

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Adm.

COMPUTATION
of
HORIZONTAL CONTROL

NAD83. (1992)

NAVD 88

State: PENNSYLVANIA

LOCALITY

PENNSYLVANIA FBN/CBN

.....

Year of Observation, 2000

Year of Computation, 2001

Chief of Party: Clifton S. Middleton, Jr.

Observer NGS

Computer Gloria G. Edwards

U.S. DEPARTMENT OF COMMERCE
National Oceanic & Atmospheric Administration
National Ocean Service
National Geodetic Survey

REPORT OF HORIZONTAL CONTROL COMPUTATIONS

Observation and Analysis Division

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State Identification: PA-854

Classification: A Order (1:10,000,000)

Horizontal Datum: NAD83 (1992)

Vertical Datum: NAVD 88

Geoid: GEOID99

Ellipsoid: GRS 80

Locality: Pennsylvania FBN/CBN

Acc. No.: GPS1463

Date of Field Work: 2000 Chief of Party: Clifton S. Middleton, Jr.

*****OFFICE COMPUTATION*****

Acc. No.: GPS°1463

Date of Computation: 3/2001

Number of Stations:

| | | | | | |
|-------------|---|------------|-----------------|---|------------|
| New: | = | 38 | Main Scheme: | = | 134 |
| Old: | | | Supplemental: | = | |
| Fixed: | = | 48 | Non-monumented: | = | |
| Readjusted: | = | 48 | Temporary: | | |
| Total | = | <u>134</u> | Total | = | <u>134</u> |

Free adjustment variance of unit weight (σ_0^2): = 98.16

Constrained adjustment variance of unit weight (σ_1^2): = 1771.90

Ratio: $\sigma_1^2/\sigma_0^2 = 18.05$

Gloria G. Edwards
Gloria G. Edwards

Geodesist in charge of work

Kathy O. Milbert
Kathy O. Milbert
Chief of Branch

Elizabeth B. Wade
Chief of Division

PROJECT DATA

Locality: Pennsylvania FBN/CBN

Source: GPS1463

Year of Observation: 2000

Sketch No: GPS1463

Number of occupied stations: 134

Number of unoccupied stations: 0

Variance of Unit Weight (free adjustment): 98.16

Degrees of Freedom (free adjustment): 1128

Variance of Unit Weight (constrained adjustment): 1771.90

Degrees of Freedom (constrained adjustment): 1229

Variance of Unit Weight (vertical adjustment): 125.09

Degrees of Freedom (vertical adjustment): 1186

Purpose

The Pennsylvania FBN/CBN project was adjusted to the NAD83 (1992) datum to enhance the existing reference system to provide the accessibility and high accuracy required for use with GPS.

This is an A Order project which consists of one hundred thirty four (134) stations with five hundred ten (510) observed vectors.

The following CORS, were included in this project. They were computed from a NAD83 (EPOCH 2000.30) transformation from the ITRF97 (EPOCH 1997.0) coordinates:

PITTSBURGH CORS ARP
GAITHERSBURG CORS ARP
PENN STATE UNIV CORS ARP
WILKES BARRE CORS ARP

Due to the unusually large velocity in the up component at Pittsburgh (-0.0077 m/yr), these coordinates were transformed to the EPOCH of the project.

Positions used for these CORS were re-computed by this office using the most recent HTDP transformation procedures.

The accuracy standards required for the new stations submitted in this project is 1:10,000,000.

Observation File Analysis

The program *CHKOBS* was run for data verification of the contents of the Blue Book observation file. No major errors were identified by this checking program.

The program *OBSCHK* was run to check the Gfile against the Bfile to verify the consistency of the data that will be loaded in the NGSIDB. No major problems were identified by this checking program.

Description Analysis

All stations in this project have either a description or recovery note, except the CORS (see program *OBSDES* printouts). Two files were submitted in the new dfile and unified format. Both files were converted to the 27 datum.

The programs *CHKDESC*, *DESC_POS*, *OLDU2NEW*, *DISCREP* and *NEIGHBOR* were run to check the formats of the submitted description files (dfiles) and to compare the recovery notes of stations in this project containing assigned PID codes with the descriptions in the NGSIDB. The error messages generated by the program *DISCREP* were caused by differences between the NGSIDB and the recent data submitted. The new information in the dfiles will be used to update the NGSIDB.

The program *OBSDES* was run to compare both dfiles with the blue book file for data consistency. No major errors were identified by this checking program. However, four stations listed on one of the printouts with SSN's 2010, 2011, 2014 and 2031 are miscellaneous recoveries submitted with the project.

The NGS new program *GEOID99* was used to determine a geoid height for each station in the project.

Free Adjustment

A minimally constrained horizontal adjustment was executed. The NAD83 CORS position and ellipsoid height for **PENN STATE UNIV CORS ARP**, were held. These coordinates were transformed from ITRF97, EPOCH 1997.0, using HTDP.

A residual plot was done on the vectors to determine if there were any outliers. The outliers were analyzed and up to 5 cm were found on the vertical components between **MIFFPORT** and **MIDDLE** and **PENN STATE UNIV CORS ARP** and **POCOPORT**. Rejections were made in the observations of the Gfile at these stations.

In a subsequent adjustment and another plot the outliers show better results. See Figure 1 for the final residual plot of the free adjustment.

This adjustment produced a variance of unit weight of 98.16 with 1128 degrees of freedom. The standard deviation of unit weight was 9.91. Because this is an A Order project, the standard errors of the observations were not scaled in the Gfile.

A comparison was made between the positions of the free adjustment and the published positions from the data base to determine the shifts. The largest shifts were up to four decimeters on the lower order stations, See Attachment 1. The largest difference at a HARN station was 0.047 m.

Differences of the ellipsoid heights from the free adjustment to the published ellipsoid heights are listed on Attachment 2. Figure 2 also shows the ellipsoid height differences. Lower order stations had larger differences.

Constrained Adjustment

A preliminary constrained adjustment was run holding the previously determined coordinates and ellipsoid heights of the Pennsylvania High Precision Network projects. In addition, the CORS coordinates (NAD83, transformed from ITRF97 - EPOCH 1997.0), coordinates from the West Virginia and Maryland HARN projects, were included. They were rigidly held fixed to prevent shifts in the controls. Attachment 3 lists the control used in this adjustment.

A residual plot was done on the vectors of the preliminary adjustment to determine if there were any outliers (Figure 3). The largest residuals were up to 24 cm in the vertical components and 7 cm horizontally.

Since the Pennsylvania HARN (1992) was adjusted prior to the existence of the CORS network, discontinuity in both the ellipsoid heights and positions was expected. Data from this FBN/CBN survey (GPS1463) provide us with the means to determine the level of this discontinuity, since these observations now tie the CORS stations to the HARN. NGS's policy is to correct discrepancies at the 5 cm level by readjustment of the HARN coordinates using these new data. The large residuals in the up component of the preliminary constrained adjustment indicate that the published ellipsoid heights from the original HARN do not fit these data.

To determine how well the Continuously Operating Reference Stations (CORS) coordinates fit these data and to determine how the previously published HARN control was shifting in relation to the CORS, a constrained adjustment was run where only the CORS coordinates were held. The CORS coordinates were transformed from the ITRF97 (Epoch 1997.0) to the NAD83, using the project date (4-21-2000) in the HTDP model. The large velocity in the up component of the CORS station Pittsburgh, caused a large discontinuity between the CORS stations.

Therefore, it was necessary to transform the CORS coordinates to the EPOCH of the project. A residual plot was done on the vectors of this adjustment to determine the outliers (Figure 4). There is a good fit between the CORS and these data.

A second adjustment was executed where the ellipsoid heights from the original PA HARN were readjusted. A comparison was made between the ellipsoid heights from this adjustment and those from the published A and B Order stations listed on Attachment 3. Differences of up to 18 cm were identified vertically. Horizontal position comparisons were up to 36 cm only on the lower order stations. All HARN position shifts were under 5 cm. See Attachments 3A and 3B.

Since NGS's policy is to readjust at the 5 cm level, the decision was made by NGS to constrain positions and ellipsoid heights of the CORS, WV and MD projects in the final horizontal adjustment. Horizontal positions from the PA HARN projects were also held in the final adjustment. Ellipsoid heights from the PA HARN projects were redetermined.

The ellipsoid height for E 313 (WV) was redetermined. The shift was 11.9 cm from the published value. It was originally determined in GPS1060/A, the Leesburg Circle reobservation survey.

Differences in meters between the redetermined ellipsoid heights from this project and the published heights from the original HARN and from several first order stations are listed on Attachment 4.

The differences in meters between the final positions from this project and the data base positions are listed on Attachment 5. All lower order controls were redetermined. All HARN positions were held and have a positional shift of 0.000. GAITHERSBURG CORS ARP, PENN STATE UNIV CORS ARP, PITTSBURGH CORS ARP and WILKES BARRE CORS ARP show position differences because these positions were computed using the project date in the HTDP program. Positions in this project for the CORS will not be published.

See Attachment 5B for the constraints used in the final constrained adjustment and Figure 5 for a plot of the residuals.

The variance of unit weight for the final A Order constrained adjustment was 1771.90 with 1229 degrees of freedom. The variance of unit weight ratio of the constrained adjustment to the free adjustment was 18.05.

Vertical Adjustment

A free vertical adjustment was done using one bench mark height as control to determine the elevation shifts in the project. An analysis of the free vertical shifts are listed on Attachment 6 and Figure 6.

These shifts were analyzed and NGS decided to constrain all of the published bench mark elevations, except the values for D 356 and Q 282. The values for these bench mark were inconsistent with the observations in the project. Differences between the IDB values and the values produced in this project were -0.139 and 0.211 meters, respectively. These values will not be used to override the NGSIDB values.

Therefore, the NGSIDB NAVD 88 bench mark elevations and NAVD 88 GPS orthometric heights of stations on Attachment 7 were constrained in the final vertical adjustment. The GPS orthometric heights held were consistent with the observations.

The following NGSIDB orthometric heights were redetermined in the final vertical adjustment. Differences between the NGSIDB heights and final heights were:

| <u>Station Name</u> | <u>Difference (m)</u> | <u>Source</u> |
|---------------------|-----------------------|---------------|
| 0 0 | -0.04 | GPS394 |
| 2G9 A | -0.06 | GPS1060/A |
| AGC ARP 2 1965 | -0.04 | GPS1183 |
| ARP BTP | -0.04 | GPS1183 |
| ARP LBE 1969 | -0.08 | GPS1262 |
| BAKER | -0.05 | GPS882/B |
| BLOOMPORT | -0.03 | GPS394 |
| BOSSLER | -0.07 | GPS394 |
| CLARPORT | -0.11 | GPS394 |
| CLEAPORT | -0.06 | GPS394 |
| DUJ ARP | 0.14 | GPS1060/A |
| EMIGS RM 3 | -0.05 | GPS394 |
| FULOP | 0.03 | GPS1508 |
| IDI A | -0.03 | GPS1060/A |
| MIFFPORT | -0.09 | GPS394 |
| N96 A | 0.04 | GPS1060/A |
| POCOPORT | 0.06 | GPS394 |
| PSB D | -0.03 | GPS1060/A |
| RICH | 0.03 | GPS1171 |
| ROSTPORT | 0.03 | GPS1060/B |
| WARMINSTER CBL 430 | 0.07 | GPS1060/A |
| WATER | -0.03 | GPS684 |
| WINGPORT | -0.56 | GPS1440 |
| YORKPORT | -0.04 | GPS1060/A |

A residual plot was done on the vectors in this adjustment. Several stations in the observations that are connected to the CORS had residual shifts up to 6 centimeters. Since these observations involved stations with ties to very long lines, inconsistencies are expected. Therefore, no rejections were made. See Figure 7. The variance of unit weight for the final vertical adjustment was 125.09 with 1186 degrees of freedom. The final elevations in this project (GPS1463) are referenced to NAVD 88.

Free Adjustment with Accuracies

A final free adjustment was run to obtain accuracies over all lines. The final positions from the constrained adjustment were used as input. The variance of unit weight was 98.16 with 1128 degrees of freedom.

Approximately sixty percent (60%) of the A order observed vectors failed the required standard (1:10,000,000), externally. The low accuracy between PENN STATE UNIV CORS ARP and PSU1 B is due to short distance of 175 meters. See the attached list of Length Relative Accuracies (Attachment 8).

Data Base Notes

854 5240 J TIDAL has a VM number of 13814. This needs to be attached to it's PID after loading.

Note that two separate descriptions were included in the project. All were converted to the 27 datum.

The CORS positions should not be used to update the NGSIDE.

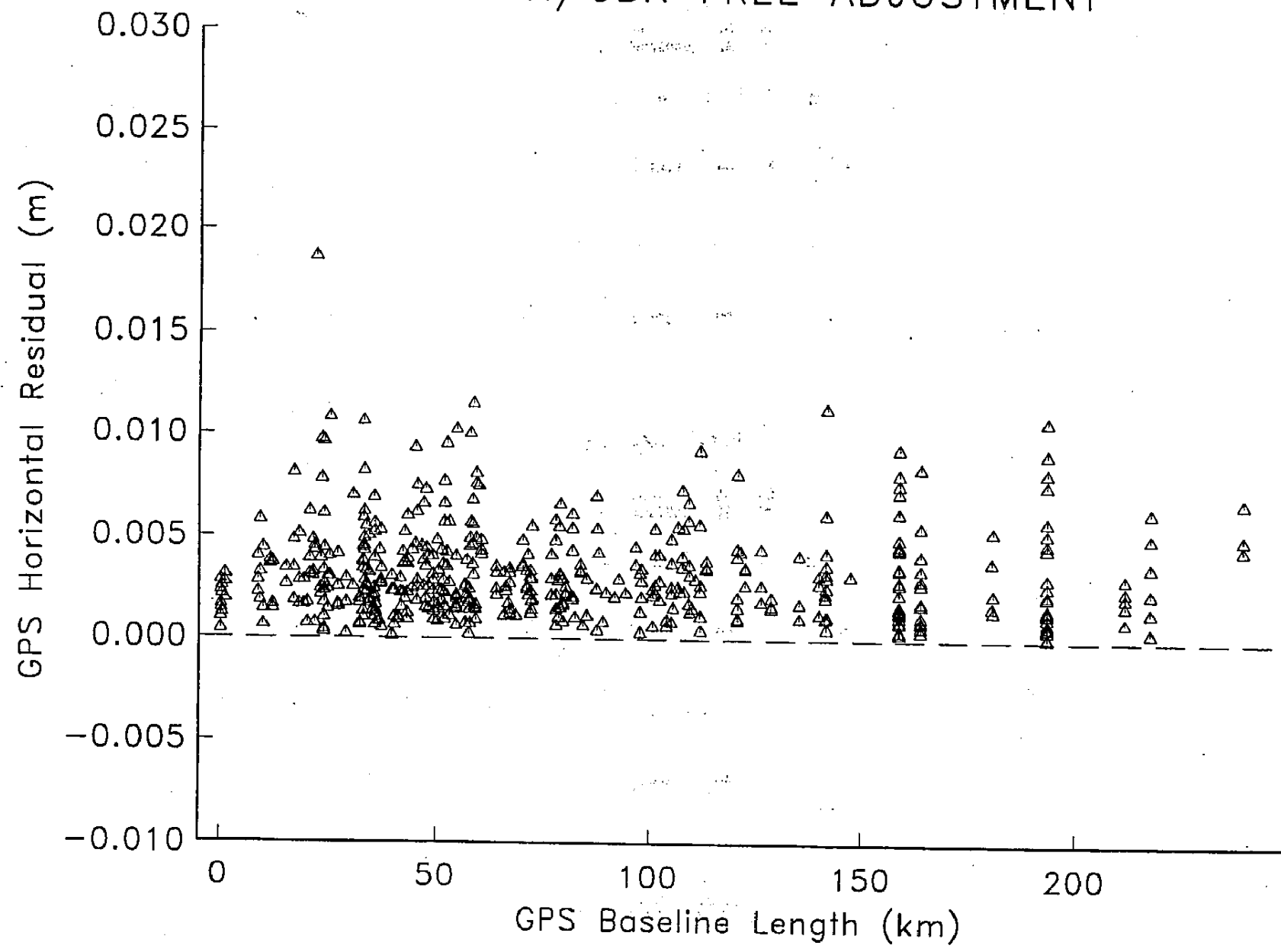
The reference stations for WILKES BARRE CORS ARP and PENN STATE UNIV CORS ARP were observed in this project, however, leveling observations to these stations are not available. Therefore, the elevation codes to these CORS stations can not be upgraded to 'K' at this time.

Comments

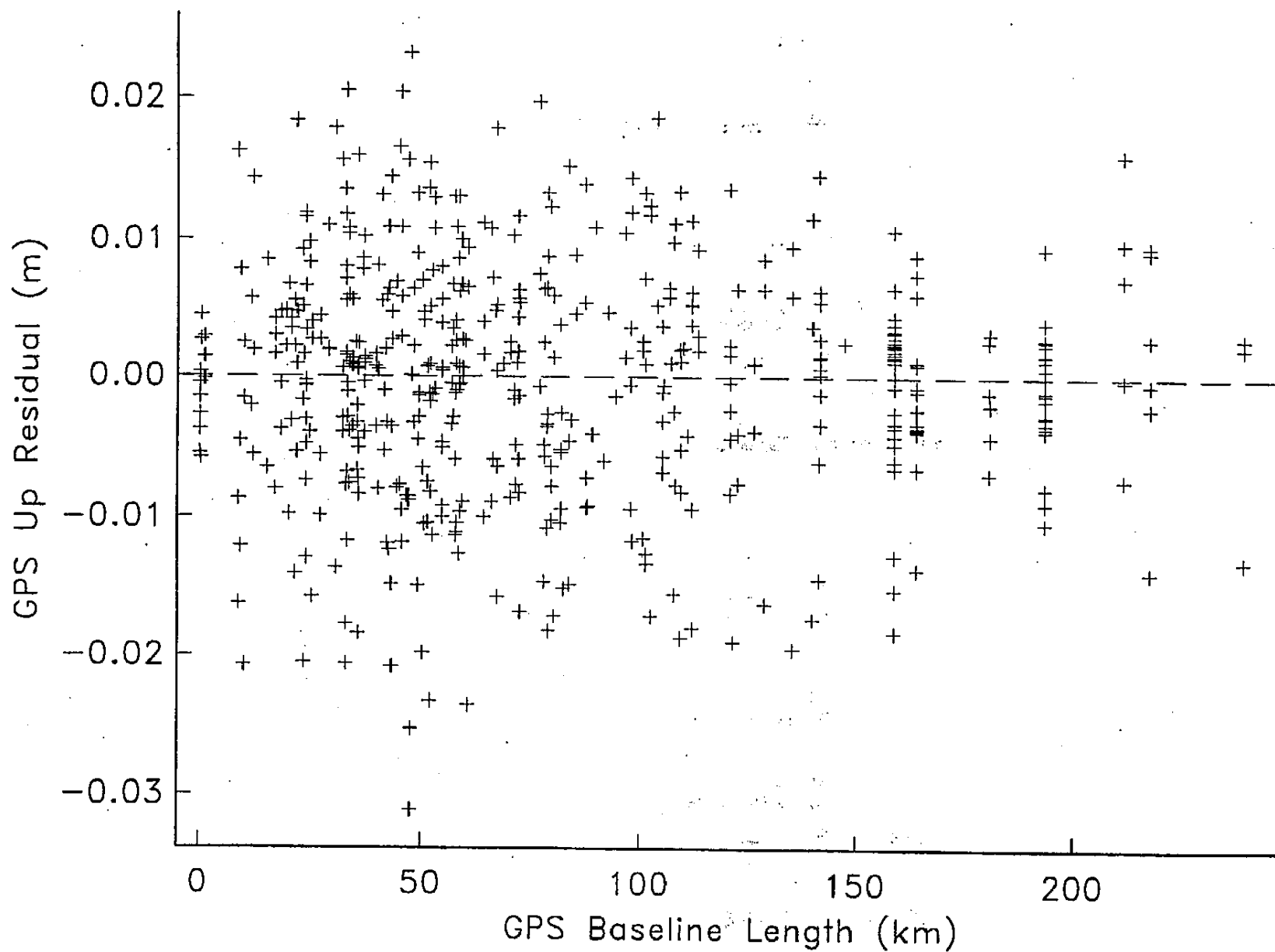
Several Media Identification records in the bbook file did not match the ones in the Gfile.

Positions were not included on several stations in the new dfile.

PA FBN/CBN FREE ADJUSTMENT



PA FBN/CBN FREE ADJUSTMENT



Adjustment of Feb 22 2001 at 08:55
Mean value is 0.007 meters

CLUSTER PROGRAM
LAST UPDATE 01/30/96

DATA BASE FILE NAME: idb
USERS FILE NAME: bbkf
COMMON STATION FILE NAME: c
STARTING TOLERANCE: 3.000 SECONDS

| CLUSTERED POINTS | | TOLERANCE | | 3.000 SECONDS | | | | | | |
|------------------|-------------------|----------------|----------------|---------------|----------|----|----|----------|---------|-------|
| SN | NAME | LATITUDE | LONGITUDE | ELEV | SOURCE | OT | ST | DISTANCE | EPOCH | ADJID |
| .008 | 0 0 | 41 8 14.72027 | 77 24 55.70487 | 134.980G | USERFILE | AA | PA | | | |
| | 0 0 | 41 8 14.71936 | 77 24 55.70440 | 168.25G (88) | GPS394 | BA | PA | 0.030 m. | | 83A |
| 065 | 266 C | 41 37 43.70773 | 80 12 35.20450 | 390.785G | USERFILE | AA | PA | | | |
| | 266 C | 41 37 43.70764 | 80 12 35.20479 | () | GPS727 | BA | PA | 0.007 m. | | 83A |
| 023 | 269 A | 40 2 20.52954 | 79 0 55.44326 | 648.264G | USERFILE | AA | PA | | | |
| | 269 A | 40 2 20.53045 | 79 0 55.44313 | 680.00G (88) | GPS1060/ | BA | PA | 0.028 m. | | 83A |
| | 269 A | 40 2 20.53045 | 79 0 55.44313 | 680.02G (88) | GPS1060/ | BA | PA | 0.028 m. | | 83A |
| 1013 | 40N I | 39 58 50.62848 | 75 52 27.22988 | 160.126G | USERFILE | AA | PA | | | |
| | 40N I | 39 58 50.62916 | 75 52 27.22818 | 193.70G (88) | GPS1060/ | 1A | PA | 0.045 m. | | 83A |
| | 40N I | 39 58 50.62916 | 75 52 27.22818 | 193.69G (88) | GPS1060/ | 1A | PA | 0.045 m. | | 83A |
| 058 | 9D4 B | 40 21 10.58660 | 76 19 45.28171 | 124.974G | USERFILE | AA | PA | | | |
| | 9D4 B | 40 21 10.58738 | 76 19 45.28174 | 159.62G (88) | GPS1060/ | BA | PA | 0.024 m. | | 83A |
| | 9D4 B | 40 21 10.58738 | 76 19 45.28174 | 159.69G (88) | GPS1060/ | BA | PA | 0.024 m. | | 83A |
| .001 | ADR PEDESTAL | 40 30 18.37467 | 79 51 56.24648 | 292.494G | USERFILE | AA | PA | | | |
| | ADR PEDESTAL | 40 30 18.37465 | 79 51 56.24678 | 326.07G (88) | GPS908 | AA | PA | 0.007 m. | 1995.00 | 83A |
| | ADR PEDESTAL | 40 30 18.37465 | 79 51 56.24678 | 326.19G (88) | GPS908 | AA | PA | 0.007 m. | 1995.00 | 83A |
| .005 | AFJ C 1993 | 40 8 10.12130 | 80 17 27.95009 | 326.317G | USERFILE | AA | PA | | | |
| | AFJ C 1993 | 40 8 10.12089 | 80 17 27.95021 | () | GPS739 | 1A | PA | 0.013 m. | | 83A |
| 1004 | AGC ARP 2 1965 | 40 21 17.00746 | 79 55 46.89831 | 347.111L | USERFILE | AA | PA | | | |
| | AGC ARP 2 1965 | 40 21 17.00710 | 79 55 46.89855 | 380.84G (88) | GPS739 | BA | PA | 0.012 m. | | 83A |
| 1025 | AOO AP 1964 STA B | 40 17 19.44772 | 78 19 24.91535 | 424.935G | USERFILE | AA | PA | | | |
| | AOO AP 1964 STA B | 40 17 19.44778 | 78 19 24.91437 | () | GPS748 | BA | PA | 0.023 m. | | 83A |
| 1090 | AP STA A 2 BFD | 41 47 51.58027 | 78 37 54.04558 | 607.243G | USERFILE | AA | PA | | | |
| | AP STA A 2 BFD | 41 47 51.58120 | 78 37 54.04259 | () | 17657/F | 3A | PA | 0.075 m. | | 83A |
| 1059 | ARP 2 1965 HZL | 40 59 13.52127 | 75 59 35.10752 | 455.401L | USERFILE | AA | PA | | | |
| | ARP 2 1965 HZL | 40 59 13.52071 | 75 59 35.10669 | 400.00L (88) | GPS748 | BA | PA | 0.02G m. | | 83A |
| 1003 | ARP BTP | 40 46 35.61466 | 79 56 58.13625 | 345.125G | USERFILE | AA | PA | | | |
| | ARP BTP | 40 46 35.61474 | 79 56 58.13605 | 378.94G (88) | GPS727 | BA | PA | 0.005 m. | | 83A |
| 1002 | ARP LBE 1969 | 40 16 38.95999 | 79 24 13.16095 | 311.130G | USERFILE | AA | PA | | | |
| | ARP LBE 1969 | 40 16 38.95959 | 79 24 13.16115 | 343.77G (88) | GPS739 | BA | PA | 0.013 m. | | 83A |
| 1077 | AVP ARP 1962 | 41 20 17.76320 | 75 43 27.28673 | 252.955G | USERFILE | AA | PA | | | |
| | AVP ARP 1962 | 41 20 17.76246 | 75 43 27.28603 | () | GPS748 | BA | PA | 0.028 m. | | 83A |
| 1003 | B 316 | 39 56 29.89946 | 80 45 14.91035 | 173.430A | USERFILE | AA | WV | | | |
| | B 316 | 39 56 29.89953 | 80 45 14.91017 | 207.22A (88) | GPS882/B | BA | WV | 0.005 m. | | 83A |
| | B 316 | 39 56 29.89953 | 80 45 14.91017 | 207.22L (88) | GPS882/B | BA | WV | 0.005 m. | | 83A |
| 1006 | BAKER | 40 42 20.35911 | 80 22 27.52646 | 333.242G | USERFILE | AA | PA | | | |

| FRANKFURT | 39 27 | 2.70920 | 00 9 | 02.99144 | 300.240 (88) | GPS394/BA | DA | WV | 0.023 m. | 1995.00 | 83A |
|--------------------------------|-------|----------|-------|----------|--------------|-----------|----|----|-----------|---------|-----|
| 1005 FULOP | 39 56 | 37.15783 | 77 59 | 56.18104 | 251.986G | USERFILE | AA | PA | | | |
| FULOP | 39 56 | 37.15740 | 77 59 | 56.18004 | 285.896 (88) | GPS394 | DA | PA | 0.027 m. | | 83A |
| FULOP | 39 56 | 37.15740 | 77 59 | 56.18004 | 285.916 (88) | GPS394 | BA | PA | 0.027 m. | | 83A |
| 1003 GAITHERSBURG CORS ARP | 39 8 | 2.34055 | 77 13 | 15.51895 | 108.946K | USERFILE | AA | MD | | | |
| GAITHERSBURG CORS LI PHASE CEN | 39 8 | 2.34060 | 77 13 | 15.51927 | 140.76K (88) | CORS0338 | AA | MD | 0.008 m. | 1997.00 | 83A |
| GAITHERSBURG CORS-GROUNDPLANE | 39 8 | 2.34070 | 77 13 | 15.51926 | 140.856 (88) | GPS852 | AA | MD | 0.009 m. | | 83A |
| GAITHERSBURG CORS-GROUNDPLANE | 39 8 | 2.34070 | 77 13 | 15.51926 | 140.486 (88) | GPS852 | AA | MD | 0.009 m. | | 83A |
| GAITHERSBURG CORS-GROUNDPLANE | 39 8 | 2.34070 | 77 13 | 15.51926 | 140.70G (88) | GPS852 | AA | MD | 0.009 m. | | 83A |
| GAITHERSBURG CORS ARP | 39 8 | 2.34060 | 77 13 | 15.51927 | 140.66K (88) | CORS0338 | AA | MD | 0.008 m. | 1997.00 | 83A |
| 1060 GARDPORT | 39 49 | 58.32291 | 75 45 | 56.53546 | 100.583G | USERFILE | AA | PA | | | |
| GARDPORT | 39 49 | 58.32071 | 75 45 | 56.54022 | () | 17499 | 3A | PA | 0.132 m. | | 83A |
| 1007 GOSPEL HILL RM 2 | 40 30 | 57.01095 | 78 24 | 21.84067 | 372.374A | USERFILE | AA | PA | | | |
| GOSPEL HILL | 40 30 | 57.78932 | 78 24 | 21.36739 | 405.81A (88) | 17289 | 24 | PA | 26.469 m. | | 83A |
| GOSPEL HILL RM 2 | 40 30 | 57.01118 | 78 24 | 21.84088 | 405.23A (88) | GPS1060/ | BA | PA | 0.009 m. | | 83A |
| GOSPEL HILL RM 2 | 40 30 | 57.01118 | 78 24 | 21.84088 | 405.23L (88) | GPS1060/ | BA | PA | 0.009 m. | | 83A |
| ALTOONA GOSPEL HILL FLAGPOLE | 40 30 | 57.56095 | 78 24 | 21.79037 | () | 17289 | 43 | PA | 17.006 m. | | 83A |
| 1086 GRANDPORT | 41 43 | 40.11312 | 77 23 | 27.76143 | 540.176G | USERFILE | AA | PA | | | |
| GRANDPORT | 41 43 | 40.11384 | 77 23 | 27.75763 | () | 17657/F | 3A | PA | 0.091 m. | | 83A |
| 1080 GREENPORT | 41 26 | 49.11930 | 80 23 | 31.63479 | 326.787G | USERFILE | AA | PA | | | |
| GREENPORT | 41 26 | 49.12224 | 80 23 | 31.63698 | () | 17658 | 3A | PA | 0.104 m. | | 83A |
| 1088 HARRISON RESET | 41 54 | 59.07864 | 77 41 | 51.19560 | 751.236G | USERFILE | AA | PA | | | |
| HARRISON RESET | 41 54 | 59.07351 | 77 41 | 51.20145 | () | 17657/F | 11 | PA | 0.208 m. | | 83A |
| 1044 HOFFPORT | 40 50 | 15.95028 | 76 32 | 52.32067 | 233.621G | USERFILE | AA | PA | | | |
| HOFFPORT | 40 50 | 15.95092 | 76 32 | 52.32245 | () | GPS144 | 3A | PA | 0.046 m. | | 83A |
| 1073 HOME | 41 14 | 53.04833 | 75 49 | 40.84325 | 260.696A | USERFILE | AA | PA | | | |
| HOME | 41 14 | 53.04777 | 75 49 | 40.84512 | 292.51A (88) | 17289 | 26 | PA | 0.047 m. | | 83A |
| 1079 HONEPORT | 41 30 | 59.52568 | 75 15 | 0.03279 | 377.067G | USERFILE | AA | PA | | | |
| HONEPORT | 41 30 | 59.52267 | 75 15 | 8.02458 | () | 17657/H | 3A | PA | 0.212 m. | | 83A |
| 1015 IDI A | 40 37 | 56.25071 | 79 6 | 38.59139 | 381.864G | USERFILE | AA | PA | | | |
| IDI A | 40 37 | 56.25166 | 79 6 | 38.59198 | 414.44G (88) | GPS1060/ | BA | PA | 0.032 m. | | 83A |
| IDI A | 40 37 | 56.25166 | 79 6 | 38.59198 | 414.60G (88) | GPS1060/ | BA | PA | 0.032 m. | | 83A |
| 1014 JORDAN | 40 37 | 39.70834 | 75 29 | 0.80831 | 87.357A | USERFILE | AA | PA | | | |
| JORDAN | 40 37 | 39.70717 | 75 29 | 0.80753 | 101.02A (88) | GPS394 | DA | PA | 0.040 m. | | 83A |
| JORDAN | 40 37 | 39.70717 | 75 29 | 0.80753 | 101.82L (88) | GPS394 | BA | PA | 0.040 m. | | 83A |
| 1084 KROUSE | 41 23 | 18.54007 | 76 30 | 23.10144 | 562.071A | USERFILE | AA | PA | | | |
| KROUSE | 41 23 | 18.53601 | 76 30 | 23.09943 | 594.15A (88) | 17289 | 26 | PA | 0.134 m. | | 83A |
| 1068 KRUMS | 40 34 | 39.71627 | 75 47 | 51.61736 | 200.853A | USERFILE | AA | PA | | | |
| KRUMS | 40 34 | 39.70716 | 75 47 | 51.61668 | 235.38A (88) | 17289 | 26 | PA | 0.281 m. | | 83A |
| 1054 LNS C | 40 7 | 14.48257 | 76 17 | 47.50652 | 86.665G | USERFILE | AA | PA | | | |
| LNS C | 40 7 | 14.48321 | 76 17 | 47.50679 | 120.96G (88) | GPS1060/ | BA | PA | 0.021 m. | | 83A |
| LNS C | 40 7 | 14.48321 | 76 17 | 47.50679 | 121.04G (88) | GPS1060/ | BA | PA | 0.021 m. | | 83A |
| 1039 LOCUST | 40 33 | 24.99594 | 77 16 | 47.84436 | 164.951G | USERFILE | AA | PA | | | |
| LOCUST | 40 33 | 24.99374 | 77 16 | 47.84406 | () | 17289 | 26 | PA | 0.068 m. | | 83A |
| 1045 LUNDY | 40 12 | 58.66472 | 76 47 | 23.69393 | 85.760A | USERFILE | AA | PA | | | |
| LUNDY | 40 12 | 58.65875 | 76 47 | 23.69043 | 120.08A (88) | 17289 | 31 | PA | 0.202 m. | | 83A |
| 1010 M 365 | 40 6 | 58.30409 | 77 20 | 3.66231 | 179.826A | USERFILE | AA | PA | | | |
| M 365 | 40 6 | 58.30496 | 77 20 | 3.66190 | 214.00A (88) | GPS1060/ | BA | PA | 0.029 m. | | 83A |

| | | | | | | | | |
|--------------------------------|----------------|----------------|--------------|----------|-------|------------------|----------|-----|
| N 365 | 40 6 58.30498 | 77 20 3.66190 | 214.00L (88) | GPS1060/ | BA PA | 0.029 m. | 83A | |
| .055 M 368 | 39 52 7.77743 | 76 14 48.21176 | 170.482A | USERFILE | AA PA | | | |
| M 368 | 39 52 7.77567 | 76 14 48.21416 | 203.70A (88) | 17499 | 3A PA | 0.079 m. | 83A | |
| .046 M 6 | 40 5 29.26096 | 76 34 48.48512 | 106.728A | USERFILE | AA PA | | | |
| M 6 | 40 5 29.25677 | 76 34 48.48909 | 140.94A (88) | 17499 | 3A PA | 0.160 m. | 83A | |
| .034 MIDDLE | 39 43 1.10704 | 77 43 25.84290 | 190.025A | USERFILE | AA MD | | | |
| MIDDLE RM 3 | 39 43 1.19986 | 77 43 27.13012 | 222.92A (88) | 17499 | 11 MD | 30.793 m. | 83A | |
| MIDDLE | 39 43 1.10712 | 77 43 25.84249 | 224.25A (88) | GPS280 | BA MD | 0.010 m. | 83A | |
| 1006 NIFFPORT | 40 40 42.59939 | 77 37 26.86035 | 214.112G | USERFILE | AA PA | | | |
| NIFFPORT | 40 40 42.59869 | 77 37 26.86002 | 247.57G (88) | GPS394 | BA PA | 0.023 m. | 83A | |
| 1035 MONTOUR | 41 23 29.34602 | 77 59 10.08028 | 667.237G | USERFILE | AA PA | | | |
| MONTOUR | 41 23 29.34396 | 77 59 10.08149 | () | 17289 | 21 PA | 0.069 m. | 83A | |
| 3019 N 353 | 41 47 12.39402 | 77 8 27.51529 | 424.319A | USERFILE | AA PA | | | |
| N 353 | 41 47 12.39315 | 77 8 27.51426 | 456.77A (88) | GPS394 | BA PA | 0.036 m. | 83A | |
| N 353 | 41 47 12.39315 | 77 8 27.51426 | 456.77L (88) | GPS394 | BA PA | 0.036 m. | 83A | |
| 1040 N96 A | 40 53 6.93951 | 77 48 57.55920 | 293.091G | USERFILE | AA PA | | | |
| N96 A | 40 53 6.93984 | 77 48 57.55976 | 326.24G (88) | GPS1060/ | BA PA | 0.017 m. | 83A | |
| N96 A | 40 53 6.93984 | 77 48 57.55976 | 326.37G (88) | GPS1060/ | BA PA | 0.017 m. | 83A | |
| 3012 OYES | 40 24 22.07865 | 76 34 56.17877 | 97.224A | USERFILE | AA PA | | | |
| OYES | 40 24 22.06764 | 76 34 56.18156 | 131.62A (88) | 17289 | 26 PA | 0.346 m. | 83A | |
| 1091 OYM C 1985 | 41 24 46.42474 | 78 29 41.33297 | 557.698G | USERFILE | AA PA | | | |
| OYM C 1985 | 41 24 46.42477 | 78 29 41.33323 | () | GPS748 | BA PA | 0.006 m. | 83A | |
| 3002 PENN STATE UNIV CORS ARP | 40 48 24.81103 | 77 50 59.26877 | 312.461G | USERFILE | AA PA | | | |
| PENN STATE UNIV CORS LI PHASE | 40 48 24.81082 | 77 50 59.26876 | . | CORS0398 | AA PA | 0.006 m. 1997.00 | 83A | |
| PENN STATE UNIV CORS ARP | 40 48 24.81077 | 77 50 59.26871 | . | CORS0398 | AA PA | 0.008 m. 1997.00 | 83A | |
| PENN STATE UNIV CORS LI PHASE | 40 48 24.81082 | 77 50 59.26876 | . | CORS0398 | AA PA | 0.006 m. 1997.00 | 83A | |
| PENN STATE UNIV CORS ARP | 40 48 24.81077 | 77 50 59.26871 | . | CORS0398 | AA PA | 0.008 m. 1997.00 | 83A | |
| 1074 PERKPORT | 40 23 19.38286 | 75 17 27.87970 | 130.980G | USERFILE | AA PA | | | |
| PERKPORT | 40 23 19.37761 | 75 17 27.87163 | () | 17657/H | 3A PA | 0.250 m. | 83A | |
| 5006 PETPORT | 38 59 37.04287 | 79 8 36.58570 | 257.627G | USERFILE | AA WV | | | |
| PETPORT | 38 59 37.04367 | 79 8 36.58644 | 289.38G (88) | GPS908/A | BA WV | 0.030 m. 1995.00 | 83A | |
| 3001 PITTSBURGH CORS ARP | 40 33 3.73288 | 79 41 50.02327 | 354.216G | USERFILE | AA PA | | | |
| PITTSBURGH CORS LI PHASE CENTE | 40 33 3.73323 | 79 41 50.02301 | . | CORS0335 | AA PA | 0.019 m. 1997.00 | 83A | |
| PITTSBURGH CORS ARP | 40 33 3.73318 | 79 41 50.02386 | . | CORS0335 | AA PA | 0.017 m. 1997.00 | 83A | |
| PITTSBURGH CORS ARP | 40 33 3.73318 | 79 41 50.02386 | . | CORS0335 | AA PA | 0.017 m. 1997.00 | 83A | |
| 2004 POCOPOORT | 41 8 21.37823 | 75 22 33.65548 | 546.192G | USERFILE | AA PA | | | |
| POCOPOORT | 41 8 21.37698 | 75 22 33.65436 | 578.61G (88) | GPS394 | BA PA | 0.047 m. | 83A | |
| 1061 PORT CLINTON 2 | 40 36 15.09444 | 75 59 26.65397 | 455.028G | USERFILE | AA PA | | | |
| PORT CLINTON 1880 | 40 36 15.09745 | 75 59 26.73809 | . | () | 17289 | 11 PA | 1.980 m. | 83A |
| PORT CLINTON 2 | 40 36 15.08332 | 75 59 26.65828 | . | () | 17289 | 21 PA | 0.358 m. | 83A |
| 1070 POTTSPOORT | 40 15 38.00823 | 75 40 8.83217 | 41.753G | USERFILE | AA PA | | | |
| POTTSPOORT | 40 15 38.00696 | 75 40 8.83487 | () | 17657/H | 3A PA | 0.092 m. | 83A | |
| 1028 PSB D | 40 53 6.99202 | 78 5 9.98117 | 549.662G | USERFILE | AA PA | | | |
| PSB D | 40 53 6.99273 | 78 5 9.98180 | 582.36G (88) | GPS1060/ | BA PA | 0.024 m. | 83A | |
| PSB D | 40 53 6.99273 | 78 5 9.98160 | 582.48G (88) | GPS1060/ | BA PA | 0.024 m. | 83A | |
| 1027 PUNXPORT | 40 58 5.16097 | 78 55 45.88891 | 403.498G | USERFILE | AA PA | | | |
| PUNXPORT | 40 58 5.16358 | 78 55 45.88654 | () | GPS144 | 3A PA | 0.098 m. | 83A | |

| | | | | | | | | | |
|------|--|--|--|--|----------------------------------|----------------|----------------|----------------------|------------|
| 1062 | QUAKE QUAKE | 40 51 12.85955 40 51 12.85925 | 76 3 33.12705 76 3 33.12960 | 561.565G () | USERFILE 17289 | AA 26 | PA PA | 0.060 m. | 83A |
| 1041 | R 151 R 151 | 40 36 46.63387 40 36 46.63179 | 77 34 5.29398 77 34 5.28124 | 114.116A 147.81A (88) | USERFILE GPS144 | AA 3A | PA PA | 0.306 m. | 83A |
| 1036 | R 16 R 16 | 40 52 49.65474 40 52 49.65369 | 77 54 58.16831 77 54 58.15713 | 217.500A 250.62A (88) | USERFILE GPS144 | AA 3A | PA PA | 0.264 m. | 83A |
| 1063 | RDG ARP 2 1963 RDG ARP 2 1963 | 40 22 42.28202 40 22 42.28100 | 75 57 51.35744 75 57 51.35652 | 60.962L 95.86L (88) | USERFILE GPS749 | AA BA | PA PA | 0.038 m. | 83A |
| 1096 | RED HILL RM 1 RED HILL | 40 29 45.22904 40 29 44.98364 | 77 7 2.08770 77 7 2.19177 | 154.420A 188.81A (88) | USERFILE 17289 | AA 26 | PA PA | 8.114 m. | 83A |
| 5021 | RICH RICH RICH | 41 52 42.68392 41 52 42.68349 41 52 42.68349 | 79 54 31.89615 79 54 31.89619 79 54 31.89619 | 411.619G 445.42G (88) 445.55G (88) | USERFILE GPS394 GPS394 | AA BA BA | PA PA PA | 0.013 m. 0.013 m. | 83A 83A |
| 2001 | ROSTPORT ROSTPORT ROSTPORT | 40 12 34.82661 40 12 34.82633 40 12 34.82633 | 79 49 49.31747 79 49 49.31750 79 49 49.31750 | 337.754G 370.91G (88) 371.05G (88) | USERFILE GPS1060/ GPS1060/ | AA 1A 1A | PA PA PA | 0.009 m. 0.009 m. | 83A 83A |
| 1042 | S 101 S 101 | 39 50 37.41480 39 50 37.41298 | 77 15 33.42601 77 15 33.42820 | 134.265A 167.97A (88) | USERFILE 17658 | AA 3A | PA PA | 0.077 m. | 83A |
| 1087 | SCENIC SCENIC | 41 13 35.10179 41 13 35.09644 | 76 56 18.71873 76 56 18.71418 | 289.667A 322.91A (88) | USERFILE 17289 | AA 26 | PA PA | 0.196 m. | 83A |
| 1048 | SELINGSGROVE SELINGSGROVE | 40 48 9.67435 40 48 9.67500 | 76 51 45.11335 76 51 45.11489 | 101.471A 135.04A (88) | USERFILE GPS144 | AA 3A | PA PA | 0.041 m. | 83A |
| 1089 | SHIVERY SHIVERY | 41 44 40.90882 41 44 40.91147 | 77 36 43.24053 77 36 43.24884 | 426.483G () | USERFILE 17657/F | AA 26 | PA PA | 0.207 m. | 83A |
| 1056 | STRAUSS STRAUSS | 40 29 55.74531 40 29 55.73859 | 76 11 29.92410 76 11 29.93218 | 161.236A 195.76A (88) | USERFILE 17289 | AA 26 | PA PA | 0.281 m. | 83A |
| 1075 | STROPORT STROPORT | 41 2 6.85363 41 2 6.85353 | 75 9 43.92800 75 9 43.92826 | 111.612G () | USERFILE 17657/H | AA 3A | PA PA | 0.007 m. | 83A |
| 1018 | SUMMER SUMMER | 40 21 37.68650 40 21 37.69321 | 78 45 58.46368 78 45 58.47632 | 554.062A 586.28A (88) | USERFILE 17289 | AA 26 | PA PA | 0.363 m. | 83A |
| 5016 | T 1 RDGRR RESET 1953 T 1 RDGRR RESET 1953 T 1 RDGRR RESET 1953 | 40 8 9.31497 40 8 9.31524 40 8 9.31524 | 75 30 39.81183 75 30 39.81130 75 30 39.81130 | -1.391A 32.55A (88) 32.55L (88) | USERFILE GPS1060/ GPS1060/ | AA 1A 1A | PA PA PA | 0.015 m. 0.015 m. | 83A 83A |
| 1019 | TT 5 3 TT 5 3 | 40 59 16.34284 40 59 18.33921 | 79 34 56.86138 79 34 58.86298 | 377.871G () | USERFILE 17289 | AA 33 | PA PA | 0.118 m. | 83A |
| 5020 | TUNA AZ MK TUNA AZ MK TUNA AZ MK | 41 59 47.73808 41 59 47.73740 41 59 47.73740 | 78 37 23.56072 78 37 23.56079 78 37 23.56079 | 398.206A 430.46A (88) 430.46L (88) | USERFILE GPS394 GPS394 | AA BA BA | PA PA PA | 0.021 m. 0.021 m. | 83A 83A |
| 1049 | UNION UNION | 40 59 41.66068 40 59 41.66001 | 76 52 27.38294 76 52 27.37916 | 121.364A () | USERFILE 17289 | AA 24 | PA PA | 0.091 m. | 83A |
| 1076 | WARMINSTER CBL 430 WARMINSTER CBL 430 WARMINSTER CBL 430 | 40 11 56.36119 40 11 56.36209 40 11 56.36209 | 75 3 40.89599 75 3 40.89557 75 3 40.89557 | 76.995G 110.60G (88) 110.64G (88) | USERFILE GPS1060/ GPS1060/ | AA BA BA | PA PA PA | 0.029 m. 0.029 m. | 83A 83A |
| 1071 | WATER WATER | 39 53 4.22822 39 53 4.22759 | 75 13 17.03262 75 13 17.03140 | -30.262G 2.63G (88) | USERFILE 17657/G | AA 1A | PA PA | 0.035 m. | 83A |
| 9008 | WILT B | 41 18 16.29528 | 76 0 57.10303 | 368.510G | USERFILE | AA | PA | | |

| | | | | | | | | | | | |
|-----|--------------------------------|----------------|----------------|--------------|-----|----------|----|----|-----------|---------|-----|
| | WILKES BARRE CORS L1 PHASE CEN | 41 18 18.91356 | 76 0 55.10112 | | | CORS0390 | AA | PA | 93.237 m. | 1997.00 | 83A |
| | WILKES BARRE CORS ARP | 41 18 18.91351 | 76 0 55.10107 | | | CORS0390 | AA | PA | 93.237 m. | 1997.00 | 83A |
| | HAYFIELD SW 1974 | 41 18 15.88252 | 78 0 57.59839 | | | 17289 | 2 | PA | 17.174 m. | | 83A |
| | WILKES BARRE CORS L1 PHASE CEN | 41 18 18.91356 | 76 0 55.10112 | | | CORS0390 | AA | PA | 93.237 m. | 1997.00 | 83A |
| | WILKES BARRE CORS ARP | 41 18 18.91351 | 76 0 55.10107 | | | CORS0390 | AA | PA | 93.237 m. | 1997.00 | 83A |
| | HAYFIELD SW 1974 | 41 18 15.88252 | 76 0 57.59839 | | | 17289 | 2 | PA | 17.174 m. | | 83A |
| | WILKES BARRE CORS L1 PHASE CEN | 41 18 18.91356 | 76 0 55.10112 | | | CORS0390 | AA | PA | 93.237 m. | 1997.00 | 83A |
| | WILKES BARRE CORS ARP | 41 18 18.91351 | 76 0 55.10107 | | | CORS0390 | AA | PA | 93.237 m. | 1997.00 | 83A |
| 004 | WILKES BARRE CORS ARP | 41 18 18.91363 | 76 0 55.10125 | 385.659G | | USERFILE | AA | PA | | | |
| | HAYFIELD NE 1974 | 41 18 20.25410 | 76 0 57.00239 | | | 17289 | 2 | PA | 60.548 m. | | 83A |
| | WILKES BARRE CORS L1 PHASE CEN | 41 18 18.91356 | 76 0 55.10112 | | | CORS0390 | AA | PA | 0.004 m. | 1997.00 | 83A |
| | WILKES BARRE CORS ARP | 41 18 18.91351 | 76 0 55.10107 | | | CORS0390 | AA | PA | 0.006 m. | 1997.00 | 83A |
| | HAYFIELD NE 1974 | 41 18 20.25410 | 76 0 57.00239 | | | 17289 | 2 | PA | 60.548 m. | | 83A |
| | WILKES BARRE CORS L1 PHASE CEN | 41 18 18.91356 | 76 0 55.10112 | | | CORS0390 | AA | PA | 0.004 m. | 1997.00 | 83A |
| | WILKES BARRE CORS ARP | 41 18 18.91351 | 76 0 55.10107 | | | CORS0390 | AA | PA | 0.006 m. | 1997.00 | 83A |
| | HAYFIELD NE 1974 | 41 18 20.25410 | 76 0 57.00239 | | | 17289 | 2 | PA | 60.548 m. | | 83A |
| | WILKES BARRE CORS L1 PHASE CEN | 41 18 18.91356 | 76 0 55.10112 | | | CORS0390 | AA | PA | 0.004 m. | 1997.00 | 83A |
| | WILKES BARRE CORS ARP | 41 18 18.91351 | 76 0 55.10107 | | | CORS0390 | AA | PA | 0.006 m. | 1997.00 | 83A |
| 017 | WINGPORT | 40 8 3.75578 | 75 16 12.60047 | 58.192G | | USERFILE | AA | PA | | | |
| | WINGPORT | 40 8 3.75486 | 75 16 12.59990 | 91.84G (88) | | GPS394 | BA | PA | 0.031 m. | | 83A |
| | WINGPORT | 40 8 3.75486 | 75 16 12.59990 | 91.24G (88) | | GPS394 | BA | PA | 0.031 m. | | 83A |
| 050 | WOLF | 40 25 3.72287 | 76 37 16.28462 | 121.828A | | USERFILE | AA | PA | | | |
| | WOLF | 40 25 3.71529 | 76 37 16.28738 | 156.15A (88) | | 17289 | 26 | PA | 0.243 m. | | 83A |
| 043 | YORKPORT | 39 55 24.00559 | 76 52 37.68823 | 111.066G | | USERFILE | AA | PA | | | |
| | YORKPORT | 39 55 24.00636 | 76 52 37.68883 | 144.44G (88) | | GPS1060/ | BA | PA | 0.028 m. | | 83A |
| | YORKPORT | 39 55 24.00636 | 76 52 37.68883 | 144.51G (88) | | GPS1060/ | BA | PA | 0.028 m. | | 83A |
| 357 | ZERBPORT | 40 42 19.09520 | 76 22 15.57880 | 486.692G | | USERFILE | AA | PA | | | |
| | ZERBPORT | 40 42 19.09306 | 76 22 15.57865 | | () | GPS144 | 3A | PA | 0.066 m. | | 83A |

ATTACHMENT 2

GPS1463

PA FBN/CBN

FREE VS IDB ELLIPSOID HEIGHT DIFFERENCES (M)

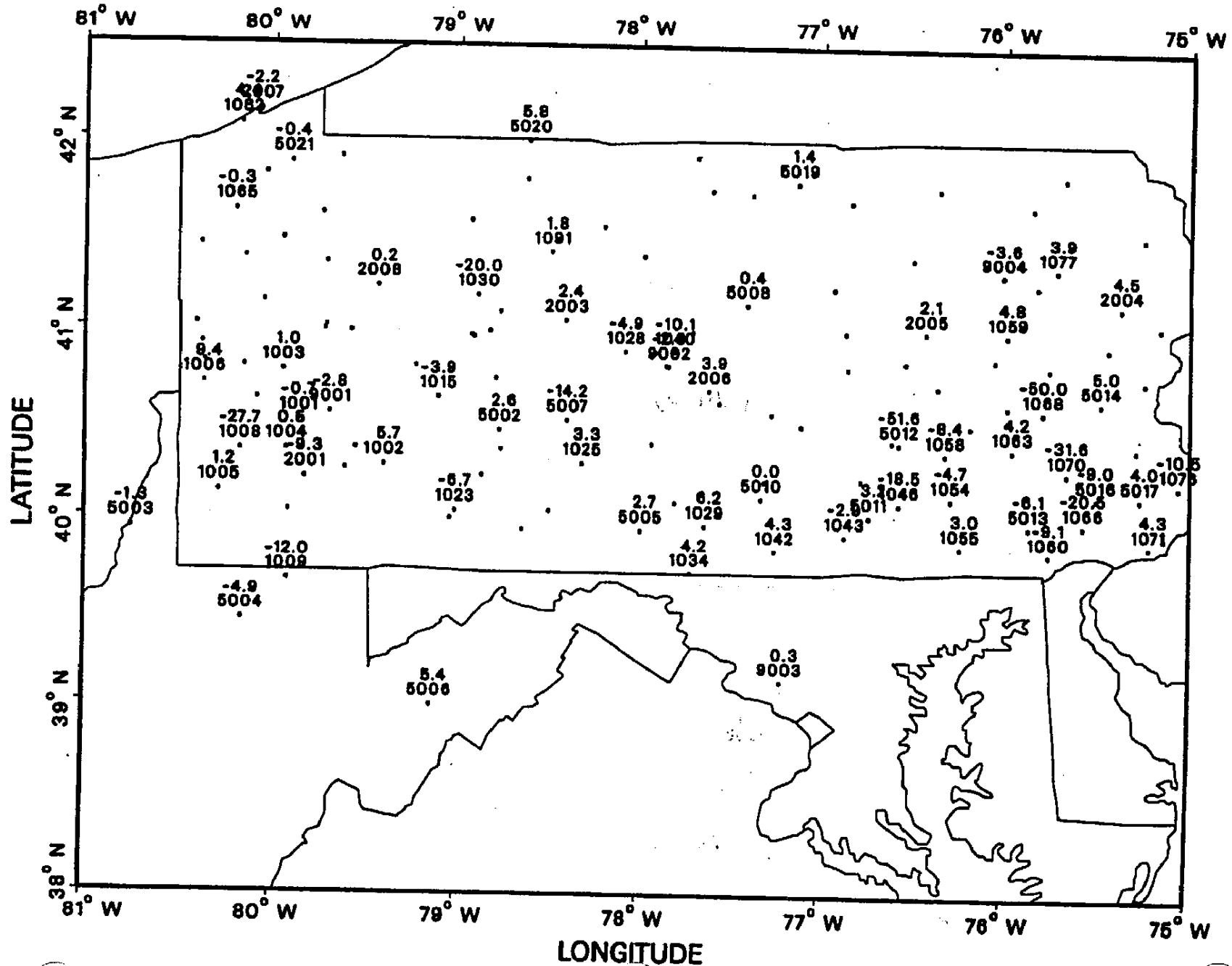
| | |
|--------------------------|--------|
| 2G6 C | -0.002 |
| ADR PEDESTAL | 0.003 |
| PENN STATE UNIV CORS ARP | -0.003 |
| O O | -0.004 |
| RICH | 0.005 |
| AGC ARP 2 1965 | -0.006 |
| M 365 | -0.006 |
| CLARPORT | -0.007 |
| GAITHERSBURG CORS ARP | -0.009 |
| WILKES BARRE CORS ARP | -0.010 |
| B 316 | 0.013 |
| ARP BTP | -0.015 |
| D 362 | 0.016 |
| AFJ C 1993 | -0.019 |
| N 353 | -0.023 |
| PITTSBURG CORS ARP | 0.023 |
| YORKPORT | 0.023 |
| BLOOMPORT | -0.025 |
| CLEAPORT | -0.025 |
| OYM C 1985 | -0.026 |
| BOSSLER | -0.029 |
| M 368 | -0.032 |
| FULOP | -0.033 |
| IDI A | 0.035 |
| AOO AP 1964 STA B | -0.038 |
| EMIGS RM 3 | -0.040 |
| MIFFPORT | -0.041 |
| LNS C | 0.042 |
| WINGPORT | -0.042 |
| AVP ARP 1962 | -0.044 |
| RDG ARP 2 1963 | -0.044 |
| ERI ARP 2 | -0.045 |
| FAIRPORT | 0.045 |
| MIDDLE | -0.047 |
| POCOPORT | -0.047 |
| PSB D | 0.047 |
| S 101 | -0.048 |
| ARP 2 1965 HZL | -0.049 |
| WATER | -0.051 |
| 40N I | 0.055 |
| ARP LBE 1969 | -0.057 |
| JORDAN | -0.057 |
| CHAMPORT | -0.061 |
| PETPPORT | -0.061 |
| 2G9 A | 0.063 |
| TUNA AZ MK | -0.064 |
| 9D4 B | 0.080 |
| T I RDGRR RESET 1953 | 0.081 |
| GARDPORT | 0.088 |
| ROSTPORT | 0.089 |
| BAKER | -0.096 |
| N96 A | 0.100 |
| WARMINSTER CBL 430 | 0.100 |
| E 313 | 0.112 |
| GOSPEL HILL RM 2 | 0.138 |

. M 6 .
DUJ ARP
BRANDPORT
CAMPORT
POTTSPORT
KRUMS
OYES

0.177
0.196
0.205
0.275
0.313
0.497
0.512

PENNSYLVANIA FBN/CBN FREE ELLIPSOID HEIGHTS VD IDB

FIGURE 2 **CM**



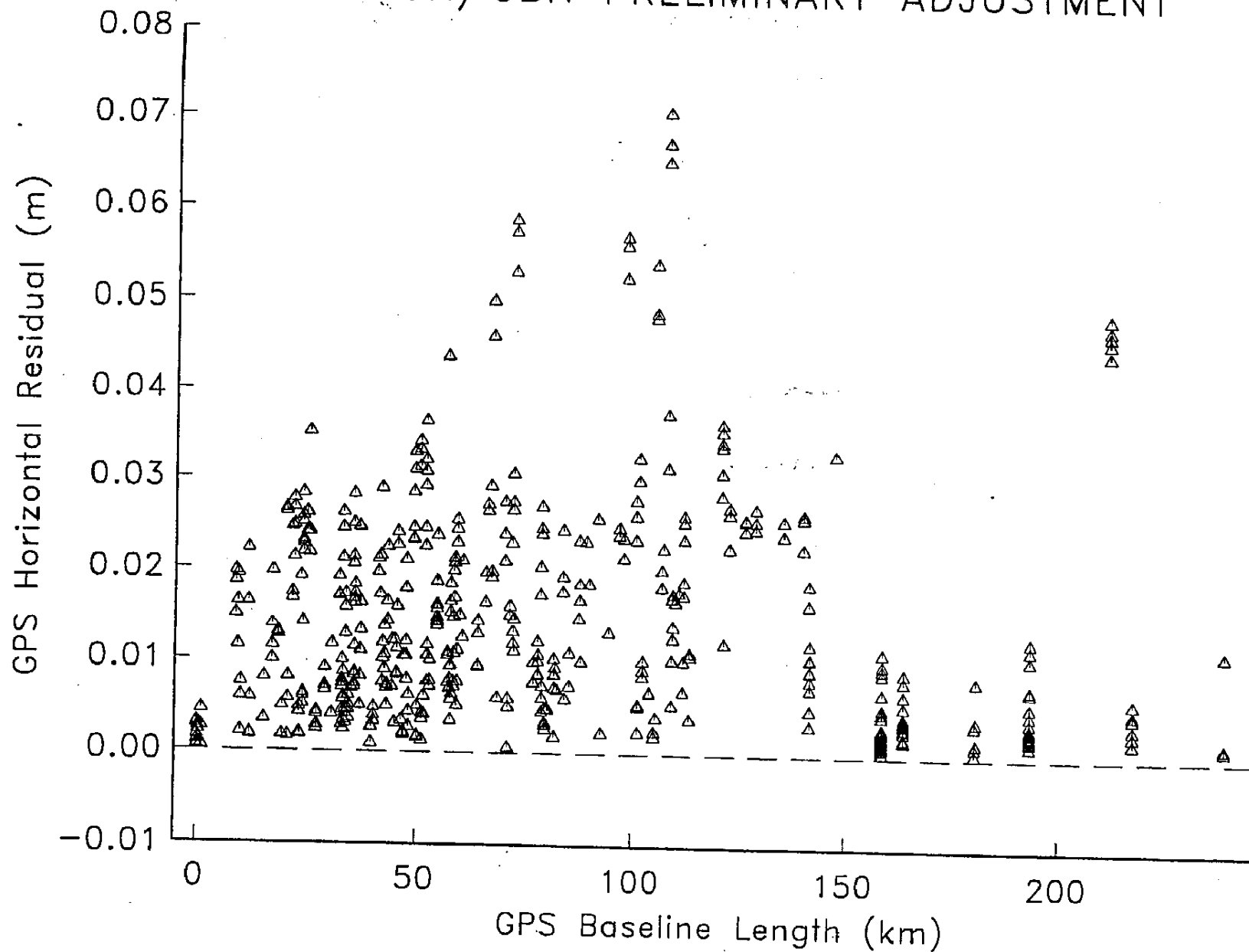
ATTACHMENT 3
PRELIMINARY ADJUSTMENT
PA FBN/CBN

| STATION NAME | SOURCE |
|--------------------------|-----------|
| 0 0 | GPS394 |
| 2G6 C | GPS727 |
| 2G9 A | GPS1060/A |
| 9D4 B | GPS1060/A |
| ADR PEDESTAL | GPS908 |
| AGC ARP 2 1965 | GPS739 |
| AOO AP 1964 STA B | GPS748 |
| ARP 2 1965 HZL | GPS748 |
| ARP BTP | GPS727 |
| ARP LBE 1969 | GPS739 |
| AVP ARP 1962 | GPS748 |
| B 316 | GPS882/B |
| BAKER | GPS882/B |
| BLOOMPORT | GPS394 |
| BOSSLER | GPS394 |
| CHAMPORT | GPS647 |
| CLARPORT | GPS394 |
| CLEAPORT | GPS394 |
| D 362 | GPS1212 |
| DUJ ARP | GPS1060/A |
| E 313 | GPS1060/A |
| EMIGS RM 3 | GPS394 |
| ERI ARP 2 | GPS727 |
| FAIRPORT | GPS908/A |
| FULOP | GPS394 |
| GAITHERSBURG CORS ARP | GPS1463 |
| GOSPEL HILL RM 2 | GPS1060/A |
| IDI A | GPS1060/A |
| JORDAN | GPS394 |
| LNS C | GPS1060/A |
| M 365 | GPS1060/A |
| MIDDLE | GPS260 |
| MIFFPORT | GPS394 |
| N 353 | GPS394 |
| N96 A | GPS1060/A |
| OYM C 1985 | GPS748 |
| PENN STATE UNIV CORS ARP | GPS1463 |
| PETPORT | GPS908/A |
| PITTSBURG CORS ARP | GPS1463 |
| POCOPORT | GPS394 |
| PSB D | GPS1060/A |
| RDG ARP 2 1963 | GPS749 |
| RICH | GPS394 |
| TUNA AZ MK | GPS394 |
| WARMINSTER CBL 430 | GPS1060/A |
| WILKES BARRE CORS ARP | GPS1463 |
| WINGPORT | GPS394 |
| YORKPORT | GPS1060/A |

ELLIPSOID HEIGHTS USED IN THE PRELIMINARY ADJUSTMENT

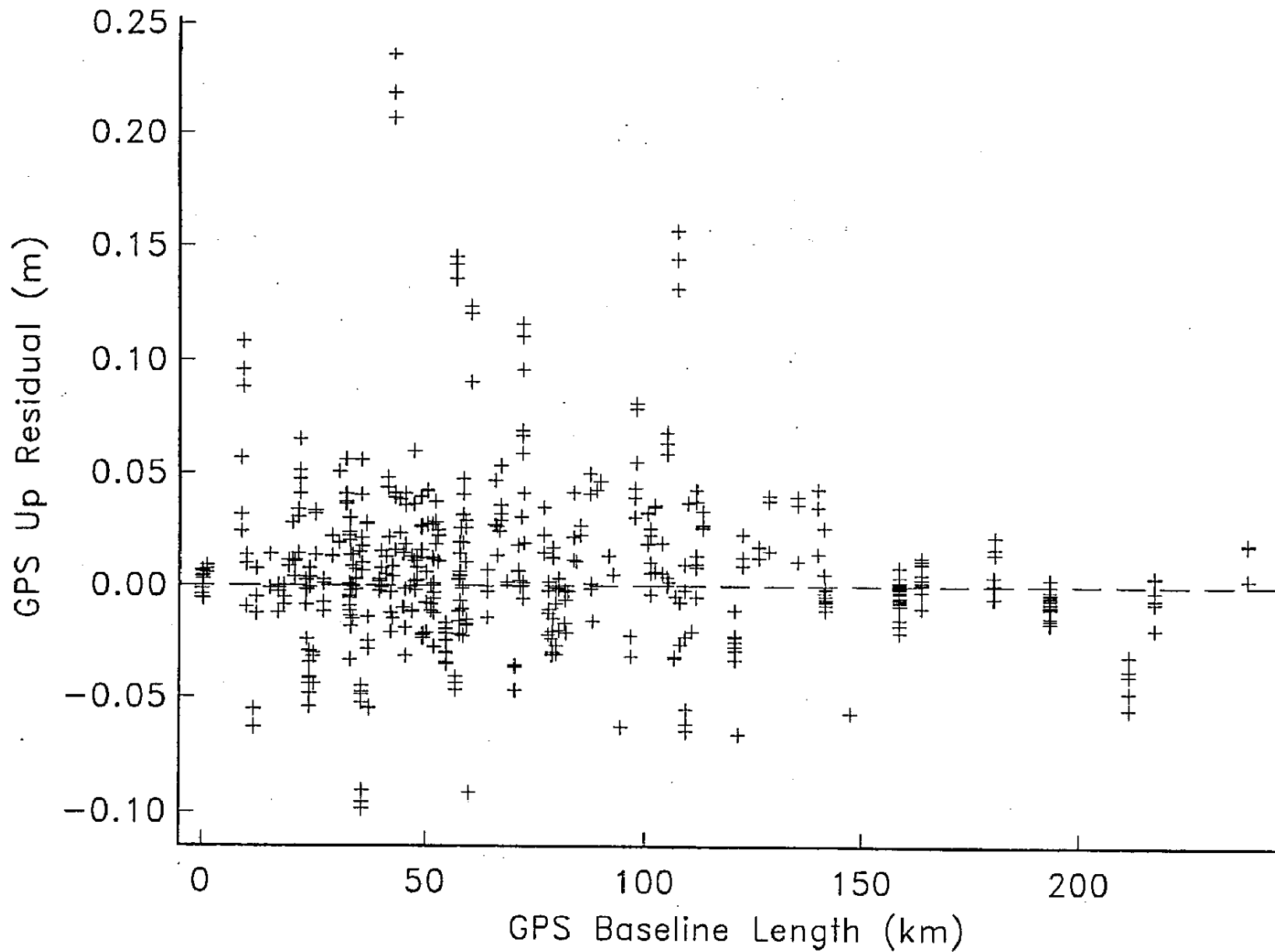
| STATION NAME | ELLIP HEIGHT | SOURCE |
|--------------------------|--------------|-----------|
| O O | 134.976 | GPS394 |
| 2G6 C | 390.783 | GPS727 |
| 2G9 A | 648.327 | GPS1060/A |
| 9D4 B | 125.054 | GPS1060/A |
| ADR PEDESTAL | 292.497 | GPS908 |
| AGC ARP 2 1965 | 347.105 | GPS739 |
| AOO AP 1964 STA B | 424.897 | GPS748 |
| ARP 2 1965 HZL | 455.352 | GPS748 |
| ARP BTP | 345.110 | GPS727 |
| ARP LBE 1969 | 311.073 | GPS739 |
| AVP ARP 1962 | 252.911 | GPS748 |
| B 316 | 173.443 | GPS882/B |
| BAKER | 333.146 | GPS882/B |
| BLOOMPORT | 112.299 | GPS394 |
| BOSSLER | 604.824 | GPS394 |
| CHAMPORT | 174.308 | GPS647 |
| CLARPORT | 408.928 | GPS394 |
| CLEAPORT | 429.146 | GPS394 |
| D 362 | 140.612 | GPS1212 |
| DUJ ARP | 516.500 | GPS1060/A |
| E 313 | 345.510 | GPS1060/A |
| EMIGS RM 3 | 126.028 | GPS394 |
| ERI ARP 2 | 187.176 | GPS727 |
| FAIRPORT | 275.769 | GPS908/A |
| FULOP | 251.953 | GPS394 |
| GAITHERSBURG CORS ARP | 108.940 | GPS1463 |
| GOSPEL HILL RM 2 | 372.512 | GPS1060/A |
| IDI A | 381.899 | GPS1060/A |
| JORDAN | 67.300 | GPS394 |
| LNS C | 86.707 | GPS1060/A |
| M 365 | 179.820 | GPS1476 |
| MIDDLE | 189.978 | GPS260 |
| MIFFPORT | 214.071 | GPS394 |
| N 353 | 424.296 | GPS394 |
| N96 A | 293.191 | GPS1060/A |
| OYM C 1985 | 557.672 | GPS748 |
| PENN STATE UNIV CORS ARP | 312.461 | GPS1463 |
| PETPORT | 257.566 | GPS908/A |
| PITTSBURG CORS ARP | 354.213 | GPS1463 |
| POCOPORT | 546.145 | GPS394 |
| PSB D | 549.709 | GPS1060/A |
| RDG ARP 2 1963 | 60.918 | GPS749 |
| RICH | 411.624 | GPS394 |
| TUNA AZ MK | 398.142 | GPS394 |
| WARMINSTER CBL 430 | 77.095 | GPS1060/A |
| WILKES BARRE CORS ARP | 385.655 | GPS1463 |
| WINGPORT | 58.150 | GPS394 |
| YORKPORT | 111.089 | GPS1060/A |

PA FBN/CBN PRELIMINARY ADJUSTMENT



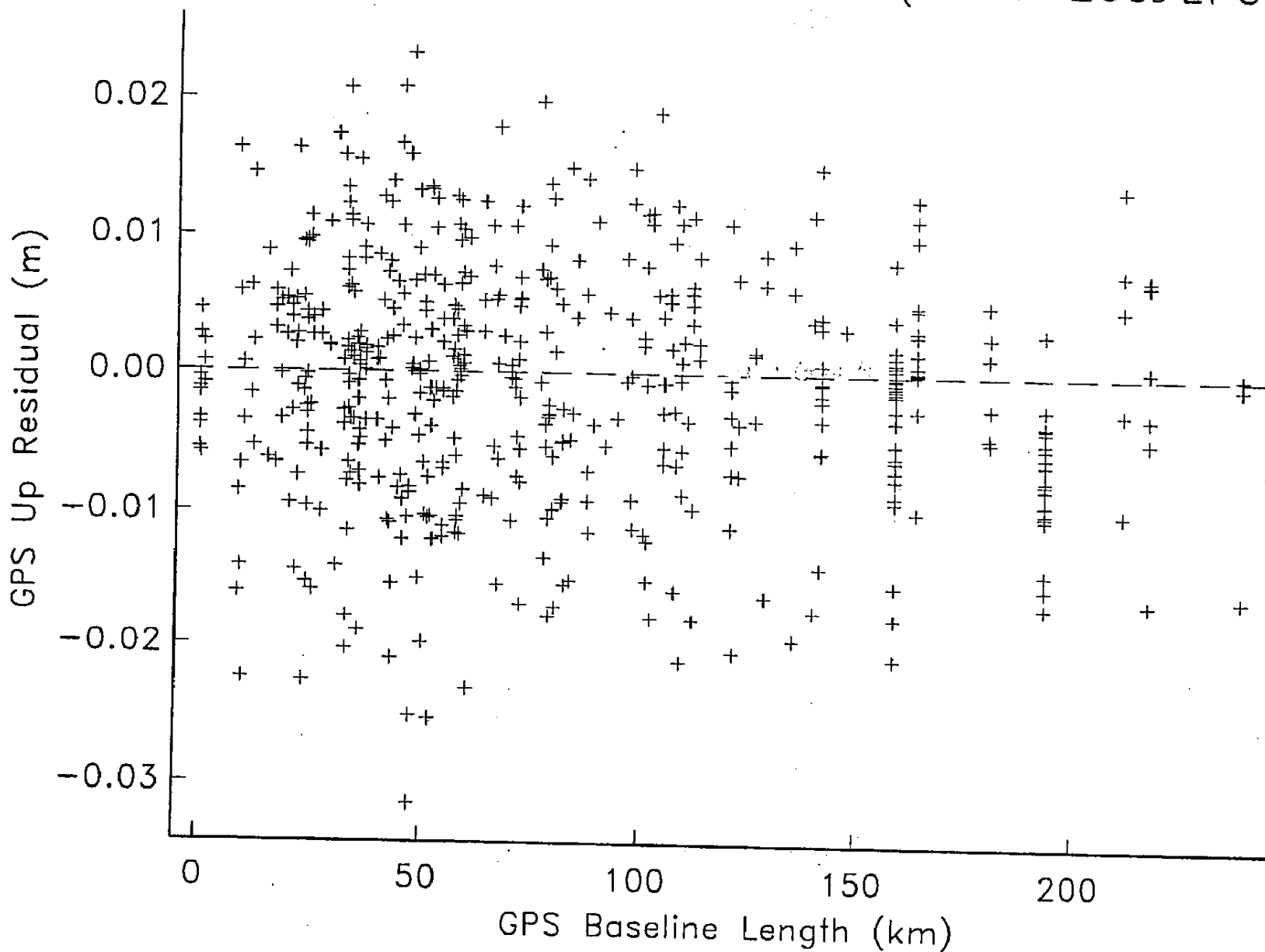
Adjustment of Mar 26 2001 at 11:16
Mean value is 0.014 meters

PA EBN/CBN PRELIMINARY ADJUSTMENT



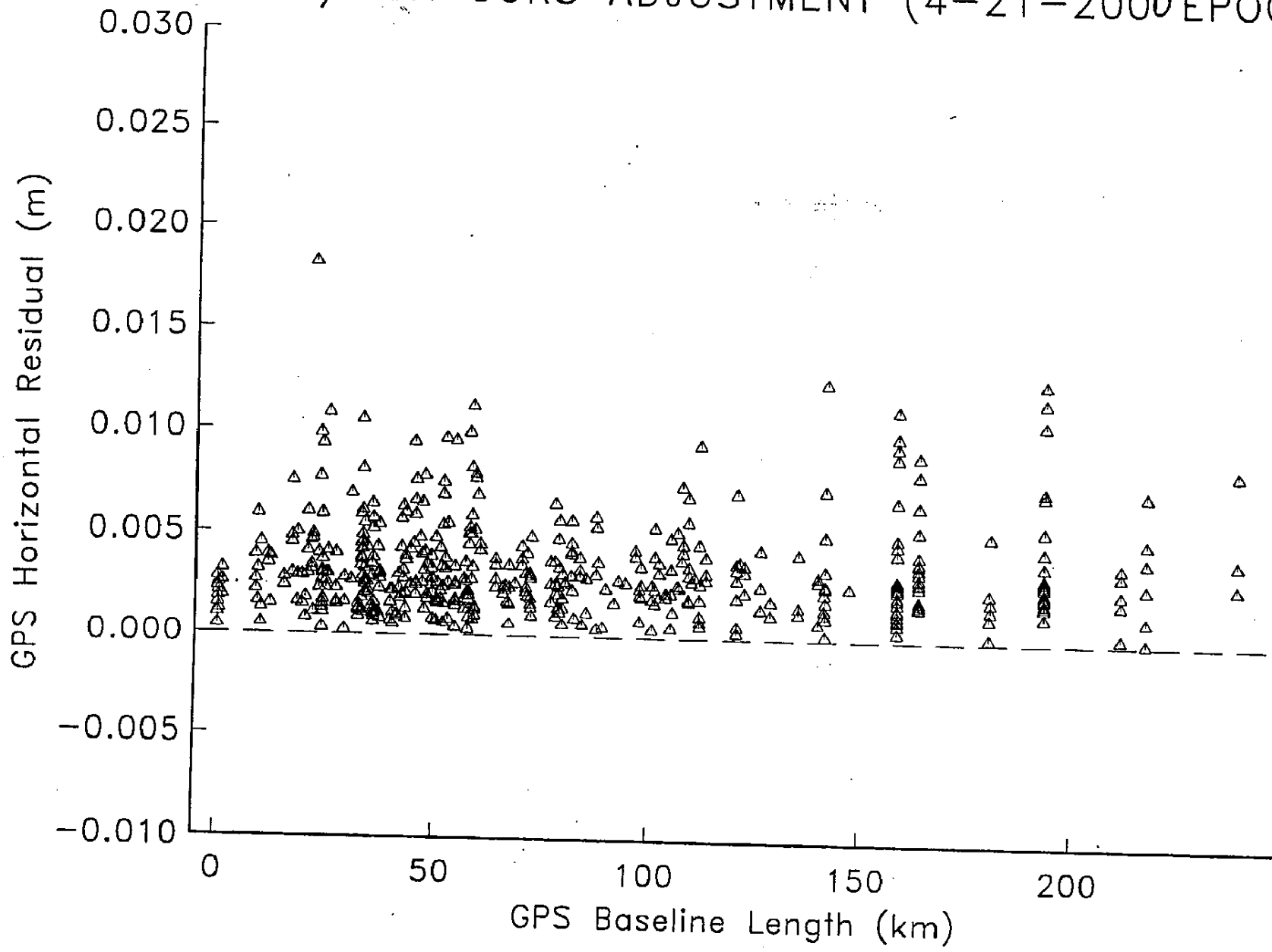
Adjustment of Mar 26 2001 at 11:16
Mean value is 0.024 meters

PA FBN/CBN CORS ADJUSTMENT (4-21-2000EPOCH)



Adjustment of Feb 23 2001 at 09:45
Mean value is 0.007 meters

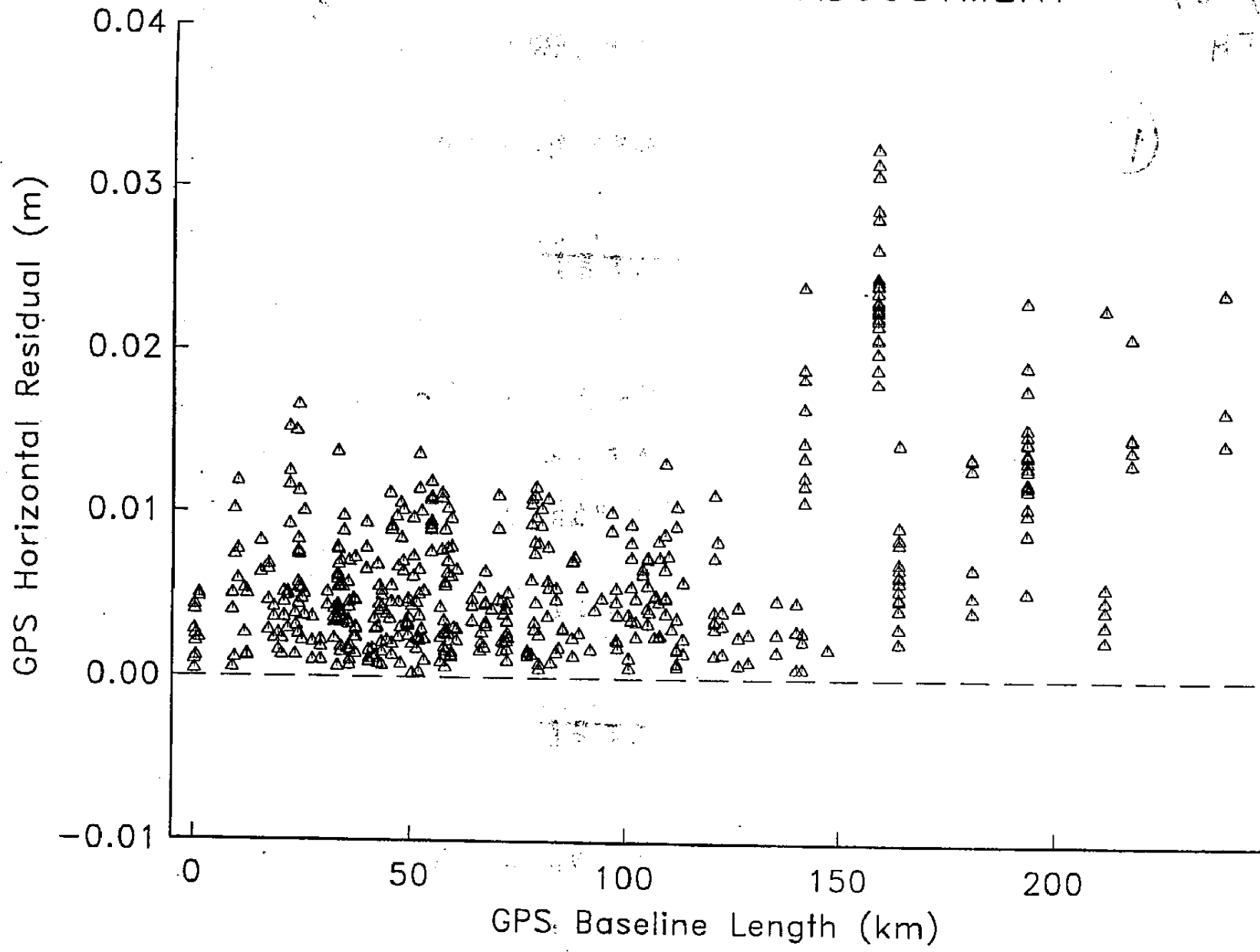
PA FBN/CBN CORS ADJUSTMENT (4-21-2000 EPOCH)



Adjustment of Feb 23 2001 at 09:45
Mean value is 0.003 meters

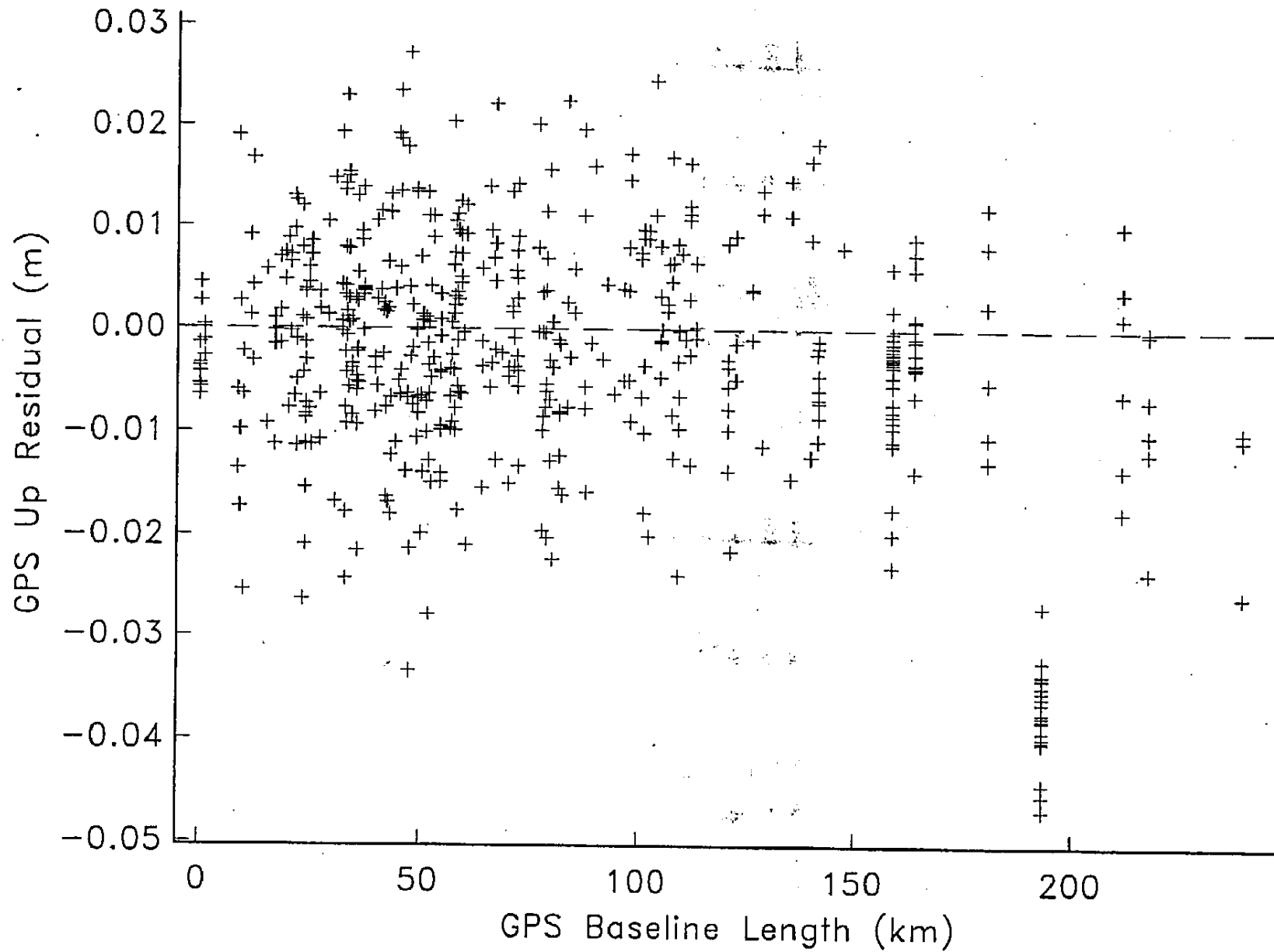
GPS1463 - CORS ADJUSTMENT

*Refined
ATOP (Trans)*



Adjustment of Dec 18 2000 at 12:08
Mean value is 0.007 meters

GPS1463 - CORS ADJUSTMENT



Adjustment of Dec 18 2000 at 12:08
Mean value is 0.009 meters

ATTACHMENT 3A
 ELLIPSOID HEIGHTS COMPARISON
 PA FBN/CBN

| STATION | DIFF. |
|--------------------------|-------|
| B 316 | 0.000 |
| E 313 | 0.000 |
| FAIRPORT | 0.000 |
| GAITHERSBURG CORS ARP | 0.000 |
| MIDDLE | 0.000 |
| PENN STATE UNIV CORS ARP | 0.000 |
| PETPPORT | 0.000 |
| PITTSBURG CORS ARP | 0.000 |
| WILKES BARRE CORS ARP | 0.000 |

PA HARN ELLIPSOID HEIGHTS REDETERMINED

| | |
|--------------------|--------|
| E 100 | -0.002 |
| RICH | 0.003 |
| 2G5 C | 0.005 |
| BORTNER | -0.009 |
| CLARPORT | -0.009 |
| B 412 | -0.010 |
| ADR PEDESTAL | -0.011 |
| OYM C 1985 | -0.012 |
| O 0 | -0.014 |
| D 362 | 0.018 |
| BLOOMPORT | -0.022 |
| CLEAPORT | -0.023 |
| ARP BTP | -0.027 |
| AGC ARP 2 1965 | -0.028 |
| IDI A | 0.030 |
| AOO AP 1964 STA B | -0.039 |
| MIFFPORT | -0.040 |
| EMIGS RM 3 | -0.042 |
| POCOPORT | -0.043 |
| ARP 2 1965 HZL | -0.048 |
| CHAMPORT | -0.048 |
| M 365 | 0.051 |
| BOSSLER | -0.052 |
| WINGPORT | -0.052 |
| ERI ARP 2 | -0.056 |
| FULOP | -0.058 |
| AVP ARP 1962 | -0.061 |
| RDG ARP 2 1963 | -0.064 |
| N 353 | -0.067 |
| 2G9 A | 0.071 |
| JORDAN | -0.074 |
| TUNA AZ MK | -0.074 |
| ARP LBE 1969 | -0.080 |
| YORKPORT | 0.081 |
| PSB D | 0.086 |
| LNS C | 0.091 |
| BAKER | -0.112 |
| 9D4 B | 0.132 |
| N96 A | 0.132 |
| WARMINSTER CBL 430 | 0.136 |
| GOSPEL HILL RM 2 | 0.158 |
| DUJ ARP | 0.185 |

ATTACHMENT 3B
POSITION COMPARISON DIFFERENCES

| SSN | NAME | LATITUDE SHIFT SECONDS | LONGITUDE SHIFT SECONDS | SHIFT METERS |
|------|--------------------|------------------------------|-------------------------------|-----------------|
| 5008 | 0 0 | 0.00000 | 0.00000 | 0.000 |
| 1065 | 2G6 C | 0.00000 | 0.00000 | 0.000 |
| 1023 | 2G9 A | 0.00000 | 0.00000 | 0.000 |
| 1058 | 9D4 B | 0.00000 | 0.00000 | 0.000 |
| 1001 | ADR PEDESTRAL | 0.00000 | 0.00000 | 0.000 |
| 1004 | AGC ARP 2 1965 | 0.00000 | 0.00000 | 0.000 |
| 1025 | AOO AP 1964 STA B | 0.00000 | 0.00000 | 0.000 |
| 1059 | ARP 2 1955 HZL | 0.00000 | 0.00000 | 0.000 |
| 1003 | ARP BTP | 0.00000 | 0.00000 | 0.000 |
| 1002 | ARP LBE 1969 | 0.00000 | 0.00000 | 0.000 |
| 1077 | AVP ARP 1962 | 0.00000 | 0.00000 | 0.000 |
| 5003 | B 316 | 0.00000 | 0.00000 | 0.000 |
| 1006 | BAKER | 0.00000 | 0.00000 | 0.000 |
| 2005 | BLOOMPORT | 0.00000 | 0.00000 | 0.000 |
| 5002 | BOSSLER | 0.00000 | 0.00000 | 0.000 |
| 1029 | CHAMPORT | 0.00000 | 0.00000 | 0.000 |
| 2008 | CLARPORT | 0.00000 | 0.00000 | 0.000 |
| 2003 | CLEAPORT | 0.00000 | 0.00000 | 0.000 |
| 2007 | D 362 | 0.00000 | 0.00000 | 0.000 |
| 1030 | DUJ ARP | 0.00000 | 0.00000 | 0.000 |
| 1009 | E 313 | 0.00000 | 0.00000 | 0.000 |
| 5011 | EMIGS RM 3 | 0.00000 | 0.00000 | 0.000 |
| 1082 | ERI ARP 2 | 0.00000 | 0.00000 | 0.000 |
| 5004 | FAIRPORT | 0.00000 | 0.00000 | 0.000 |
| 5005 | FULOP | 0.00000 | 0.00000 | 0.000 |
| 5007 | GOSPEL HILL RM 2 | 0.00000 | 0.00000 | 0.000 |
| 1015 | IDI A | 0.00000 | 0.00000 | 0.000 |
| 5014 | JORDAN | 0.00000 | 0.00000 | 0.000 |
| 1054 | LNS C | 0.00000 | 0.00000 | 0.000 |
| 5010 | M 365 | 0.00000 | 0.00000 | 0.000 |
| 1034 | MIDDLE | 0.00000 | 0.00000 | 0.000 |
| 2006 | MIFFPORT | 0.00000 | 0.00000 | 0.000 |
| 5019 | N 353 | 0.00000 | 0.00000 | 0.000 |
| 1040 | N96 A | 0.00000 | 0.00000 | 0.000 |
| 1091 | OYM C 1985 | 0.00000 | 0.00000 | 0.000 |
| 5006 | PETPORT | 0.00000 | 0.00000 | 0.000 |
| 2004 | POCOPORT | 0.00000 | 0.00000 | 0.000 |
| 1028 | PSB D | 0.00000 | 0.00000 | 0.000 |
| 1063 | RDG ARP 2 1963 | 0.00000 | 0.00000 | 0.000 |
| 5021 | RICH | 0.00000 | 0.00000 | 0.000 |
| 5020 | TUNA AZ MK | 0.00000 | 0.00000 | 0.000 |
| 1076 | WARMINSTER CBL 430 | 0.00000 | 0.00000 | 0.000 |
| 5017 | WINGPORT | 0.00000 | 0.00000 | 0.000 |
| 1043 | YORKPORT | 0.00000 | 0.00000 | 0.000 |

CORS POSITIONS WERE TRANSFORMED

| | | | | |
|------|--------------------------|----------|----------|-------|
| 9004 | WILKES BARRE CORS ARP | 0.00006 | 0.00010 | 0.003 |
| 9003 | GAITHERSBURG CORS ARP | -0.00009 | -0.00023 | 0.006 |
| 9002 | PENN STATE UNIV CORS ARP | 0.00026 | 0.00006 | 0.008 |
| 9001 | PITTSBURG CORS ARP | -0.00027 | -0.00052 | 0.015 |

LOWER ORDER POINTS

| | | | |
|--------------------------|----------|----------|-------|
| 1071 WATER | 0.00007 | 0.00059 | 0.014 |
| 1005 AFJ C 1993 | 0.00052 | -0.00017 | 0.017 |
| 1066 BRANPORT | 0.00025 | -0.00100 | 0.025 |
| 5016 TI RDGRR RESET 1953 | -0.00082 | -0.00007 | 0.025 |
| 1075 STROPORT | -0.00060 | -0.00091 | 0.028 |
| 5013 40 NI | -0.00093 | 0.00135 | 0.043 |
| 1011 FAA 8G7 A | 0.00091 | -0.00159 | 0.047 |
| 1048 SELINGSGROVE | -0.00081 | -0.00176 | 0.048 |
| 1008 CAMPORT | 0.00028 | 0.00215 | 0.051 |
| 1073 HOME | 0.00019 | -0.00232 | 0.054 |
| 1044 HOFFPORT | -0.00085 | -0.00211 | 0.056 |
| 1057 ZERBPORT | 0.00189 | -0.00025 | 0.059 |
| 1039 LOCUST | 0.00206 | 0.00011 | 0.064 |
| 1035 MONTOUR | 0.00187 | -0.00143 | 0.067 |
| 1062 QUAKE | -0.00010 | -0.00311 | 0.073 |
| 1090 AP STA A 2 BFD | -0.00115 | 0.00292 | 0.076 |
| 1042 S 101 | 0.00180 | -0.00236 | 0.079 |
| 1049 UNION | 0.00041 | 0.00348 | 0.082 |
| 1055 M 368 | 0.00152 | -0.00282 | 0.082 |
| 1086 GRANDPORT | -0.00103 | 0.00356 | 0.088 |
| 1070 POTTSPOINT | 0.00172 | -0.00307 | 0.090 |
| 1095 DRAKE CBL 0 | -0.00240 | -0.00221 | 0.090 |
| 1027 PUNXPORT | 0.00271 | 0.00222 | 0.098 |
| 1080 GREENPORT | 0.00311 | -0.00223 | 0.109 |
| 1019 TT 5 3 | 0.00363 | -0.00169 | 0.119 |
| 1084 KROUSE | 0.00370 | 0.00168 | 0.121 |
| 1072 EASTPORT | 0.00096 | 0.00535 | 0.129 |
| 1094 CORRPORT | -0.00214 | -0.00502 | 0.133 |
| 1060 GARDPORT | 0.00173 | -0.00529 | 0.137 |
| 1046 M 6 | 0.00404 | -0.00430 | 0.161 |
| 1087 SCENIC | 0.00502 | 0.00428 | 0.184 |
| 1079 HONEPORT | 0.00222 | 0.00743 | 0.185 |
| 1067 CARBPORT | 0.00334 | 0.00688 | 0.191 |
| 1045 LUNDY | 0.00580 | 0.00323 | 0.195 |
| 1088 HARRISON RESET | 0.00487 | -0.00601 | 0.204 |
| 1089 SHIVERY | -0.00291 | -0.00835 | 0.213 |
| 1074 PERKPORT | 0.00459 | 0.00740 | 0.225 |
| 2002 CASTPORT | -0.00250 | -0.00958 | 0.237 |
| 1050 WOLF | 0.00741 | -0.00308 | 0.240 |
| 1036 R 16 | 0.00091 | 0.01100 | 0.259 |
| 1068 KRUMS | 0.00860 | 0.00012 | 0.265 |
| 1056 STRAUSS | 0.00647 | -0.00848 | 0.282 |
| 1041 R 151 | 0.00195 | 0.01254 | 0.301 |
| 1024 BEDFORD | -0.00651 | -0.00995 | 0.310 |
| 5012 OYES | 0.01089 | -0.00315 | 0.344 |
| 1061 PORT CLINTON 2 | 0.01070 | -0.00487 | 0.349 |
| 1018 SUMMER | -0.00662 | -0.01265 | 0.362 |

STATISTICS

File one bbk.sec
 File two gpcl

Min Shift 0.000
 Max Shift 0.362

ATTACHMENT 4
PA FBN/CBN
FINAL ELLIPSOID HEIGHTS vs IDB

| | |
|--------------------------|--------|
| B 316 | 0.000 |
| FAIRPORT | 0.000 |
| MIDDLE | 0.000 |
| PETPPORT | 0.000 |
| ADR PEDESTAL | 0.003 |
| GAITHERSBURG CORS ARP | 0.003 |
| PENN STATE UNIV CORS ARP | 0.003 |
| RICH | -0.005 |
| WILKES BARRE CORS ARP | 0.006 |
| 2G6 C | -0.007 |
| CLARPORT | 0.008 |
| OYM C 1985 | 0.010 |
| O 0 | 0.013 |
| AGC ARP 2 1965 | 0.015 |
| ARP BTP | 0.018 |
| D 362 | -0.019 |
| AFJ C 1993 | 0.020 |
| M 368 | 0.020 |
| BLOOMPORT | 0.022 |
| CLEAPORT | 0.022 |
| PITTSBURG CORS ARP | -0.026 |
| AOO AP 1964 STA B | 0.034 |
| S 101 | 0.034 |
| MIFFPORT | 0.039 |
| EMIGS RM 3 | 0.041 |
| IDI A | -0.041 |
| POCOPORT | 0.043 |
| BOSSLER | 0.045 |
| CHAMPORT | 0.045 |
| ARP 2 1965 HZL | 0.048 |
| WATER | 0.050 |
| M 365 | -0.052 |
| WINGPORT | 0.052 |
| ERI ARP 2 | 0.054 |
| FULOP | 0.054 |
| AVP ARP 1962 | 0.061 |
| RDG ARP 2 1963 | 0.064 |
| 40N I | -0.066 |
| N 353 | 0.066 |
| ARP LBE 1969 | 0.067 |
| TUNA AZ MK | 0.072 |
| JORDAN | 0.073 |
| T I RDGRR RESET 1953 | -0.083 |
| YORKPORT | -0.083 |
| 2G9 A | -0.084 |
| PSB D | -0.090 |
| LNS C | -0.091 |
| ROSTPORT | -0.092 |
| GARDPORT | -0.095 |
| BAKER | 0.103 |
| E 313 | -0.119 |
| 9D4 B | -0.132 |
| N96 A | -0.133 |
| WARMINSTER CBL 430 | -0.136 |
| GOSPEL HILL RM 2 | -0.163 |
| DUJ ARP | -0.188 |

| | |
|-----------|--------|
| M 6 | -0.190 |
| BRANDPORT | -0.207 |
| CAMPORP | -0.273 |
| POTTSPORT | -0.316 |
| KRUMS | -0.501 |
| OYES | -0.528 |

*WV STATION ELLIPSOID HEIGHT REDETERMINED BECAUSE OF LARGE RESIDUALS

CLUSTER PROGRAM
LAST UPDATE 01/30/96

DATA BASE FILE NAME: idb
USERS FILE NAME: final.bbk
COMMON STATION FILE NAME: c
STARTING TOLERANCE: 3.000 SECONDS

CLUSTERED POINTS TOLERANCE 3.000 SECONDS

| SSN | NAME | LATITUDE | LONGITUDE | ELEV | SOURCE | OT | ST | DISTANCE | EPOCH | ADJID |
|------|-------------------|----------------|----------------|--------------|----------|----|----|------------|---------|-------|
| 5008 | 0 0 | 41 8 14.71936 | 77 24 55.70440 | 168.291G | USERFILE | AA | PA | | | |
| | 0 0 | 41 8 14.71936 | 77 24 55.70440 | 168.25G (88) | GPS394 | BA | PA | 0.000 m ✓ | | 83A |
| 1065 | 266 C | 41 37 43.70764 | 80 12 35.20479 | 424.5586 | USERFILE | AA | PA | | | |
| | 266 C | 41 37 43.70764 | 80 12 35.20479 | () | GPS727 | BA | PA | 0.000 m ✓ | | 83A |
| 1023 | 269 A | 40 2 20.53045 | 79 0 55.44313 | 680.082G | USERFILE | AA | PA | | | |
| | 269 A | 40 2 20.53045 | 79 0 55.44313 | 680.00G (88) | GPS1060/ | BA | PA | 0.000 m ✓ | | 83A |
| | 269 A | 40 2 20.53045 | 79 0 55.44313 | 680.02G (88) | GPS1060/ | BA | PA | 0.000 m ✓ | | 83A |
| 5013 | 40N I | 39 58 50.62823 | 75 52 27.22953 | 193.690G | USERFILE | AA | PA | | | |
| | 40N I | 39 58 50.62916 | 75 52 27.22818 | 193.70G (88) | GPS1060/ | 1A | PA | 0.043 m. | | 83A |
| | 40N I | 39 58 50.62916 | 75 52 27.22818 | 193.69G (88) | GPS1060/ | 1A | PA | 0.043 m. | | 83A |
| 1058 | 9D4 B | 40 21 10.58738 | 76 19 45.28174 | 159.690G | USERFILE | AA | PA | | | |
| | 9D4 B | 40 21 10.58738 | 76 19 45.28174 | 159.62G (88) | GPS1060/ | BA | PA | 0.000 m. ✓ | | 83A |
| | 9D4 B | 40 21 10.58738 | 76 19 45.28174 | 159.69G (88) | GPS1060/ | BA | PA | 0.000 m. ✓ | | 83A |
| 1001 | ADR PEDESTAL | 40 30 18.37465 | 79 51 56.24678 | 326.190G | USERFILE | AA | PA | | | |
| | ADR PEDESTAL | 40 30 18.37465 | 79 51 56.24678 | 326.07G (88) | GPS908 | AA | PA | 0.000 m ✓ | 1995.00 | 83A |
| | ADR PEDESTAL | 40 30 18.37465 | 79 51 56.24678 | 326.19G (88) | GPS908 | AA | PA | 0.000 m ✓ | 1995.00 | 83A |
| 1005 | AFJ C 1993 | 40 8 10.12141 | 80 17 27.95004 | 359.969G | USERFILE | AA | PA | | | |
| | AFJ C 1993 | 40 8 10.12089 | 80 17 27.95021 | () | GPS739 | 1A | PA | 0.017 m. | | 83A |
| 1004 | AGC ARP 2 1965 | 40 21 17.00710 | 79 55 46.89855 | 380.676G | USERFILE | AA | PA | | | |
| | AGC ARP 2 1965 | 40 21 17.00710 | 79 55 46.89855 | 380.64G (88) | GPS739 | BA | PA | 0.000 m ✓ | | 83A |
| 1025 | AOO AP 1964 STA B | 40 17 19.44778 | 78 19 24.91437 | 457.991G | USERFILE | AA | PA | | | |
| | AOO AP 1964 STA B | 40 17 19.44778 | 78 19 24.91437 | () | GPS748 | BA | PA | 0.000 m ✓ | | 83A |
| 1090 | AP STA A 2 BFD | 41 47 51.58005 | 78 37 54.04551 | 639.101G | USERFILE | AA | PA | | | |
| | AP STA A 2 BFD | 41 47 51.58120 | 78 37 54.04259 | () | 17657/F | 3A | PA | 0.076 m. | | 83A |
| 1059 | ARP 2 1965 HZL | 40 59 13.52071 | 75 59 35.10869 | 488.001L | USERFILE | AA | PA | | | |
| | ARP 2 1965 HZL | 40 59 13.52071 | 75 59 35.10669 | 488.00L (88) | GPS748 | BA | PA | 0.000 m ✓ | | 83A |
| 1003 | ARP BTP | 40 46 35.61474 | 79 56 58.13605 | 378.975G | USERFILE | AA | PA | | | |
| | ARP BTP | 40 46 35.61474 | 79 56 58.13605 | 378.94G (88) | GPS727 | BA | PA | 0.000 m ✓ | | 83A |
| 1002 | ARP LBE 1969 | 40 16 38.95959 | 79 24 13.16115 | 343.853G | USERFILE | AA | PA | | | |
| | ARP LBE 1969 | 40 16 38.95959 | 79 24 13.16115 | 343.77G (88) | GPS739 | BA | PA | 0.000 m ✓ | | 83A |
| 1077 | AVP ARP 1962 | 41 20 17.76246 | 75 43 27.28603 | 284.534G | USERFILE | AA | PA | | | |
| | AVP ARP 1962 | 41 20 17.76246 | 75 43 27.28603 | () | GPS748 | BA | PA | 0.000 m ✓ | | 83A |
| 5003 | B 316 | 39 56 29.89953 | 80 45 14.91017 | 207.220A | USERFILE | AA | WV | | | |
| | B 316 | 39 56 29.89953 | 80 45 14.91017 | 207.22A (88) | GPS882/B | BA | WV | 0.000 m. ✓ | | 83A |
| | B 316 | 39 56 29.89953 | 80 45 14.91017 | 207.22L (88) | GPS882/B | BA | WV | 0.000 m. ✓ | | 83A |
| 1006 | BAKER | 40 42 20.35922 | 80 22 27.52599 | 367.497G | USERFILE | AA | PA | | | |

| | | | | | | | | |
|--------------------------------|----------------|----------------|--------------|----------|----|----|------------|-----|
| BAKER | 40 42 20.35922 | 80 22 27.52599 | 367.45G (88) | GPS882/B | BA | PA | 0.000 m ✓ | 83A |
| 1024 BEDFORD | 40 2 35.50720 | 78 30 12.16128 | 453.990G | USERFILE | AA | PA | | |
| BEDFORD | 40 2 35.51371 | 78 30 12.17124 | { | 17658 | 11 | PA | 0.310 m. | 83A |
| BEDFORD RADIO STA WAKM-FM MAST | 40 2 35.79386 | 78 30 12.58131 | } | 17658 | 43 | PA | 13.316 m. | 83A |
| 2005 BLOOMPORT | 40 59 50.73403 | 76 26 18.81208 | 145.119G | USERFILE | AA | PA | | |
| BLOOMPORT | 40 59 50.73403 | 76 26 18.81208 | 145.09G (88) | GPS394 | AA | PA | 0.000 m. ✓ | 83A |
| 5002 BOSSLER | 40 27 37.61452 | 78 46 34.78734 | 637.127G | USERFILE | AA | PA | | |
| BOSSLER | 40 27 37.61452 | 78 46 34.78734 | 637.06G (88) | GPS394 | BA | PA | 0.000 m. ✓ | 83A |
| 1066 BRANDPORT | 39 59 24.80539 | 75 34 46.72091 | 141.150G | USERFILE | AA | PA | | |
| BRANDPORT | 39 59 24.80514 | 75 34 46.72191 | () | 17657/H | 3A | PA | 0.025 m. | 83A |
| 1008 CAMPORT | 40 21 2.58132 | 80 10 48.48537 | 362.125G | USERFILE | AA | PA | | |
| CAMPORT | 40 21 2.58104 | 80 10 48.48323 | () | 17658 | 3A | PA | 0.051 m. | 83A |
| 1067 CARBPORT | 40 48 32.95089 | 75 45 48.16804 | 159.045G | USERFILE | AA | PA | | |
| CARBPORT | 40 48 32.94755 | 75 45 48.16116 | () | GPS144 | 3A | PA | 0.191 m. | 83A |
| 2002 CASTPORT | 41 1 28.34848 | 80 24 52.57929 | 315.089G | USERFILE | AA | PA | | |
| CASTPORT | 41 1 28.35098 | 80 24 52.58887 | () | 17658 | 3A | PA | 0.237 m. | 83A |
| 1029 CHAMPORT | 39 58 17.34130 | 77 38 45.00845 | 208.700L | USERFILE | AA | PA | | |
| CHAMPORT | 39 58 17.34130 | 77 38 45.00845 | 208.70L (88) | GPS647 | BA | PA | 0.000 m. ✓ | 83A |
| 2008 CLARPORT | 41 13 31.98790 | 79 26 26.16767 | 441.942G | USERFILE | AA | PA | | |
| CLARPORT | 41 13 31.98790 | 79 26 26.16767 | 441.83G (88) | GPS394 | AA | PA | 0.000 m. ✓ | 83A |
| 2003 CLEAPORT | 41 2 54.20930 | 78 24 49.93388 | 461.627G | USERFILE | AA | PA | | |
| CLEAPORT | 41 2 54.20930 | 78 24 49.93388 | 461.57G (88) | GPS394 | BA | PA | 0.000 m. ✓ | 83A |
| 1094 CORRPORT | 41 54 25.90613 | 79 38 27.63417 | 527.249G | USERFILE | AA | PA | | |
| CORRPORT | 41 54 25.90827 | 79 38 27.63919 | () | 17657/F | 3A | PA | 0.133 m. | 83A |
| 2007 D 362 | 42 9 11.31355 | 80 4 42.43664 | 175.522A | USERFILE | AA | PA | | |
| D 362 | 42 9 11.31355 | 80 4 42.43664 | 175.52A (88) | GPS1212 | AA | PA | 0.000 m. ✓ | 83A |
| D 362 | 42 9 11.31355 | 80 4 42.43664 | 175.53L (88) | GPS1212 | AA | PA | 0.000 m. | 83A |
| ERIE HBR INNER RNG R LT | 42 9 11.47267 | 80 4 43.04894 | { | 17657/F | 41 | PA | 14.891 m. | 83A |
| 1095 DRAKE CBL 0 | 41 36 56.00964 | 79 44 31.88916 | 487.079G | USERFILE | AA | PA | | |
| DRAKE CBL 0 | 41 36 56.01204 | 79 44 31.89137 | () | 17657/F | 3A | PA | 0.090 m. | 83A |
| 1030 DUJ ARP | 41 10 42.64329 | 78 53 49.51946 | 548.609G | USERFILE | AA | PA | | |
| DUJ ARP | 41 10 42.64329 | 78 53 49.51946 | 548.55G (88) | GPS1060/ | BA | PA | 0.000 m. ✓ | 83A |
| DUJ ARP | 41 10 42.64329 | 78 53 49.51946 | 548.75G (88) | GPS1060/ | BA | PA | 0.000 m. ✓ | 83A |
| 1009 E 313 | 39 40 10.80785 | 79 55 9.32003 | 377.956A | USERFILE | AA | WV | | |
| E 313 | 39 40 10.80785 | 79 55 9.32003 | 377.95A (88) | GPS1060/ | BA | WV | 0.000 m. ✓ | 83A |
| E 313 | 39 40 10.80785 | 79 55 9.32003 | 377.96L (88) | GPS1060/ | BA | WV | 0.000 m. ✓ | 83A |
| 1072 EASTPORT | 40 44 31.88731 | 75 14 43.92660 | 119.293G | USERFILE | AA | PA | | |
| EASTPORT | 40 44 31.88635 | 75 14 43.92125 | () | 17657/H | 3A | PA | 0.129 m. | 83A |
| 5011 EMIGS RM 3 | 40 1 37.71836 | 76 44 41.28571 | 159.950G | USERFILE | AA | PA | | |
| EMIGS | 40 1 37.74870 | 76 44 41.11899 | 159.89A (88) | 17499 | 26 | PA | 4.062 m. ✓ | 83A |
| EMIGS RM 3 | 40 1 37.71836 | 76 44 41.28571 | 159.90G (88) | GPS394 | BA | PA | 0.000 m. ✓ | 83A |
| 1082 ERI ARP 2 | 42 4 52.89364 | 80 10 42.24795 | 222.019G | USERFILE | AA | PA | | |
| ERI ARP 2 | 42 4 52.89364 | 80 10 42.24795 | () | GPS727 | BA | PA | 0.000 m. ✓ | 83A |
| 1011 FAA 867 A | 40 47 50.17165 | 80 9 31.19859 | 274.288G | USERFILE | AA | PA | | |
| FAA 867 A | 40 47 50.17074 | 80 9 31.20018 | () | 17658 | 3A | PA | 0.047 m. | 83A |
| 5004 FAIRPORT | 39 27 2.70920 | 80 9 52.99144 | 308.240G | USERFILE | AA | WV | | |

| | | | | | | | | | | | | |
|--------------------------------|-------|----------|-------|----------|----------|------|----------|----|----|----------|---------|---------|
| FAIRPORT | 39 27 | 2.70920 | 80 9 | 52.99144 | 308.246 | (88) | GPS908/A | BA | WV | 0.000 m | 1995.00 | 83A |
| .005 FULOP | 39 56 | 37.15740 | 77 59 | 56.18004 | 285.884G | | USERFILE | AA | PA | | | |
| FULOP | 39 56 | 37.15740 | 77 59 | 56.18004 | 285.896 | (88) | GPS394 | BA | PA | 0.000 m | | 83A |
| FULOP | 39 56 | 37.15740 | 77 59 | 56.18004 | 285.916 | (88) | GPS394 | BA | PA | 0.000 m | | 83A |
| .003 GAITHERSBURG CORS ARP | 39 8 | 2.34051 | 77 13 | 15.51904 | 140.661K | | USERFILE | AA | MD | | | |
| GAITHERSBURG CORS L1 PHASE CEN | 39 8 | 2.34060 | 77 13 | 15.51927 | 140.76K | (88) | CORS0338 | AA | MD | 0.006 m | 1997.00 | 83A |
| GAITHERSBURG CORS-GROUNDPLANE | 39 8 | 2.34070 | 77 13 | 15.51926 | 140.856 | (88) | GPS852 | AA | MD | 0.008 m | | 83A |
| GAITHERSBURG CORS-GROUNDPLANE | 39 8 | 2.34070 | 77 13 | 15.51926 | 140.486 | (88) | GPS852 | AA | MD | 0.008 m | | 83A |
| GAITHERSBURG CORS-GROUNDPLANE | 39 8 | 2.34070 | 77 13 | 15.51926 | 140.706 | (88) | GPS852 | AA | MD | 0.008 m | | 83A |
| GAITHERSBURG CORS ARP | 39 8 | 2.34060 | 77 13 | 15.51927 | 140.66K | (88) | CORS0338 | AA | MD | 0.006 m | 1997.00 | 83A new |
| .060 GARDPORT | 39 49 | 58.32244 | 75 45 | 56.53493 | 133.650G | | USERFILE | AA | PA | | | |
| GARDPORT | 39 49 | 58.32071 | 75 45 | 56.54022 | | () | 17499 | 3A | PA | 0.137 m | | 83A |
| .007 GOSPEL HILL RM 2 | 40 30 | 57.01118 | 78 24 | 21.84088 | 405.229A | | USERFILE | AA | PA | | | |
| GOSPEL HILL | 40 30 | 57.78932 | 78 24 | 21.36739 | 405.81A | (88) | 17289 | 24 | PA | 26.464 m | | 83A |
| GOSPEL HILL RM 2 | 40 30 | 57.01118 | 78 24 | 21.84088 | 405.23A | (88) | GPS1060/ | BA | PA | 0.000 m | | 83A |
| GOSPEL HILL RM 2 | 40 30 | 57.01118 | 78 24 | 21.84088 | 405.23L | (88) | GPS1060/ | BA | PA | 0.000 m | | 83A |
| ALTOONA GOSPEL HILL FLAGPOLE | 40 30 | 57.56095 | 78 24 | 21.79037 | | () | 17289 | 43 | PA | 17.000 m | | 83A |
| 1086 GRANDPORT | 41 43 | 40.11281 | 77 23 | 27.76119 | 572.480G | | USERFILE | AA | PA | | | |
| GRANDPORT | 41 43 | 40.11384 | 77 23 | 27.75763 | | () | 17657/F | 3A | PA | 0.088 m | | 83A |
| 1080 GREENPORT | 41 26 | 49.11913 | 80 23 | 31.63475 | 360.514G | | USERFILE | AA | PA | | | |
| GREENPORT | 41 26 | 49.12224 | 80 23 | 31.63698 | | () | 17658 | 3A | PA | 0.109 m | | 83A |
| 1088 HARRISON RESET | 41 54 | 59.07838 | 77 41 | 51.19544 | 782.996G | | USERFILE | AA | PA | | | |
| HARRISON RESET | 41 54 | 59.07351 | 77 41 | 51.20145 | | () | 17657/F | 11 | PA | 0.204 m | | 83A |
| 1044 HOFFPORT | 40 50 | 15.95007 | 76 32 | 52.32034 | 266.795G | | USERFILE | AA | PA | | | |
| HOFFPORT | 40 50 | 15.95092 | 76 32 | 52.32245 | | () | GPS144 | 3A | PA | 0.056 m | | 83A |
| 1073 HOME | 41 14 | 53.04796 | 75 49 | 40.84280 | 292.516A | | USERFILE | AA | PA | | | |
| HOME | 41 14 | 53.04777 | 75 49 | 40.84512 | 292.51A | (88) | 17289 | 26 | PA | 0.054 m | | 83A |
| 1079 HONEPORT | 41 30 | 59.52489 | 75 15 | 8.03201 | 409.018G | | USERFILE | AA | PA | | | |
| HONEPORT | 41 30 | 59.52267 | 75 15 | 8.02458 | | () | 17657/H | 3A | PA | 0.185 m | | 83A |
| 1015 IDI A | 40 37 | 56.25166 | 79 6 | 38.59198 | 414.626G | | USERFILE | AA | PA | | | |
| IDI A | 40 37 | 56.25166 | 79 6 | 38.59198 | 414.44G | (88) | GPS1060/ | BA | PA | 0.000 m | | 83A |
| IDI A | 40 37 | 56.25166 | 79 6 | 38.59198 | 414.60G | (88) | GPS1060/ | BA | PA | 0.000 m | | 83A |
| 5014 JORDAN | 40 37 | 39.70717 | 75 29 | 0.80753 | 101.823A | | USERFILE | AA | PA | | | |
| JORDAN | 40 37 | 39.70717 | 75 29 | 0.80753 | 101.82A | (88) | GPS394 | BA | PA | 0.000 m | | 83A |
| JORDAN | 40 37 | 39.70717 | 75 29 | 0.80753 | 101.82L | (88) | GPS394 | BA | PA | 0.000 m | | 83A |
| 1084 KROUSE | 41 23 | 18.53971 | 76 30 | 23.10111 | 594.151A | | USERFILE | AA | PA | | | |
| KROUSE | 41 23 | 18.53601 | 76 30 | 23.09943 | 594.15A | (88) | 17289 | 26 | PA | 0.121 m | | 83A |
| 1068 KRUMS | 40 34 | 39.71576 | 75 47 | 51.61680 | 235.378A | | USERFILE | AA | PA | | | |
| KRUMS | 40 34 | 39.70716 | 75 47 | 51.61668 | 235.38A | (88) | 17289 | 26 | PA | 0.265 m | | 83A |
| 1054 LNS C | 40 7 | 14.48321 | 76 17 | 47.50679 | 121.040G | | USERFILE | AA | PA | | | |
| LNS C | 40 7 | 14.48321 | 76 17 | 47.50679 | 120.96G | (88) | GPS1060/ | BA | PA | 0.000 m | | 83A |
| LNS C | 40 7 | 14.48321 | 76 17 | 47.50679 | 121.04G | (88) | GPS1060/ | BA | PA | 0.000 m | | 83A |
| 1039 LOCUST | 40 33 | 24.99580 | 77 16 | 47.64417 | 198.667G | | USERFILE | AA | PA | | | |
| LOCUST | 40 33 | 24.99374 | 77 16 | 47.64406 | | () | 17289 | 26 | PA | 0.064 m | | 83A |
| 1045 LUNDY | 40 12 | 58.66455 | 76 47 | 23.69366 | 120.075A | | USERFILE | AA | PA | | | |
| LUNDY | 40 12 | 58.65875 | 76 47 | 23.69043 | 120.08A | (88) | 17289 | 31 | PA | 0.195 m | | 83A |
| 5010 M 365 | 40 6 | 58.30496 | 77 20 | 3.66190 | 213.996A | | USERFILE | AA | PA | | | |
| M 365 | 40 6 | 58.30496 | 77 20 | 3.66190 | 214.00A | (88) | GPS1060/ | BA | PA | 0.000 m | | 83A |

| | | | | | | | | | |
|------|--|--|--|--|----------------------------------|----------------|----------------|--------------------------|------------|
| 1082 | QUAKE QUAKE | 40 51 12.85915 40 51 12.85925 | 76 3 33.12649 76 3 33.12960 | 594.683G () | USERFILE 17289 | AA 26 | PA PA | 0.073 m. | 83A |
| 1041 | R 151 R 151 | 40 36 46.63374 40 36 46.63179 | 77 34 5.29378 77 34 5.28124 | 147.813A 147.81A (88) | USERFILE GPS144 | AA 3A | PA PA | 0.301 m. | 83A |
| 1036 | R 16 R 16 | 40 52 49.65460 40 52 49.65369 | 77 54 58.16813 77 54 58.15713 | 250.623A 250.62A (88) | USERFILE GPS144 | AA 3A | PA PA | 0.259 m. | 83A |
| 1063 | RDG ARP 2 1963 RDG ARP 2 1963 | 40 22 42.28100 40 22 42.28100 | 75 57 51.35652 75 57 51.35652 | 95.860L 95.86L (88) | USERFILE GPS749 | AA BA | PA PA | 0.000 m. ✓ | 83A |
| 1096 | RED HILL RM 1 RED HILL | 40 29 45.22891 40 29 44.98364 | 77 7 2.06747 77 7 2.19177 | 188.269A 188.81A (88) | USERFILE 17289 | AA 26 | PA PA | 8.112 m. | 83A |
| 5021 | RICH RICH RICH | 41 52 42.68349 41 52 42.68349 41 52 42.68349 | 79 54 31.89619 79 54 31.89619 79 54 31.89619 | 445.520G 445.42G (88) 445.55G (88) | USERFILE GPS394 GPS394 | AA BA BA | PA PA PA | 0.000 m. ✓ 0.000 m. ✓ | 83A 83A |
| 2001 | ROSTPORT ROSTPORT ROSTPORT | 40 12 34.82664 40 12 34.82633 40 12 34.82633 | 79 49 49.31751 79 49 49.31750 79 49 49.31750 | 371.019G 370.91G (88) 371.05G (88) | USERFILE GPS1060/ GPS1060/ | AA 1A 1A | PA PA PA | 0.010 m. 0.010 m. | 83A 83A |
| 1042 | S 101 S 101 | 39 50 37.41478 39 50 37.41298 | 77 15 33.42584 77 15 33.42820 | 167.970A 167.97A (88) | USERFILE 17658 | AA 3A | PA PA | 0.079 m. | 83A |
| 1087 | SCENIC SCENIC | 41 13 35.10146 41 13 35.09644 | 76 56 18.71846 76 56 18.71418 | 322.908A 322.91A (88) | USERFILE 17289 | AA 26 | PA PA | 0.184 m. | 83A |
| 1048 | SELINGSGROVE SELINGSGROVE | 40 48 9.67419 40 48 9.67500 | 76 51 45.11313 76 51 45.11489 | 135.045A 135.04A (88) | USERFILE GPS144 | AA 3A | PA PA | 0.048 m. | 83A |
| 1089 | SHIVERY SHIVERY | 41 44 40.90856 41 44 40.91147 | 77 36 43.24049 77 36 43.24884 | 458.481G () | USERFILE 17657/F | AA 26 | PA PA | 0.213 m. | 83A |
| 1056 | STRAUSS STRAUSS | 40 29 55.74506 40 29 55.73859 | 76 11 29.92370 76 11 29.93218 | 195.756A 195.76A (88) | USERFILE 17289 | AA 26 | PA PA | 0.282 m. | 83A |
| 1075 | STROPORT STROPORT | 41 2 6.85293 41 2 6.85353 | 75 9 43.92735 75 9 43.92826 | 144.697G () | USERFILE 17657/H | AA 3A | PA PA | 0.028 m. | 83A |
| 1018 | SUMMER SUMMER | 40 21 37.68659 40 21 37.69321 | 78 45 58.46366 78 45 58.47632 | 586.276A 586.28A (88) | USERFILE 17289 | AA 26 | PA PA | 0.362 m. | 83A |
| 5016 | T 1 RDGRR RESET 1953 T 1 RDGRR RESET 1053 T 1 RDGRR RESET 1953 | 40 8 9.31442 40 8 9.31524 40 8 9.31524 | 75 30 39.81123 75 30 39.81130 75 30 39.81130 | 32.546A 32.55A (88) 32.55L (88) | USERFILE GPS1060/ GPS1060/ | AA 1A 1A | PA PA PA | 0.025 m. 0.025 m. | 83A 83A |
| 1019 | TT 5 3 TT 5 3 | 40 59 18.34284 40 59 18.33921 | 79 34 58.86129 79 34 58.86298 | 411.225G () | USERFILE 17289 | AA 33 | PA PA | 0.119 m. | 83A |
| 5020 | TUNA AZ MK TUNA AZ MK TUNA AZ MK | 41 59 47.73740 41 59 47.73740 41 59 47.73740 | 78 37 23.56079 78 37 23.56079 78 37 23.56079 | 430.460A 430.46A (88) 430.46L (88) | USERFILE GPS394 GPS394 | AA BA BA | PA PA PA | 0.000 m. ✓ 0.000 m. ✓ | 83A 83A |
| 1049 | UNION UNION | 40 59 41.66042 40 59 41.66001 | 76 52 27.38264 76 52 27.37916 | 154.740A () | USERFILE 17289 | AA 24 | PA PA | 0.082 m. | 83A |
| 1076 | WARMINSTER CBL 430 WARMINSTER CBL 430 WARMINSTER CBL 430 | 40 11 56.36209 40 11 56.36209 40 11 56.36209 | 75 3 40.89557 75 3 40.89557 75 3 40.89557 | 110.573G 110.60G (88) 110.64G (88) | USERFILE GPS1060/ GPS1060/ | AA BA BA | PA PA PA | 0.000 m. ✓ 0.000 m. ✓ | 83A 83A |
| 1071 | WATER WATER | 39 53 4.22766 39 53 4.22759 | 75 13 17.03199 75 13 17.03140 | 2.664G 2.63G (88) | USERFILE 17657/G | AA 1A | PA PA | 0.014 m. | 83A |
| 9008 | WIL1 B | 41 18 16.29522 | 76 0 57.10295 | 400.228G | USERFILE | AA | PA | | |

| | | | | | | | | |
|--------------------------------|----------------|----------------|--------------|----------|----|----|-------------------|-----|
| HAYFIELD SW 1974 | 41 18 15.88252 | 76 0 57.59839 | | 17289 | 2 | PA | 17.174 m. | 83A |
| WILKES BARRE CORS L1 PHASE CEN | 41 18 18.91356 | 76 0 55.10112 | | CORS0390 | AA | PA | 93.238 m. 1997.00 | 83A |
| WILKES BARRE CORS ARP | 41 18 18.91351 | 76 0 55.10107 | | CORS0390 | AA | PA | 93.237 m. 1997.00 | 83A |
| HAYFIELD SW 1974 | 41 18 15.88252 | 76 0 57.59839 | | 17289 | 2 | PA | 17.174 m. | 83A |
| WILKES BARRE CORS L1 PHASE CEN | 41 18 18.91356 | 76 0 55.10112 | | CORS0390 | AA | PA | 93.238 m. 1997.00 | 83A |
| WILKES BARRE CORS ARP | 41 18 18.91351 | 76 0 55.10107 | | CORS0390 | AA | PA | 93.237 m. 1997.00 | 83A |
| HAYFIELD SW 1974 | 41 18 15.88252 | 76 0 57.59839 | | 17289 | 2 | PA | 17.174 m. | 83A |
| WILKES BARRE CORS L1 PHASE CEN | 41 18 18.91356 | 76 0 55.10112 | | CORS0390 | AA | PA | 93.238 m. 1997.00 | 83A |
| WILKES BARRE CORS ARP | 41 18 18.91351 | 76 0 55.10107 | | CORS0390 | AA | PA | 93.237 m. 1997.00 | 83A |
| 9004 WILKES BARRE CORS ARP | 41 18 18.91357 | 76 0 55.10117 | 417.375G | USERFILE | AA | PA | | |
| HAYFIELD NE 1974 | 41 18 20.25410 | 76 0 57.00239 | | 17289 | 2 | PA | 60.551 m. | 83A |
| WILKES BARRE CORS L1 PHASE CEN | 41 18 18.91356 | 76 0 55.10112 | | CORS0390 | AA | PA | 0.001 m. 1997.00 | 83A |
| WILKES BARRE CORS ARP | 41 18 18.91351 | 76 0 55.10107 | | CORS0390 | AA | PA | 0.003 m. 1997.00 | 83A |
| HAYFIELD NE 1974 | 41 18 20.25410 | 76 0 57.00239 | | 17289 | 2 | PA | 60.551 m. | 83A |
| WILKES BARRE CORS L1 PHASE CEN | 41 18 18.91356 | 76 0 55.10112 | | CORS0390 | AA | PA | 0.001 m. 1997.00 | 83A |
| WILKES BARRE CORS ARP | 41 18 18.91351 | 76 0 55.10107 | | CORS0390 | AA | PA | 0.003 m. 1997.00 | 83A |
| HAYFIELD NE 1974 | 41 18 20.25410 | 76 0 57.00239 | | 17289 | 2 | PA | 60.551 m. | 83A |
| WILKES BARRE CORS L1 PHASE CEN | 41 18 18.91356 | 76 0 55.10112 | | CORS0390 | AA | PA | 0.001 m. 1997.00 | 83A |
| WILKES BARRE CORS ARP | 41 18 18.91351 | 76 0 55.10107 | | CORS0390 | AA | PA | 0.003 m. 1997.00 | 83A |
| 5017 WINGPORT | 40 8 3.75486 | 75 16 12.59990 | 91.802G | USERFILE | AA | PA | | |
| WINGPORT | 40 8 3.75486 | 75 16 12.59990 | 91.84G (88) | GPS394 | BA | PA | 0.000 m. ✓ | 83A |
| WINGPORT | 40 8 3.75486 | 75 16 12.59990 | 91.24G (88) | GPS394 | BA | PA | 0.000 m. ✓ | 83A |
| 1050 WOLF | 40 25 3.72270 | 76 37 16.28430 | 156.146A | USERFILE | AA | PA | | |
| WOLF | 40 25 3.71529 | 76 37 16.28738 | 156.15A (88) | 17289 | 26 | PA | 0.240 m. | 83A |
| 1043 YORKPORT | 39 55 24.00636 | 76 52 37.68883 | 144.554G | USERFILE | AA | PA | | |
| YORKPORT | 39 55 24.00636 | 76 52 37.68883 | 144.44G (88) | GPS1060/ | BA | PA | 0.000 m. ✓ | 83A |
| YORKPORT | 39 55 24.00636 | 76 52 37.68883 | 144.51G (88) | GPS1060/ | BA | PA | 0.000 m. ✓ | 83A |
| 1057 ZERBPORT | 40 42 19.09495 | 76 22 15.57840 | 520.183G | USERFILE | AA | PA | | |
| ZERBPORT | 40 42 19.09306 | 76 22 15.57865 | () | GPS144 | 3A | PA | 0.059 m. | 83A |

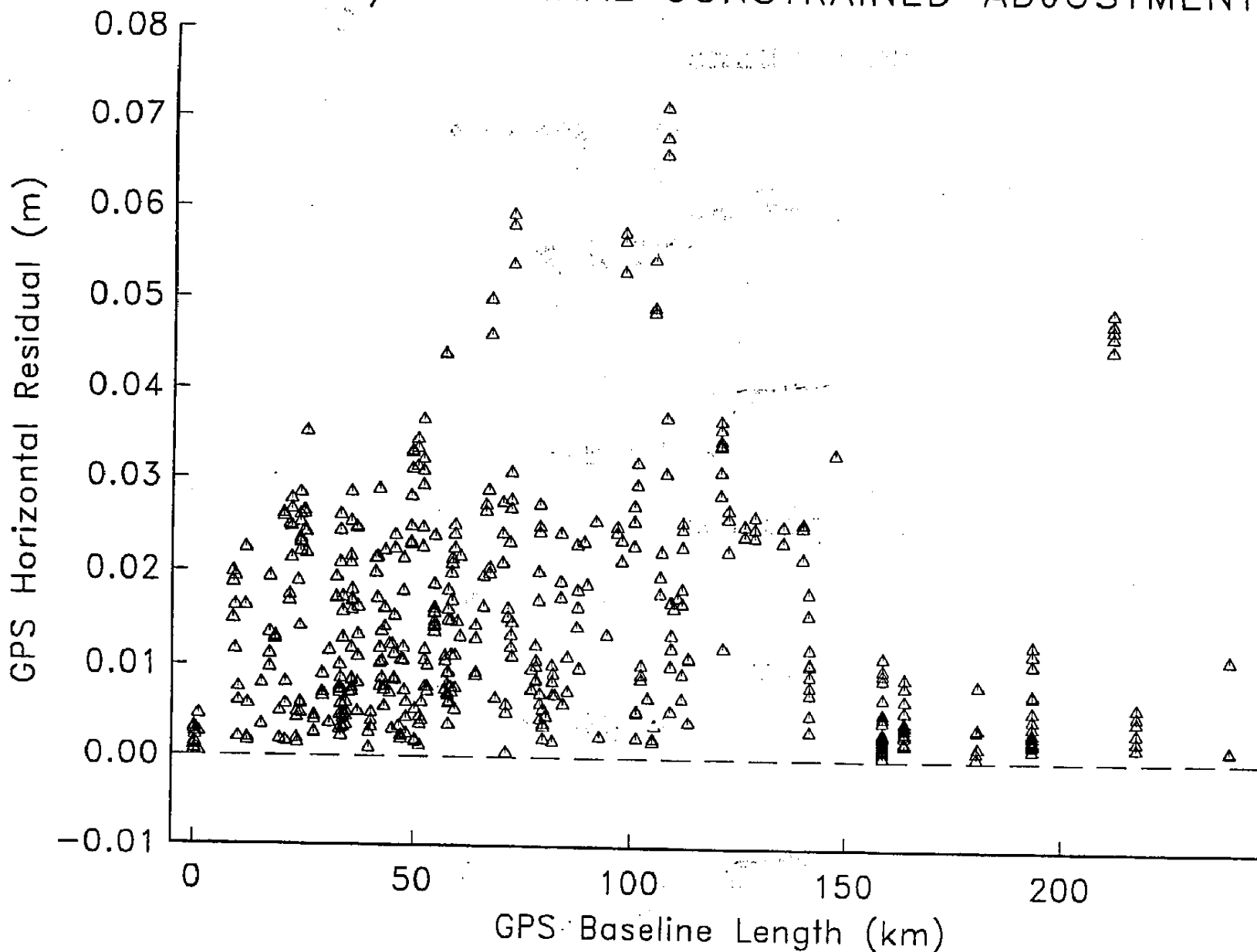
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ATTACHMENT 5B
PA FBN/CBN FINAL CONTROLS

| STATION NAME | O/T | HEIGHTS (M) | SOURCE |
|--------------------------|-----|-------------|-------------|
| 0 0 | BA | | GPS394 |
| 2G6 C | BA | | GPS727 |
| 2G9 A | BA | | GPS1060/A |
| 9D4 B | BA | | GPS1060/A |
| ADR PEDESTAL | AA | | GPS908 |
| AGC ARP 2 1965 | BA | | GPS739 |
| AOO AP 1964 STA B | BA | | GPS748 |
| ARP 2 1965 HZL | BA | | GPS748 |
| ARP BTP | BA | | GPS727 |
| ARP LBE 1969 | BA | | GPS739 |
| AVP ARP 1962 | BA | | GPS748 |
| B 316 | BA | 173.443 | GPS882/B |
| BAKER | BA | | GPS882/B |
| BLOOMPORT | AA | | GPS394 |
| BOSSLER | BA | | GPS394 |
| CHAMPORT | BA | | GPS647 |
| CLARPORT | AA | | GPS394 |
| CLEAPORT | BA | | GPS394 |
| D 362 | AA | | GPS1212 |
| DUJ ARP | BA | | GPS1060/A |
| E 313 | BA | | GPS1060/A * |
| EMIGS RM 3 | BA | | GPS394 |
| ERI ARP 2 | BA | | GPS727 |
| FAIRPORT | BA | 275.769 | GPS908/A |
| FULOP | BA | | GPS394 |
| GAITHERSBURG CORS ARP | AA | 108.940 | GPS1463 |
| GOSPEL HILL RM 2 | BA | | GPS1060/A |
| IDI A | BA | | GPS1060/A |
| JORDAN | BA | | GPS394 |
| LNS C | BA | | GPS1060/A |
| M 365 | BA | | GPS1060/A |
| MIDDLE | BA | 189.978 | GPS260 |
| MIFFPORT | BA | | GPS394 |
| N 353 | BA | | GPS394 |
| N96 A | BA | | GPS1060/A |
| OYM C 1985 | BA | | GPS748 |
| PENN STATE UNIV CORS ARP | AA | 312.461 | GPS1463 |
| PETPORT | BA | 257.566 | GPS908/A |
| PITTSBURG CORS ARP | AA | 354.213 | GPS1463 |
| POCOPORT | BA | | GPS394 |
| PSB D | BA | | GPS1060/A |
| RDG ARP 2 1963 | BA | | GPS749 |
| RICH | BA | | GPS394 |
| TUNA AZ MK | BA | | GPS394 |
| WARMINSTER CBL 430 | BA | | GPS1060/A |
| WILKES BARRE CORS ARP | AA | 385.655 | GPS1463 |
| WINGPORT | BA | | GPS394 |
| YORKPORT | BA | | GPS1060/A |

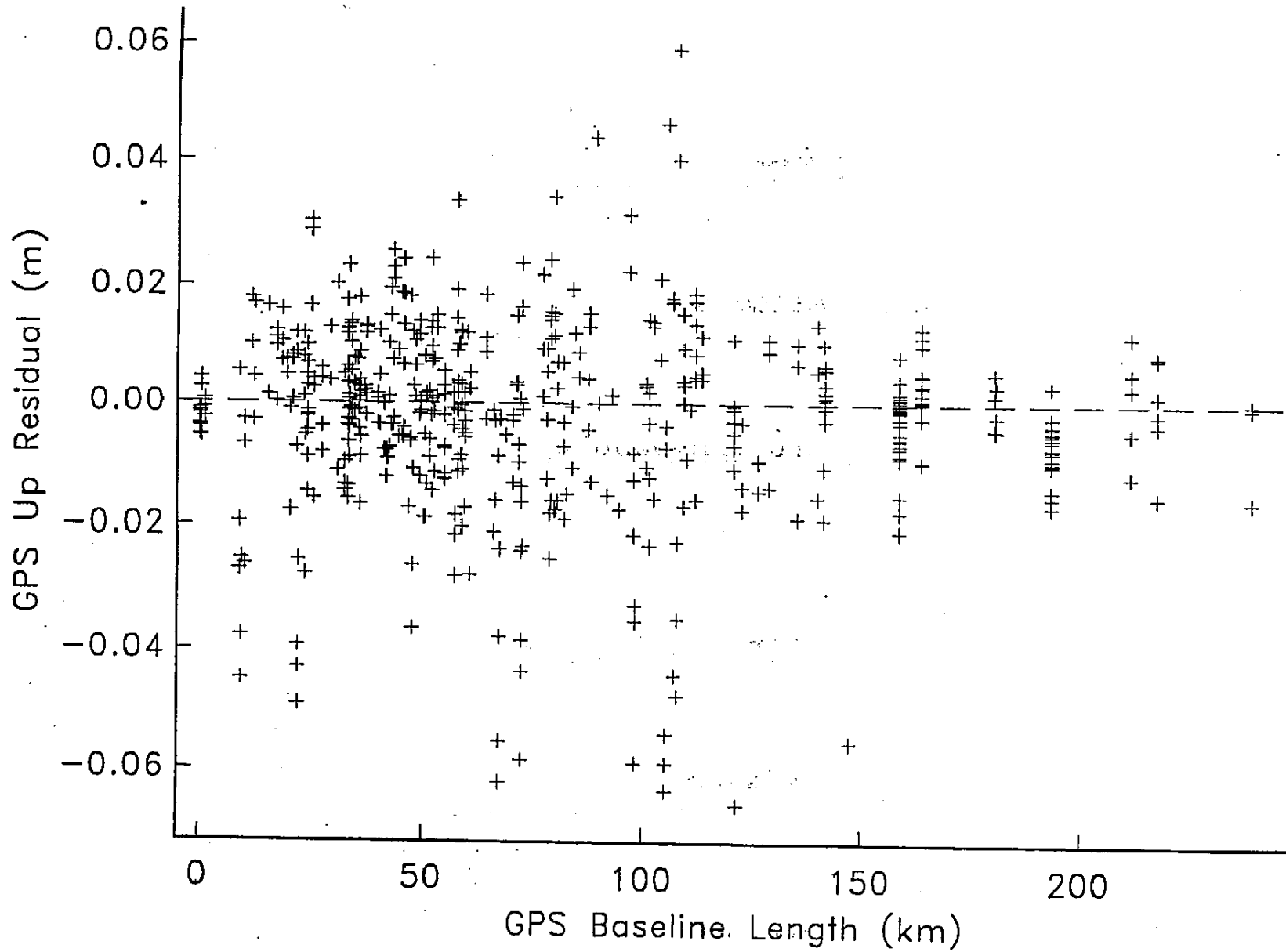
* ELLIPSOID HEIGHT REDETERMINED IN THE FINAL ADJUSTMENT

PA FBN/CBN FINAL CONSTRAINED ADJUSTMENT



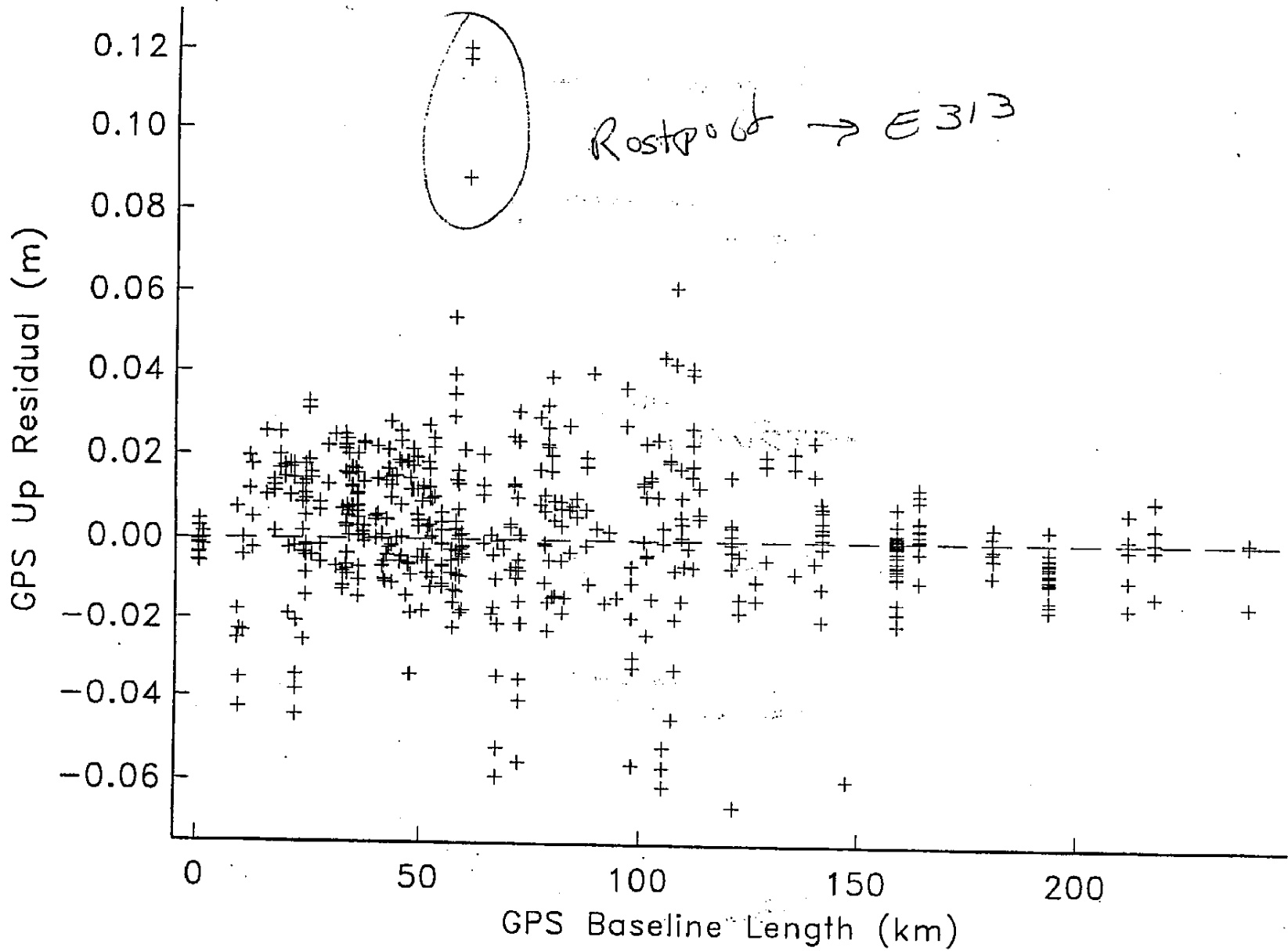
Adjustment of Mar 26 2001 at 14:35
Mean value is 0.014 meters

PA FBN/CBN FINAL CONSTRAINED ADJUSTMENT



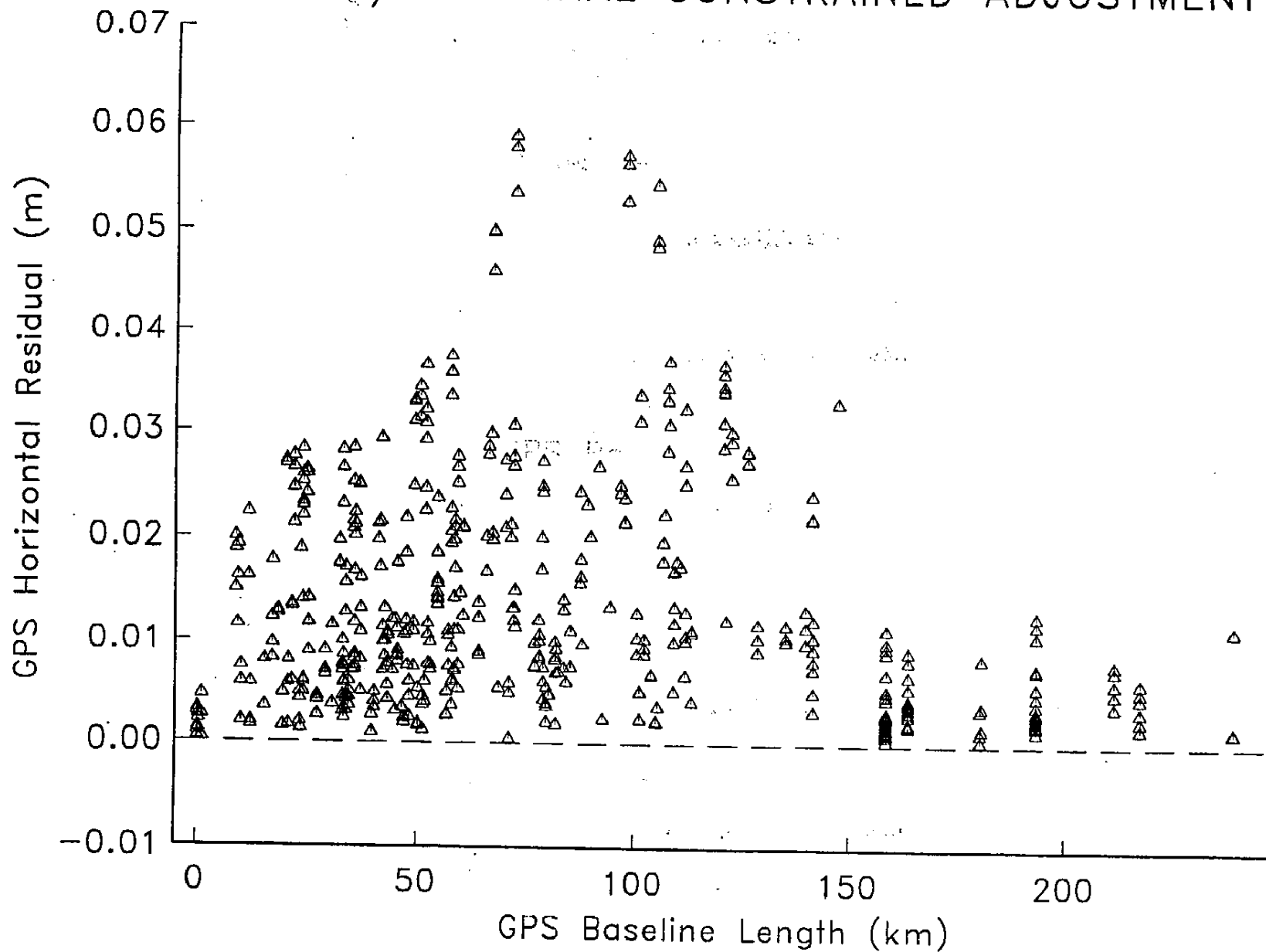
Adjustment of Mar 26 2001 at 14:35
Mean value is 0.011 meters

PA FBN/CBN FINAL CONSTRAINED ADJUSTMENT



Adjustment of Feb 28 2001 at 10:48
Mean value is 0.013 meters

PA FBN/CBN FINAL CONSTRAINED ADJUSTMENT



Adjustment of Feb 28 2001 at 10:48
Mean value is 0.013 meters

ATTACHMENT 6
PA FBN/CBN
FREE VERTICAL HEIGHTS vs IDB

| SSN | DESIGNATION | CONST | FREE | DIFF (cm) |
|------|-----------------------|---------|---------|-----------|
| 1021 | 101 USGS | 415.552 | 415.550 | -0.2 |
| 1022 | 19 JWM | 339.813 | 339.810 | -0.3 |
| 5013 | 40N I | 193.690 | 193.690 | 0.0 |
| 1058 | 9D4 B | 159.690 | 159.690 | 0.0 |
| 5022 | A 404 | 442.178 | 442.220 | 4.2 |
| 1001 | ADR PEDESTRAL | 326.190 | 326.180 | -1.0 |
| 1059 | ARP 2 1965 HZL | 488.000 | 488.040 | 4.0 |
| 5003 | B 316 | 207.220 | 207.180 | -4.0 |
| 1085 | B 412 | 443.834 | 443.850 | 1.6 |
| 1029 | CHAMPORT | 208.700 | 208.660 | -4.0 |
| 1031 | D 333 PADH | 182.019 | 182.000 | -1.9 |
| 2007 | D 362 | 175.524 | 175.480 | -4.4 |
| 1053 | D 406 | 348.439 | 348.390 | -4.9 |
| 1026 | E 100 | 402.134 | 402.170 | 3.6 |
| 1009 | E 313 | 377.956 | 377.900 | -5.6 |
| 1010 | E 402 | 371.572 | 371.590 | 1.8 |
| 1064 | E 408 | 389.618 | 389.610 | -0.8 |
| 5018 | F 279 | 463.696 | 463.680 | -1.6 |
| 1038 | F 318 | 446.425 | 446.450 | 2.5 |
| 5004 | FAIRPORT | 308.240 | 308.240 | 0.0 |
| 1014 | G 316 | 586.700 | 586.710 | 1.0 |
| 9003 | GAITHERSBURG CORS ARP | 140.660 | 140.660 | 0.0 |
| 5007 | GOSPEL HILL RM 2 | 405.229 | 405.210 | -1.9 |
| 1073 | HOME | 292.516 | 292.550 | 3.4 |
| 1078 | J 245 | 395.554 | 395.560 | 0.6 |
| 5014 | JORDAN | 101.823 | 101.790 | -3.3 |
| 5009 | K 358 PADH | 206.072 | 206.090 | 1.8 |
| 1016 | K 403 | 396.318 | 396.350 | 3.2 |
| 1069 | KREGER AZ MK | 218.652 | 218.650 | -0.2 |
| 1084 | KROUSE | 594.151 | 594.200 | 4.9 |
| 1068 | KRUMS | 235.378 | 235.400 | 2.2 |
| 1054 | LNS C | 121.040 | 121.060 | 2.0 |
| 1045 | LUNDY | 120.075 | 120.070 | -0.5 |
| 5010 | M 365 | 213.996 | 213.950 | -4.6 |
| 1055 | M 368 | 203.700 | 203.730 | 3.0 |
| 1046 | M 6 | 140.944 | 140.920 | -2.4 |
| 1034 | MIDDLE | 224.253 | 224.240 | -1.3 |
| 5019 | N 353 | 456.767 | 456.790 | 2.3 |
| 1032 | N 63 | 390.758 | 390.750 | -0.8 |
| 5012 | OYES | 131.619 | 131.630 | 1.1 |
| 1041 | R 151 | 147.813 | 147.790 | -2.3 |
| 1036 | R 16 | 250.623 | 250.630 | 0.7 |
| 5023 | R 408 | 433.048 | 433.040 | -0.8 |
| 1063 | RDG ARP 2 1963 | 95.860 | 95.820 | -4.0 |
| 1096 | RED HILL RM 1 | 188.269 | 188.270 | 0.1 |
| 1042 | S 101 | 167.970 | 167.920 | -5.0 |
| 1087 | SCENIC | 322.908 | 322.870 | -3.8 |
| 1048 | SELINGSGROVE | 135.045 | 135.040 | -0.5 |
| 1056 | STRAUSS | 195.756 | 195.790 | 3.4 |
| 1018 | SUMMER | 586.276 | 586.300 | 2.4 |
| 5001 | T 404 | 369.602 | 369.590 | -1.2 |
| 5016 | T I RDGRR RESET 1953 | 32.546 | 32.540 | -0.6 |
| 1093 | TTS 64 K | 573.625 | 573.660 | 3.5 |
| 5020 | TUNA AZ MK | 430.460 | 430.450 | -1.0 |

1049 UNION
1092 V 25
1020 V 404
1050 WOLF

| | | |
|---------|---------|-----|
| 154.740 | 154.750 | 1.0 |
| 338.217 | 338.270 | 5.3 |
| 357.344 | 357.370 | 2.6 |
| 156.146 | 156.150 | 0.4 |

ATTACHMENT 7
FINAL VERTICAL CONTROLS
PA FBN/CBN

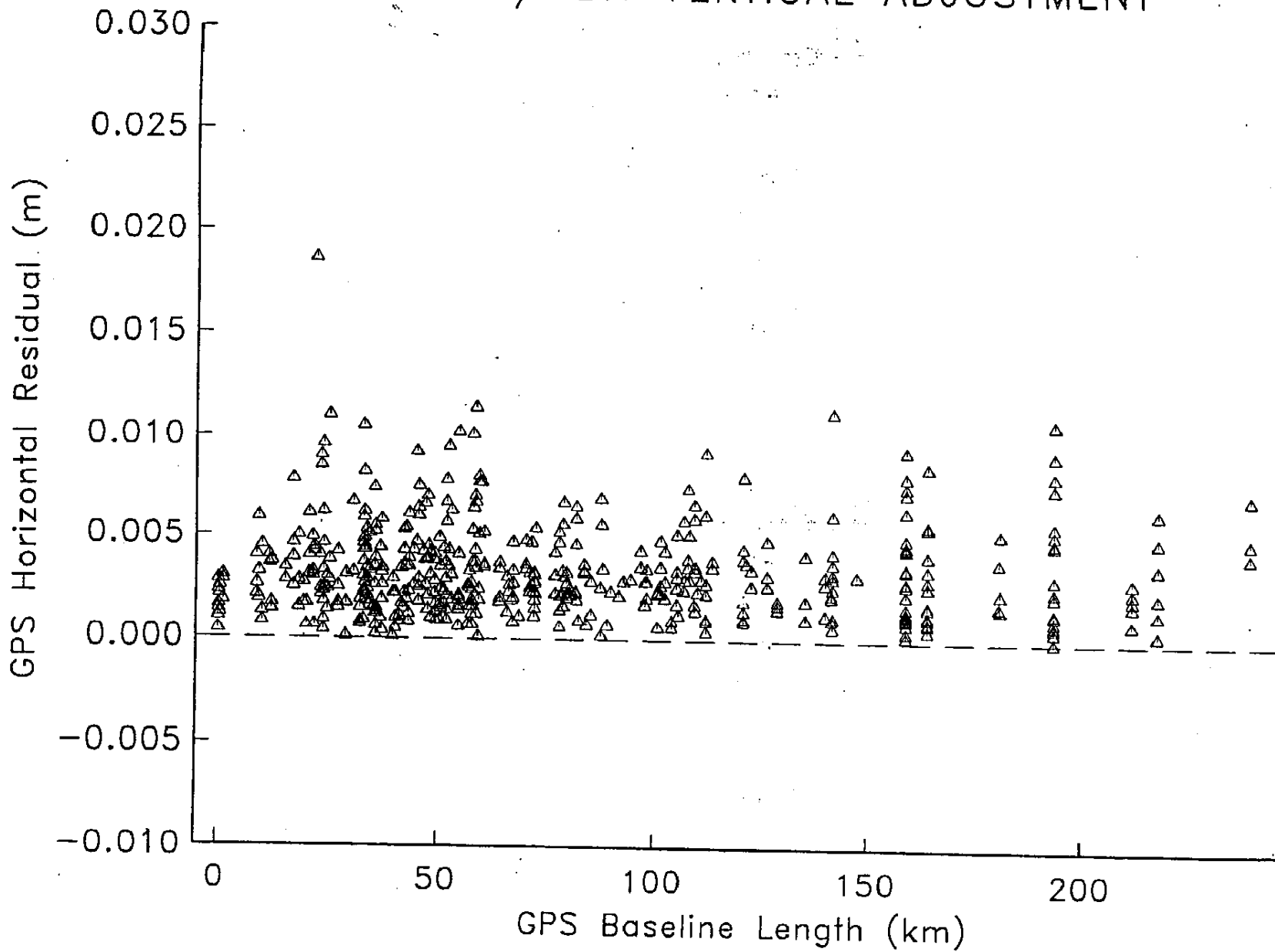
| STATION NAME | CODE | ELEVATION | SOURCE |
|-----------------------|------|-----------|------------|
| 101 USGS | A | 415.552 | L21165 |
| 19 JWM | A | 339.813 | L18127/1 |
| 40N I | G | 193.69 | GPS1060/B |
| 9D4 B | G | 159.69 | GPS1060/A |
| A 404 | A | 442.178 | L24466/2 |
| ADR PEDESTAL | G | 326.19 | GPS1477 |
| ARP 2 1965 HZL | L | 488.00 | GPS1060/33 |
| B 316 | A | 207.220 | L24389/1 |
| B 412 | A | 443.834 | L24386/3 |
| CHAMPORT | L | 208.70 | GPS647 |
| D 333 PADH | A | 182.019 | L20856 |
| D 362 | A | 175.524 | L25476/3 |
| D 406 | A | 348.439 | L24450/1 |
| E 100 | A | 402.134 | L6587 |
| E 313 | A | 377.956 | L25435 |
| E 402 | A | 371.572 | L24466/2 |
| E 408 | A | 389.618 | L24450/1 |
| F 279 | A | 463.696 | L18446 |
| F 318 | A | 446.425 | L21165 |
| FAIRPORT | G | 308.24 | GPS908/A |
| G 316 | A | 586.700 | L21041 |
| GAITHERSBURG CORS ARP | K | 140.66 | GPS751/B |
| GOSPEL HILL 1M 2 | A | 405.229 | L20933 |
| HOME | A | 292.516 | L17448 |
| J 245 | A | 395.554 | L18127/1 |
| JORDAN | A | 101.823 | L18438 |
| K 358 PADH | A | 206.072 | L21699 |
| K 403 | A | 396.318 | L24466/2 |
| KREGER AZ MK | A | 218.652 | L21795 |
| KROUSE | A | 594.151 | L21779 |
| KRUMS | A | 235.378 | L18438 |
| LNS C | G | 121.04 | GPS1060/A |
| LUNDY | A | 120.075 | L18013 |
| M 365 | A | 213.996 | L24379/2 |
| M 368 | A | 203.700 | L24379/1 |
| M 6 | A | 140.944 | L15748 |
| MIDDLE | A | 224.253 | L24885 |
| N 353 | A | 456.767 | L21515 |
| N 63 | A | 390.758 | L6547 |
| OYES | A | 131.619 | L18438 |
| PETPORT | G | 289.38 | GPS908/A |
| R 151 | A | 147.813 | L9312 |
| R 16 | A | 250.623 | L2130 |
| R 408 | A | 433.048 | L24450/1 |
| RDG ARP 2 1963 | L | 95.86 | GPS1060/31 |
| RED HILL RM 1 | A | 188.269 | L20912 |
| S 101 | A | 167.970 | L6729/1 |
| SCENIC | A | 322.908 | L24386/3 |
| SELINGSGROVE | A | 135.045 | L3278 |
| STRAUSS | A | 195.756 | L18438 |
| SUMMER | A | 586.276 | L21041 |
| T 1 RDGRR RESET 1953 | A | 32.546 | L20795 |
| T 404 | A | 369.602 | L24450/1 |
| TTS 64 K | A | 573.625 | L6679 |

TUNA AZ MK
UNION
V 25
V 404
WOLF

A 430.460
A 154.740
A 338.217
A 357.344
A 156.146

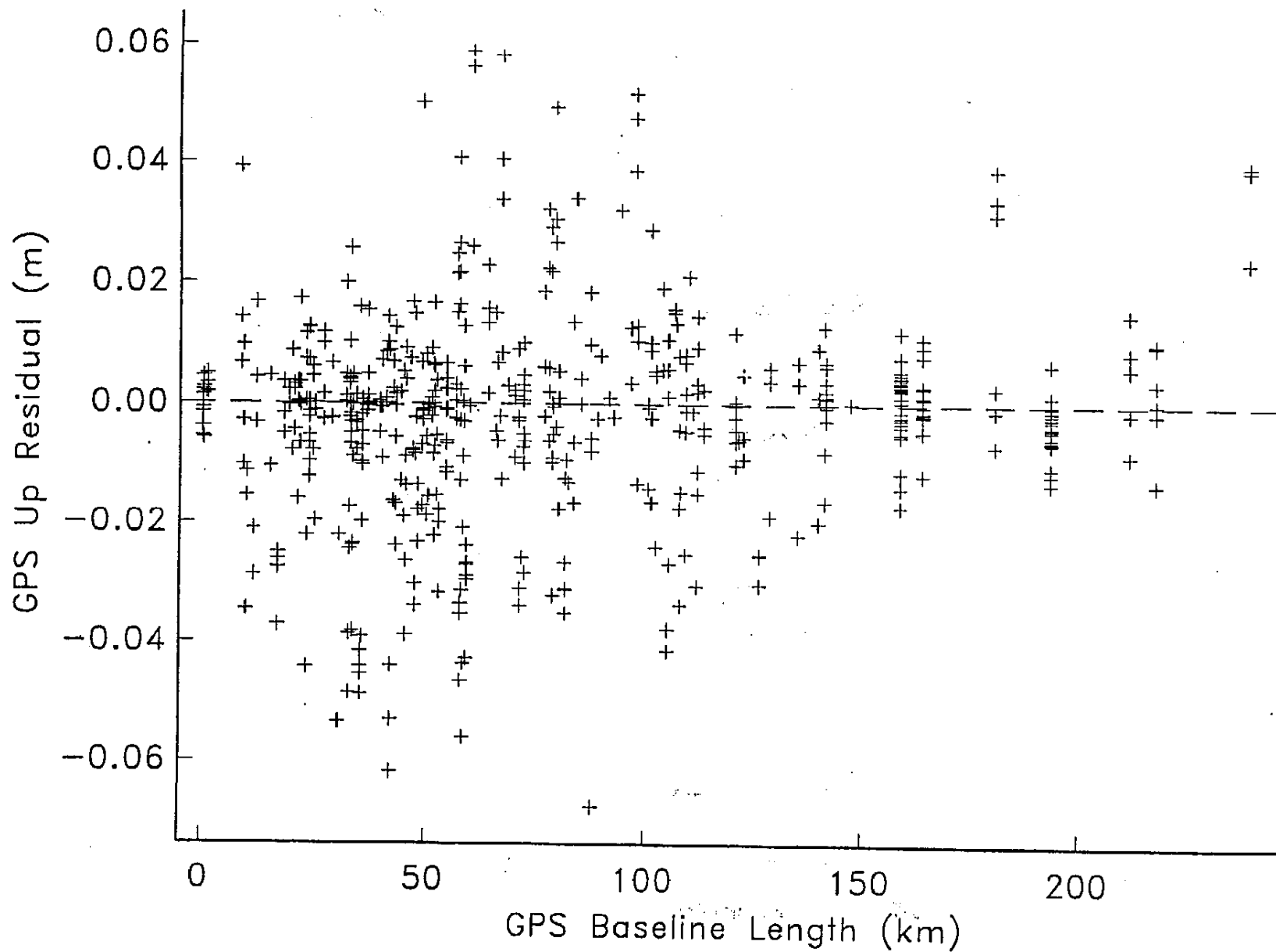
L21124
L24386/3
L2363
L24450/1
L18013

PA FBN/CBN VERTICAL ADJUSTMENT

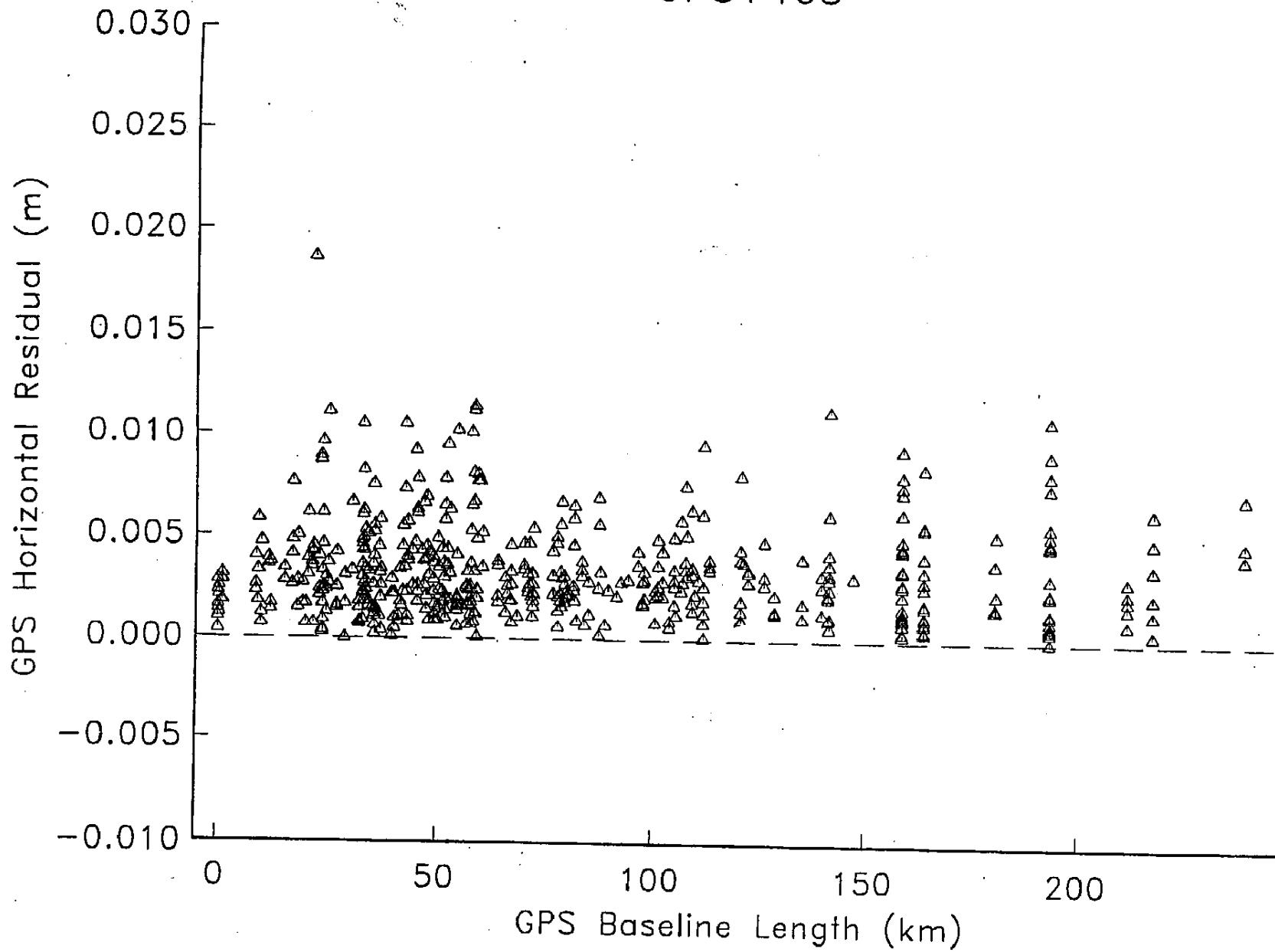


Adjustment of Feb 22 2001 at 09:06
Mean value is 0.003 meters

PA FBN/CBN VERTICAL ADJUSTMENT



GPS1463



Adjustment of Jan 8 2001 at 08:05
Mean value is 0.003 meters

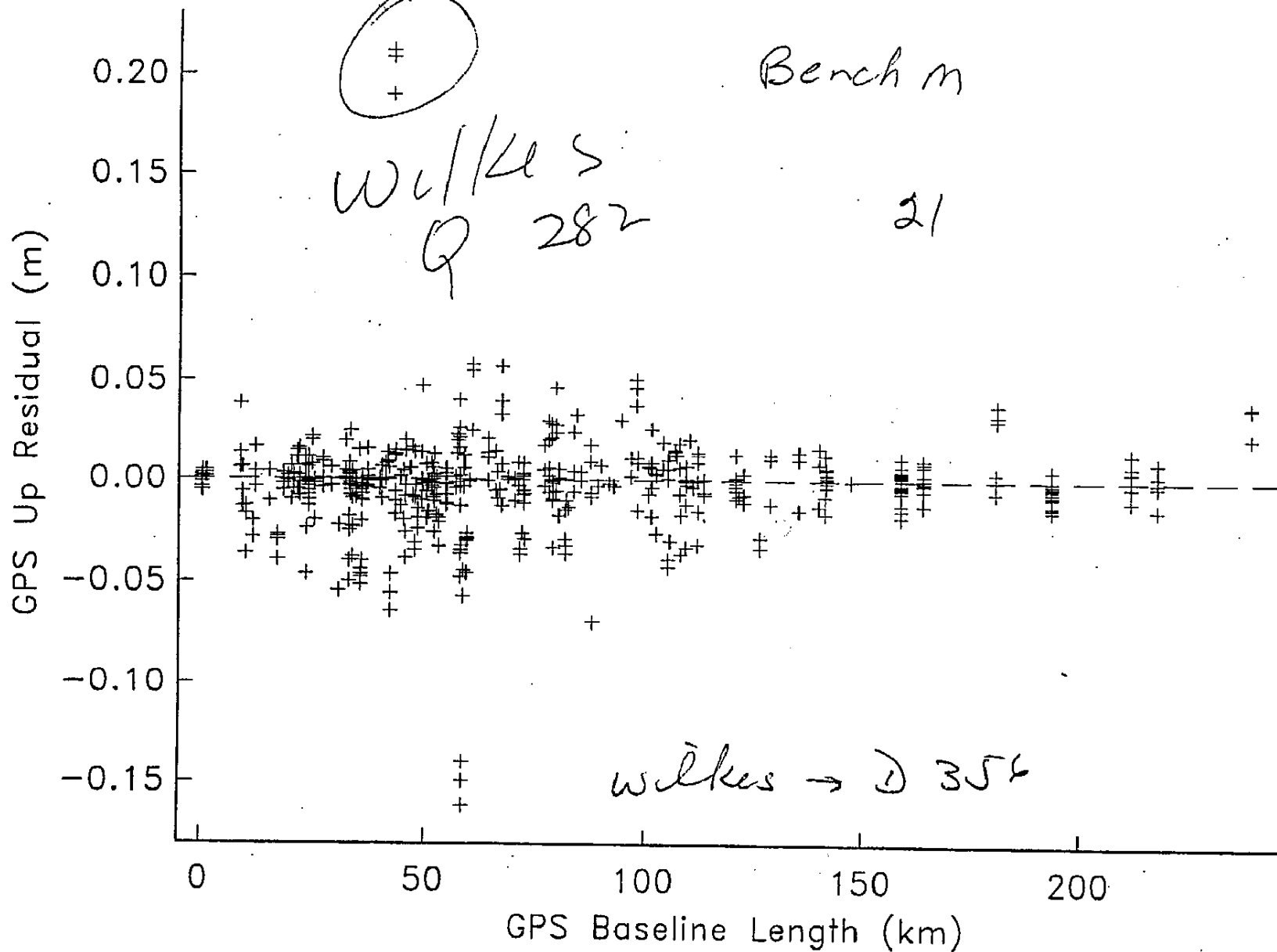
GPS1463

Vertical

Benchmark

walkers
Q 282

21



Adjustment of Jan 8 2001 at 08:05
Mean value is 0.014 meters

LENGTH RELATIVE ACCURACIES (USING A - PRIORI WEIGHTS)

| FROM STATION | TO STATION | DISTANCE METERS | INTERNAL ACCURACY | EXTERNAL ACCURACY |
|--------------------------|--------------------------|-----------------|-------------------|-------------------|
| ROSTPORT | PENN STATE UNIV CORS ARP | 180490 | 1: 0 | 1: 0 |
| CASTPORT | PENN STATE UNIV CORS ARP | 217404 | 1: 0 | 1: 0 |
| AP STA A 2 BFD | CLARPORT | 92729 | 1: 61177610 | 1: 0 |
| PENN STATE UNIV CORS ARP | PSU1B | 175 | 1: 119107 | 1: 89175 |
| R 151 | MIFFPORT | 8684 | 1: 4921715 | 1: 486050 |
| PENN STATE UNIV CORS ARP | PSU1A | 1113 | 1: 779847 | 1: 529242 |
| N96 A | PENN STATE UNIV CORS ARP | 9158 | 1: 5095781 | 1: 550549 |
| WILKES BARRE CORS ARP | WILI B | 94 | 1: 135471 | 1: 590954 |
| ERI ARP 2 | D 362 | 11484 | 1: 4949179 | 1: 617060 |
| HOFFPORT | BLOOMPORT | 19980 | 1: 13070286 | 1: 793461 |
| PSB D | PENN STATE UNIV CORS ARP | 21748 | 1: 17107163 | 1: 906586 |
| AVP ARP 1962 | WILKES BARRE CORS ARP | 24644 | 1: 19336658 | 1: 973596 |
| KREGER AZ MK | POCOPORT | 25156 | 1: 16161258 | 1: 979748 |
| MIFFPORT | PENN STATE UNIV CORS ARP | 23804 | 1: 37860237 | 1: 1035826 |
| STROPORT | POCOPORT | 21365 | 1: 15571227 | 1: 1066636 |
| 9D4 B | BLOOMPORT | 72163 | 1: 41679056 | 1: 1283607 |
| POCOPORT | WILKES BARRE CORS ARP | 56690 | 1: 0 | 1: 1292892 |
| HOME | WILKES BARRE CORS ARP | 18929 | 1: 15908861 | 1: 1326183 |
| MIFFPORT | M 365 | 67112 | 1: 57474225 | 1: 1380325 |
| AGC ARP 2 1965 | ROSTPORT | 18187 | 1: 11227401 | 1: 1409080 |
| ZERBPORT | BLOOMPORT | 32940 | 1: 19173302 | 1: 1419813 |
| SELINGSGROVE | BLOOMPORT | 41761 | 1: 28591565 | 1: 1494918 |
| UNION | BLOOMPORT | 36662 | 1: 29566865 | 1: 1511493 |
| ARP 2 1965 HZL | WILKES BARRE CORS ARP | 35385 | 1: 22763956 | 1: 1525326 |
| BLOOMPORT | WILKES BARRE CORS ARP | 49307 | 1: 89466626 | 1: 1527562 |
| WARMINSTER CBL 430 | POCOPORT | 107757 | 1: 67264983 | 1: 1583686 |
| TDI A | PITTSBURG CORS ARP | 50465 | 1: 38708823 | 1: 1627577 |

LENGTH RELATIVE ACCURACIES (USING A - PRIORI WEIGHTS)

| FROM STATION | TO STATION | DISTANCE METERS | INTERNAL ACCURACY | EXTERNAL ACCURACY |
|-------------------|--------------------------|-----------------|-------------------|-------------------|
| R 16 | PENN STATE UNIV CORS ARP | 9903 | 1: 6017825 | 1: 1663433 |
| O 0 | PENN STATE UNIV CORS ARP | 51807 | 1: 47706374 | 1: 1725599 |
| LNS C | BLOOMPORT | 98098 | 1: 56037458 | 1: 1786045 |
| LOCUST | MIFFPORT | 32104 | 1: 22767190 | 1: 1807498 |
| CARBPORT | POCOPORT | 49065 | 1: 34664695 | 1: 1987993 |
| OYM C 1985 | CLEAPORT | 41049 | 1: 23532003 | 1: 2019139 |
| QUAKE | BLOOMPORT | 35728 | 1: 28076769 | 1: 2058589 |
| YORKPORT | MIFFPORT | 105189 | 1: 58151607 | 1: 2084383 |
| SCENIC | BLOOMPORT | 49095 | 1: 27794268 | 1: 2117525 |
| D 333 PADH | MIFFPORT | 41490 | 1: 23723569 | 1: 2170371 |
| EASTPORT | POCOPORT | 45449 | 1: 29958618 | 1: 2181919 |
| BLOOMPORT | OYES | 66776 | 1: 20898312 | 1: 2461052 |
| D 362 | RICH | 33584 | 1: 18115832 | 1: 2463533 |
| WOLF | BLOOMPORT | 66202 | 1: 40547892 | 1: 2513714 |
| K 358 PADH | PENN STATE UNIV CORS ARP | 23313 | 1: 9204944 | 1: 2532951 |
| STRAUSS | BLOOMPORT | 59167 | 1: 35647248 | 1: 2539996 |
| 269 A | ROSTPORT | 72009 | 1: 48019872 | 1: 2606520 |
| HONEPORT | POCOPORT | 43164 | 1: 26616073 | 1: 2647134 |
| RED HILL RM 1 | MIFFPORT | 47462 | 1: 29329255 | 1: 2663399 |
| KRUMS | POCOPORT | 71789 | 1: 46370007 | 1: 2736747 |
| ARP LBE 1969 | ROSTPORT | 37083 | 1: 25549160 | 1: 2741007 |
| ADR PEDESTAL | PITTSBURG CORS ARP | 15153 | 1: 11649288 | 1: 2783922 |
| BOSSLER | PITTSBURG CORS ARP | 78706 | 1: 76544759 | 1: 2827612 |
| FARCHT | MIFFPORT | 58625 | 1: 31517715 | 1: 2950150 |
| ADD AP 1964 STA B | PENN STATE UNIV CORS ARP | 70156 | 1: 41210116 | 1: 3012493 |
| BAKER | CASTPORT | 35576 | 1: 22008246 | 1: 3072425 |
| M 353 | WILKES BARRE CORS ARP | 108085 | 1: 58332046 | 1: 3248556 |

LENGTH RELATIVE ACCURACIES (USING A - PRIORI WEIGHTS)

| FROM STATION | TO STATION | DISTANCE METERS | INTERNAL ACCURACY | EXTERNAL ACCURACY |
|-----------------------|--------------------------|-----------------|-------------------|-------------------|
| CLEAPORT | A 404 | 30505 | 1: 22145519 | 1: 3301018 |
| GEISLER | MIFFPORT | 67157 | 1: 35395743 | 1: 3327021 |
| LUNDY | BLOOMPORT | 91697 | 1: 58615159 | 1: 3411451 |
| PORT CLINTON 2 | BLOOMPORT | 57753 | 1: 39094061 | 1: 3453868 |
| BLOOMPORT | PENN STATE UNIV CORS ARP | 120778 | 1: 0 | 1: 3456460 |
| E 313 | ROSTPORT | 60441 | 1: 34553633 | 1: 3505493 |
| FULOP | PENN STATE UNIV CORS ARP | 96691 | 1: 60142081 | 1: 3552532 |
| WILKES BARRE CORS ARP | WILI A | 358 | 1: 672540 | 1: 3585120 |
| CLEAPORT | PENN STATE UNIV CORS ARP | 54560 | 1: 94560604 | 1: 3634043 |
| 101 US6S | CLEAPORT | 47461 | 1: 32941010 | 1: 3713128 |
| Q 282 | WILKES BARRE CORS ARP | 42544 | 1: 26578962 | 1: 3714063 |
| M 6 | BLOOMPORT | 101315 | 1: 60096113 | 1: 3795713 |
| SELINGSGROVE | MIFFPORT | 65790 | 1: 44666005 | 1: 3886950 |
| KROUSE | WILKES BARRE CORS ARP | 42132 | 1: 26954389 | 1: 3909597 |
| ROSTPORT | FAIRPORT | 88995 | 1: 25510656 | 1: 3917952 |
| TT 5 3 | CLARPORT | 28925 | 1: 16311595 | 1: 3974896 |
| PERKPORT | POCOPORT | 83661 | 1: 53515334 | 1: 4011412 |
| POTTSPORT | POCOPORT | 100679 | 1: 62819178 | 1: 4023220 |
| PUNXPORT | CLEAPORT | 44279 | 1: 36167512 | 1: 4267862 |
| F 318 | CLEAPORT | 35600 | 1: 26053317 | 1: 4413717 |
| MIDDLE | MIFFPORT | 107105 | 1: 43336533 | 1: 4451556 |
| CHAMPORT | MIFFPORT | 78531 | 1: 39881604 | 1: 4453364 |
| POCOPORI | PENN STATE UNIV CORS ARP | 211460 | 1: 0 | 1: 4549849 |
| POCOPORT | T I RDGRR RESET 1953 | 112007 | 1: 66103470 | 1: 4555095 |
| BAKER | PITTSBURG CORS ARP | 59805 | 1: 43493197 | 1: 4574114 |
| S 101 | MIFFPORT | 97752 | 1: 53068500 | 1: 4599181 |
| MIFFPORT | FULOP | 87599 | 1: 53224320 | 1: 4849548 |

LENGTH RELATIVE ACCURACIES (USING A - PRIORI WEIGHTS)

| FROM STATION | TO STATION | DISTANCE METERS | INTERNAL ACCURACY | EXTERNAL ACCURACY |
|------------------|--------------------------|-----------------|-------------------|-------------------|
| KRUMS | BLOOMPORT | 71406 | 1: 46548349 | 1: 4915659 |
| BV-125 | CASTPORT | 12045 | 1: 5960078 | 1: 4925067 |
| ARP BTP | PITTSBURG CORS ARP | 32898 | 1: 22637926 | 1: 5025043 |
| ROSTPORT | PETPPORT | 147342 | 1: 35708451 | 1: 5026639 |
| BLOOMPORT | 40N I | 122617 | 1: 66273538 | 1: 5141840 |
| CLARPORT | T 404 | 35069 | 1: 11535847 | 1: 5265198 |
| BRANDPORT | POCOPORT | 128761 | 1: 74644207 | 1: 5274453 |
| UNION | MIFFPORT | 72351 | 1: 54960785 | 1: 5324062 |
| LUNDY | MIFFPORT | 87422 | 1: 58992305 | 1: 5328664 |
| M 368 | BLOOMPORT | 126376 | 1: 70233622 | 1: 5442816 |
| WOLF | MIFFPORT | 89757 | 1: 63296609 | 1: 5444996 |
| D 406 | D 362 | 36956 | 1: 15789149 | 1: 5446830 |
| V 25 | CLEAPORT | 58444 | 1: 33909084 | 1: 5587627 |
| POCOPORT | 854 5240 TIDAL | 135316 | 1: 73297434 | 1: 5620831 |
| F 279 | WILKES BARRE CORS ARP | 64039 | 1: 44212603 | 1: 5656743 |
| D 356 | WILKES BARRE CORS ARP | 58378 | 1: 28879148 | 1: 5682974 |
| V 404 | CLARPORT | 32827 | 1: 19652207 | 1: 5694874 |
| WATER | POCOPORT | 139953 | 1: 76694986 | 1: 5831549 |
| CLEAPORT | TUNA AZ MK | 106756 | 1: 66668220 | 1: 6427736 |
| M 6 | MIFFPORT | 110034 | 1: 71947481 | 1: 6436921 |
| DUJ ARP | CLEAPORT | 43084 | 1: 28774638 | 1: 6508018 |
| CLEAPORT | BOSSLER | 72114 | 1: 52109499 | 1: 6564734 |
| MELAN | ROSTPORT | 20533 | 1: 12109594 | 1: 6678642 |
| GOSPEL HILL RM 2 | PENN STATE UNIV CORS ARP | 57076 | 1: 38016339 | 1: 6699648 |
| GB 126 | PITTSBURG CORS ARP | 23897 | 1: 14575647 | 1: 6869077 |
| CORRPORT | D 362 | 45374 | 1: 25063927 | 1: 6922973 |
| POCOPORT | WINGPORT | 111954 | 1: 67377779 | 1: 6953549 |

LENGTH RELATIVE ACCURACIES (USING A - PRIORI WEIGHTS)

| FROM STATION | TO STATION | DISTANCE METERS | INTERNAL ACCURACY | EXTERNAL ACCURACY |
|----------------|--------------------------|-----------------|-------------------|-------------------|
| POCOPORT | JORDAN | 57534 | 1: 41165753 | 1: 7041955 |
| MONTOUR | CLEAPORT | 52334 | 1: 20331154 | 1: 7081713 |
| K 403 | CLARPORT | 52933 | 1: 30231900 | 1: 7124553 |
| OYM C 1985 | CLARPORT | 81881 | 1: 59181821 | 1: 7547409 |
| BLOOMPOR | EMIGS RM 3 | 110827 | 1: 65242406 | 1: 7666488 |
| CLARPORT | TUNA AZ MK | 109437 | 1: 79025829 | 1: 7753898 |
| B 412 | WILKES BARRE CORS ARP | 81627 | 1: 38915409 | 1: 8023708 |
| CLARPORT | R 408 | 27060 | 1: 16491383 | 1: 8081866 |
| CHAMPOR | PENN STATE UNIV CORS ARP | 94370 | 1: 49428394 | 1: 8327749 |
| SCENIC | WILKES BARRE CORS ARP | 77860 | 1: 49894266 | 1: 8394350 |
| D 333 PADH | PENN STATE UNIV CORS ARP | 46520 | 1: 25621701 | 1: 8449392 |
| AP STA A 2 BFD | CLEAPORT | 85190 | 1: 47512885 | 1: 8617291 |
| GB 109 | ROSTPORT | 19255 | 1: 12287519 | 1: 8743649 |
| GARDPORT | BLOOMPOR | 141362 | 1: 74847217 | 1: 8885850 |
| CLARPORT | PITTSBURG CORS ARP | 77970 | 1: 0 | 1: 9039347 |
| HOFFPORT | WILKES BARRE CORS ARP | 68550 | 1: 47816910 | 1: 9278030 |
| GRANDPORT | PENN STATE UNIV CORS ARP | 109267 | 1: 59617989 | 1: 9897600 |
| PLUXPORT | CLARPORT | 51595 | 1: 38448340 | 1: 10275857 |
| BV 110 | CASTPORT | 23105 | 1: 11157926 | 1: 10375877 |
| 101 USGS | CLARPORT | 76899 | 1: 47621952 | 1: 10702120 |
| 19 JMM 1948 | PITTSBURG CORS ARP | 34272 | 1: 25592934 | 1: 10935438 |
| FAA 867 A | PITTSBURG CORS ARP | 47643 | 1: 34782598 | 1: 11144903 |
| GREENPORT | CASTPORT | 46955 | 1: 23877785 | 1: 11549479 |
| J 245 | CASTPORT | 44958 | 1: 20885178 | 1: 11586789 |
| CAMPOR | ROSTPORT | 33618 | 1: 23520377 | 1: 11836793 |
| FAA 867 A | CASTPORT | 33196 | 1: 21914891 | 1: 12053129 |
| MIDDLE | PENN STATE UNIV CORS ARP | 121500 | 1: 49858334 | 1: 12233966 |

LENGTH RELATIVE ACCURACIES (USING A - PRIORI WEIGHTS)

| FROM STATION | TO STATION | DISTANCE METERS | INTERNAL ACCURACY | EXTERNAL ACCURACY |
|----------------|--------------------------|-----------------|-------------------|-------------------|
| AFJ C 1993 | ROSTPORT | 40086 | 1: 29176229 | 1: 12529731 |
| CLARPORT | A 404 | 58018 | 1: 41893013 | 1: 12599020 |
| SHIVERY | CLEAPORT | 102362 | 1: 61087767 | 1: 12830424 |
| CLARPORT | RICH | 82379 | 1: 47601367 | 1: 13196598 |
| N 63 | CASTPORT | 33123 | 1: 16431718 | 1: 13365968 |
| V 25 | PENN STATE UNIV CORS ARP | 87944 | 1: 51942872 | 1: 14050127 |
| HARRISON RESET | CLEAPORT | 113467 | 1: 64343576 | 1: 15056512 |
| ROSTPORT | B 316 | 84233 | 1: 33651878 | 1: 15575637 |
| GEISLER | PENN STATE UNIV CORS ARP | 79608 | 1: 42632006 | 1: 16594718 |
| E 402 | PITTSBURG CORS ARP | 48106 | 1: 28065411 | 1: 16611503 |
| 266 C | D 362 | 59252 | 1: 26360517 | 1: 16764315 |
| MIFFPORT | EMIGS RM 3 | 103979 | 1: 66097594 | 1: 17295164 |
| CLARPORT | PENN STATE UNIV CORS ARP | 141659 | 1: 0 | 1: 19222070 |
| RDG ARP 2 1963 | BLOOMPORT | 79578 | 1: 50135765 | 1: 20328992 |
| BORTNER | ROSTPORT | 71029 | 1: 40686474 | 1: 26167989 |
| CASTPORT | PITTSBURG CORS ARP | 80197 | 1: 0 | 1: 27339448 |
| E 408 | CLARPORT | 51186 | 1: 31770388 | 1: 27687996 |
| G 316 | PITTSBURG CORS ARP | 78900 | 1: 49840859 | 1: 27702187 |
| SUMMER | PITTSBURG CORS ARP | 81760 | 1: 51894008 | 1: 30214287 |
| DRAKE CBL 0 | CLARPORT | 50121 | 1: 27498413 | 1: 30218788 |
| BEDFORD | PENN STATE UNIV CORS ARP | 101334 | 1: 56505507 | 1: 34700787 |
| E 100 | PITTSBURG CORS ARP | 111870 | 1: 62466734 | 1: 36695549 |
| BLOOMPORT | N 353 | 105532 | 1: 49599418 | 1: 44015349 |
| E 100 | ROSTPORT | 105147 | 1: 61085516 | 1: 45763606 |
| ROSTPORT | PITTSBURG CORS ARP | 39557 | 1: 56374421 | 1: 49635390 |
| D 362 | PENN STATE UNIV CORS ARP | 238735 | 1: 0 | 1: 53365800 |
| TTS 64 K | CLARPORT | 57810 | 1: 38464875 | 1: 56024171 |

LENGTH RELATIVE ACCURACIES (USING A - PRIORI WEIGHTS)

| FROM STATION | TO STATION | DISTANCE METERS | INTERNAL ACCURACY | EXTERNAL ACCURACY |
|--------------------------|--------------------------|-----------------|-------------------|-------------------|
| PENN STATE UNIV CORS ARP | WILKES BARRE CORS ARP | 163845 | 1: 0 | 1: 60709627 |
| D 362 | PITTSBURG CORS ARP | 180769 | 1: 0 | 1: 62160800 |
| PENN STATE UNIV CORS ARP | GAITHERSBURG CORS ARP | 193359 | 1: 0 | 1: 76943141 |
| PITTSBURG CORS ARP | PENN STATE UNIV CORS ARP | 158749 | 1: 0 | 1: 83073906 |