E) 20:13 O503107E.138)					
0503	Delta-N	20901.1168	-0.0033	0.0372	0.1
0107	Delta-E	123.7383	-0.0074	0.0324	0.2
	Delta-U	45.0247	-0.0145	0.0323	0.4
	Length	20901.5316			
(V24 Day138(D) 19:36 O503207D.138)					
0503	Delta-N	-21698.3856	-0.0034	0.0342	0.1
0207	Delta-E	292.7683	0.0023	0.0315	0.1
	Delta-U	-49.4067	0.0107	0.0291	0.4
	Length	21700.4168			
(V50 Day139(F) 14:12 O505113F.139)					
0505	Delta-N	20793.9134	0.0053	0.0413	0.1
0113	Delta-E	43.4517	0.0147	0.0352	0.4
	Delta-U	51.3786	0.0256	0.0370	0.7
	Length	20794.0223			
(V51 Day139(G) 14:43 O505212G.139)					
0505	Delta-N	-21747.4431	-0.0073	0.0343	0.2
0212	Delta-E	-10530.2831	-0.0081	0.0315	0.3
	Delta-U	72.8274	-0.0012	0.0293	0.0
	Length	24162.8527			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V52 Day139(G) 14:44 O505213G.139)					
0505	Delta-N	-21738.3338	0.0008	0.0346	0.0
0213	Delta-E	133.5444	-0.0101	0.0326	0.3
	Delta-U	3.4182	0.0151	0.0296	0.5
	Length	21738.7442			
(V151 Day141(B) 12:26 O506201B.141)					
0506	Delta-N	21043.1062	-0.0067	0.0329	0.2
0201	Delta-E	54.1724	-0.0088	0.0306	0.3
	Delta-U	-29.5773	0.0066	0.0277	0.2
	Length	21043.1967			
(V153 Day141(D) 13:38 O506301D.141)					
0506	Delta-N	-14996.4643	-0.0145	0.0319	0.5
0301	Delta-E	242.1004	0.0125	0.0299	0.4
	Delta-U	19.9333	0.0133	0.0263	0.5
	Length	14998.4316			
(V155 Day141(E) 14:02 O506302E.141)					
0506	Delta-N	-20173.5502	-0.0024	0.0327	0.1
0302	Delta-E	10897.1637	-0.0055	0.0303	0.2
	Delta-U	-7.5163	0.0261	0.0273	1.0
	Length	22928.5927			
(V152 Day141(D) 13:35 O506702D.141)					
0506	Delta-N	-14767.9959	-0.0017	0.0326	0.1
0702	Delta-E	-15904.2762	0.0037	0.0303	0.1
	Delta-U	44.0059	0.0063	0.0271	0.2
	Length	21703.4938			
(V149 Day141(A) 11:52 O507304A.141)					
0507	Delta-N	-20741.7795	0.0011	0.0353	0.0
0304	Delta-E	1770.7081	-0.0027	0.0310	0.1
	Delta-U	-95.6747	0.0309	0.0303	1.0
	Length	20817.4441			
(V148 Day141(C) 12:46 O507506C.141)					
0507	Delta-N	-527.9007	-0.0036	0.0342	0.1
0506	Delta-E	-31811.8435	0.0008	0.0311	0.0
	Delta-U	30.4865	-0.0185	0.0298	0.6
	Length	31816.2379			
(V147 Day141(C) 13:00 O507604C.141)					
0507	Delta-N	-3527.1510	-0.0008	0.0335	0.0
0604	Delta-E	-18068.3835	0.0001	0.0304	0.0
	Delta-U	-2.2057	-0.0268	0.0289	0.9
	Length	18409.4346			
(V126 Day140(A) 13:17 O508210A.140)					
0508	Delta-N	20973.0459	-0.0160	0.0357	0.4
0210	Delta-E	31182.0404	-0.0115	0.0324	0.4
	Delta-U	44.2549	0.0813	0.0314	2.6
	Length	37579.1200			
(V110 Day140(A) 13:18 O509210A.140)					
0509	Delta-N	21106.5390	-0.0018	0.0337	0.1
0210	Delta-E	179.8439	0.0192	0.0312	0.6
	Delta-U	38.0049	0.0373	0.0290	1.3
	Length	21107.3394			
(V111 Day140(A) 13:18 O509508A.140)					
0509	Delta-N	175.1312	0.0201	0.0352	0.6
0508	Delta-E	-31030.0627	0.0072	0.0310	0.2
	Delta-U	-52.2836	-0.0203	0.0310	0.7
	Length	31030.6010			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V106 Day140(B) 14:13 0510210B.140)					
0510	Delta-N	21155.8860	-0.0059	0.0344	0.2
0210	Delta-E	-31207.0286	-0.0143	0.0311	0.5
	Delta-U	-66.0380	0.0359	0.0293	1.2
	Length	37702.1817			
(V108 Day140(C) 14:47 0510213C.140)					
0510	Delta-N	21178.9288	0.0118	0.0328	0.4
0213	Delta-E	286.1115	0.0034	0.0310	0.1
	Delta-U	-55.7133	-0.0362	0.0276	1.3
	Length	21180.9346			
(V107 Day140(B) 14:13 0510504B.140)					
0510	Delta-N	42999.4136	-0.0341	0.0393	0.9
0504	Delta-E	-31061.5698	0.0270	0.0333	0.8
	Delta-U	-88.7101	0.0518	0.0346	1.5
	Length	53045.0616			
(V170 Day141(A) 17:25 0511603A.141)					
0511	Delta-N	-52533.4777	-0.0624	0.0398	1.6
0603	Delta-E	-95579.8549	-0.0145	0.0335	0.4
	Delta-U	-295.0087	0.0245	0.0353	0.7
	Length	109065.8607			
(V127 Day140(K) 19:46 0512404K.140)					
0512	Delta-N	-21291.0637	0.0072	0.0327	0.2
0404	Delta-E	71.1360	-0.0006	0.0301	0.0
	Delta-U	46.0542	0.0394	0.0271	1.5
	Length	21291.2324			
(V124 Day140(N) 21:18 0513406N.140)					
0513	Delta-N	-15914.9669	-0.0006	0.0334	0.0
0406	Delta-E	-10634.4499	-0.0046	0.0302	0.2
	Delta-U	-103.9550	0.0637	0.0285	2.2
	Length	19141.2775			
(V125 Day140(N) 21:20 0513407N.140)					
0513	Delta-N	-21076.5349	0.0156	0.0335	0.5
0407	Delta-E	-37.2898	0.0081	0.0303	0.3
	Delta-U	14.1657	0.0080	0.0287	0.3
	Length	21076.5726			
(V109 Day140(F) 17:07 0514509F.140)					
0514	Delta-N	41372.1850	0.0305	0.0358	0.9
0509	Delta-E	7.5838	-0.0004	0.0314	0.0
	Delta-U	-15.4569	0.0376	0.0311	1.2
	Length	41372.1885			
(V104 Day140(P) 22:40 0515409P.140)					
0515	Delta-N	-20320.2432	-0.0260	0.0401	0.6
0409	Delta-E	-40858.0583	-0.0019	0.0333	0.1
	Delta-U	-208.4753	0.0574	0.0361	1.6
	Length	45632.6273			
(V105 Day140(P) 22:40 0515410P.140)					
0515	Delta-N	-20717.9572	0.0066	0.0345	0.2
0410	Delta-E	-31272.4912	-0.0084	0.0310	0.3
	Delta-U	-134.0070	0.0011	0.0296	0.0
	Length	37512.9366			
(V88 Day139(S) 21:26 0515413S.139)					
0515	Delta-N	-20882.1837	0.0295	0.0427	0.7
0413	Delta-E	-28.3367	-0.0109	0.0336	0.3
	Delta-U	-75.1492	-0.0559	0.0398	1.4
	Length	20882.3381			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V101 Day140(C) 14:47 0516213C.140)					
0516	Delta-N	41291.1060	-0.0129	0.0349	0.4
0213	Delta-E	69.9710	0.0131	0.0325	0.4
	Delta-U	-27.4718	-0.0051	0.0302	0.2
	Length	41291.1744			
(V102 Day140(C) 14:44 0516510C.140)					
0516	Delta-N	20112.2433	-0.0250	0.0326	0.8
0510	Delta-E	-216.3381	0.0122	0.0310	0.4
	Delta-U	48.6383	0.0310	0.0274	1.1
	Length	20113.4656			
(V103 Day140(D) 16:03 0516515D.140)					
0516	Delta-N	-21448.6535	0.0192	0.0319	0.6
0515	Delta-E	-106.7701	-0.0144	0.0317	0.5
	Delta-U	-3.6812	-0.0213	0.0264	0.8
	Length	21448.9196			
(V36 Day139(D) 13:01 0601110D.139)					
0601	Delta-N	15673.5271	-0.0029	0.0332	0.1
0110	Delta-E	-8.3237	-0.0061	0.0313	0.2
	Delta-U	62.0257	0.0393	0.0281	1.4
	Length	15673.6520			
(V37 Day139(D) 13:03 0601111D.139)					
0601	Delta-N	15736.4010	-0.0046	0.0377	0.1
0111	Delta-E	10093.0891	-0.0015	0.0322	0.0
	Delta-U	35.1067	0.0166	0.0340	0.5
	Length	18695.0794			
(V38 Day139(C) 12:37 0601504C.139)					
0601	Delta-N	-5125.0098	0.0150	0.0315	0.5
0504	Delta-E	-33.4683	-0.0080	0.0297	0.3
	Delta-U	-0.7466	-0.0485	0.0260	1.9
	Length	5125.1191			
(V180 Day148(A) 13:52 0603403A.148)					
0603	Delta-N	31748.0718	-0.0663	0.0411	1.6
0403	Delta-E	116715.8097	-0.0255	0.0369	0.7
	Delta-U	-361.3303	-0.0142	0.0373	0.4
	Length	120957.2274			
(V150 Day141(C) 13:00 0604506C.141)					
0604	Delta-N	2988.5764	-0.0080	0.0334	0.2
0506	Delta-E	-13745.7533	0.0009	0.0306	0.0
	Delta-U	44.0342	0.0121	0.0288	0.4
	Length	14066.9564			
(V140 Day140(Q) 23:16 0606410Q.140)					
0606	Delta-N	-6149.5402	0.0016	0.0346	0.0
0410	Delta-E	16152.3837	0.0059	0.0308	0.2
	Delta-U	76.0535	0.0613	0.0294	2.1
	Length	17283.5797			
(V32 Day139(B) 12:13 0700109B.139)					
0700	Delta-N	7633.9138	0.0000	0.0329	0.0
0109	Delta-E	-5198.5918	0.0038	0.0302	0.1
	Delta-U	-3.6140	-0.0048	0.0277	0.2
	Length	9235.9087			
(V33 Day139(B) 12:14 0700110B.139)					
0700	Delta-N	7585.5006	0.0031	0.0333	0.1
0110	Delta-E	5271.6258	-0.0021	0.0309	0.1
	Delta-U	-2.8500	-0.0137	0.0280	0.5
	Length	9237.4167			

From To	Component	Adj Value	Residual	StdErr	StdRes
(V35 Day139(C) 12:37 0700504C.139)					
0700	Delta-N	-13213.0156	0.0280	0.0325	0.9
0504	Delta-E	5251.2140	-0.0231	0.0302	0.8
	Delta-U	-73.6733	-0.0149	0.0272	0.5
	Length	14218.4548			
(V34 Day139(C) 12:35 0700601C.139)					
0700	Delta-N	-8087.9990	0.0126	0.0316	0.4
0601	Delta-E	5283.5124	-0.0150	0.0299	0.5
	Delta-U	-70.9497	0.0294	0.0261	1.1
	Length	9661.0695			
(V2 Day138(I) 22:43 0701101I.138)					
0701	Delta-N	-20777.5784	-0.0171	0.0369	0.5
0101	Delta-E	15867.0428	0.0274	0.0319	0.9
	Delta-U	-68.0990	0.0416	0.0327	1.3
	Length	26143.3634			
(V1 Day138(I) 22:43 0701501I.138)					
0701	Delta-N	-42074.7925	-0.0310	0.0400	0.8
0501	Delta-E	15818.3804	0.0222	0.0325	0.7
	Delta-U	-162.9276	-0.0425	0.0364	1.2
	Length	44950.3711			

SECTION 5

Adjusted Azimuths and Horizontal Distances

Adjusted Azimuths and Horizontal Distances (US Feet)

(Relative Confidence of Azimuth is in Seconds)

From	To	Grid Azimuth	Grid Dist Grnd Dist	95% RelConfidence Azi Dist PPM
0101	0102	92-17-45.88	10881.1796 10881.9238	1.23 0.0574 5.2769
0101	0103	91-27-22.83	21259.8569 21261.3142	0.59 0.0519 2.4418
0101	0501	180-18-16.74	21296.0451 21297.4032	0.52 0.0626 2.9406
0102	0103	90-34-34.13	10381.0708 10381.7710	1.29 0.0574 5.5246
0103	0104	74-27-20.05	10958.8216 10959.5578	1.40 0.0604 5.5146
0103	0502	153-41-14.80	23439.4824 23440.9360	0.51 0.0653 2.7853
0105	0104	285-17-19.79	11334.2157 11334.9697	1.28 0.0625 5.5143
0106	0104	277-31-28.08	22097.7490 22099.2452	0.60 0.0558 2.5236
0106	0105	269-30-15.03	10974.7924 10975.5337	1.29 0.0604 5.5031
0106	0107	89-36-28.46	10034.0890 10034.7933	1.34 0.0563 5.6061
0108	0107	270-59-08.59	10501.6555 10502.4093	1.48 0.0624 5.9416
0109	0107	270-03-39.09	21075.6361 21077.1596	0.66 0.0539 2.5573
0109	0108	269-08-33.21	10576.7071 10577.4740	1.48 0.0612 5.7903
0109	0110	90-10-27.30	10469.5739 10470.3388	1.24 0.0567 5.4156
0110	0111	89-32-21.37	10100.8914 10101.6237	1.36 0.0581 5.7495
0111	0112	90-12-32.95	10083.2675 10083.9724	1.24 0.0544 5.3912
0111	0600	358-58-07.96	7879.7192 7880.2958	1.57 0.0656 8.3299
0112	0113	90-10-08.86	11018.5371 11019.3018	1.43 0.0661 5.9963
0112	0505	152-04-06.34	23570.9344 23572.4374	0.53 0.0658 2.7897
0112	0600	307-44-37.43	12930.6544 12931.5746	0.99 0.0614 4.7516
0201	0202	91-03-01.49	10671.3080 10671.8027	1.16 0.0564 5.2881
0201	0203	90-36-50.30	21170.6887 21171.6888	0.49 0.0464 2.1935
0201	0506	180-16-55.40	21042.3091 21043.2031	0.38 0.0419 1.9929
0201	0602	297-12-07.74	106329.9234 106336.3567	0.08 0.0409 0.3843
0202	0203	90-10-13.48	10500.0050 10500.4920	1.19 0.0566 5.3881

From	To	Grid Azimuth	Grid Dist Grnd Dist	95% RelConfidence Azi Dist PPM
0203	0204	90-35-51.06	10501.8127 10502.2960	1.01 0.0482 4.5885
0203	0502	26-01-17.57	23999.4640 24000.7082	0.49 0.0587 2.4478
0204	0201	270-36-30.66	31672.5011 31673.9551	0.29 0.0415 1.3103
0204	0205	91-22-32.23	11010.0514 11010.5641	1.26 0.0620 5.6305
0204	0206	89-09-29.58	21732.4567 21733.4663	0.53 0.0511 2.3536
0204	0304	177-30-02.11	40990.6671 40991.9983	0.24 0.0533 1.3005
0204	0502	0-04-22.08	21676.1523 21677.2486	0.50 0.0567 2.6148
0204	0506	236-54-35.21	37925.3400 37926.9001	0.24 0.0422 1.1121
0204	0507	179-53-43.60	20208.7436 20209.5533	0.49 0.0531 2.6289
0206	0205	266-53-05.42	10739.1019 10739.6208	1.28 0.0611 5.6916
0206	0207	90-38-04.60	10594.7621 10595.2765	1.14 0.0539 5.0893
0206	0503	25-29-52.27	23908.4077 23909.7086	0.48 0.0586 2.4502
0207	0508	179-39-59.92	21083.8363 21084.7403	0.52 0.0597 2.8322
0208	0207	269-16-57.82	10110.2906 10110.7877	1.27 0.0549 5.4313
0208	0209	90-31-39.74	10616.6237 10617.1503	1.36 0.0625 5.8916
0208	0508	205-12-48.89	23443.6081 23444.6203	0.45 0.0549 2.3430
0210	0208	270-36-18.28	21185.4450 21186.5087	0.53 0.0490 2.3122
0210	0209	270-40-58.09	10568.8407 10569.3731	1.33 0.0616 5.8329
0210	0504	0-12-03.42	21842.8075 21844.0365	0.45 0.0526 2.4062
0211	0210	268-49-52.70	10243.4955 10244.0254	1.35 0.0638 6.2253
0212	0210	269-46-51.00	20828.3135 20829.4050	0.57 0.0537 2.5797
0212	0211	270-41-58.19	10587.5855 10588.1483	1.30 0.0630 5.9465
0212	0213	89-46-11.19	10663.2672 10663.8232	1.10 0.0536 5.0229
0301	0302	116-02-55.18	11845.8894 11846.2302	0.89 0.0494 4.1679
0301	0511	180-20-55.93	26280.5386 26281.1486	0.43 0.0608 2.3120
0301	0702	270-56-43.95	16147.4889 16147.9973	0.53 0.0375 2.3237
0302	0303	104-51-37.54	10690.5873 10690.8544	1.16 0.0578 5.4047

From	To	Grid Azimuth	Grid Dist Grnd Dist	95% RelConfidence Azi Dist PPM
0302	0304	90-07-12.05	22712.4450 22712.9746	0.46 0.0472 2.0774
0303	0304	77-43-18.73	12669.1551 12669.4277	0.98 0.0577 4.5523
0304	0404	182-11-30.32	42382.1803 42382.6184	0.23 0.0526 1.2421
0304	0512	184-32-17.51	21126.4261 21126.7574	0.56 0.0627 2.9692
0305	0304	270-54-18.77	9235.7681 9235.9618	1.32 0.0563 6.0907
0306	0304	270-13-15.85	19847.5094 19847.9455	0.53 0.0479 2.4117
0306	0305	269-37-32.55	10612.9727 10613.2177	1.15 0.0563 5.3042
0306	0513	153-33-51.55	23684.1254 23684.5350	0.46 0.0549 2.3183
0307	0306	269-49-56.72	10318.3288 10318.5842	1.07 0.0503 4.8701
0307	0508	1-24-20.89	20122.5832 20123.2097	0.50 0.0534 2.6545
0307	0513	179-23-27.86	21238.9660 21239.3472	0.50 0.0546 2.5718
0308	0307	270-27-13.74	10396.8083 10397.0784	0.99 0.0458 4.4077
0308	0309	97-59-38.93	11041.3108 11041.5734	0.85 0.0417 3.7744
0308	0508	333-52-58.41	22495.7798 22496.4933	0.44 0.0509 2.2618
0309	0307	274-20-14.96	21391.7656 21392.2610	0.51 0.0482 2.2552
0310	0308	273-32-14.22	21255.1253 21255.6819	0.46 0.0429 2.0185
0310	0309	268-45-03.75	10283.0599 10283.3009	0.96 0.0421 4.0970
0310	0311	83-19-38.35	10508.9906 10509.2780	1.22 0.0589 5.6063
0310	0312	86-20-13.11	21049.8905 21050.4549	0.51 0.0491 2.3305
0310	0509	359-45-49.39	21390.8937 21391.5790	0.44 0.0501 2.3442
0310	0514	180-03-40.84	19980.3864 19980.7780	0.52 0.0547 2.7381
0312	0311	269-19-45.47	10569.8065 10570.1059	1.18 0.0576 5.4527
0312	0515	153-48-06.27	23921.0514 23921.5736	0.46 0.0551 2.3028
0312	0516	90-04-56.93	10599.2912 10599.5879	1.06 0.0531 5.0111
0401	0402	88-09-06.98	10508.4966 10508.5087	1.28 0.0604 5.7524
0401	0511	0-14-26.66	21644.6267 21644.8108	0.59 0.0689 3.1814
0403	0301	336-08-05.54	52040.7262 52041.5556	0.15 0.0408 0.7842

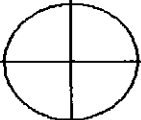
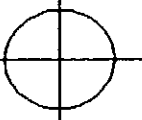
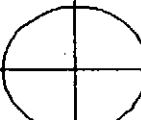
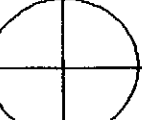
From	To	Grid Azimuth	Grid Dist Grnd Dist	95% RelConfidence Azi Dist PPM
0403	0401	269-06-14.28	21308.4707 21308.4929	0.56 0.0530 2.4863
0403	0402	270-01-48.19	10802.8358 10802.8452	1.23 0.0603 5.5806
0404	0403	270-03-02.00	10679.2327 10679.2393	1.04 0.0494 4.6296
0404	0405	90-28-00.78	10720.0058 10719.9895	1.07 0.0514 4.7969
0404	0406	76-27-57.39	21995.4481 21995.4053	0.48 0.0475 2.1617
0405	0406	63-51-23.02	11880.4671 11880.4210	0.77 0.0419 3.5230
0405	0605	15-01-49.85	13268.6425 13268.6321	0.90 0.0624 4.7051
0406	0407	115-56-38.72	11787.3759 11787.3393	1.00 0.0545 4.6278
0406	0605	316-22-37.70	10470.9597 10470.9472	1.16 0.0594 5.6737
0407	0408	90-05-05.22	10313.3526 10313.3307	1.16 0.0524 5.0845
0407	0409	89-05-23.67	22190.1547 22190.0780	0.55 0.0524 2.3622
0408	0409	88-13-34.38	11879.7065 11879.6635	0.97 0.0495 4.1647
0408	0410	89-59-57.63	21460.9429 21460.8919	0.52 0.0481 2.2430
0408	0606	40-50-51.42	8105.9266 8105.9080	1.53 0.0606 7.4794
0409	0410	92-11-42.34	9593.9689 9593.9340	1.22 0.0493 5.1424
0410	0411	90-05-47.08	10142.4956 10142.4720	0.82 0.0356 3.5124
0410	0412	90-21-03.72	20793.4468 20793.3919	0.58 0.0489 2.3509
0410	0514	358-57-18.68	20958.6067 20958.7217	0.48 0.0530 2.5279
0410	0607	153-17-46.92	38451.4224 38450.7507	0.33 0.0661 1.7200
0411	0514	333-21-02.69	23464.8873 23465.0167	0.46 0.0553 2.3571
0411	0607	168-15-26.91	35067.1221 35066.5117	0.35 0.0663 1.8918
0412	0411	270-35-36.58	10651.1467 10651.1193	1.16 0.0508 4.7678
0412	0413	89-39-36.67	10451.7584 10451.7396	1.47 0.0627 5.9980
0412	0515	26-26-14.05	23390.1267 23390.2786	0.48 0.0603 2.5784
0501	0201	179-50-46.69	21595.3193 21596.4560	0.40 0.0456 2.1134
0501	0602	285-56-59.81	98296.0077 98302.4648	0.10 0.0433 0.4404
0502	0104	0-24-07.13	23948.2970 23949.7715	0.50 0.0708 2.9573

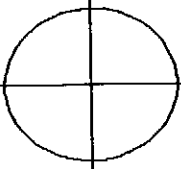
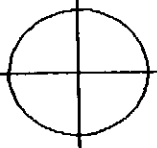
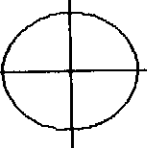
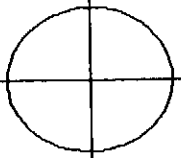
From	To	Grid Azimuth	Grid Dist Grnd Dist	95% RelConfidence Azi Dist PPM
0516	0510	359-12-06.30	20112.6891 20113.3952	0.54 0.0561 2.7892
0516	0515	180-06-11.67	21448.4614 21448.9335	0.52 0.0563 2.6237
0601	0110	359-51-56.47	15672.4447 15673.5159	0.66 0.0547 3.4917
0601	0111	32-34-17.40	18693.7761 18695.0430	0.66 0.0626 3.3494
0601	0504	180-16-12.98	5124.8024 5125.1227	2.07 0.0552 10.7708
0603	0403	75-09-08.43	120958.6732 120957.3303	0.00 0.0000 0.0000
0604	0506	282-22-00.18	14066.3824 14066.8840	0.91 0.0579 4.1197
0606	0410	110-46-43.76	17283.4345 17283.3940	0.76 0.0592 3.4240
0700	0109	325-39-18.15	9235.2542 9235.9156	1.20 0.0562 6.0888
0700	0110	34-42-25.40	9236.7621 9237.4237	1.12 0.0512 5.5466
0700	0504	158-14-06.11	14217.3630 14218.2985	0.68 0.0496 3.4887
0700	0601	146-45-16.36	9660.1864 9660.8325	1.02 0.0494 5.1091
0701	0101	142-48-23.31	26141.3853 26143.3323	0.43 0.0580 2.2181
0701	0501	159-34-11.56	44947.1652 44950.2579	0.20 0.0477 1.0622

SECTION 6

Network Map

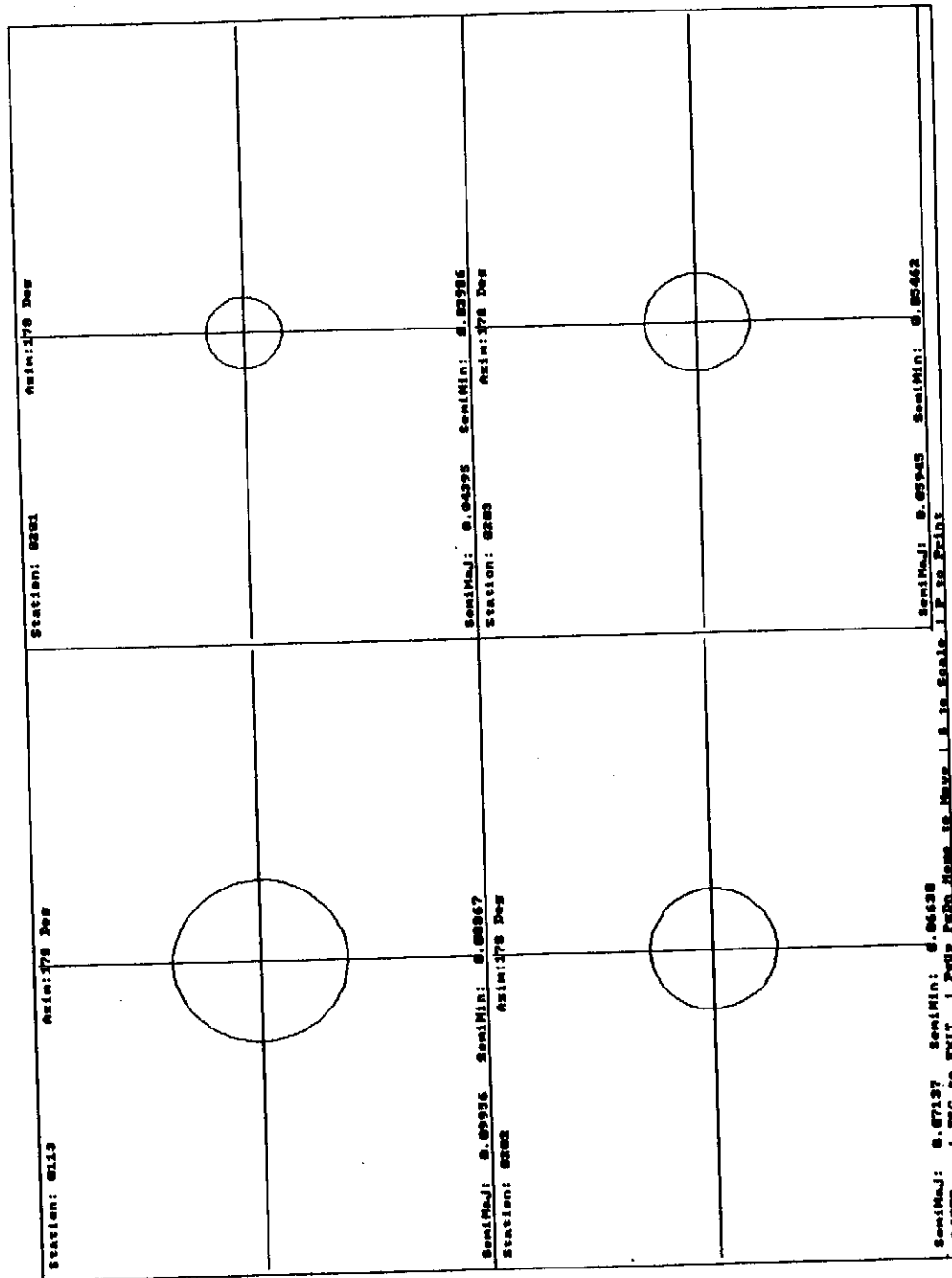
Error Ellipsis Plot

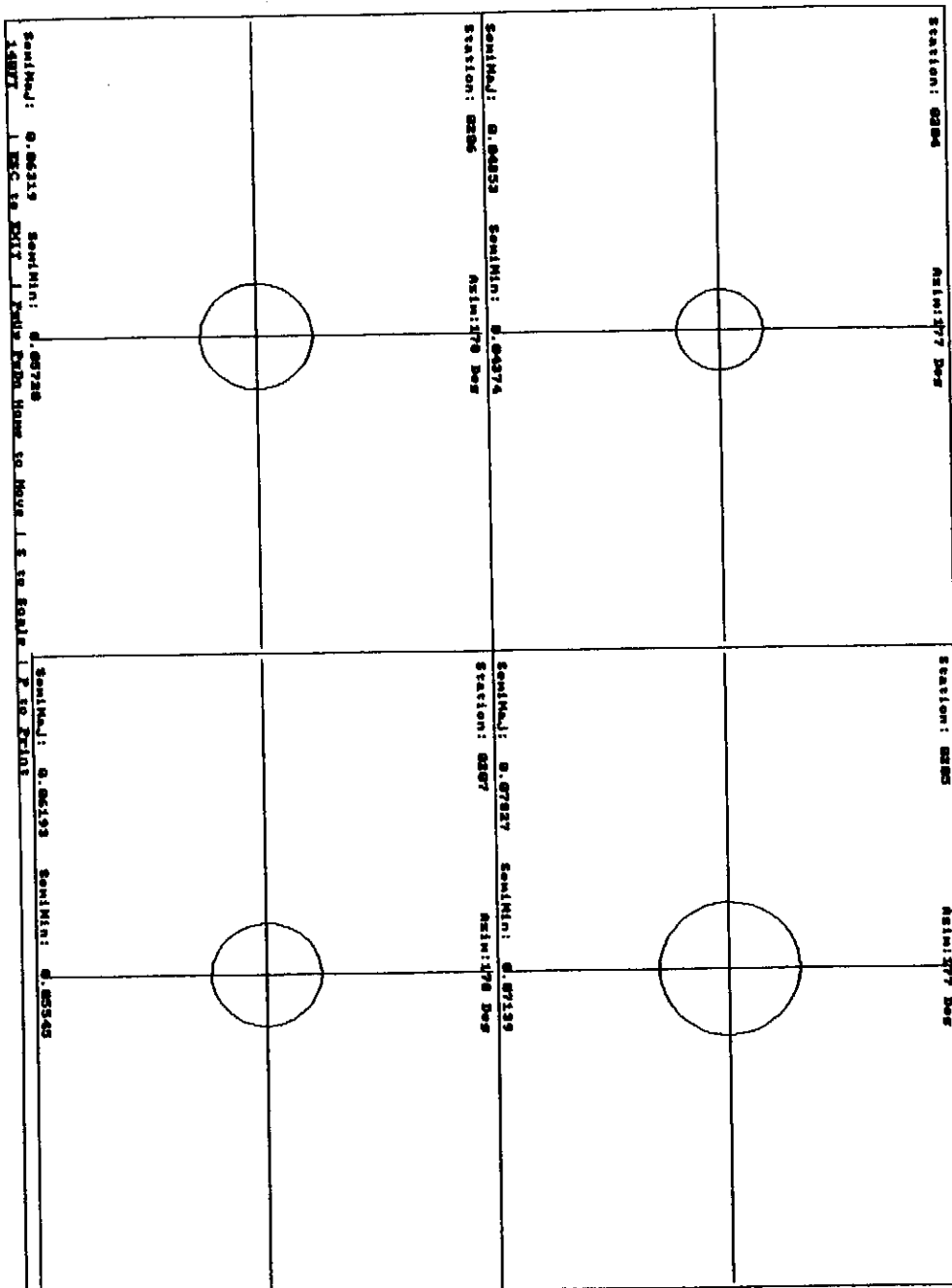
Station: 0101	Asim: 176 Deg	Station: 0102	Asim: 176 Deg
SemiMaj: 0.07127 SemiMin: 0.00109 Station: 0103 Asim: 176 Deg	SemiMaj: 0.00043 SemiMin: 0.00100 Station: 0104 Asim: 176 Deg	SemiMaj: 0.00323 SemiMin: 0.07103 Station: 0104 Asim: 177 Deg	SemiMaj: 0.07729 SemiMin: 0.00344 Station: 0105 Asim: 177 Deg
			

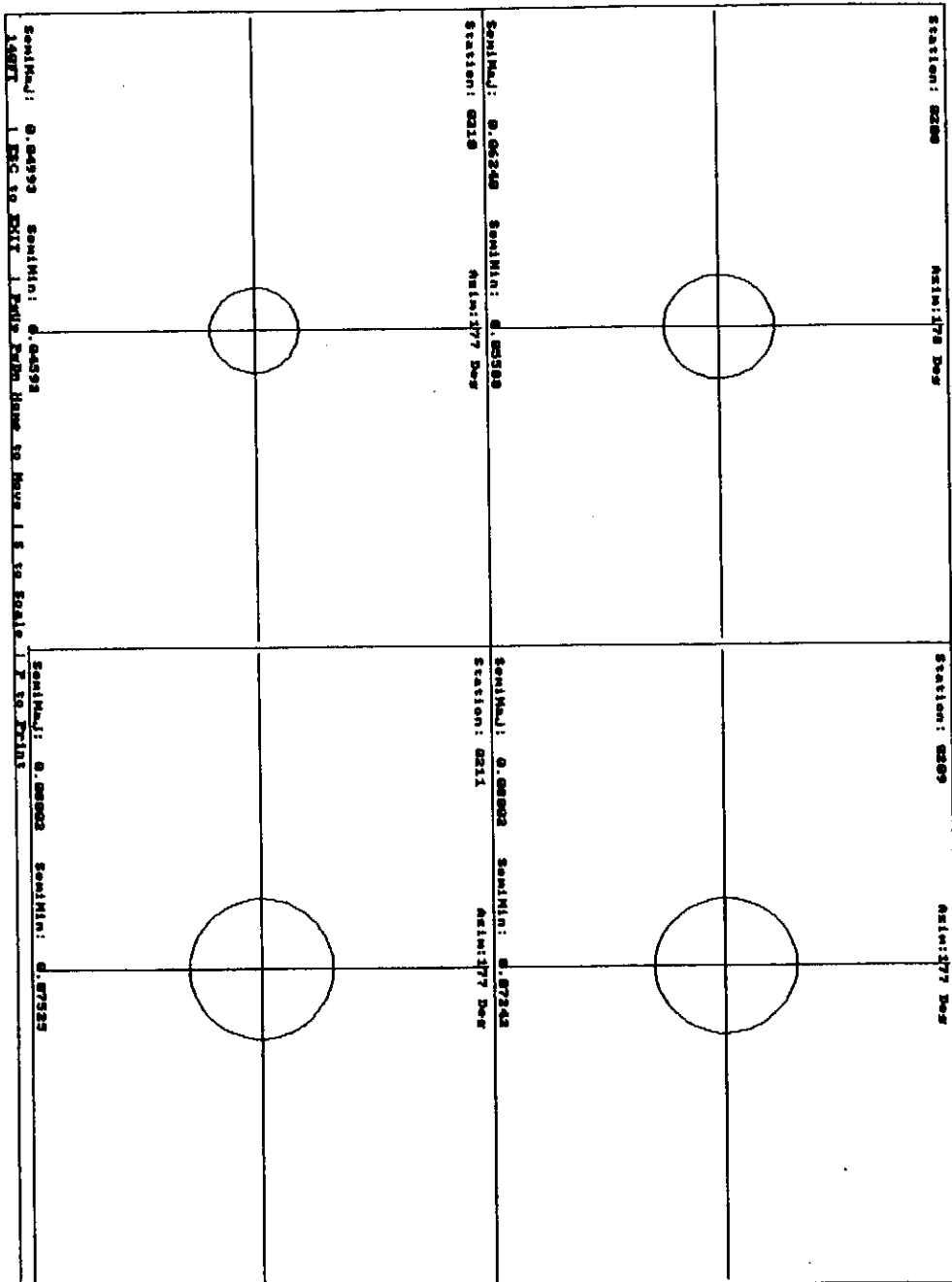
Station: 0100 Azim: 477 Deg 	Station: 0106 Azim: 478 Deg 
Sighting: 0.07263 Sighting: 0.00000 Station: 0107 Azim: 478 Deg 	Sighting: 0.07328 Sighting: 0.00496 Station: 0108 Azim: 478 Deg 

Sighting: 0.07193 Sighting: 0.00106
 100FT 1 PC to Exit 1 Pull Pad to Home to Move 1 S to Scale 1 P to Exit

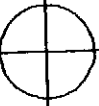
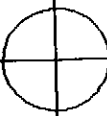
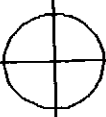
Station: 0109	Anim: 170 Deg	Station: 0110	Anim: 170 Deg
SentMaj: 0.07000	SentMin: 0.00000	SentMaj: 0.05370	SentMin: 0.00000
1400T	1 DEG to 0.111	1 DEG to 0.111	1 DEG to 0.111
Station: 0111	Anim: 170 Deg	Station: 0112	Anim: 170 Deg
SentMaj: 0.07000	SentMin: 0.00000	SentMaj: 0.05370	SentMin: 0.00000
1400T	1 DEG to 0.111	1 DEG to 0.111	1 DEG to 0.111

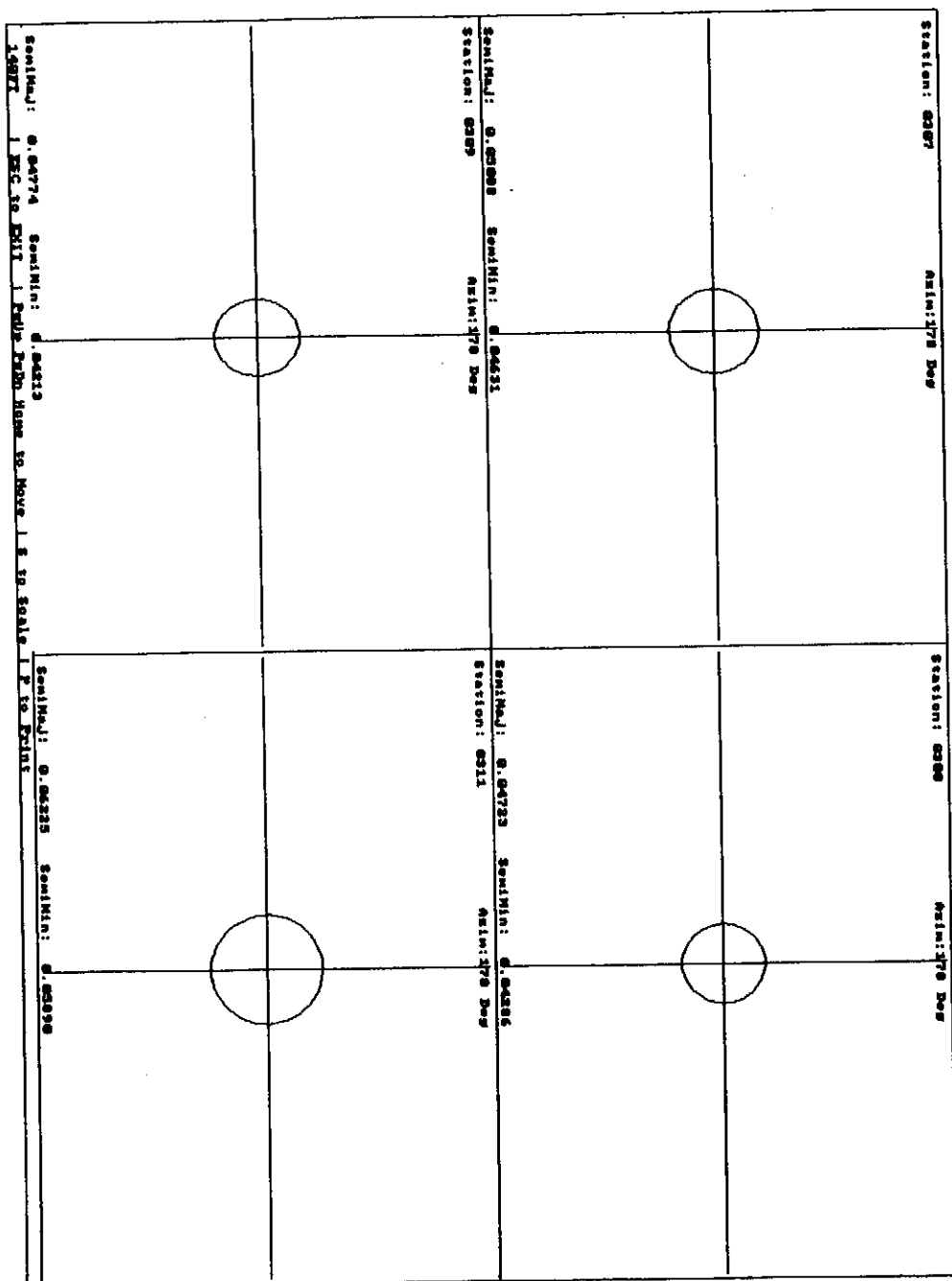


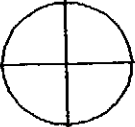
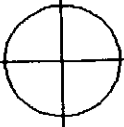
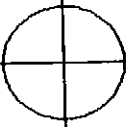
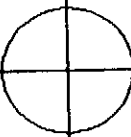


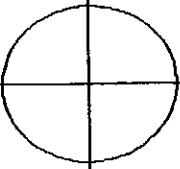
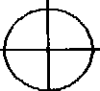
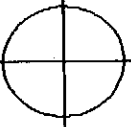
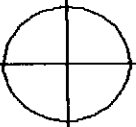


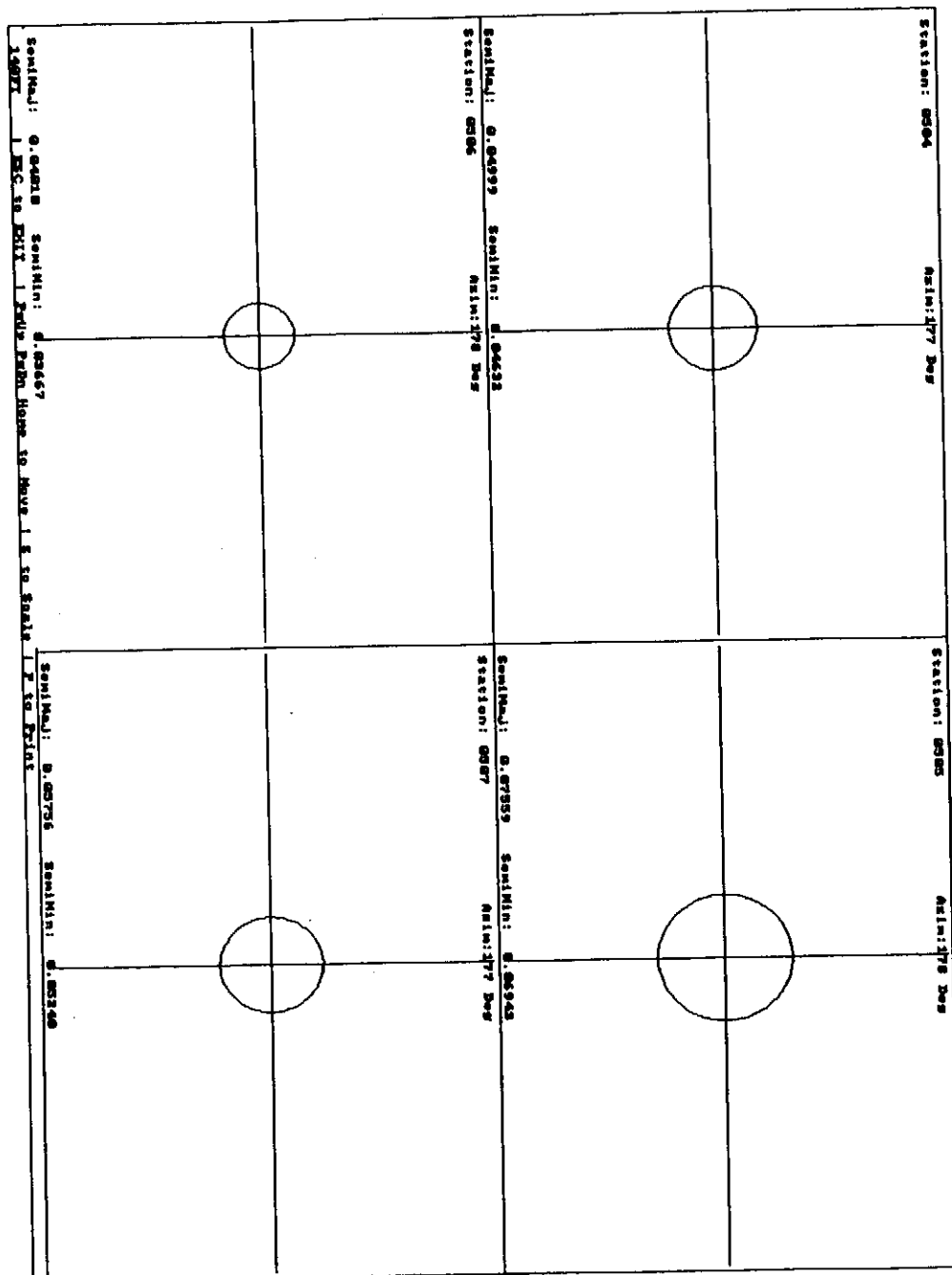
Station: 0303	Asim: 470 Deg	Station: 0304	Asim: 470 Deg
SemiMaj: 0.07136	SemiMin: 0.06671	SemiMaj: 0.06930	SemiMin: 0.06467
Station: 0305	Asim: 470 Deg	Station: 0306	Asim: 470 Deg
SemiMaj: 0.07136	SemiMin: 0.06671	SemiMaj: 0.06930	SemiMin: 0.06467
Station: 0307	Asim: 470 Deg	Station: 0308	Asim: 470 Deg
SemiMaj: 0.07136	SemiMin: 0.06671	SemiMaj: 0.06930	SemiMin: 0.06467

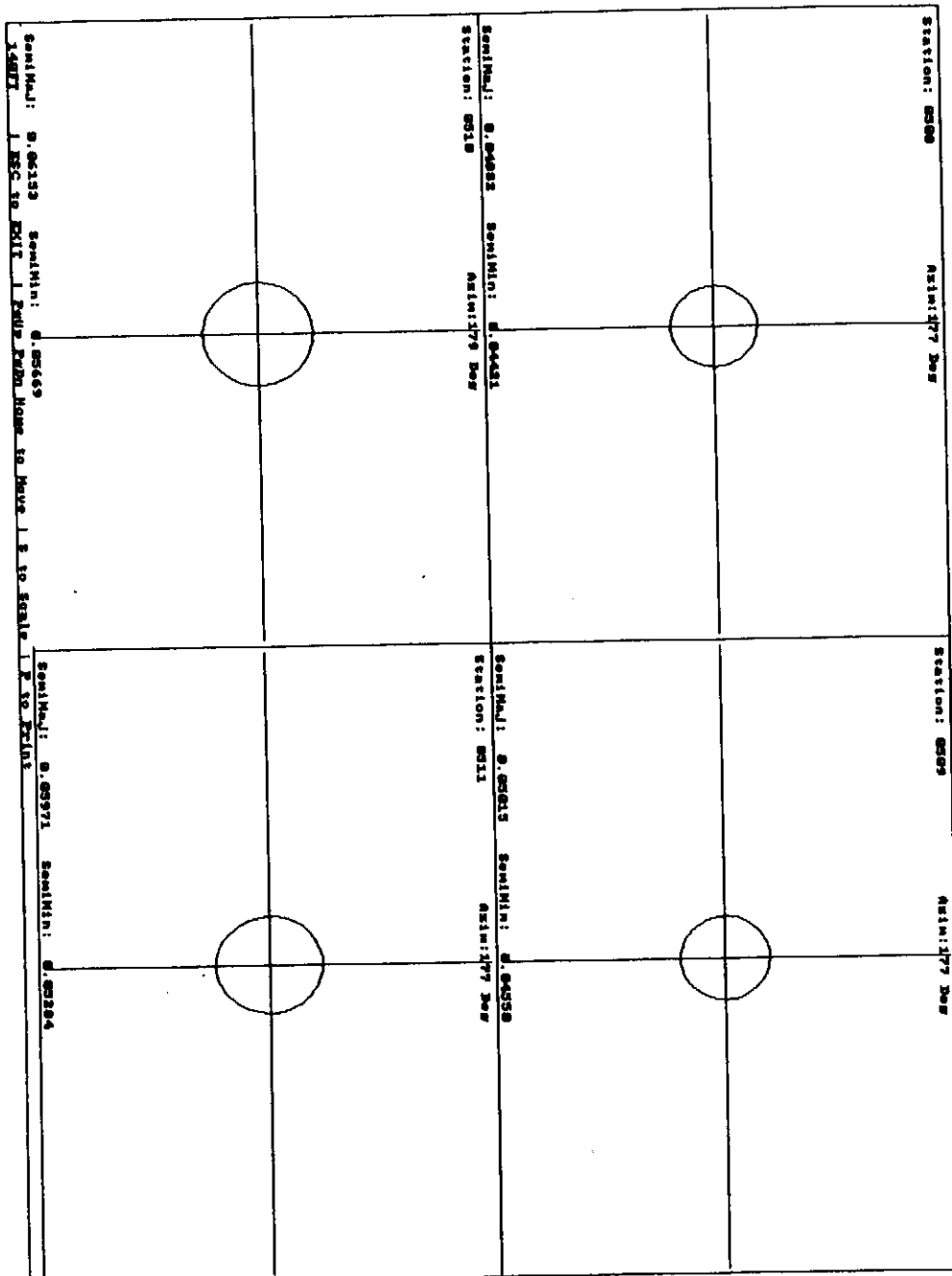
Station: 0512	Anim: 178 Dwg	Station: 0401	Anim: 177 Dwg
			
SentMaj: 0.05171 SentMin: 0.04905 Station: 0403 Anim: 177 Dwg	SentMaj: 0.05702 SentMin: 0.05237 Station: 0404 Anim: 178 Dwg	SentMaj: 0.04461 SentMin: 0.04037 Station: 0407 Anim: 178 Dwg	SentMaj: 0.05397 SentMin: 0.04944 Station: 0407 Anim: 178 Dwg

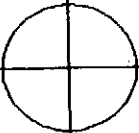
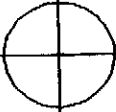
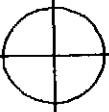
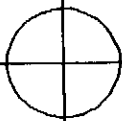


Station: 0405	Antenna: 278 Deg	Station: 0406	Antenna: 278 Deg
			
Sent/Maj: 0.06563 Sent/Min: 0.06433 Station: 0407 Antenna: 278 Deg		Sent/Maj: 0.06543 Sent/Min: 0.06738 Station: 0408 Antenna: 278 Deg	
			
Sent/Maj: 0.06534 Sent/Min: 0.06073 140RT REC to EXIT Exit Path Name to Move 5 to Scale 7 to Point		Sent/Maj: 0.07025 Sent/Min: 0.06437	

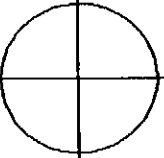
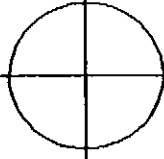
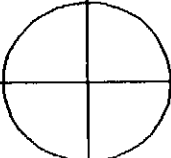
Station: 0413 SentNoJ: 0.09451 SentMin: 0.00307 Station: 0502 SentNoJ: 0.09451 SentMin: 0.00307	Asim:177 Deg 	Station: 0501 SentNoJ: 0.09451 SentMin: 0.00307 Station: 0503 SentNoJ: 0.09451 SentMin: 0.00307	Asim:178 Deg 
Station: 0413 SentNoJ: 0.09451 SentMin: 0.00307 Station: 0502 SentNoJ: 0.09451 SentMin: 0.00307			





Station: 0013	Anim: 170 Day	Station: 0013	Anim: 170 Day
SemiMaj: 0.00471 SemiMin: 0.00000 Station: 0014 Anim: 170 Day		SemiMaj: 0.00354 SemiMin: 0.00479 Station: 0013 Anim: 170 Day	
			
SemiMaj: 0.00471 SemiMin: 0.00000 Station: 0013 Anim: 170 Day		SemiMaj: 0.00000 SemiMin: 0.00471 Station: 0013 Anim: 170 Day	

Station: 0016	Anim: 179 Dog	Station: 0000	Anim: 177 Dog
SemiMaj: 0.00000 SemiMin: 0.00000 Station: 00000 Anim: 177 Dog		SemiMaj: 0.00000 SemiMin: 0.00000 Station: 00000 Anim: 176 Dog	
SemiMaj: 0.00000 SemiMin: 0.00000 Station: 00000 Anim: 177 Dog		SemiMaj: 0.00000 SemiMin: 0.00000 Station: 00000 Anim: 176 Dog	

Station: 0605 Azim: 178 Deg 	Station: 0606 Azim: 178 Deg 
SemiMaj: 0.0043 SemiMin: 0.0776 Station: 0607 Azim: 178 Deg 	SemiMaj: 0.0039 SemiMin: 0.0767

SemiMaj: 0.0000 SemiMin: 0.0038
 14877 1 DEG to DMT 1 Full Page Home to Move 1 8 to Scale 1 9 to Print

42 Monuments Story County GPS Monuments -- Dec 1998

