



# NOAA Technical Report NOS NGS 55

## Local Tie Information Report IERS Network Site: Brewster, WA

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**Dates of Survey: July 20, 2011 - August 03, 2011  
Date of Report: April, 2012**



**U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE  
NATIONAL GEODETIC SURVEY  
GEODETIC SERVICES DIVISION  
INSTRUMENTATION & METHODOLOGIES BRANCH**

**INTERNATIONAL EARTH ROTATION & REFERENCE SYSTEMS  
SERVICE**

**LOCAL TIE INFORMATION REPORT  
IERS NETWORK SITE: BREWSTER, WA**



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# Introduction

In the spirit of scientific cooperation, the National Geodetic Survey (NGS) contributes to future realizations of the International Terrestrial Reference Frame (ITRF) by providing the International Earth Rotation and Reference Systems Service (IERS) with local tie information for geodetic techniques co-located at IERS Network Sites considered a priority by that service. Within NGS, these type surveys are the responsibility of the IERS Site Survey (ISS) program.

During July and August of 2011, the NGS ISS program conducted a local tie vector survey at IERS network site BREWSTER. Two geodetic techniques are co-located at this site; a Very Long Baseline Array (VLBA) radio telescope operated by the National Radio Astronomy Observatory (NRAO) and an International GNSS Service (IGS) tracking station operated by the Jet Propulsion Laboratory (JPL). No previous tie vector information had been determined between the two techniques represented at this site.

This report documents the instrumentation, procedures, data analysis, and local tie information results associated with this survey.

## 1. Site description

IERS network site BREWSTER is located in the United States of America, in Washington state at longitude W119° 41' and latitude N48° 8', near the town of Brewster at a National Radio Astronomy Observatory (NRAO). Two systems representing two separate geodetic techniques are co-located at this site.

Technique Name	Domes#	Description	Code
7614 VLBA	40473S001	25-M VLBA Antenna Reference Point	7614
BREW GPS	40473M001	Divot on a SCIGN mount	BREW

Table 1 – IERS Network site information can be found at <http://itrf.ensg.ign.fr/GIS/>

## 2. Instrumentation

### 2.1. Tacheometers, EDM, Theodolites

#### 2.1.1. Description

Two (2) Leica TDM5005 Electronic Tacheometer, S/Ns: 441698 and 441773.

Specifications:

Angular measurement uncertainty:  $\pm 0.7''$

Distance standard deviation of a single measurement: 1 mm + 2 ppm

#### 2.1.2 Calibrations

Instruments calibrated by Leica Geosystem AG Heerbrugg, Switzerland.

Inspection date: 08/15/2008 / 08/20/2008

Both instruments were found to be within factory specifications (see Attachment A).

#### 2.1.3 Auxiliary Equipment

Wild NL4 Collimator, S/N: 40145 pointing accuracy, 1: 200,000

Thermometer/hygrometer: Omega RH83, checked against thermistors maintained at the Instrumentation and Methodologies Branch (IMB) of NGS's Geodetic Services Division (GSD).

Barometer: Leitz AIR-HB-1L, S/N: 1L1890

## **2.2 GPS units**

### **2.2.1 Receivers**

Four (4) Trimble R7 L1/L2+L2C 5700 chassis w/Maxwell-5 ASIC, P/N: 50157-00, S/Ns: 220375164, 220375172, 220390608 and 220390619

Specifications for Static GPS Surveying:

Horizontal +/- 5 mm + 0.5 ppm RMS

Vertical +/- 5 mm + 1 ppm RMS

### **2.2.2 Antennas**

Four (4) TPSCR.G3, Topcon GPS/GLONASS/Galileo choke ring antenna, model CR-G3, P/N: 1-044301-01, S/Ns 383-1613, -1614, -1626 and -1628

### **2.2.3 Analysis software, mode of operation**

GPS data reduction and adjustment were undertaken using Trimble Geomatics Office (TGO) processing software version 1.63. L1 observations were used along with the Hopfield troposphere model. Only observables above 15° were used. Carrier phase ambiguities were resolved to their integer values. Precise IGS orbits and WGS84 orientation parameters were used in the processing. NGS antenna phase center offset and phase center variation models were also applied. ITRF08 epoch 2011/07/28 coordinates for IGS tracking station BREW were held fixed in a minimally constrained, least squares adjustment in TGO to combine redundant observations (multiple vectors over the same baseline).

## **2.3 Leveling**

### **2.3.1 Leveling instruments**

Leica DNA03 digital level, P/N: 723289, S/N: 332228.

Height measurement accuracy, +/-0.3 mm per km double run.

### **2.3.2 Leveling rods**

Single-piece Leica 2-meter invar rod, P/N: 563660 S/N: 30721

### **2.3.3 Checks carried out before measurements**

Daily instrument collimation test procedures were undertaken on-site prior to data collection.

Leveling rod bubbles were checked daily, prior to use.

## **2.4 Tripods**

Wild Type II tall wooden tripods and Crane Tri-Max tall composite tripods were used. Target, reflector and instrument heights were measured by differential leveling at time of set up; centering achieved using the NL4 Collimator. Heights and collimation were checked for any disparity before taking down tripods.

## **2.5 Forced centering devices**

Wild GDF21 tribrachs were precisely collimated and secured over the network stations each day. The tribrach accommodates both the tacheometer and target/reflector.

## 2.6 Targets, reflectors

Except for the intersection observations at BREW GPS, six (6) Leica GPH1P precision reflectors were used as needed for tacheometer observations, acting as both target and reflector. For each reflector, the manufacturer-provided offset values of -34.4 mm were validated at the IMB facility. To minimize the loss of precision in distance measurement, the GPH1P must be precisely pointed back to the tacheometer. To that end, the GPH1Ps used on the radio telescope measurements were mounted to small, radio-controlled, pan-tilt units. The pan-tilt units were then remotely pointed to the tacheometer by the observer after each motion of the radio telescope.

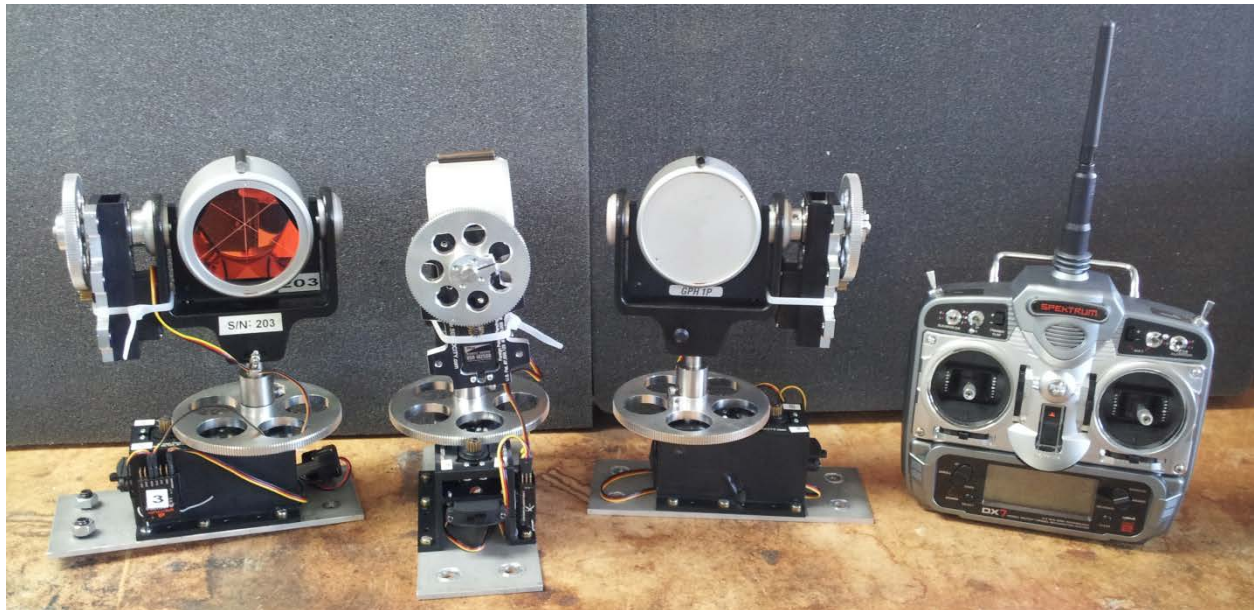


Figure 1 – GPH1P outfitted with two R/C servos (pan and tilt axes) to allow precise pointing of target from remote location (tacheometer).

## 3. Measurement Setup

### 3.1 Ground network

In December, 1993 Allied Signal Technical Services conducted a survey at the site to tie the radio telescope to three network stations, NW VLBA, BREWSTER 7614 RM 1, BREWSTER 7614 RM 2 and JPL 4019-S. JPL 4019-S was a JPL steel marker plate set in the top center of a 4.3 meter concrete pillar. The BREW GPS CORS monument is bolted to the top of JPL 4019-S, rendering it inaccessible.



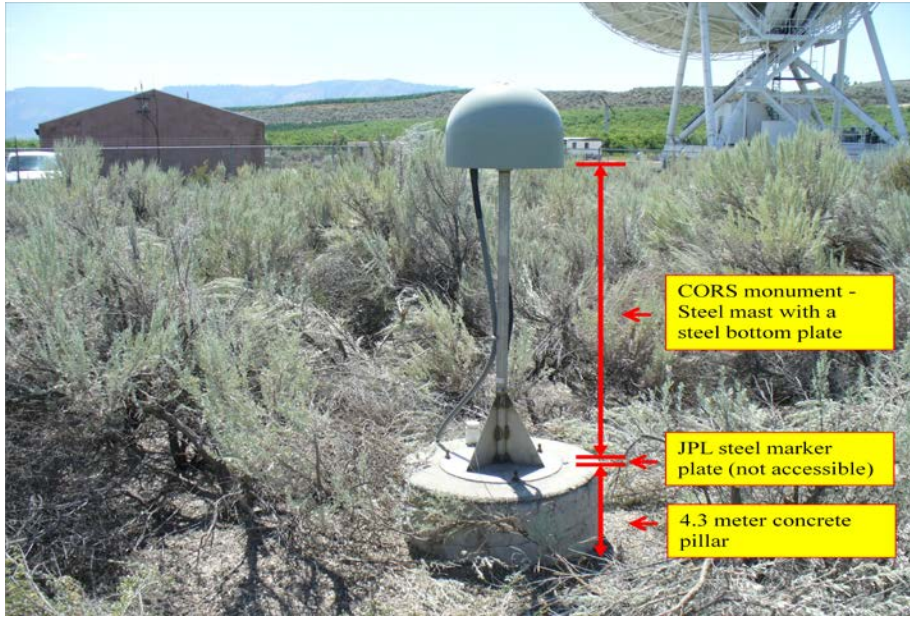


Figure 2 – JPL 4019-S is no longer accessible being covered by the BREW GPS CORS monument.

For the current survey, all monuments were recovered in good conditions and three additional permanent monuments, BREWSTER A, BREWSTER B and BREWSTER C, were established. A temporary point was added to assist with the network tie to BREW GPS, and included in network observations. The radio telescope does not have a physical reference point associated with it. The physical reference point for BREW GPS is inaccessible. Both techniques were observed indirectly.

### 3.1.1 Listing

Network Station Name (2011 Survey)	Network Station Name (1993 Survey)
NW VLBA	NW VLBA 1990
BREWSTER 7614 RM 1	BREWSTER 7614 RM 1
BREWSTER 7614 RM 2	BREWSTER 7614 RM 2
BREWSTER A	N/A
BREWSTER B	N/A
BREWSTER C	N/A
N/A	JPL 4019-S
N/A	VLBA PLATE

Table 2 - Listing of Network Stations

NW VLBA (PID- TP1394) is a NGS Horizontal control disk set in the top of a concrete post monument. This monument is a NGS Federal Base Network station.

BREWSTER 7614 RM 1 is a stainless steel rod, inside of grease filled sleeve, inside of a protective PVC sleeve, and with an aluminum logo cap. The stainless steel rod associated with BREWSTER 7614 RM 1



was previously reported to have been driven to a depth of 4.0 meters. The grease-filled sleeve depth is unknown.

BREWSTER 7614 RM 2 is a stainless steel rod, inside of a grease-filled sleeve, inside of a protective PVC sleeve, and with an aluminum logo cap. The stainless steel rod associated with BREWSTER 7614 RM 2 was previously reported to have been driven to a depth of 3.5 meters. The grease-filled sleeve depth is unknown.

Three new survey control marks were set during a 2010 reconnaissance trip (BREWSTER A, BREWSTER B, and BREWSTER C). New marks were set in strategic locations to allow for inter-visibility with existing control marks, to take advantage of the terrain, and to allow for line of sight between all marks above the top level of the perimeter fence. The marks are NGS horizontal control disks set in top of concrete post type monuments. NGS specifications for the setting of concrete post marks were met or exceeded.

### 3.1.2 Map of Network

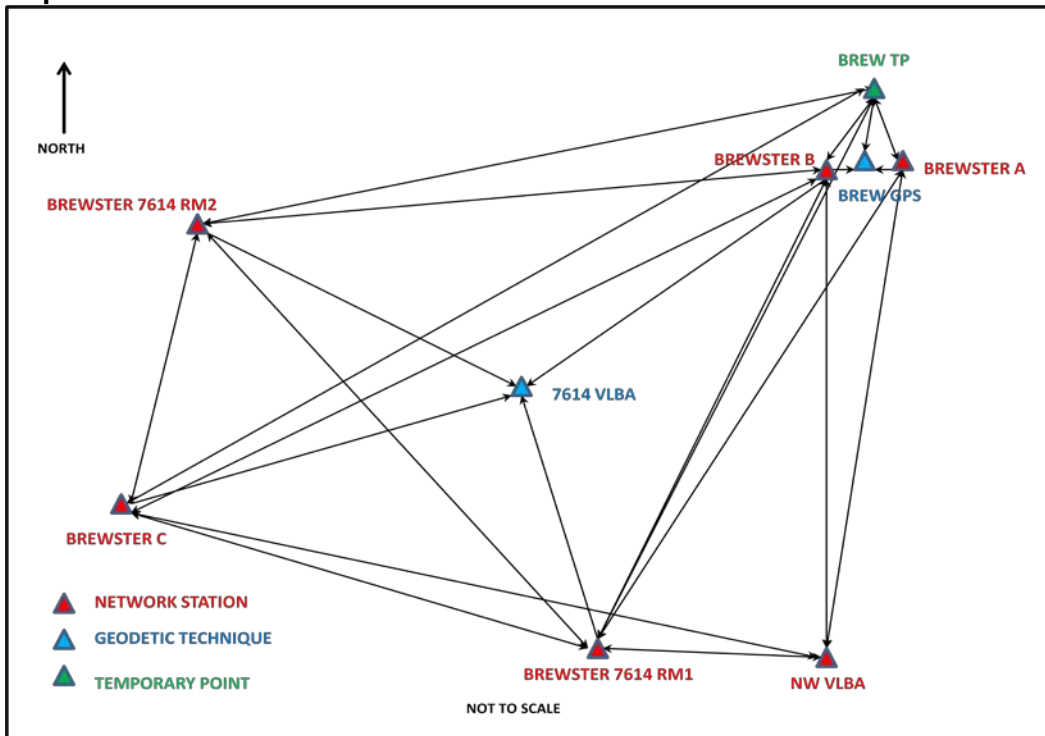


Figure 3 - Map of Network Stations

## 3.2 Representation of Technique Reference Points

### 3.2.1 VLBI/VLBA

The invariant reference point (IVP) is a theoretical point and is defined as the intersection of the azimuth axis with the common perpendicular of the azimuth and elevation axis (Johnston et al, 2004). An indirect approach was used to determine the IVP in this survey, or conventional reference point (CRP). In this report, the acronym CRP is used interchangeably with IVP. Note: the support struts for the telescope are thermally insulated to minimize thermal expansion.



Figure 4 - 7614 VLBA, view looking to the south.

### 3.2.2 SLR (N/A)

This technique was not represented at this site.

### 3.2.3 GPS

The GPS reference point is defined by a divot on a SCIGN mount. The monument consists of a steel mast with a steel bottom plate bolted to a JPL steel marker plate. The JPL plate is set atop a 4.3 meter concrete pillar buried to a depth of 3.7 meters. The antenna mount on top of the steel mast is a SCIGN mount. A GPS choke ring antenna is collimated over the divot at a height of 0.0083 m. The antenna was not removed this survey for direct measurement to the divot located on the stainless steel plate. Permission was provided by the Jet Propulsion Laboratory (JPL) to remove the antenna radome during field observations. Visit [http://igscb.jpl.nasa.gov/igscb/station/log/brew\\_20101021.log](http://igscb.jpl.nasa.gov/igscb/station/log/brew_20101021.log) for the most current version of the IGS site log.



Figure 5 - BREW GPS, view looking to the south.

### 3.2.4 DORIS (N/A)

This technique was not represented at this site.

### **3.2.5 GLONASS (N/A)**

This technique was not represented at this site.

## **4. Observations**

### **4.1 Conventional Survey**

A complete list of unadjusted and adjusted tacheometer and EDM field observations consisting of directions, zenith distances, slope distances, and instrument and target heights are included in Attachment A. Terrestrial 3-D Adjustment, Star\*Net® File BREWSTER. LST.

### **4.2 Leveling**

The primary leveling loop began at NW VLBA and ran through BREWSTER 7614 RM 1, BREWSTER C, BREWSTER 7614 RM 2, BREWSTER B, BREWSTER A and closed back on NW VLBA. Later, a loop was run from BREWSTER B through temporary point BREW TP, BREWSTER A, closing back on BREWSTER B. A third and final loop began at BREWSTER B, ran through BREW GPS Antenna Reference Point (ARP), BREWSTER A and closed back on BREWSTER B. See Attachment B for an abstract of leveling observation with leveled height differences.

### **4.3 GPS**

GPS data were collected for four of the main scheme network stations (BREWSTER 7614 RM 1, BREWSTER 7614 RM 2, BREWSTER C, and BREWSTER B) on three separate days during three independent and simultaneous 6 hour (average length) sessions. See Attachment C for base line solution information.

### **4.4 General Comments**

Data collection software GeoObs v1.04.02 was used for recording field measurements and for data quality checks.

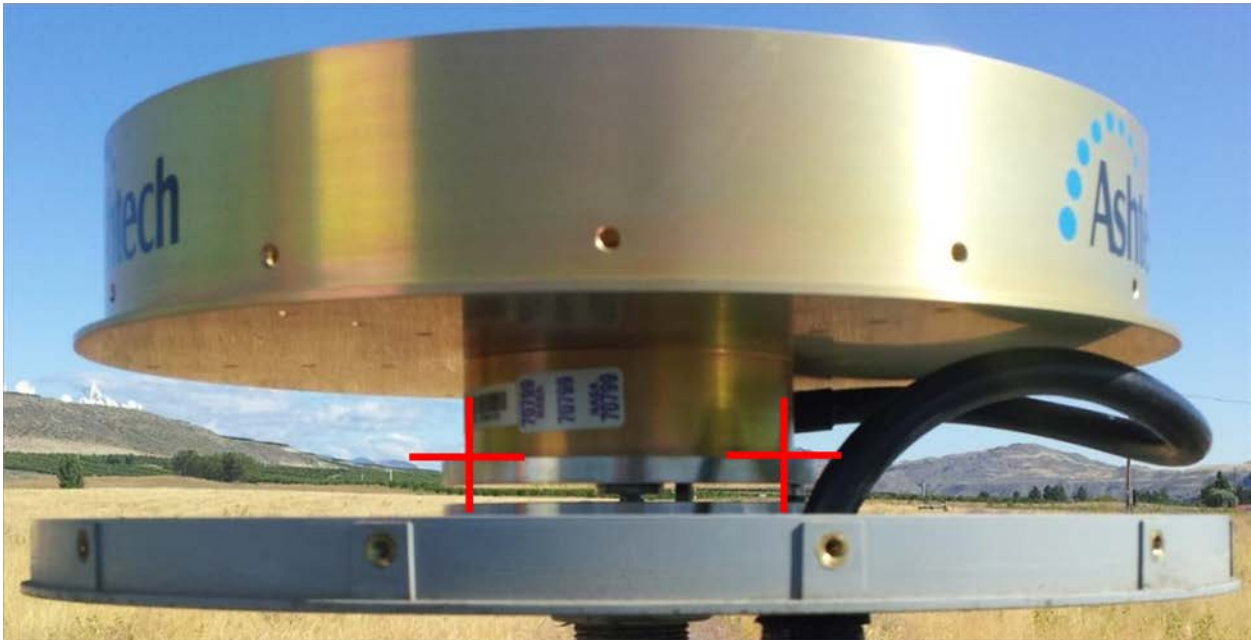
The azimuth axis of the radio telescope was indirectly determined by angle and distance measurement to precision prisms configured to scribe a series of three circles around the axis. The prisms were modified such that they could be precisely pointed back to the instrument using a remotely controlled device. A ridged aluminum bar, with three Leica GPH1P precision prisms attached, was mounted to one of the two radio telescope trunions. The radio telescope was rotated at intervals of approximately 15 degrees on the azimuth axis, while the elevation axis was held fixed. At each stop in the rotation sequence, 3-D measurements were taken to each prism (3 sets of direct and reverse measurements) from a network station. This procedure was repeated from three network stations.

The elevation axis of the radio telescope was indirectly determined by angle and distance measurement to precision prisms configured to scribe a series of three circles around the axis. Three Leica GPH1P precision prisms were attached to the support structure of the radio telescope. The radio telescope was rotated at intervals of approximately 15 degrees on the elevation axis, while the azimuth axis was held fixed. At each stop in the rotation sequence, 3-D measurements were taken to each prism (3sets of direct and reverse measurements) from a network station. This procedure was repeated from three network stations.

The horizontal position of BREW GPS was determined by intersection from two network stations and a temporary point. Tangents to the GPS antenna were measured with the antenna radome removed.

Observations tangent to the GPS antenna pre-amplifier housing were later reduced to the center of the antenna. This method was chosen so that the GPS antenna would not need to be removed from the pier mount.

Differential leveling was conducted through all ground control stations. Additionally, leveling procedures were used to transfer height information to the top of the SCIGN mount (also ARP) of IGS tracking station BREW. These height differences were also used effectively to check GPS-derived heights and trigonometric leveling observations between network stations for quality. The ability to compare trig leveling against a standard while observing the radio telescope targets in the same data set provided quality assurance for those observations.



**Figure 6 - Leveling to the ARP was achieved by centering the level instrument reticle coincident with the ARP, indicated by the red cross marks on the image. Foresight measurements to the ARP were observed to one side, while backsights were observed to the opposite side of the ARP in order to account for any mis-leveling of the SCIGN mount.**

With the radome removed, high precision leveling was conducted to opposite points coincident with the intersection of the top of the SCIGN mount and the bottom of the GPS antenna preamp, or ARP. Leveling procedures adhered to Federal Geodetic Control Subcommittee (FCGS) first-order, class I field specifications. However, because the site survey did not require heights referenced to a vertical datum, network geometry requirements for a tie to existent vertical control were ignored. Translev v4.16 was used to facilitate the process of editing, formatting and checking of the digital leveling observation data, apply refraction corrections and create an abstract of observations.

## 5. Data Analysis and Results

### 5.1 Terrestrial Survey

#### 5.1.1 Analysis software

Two least squares adjustments were conducted on the terrestrial survey data using commercially available software StarNet version no.7.1.0.5; a minimally constrained vertical adjustment and a minimally constrained 3-dimensional (3-D) adjustment. Results were reviewed for outliers in the survey observations and used to verify the accuracy of the survey.

The vertical adjustment, consisting of the leveled height differences between all network stations and BREW GPS, was conducted to establish height information for all network stations and BREW GPS. See Attachment D for leveling data adjustment results.

The 3-D adjustment consisted of terrestrial observations of all network stations, BREW GPS, and intermediate target points on the radio telescope, which produced adjusted local coordinates for the network stations and BREW GPS, and computed local coordinates for the radio telescope intermediate targets. See Attachment A. for 3-D data adjustment results.

AXIS Software, developed by Geoscience Australia (GSA), was used to determine the radio telescope CRP. Coordinates for each target were computed during the 3-D adjustment, at each orientation of the radio telescope. These points were used to derive 3-D circles in space, which were used to determine the radio telescope CRP. The following excerpt was taken from a GSA site survey report and edited to reflect the particular circumstances of this survey. In the following excerpt, the term IVP is interchangeable with CRP.

The StarNet .dmp file, generated by the 3-D adjustment, included the full variance-covariance matrix required by AXIS. The .dmp file was placed into a directory with the AXIS software along with a setup.axs file. The setup file was edited repeatedly to derive estimates of circle parameters for each target and each rotation sequence. Once initial estimates were refined for all target rotation sequences, geometric constraints were added. Initial constraints introduced included:

- ENORMAL, NNORMAL, UNORMAL – used to constrain normal parameters together;
- TOUCH – used to force two axes to touch each other (in 3D) at some reference point;
- CENTRE – used to constrain together centre to centre distances.

With updated circle parameter estimates for each target rotation sequence, IVP coordinates were derived. Additional constraints were introduced to constrain separate IVP realizations.

Constraints applied included:

- OFFSET – used to constrain the computed offset to be identical for independent IVP estimates;
- ORTHOG – used to constrain the orthogonality between three axes;
- UIVP – used to constrain the individual IVP determination in the UP component together.

For CRP computation results, see Attachment E. AXIS Output File OUTPUT.AXS, section 4.18 COMPUTED SOLUTION PARAMETER SUMMARY.

#### 5.1.2 Topocentric coordinates and covariance

For topocentric coordinates and covariance information used in CRP computations, see Attachment E. AXIS Output File OUTPUT.AXS, section 2. INPUT SOLUTION.

### 5.1.3 Correlation matrix

For computed correlation matrix information, see Attachment F. SINEX File NGSBREW1107GA.SNX.

### 5.1.4 Reference temperature of radio telescope [for thermal expansion]

A height correction for the CRP of the radio telescope was computed based on the following procedure provided by the current chair of the IERS Site Survey Working Group through e-mail correspondence.

- i) Compute a mean survey temperature and see to what extent it differs from the reference.
  - ii) Multiply the CRP height by 0.000012 and by the temperature difference
  - iii) Correct the CRP height if it is needed.
- **Telescope reference temperature: 12.4<sup>o</sup>C** from Antenna Information File Format Version of 2008.04.22 (A. Nothnagel, 2009) provided to NGS by the working group chair. See <http://vlbi.geod.uni-bonn.de/IVS-AC/Conventions/antenna-info.txt>
  - **Mean survey temperature: 25.7<sup>o</sup>C** – computed from met data extracted from a NRAO data base and provided to the NGS by NRAO’s Array Operations Center. This is the average temperature throughout the period of observations on the telescope’s elevation axis.
  - **Temperature difference** (reference - observed): **-13.3<sup>o</sup>C**
  - **Total height of elevation axis** (foundation + length of fixed axis): **14.2 meters**

$$\text{Correction} = 14.2 \text{ m} \quad 0.000012 \text{ m/}^{\circ}\text{C} \quad -13.3^{\circ}\text{C} = -0.0022 \text{ m}$$

The computed height correction for thermal expansion was not applied to the telescope’s CRP coordinates in any of the tables included in this report or to the telescope’s CRP coordinates in the SINEX file.

## 5.2 GPS Observations

### 5.2.1 Analysis Software

TGO v1.63 integrated adjustment software was used to perform least square estimates, constraining the ITRF2008 (2011/07/28) coordinate for BREW GPS. See Attachment G. for GPS covariant terms. See Attachment H. IERS ITRS Product Center SINEX file, for updated coordinates of BREW GPS, computed for DOMES number 40473M001 at: [http://itrf.ensg.ign.fr/site\\_info\\_and\\_select/solutions\\_extraction.php](http://itrf.ensg.ign.fr/site_info_and_select/solutions_extraction.php).

### 5.2.2 Results

GPS data were used exclusively for transformation from a topocentric to geocentric reference frame using AXIS software. Table 3 includes the adjusted ITRF2008 (2011/07/28) geocentric coordinates for those network stations included in the GPS survey.



NETWORK STATION	X	Y	Z
BREW GPS	-2112007.2420	-3705351.8248	4726827.1009
BREWSTER 7614 RM 2	-2112090.9511	-3705308.6063	4726819.3297
BREWSTER C	-2112117.6421	-3705330.5374	4726790.8235
BREWSTER 7614 RM 1	-2112067.5309	-3705378.8250	4726776.4168
BREWSTER B	-2112012.3843	-3705347.4334	4726826.3278

Table 3 – GPS-derived geocentric coordinates

### 5.3 Additional Parameters

AXIS software results show the radio telescope elevation **axis** to be **offset** from the azimuth axis by **2.1346 meters**. IVP/TOUCH/INTERSECT PARAMETER VALUES AND THEIR PRECISION can be found in Attachment E, AXIS output results file, near the end of section 4.14. The International VLBI Service (IVS) reports an estimated offset value of **2.1306 meters** (A. Nothnagel, 2009), a difference of 4.0 mm. See <http://vlbi.geod.uni-bonn.de/IVS-AC/Conventions/antenna-info.txt>

### 5.4 Transformation

The adjusted local topocentric coordinates for all stations were aligned to ITRF08 epoch 2011/07/28 in a transformation using AXIS software. Results can be found in Attachment E. AXIS output results file, section 5. ITRF08 epoch 2011/07/28, GPS-determined coordinates of network stations BREWSTER 7614 RM 1, BREWSTER 7614 RM 2, BREWSTER C and BREWSTER B were used in the alignment sequence.

### 5.5 Description of SINEX generation

The SINEX file was directly generated by AXIS. For details, see Attachment E., section 6.1 USER INPUT SINEX INFORMATION. The following SINEX naming convention, adopted by GSA for local survey data, was also used for this survey.

**XXXNNNNYYMMFV.SNX**

Where:

- XXX** is a three-character organization designation
- NNNN** is a four-character site designation
- YY** is the year of the survey
- MM** is the month of the survey
- F** is the frame code (G for global, L for local)
- V** is the file version

See Attachment F. for SINEX file NGSBREW1107GA.SNX.

### 5.6 Discussion of Results

A minimally constrained vertical adjustment of differential leveling data was run in anticipation of the 3-D adjustment of tacheometer observations. A GPS derived orthometric height for BREWSTER RM 1 was held fixed. Data from three leveling loops connected the bench mark to seven network stations, in addition to BREW TP and BREW GPS ARP.

- The residuals of the adjusted elevations were consistent among all eight points.
- The sum squares of standard residuals is 1.397 with an error factor of 0.682.
- The Chi-square test at 5 % level passed with lower and upper bounds at 0.268 and 1.765, respectively.

See [Attachment D. Leveling Data Adjustment Results](#) for additional details.

NGS geoid/vertical deflection software showed no significant slope or deflection within the boundary of the project. Hence, adjusted elevation *differences* were assumed valid for all necessary height applications, including calls for ellipsoid height differences.

A minimally constrained 3-D adjustment of tacheometer observations was run. Assumed local coordinates and height at BREWSTER 7614 RM1 were held fixed along with an azimuth line from this station to BREWSTER RM 2. Also included were adjusted height differences for all other network stations and BREW GPS from the leveling observations.

- The residuals of the distances and directions were consistent among the Network Stations and BREW GPS.
- The sum squares of standard residuals is 175.203 with a total error factor of 0.822.
- The Chi-square test at 5 % level passed with lower and upper bounds at 0.914 and 1.086, respectively.

Note - The numbers and counts are slightly misleading because the majority of the observations are to the no-check targets, which do not produce residuals. While they are “counted,” their observations have no effect on the quality indicators, such as the error factor. As for the remaining observations, residuals were consistent throughout.

The error factor for zeniths can safely be ignored. It is suspected that ground-level refraction caused vertical pointing of the tacheometer to be more erratic to network stations, but with a definite bias. Imprecise pointing increases residual spread. Constraining the elevations at these points reveals the bias. Both of these conditions, present in this adjustment, adversely affected the error factor. However, any adverse affect to heights was effectively nullified by constraining the adjusted elevations. Ground-level refraction is unlikely to have affected the no-check observations to radio telescope targets because the targets are 8+ meters above the ground.

See Attachment A. 3-Dimensional Adjustment Results for additional details.

The least squares solution of the radio telescope CRP position included:

- 15 targets
- 3 CRP estimates (constrained together)
- 285 coordinate observations
- 129 unknowns
- 226 conditions
- 39 constraints
- 58 additional constraints.

The resultant linear system was 129 x 129 with degrees of freedom 479. The computed variance factor was 0.22546. CRP model (circle) fit residuals were 0.3 mm Root Mean Square Error (RMS) for the in-plane residuals and 0.6 mm for the out-of-plane residuals.

See Attachment E. AXIS Output File OUTPUT.AXS, section 4. LEAST SQUARES ESTIMATION for additional details.

Table 4 contains the adjusted geocentric coordinates for the network stations, BREW GPS, and 7614 VLBA.

Station Name	X (m)	X $\sigma$ (m)	Y (m)	Y $\sigma$ (m)	Z (m)	X $\sigma$ (m)
BREWSTER 7614 RM 1	-2112067.5313	0.0001	-3705378.8256	0.0001	4726776.4175	0.0001
BREWSTER C	-2112117.6421	0.0001	-3705330.5376	0.0002	4726790.8234	0.0002
BREWSTER 7614 RM2	-2112090.9510	0.0001	-3705308.6056	0.0002	4726819.3292	0.0002
BREWSTER B	-2112012.3840	0.0001	-3705347.4332	0.0002	4726826.3277	0.0002
BREWSTER A	-2112002.8772	0.0002	-3705352.3317	0.0002	4726826.5246	0.0002
BREW GPS	-2112007.2413	0.0004	-3705351.8256	0.0003	4726827.0996	0.0003
7614 VLBA	-2112065.1830	0.0002	-3705356.5044	0.0003	4726813.6900	0.0004

Table 4 - Adjusted coordinates transformed to ITRF08 epoch 2011/07/28 using AXIS software.

Table 5 contains geocentric and topocentric vector comparisons (2011 NGS survey vs. reported and updated IERS ITRS) from BREW GPS to 7614 VLBA.

Source	From Station	To Station	$\Delta X$ (m)	$\Delta Y$ (m)	$\Delta Z$ (m)
2011 Local-Tie Survey	BREW GPS	7614 VLBA	-57.9418	-4.6788	-13.4096
IERS ITRS Product Center	BREW GPS	7614 VLBA	-57.9425	-4.6757	-13.4156
<b>Geocentric</b>			<b>0.0007</b>	<b>-0.0031</b>	<b>0.0060</b>
			<b><math>\Delta n</math> (m)</b>	<b><math>\Delta e</math> (m)</b>	<b><math>\Delta u</math> (m)</b>
2011 Local-Tie Survey	BREW GPS	7614 VLBA	-33.3436	-48.0218	11.8772
IERS ITRS Product Center	BREW GPS	7614 VLBA	-33.3458	-48.0240	11.8712
<b>Topocentric</b>			<b>0.0022</b>	<b>0.0022</b>	<b>0.0060</b>

Table 5 - Vector comparisons, 2011 survey versus IERS ITRS computed. See Attachment H for IERS ITRS updated coordinates used to compute the inverse vector for this comparison and Attachment J for source of inverse values.

## 5.7 Comparison with Previous Surveys

In December 1993, Allied Signal Technical Services conducted a survey at the site to tie the radio telescope CRP to three network stations, NW VLBA, BREWSTER 7614 RMs 1 and BREWSTER 7614 RM 2. The following tables contain vector comparisons with the previous survey. Table 6 is geocentric and Table 7 is topocentric. Inverse software used is NGS INVERS3D, found at [http://www.ngs.noaa.gov/cgi-bin/Inv\\_Fwd/invers3d.prl](http://www.ngs.noaa.gov/cgi-bin/Inv_Fwd/invers3d.prl)

Source	From	To	$\Delta X$	$\Delta Y$	$\Delta Z$
NGS 2011	BREWSTER 7614 RM 1	BREWSTER 7614 RM 2	-23.4197	70.2200	42.9117
ASTS 1993	BREWSTER 7614 RM 1	BREWSTER 7614 RM 2	-23.420	70.221	42.911
			0.000	-0.001	0.001
NGS 2011	BREWSTER 7614 RM 1	7614 VLBA	2.3482	22.3212	37.2725
ASTS 1993	BREWSTER 7614 RM 1	7614 VLBA	2.347	22.321	37.274
			0.001	0.000	-0.002
NGS 2011	BREWSTER 7614 RM 2	7614 VLBA	25.7679	-47.8988	-5.6392
ASTS 1993	BREWSTER 7614 RM 2	7614 VLBA	25.767	-47.900	-5.637
			0.001	0.001	-0.002

Table 6. Geocentric vector comparisons, NGS 2011 versus 1993 ASTS survey

Source	From	To	$\Delta n$	$\Delta e$	$\Delta u$
NGS 2011	BREWSTER 7614 RM 1	BREWSTER 7614 RM 2	65.4333	-55.1197	-1.0213
ASTS 1993	BREWSTER 7614 RM 1	BREWSTER 7614 RM 2	65.433	-55.120	-1.022
			0.000	-0.000	-0.001
NGS 2011	BREWSTER 7614 RM 1	7614 VLBA	40.1836	-9.0135	14.0367
ASTS 1993	BREWSTER 7614 RM 1	7614 VLBA	40.184	-9.0144	14.0383
			0.000	-0.000	0.001
NGS 2011	BREWSTER 7614 RM 2	7614 VLBA	-25.2495	46.1066	15.0574
ASTS 1993	BREWSTER 7614 RM 2	7614 VLBA	-25.249	46.106	15.060
			-0.001	0.001	0.003

Table 7. Topocentric vector comparisons, NGS 2011 versus 1993 ASTS survey

## 6. Planning Aspects

- Contact the Head of the NRAO VLBA Site Group based out of Socorro, NM to coordinate access to 7614 VLBA with on-site technicians. At the time of the 2011 survey, Mr. Eric Carlow was the Head of the NRAO VLBA Site Group. Email address: [ecarlowe@nrao.edu](mailto:ecarlowe@nrao.edu), Phone number: (575) 835 7129.
- Contact the IGS Tracking Station Responsible Agency Primary Contact before tampering with BREW GPS. Contact information is provided in the IGS Tracking Station Site log for station BREW ([http://igs.cb.jpl.nasa.gov/igs/scb/station/log/brew\\_20101021.log](http://igs.cb.jpl.nasa.gov/igs/scb/station/log/brew_20101021.log)). The responsible agency at the time of the survey was the Jet Propulsion Laboratory. The primary contact at the time of the survey was David Stowers.
- Coordinate in advance with the on-site technicians to take advantage of radio telescope down time. At the time of the survey, every Wednesday was a “maintenance day” for the on-site technicians, providing a perfect opportunity for observing with this technique.
- Site personnel drives the radio telescope under survey team direction during observations.
- NW VLBA is not strategically located and additional network station monuments were set around the techniques. It was included in network observations at this time, but would not necessarily need to be used in future surveys.
- Afternoon heat shimmer made sightings on network stations difficult.
  - Plan these observations earlier in the day. Monuments are located outside the fenced compound. Tripods set up could begin at sunrise before Brewster personnel arrive to unlock the gate.
  - Line of sight between stations was obstructed by local vegetation and required extensive pruning. Consideration should be given to removal (brush hogging) along sight paths
  - Elevate tachometer and targets on tall tripods or stands (would also allow lines-of-sight to clear over fence). Tall setups (2+ meters) would be especially useful at BREWSTER 7614 RM 1, BREWSTER A and BREWSTER B when observing network stations crossing over the radio telescope chain-link perimeter fence. Consideration should be given to installing wooden observing stands for the survey.
- A temporary point was established and tied to the network to assist in observations to BREW GPS. Consideration should be given to installing a permanent monument on the south side of BREW GPS to complement the two existent ones to the east and west.

## 7. References

Axel Nothnagel (2009) Conventions on thermal expansion modelling of radio telescopes for geodetic and astrometric VLBI; *Journal of Geodesy*, Vol. 83(3), 787-792, DOI: 10.1007/s00190-008-0284-z

Johnston, G., Dawson, J. and Naebkhil, S., 2004. The 2003 Mount Stromlo Local Tie Survey. *Geoscience Australia Record*, 2004/20, 25pp. Available online: [http://www.ga.gov.au/image\\_cache/GA5653.pdf](http://www.ga.gov.au/image_cache/GA5653.pdf)

### 7.1 Name of person responsible for observations

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### 7.3 Location of observation data and results archive

National Geodetic Survey  
Instrumentation & Methodologies Branch  
P.O. Box 190  
Corbin, VA 22446  
(540) 373-1243

# ATTACHMENTS

## A. Terrestrial 3-D Adjustment, Star\*Net® File BREWSTER. LST

MicroSurvey STAR\*NET-PRO Version 7.1.0.5  
Run Date: Mon Feb 27 2012 15:09:57

Summary of Files Used and Option Settings  
=====

### Project Folder and Data Files

Project Name TEST2  
Project Folder C:\ISS PROGRAM\AAAAA BREWSTER\TEST\TEST2  
Data File List 1. Test2.dat

### Project Option Settings

STAR\*NET Run Mode : Adjust with Error Propagation  
Type of Adjustment : 3D  
Project Units : Meters; DMS  
Coordinate System : LOCAL  
Apply Average Scale Factor : 1.0000000000  
Input/Output Coordinate Order : North-East  
Angle Data Station Order : At-From-To  
Distance/Vertical Data Type : Slope/Zenith  
Convergence Limit; Max Iterations : 0.010000; 10  
Default Coefficient of Refraction : 0.070000  
Earth Radius : 6372000.00 Meters  
Create Coordinate File : Yes  
Create Ground Scale Coordinate File : No  
Create Dump File : Yes

### Instrument Standard Error Settings

Project Default Instrument  
Distances (Constant) : 0.000300 Meters  
Distances (PPM) : 1.000000  
Angles : 0.500000 Seconds  
Directions : 0.500000 Seconds  
Azimuths & Bearings : 0.100000 Seconds  
Zeniths : 3.000000 Seconds  
Elevation Differences (Constant) : 0.000500 Meters  
Elevation Differences (PPM) : 3.000000  
Differential Levels : 3.000000 Meters / Km  
Centering Error Instrument : 0.000300 Meters  
Centering Error Target : 0.000300 Meters  
Centering Error Vertical : 0.000300 Meters



Summary of Unadjusted Input Observations

Number of Entered Stations (Meters) = 1

Partially Fixed	N	E	Elev	Description
	StdErr	StdErr	StdErr	
7614_RM1	0.0000	0.0000	0.0000	
	0.0001	0.0001	0.0001	

Number of Distance Observations (Meters) = 202

From	To	Distance	StdErr	HI	HT	Type
7614_RM1	BREWSTER_C	71.0674	0.0006	1.731	1.617	S
7614_RM1	7614_RM2	85.5617	0.0006	1.731	1.686	S
7614_RM1	BREWSTER_B	80.7328	0.0006	1.731	1.717	S
7614_RM1	BREWSTER_A	85.9840	0.0006	1.731	2.006	S
7614_RM1	NW_VLBA	33.1583	0.0005	1.731	1.576	S
BREWSTER_C	7614_RM2	44.7879	0.0005	1.617	1.686	S
BREWSTER_C	BREWSTER_B	112.3637	0.0006	1.617	1.717	S
BREWSTER_C	BREWSTER_A	122.1547	0.0006	1.617	2.006	S
BREWSTER_C	NW_VLBA	103.4226	0.0006	1.617	1.576	S
BREWSTER_C	7614_RM1	71.0674	0.0006	1.617	1.731	S
7614_RM2	BREWSTER_B	87.9174	0.0006	1.686	1.717	S
7614_RM2	BREWSTER_A	98.5997	0.0006	1.686	2.006	S
7614_RM2	7614_RM1	85.5620	0.0006	1.686	1.731	S
7614_RM2	BREWSTER_C	44.7881	0.0005	1.686	1.617	S
BREWSTER_A	7614_RM1	85.9811	0.0006	1.767	1.864	S
BREWSTER_A	BREWSTER_C	122.1490	0.0006	1.767	1.823	S
BREWSTER_A	BREWSTER_B	10.6952	0.0005	1.767	1.583	S
BREWSTER_A	1009	13.0854	0.0005	1.767	1.393	S
BREWSTER_B	1009	14.9223	0.0005	1.583	1.393	S
BREWSTER_B	BREWSTER_A	10.6952	0.0005	1.583	1.767	S
BREWSTER_B	7614_RM1	80.7304	0.0006	1.583	1.864	S
BREWSTER_B	BREWSTER_C	112.3592	0.0006	1.583	1.823	S
1009	BREWSTER_A	13.0851	0.0005	1.393	1.767	S
1009	7614_RM1	95.6009	0.0006	1.393	1.864	S
1009	BREWSTER_B	14.9221	0.0005	1.393	1.583	S
1009	BREWSTER_C	125.0237	0.0006	1.393	1.823	S
1009	7614_RM2	97.1171	0.0006	1.393	1.731	S
BREWSTER_A	7614_RM1	85.9811	0.0006	1.738	1.890	S
BREWSTER_A	7614_RM2	98.5942	0.0006	1.738	1.709	S
BREWSTER_A	BREWSTER_B	10.6995	0.0005	1.738	1.299	S
BREWSTER_A	NW_VLBA	76.8545	0.0006	1.738	1.620	S
NW_VLBA	7614_RM1	33.1590	0.0005	1.620	1.890	S
NW_VLBA	BREWSTER_C	103.4222	0.0006	1.620	1.709	S
NW_VLBA	BREWSTER_B	75.7429	0.0006	1.620	1.299	S
NW_VLBA	BREWSTER_A	76.8546	0.0006	1.620	1.738	S
BREWSTER_B	7614_RM1	80.7319	0.0006	1.764	1.820	S
BREWSTER_B	108502	54.8361	0.0006	1.764	0.000	S
BREWSTER_B	108504	53.7804	0.0006	1.764	0.000	S
BREWSTER_B	108506	54.1455	0.0006	1.764	0.000	S
BREWSTER_B	7614_RM2	87.9153	0.0006	1.764	1.810	S
BREWSTER_B	7614_RM1	80.7318	0.0006	1.764	1.820	S
BREWSTER_B	92502	54.8722	0.0006	1.764	0.000	S
BREWSTER_B	92504	53.6993	0.0006	1.764	0.000	S

From	To	Distance	StdErr	HI	HT	Type
BREWSTER_B	92506	54.2499	0.0006	1.764	0.000	S
BREWSTER_B	7614_RM2	87.9153	0.0006	1.764	1.810	S
BREWSTER_B	7614_RM1	80.7319	0.0006	1.764	1.820	S
BREWSTER_B	77502	55.0423	0.0006	1.764	0.000	S
BREWSTER_B	77504	53.8447	0.0006	1.764	0.000	S
BREWSTER_B	77506	54.5453	0.0006	1.764	0.000	S
BREWSTER_B	7614_RM2	87.9153	0.0006	1.764	1.810	S
BREWSTER_B	7614_RM1	80.7318	0.0006	1.764	1.820	S
BREWSTER_B	63502	55.3222	0.0006	1.764	0.000	S
BREWSTER_B	63504	54.1835	0.0006	1.764	0.000	S
BREWSTER_B	63506	54.9950	0.0006	1.764	0.000	S
BREWSTER_B	7614_RM1	80.7318	0.0006	1.764	1.820	S
BREWSTER_B	48502	55.7152	0.0006	1.764	0.000	S
BREWSTER_B	48504	54.7196	0.0006	1.764	0.000	S
BREWSTER_B	48506	55.6005	0.0006	1.764	0.000	S
BREWSTER_B	7614_RM1	80.7318	0.0006	1.764	1.820	S
BREWSTER_B	27502	56.3688	0.0006	1.764	0.000	S
BREWSTER_B	27504	55.6808	0.0006	1.764	0.000	S
BREWSTER_B	27506	56.5754	0.0006	1.764	0.000	S
BREWSTER_B	7614_RM2	87.9156	0.0006	1.764	1.810	S
7614_RM2	BREWSTER_B	87.9159	0.0006	1.810	1.764	S
7614_RM2	107408	54.4316	0.0006	1.810	0.000	S
7614_RM2	107410	53.2866	0.0006	1.810	0.000	S
7614_RM2	107412	53.6528	0.0006	1.810	0.000	S
7614_RM2	7614_RM1	85.5614	0.0006	1.810	1.820	S
7614_RM2	BREWSTER_B	87.9156	0.0006	1.810	1.764	S
7614_RM2	90408	54.5046	0.0006	1.810	0.000	S
7614_RM2	90410	53.2516	0.0006	1.810	0.000	S
7614_RM2	90412	53.8156	0.0006	1.810	0.000	S
7614_RM2	7614_RM1	85.5612	0.0006	1.810	1.820	S
7614_RM2	BREWSTER_B	87.9160	0.0006	1.810	1.764	S
7614_RM2	75408	54.7094	0.0006	1.810	0.000	S
7614_RM2	75410	53.4551	0.0006	1.810	0.000	S
7614_RM2	75412	54.1613	0.0006	1.810	0.000	S
7614_RM2	7614_RM1	85.5613	0.0006	1.810	1.820	S
7614_RM2	BREWSTER_B	87.9161	0.0006	1.810	1.764	S
7614_RM2	60408	55.0327	0.0006	1.810	0.000	S
7614_RM2	60410	53.8649	0.0006	1.810	0.000	S
7614_RM2	60412	54.6736	0.0006	1.810	0.000	S
7614_RM2	7614_RM1	85.5614	0.0006	1.810	1.820	S
7614_RM2	BREWSTER_B	87.9162	0.0006	1.810	1.764	S
7614_RM2	45408	55.4482	0.0006	1.810	0.000	S
7614_RM2	45410	54.4458	0.0006	1.810	0.000	S
7614_RM2	45412	55.3086	0.0006	1.810	0.000	S
7614_RM2	7614_RM1	85.5614	0.0006	1.810	1.820	S
7614_RM2	BREWSTER_B	87.9161	0.0006	1.810	1.764	S
7614_RM2	30408	55.9277	0.0006	1.810	0.000	S
7614_RM2	30410	55.1558	0.0006	1.810	0.000	S
7614_RM2	30412	56.0234	0.0006	1.810	0.000	S
7614_RM2	7614_RM1	85.5613	0.0006	1.810	1.820	S
7614_RM1	BREWSTER_B	80.7324	0.0006	1.820	1.764	S
7614_RM1	30214	46.0698	0.0005	1.820	0.000	S
7614_RM1	30216	43.5067	0.0005	1.820	0.000	S
7614_RM1	30218	43.4410	0.0005	1.820	0.000	S
7614_RM1	7614_RM2	85.5612	0.0006	1.820	1.810	S

From	To	Distance	StdErr	HI	HT	Type
7614_RM1	BREWSTER_B	80.7323	0.0006	1.820	1.764	S
7614_RM1	45214	45.6213	0.0005	1.820	0.000	S
7614_RM1	45216	42.8050	0.0005	1.820	0.000	S
7614_RM1	45218	42.7329	0.0005	1.820	0.000	S
7614_RM1	7614_RM2	85.5613	0.0006	1.820	1.810	S
7614_RM1	BREWSTER_B	80.7324	0.0006	1.820	1.764	S
7614_RM1	60214	45.2246	0.0005	1.820	0.000	S
7614_RM1	60216	42.2152	0.0005	1.820	0.000	S
7614_RM1	60218	42.0891	0.0005	1.820	0.000	S
7614_RM1	7614_RM2	85.5612	0.0006	1.820	1.810	S
7614_RM1	BREWSTER_B	80.7324	0.0006	1.820	1.764	S
7614_RM1	75214	44.9081	0.0005	1.820	0.000	S
7614_RM1	75216	41.7828	0.0005	1.820	0.000	S
7614_RM1	75218	41.5576	0.0005	1.820	0.000	S
7614_RM1	7614_RM2	85.5613	0.0006	1.820	1.810	S
7614_RM1	BREWSTER_B	80.7322	0.0006	1.820	1.764	S
7614_RM1	90214	44.6952	0.0005	1.820	0.000	S
7614_RM1	90216	41.5423	0.0005	1.820	0.000	S
7614_RM1	90218	41.1790	0.0005	1.820	0.000	S
7614_RM1	7614_RM2	85.5613	0.0006	1.820	1.810	S
7614_RM1	BREWSTER_B	80.7322	0.0006	1.820	1.764	S
7614_RM1	107216	41.5132	0.0005	1.820	0.000	S
7614_RM1	107218	40.9835	0.0005	1.820	0.000	S
7614_RM1	7614_RM2	85.5614	0.0006	1.820	1.810	S
7614_RM1	BREWSTER_C	71.0674	0.0006	1.882	1.734	S
7614_RM1	208201	42.3862	0.0005	1.882	0.000	S
7614_RM1	208203	42.2550	0.0005	1.882	0.000	S
7614_RM1	208205	42.1215	0.0005	1.882	0.000	S
7614_RM1	BREWSTER_B	80.7306	0.0006	1.882	1.673	S
7614_RM1	BREWSTER_C	71.0676	0.0006	1.882	1.734	S
7614_RM1	222201	41.2016	0.0005	1.882	0.000	S
7614_RM1	222203	41.0507	0.0005	1.882	0.000	S
7614_RM1	222205	40.8970	0.0005	1.882	0.000	S
7614_RM1	BREWSTER_B	80.7307	0.0006	1.882	1.673	S
7614_RM1	BREWSTER_C	71.0676	0.0006	1.882	1.734	S
7614_RM1	237201	40.0622	0.0005	1.882	0.000	S
7614_RM1	237203	39.8863	0.0005	1.882	0.000	S
7614_RM1	237205	39.7075	0.0005	1.882	0.000	S
7614_RM1	BREWSTER_B	80.7306	0.0006	1.882	1.673	S
7614_RM1	BREWSTER_C	71.0675	0.0006	1.882	1.734	S
7614_RM1	252201	39.1444	0.0005	1.882	0.000	S
7614_RM1	252203	38.9415	0.0005	1.882	0.000	S
7614_RM1	252205	38.7357	0.0005	1.882	0.000	S
7614_RM1	BREWSTER_B	80.7307	0.0006	1.882	1.673	S
7614_RM1	BREWSTER_C	71.0676	0.0006	1.882	1.734	S
7614_RM1	288201	38.2854	0.0005	1.882	0.000	S
7614_RM1	288203	38.0246	0.0005	1.882	0.000	S
7614_RM1	288205	37.7600	0.0005	1.882	0.000	S
7614_RM1	BREWSTER_B	80.7306	0.0006	1.882	1.673	S
7614_RM1	BREWSTER_C	71.0675	0.0006	1.882	1.734	S
7614_RM1	303201	38.5703	0.0005	1.882	0.000	S
7614_RM1	303203	38.2943	0.0005	1.882	0.000	S
7614_RM1	303205	38.0141	0.0005	1.882	0.000	S
7614_RM1	BREWSTER_B	80.7307	0.0006	1.882	1.673	S
BREWSTER_C	7614_RM2	44.7885	0.0005	1.734	1.775	S

From	To	Distance	StdErr	HI	HT	Type
BREWSTER_C	353307	60.8861	0.0006	1.734	0.000	S
BREWSTER_C	353309	60.7948	0.0006	1.734	0.000	S
BREWSTER_C	353311	60.7014	0.0006	1.734	0.000	S
BREWSTER_C	7614_RM1	71.0676	0.0006	1.734	1.882	S
BREWSTER_C	7614_RM2	44.7885	0.0005	1.734	1.775	S
BREWSTER_C	23307	57.5740	0.0006	1.734	0.000	S
BREWSTER_C	23309	57.3821	0.0006	1.734	0.000	S
BREWSTER_C	23311	57.1877	0.0006	1.734	0.000	S
BREWSTER_C	7614_RM1	71.0676	0.0006	1.734	1.882	S
BREWSTER_C	7614_RM2	44.7885	0.0005	1.734	1.775	S
BREWSTER_C	37307	57.7125	0.0006	1.734	0.000	S
BREWSTER_C	37309	57.5025	0.0006	1.734	0.000	S
BREWSTER_C	37311	57.2901	0.0006	1.734	0.000	S
BREWSTER_C	7614_RM1	71.0675	0.0006	1.734	1.882	S
BREWSTER_C	7614_RM2	44.7885	0.0005	1.734	1.775	S
BREWSTER_C	51307	58.1736	0.0006	1.734	0.000	S
BREWSTER_C	51309	57.9519	0.0006	1.734	0.000	S
BREWSTER_C	51311	57.7279	0.0006	1.734	0.000	S
BREWSTER_C	7614_RM1	71.0676	0.0006	1.734	1.882	S
BREWSTER_C	7614_RM2	44.7884	0.0005	1.734	1.775	S
BREWSTER_C	65307	58.9212	0.0006	1.734	0.000	S
BREWSTER_C	65309	58.6934	0.0006	1.734	0.000	S
BREWSTER_C	65311	58.4635	0.0006	1.734	0.000	S
BREWSTER_C	7614_RM1	71.0676	0.0006	1.734	1.882	S
BREWSTER_C	7614_RM2	44.7885	0.0005	1.734	1.775	S
BREWSTER_C	81307	59.9037	0.0006	1.734	0.000	S
BREWSTER_C	81309	59.6757	0.0006	1.734	0.000	S
BREWSTER_C	81311	59.4458	0.0006	1.734	0.000	S
BREWSTER_C	7614_RM1	71.0676	0.0006	1.734	1.882	S
7614_RM2	BREWSTER_B	87.9150	0.0006	1.775	1.673	S
7614_RM2	65413	49.5055	0.0005	1.775	0.000	S
7614_RM2	65415	49.2716	0.0005	1.775	0.000	S
7614_RM2	65417	49.0339	0.0005	1.775	0.000	S
7614_RM2	BREWSTER_C	44.7882	0.0005	1.775	1.734	S
7614_RM2	BREWSTER_B	87.9152	0.0006	1.775	1.673	S
7614_RM2	80413	49.9257	0.0005	1.775	0.000	S
7614_RM2	80415	49.6783	0.0005	1.775	0.000	S
7614_RM2	81417	49.4272	0.0005	1.775	0.000	S
7614_RM2	BREWSTER_C	44.7882	0.0005	1.775	1.734	S
7614_RM2	BREWSTER_B	87.9151	0.0006	1.775	1.673	S
7614_RM2	95413	50.6824	0.0006	1.775	0.000	S
7614_RM2	95415	50.4285	0.0006	1.775	0.000	S
7614_RM2	95417	50.1709	0.0006	1.775	0.000	S
7614_RM2	BREWSTER_C	44.7882	0.0005	1.775	1.734	S
7614_RM2	BREWSTER_B	87.9153	0.0006	1.775	1.673	S
7614_RM2	105413	51.3429	0.0006	1.775	0.000	S
7614_RM2	105415	51.0884	0.0006	1.775	0.000	S
7614_RM2	105417	50.8306	0.0006	1.775	0.000	S
7614_RM2	BREWSTER_C	44.7882	0.0005	1.775	1.734	S

Number of Zenith Observations (DMS) = 202

From	To	Zenith	StdErr	HI	HT
7614_RM1	BREWSTER_C	90-39-53.40	3.24	1.731	1.617
7614_RM1	7614_RM2	90-42-53.90	3.17	1.731	1.686
7614_RM1	BREWSTER_B	89-29-16.80	3.19	1.731	1.717
7614_RM1	BREWSTER_A	89-25-46.50	3.17	1.731	2.006
7614_RM1	NW_VLBA	89-57-16.90	4.00	1.731	1.576
BREWSTER_C	7614_RM2	90-18-34.70	3.58	1.617	1.686
BREWSTER_C	BREWSTER_B	89-12-44.10	3.10	1.617	1.717
BREWSTER_C	BREWSTER_A	89-12-45.50	3.08	1.617	2.006
BREWSTER_C	NW_VLBA	89-31-45.80	3.12	1.617	1.576
BREWSTER_C	7614_RM1	89-20-07.90	3.24	1.617	1.731
7614_RM2	BREWSTER_B	88-50-07.00	3.16	1.686	1.717
7614_RM2	BREWSTER_A	88-53-00.20	3.13	1.686	2.006
7614_RM2	7614_RM1	89-17-10.60	3.17	1.686	1.731
7614_RM2	BREWSTER_C	89-41-22.90	3.58	1.686	1.617
BREWSTER_A	7614_RM1	90-19-30.90	3.17	1.767	1.864
BREWSTER_A	BREWSTER_C	90-34-53.30	3.08	1.767	1.823
BREWSTER_A	BREWSTER_B	90-08-58.40	8.71	1.767	1.583
BREWSTER_A	1009	90-17-49.40	7.33	1.767	1.393
BREWSTER_B	1009	90-09-04.80	6.59	1.583	1.393
BREWSTER_B	BREWSTER_A	89-50-39.70	8.71	1.583	1.767
BREWSTER_B	7614_RM1	90-19-30.70	3.19	1.583	1.864
BREWSTER_B	BREWSTER_C	90-37-01.50	3.10	1.583	1.823
1009	BREWSTER_A	89-41-54.60	7.33	1.393	1.767
1009	7614_RM1	90-15-01.80	3.14	1.393	1.864
1009	BREWSTER_B	89-50-42.20	6.59	1.393	1.583
1009	BREWSTER_C	90-32-12.90	3.08	1.393	1.823
1009	7614_RM2	90-55-43.20	3.13	1.393	1.731
BREWSTER_A	7614_RM1	90-17-17.70	3.17	1.738	1.890
BREWSTER_A	7614_RM2	90-57-02.40	3.13	1.738	1.709
BREWSTER_A	BREWSTER_B	91-31-01.30	8.71	1.738	1.299
BREWSTER_A	NW_VLBA	90-23-17.60	3.21	1.738	1.620
NW_VLBA	7614_RM1	89-50-46.80	4.00	1.620	1.890
NW_VLBA	BREWSTER_C	90-26-41.80	3.12	1.620	1.709
NW_VLBA	BREWSTER_B	89-49-23.20	3.21	1.620	1.299
NW_VLBA	BREWSTER_A	89-36-52.20	3.21	1.620	1.738
BREWSTER_B	7614_RM1	90-29-02.90	3.19	1.764	1.820
BREWSTER_B	108502	78-25-22.00	3.40	1.764	0.000
BREWSTER_B	108504	79-01-25.90	3.41	1.764	0.000
BREWSTER_B	108506	78-20-39.60	3.41	1.764	0.000
BREWSTER_B	7614_RM2	91-07-02.10	3.16	1.764	1.810
BREWSTER_B	7614_RM1	90-29-02.40	3.19	1.764	1.820
BREWSTER_B	92502	77-52-18.20	3.40	1.764	0.000
BREWSTER_B	92504	78-08-18.20	3.41	1.764	0.000
BREWSTER_B	92506	77-32-16.20	3.41	1.764	0.000
BREWSTER_B	7614_RM2	91-07-04.10	3.16	1.764	1.810
BREWSTER_B	7614_RM1	90-29-03.70	3.19	1.764	1.820
BREWSTER_B	77502	77-22-25.80	3.40	1.764	0.000
BREWSTER_B	77504	77-18-00.90	3.41	1.764	0.000
BREWSTER_B	77506	76-49-34.70	3.40	1.764	0.000
BREWSTER_B	7614_RM2	91-07-05.30	3.16	1.764	1.810
BREWSTER_B	7614_RM1	90-29-06.50	3.19	1.764	1.820
BREWSTER_B	63502	76-57-14.10	3.39	1.764	0.000
BREWSTER_B	63504	76-33-34.80	3.41	1.764	0.000

From	To	Zenith	StdErr	HI	HT
BREWSTER_B	63506	76-14-37.50	3.40	1.764	0.000
BREWSTER_B	7614_RM1	90-29-01.50	3.19	1.764	1.820
BREWSTER_B	48502	76-36-41.70	3.39	1.764	0.000
BREWSTER_B	48504	75-55-06.00	3.40	1.764	0.000
BREWSTER_B	48506	75-47-24.40	3.39	1.764	0.000
BREWSTER_B	7614_RM1	90-29-03.70	3.19	1.764	1.820
BREWSTER_B	27502	76-20-32.00	3.38	1.764	0.000
BREWSTER_B	27504	75-20-21.10	3.39	1.764	0.000
BREWSTER_B	27506	75-28-28.20	3.38	1.764	0.000
BREWSTER_B	7614_RM2	91-07-01.60	3.16	1.764	1.810
7614_RM2	BREWSTER_B	88-53-10.30	3.16	1.810	1.764
7614_RM2	107408	76-28-04.40	3.40	1.810	0.000
7614_RM2	107410	77-00-20.90	3.42	1.810	0.000
7614_RM2	107412	76-19-42.50	3.41	1.810	0.000
7614_RM2	7614_RM1	89-18-38.10	3.17	1.810	1.820
7614_RM2	BREWSTER_B	88-53-09.80	3.16	1.810	1.764
7614_RM2	90408	75-51-49.60	3.40	1.810	0.000
7614_RM2	90410	76-01-26.90	3.42	1.810	0.000
7614_RM2	90412	75-26-51.70	3.41	1.810	0.000
7614_RM2	7614_RM1	89-18-36.70	3.17	1.810	1.820
7614_RM2	BREWSTER_B	88-53-11.10	3.16	1.810	1.764
7614_RM2	75408	75-22-31.00	3.40	1.810	0.000
7614_RM2	75410	75-11-24.40	3.42	1.810	0.000
7614_RM2	75412	74-45-08.50	3.41	1.810	0.000
7614_RM2	7614_RM1	89-18-39.00	3.17	1.810	1.820
7614_RM2	BREWSTER_B	88-53-09.90	3.16	1.810	1.764
7614_RM2	60408	74-57-35.00	3.40	1.810	0.000
7614_RM2	60410	74-26-43.40	3.41	1.810	0.000
7614_RM2	60412	74-10-55.10	3.40	1.810	0.000
7614_RM2	7614_RM1	89-18-38.70	3.17	1.810	1.820
7614_RM2	BREWSTER_B	88-53-09.60	3.16	1.810	1.764
7614_RM2	45408	74-39-07.70	3.39	1.810	0.000
7614_RM2	45410	73-51-17.20	3.40	1.810	0.000
7614_RM2	45412	73-46-56.40	3.39	1.810	0.000
7614_RM2	7614_RM1	89-18-38.50	3.17	1.810	1.820
7614_RM2	BREWSTER_B	88-53-10.40	3.16	1.810	1.764
7614_RM2	30408	74-28-11.50	3.38	1.810	0.000
7614_RM2	30410	73-27-13.30	3.39	1.810	0.000
7614_RM2	30412	73-34-24.30	3.38	1.810	0.000
7614_RM2	7614_RM1	89-18-39.00	3.17	1.810	1.820
7614_RM1	BREWSTER_B	89-31-05.00	3.19	1.820	1.764
7614_RM1	30214	72-22-52.90	3.55	1.820	0.000
7614_RM1	30216	70-17-06.40	3.61	1.820	0.000
7614_RM1	30218	70-03-51.40	3.61	1.820	0.000
7614_RM1	7614_RM2	90-41-29.50	3.17	1.820	1.810
7614_RM1	BREWSTER_B	89-31-03.30	3.19	1.820	1.764
7614_RM1	45214	72-35-42.60	3.56	1.820	0.000
7614_RM1	45216	70-45-15.30	3.63	1.820	0.000
7614_RM1	45218	70-16-56.80	3.63	1.820	0.000
7614_RM1	7614_RM2	90-41-28.60	3.17	1.820	1.810
7614_RM1	BREWSTER_B	89-31-02.80	3.19	1.820	1.764
7614_RM1	60214	72-57-48.20	3.57	1.820	0.000
7614_RM1	60216	71-28-26.10	3.65	1.820	0.000
7614_RM1	60218	70-45-19.30	3.65	1.820	0.000
7614_RM1	7614_RM2	90-41-27.60	3.17	1.820	1.810



From	To	Zenith	StdErr	HI	HT
7614_RM1	BREWSTER_B	89-31-04.10	3.19	1.820	1.764
7614_RM1	75214	73-27-34.80	3.58	1.820	0.000
7614_RM1	75216	72-23-47.50	3.66	1.820	0.000
7614_RM1	75218	71-27-23.10	3.67	1.820	0.000
7614_RM1	7614_RM2	90-41-27.10	3.17	1.820	1.810
7614_RM1	BREWSTER_B	89-31-03.00	3.19	1.820	1.764
7614_RM1	90214	74-03-05.60	3.58	1.820	0.000
7614_RM1	90216	73-27-16.70	3.67	1.820	0.000
7614_RM1	90218	72-20-26.70	3.68	1.820	0.000
7614_RM1	7614_RM2	90-41-27.90	3.17	1.820	1.810
7614_RM1	BREWSTER_B	89-31-03.40	3.19	1.820	1.764
7614_RM1	107216	74-33-43.90	3.67	1.820	0.000
7614_RM1	107218	73-20-31.40	3.68	1.820	0.000
7614_RM1	7614_RM2	90-41-27.70	3.17	1.820	1.810
7614_RM1	BREWSTER_C	90-41-34.40	3.24	1.882	1.734
7614_RM1	208201	71-48-27.70	3.64	1.882	0.000
7614_RM1	208203	72-39-17.80	3.65	1.882	0.000
7614_RM1	208205	73-33-20.60	3.65	1.882	0.000
7614_RM1	BREWSTER_B	89-37-32.10	3.19	1.882	1.673
7614_RM1	BREWSTER_C	90-41-34.90	3.24	1.882	1.734
7614_RM1	222201	71-15-53.50	3.68	1.882	0.000
7614_RM1	222203	72-07-43.50	3.68	1.882	0.000
7614_RM1	222205	73-02-54.60	3.68	1.882	0.000
7614_RM1	BREWSTER_B	89-37-33.50	3.19	1.882	1.673
7614_RM1	BREWSTER_C	90-41-34.70	3.24	1.882	1.734
7614_RM1	237201	70-42-40.80	3.71	1.882	0.000
7614_RM1	237203	71-35-18.70	3.72	1.882	0.000
7614_RM1	237205	72-31-28.00	3.72	1.882	0.000
7614_RM1	BREWSTER_B	89-37-33.60	3.19	1.882	1.673
7614_RM1	BREWSTER_C	90-41-33.70	3.24	1.882	1.734
7614_RM1	252201	70-14-25.70	3.74	1.882	0.000
7614_RM1	252203	71-07-29.70	3.75	1.882	0.000
7614_RM1	252205	72-04-20.00	3.76	1.882	0.000
7614_RM1	BREWSTER_B	89-37-32.60	3.19	1.882	1.673
7614_RM1	BREWSTER_C	90-41-33.10	3.24	1.882	1.734
7614_RM1	288201	69-46-30.20	3.77	1.882	0.000
7614_RM1	288203	70-38-59.10	3.78	1.882	0.000
7614_RM1	288205	71-35-43.40	3.79	1.882	0.000
7614_RM1	BREWSTER_B	89-37-32.70	3.19	1.882	1.673
7614_RM1	BREWSTER_C	90-41-32.60	3.24	1.882	1.734
7614_RM1	303201	69-55-50.10	3.76	1.882	0.000
7614_RM1	303203	70-47-27.70	3.77	1.882	0.000
7614_RM1	303205	71-43-23.00	3.78	1.882	0.000
7614_RM1	BREWSTER_B	89-37-31.20	3.19	1.882	1.673
BREWSTER_C	7614_RM2	90-20-43.40	3.58	1.734	1.775
BREWSTER_C	353307	76-37-02.70	3.33	1.734	0.000
BREWSTER_C	353309	77-12-44.80	3.33	1.734	0.000
BREWSTER_C	353311	77-50-35.10	3.33	1.734	0.000
BREWSTER_C	7614_RM1	89-18-29.70	3.24	1.734	1.882
BREWSTER_C	7614_RM2	90-20-45.20	3.58	1.734	1.775
BREWSTER_C	23307	75-49-55.00	3.36	1.734	0.000
BREWSTER_C	23309	76-26-15.10	3.37	1.734	0.000
BREWSTER_C	23311	77-05-02.10	3.37	1.734	0.000
BREWSTER_C	7614_RM1	89-18-29.80	3.24	1.734	1.882
BREWSTER_C	7614_RM2	90-20-42.30	3.58	1.734	1.775

From	To	Zenith	StdErr	HI	HT
BREWSTER_C	37307	75-51-58.40	3.36	1.734	0.000
BREWSTER_C	37309	76-27-59.70	3.36	1.734	0.000
BREWSTER_C	37311	77-06-26.70	3.37	1.734	0.000
BREWSTER_C	7614_RM1	89-18-31.60	3.24	1.734	1.882
BREWSTER_C	7614_RM2	90-20-44.10	3.58	1.734	1.775
BREWSTER_C	51307	75-58-50.30	3.36	1.734	0.000
BREWSTER_C	51309	76-34-24.60	3.36	1.734	0.000
BREWSTER_C	51311	77-12-24.00	3.36	1.734	0.000
BREWSTER_C	7614_RM1	89-18-30.10	3.24	1.734	1.882
BREWSTER_C	7614_RM2	90-20-45.20	3.58	1.734	1.775
BREWSTER_C	65307	76-09-42.50	3.35	1.734	0.000
BREWSTER_C	65309	76-44-45.40	3.35	1.734	0.000
BREWSTER_C	65311	77-22-13.30	3.35	1.734	0.000
BREWSTER_C	7614_RM1	89-18-28.70	3.24	1.734	1.882
BREWSTER_C	7614_RM2	90-20-44.80	3.58	1.734	1.775
BREWSTER_C	81307	76-23-37.20	3.34	1.734	0.000
BREWSTER_C	81309	76-58-06.60	3.34	1.734	0.000
BREWSTER_C	81311	77-34-56.70	3.34	1.734	0.000
BREWSTER_C	7614_RM1	89-18-29.00	3.24	1.734	1.882
7614_RM2	BREWSTER_B	88-55-17.80	3.16	1.775	1.673
7614_RM2	65413	73-07-58.90	3.48	1.775	0.000
7614_RM2	65415	73-49-20.70	3.49	1.775	0.000
7614_RM2	65417	74-33-54.00	3.49	1.775	0.000
7614_RM2	BREWSTER_C	89-39-12.90	3.58	1.775	1.734
7614_RM2	BREWSTER_B	88-55-16.30	3.16	1.775	1.673
7614_RM2	80413	73-16-42.40	3.47	1.775	0.000
7614_RM2	80415	73-57-27.10	3.48	1.775	0.000
7614_RM2	81417	74-41-23.90	3.48	1.775	0.000
7614_RM2	BREWSTER_C	89-39-14.60	3.58	1.775	1.734
7614_RM2	BREWSTER_B	88-55-18.30	3.16	1.775	1.673
7614_RM2	95413	73-32-07.20	3.46	1.775	0.000
7614_RM2	95415	74-12-10.00	3.47	1.775	0.000
7614_RM2	95417	74-55-22.40	3.47	1.775	0.000
7614_RM2	BREWSTER_C	89-39-17.20	3.58	1.775	1.734
7614_RM2	BREWSTER_B	88-55-21.60	3.16	1.775	1.673
7614_RM2	105413	73-45-13.00	3.45	1.775	0.000
7614_RM2	105415	74-24-45.00	3.45	1.775	0.000
7614_RM2	105417	75-07-20.40	3.46	1.775	0.000
7614_RM2	BREWSTER_C	89-39-19.40	3.58	1.775	1.734

Number of Differential Level Observations (Meters) = 10

From	To	Elev Diff	StdErr	Length
NW_VLBA	7614_RM1	-0.1811	0.0002	n/a
7614_RM1	BREWSTER_C	-0.7097	0.0003	n/a
BREWSTER_C	7614_RM2	-0.3117	0.0002	n/a
7614_RM2	BREWSTER_B	1.7580	0.0003	n/a
BREWSTER_B	1009	0.1500	0.0001	n/a
1009	BREWSTER_A	-0.3051	0.0001	n/a
BREWSTER_B	BREWSTER_A	-0.1551	0.0001	n/a
BREWSTER_B	BREW_GPS	1.4222	0.0001	n/a
BREW_GPS	BREWSTER_A	-1.5771	0.0001	n/a
BREWSTER_A	NW_VLBA	-0.4006	0.0003	n/a

Number of Direction Observations (DMS) = 210

From	To	Direction	StdErr
Set 1			
7614_RM1	BREWSTER_C	0-00-00.00	1.33
7614_RM1	7614_RM2	31-32-09.90	1.14
7614_RM1	BREWSTER_B	95-16-52.90	1.19
7614_RM1	BREWSTER_A	101-41-33.80	1.13
7614_RM1	NW_VLBA	164-43-35.00	2.69
Set 2			
BREWSTER_C	7614_RM2	0-00-00.00	2.02
BREWSTER_C	BREWSTER_B	46-41-35.90	0.93
BREWSTER_C	BREWSTER_A	48-48-00.00	0.87
BREWSTER_C	NW_VLBA	87-31-50.60	0.98
BREWSTER_C	7614_RM1	92-22-33.90	1.33
Set 3			
7614_RM2	BREWSTER_B	0-00-00.00	1.11
7614_RM2	BREWSTER_A	0-19-53.90	1.02
7614_RM2	7614_RM1	55-27-20.10	1.14
7614_RM2	BREWSTER_C	111-32-33.20	2.02
Set 4			
BREWSTER_A	7614_RM1	0-00-00.00	1.13
BREWSTER_A	BREWSTER_C	34-43-53.00	0.87
BREWSTER_A	BREW_GPS	47-25-34.50	21.14
BREWSTER_A	7614_RM2	54-43-13.20	1.02
BREWSTER_A	BREWSTER_B	57-26-47.60	8.20
BREWSTER_A	1009	134-27-04.10	6.71
Set 5			
BREWSTER_B	1009	0-00-00.00	5.89
BREWSTER_B	BREWSTER_A	58-41-52.70	8.20
BREWSTER_B	BREW_GPS	64-54-33.70	13.15
BREWSTER_B	7614_RM1	174-50-27.50	1.19
BREWSTER_B	BREWSTER_C	213-52-37.80	0.93
BREWSTER_B	7614_RM2	235-38-25.80	1.11

From	To	Direction	StdErr
Set 6			
1009	BREWSTER_A	0-00-00.00	6.71
1009	BREW_GPS	17-48-37.90	6.49
1009	7614_RM1	39-56-31.00	1.04
1009	BREWSTER_B	44-17-46.60	5.89
1009	BREWSTER_C	74-21-31.40	0.86
1009	7614_RM2	92-38-56.90	1.03
Set 7			
BREWSTER_A	7614_RM1	0-00-00.00	1.13
BREWSTER_A	BREWSTER_C	34-43-52.80	0.87
BREWSTER_A	7614_RM2	54-43-11.40	1.02
BREWSTER_A	BREWSTER_B	57-26-36.10	8.20
BREWSTER_A	NW_VLBA	337-23-01.80	1.24
Set 8			
NW_VLBA	7614_RM1	0-00-00.00	2.69
NW_VLBA	BREWSTER_C	10-25-41.20	0.98
NW_VLBA	BREWSTER_B	86-21-19.50	1.26
NW_VLBA	BREWSTER_A	94-21-04.20	1.24
Set 9			
BREWSTER_B	7614_RM1	0-00-00.00	1.19
BREWSTER_B	108502	22-41-10.40	1.70
BREWSTER_B	108504	28-42-49.50	1.73
BREWSTER_B	108506	31-40-37.90	1.72
BREWSTER_B	7614_RM2	60-47-58.00	1.11
Set 10			
BREWSTER_B	7614_RM1	0-00-00.00	1.19
BREWSTER_B	92502	22-40-53.80	1.71
BREWSTER_B	92504	28-43-38.10	1.74
BREWSTER_B	92506	31-41-01.60	1.73
BREWSTER_B	7614_RM2	60-47-59.40	1.11
Set 11			
BREWSTER_B	7614_RM1	0-00-00.00	1.19
BREWSTER_B	77502	22-41-08.70	1.70
BREWSTER_B	77504	28-43-44.90	1.74
BREWSTER_B	77506	31-40-06.00	1.72
BREWSTER_B	7614_RM2	60-47-57.40	1.11
Set 12			
BREWSTER_B	7614_RM1	0-00-00.00	1.19
BREWSTER_B	63502	22-41-46.60	1.70
BREWSTER_B	63504	28-43-08.80	1.73
BREWSTER_B	63506	31-38-04.20	1.71
BREWSTER_B	7614_RM2	60-47-58.70	1.11

From	To	Direction	StdErr
Set 13			
BREWSTER_B	7614_RM1	0-00-00.00	1.19
BREWSTER_B	48502	22-42-48.90	1.69
BREWSTER_B	48504	28-41-54.30	1.72
BREWSTER_B	48506	31-34-53.40	1.70
BREWSTER_B	7614_RM2	60-47-58.80	1.11
Set 14			
BREWSTER_B	7614_RM1	0-00-00.00	1.19
BREWSTER_B	27502	22-44-42.70	1.67
BREWSTER_B	27504	28-39-15.10	1.70
BREWSTER_B	27506	31-29-15.30	1.67
BREWSTER_B	7614_RM2	60-47-59.20	1.11
Set 15			
7614_RM2	BREWSTER_B	0-00-00.00	1.11
7614_RM2	107408	29-45-00.70	1.73
7614_RM2	107410	35-51-41.70	1.76
7614_RM2	107412	38-52-40.00	1.75
7614_RM2	7614_RM1	55-27-18.20	1.14
Set 16			
7614_RM2	BREWSTER_B	0-00-00.00	1.11
7614_RM2	90408	29-44-41.90	1.73
7614_RM2	90410	35-52-21.70	1.77
7614_RM2	90412	38-52-56.80	1.75
7614_RM2	7614_RM1	55-27-15.60	1.14
Set 17			
7614_RM2	BREWSTER_B	0-00-00.00	1.11
7614_RM2	75408	29-45-04.70	1.73
7614_RM2	75410	35-52-20.00	1.77
7614_RM2	75412	38-51-55.10	1.75
7614_RM2	7614_RM1	55-27-16.90	1.14
Set 18			
7614_RM2	BREWSTER_B	0-00-00.00	1.11
7614_RM2	60408	29-45-58.20	1.72
7614_RM2	60410	35-51-45.60	1.76
7614_RM2	60412	38-49-48.30	1.74
7614_RM2	7614_RM1	55-27-16.40	1.14
Set 19			
7614_RM2	BREWSTER_B	0-00-00.00	1.11
7614_RM2	45408	29-47-19.60	1.71
7614_RM2	45410	35-50-38.00	1.75
7614_RM2	45412	38-46-44.70	1.72
7614_RM2	7614_RM1	55-27-15.20	1.14

From	To	Direction	StdErr
Set 20			
7614_RM2	BREWSTER_B	0-00-00.00	1.11
7614_RM2	30408	29-49-07.30	1.70
7614_RM2	30410	35-49-08.60	1.73
7614_RM2	30412	38-42-56.90	1.70
7614_RM2	7614_RM1	55-27-15.60	1.14
Set 21			
7614_RM1	BREWSTER_B	0-00-00.00	1.19
7614_RM1	30214	319-10-21.70	2.05
7614_RM1	30216	325-43-52.30	2.19
7614_RM1	30218	329-41-32.80	2.20
7614_RM1	7614_RM2	296-15-19.10	1.14
Set 22			
7614_RM1	BREWSTER_B	0-00-00.00	1.19
7614_RM1	45214	318-56-26.10	2.07
7614_RM1	45216	325-28-30.50	2.22
7614_RM1	45218	329-27-57.00	2.23
7614_RM1	7614_RM2	296-15-19.80	1.14
Set 23			
7614_RM1	BREWSTER_B	0-00-00.00	1.19
7614_RM1	60214	318-45-31.40	2.08
7614_RM1	60216	325-17-21.00	2.24
7614_RM1	60218	329-16-47.30	2.26
7614_RM1	7614_RM2	296-15-19.50	1.14
Set 24			
7614_RM1	BREWSTER_B	0-00-00.00	1.19
7614_RM1	75214	318-38-17.60	2.09
7614_RM1	75216	325-11-21.90	2.25
7614_RM1	75218	329-08-57.10	2.28
7614_RM1	7614_RM2	296-15-18.40	1.14
Set 25			
7614_RM1	BREWSTER_B	0-00-00.00	1.19
7614_RM1	90214	318-35-24.60	2.10
7614_RM1	90216	325-11-16.30	2.25
7614_RM1	90218	329-05-09.30	2.29
7614_RM1	7614_RM2	296-15-19.20	1.14
Set 26			
7614_RM1	BREWSTER_B	0-00-00.00	1.19
7614_RM1	107216	325-16-59.10	2.24
7614_RM1	107218	329-05-44.90	2.28
7614_RM1	7614_RM2	296-15-19.10	1.14
Set 27			
7614_RM1	BREWSTER_C	0-00-00.00	1.33
7614_RM1	208201	66-18-34.30	2.23
7614_RM1	208203	66-22-54.80	2.23
7614_RM1	208205	66-27-14.80	2.22
7614_RM1	BREWSTER_B	95-16-53.40	1.19



From	To	Direction	StdErr
Set 28			
7614_RM1	BREWSTER_C	0-00-00.00	1.33
7614_RM1	222201	65-52-30.50	2.30
7614_RM1	222203	65-58-16.70	2.29
7614_RM1	222205	66-04-00.40	2.29
7614_RM1	BREWSTER_B	95-16-52.20	1.19
Set 29			
7614_RM1	BREWSTER_C	0-00-00.00	1.33
7614_RM1	237201	64-53-17.70	2.37
7614_RM1	237203	65-00-18.60	2.37
7614_RM1	237205	65-07-14.20	2.36
7614_RM1	BREWSTER_B	95-16-52.70	1.19
Set 30			
7614_RM1	BREWSTER_C	0-00-00.00	1.33
7614_RM1	252201	63-23-43.60	2.43
7614_RM1	252203	63-31-29.10	2.43
7614_RM1	252205	63-39-01.80	2.43
7614_RM1	BREWSTER_B	95-16-53.70	1.19
Set 31			
7614_RM1	BREWSTER_C	0-00-00.00	1.33
7614_RM1	288201	58-28-21.20	2.49
7614_RM1	288203	58-34-51.60	2.49
7614_RM1	288205	58-41-13.70	2.49
7614_RM1	BREWSTER_B	95-16-53.50	1.19
Set 32			
7614_RM1	BREWSTER_C	0-00-00.00	1.33
7614_RM1	303201	56-20-27.30	2.47
7614_RM1	303203	56-25-16.30	2.47
7614_RM1	303205	56-30-00.30	2.48
7614_RM1	BREWSTER_B	95-16-52.50	1.19
Set 33			
BREWSTER_C	7614_RM2	0-00-00.00	2.02
BREWSTER_C	353307	61-46-22.70	1.56
BREWSTER_C	353309	61-50-02.90	1.56
BREWSTER_C	353311	61-53-42.80	1.56
BREWSTER_C	7614_RM1	92-22-35.10	1.33
Set 34			
BREWSTER_C	7614_RM2	0-00-00.00	2.02
BREWSTER_C	23307	57-16-07.30	1.65
BREWSTER_C	23309	57-20-37.40	1.65
BREWSTER_C	23311	57-25-10.00	1.65
BREWSTER_C	7614_RM1	92-22-34.80	1.33

From	To	Direction	StdErr
Set 35			
BREWSTER_C	7614_RM2	0-00-00.00	2.02
BREWSTER_C	37307	55-51-57.40	1.64
BREWSTER_C	37309	55-55-34.90	1.64
BREWSTER_C	37311	55-59-12.10	1.64
BREWSTER_C	7614_RM1	92-22-35.60	1.33
Set 36			
BREWSTER_C	7614_RM2	0-00-00.00	2.02
BREWSTER_C	51307	54-39-01.20	1.63
BREWSTER_C	51309	54-41-31.70	1.63
BREWSTER_C	51311	54-44-01.80	1.63
BREWSTER_C	7614_RM1	92-22-33.40	1.33
Set 37			
BREWSTER_C	7614_RM2	0-00-00.00	2.02
BREWSTER_C	65307	53-36-52.40	1.61
BREWSTER_C	65309	53-38-06.10	1.61
BREWSTER_C	65311	53-39-20.90	1.61
BREWSTER_C	7614_RM1	92-22-33.50	1.33
Set 38			
BREWSTER_C	7614_RM2	0-00-00.00	2.02
BREWSTER_C	81307	52-49-31.80	1.58
BREWSTER_C	81309	52-49-28.20	1.59
BREWSTER_C	81311	52-49-25.50	1.59
BREWSTER_C	7614_RM1	92-22-34.90	1.33
Set 39			
7614_RM2	BREWSTER_B	0-00-00.00	1.11
7614_RM2	65413	33-14-34.40	1.91
7614_RM2	65415	33-19-07.90	1.92
7614_RM2	65417	33-23-35.40	1.92
7614_RM2	BREWSTER_C	111-32-31.80	2.02
Set 40			
7614_RM2	BREWSTER_B	0-00-00.00	1.11
7614_RM2	80413	31-40-32.20	1.90
7614_RM2	80415	31-43-41.60	1.90
7614_RM2	81417	31-46-47.80	1.90
7614_RM2	BREWSTER_C	111-32-29.40	2.02
Set 41			
7614_RM2	BREWSTER_B	0-00-00.00	1.11
7614_RM2	95413	30-20-13.60	1.87
7614_RM2	95415	30-21-48.10	1.87
7614_RM2	95417	30-23-20.70	1.87
7614_RM2	BREWSTER_C	111-32-27.50	2.02

From	To	Direction	StdErr
Set 42			
7614_RM2	BREWSTER_B	0-00-00.00	1.11
7614_RM2	105413	29-37-29.40	1.84
7614_RM2	105415	29-38-00.00	1.85
7614_RM2	105417	29-38-25.10	1.85
7614_RM2	BREWSTER_C	111-32-28.20	2.02

Number of Azimuth/Bearing Observations (DMS) = 1

From	To	Bearing	StdErr
7614_RM1	7614_RM2	N40-06-36.27W	0.10

Adjustment Statistical Summary  
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Iterations = 2  
 Number of Stations = 109  
 Number of Observations = 628  
 Number of Unknowns = 369  
 Number of Redundant Obs = 259

Observation	Count	Sum Squares of StdRes	Error Factor
Coordinates	3	0.000	0.000
Directions	210	47.970	0.744
Distances	202	22.406	0.519
Az/Bearings	1	0.000	0.000
Zeniths	202	102.416	1.109
Level Data	10	2.410	0.765
Total	628	175.203	0.822

Warning: The Chi-Square Test at 5.00% Level Exceeded Lower Bound  
 Lower/Upper Bounds (0.914/1.086)

Adjusted Coordinates (Meters)

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Station	N	E	Elev	Description
7614_RM1	0.0000	-0.0000	0.0000	
7614_RM2	65.4334	-55.1197	-1.0212	
NW_VLBA	-1.7815	33.1108	0.1812	
BREWSTER_C	22.3761	-67.4475	-0.7097	
BREWSTER_B	73.9574	32.3651	0.7368	
1009	87.0345	39.5524	0.8868	
BREWSTER_A	74.4256	43.0501	0.5817	
BREW_GPS	73.5274	39.0081	2.1589	
108502	36.8575	-6.4870	13.5058	
108504	41.7067	-9.4364	12.7407	
108506	43.7786	-11.2389	13.4399	
92502	36.9047	-6.4310	14.0296	
92504	41.8653	-9.2507	13.5387	
92506	43.8161	-11.1952	14.2077	
77502	36.8636	-6.4800	14.5325	
77504	41.8823	-9.2320	14.3382	
77506	43.7259	-11.3008	14.9320	
63502	36.7442	-6.6191	14.9890	
63504	41.7698	-9.3625	15.0949	
63506	43.5247	-11.5357	15.5782	
48502	36.5443	-6.8523	15.4018	
48504	41.5251	-9.6483	15.8144	
48506	43.2092	-11.9032	16.1494	
27502	36.1700	-7.2883	15.8108	
27504	41.0078	-10.2503	16.5935	
27506	42.6405	-12.5646	16.6906	
107408	43.7526	-6.8442	13.5255	
107410	39.2400	-10.2888	12.7707	
107412	36.8017	-11.5532	13.4702	
90408	43.7839	-6.9030	14.1006	
90410	39.3556	-10.5072	13.6500	
90412	36.8218	-11.5921	14.3109	
75408	43.7448	-6.8298	14.6024	
75410	39.3541	-10.5034	14.4528	
75412	36.7440	-11.4450	15.0330	
60408	43.6459	-6.6433	15.0699	
60410	39.2541	-10.3153	15.2333	
60412	36.5797	-11.1360	15.6921	
45408	43.4940	-6.3572	15.4650	
45410	39.0637	-9.9559	15.9289	
45412	36.3424	-10.6884	16.2360	
30408	43.2981	-5.9903	15.7634	
30410	38.7945	-9.4492	16.4969	
30412	36.0476	-10.1297	16.6317	
30214	41.9468	-12.9787	15.7641	
30216	40.2530	-7.5579	16.4963	
30218	40.5612	-4.7453	16.6316	
45214	41.5348	-13.0359	15.4660	
45216	39.6849	-7.6350	15.9291	
45218	39.9360	-4.8324	16.2371	
60214	41.2145	-13.0792	15.0698	
60216	39.2819	-7.6898	15.2330	

Station	N	E	Elev	Description
60218	39.4337	-4.9015	15.6924	
75214	41.0057	-13.1078	14.6046	
75216	39.0710	-7.7190	14.4560	
75218	39.0879	-4.9490	15.0361	
90214	40.9233	-13.1194	14.1007	
90216	39.0668	-7.7194	13.6499	
90218	38.9223	-4.9717	14.3116	
107216	39.2692	-7.6916	12.8702	
107218	38.9479	-4.9682	13.5679	
208201	40.0929	-3.7454	15.1157	
208203	40.1633	-3.7008	14.4797	
208205	40.2327	-3.6560	13.8063	
222201	38.8207	-3.9235	15.1161	
222203	38.8784	-3.8634	14.4800	
222205	38.9347	-3.8035	13.8064	
237201	37.5506	-4.4498	15.1161	
237203	37.5907	-4.3768	14.4800	
237205	37.6294	-4.3045	13.8065	
252201	36.4582	-5.2869	15.1161	
252203	36.4779	-5.2057	14.4802	
252205	36.4966	-5.1267	13.8059	
288201	34.9793	-8.1875	15.1179	
288203	34.9478	-8.1104	14.4815	
288205	34.9160	-8.0349	13.8042	
303201	34.9433	-9.5629	15.1181	
303203	34.8930	-9.4966	14.4818	
303205	34.8424	-9.4314	13.8040	
353307	34.9438	-9.5634	15.1163	
353309	34.8935	-9.4971	14.4802	
353311	34.8429	-9.4318	13.8072	
23307	38.4678	-13.9945	15.1163	
23309	38.3861	-14.0125	14.4805	
23311	38.3037	-14.0309	13.8069	
37307	39.8161	-14.2689	15.1167	
37309	39.7416	-14.3072	14.4804	
37311	39.6670	-14.3460	13.8069	
51307	41.0977	-14.2022	15.1166	
51309	41.0347	-14.2573	14.4804	
51311	40.9718	-14.3128	13.8071	
65307	42.3257	-13.8275	15.1169	
65309	42.2783	-13.8964	14.4807	
65311	42.2307	-13.9652	13.8070	
81307	43.4282	-13.1644	15.1164	
81309	43.3989	-13.2428	14.4802	
81311	43.3694	-13.3211	13.8070	
65413	43.4273	-13.1650	15.1179	
65415	43.3974	-13.2431	14.4816	
65417	43.3689	-13.3205	13.8039	
80413	44.3898	-12.1849	15.1185	
80415	44.3817	-12.2678	14.4824	
81417	44.3742	-12.3502	13.8047	
95413	45.0675	-10.9881	15.1184	
95415	45.0810	-11.0703	14.4821	
95417	45.0948	-11.1521	13.8042	
105413	45.3371	-10.1097	15.1179	

Station	N	E	Elev	Description
105415	45.3643	-10.1886	14.4818	
105417	45.3927	-10.2667	13.80	

Adjusted Observations and Residuals

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Adjusted Coordinate Observations (Meters)  
 (Stations with Partially Fixed Coordinate Components)

Station	Component	Adj Coordinate	Residual	StdErr	StdRes	File:Line
7614_RM1	N	0.0000	0.0000	0.0001	0.0	1:1
	E	-0.0000	-0.0000	0.0001	0.0	1:1
	Elev	0.0000	0.0000	0.0001	0.0	1:1

Adjusted Distance Observations (Meters)

From	To	Distance	Residual	StdErr	StdRes	File:Line
7614_RM1	BREWSTER_C	71.0672	-0.0002	0.0006	0.4	1:18
7614_RM1	7614_RM2	85.5619	0.0002	0.0006	0.4	1:19
7614_RM1	BREWSTER_B	80.7324	-0.0004	0.0006	0.7	1:20
7614_RM1	BREWSTER_A	85.9838	-0.0002	0.0006	0.4	1:21
7614_RM1	NW_VLBA	33.1587	0.0004	0.0005	0.8	1:22
BREWSTER_C	7614_RM2	44.7880	0.0001	0.0005	0.2	1:25
BREWSTER_C	BREWSTER_B	112.3636	-0.0001	0.0006	0.1	1:26
BREWSTER_C	BREWSTER_A	122.1544	-0.0003	0.0006	0.4	1:27
BREWSTER_C	NW_VLBA	103.4229	0.0003	0.0006	0.5	1:28
BREWSTER_C	7614_RM1	71.0672	-0.0002	0.0006	0.4	1:29
7614_RM2	BREWSTER_B	87.9172	-0.0002	0.0006	0.3	1:32
7614_RM2	BREWSTER_A	98.5995	-0.0002	0.0006	0.3	1:33
7614_RM2	7614_RM1	85.5619	-0.0001	0.0006	0.1	1:34
7614_RM2	BREWSTER_C	44.7880	-0.0001	0.0005	0.2	1:35
BREWSTER_A	7614_RM1	85.9809	-0.0002	0.0006	0.4	1:39
BREWSTER_A	BREWSTER_C	122.1491	0.0001	0.0006	0.2	1:40
BREWSTER_A	BREWSTER_B	10.6953	0.0001	0.0005	0.2	1:45
BREWSTER_A	1009	13.0853	-0.0001	0.0005	0.3	1:46
BREWSTER_B	1009	14.9222	-0.0001	0.0005	0.2	1:49
BREWSTER_B	BREWSTER_A	10.6953	0.0001	0.0005	0.2	1:50
BREWSTER_B	7614_RM1	80.7304	0.0000	0.0006	0.1	1:54
BREWSTER_B	BREWSTER_C	112.3595	0.0003	0.0006	0.5	1:55
1009	BREWSTER_A	13.0853	0.0002	0.0005	0.3	1:59
1009	7614_RM1	95.6011	0.0002	0.0006	0.4	1:63
1009	BREWSTER_B	14.9222	0.0001	0.0005	0.1	1:64
1009	BREWSTER_C	125.0243	0.0006	0.0006	1.0	1:65



From	To	Distance	Residual	StdErr	StdRes	File:Line
1009	7614_RM2	97.1179	0.0008	0.0006	1.4	1:66
BREWSTER_A	7614_RM1	85.9806	-0.0005	0.0006	0.9	1:70
BREWSTER_A	7614_RM2	98.5943	0.0001	0.0006	0.1	1:72
BREWSTER_A	BREWSTER_B	10.6990	-0.0005	0.0005	0.9	1:73
BREWSTER_A	NW_VLBA	76.8543	-0.0002	0.0006	0.4	1:74
NW_VLBA	7614_RM1	33.1588	-0.0002	0.0005	0.3	1:77
NW_VLBA	BREWSTER_C	103.4225	0.0003	0.0006	0.5	1:78
NW_VLBA	BREWSTER_B	75.7430	0.0001	0.0006	0.1	1:79
NW_VLBA	BREWSTER_A	76.8543	-0.0003	0.0006	0.5	1:80
BREWSTER_B	7614_RM1	80.7320	0.0001	0.0006	0.2	1:84
BREWSTER_B	108502	54.8361	0.0000	0.0006	0.0	1:85
BREWSTER_B	108504	53.7804	0.0000	0.0006	0.0	1:86
BREWSTER_B	108506	54.1455	0.0000	0.0006	0.0	1:87
BREWSTER_B	7614_RM2	87.9157	0.0004	0.0006	0.7	1:88
BREWSTER_B	7614_RM1	80.7320	0.0002	0.0006	0.4	1:91
BREWSTER_B	92502	54.8722	0.0000	0.0006	0.0	1:92
BREWSTER_B	92504	53.6993	0.0000	0.0006	0.0	1:93
BREWSTER_B	92506	54.2499	0.0000	0.0006	0.0	1:94
BREWSTER_B	7614_RM2	87.9157	0.0004	0.0006	0.7	1:95
BREWSTER_B	7614_RM1	80.7320	0.0001	0.0006	0.2	1:98
BREWSTER_B	77502	55.0423	0.0000	0.0006	0.0	1:99
BREWSTER_B	77504	53.8447	0.0000	0.0006	0.0	1:100
BREWSTER_B	77506	54.5453	0.0000	0.0006	0.0	1:101
BREWSTER_B	7614_RM2	87.9157	0.0004	0.0006	0.7	1:102
BREWSTER_B	7614_RM1	80.7320	0.0002	0.0006	0.4	1:105
BREWSTER_B	63502	55.3222	0.0000	0.0006	0.0	1:106
BREWSTER_B	63504	54.1835	0.0000	0.0006	0.0	1:107
BREWSTER_B	63506	54.9950	0.0000	0.0006	0.0	1:108
BREWSTER_B	7614_RM1	80.7320	0.0002	0.0006	0.4	1:112
BREWSTER_B	48502	55.7152	0.0000	0.0006	0.0	1:113
BREWSTER_B	48504	54.7196	0.0000	0.0006	0.0	1:114
BREWSTER_B	48506	55.6005	0.0000	0.0006	0.0	1:115
BREWSTER_B	7614_RM1	80.7320	0.0002	0.0006	0.4	1:119
BREWSTER_B	27502	56.3688	0.0000	0.0006	0.0	1:120
BREWSTER_B	27504	55.6808	0.0000	0.0006	0.0	1:121
BREWSTER_B	27506	56.5754	0.0000	0.0006	0.0	1:122
BREWSTER_B	7614_RM2	87.9157	0.0001	0.0006	0.2	1:123
7614_RM2	BREWSTER_B	87.9157	-0.0002	0.0006	0.3	1:126
7614_RM2	107408	54.4316	0.0000	0.0006	0.0	1:127

From	To	Distance	Residual	StdErr	StdRes	File:Line
7614_RM2	107410	53.2866	0.0000	0.0006	0.0	1:128
7614_RM2	107412	53.6528	0.0000	0.0006	0.0	1:129
7614_RM2	7614_RM1	85.5615	0.0001	0.0006	0.2	1:130
7614_RM2	BREWSTER_B	87.9157	0.0001	0.0006	0.2	1:133
7614_RM2	90408	54.5046	0.0000	0.0006	0.0	1:134
7614_RM2	90410	53.2516	0.0000	0.0006	0.0	1:135
7614_RM2	90412	53.8156	0.0000	0.0006	0.0	1:136
7614_RM2	7614_RM1	85.5615	0.0003	0.0006	0.5	1:137
7614_RM2	BREWSTER_B	87.9157	-0.0003	0.0006	0.5	1:140
7614_RM2	75408	54.7094	0.0000	0.0006	0.0	1:141
7614_RM2	75410	53.4551	0.0000	0.0006	0.0	1:142
7614_RM2	75412	54.1613	0.0000	0.0006	0.0	1:143
7614_RM2	7614_RM1	85.5615	0.0002	0.0006	0.3	1:144
7614_RM2	BREWSTER_B	87.9157	-0.0004	0.0006	0.7	1:147
7614_RM2	60408	55.0327	0.0000	0.0006	0.0	1:148
7614_RM2	60410	53.8649	0.0000	0.0006	0.0	1:149
7614_RM2	60412	54.6736	0.0000	0.0006	0.0	1:150
7614_RM2	7614_RM1	85.5615	0.0001	0.0006	0.2	1:151
7614_RM2	BREWSTER_B	87.9157	-0.0005	0.0006	0.8	1:154
7614_RM2	45408	55.4482	0.0000	0.0006	0.0	1:155
7614_RM2	45410	54.4458	0.0000	0.0006	0.0	1:156
7614_RM2	45412	55.3086	0.0000	0.0006	0.0	1:157
7614_RM2	7614_RM1	85.5615	0.0001	0.0006	0.2	1:158
7614_RM2	BREWSTER_B	87.9157	-0.0004	0.0006	0.7	1:161
7614_RM2	30408	55.9277	0.0000	0.0006	0.0	1:162
7614_RM2	30410	55.1558	0.0000	0.0006	0.0	1:163
7614_RM2	30412	56.0234	0.0000	0.0006	0.0	1:164
7614_RM2	7614_RM1	85.5615	0.0002	0.0006	0.3	1:165
7614_RM1	BREWSTER_B	80.7320	-0.0004	0.0006	0.7	1:168
7614_RM1	30214	46.0698	0.0000	0.0005	0.0	1:169
7614_RM1	30216	43.5067	0.0000	0.0005	0.0	1:170
7614_RM1	30218	43.4410	0.0000	0.0005	0.0	1:171
7614_RM1	7614_RM2	85.5615	0.0003	0.0006	0.5	1:172
7614_RM1	BREWSTER_B	80.7320	-0.0003	0.0006	0.5	1:175
7614_RM1	45214	45.6213	0.0000	0.0005	0.0	1:176
7614_RM1	45216	42.8050	0.0000	0.0005	0.0	1:177
7614_RM1	45218	42.7329	0.0000	0.0005	0.0	1:178
7614_RM1	7614_RM2	85.5615	0.0002	0.0006	0.3	1:179
7614_RM1	BREWSTER_B	80.7320	-0.0004	0.0006	0.7	1:182

From	To	Distance	Residual	StdErr	StdRes	File:Line
7614_RM1	60214	45.2246	0.0000	0.0005	0.0	1:183
7614_RM1	60216	42.2152	0.0000	0.0005	0.0	1:184
7614_RM1	60218	42.0891	0.0000	0.0005	0.0	1:185
7614_RM1	7614_RM2	85.5615	0.0003	0.0006	0.5	1:186
7614_RM1	BREWSTER_B	80.7320	-0.0004	0.0006	0.7	1:189
7614_RM1	75214	44.9081	0.0000	0.0005	0.0	1:190
7614_RM1	75216	41.7828	0.0000	0.0005	0.0	1:191
7614_RM1	75218	41.5576	0.0000	0.0005	0.0	1:192
7614_RM1	7614_RM2	85.5615	0.0002	0.0006	0.3	1:193
7614_RM1	BREWSTER_B	80.7320	-0.0002	0.0006	0.3	1:196
7614_RM1	90214	44.6952	0.0000	0.0005	0.0	1:197
7614_RM1	90216	41.5423	0.0000	0.0005	0.0	1:198
7614_RM1	90218	41.1790	0.0000	0.0005	0.0	1:199
7614_RM1	7614_RM2	85.5615	0.0002	0.0006	0.3	1:200
7614_RM1	BREWSTER_B	80.7320	-0.0002	0.0006	0.3	1:203
7614_RM1	107216	41.5132	0.0000	0.0005	0.0	1:204
7614_RM1	107218	40.9835	0.0000	0.0005	0.0	1:205
7614_RM1	7614_RM2	85.5615	0.0001	0.0006	0.2	1:206
7614_RM1	BREWSTER_C	71.0676	0.0002	0.0006	0.3	1:210
7614_RM1	208201	42.3862	0.0000	0.0005	0.0	1:211
7614_RM1	208203	42.2550	0.0000	0.0005	0.0	1:212
7614_RM1	208205	42.1215	0.0000	0.0005	0.0	1:213
7614_RM1	BREWSTER_B	80.7309	0.0003	0.0006	0.5	1:214
7614_RM1	BREWSTER_C	71.0676	-0.0000	0.0006	0.1	1:217
7614_RM1	222201	41.2016	0.0000	0.0005	0.0	1:218
7614_RM1	222203	41.0507	0.0000	0.0005	0.0	1:219
7614_RM1	222205	40.8970	0.0000	0.0005	0.0	1:220
7614_RM1	BREWSTER_B	80.7309	0.0002	0.0006	0.3	1:221
7614_RM1	BREWSTER_C	71.0676	-0.0000	0.0006	0.1	1:224
7614_RM1	237201	40.0622	0.0000	0.0005	0.0	1:225
7614_RM1	237203	39.8863	0.0000	0.0005	0.0	1:226
7614_RM1	237205	39.7075	0.0000	0.0005	0.0	1:227
7614_RM1	BREWSTER_B	80.7309	0.0003	0.0006	0.5	1:228
7614_RM1	BREWSTER_C	71.0676	0.0001	0.0006	0.1	1:231
7614_RM1	252201	39.1444	0.0000	0.0005	0.0	1:232
7614_RM1	252203	38.9415	0.0000	0.0005	0.0	1:233
7614_RM1	252205	38.7357	0.0000	0.0005	0.0	1:234
7614_RM1	BREWSTER_B	80.7309	0.0002	0.0006	0.3	1:235
7614_RM1	BREWSTER_C	71.0676	-0.0000	0.0006	0.1	1:238

From	To	Distance	Residual	StdErr	StdRes	File:Line
7614_RM1	288201	38.2854	0.0000	0.0005	0.0	1:239
7614_RM1	288203	38.0246	0.0000	0.0005	0.0	1:240
7614_RM1	288205	37.7600	0.0000	0.0005	0.0	1:241
7614_RM1	BREWSTER_B	80.7309	0.0003	0.0006	0.5	1:242
7614_RM1	BREWSTER_C	71.0676	0.0001	0.0006	0.1	1:245
7614_RM1	303201	38.5703	0.0000	0.0005	0.0	1:246
7614_RM1	303203	38.2943	0.0000	0.0005	0.0	1:247
7614_RM1	303205	38.0141	0.0000	0.0005	0.0	1:248
7614_RM1	BREWSTER_B	80.7309	0.0002	0.0006	0.3	1:249
BREWSTER_C	7614_RM2	44.7882	-0.0003	0.0005	0.6	1:252
BREWSTER_C	353307	60.8861	0.0000	0.0006	0.0	1:253
BREWSTER_C	353309	60.7948	0.0000	0.0006	0.0	1:254
BREWSTER_C	353311	60.7014	0.0000	0.0006	0.0	1:255
BREWSTER_C	7614_RM1	71.0676	-0.0000	0.0006	0.1	1:256
BREWSTER_C	7614_RM2	44.7882	-0.0003	0.0005	0.6	1:259
BREWSTER_C	23307	57.5740	0.0000	0.0006	0.0	1:260
BREWSTER_C	23309	57.3821	0.0000	0.0006	0.0	1:261
BREWSTER_C	23311	57.1877	0.0000	0.0006	0.0	1:262
BREWSTER_C	7614_RM1	71.0676	-0.0000	0.0006	0.1	1:263
BREWSTER_C	7614_RM2	44.7882	-0.0003	0.0005	0.6	1:266
BREWSTER_C	37307	57.7125	0.0000	0.0006	0.0	1:267
BREWSTER_C	37309	57.5025	0.0000	0.0006	0.0	1:268
BREWSTER_C	37311	57.2901	0.0000	0.0006	0.0	1:269
BREWSTER_C	7614_RM1	71.0676	0.0001	0.0006	0.1	1:270
BREWSTER_C	7614_RM2	44.7882	-0.0003	0.0005	0.6	1:273
BREWSTER_C	51307	58.1736	0.0000	0.0006	0.0	1:274
BREWSTER_C	51309	57.9519	0.0000	0.0006	0.0	1:275
BREWSTER_C	51311	57.7279	0.0000	0.0006	0.0	1:276
BREWSTER_C	7614_RM1	71.0676	-0.0000	0.0006	0.1	1:277
BREWSTER_C	7614_RM2	44.7882	-0.0002	0.0005	0.4	1:280
BREWSTER_C	65307	58.9212	0.0000	0.0006	0.0	1:281
BREWSTER_C	65309	58.6934	0.0000	0.0006	0.0	1:282
BREWSTER_C	65311	58.4635	0.0000	0.0006	0.0	1:283
BREWSTER_C	7614_RM1	71.0676	-0.0000	0.0006	0.1	1:284
BREWSTER_C	7614_RM2	44.7882	-0.0003	0.0005	0.6	1:287
BREWSTER_C	81307	59.9037	0.0000	0.0006	0.0	1:288
BREWSTER_C	81309	59.6757	0.0000	0.0006	0.0	1:289
BREWSTER_C	81311	59.4458	0.0000	0.0006	0.0	1:290
BREWSTER_C	7614_RM1	71.0676	-0.0000	0.0006	0.1	1:291

From	To	Distance	Residual	StdErr	StdRes	File:Line
7614_RM2	BREWSTER_B	87.9147	-0.0003	0.0006	0.6	1:294
7614_RM2	65413	49.5055	0.0000	0.0005	0.0	1:295
7614_RM2	65415	49.2716	0.0000	0.0005	0.0	1:296
7614_RM2	65417	49.0339	0.0000	0.0005	0.0	1:297
7614_RM2	BREWSTER_C	44.7882	-0.0000	0.0005	0.0	1:298
7614_RM2	BREWSTER_B	87.9147	-0.0005	0.0006	0.9	1:301
7614_RM2	80413	49.9257	0.0000	0.0005	0.0	1:302
7614_RM2	80415	49.6783	0.0000	0.0005	0.0	1:303
7614_RM2	81417	49.4272	0.0000	0.0005	0.0	1:304
7614_RM2	BREWSTER_C	44.7882	-0.0000	0.0005	0.0	1:305
7614_RM2	BREWSTER_B	87.9147	-0.0004	0.0006	0.8	1:308
7614_RM2	95413	50.6824	0.0000	0.0006	0.0	1:309
7614_RM2	95415	50.4285	0.0000	0.0006	0.0	1:310
7614_RM2	95417	50.1709	0.0000	0.0006	0.0	1:311
7614_RM2	BREWSTER_C	44.7882	-0.0000	0.0005	0.0	1:312
7614_RM2	BREWSTER_B	87.9147	-0.0006	0.0006	1.1	1:315
7614_RM2	105413	51.3429	0.0000	0.0006	0.0	1:316
7614_RM2	105415	51.0884	0.0000	0.0006	0.0	1:317
7614_RM2	105417	50.8306	0.0000	0.0006	0.0	1:318
7614_RM2	BREWSTER_C	44.7882	-0.0000	0.0005	0.0	1:319

Adjusted Zenith Observations (DMS)

From	To	Zenith	Residual	StdErr	StdRes	File:Line
7614_RM1	BREWSTER_C	90-39-53.85	0-00-00.45	3.24	0.1	1:18
7614_RM1	7614_RM2	90-42-51.91	-0-00-01.99	3.17	0.6	1:19
7614_RM1	BREWSTER_B	89-29-16.75	-0-00-00.05	3.19	0.0	1:20
7614_RM1	BREWSTER_A	89-25-46.90	0-00-00.40	3.17	0.1	1:21
7614_RM1	NW_VLBA	89-57-19.59	0-00-02.69	4.00	0.7	1:22
BREWSTER_C	7614_RM2	90-18-34.76	0-00-00.06	3.58	0.0	1:25
BREWSTER_C	BREWSTER_B	89-12-42.93	-0-00-01.17	3.10	0.4	1:26
BREWSTER_C	BREWSTER_A	89-12-43.54	-0-00-01.96	3.08	0.6	1:27
BREWSTER_C	NW_VLBA	89-31-45.62	-0-00-00.18	3.12	0.1	1:28
BREWSTER_C	7614_RM1	89-20-08.12	0-00-00.22	3.24	0.1	1:29
7614_RM2	BREWSTER_B	88-50-05.53	-0-00-01.47	3.16	0.5	1:32
7614_RM2	BREWSTER_A	88-52-58.96	-0-00-01.24	3.13	0.4	1:33
7614_RM2	7614_RM1	89-17-10.47	-0-00-00.13	3.17	0.0	1:34
7614_RM2	BREWSTER_C	89-41-26.49	0-00-03.59	3.58	1.0	1:35
BREWSTER_A	7614_RM1	90-19-24.08	-0-00-06.82	3.17	2.2	1:39

From	To	Zenith	Residual	StdErr	StdRes	File:Line
BREWSTER_A	BREWSTER_C	90-34-47.48	-0-00-05.82	3.08	1.9	1:40
BREWSTER_A	BREWSTER_B	90-09-09.02	0-00-10.62	8.71	1.2	1:45
BREWSTER_A	1009	90-17-57.09	0-00-07.69	7.33	1.0	1:46
BREWSTER_B	1009	90-09-11.15	0-00-06.35	6.59	1.0	1:49
BREWSTER_B	BREWSTER_A	89-50-51.28	0-00-11.58	8.71	1.3	1:50
BREWSTER_B	7614_RM1	90-19-26.92	-0-00-03.78	3.19	1.2	1:54
BREWSTER_B	BREWSTER_C	90-36-56.83	-0-00-04.67	3.10	1.5	1:55
1009	BREWSTER_A	89-42-03.27	0-00-08.67	7.33	1.2	1:59
1009	7614_RM1	90-14-59.79	-0-00-02.01	3.14	0.6	1:63
1009	BREWSTER_B	89-50-49.26	0-00-07.06	6.59	1.1	1:64
1009	BREWSTER_C	90-32-06.84	-0-00-06.06	3.08	2.0	1:65
1009	7614_RM2	90-55-36.32	-0-00-06.88	3.13	2.2	1:66
BREWSTER_A	7614_RM1	90-17-14.30	-0-00-03.40	3.17	1.1	1:70
BREWSTER_A	7614_RM2	90-56-56.37	-0-00-06.03	3.13	1.9	1:72
BREWSTER_A	BREWSTER_B	91-31-15.20	0-00-13.90	8.71	1.6	1:73
BREWSTER_A	NW_VLBA	90-23-14.75	-0-00-02.85	3.21	0.9	1:74
NW_VLBA	7614_RM1	89-50-49.09	0-00-02.29	4.00	0.6	1:77
NW_VLBA	BREWSTER_C	90-26-39.94	-0-00-01.86	3.12	0.6	1:78
NW_VLBA	BREWSTER_B	89-49-20.23	-0-00-02.97	3.21	0.9	1:79
NW_VLBA	BREWSTER_A	89-36-47.39	-0-00-04.81	3.21	1.5	1:80
BREWSTER_B	7614_RM1	90-29-01.26	-0-00-01.64	3.19	0.5	1:84
BREWSTER_B	108502	78-25-22.00	0-00-00.00	3.40	0.0	1:85
BREWSTER_B	108504	79-01-25.90	-0-00-00.00	3.41	0.0	1:86
BREWSTER_B	108506	78-20-39.60	0-00-00.00	3.41	0.0	1:87
BREWSTER_B	7614_RM2	91-06-57.71	-0-00-04.39	3.16	1.4	1:88
BREWSTER_B	7614_RM1	90-29-01.26	-0-00-01.14	3.19	0.4	1:91
BREWSTER_B	92502	77-52-18.20	-0-00-00.00	3.40	0.0	1:92
BREWSTER_B	92504	78-08-18.20	-0-00-00.00	3.41	0.0	1:93
BREWSTER_B	92506	77-32-16.20	-0-00-00.00	3.41	0.0	1:94
BREWSTER_B	7614_RM2	91-06-57.71	-0-00-06.39	3.16	2.0	1:95
BREWSTER_B	7614_RM1	90-29-01.26	-0-00-02.44	3.19	0.8	1:98
BREWSTER_B	77502	77-22-25.80	0-00-00.00	3.40	0.0	1:99
BREWSTER_B	77504	77-18-00.90	-0-00-00.00	3.41	0.0	1:100
BREWSTER_B	77506	76-49-34.70	-0-00-00.00	3.40	0.0	1:101
BREWSTER_B	7614_RM2	91-06-57.71	-0-00-07.59	3.16	2.4	1:102
BREWSTER_B	7614_RM1	90-29-01.26	-0-00-05.24	3.19	1.6	1:105
BREWSTER_B	63502	76-57-14.10	-0-00-00.00	3.39	0.0	1:106
BREWSTER_B	63504	76-33-34.80	0-00-00.00	3.41	0.0	1:107
BREWSTER_B	63506	76-14-37.50	-0-00-00.00	3.40	0.0	1:108

From	To	Zenith	Residual	StdErr	StdRes	File:Line
BREWSTER_B	7614_RM1	90-29-01.26	-0-00-00.24	3.19	0.1	1:112
BREWSTER_B	48502	76-36-41.70	-0-00-00.00	3.39	0.0	1:113
BREWSTER_B	48504	75-55-06.00	-0-00-00.00	3.40	0.0	1:114
BREWSTER_B	48506	75-47-24.40	0-00-00.00	3.39	0.0	1:115
BREWSTER_B	7614_RM1	90-29-01.26	-0-00-02.44	3.19	0.8	1:119
BREWSTER_B	27502	76-20-32.00	0-00-00.00	3.38	0.0	1:120
BREWSTER_B	27504	75-20-21.10	0-00-00.00	3.39	0.0	1:121
BREWSTER_B	27506	75-28-28.20	0-00-00.00	3.38	0.0	1:122
BREWSTER_B	7614_RM2	91-06-57.71	-0-00-03.89	3.16	1.2	1:123
7614_RM2	BREWSTER_B	88-53-04.74	-0-00-05.56	3.16	1.8	1:126
7614_RM2	107408	76-28-04.40	0-00-00.00	3.40	0.0	1:127
7614_RM2	107410	77-00-20.90	0-00-00.00	3.42	0.0	1:128
7614_RM2	107412	76-19-42.50	0-00-00.00	3.41	0.0	1:129
7614_RM2	7614_RM1	89-18-36.29	-0-00-01.81	3.17	0.6	1:130
7614_RM2	BREWSTER_B	88-53-04.74	-0-00-05.06	3.16	1.6	1:133
7614_RM2	90408	75-51-49.60	0-00-00.00	3.40	0.0	1:134
7614_RM2	90410	76-01-26.90	0-00-00.00	3.42	0.0	1:135
7614_RM2	90412	75-26-51.70	0-00-00.00	3.41	0.0	1:136
7614_RM2	7614_RM1	89-18-36.29	-0-00-00.41	3.17	0.1	1:137
7614_RM2	BREWSTER_B	88-53-04.74	-0-00-06.36	3.16	2.0	1:140
7614_RM2	75408	75-22-31.00	0-00-00.00	3.40	0.0	1:141
7614_RM2	75410	75-11-24.40	0-00-00.00	3.42	0.0	1:142
7614_RM2	75412	74-45-08.50	0-00-00.00	3.41	0.0	1:143
7614_RM2	7614_RM1	89-18-36.29	-0-00-02.71	3.17	0.9	1:144
7614_RM2	BREWSTER_B	88-53-04.74	-0-00-05.16	3.16	1.6	1:147
7614_RM2	60408	74-57-35.00	0-00-00.00	3.40	0.0	1:148
7614_RM2	60410	74-26-43.40	0-00-00.00	3.41	0.0	1:149
7614_RM2	60412	74-10-55.10	0-00-00.00	3.40	0.0	1:150
7614_RM2	7614_RM1	89-18-36.29	-0-00-02.41	3.17	0.8	1:151
7614_RM2	BREWSTER_B	88-53-04.74	-0-00-04.86	3.16	1.5	1:154
7614_RM2	45408	74-39-07.70	0-00-00.00	3.39	0.0	1:155
7614_RM2	45410	73-51-17.20	0-00-00.00	3.40	0.0	1:156
7614_RM2	45412	73-46-56.40	0-00-00.00	3.39	0.0	1:157
7614_RM2	7614_RM1	89-18-36.29	-0-00-02.21	3.17	0.7	1:158
7614_RM2	BREWSTER_B	88-53-04.74	-0-00-05.66	3.16	1.8	1:161
7614_RM2	30408	74-28-11.50	0-00-00.00	3.38	0.0	1:162
7614_RM2	30410	73-27-13.30	0-00-00.00	3.39	0.0	1:163
7614_RM2	30412	73-34-24.30	0-00-00.00	3.38	0.0	1:164
7614_RM2	7614_RM1	89-18-36.29	-0-00-02.71	3.17	0.9	1:165

From	To	Zenith	Residual	StdErr	StdRes	File:Line
7614_RM1	BREWSTER_B	89-31-00.99	-0-00-04.01	3.19	1.3	1:168
7614_RM1	30214	72-22-52.90	0-00-00.00	3.55	0.0	1:169
7614_RM1	30216	70-17-06.40	0-00-00.00	3.61	0.0	1:170
7614_RM1	30218	70-03-51.40	0-00-00.00	3.61	0.0	1:171
7614_RM1	7614_RM2	90-41-26.09	-0-00-03.41	3.17	1.1	1:172
7614_RM1	BREWSTER_B	89-31-00.99	-0-00-02.31	3.19	0.7	1:175
7614_RM1	45214	72-35-42.60	-0-00-00.00	3.56	0.0	1:176
7614_RM1	45216	70-45-15.30	0-00-00.00	3.63	0.0	1:177
7614_RM1	45218	70-16-56.80	0-00-00.00	3.63	0.0	1:178
7614_RM1	7614_RM2	90-41-26.09	-0-00-02.51	3.17	0.8	1:179
7614_RM1	BREWSTER_B	89-31-00.99	-0-00-01.81	3.19	0.6	1:182
7614_RM1	60214	72-57-48.20	0-00-00.00	3.57	0.0	1:183
7614_RM1	60216	71-28-26.10	0-00-00.00	3.65	0.0	1:184
7614_RM1	60218	70-45-19.30	0-00-00.00	3.65	0.0	1:185
7614_RM1	7614_RM2	90-41-26.09	-0-00-01.51	3.17	0.5	1:186
7614_RM1	BREWSTER_B	89-31-00.99	-0-00-03.11	3.19	1.0	1:189
7614_RM1	75214	73-27-34.80	0-00-00.00	3.58	0.0	1:190
7614_RM1	75216	72-23-47.50	0-00-00.00	3.66	0.0	1:191
7614_RM1	75218	71-27-23.10	0-00-00.00	3.67	0.0	1:192
7614_RM1	7614_RM2	90-41-26.09	-0-00-01.01	3.17	0.3	1:193
7614_RM1	BREWSTER_B	89-31-00.99	-0-00-02.01	3.19	0.6	1:196
7614_RM1	90214	74-03-05.60	0-00-00.00	3.58	0.0	1:197
7614_RM1	90216	73-27-16.70	-0-00-00.00	3.67	0.0	1:198
7614_RM1	90218	72-20-26.70	0-00-00.00	3.68	0.0	1:199
7614_RM1	7614_RM2	90-41-26.09	-0-00-01.81	3.17	0.6	1:200
7614_RM1	BREWSTER_B	89-31-00.99	-0-00-02.41	3.19	0.8	1:203
7614_RM1	107216	74-33-43.90	0-00-00.00	3.67	0.0	1:204
7614_RM1	107218	73-20-31.40	0-00-00.00	3.68	0.0	1:205
7614_RM1	7614_RM2	90-41-26.09	-0-00-01.61	3.17	0.5	1:206
7614_RM1	BREWSTER_C	90-41-32.53	-0-00-01.87	3.24	0.6	1:210
7614_RM1	208201	71-48-27.70	0-00-00.00	3.64	0.0	1:211
7614_RM1	208203	72-39-17.80	-0-00-00.00	3.65	0.0	1:212
7614_RM1	208205	73-33-20.60	0-00-00.00	3.65	0.0	1:213
7614_RM1	BREWSTER_B	89-37-32.39	0-00-00.29	3.19	0.1	1:214
7614_RM1	BREWSTER_C	90-41-32.53	-0-00-02.37	3.24	0.7	1:217
7614_RM1	222201	71-15-53.50	0-00-00.00	3.68	0.0	1:218
7614_RM1	222203	72-07-43.50	0-00-00.00	3.68	0.0	1:219
7614_RM1	222205	73-02-54.60	-0-00-00.00	3.68	0.0	1:220
7614_RM1	BREWSTER_B	89-37-32.39	-0-00-01.11	3.19	0.3	1:221



From	To	Zenith	Residual	StdErr	StdRes	File:Line
7614_RM1	BREWSTER_C	90-41-32.53	-0-00-02.17	3.24	0.7	1:224
7614_RM1	237201	70-42-40.80	-0-00-00.00	3.71	0.0	1:225
7614_RM1	237203	71-35-18.70	0-00-00.00	3.72	0.0	1:226
7614_RM1	237205	72-31-28.00	0-00-00.00	3.72	0.0	1:227
7614_RM1	BREWSTER_B	89-37-32.39	-0-00-01.21	3.19	0.4	1:228
7614_RM1	BREWSTER_C	90-41-32.53	-0-00-01.17	3.24	0.4	1:231
7614_RM1	252201	70-14-25.70	0-00-00.00	3.74	0.0	1:232
7614_RM1	252203	71-07-29.70	0-00-00.00	3.75	0.0	1:233
7614_RM1	252205	72-04-20.00	0-00-00.00	3.76	0.0	1:234
7614_RM1	BREWSTER_B	89-37-32.39	-0-00-00.21	3.19	0.1	1:235
7614_RM1	BREWSTER_C	90-41-32.53	-0-00-00.57	3.24	0.2	1:238
7614_RM1	288201	69-46-30.20	0-00-00.00	3.77	0.0	1:239
7614_RM1	288203	70-38-59.10	0-00-00.00	3.78	0.0	1:240
7614_RM1	288205	71-35-43.40	0-00-00.00	3.79	0.0	1:241
7614_RM1	BREWSTER_B	89-37-32.39	-0-00-00.31	3.19	0.1	1:242
7614_RM1	BREWSTER_C	90-41-32.53	-0-00-00.07	3.24	0.0	1:245
7614_RM1	303201	69-55-50.10	-0-00-00.00	3.76	0.0	1:246
7614_RM1	303203	70-47-27.70	-0-00-00.00	3.77	0.0	1:247
7614_RM1	303205	71-43-23.00	-0-00-00.00	3.78	0.0	1:248
7614_RM1	BREWSTER_B	89-37-32.39	0-00-01.19	3.19	0.4	1:249
BREWSTER_C	7614_RM2	90-20-45.09	0-00-01.69	3.58	0.5	1:252
BREWSTER_C	353307	76-37-02.70	0-00-00.00	3.33	0.0	1:253
BREWSTER_C	353309	77-12-44.80	0-00-00.00	3.33	0.0	1:254
BREWSTER_C	353311	77-50-35.10	0-00-00.00	3.33	0.0	1:255
BREWSTER_C	7614_RM1	89-18-29.45	-0-00-00.25	3.24	0.1	1:256
BREWSTER_C	7614_RM2	90-20-45.09	-0-00-00.11	3.58	0.0	1:259
BREWSTER_C	23307	75-49-55.00	0-00-00.00	3.36	0.0	1:260
BREWSTER_C	23309	76-26-15.10	-0-00-00.00	3.37	0.0	1:261
BREWSTER_C	23311	77-05-02.10	-0-00-00.00	3.37	0.0	1:262
BREWSTER_C	7614_RM1	89-18-29.45	-0-00-00.35	3.24	0.1	1:263
BREWSTER_C	7614_RM2	90-20-45.09	0-00-02.79	3.58	0.8	1:266
BREWSTER_C	37307	75-51-58.40	0-00-00.00	3.36	0.0	1:267
BREWSTER_C	37309	76-27-59.70	0-00-00.00	3.36	0.0	1:268
BREWSTER_C	37311	77-06-26.70	0-00-00.00	3.37	0.0	1:269
BREWSTER_C	7614_RM1	89-18-29.45	-0-00-02.15	3.24	0.7	1:270
BREWSTER_C	7614_RM2	90-20-45.09	0-00-00.99	3.58	0.3	1:273
BREWSTER_C	51307	75-58-50.30	0-00-00.00	3.36	0.0	1:274
BREWSTER_C	51309	76-34-24.60	0-00-00.00	3.36	0.0	1:275
BREWSTER_C	51311	77-12-24.00	0-00-00.00	3.36	0.0	1:276

From	To	Zenith	Residual	StdErr	StdRes	File:Line
BREWSTER_C	7614_RM1	89-18-29.45	-0-00-00.65	3.24	0.2	1:277
BREWSTER_C	7614_RM2	90-20-45.09	-0-00-00.11	3.58	0.0	1:280
BREWSTER_C	65307	76-09-42.50	0-00-00.00	3.35	0.0	1:281
BREWSTER_C	65309	76-44-45.40	-0-00-00.00	3.35	0.0	1:282
BREWSTER_C	65311	77-22-13.30	0-00-00.00	3.35	0.0	1:283
BREWSTER_C	7614_RM1	89-18-29.45	0-00-00.75	3.24	0.2	1:284
BREWSTER_C	7614_RM2	90-20-45.09	0-00-00.29	3.58	0.1	1:287
BREWSTER_C	81307	76-23-37.20	0-00-00.00	3.34	0.0	1:288
BREWSTER_C	81309	76-58-06.60	0-00-00.00	3.34	0.0	1:289
BREWSTER_C	81311	77-34-56.70	0-00-00.00	3.34	0.0	1:290
BREWSTER_C	7614_RM1	89-18-29.45	0-00-00.45	3.24	0.1	1:291
7614_RM2	BREWSTER_B	88-55-14.46	-0-00-03.34	3.16	1.1	1:294
7614_RM2	65413	73-07-58.90	-0-00-00.00	3.48	0.0	1:295
7614_RM2	65415	73-49-20.70	0-00-00.00	3.49	0.0	1:296
7614_RM2	65417	74-33-54.00	0-00-00.00	3.49	0.0	1:297
7614_RM2	BREWSTER_C	89-39-16.16	0-00-03.26	3.58	0.9	1:298
7614_RM2	BREWSTER_B	88-55-14.46	-0-00-01.84	3.16	0.6	1:301
7614_RM2	80413	73-16-42.40	0-00-00.00	3.47	0.0	1:302
7614_RM2	80415	73-57-27.10	0-00-00.00	3.48	0.0	1:303
7614_RM2	81417	74-41-23.90	0-00-00.00	3.48	0.0	1:304
7614_RM2	BREWSTER_C	89-39-16.16	0-00-01.56	3.58	0.4	1:305
7614_RM2	BREWSTER_B	88-55-14.46	-0-00-03.84	3.16	1.2	1:308
7614_RM2	95413	73-32-07.20	0-00-00.00	3.46	0.0	1:309
7614_RM2	95415	74-12-10.00	0-00-00.00	3.47	0.0	1:310
7614_RM2	95417	74-55-22.40	0-00-00.00	3.47	0.0	1:311
7614_RM2	BREWSTER_C	89-39-16.16	-0-00-01.04	3.58	0.3	1:312
7614_RM2	BREWSTER_B	88-55-14.46	-0-00-07.14	3.16	2.3	1:315
7614_RM2	105413	73-45-13.00	0-00-00.00	3.45	0.0	1:316
7614_RM2	105415	74-24-45.00	0-00-00.00	3.45	0.0	1:317
7614_RM2	105417	75-07-20.40	0-00-00.00	3.46	0.0	1:318
7614_RM2	BREWSTER_C	89-39-16.16	-0-00-03.24	3.58	0.9	1:319

Adjusted Differential Level Observations (Meters)

From	To	Elev Diff	Residual	StdErr	StdRes	File:Line
NW_VLBA	7614_RM1	-0.1812	-0.0001	0.0002	0.3	1:6
7614_RM1	BREWSTER_C	-0.7097	-0.0000	0.0003	0.1	1:7
BREWSTER_C	7614_RM2	-0.3115	0.0002	0.0002	0.9	1:8
7614_RM2	BREWSTER_B	1.7580	0.0000	0.0003	0.1	1:9
BREWSTER_B	1009	0.1500	0.0000	0.0001	0.4	1:10
1009	BREWSTER_A	-0.3051	0.0000	0.0001	0.2	1:11
BREWSTER_B	BREWSTER_A	-0.1550	0.0001	0.0001	0.6	1:12
BREWSTER_B	BREW_GPS	1.4221	-0.0001	0.0001	0.7	1:13
BREW_GPS	BREWSTER_A	-1.5771	-0.0001	0.0001	0.7	1:14
BREWSTER_A	NW_VLBA	-0.4006	0.0000	0.0003	0.1	1:15

Adjusted Direction Observations (DMS)

From	To	Direction	Residual	StdErr	StdRes	File:Line
Set 1						
7614_RM1	BREWSTER_C	359-59-59.40	-0-00-00.60	1.33	0.5	1:18
7614_RM1	7614_RM2	31-32-10.42	0-00-00.52	1.14	0.5	1:19
7614_RM1	BREWSTER_B	95-16-52.86	-0-00-00.04	1.19	0.0	1:20
7614_RM1	BREWSTER_A	101-41-33.90	0-00-00.10	1.13	0.1	1:21
7614_RM1	NW_VLBA	164-43-34.13	-0-00-00.87	2.69	0.3	1:22
Set 2						
BREWSTER_C	7614_RM2	359-59-58.50	-0-00-01.50	2.02	0.7	1:25
BREWSTER_C	BREWSTER_B	46-41-36.21	0-00-00.31	0.93	0.3	1:26
BREWSTER_C	BREWSTER_A	48-47-59.55	-0-00-00.45	0.87	0.5	1:27
BREWSTER_C	NW_VLBA	87-31-51.33	0-00-00.73	0.98	0.7	1:28
BREWSTER_C	7614_RM1	92-22-33.63	-0-00-00.27	1.33	0.2	1:29
Set 3						
7614_RM2	BREWSTER_B	0-00-01.07	0-00-01.07	1.11	1.0	1:32
7614_RM2	BREWSTER_A	0-19-54.15	0-00-00.25	1.02	0.2	1:33
7614_RM2	7614_RM1	55-27-18.84	-0-00-01.26	1.14	1.1	1:34
7614_RM2	BREWSTER_C	111-32-32.69	-0-00-00.51	2.02	0.3	1:35

From	To	Direction	Residual	StdErr	StdRes	File:Line
Set 4						
BREWSTER_A	7614_RM1	0-00-01.16	0-00-01.16	1.13	1.0	1:39
BREWSTER_A	BREWSTER_C	34-43-52.59	-0-00-00.41	0.87	0.5	1:40
BREWSTER_A	BREW_GPS	47-25-34.18	-0-00-00.32	21.14	0.0	1:43
BREWSTER_A	7614_RM2	54-43-12.99	-0-00-00.21	1.02	0.2	1:44
BREWSTER_A	BREWSTER_B	57-26-41.98	-0-00-05.62	8.20	0.7	1:45
BREWSTER_A	1009	134-27-00.52	-0-00-03.58	6.71	0.5	1:46
Set 5						
BREWSTER_B	1009	359-59-59.14	-0-00-00.86	5.89	0.1	1:49
BREWSTER_B	BREWSTER_A	58-41-49.45	-0-00-03.25	8.20	0.4	1:50
BREWSTER_B	BREW_GPS	64-54-33.51	-0-00-00.19	13.15	0.0	1:53
BREWSTER_B	7614_RM1	174-50-27.59	0-00-00.09	1.19	0.1	1:54
BREWSTER_B	BREWSTER_C	213-52-36.72	-0-00-01.08	0.93	1.2	1:55
BREWSTER_B	7614_RM2	235-38-27.38	0-00-01.58	1.11	1.4	1:56
Set 6						
1009	BREWSTER_A	359-59-55.70	-0-00-04.30	6.71	0.6	1:59
1009	BREW_GPS	17-48-37.93	0-00-00.03	6.49	0.0	1:62
1009	7614_RM1	39-56-30.30	-0-00-00.70	1.04	0.7	1:63
1009	BREWSTER_B	44-17-46.85	0-00-00.25	5.89	0.0	1:64
1009	BREWSTER_C	74-21-31.02	-0-00-00.38	0.86	0.4	1:65
1009	7614_RM2	92-38-58.23	0-00-01.33	1.03	1.3	1:66
Set 7						
BREWSTER_A	7614_RM1	0-00-00.00	0-00-00.00	1.13	0.0	1:70
BREWSTER_A	BREWSTER_C	34-43-51.43	-0-00-01.37	0.87	1.6	1:71
BREWSTER_A	7614_RM2	54-43-11.83	0-00-00.43	1.02	0.4	1:72
BREWSTER_A	BREWSTER_B	57-26-40.82	0-00-04.72	8.20	0.6	1:73
BREWSTER_A	NW_VLBA	337-23-03.83	0-00-02.03	1.24	1.6	1:74
Set 8						
NW_VLBA	7614_RM1	359-59-58.84	-0-00-01.16	2.69	0.4	1:77
NW_VLBA	BREWSTER_C	10-25-41.81	0-00-00.61	0.98	0.6	1:78
NW_VLBA	BREWSTER_B	86-21-20.56	0-00-01.06	1.26	0.8	1:79
NW_VLBA	BREWSTER_A	94-21-02.43	-0-00-01.77	1.24	1.4	1:80

From	To	Direction	Residual	StdErr	StdRes	File:Line
Set 9						
BREWSTER_B	7614_RM1	359-59-59.04	-0-00-00.96	1.19	0.8	1:84
BREWSTER_B	108502	22-41-10.40	-0-00-00.00	1.70	0.0	1:85
BREWSTER_B	108504	28-42-49.50	-0-00-00.00	1.73	0.0	1:86
BREWSTER_B	108506	31-40-37.90	-0-00-00.00	1.72	0.0	1:87
BREWSTER_B	7614_RM2	60-47-58.83	0-00-00.83	1.11	0.7	1:88
Set 10						
BREWSTER_B	7614_RM1	359-59-59.79	-0-00-00.21	1.19	0.2	1:91
BREWSTER_B	92502	22-40-53.80	-0-00-00.00	1.71	0.0	1:92
BREWSTER_B	92504	28-43-38.10	-0-00-00.00	1.74	0.0	1:93
BREWSTER_B	92506	31-41-01.60	-0-00-00.00	1.73	0.0	1:94
BREWSTER_B	7614_RM2	60-47-59.58	0-00-00.18	1.11	0.2	1:95
Set 11						
BREWSTER_B	7614_RM1	359-59-58.72	-0-00-01.28	1.19	1.1	1:98
BREWSTER_B	77502	22-41-08.70	-0-00-00.00	1.70	0.0	1:99
BREWSTER_B	77504	28-43-44.90	-0-00-00.00	1.74	0.0	1:100
BREWSTER_B	77506	31-40-06.00	-0-00-00.00	1.72	0.0	1:101
BREWSTER_B	7614_RM2	60-47-58.51	0-00-01.11	1.11	1.0	1:102
Set 12						
BREWSTER_B	7614_RM1	359-59-59.42	-0-00-00.58	1.19	0.5	1:105
BREWSTER_B	63502	22-41-46.60	-0-00-00.00	1.70	0.0	1:106
BREWSTER_B	63504	28-43-08.80	-0-00-00.00	1.73	0.0	1:107
BREWSTER_B	63506	31-38-04.20	-0-00-00.00	1.71	0.0	1:108
BREWSTER_B	7614_RM2	60-47-59.21	0-00-00.51	1.11	0.5	1:109
Set 13						
BREWSTER_B	7614_RM1	359-59-59.47	-0-00-00.53	1.19	0.4	1:112
BREWSTER_B	48502	22-42-48.90	-0-00-00.00	1.69	0.0	1:113
BREWSTER_B	48504	28-41-54.30	-0-00-00.00	1.72	0.0	1:114
BREWSTER_B	48506	31-34-53.40	-0-00-00.00	1.70	0.0	1:115
BREWSTER_B	7614_RM2	60-47-59.26	0-00-00.46	1.11	0.4	1:116

From	To	Direction	Residual	StdErr	StdRes	File:Line
Set 14						
BREWSTER_B	7614_RM1	359-59-59.69	-0-00-00.31	1.19	0.3	1:119
BREWSTER_B	27502	22-44-42.70	-0-00-00.00	1.67	0.0	1:120
BREWSTER_B	27504	28-39-15.10	-0-00-00.00	1.70	0.0	1:121
BREWSTER_B	27506	31-29-15.30	-0-00-00.00	1.67	0.0	1:122
BREWSTER_B	7614_RM2	60-47-59.47	0-00-00.27	1.11	0.2	1:123
Set 15						
7614_RM2	BREWSTER_B	0-00-00.21	0-00-00.21	1.11	0.2	1:126
7614_RM2	107408	29-45-00.70	-0-00-00.00	1.73	0.0	1:127
7614_RM2	107410	35-51-41.70	-0-00-00.00	1.76	0.0	1:128
7614_RM2	107412	38-52-40.00	-0-00-00.00	1.75	0.0	1:129
7614_RM2	7614_RM1	55-27-17.98	-0-00-00.22	1.14	0.2	1:130
Set 16						
7614_RM2	BREWSTER_B	359-59-58.94	-0-00-01.06	1.11	1.0	1:133
7614_RM2	90408	29-44-41.90	-0-00-00.00	1.73	0.0	1:134
7614_RM2	90410	35-52-21.70	-0-00-00.00	1.77	0.0	1:135
7614_RM2	90412	38-52-56.80	-0-00-00.00	1.75	0.0	1:136
7614_RM2	7614_RM1	55-27-16.71	0-00-01.11	1.14	1.0	1:137
Set 17						
7614_RM2	BREWSTER_B	359-59-59.57	-0-00-00.43	1.11	0.4	1:140
7614_RM2	75408	29-45-04.70	-0-00-00.00	1.73	0.0	1:141
7614_RM2	75410	35-52-20.00	-0-00-00.00	1.77	0.0	1:142
7614_RM2	75412	38-51-55.10	-0-00-00.00	1.75	0.0	1:143
7614_RM2	7614_RM1	55-27-17.35	0-00-00.45	1.14	0.4	1:144
Set 18						
7614_RM2	BREWSTER_B	359-59-59.33	-0-00-00.67	1.11	0.6	1:147
7614_RM2	60408	29-45-58.20	-0-00-00.00	1.72	0.0	1:148
7614_RM2	60410	35-51-45.60	-0-00-00.00	1.76	0.0	1:149
7614_RM2	60412	38-49-48.30	-0-00-00.00	1.74	0.0	1:150
7614_RM2	7614_RM1	55-27-17.10	0-00-00.70	1.14	0.6	1:151

From	To	Direction	Residual	StdErr	StdRes	File:Line
Set 19						
7614_RM2	BREWSTER_B	359-59-58.74	-0-00-01.26	1.11	1.1	1:154
7614_RM2	45408	29-47-19.60	-0-00-00.00	1.71	0.0	1:155
7614_RM2	45410	35-50-38.00	-0-00-00.00	1.75	0.0	1:156
7614_RM2	45412	38-46-44.70	-0-00-00.00	1.72	0.0	1:157
7614_RM2	7614_RM1	55-27-16.51	0-00-01.31	1.14	1.2	1:158
Set 20						
7614_RM2	BREWSTER_B	359-59-58.94	-0-00-01.06	1.11	1.0	1:161
7614_RM2	30408	29-49-07.30	-0-00-00.00	1.70	0.0	1:162
7614_RM2	30410	35-49-08.60	-0-00-00.00	1.73	0.0	1:163
7614_RM2	30412	38-42-56.90	-0-00-00.00	1.70	0.0	1:164
7614_RM2	7614_RM1	55-27-16.71	0-00-01.11	1.14	1.0	1:165
Set 21						
7614_RM1	BREWSTER_B	0-00-00.81	0-00-00.81	1.19	0.7	1:168
7614_RM1	30214	319-10-21.70	-0-00-00.00	2.05	0.0	1:169
7614_RM1	30216	325-43-52.30	-0-00-00.00	2.19	0.0	1:170
7614_RM1	30218	329-41-32.80	-0-00-00.00	2.20	0.0	1:171
7614_RM1	7614_RM2	296-15-18.37	-0-00-00.73	1.14	0.6	1:172
Set 22						
7614_RM1	BREWSTER_B	0-00-01.17	0-00-01.17	1.19	1.0	1:175
7614_RM1	45214	318-56-26.10	-0-00-00.00	2.07	0.0	1:176
7614_RM1	45216	325-28-30.50	-0-00-00.00	2.22	0.0	1:177
7614_RM1	45218	329-27-57.00	-0-00-00.00	2.23	0.0	1:178
7614_RM1	7614_RM2	296-15-18.73	-0-00-01.07	1.14	0.9	1:179
Set 23						
7614_RM1	BREWSTER_B	0-00-01.02	0-00-01.02	1.19	0.9	1:182
7614_RM1	60214	318-45-31.40	-0-00-00.00	2.08	0.0	1:183
7614_RM1	60216	325-17-21.00	-0-00-00.00	2.24	0.0	1:184
7614_RM1	60218	329-16-47.30	-0-00-00.00	2.26	0.0	1:185
7614_RM1	7614_RM2	296-15-18.58	-0-00-00.92	1.14	0.8	1:186

From	To	Direction	Residual	StdErr	StdRes	File:Line
Set 24						
7614_RM1	BREWSTER_B	0-00-00.44	0-00-00.44	1.19	0.4	1:189
7614_RM1	75214	318-38-17.60	-0-00-00.00	2.09	0.0	1:190
7614_RM1	75216	325-11-21.90	-0-00-00.00	2.25	0.0	1:191
7614_RM1	75218	329-08-57.10	-0-00-00.00	2.28	0.0	1:192
7614_RM1	7614_RM2	296-15-18.00	-0-00-00.40	1.14	0.4	1:193
Set 25						
7614_RM1	BREWSTER_B	0-00-00.86	0-00-00.86	1.19	0.7	1:196
7614_RM1	90214	318-35-24.60	-0-00-00.00	2.10	0.0	1:197
7614_RM1	90216	325-11-16.30	-0-00-00.00	2.25	0.0	1:198
7614_RM1	90218	329-05-09.30	-0-00-00.00	2.29	0.0	1:199
7614_RM1	7614_RM2	296-15-18.42	-0-00-00.78	1.14	0.7	1:200
Set 26						
7614_RM1	BREWSTER_B	0-00-00.81	0-00-00.81	1.19	0.7	1:203
7614_RM1	107216	325-16-59.10	-0-00-00.00	2.24	0.0	1:204
7614_RM1	107218	329-05-44.90	-0-00-00.00	2.28	0.0	1:205
7614_RM1	7614_RM2	296-15-18.37	-0-00-00.73	1.14	0.6	1:206
Set 27						
7614_RM1	BREWSTER_C	359-59-59.97	-0-00-00.03	1.33	0.0	1:210
7614_RM1	208201	66-18-34.30	-0-00-00.00	2.23	0.0	1:211
7614_RM1	208203	66-22-54.80	-0-00-00.00	2.23	0.0	1:212
7614_RM1	208205	66-27-14.80	-0-00-00.00	2.22	0.0	1:213
7614_RM1	BREWSTER_B	95-16-53.43	0-00-00.03	1.19	0.0	1:214
Set 28						
7614_RM1	BREWSTER_C	359-59-59.30	-0-00-00.70	1.33	0.5	1:217
7614_RM1	222201	65-52-30.50	-0-00-00.00	2.30	0.0	1:218
7614_RM1	222203	65-58-16.70	-0-00-00.00	2.29	0.0	1:219
7614_RM1	222205	66-04-00.40	-0-00-00.00	2.29	0.0	1:220
7614_RM1	BREWSTER_B	95-16-52.76	0-00-00.56	1.19	0.5	1:221



From	To	Direction	Residual	StdErr	StdRes	File:Line
Set 29						
7614_RM1	BREWSTER_C	359-59-59.58	-0-00-00.42	1.33	0.3	1:224
7614_RM1	237201	64-53-17.70	-0-00-00.00	2.37	0.0	1:225
7614_RM1	237203	65-00-18.60	-0-00-00.00	2.37	0.0	1:226
7614_RM1	237205	65-07-14.20	-0-00-00.00	2.36	0.0	1:227
7614_RM1	BREWSTER_B	95-16-53.04	0-00-00.34	1.19	0.3	1:228
Set 30						
7614_RM1	BREWSTER_C	0-00-00.13	0-00-00.13	1.33	0.1	1:231
7614_RM1	252201	63-23-43.60	-0-00-00.00	2.43	0.0	1:232
7614_RM1	252203	63-31-29.10	-0-00-00.00	2.43	0.0	1:233
7614_RM1	252205	63-39-01.80	-0-00-00.00	2.43	0.0	1:234
7614_RM1	BREWSTER_B	95-16-53.59	-0-00-00.11	1.19	0.1	1:235
Set 31						
7614_RM1	BREWSTER_C	0-00-00.02	0-00-00.02	1.33	0.0	1:238
7614_RM1	288201	58-28-21.20	-0-00-00.00	2.49	0.0	1:239
7614_RM1	288203	58-34-51.60	-0-00-00.00	2.49	0.0	1:240
7614_RM1	288205	58-41-13.70	-0-00-00.00	2.49	0.0	1:241
7614_RM1	BREWSTER_B	95-16-53.48	-0-00-00.02	1.19	0.0	1:242
Set 32						
7614_RM1	BREWSTER_C	359-59-59.47	-0-00-00.53	1.33	0.4	1:245
7614_RM1	303201	56-20-27.30	-0-00-00.00	2.47	0.0	1:246
7614_RM1	303203	56-25-16.30	-0-00-00.00	2.47	0.0	1:247
7614_RM1	303205	56-30-00.30	-0-00-00.00	2.48	0.0	1:248
7614_RM1	BREWSTER_B	95-16-52.93	0-00-00.43	1.19	0.4	1:249
Set 33						
BREWSTER_C	7614_RM2	359-59-59.98	-0-00-00.02	2.02	0.0	1:252
BREWSTER_C	353307	61-46-22.70	-0-00-00.00	1.56	0.0	1:253
BREWSTER_C	353309	61-50-02.90	-0-00-00.00	1.56	0.0	1:254
BREWSTER_C	353311	61-53-42.80	-0-00-00.00	1.56	0.0	1:255
BREWSTER_C	7614_RM1	92-22-35.11	0-00-00.01	1.33	0.0	1:256

From	To	Direction	Residual	StdErr	StdRes	File:Line
Set 34						
BREWSTER_C	7614_RM2	359-59-59.77	-0-00-00.23	2.02	0.1	1:259
BREWSTER_C	23307	57-16-07.30	-0-00-00.00	1.65	0.0	1:260
BREWSTER_C	23309	57-20-37.40	-0-00-00.00	1.65	0.0	1:261
BREWSTER_C	23311	57-25-10.00	-0-00-00.00	1.65	0.0	1:262
BREWSTER_C	7614_RM1	92-22-34.90	0-00-00.10	1.33	0.1	1:263
Set 35						
BREWSTER_C	7614_RM2	0-00-00.33	0-00-00.33	2.02	0.2	1:266
BREWSTER_C	37307	55-51-57.40	-0-00-00.00	1.64	0.0	1:267
BREWSTER_C	37309	55-55-34.90	-0-00-00.00	1.64	0.0	1:268
BREWSTER_C	37311	55-59-12.10	-0-00-00.00	1.64	0.0	1:269
BREWSTER_C	7614_RM1	92-22-35.46	-0-00-00.14	1.33	0.1	1:270
Set 36						
BREWSTER_C	7614_RM2	359-59-58.79	-0-00-01.21	2.02	0.6	1:273
BREWSTER_C	51307	54-39-01.20	-0-00-00.00	1.63	0.0	1:274
BREWSTER_C	51309	54-41-31.70	-0-00-00.00	1.63	0.0	1:275
BREWSTER_C	51311	54-44-01.80	-0-00-00.00	1.63	0.0	1:276
BREWSTER_C	7614_RM1	92-22-33.92	0-00-00.52	1.33	0.4	1:277
Set 37						
BREWSTER_C	7614_RM2	359-59-58.86	-0-00-01.14	2.02	0.6	1:280
BREWSTER_C	65307	53-36-52.40	-0-00-00.00	1.61	0.0	1:281
BREWSTER_C	65309	53-38-06.10	-0-00-00.00	1.61	0.0	1:282
BREWSTER_C	65311	53-39-20.90	-0-00-00.00	1.61	0.0	1:283
BREWSTER_C	7614_RM1	92-22-33.99	0-00-00.49	1.33	0.4	1:284
Set 38						
BREWSTER_C	7614_RM2	359-59-59.84	-0-00-00.16	2.02	0.1	1:287
BREWSTER_C	81307	52-49-31.80	-0-00-00.00	1.58	0.0	1:288
BREWSTER_C	81309	52-49-28.20	-0-00-00.00	1.59	0.0	1:289
BREWSTER_C	81311	52-49-25.50	-0-00-00.00	1.59	0.0	1:290
BREWSTER_C	7614_RM1	92-22-34.97	0-00-00.07	1.33	0.1	1:291

From	To	Direction	Residual	StdErr	StdRes	File:Line
Set 39						
7614_RM2	BREWSTER_B	0-00-00.04	0-00-00.04	1.11	0.0	1:294
7614_RM2	65413	33-14-34.40	-0-00-00.00	1.91	0.0	1:295
7614_RM2	65415	33-19-07.90	-0-00-00.00	1.92	0.0	1:296
7614_RM2	65417	33-23-35.40	-0-00-00.00	1.92	0.0	1:297
7614_RM2	BREWSTER_C	111-32-31.66	-0-00-00.14	2.02	0.1	1:298
Set 40						
7614_RM2	BREWSTER_B	359-59-59.48	-0-00-00.52	1.11	0.5	1:301
7614_RM2	80413	31-40-32.20	-0-00-00.00	1.90	0.0	1:302
7614_RM2	80415	31-43-41.60	-0-00-00.00	1.90	0.0	1:303
7614_RM2	81417	31-46-47.80	-0-00-00.00	1.90	0.0	1:304
7614_RM2	BREWSTER_C	111-32-31.10	0-00-01.70	2.02	0.8	1:305
Set 41						
7614_RM2	BREWSTER_B	359-59-59.04	-0-00-00.96	1.11	0.9	1:308
7614_RM2	95413	30-20-13.60	-0-00-00.00	1.87	0.0	1:309
7614_RM2	95415	30-21-48.10	-0-00-00.00	1.87	0.0	1:310
7614_RM2	95417	30-23-20.70	-0-00-00.00	1.87	0.0	1:311
7614_RM2	BREWSTER_C	111-32-30.66	0-00-03.16	2.02	1.6	1:312
Set 42						
7614_RM2	BREWSTER_B	359-59-59.20	-0-00-00.80	1.11	0.7	1:315
7614_RM2	105413	29-37-29.40	-0-00-00.00	1.84	0.0	1:316
7614_RM2	105415	29-38-00.00	-0-00-00.00	1.85	0.0	1:317
7614_RM2	105417	29-38-25.10	-0-00-00.00	1.85	0.0	1:318
7614_RM2	BREWSTER_C	111-32-30.82	0-00-02.62	2.02	1.3	1:319

Adjusted Azimuth/Bearing Observations (DMS)

From	To	Bearing	Residual	StdErr	StdRes	File:Line
7614_RM1	7614_RM2	N40-06-36.27W	0-00-00.00	0.10	0.0	1:4

Adjusted Bearings (DMS) and Horizontal Distances (Meters)

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(Relative Confidence of Bearing is in Seconds)

From	To	Bearing	Distance	95% RelConfidence		
				Brg	Dist	PPM
1009	7614_RM1	S24-26-21.16W	95.6002	1.40	0.0006	5.8290
1009	7614_RM2	S77-08-49.08W	97.1052	1.44	0.0005	5.4316
1009	BREWSTER_A	S15-30-13.44E	13.0851	8.19	0.0006	48.2724
1009	BREWSTER_B	S28-47-37.71W	14.9221	8.10	0.0005	36.0241
1009	BREWSTER_C	S58-51-21.88W	125.0188	1.30	0.0005	4.2014
1009	BREW_GPS	S02-18-28.79W	13.5181	15.72	0.0009	70.1615
23307	BREWSTER_C	S73-14-45.11W	55.8227	4.92	0.0014	25.6509
23309	BREWSTER_C	S73-19-15.21W	55.7819	4.92	0.0014	25.5491
23311	BREWSTER_C	S73-23-47.81W	55.7407	4.92	0.0014	25.4459
27502	BREWSTER_B	N46-22-49.18E	54.7748	4.61	0.0014	25.9570
27504	BREWSTER_B	N52-17-21.58E	53.8678	4.66	0.0014	26.5120
27506	BREWSTER_B	N55-07-21.78E	54.7670	4.61	0.0014	26.1274
30214	7614_RM1	S17-11-32.94E	43.9087	5.44	0.0014	32.0202
30216	7614_RM1	S10-38-02.34E	40.9564	5.75	0.0014	34.3392
30218	7614_RM1	S06-40-21.84E	40.8378	5.77	0.0014	34.4658
30408	7614_RM2	N65-44-45.68W	53.8857	4.61	0.0014	26.6825
30410	7614_RM2	N59-44-44.38W	52.8717	4.68	0.0014	27.3146
30412	7614_RM2	N56-50-56.08W	53.7366	4.62	0.0014	26.9371
37307	BREWSTER_C	S71-50-34.65W	55.9654	4.91	0.0014	25.5904
37309	BREWSTER_C	S71-54-12.15W	55.9058	4.91	0.0014	25.4966
37311	BREWSTER_C	S71-57-49.35W	55.8458	4.92	0.0014	25.4016
45214	7614_RM1	S17-25-28.91E	43.5325	5.47	0.0014	32.2104
45216	7614_RM1	S10-53-24.51E	40.4127	5.82	0.0014	34.6282
45218	7614_RM1	S06-53-58.01E	40.2273	5.84	0.0014	34.8519
45408	7614_RM2	N65-46-33.19W	53.4707	4.64	0.0014	26.8122
45410	7614_RM2	N59-43-14.79W	52.2984	4.72	0.0014	27.4672
45412	7614_RM2	N56-47-08.09W	53.1077	4.66	0.0014	27.1453
48502	BREWSTER_B	N46-20-55.60E	54.2010	4.64	0.0014	26.1369
48504	BREWSTER_B	N52-20-01.00E	53.0752	4.71	0.0014	26.7278
48506	BREWSTER_B	N55-13-00.10E	53.8992	4.66	0.0014	26.4117
51307	BREWSTER_C	S70-37-39.98W	56.4408	4.88	0.0014	25.3908
51309	BREWSTER_C	S70-40-10.48W	56.3679	4.89	0.0014	25.3030
51311	BREWSTER_C	S70-42-40.58W	56.2948	4.89	0.0014	25.2138
60214	7614_RM1	S17-36-23.45E	43.2400	5.50	0.0014	32.3258
60216	7614_RM1	S11-04-33.85E	40.0275	5.86	0.0014	34.7731
60218	7614_RM1	S07-05-07.55E	39.7371	5.90	0.0014	35.1178
60408	7614_RM2	N65-47-55.17W	53.1474	4.66	0.0014	26.8827
60410	7614_RM2	N59-42-07.77W	51.8921	4.75	0.0014	27.5188
60412	7614_RM2	N56-44-05.07W	52.6032	4.70	0.0014	27.2693
63502	BREWSTER_B	N46-19-53.35E	53.8942	4.66	0.0014	26.2014
63504	BREWSTER_B	N52-21-15.55E	52.6995	4.74	0.0014	26.7716
63506	BREWSTER_B	N55-16-10.95E	53.4175	4.69	0.0014	26.5249
65307	BREWSTER_C	S69-35-31.11W	57.2110	4.85	0.0014	25.0744
65309	BREWSTER_C	S69-36-44.81W	57.1299	4.85	0.0014	24.9904
65311	BREWSTER_C	S69-37-59.61W	57.0488	4.85	0.0014	24.9048
65413	7614_RM2	N62-19-19.69W	47.3758	5.30	0.0014	29.9273
65415	7614_RM2	N62-14-46.19W	47.3205	5.30	0.0014	29.8222
65417	7614_RM2	N62-10-18.69W	47.2653	5.31	0.0014	29.7145
75214	7614_RM1	S17-43-36.67E	43.0497	5.52	0.0014	32.3593
75216	7614_RM1	S11-10-32.37E	39.8262	5.89	0.0014	34.7625

From	To	Bearing	Distance	95% RelConfidence		
				Brg	Dist	PPM
75218	7614_RM1	S07-12-57.17E	39.4000	5.94	0.0014	35.2430
75408	7614_RM2	N65-48-48.92W	52.9368	4.67	0.0014	26.8888
75410	7614_RM2	N59-41-33.62W	51.6792	4.76	0.0014	27.4657
75412	7614_RM2	N56-41-58.52W	52.2547	4.72	0.0014	27.3007
77502	BREWSTER_B	N46-19-16.14E	53.7112	4.67	0.0014	26.2053
77504	BREWSTER_B	N52-21-52.34E	52.5274	4.75	0.0014	26.7205
77506	BREWSTER_B	N55-18-13.44E	53.1098	4.71	0.0014	26.5504
81307	BREWSTER_C	S68-48-09.54W	58.2224	4.79	0.0014	24.6713
81309	BREWSTER_C	S68-48-05.94W	58.1388	4.80	0.0014	24.5888
81311	BREWSTER_C	S68-48-03.24W	58.0551	4.80	0.0014	24.5049
92502	BREWSTER_B	N46-19-00.17E	53.6474	4.68	0.0014	26.1505
92504	BREWSTER_B	N52-21-44.47E	52.5526	4.75	0.0014	26.5771
92506	BREWSTER_B	N55-19-07.97E	52.9717	4.72	0.0014	26.4901
105413	7614_RM2	N65-56-23.84W	49.2926	5.15	0.0014	28.8453
105415	7614_RM2	N65-55-53.24W	49.2094	5.15	0.0014	28.7568
105417	7614_RM2	N65-55-28.14W	49.1265	5.16	0.0014	28.6659
107216	7614_RM1	S11-04-55.54E	40.0154	5.87	0.0014	34.2880
107218	7614_RM1	S07-16-09.74E	39.2635	5.96	0.0014	35.0398
107408	7614_RM2	N65-48-53.55W	52.9205	4.68	0.0014	26.6934
107410	7614_RM2	N59-42-12.55W	51.9220	4.74	0.0014	27.0351
107412	7614_RM2	N56-41-14.25W	52.1326	4.73	0.0014	27.0578
108502	BREWSTER_B	N46-19-17.52E	53.7204	4.67	0.0014	26.0340
108504	BREWSTER_B	N52-20-56.62E	52.7965	4.73	0.0014	26.3409
108506	BREWSTER_B	N55-18-45.02E	53.0289	4.72	0.0014	26.3393
208201	7614_RM1	S05-20-12.96E	40.2674	5.91	0.0014	34.5391
208203	7614_RM1	S05-15-52.46E	40.3335	5.91	0.0014	34.3461
208205	7614_RM1	S05-11-32.46E	40.3985	5.90	0.0014	34.1539
222201	7614_RM1	S05-46-16.10E	39.0184	6.07	0.0014	35.5678
222203	7614_RM1	S05-40-29.90E	39.0699	6.06	0.0014	35.3813
222205	7614_RM1	S05-34-46.20E	39.1201	6.05	0.0014	35.1959
237201	7614_RM1	S06-45-29.17E	37.8133	6.23	0.0014	36.6222
237203	7614_RM1	S06-38-28.27E	37.8446	6.22	0.0014	36.4488
237205	7614_RM1	S06-31-32.67E	37.8748	6.22	0.0014	36.2762
252201	7614_RM1	S08-15-03.83E	36.8395	6.36	0.0014	37.5227
252203	7614_RM1	S08-07-18.33E	36.8474	6.36	0.0014	37.3679
252205	7614_RM1	S07-59-45.63E	36.8549	6.36	0.0014	37.2133
288201	7614_RM1	S13-10-26.12E	35.9248	6.50	0.0014	38.4115
288203	7614_RM1	S13-03-55.72E	35.8766	6.50	0.0014	38.3102
288205	7614_RM1	S12-57-33.62E	35.8286	6.51	0.0014	38.2080
303201	7614_RM1	S15-18-19.46E	36.2282	6.45	0.0014	38.1121
303203	7614_RM1	S15-13-30.46E	36.1622	6.46	0.0014	38.0281
303205	7614_RM1	S15-08-46.46E	36.0963	6.47	0.0014	37.9431
353307	BREWSTER_C	S77-45-00.30W	59.2328	4.75	0.0014	24.2821
353309	BREWSTER_C	S77-48-40.50W	59.2869	4.74	0.0014	24.1482
353311	BREWSTER_C	S77-52-20.40W	59.3401	4.74	0.0014	24.0136
7614_RM1	90214	N17-46-30.09W	42.9748	5.53	0.0014	32.3081
7614_RM1	90216	N11-10-38.39W	39.8222	5.89	0.0014	34.5965
7614_RM1	90218	N07-16-45.39W	39.2385	5.96	0.0014	35.2165
7614_RM1	7614_RM2	N40-06-36.27W	85.5553	0.24	0.0002	2.7654
7614_RM1	BREWSTER_A	N30-02-47.21E	85.9795	1.19	0.0004	4.5134
7614_RM1	BREWSTER_B	N23-38-06.17E	80.7291	0.79	0.0002	2.9744
7614_RM1	BREWSTER_C	N71-38-47.29W	71.0624	0.87	0.0003	3.8314
7614_RM1	NW_VLBA	S86-55-12.57E	33.1587	3.46	0.0006	17.5508
7614_RM2	80413	S63-53-21.32E	47.8145	5.26	0.0014	29.6724

From	To	Bearing	Distance	95% RelConfidence		
				Brg	Dist	PPM
7614_RM2	80415	S63-50-11.92E	47.7436	5.27	0.0014	29.5766
7614_RM2	81417	S63-47-05.72E	47.6730	5.27	0.0014	29.4781
7614_RM2	90408	S65-49-11.08E	52.8540	4.68	0.0014	26.8312
7614_RM2	90410	S59-41-31.28E	51.6752	4.76	0.0014	27.3136
7614_RM2	90412	S56-40-56.18E	52.0891	4.73	0.0014	27.2373
7614_RM2	95413	S65-13-39.48E	48.6041	5.20	0.0014	29.2245
7614_RM2	95415	S65-12-04.98E	48.5238	5.21	0.0014	29.1343
7614_RM2	95417	S65-10-32.38E	48.4438	5.21	0.0014	29.0413
7614_RM2	BREWSTER_A	N84-45-59.04E	98.5807	1.02	0.0004	4.2643
7614_RM2	BREWSTER_B	N84-26-05.96E	87.8990	0.73	0.0003	2.9504
7614_RM2	BREWSTER_C	S15-58-37.58W	44.7873	1.21	0.0003	6.7206
BREWSTER_A	BREWSTER_B	S87-29-28.02W	10.6953	7.85	0.0004	38.1434
BREWSTER_A	BREWSTER_C	S64-46-38.63W	122.1428	1.06	0.0004	3.3651
BREWSTER_A	BREW_GPS	S77-28-20.23W	4.1406	38.27	0.0011	277.2288
BREWSTER_A	NW_VLBA	S07-25-51.03W	76.8525	1.85	0.0006	7.5398
BREWSTER_B	BREWSTER_C	S62-40-15.29W	112.3530	0.88	0.0003	2.6257
BREWSTER_B	BREW_GPS	S86-17-47.92E	6.6569	24.34	0.0011	169.1549
BREWSTER_B	NW_VLBA	S00-33-50.85E	75.7426	1.75	0.0005	7.2219
BREWSTER_C	NW_VLBA	S76-29-29.59E	103.4194	1.34	0.0006	5.5068

Error Propagation  
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Station Coordinate Standard Deviations (Meters)

Station	N	E	Elev
7614_RM1	0.000100	0.000100	0.000100
7614_RM2	0.000127	0.000122	0.000198
NW_VLBA	0.000246	0.000260	0.000189
BREWSTER_C	0.000163	0.000144	0.000192
BREWSTER_B	0.000152	0.000150	0.000196
1009	0.000278	0.000254	0.000206
BREWSTER_A	0.000211	0.000204	0.000200
BREW_GPS	0.000348	0.000479	0.000208
108502	0.000546	0.000551	0.000913
108504	0.000535	0.000556	0.000901
108506	0.000533	0.000562	0.000905
92502	0.000547	0.000552	0.000913
92504	0.000536	0.000558	0.000899
92506	0.000533	0.000564	0.000904
77502	0.000548	0.000553	0.000914
77504	0.000537	0.000559	0.000899
77506	0.000535	0.000566	0.000906
63502	0.000549	0.000554	0.000916
63504	0.000539	0.000561	0.000901
63506	0.000536	0.000568	0.000911
48502	0.000550	0.000555	0.000920
48504	0.000540	0.000564	0.000907
48506	0.000538	0.000570	0.000917
27502	0.000552	0.000557	0.000927
27504	0.000543	0.000567	0.000917
27506	0.000540	0.000572	0.000928
107408	0.000519	0.000577	0.000905
107410	0.000524	0.000566	0.000892
107412	0.000529	0.000565	0.000895
90408	0.000519	0.000578	0.000904
90410	0.000524	0.000569	0.000890
90412	0.000530	0.000567	0.000895
75408	0.000519	0.000580	0.000905
75410	0.000525	0.000571	0.000890
75412	0.000532	0.000569	0.000897
60408	0.000520	0.000582	0.000908
60410	0.000527	0.000574	0.000893
60412	0.000533	0.000572	0.000902
45408	0.000521	0.000584	0.000913
45410	0.000528	0.000577	0.000899
45412	0.000535	0.000574	0.000909
30408	0.000522	0.000585	0.000918
30410	0.000530	0.000579	0.000906
30412	0.000536	0.000577	0.000917
30214	0.000575	0.000493	0.000780
30216	0.000580	0.000481	0.000747
30218	0.000582	0.000479	0.000746
45214	0.000573	0.000492	0.000776
45216	0.000577	0.000480	0.000740
45218	0.000580	0.000478	0.000739

Station	N	E	Elev
60214	0.000571	0.000492	0.000772
60216	0.000574	0.000480	0.000735
60218	0.000577	0.000477	0.000733
75214	0.000570	0.000491	0.000769
75216	0.000571	0.000479	0.000732
75218	0.000575	0.000476	0.000728
90214	0.000568	0.000491	0.000768
90216	0.000568	0.000479	0.000731
90218	0.000572	0.000476	0.000726
107216	0.000566	0.000479	0.000733
107218	0.000569	0.000476	0.000725
208201	0.000576	0.000483	0.000738
208203	0.000574	0.000483	0.000738
208205	0.000572	0.000483	0.000738
222201	0.000575	0.000480	0.000724
222203	0.000573	0.000481	0.000724
222205	0.000571	0.000481	0.000724
237201	0.000573	0.000478	0.000711
237203	0.000571	0.000478	0.000710
237205	0.000569	0.000478	0.000710
252201	0.000572	0.000477	0.000700
252203	0.000570	0.000477	0.000699
252205	0.000567	0.000477	0.000699
288201	0.000568	0.000479	0.000690
288203	0.000566	0.000478	0.000689
288205	0.000564	0.000478	0.000688
303201	0.000567	0.000481	0.000694
303203	0.000564	0.000481	0.000692
303205	0.000562	0.000480	0.000691
353307	0.000563	0.000603	0.000983
353309	0.000563	0.000600	0.000983
353311	0.000563	0.000598	0.000984
23307	0.000554	0.000598	0.000940
23309	0.000553	0.000596	0.000939
23311	0.000553	0.000593	0.000938
37307	0.000555	0.000598	0.000942
37309	0.000554	0.000595	0.000941
37311	0.000554	0.000593	0.000940
51307	0.000557	0.000598	0.000948
51309	0.000557	0.000595	0.000947
51311	0.000556	0.000593	0.000945
65307	0.000560	0.000598	0.000957
65309	0.000559	0.000596	0.000956
65311	0.000559	0.000593	0.000955
81307	0.000564	0.000599	0.000970
81309	0.000563	0.000596	0.000969
81311	0.000562	0.000594	0.000967
65413	0.000529	0.000576	0.000839
65415	0.000528	0.000573	0.000838
65417	0.000528	0.000571	0.000837
80413	0.000528	0.000578	0.000844
80415	0.000528	0.000575	0.000843
81417	0.000527	0.000573	0.000842
95413	0.000529	0.000580	0.000854
95415	0.000528	0.000578	0.000852



Station	N	E	Elev
95417	0.000527	0.000575	0.000851
105413	0.000529	0.000581	0.000862
105415	0.000529	0.000579	0.000860
105417	0.000528	0.000577	0.000859

Station Coordinate Error Ellipses (Meters)  
Confidence Region = 95

Station	Semi-Major Axis	Semi-Minor Axis	Azimuth of Major Axis	Elev
7614_RM1	0.000245	0.000245	0-00	0.000196
7614_RM2	0.000340	0.000265	139-53	0.000388
NW_VLBA	0.000673	0.000561	54-04	0.000370
BREWSTER_C	0.000404	0.000347	164-00	0.000377
BREWSTER_B	0.000406	0.000330	136-42	0.000384
1009	0.000733	0.000558	145-10	0.000404
BREWSTER_A	0.000566	0.000444	139-13	0.000392
BREW_GPS	0.001175	0.000849	84-23	0.000407
108502	0.001437	0.001241	46-35	0.001790
108504	0.001430	0.001236	52-40	0.001767
108506	0.001436	0.001237	55-38	0.001773
92502	0.001441	0.001241	46-35	0.001789
92504	0.001435	0.001235	52-40	0.001762
92506	0.001442	0.001237	55-37	0.001772
77502	0.001446	0.001241	46-35	0.001791
77504	0.001442	0.001235	52-39	0.001762
77506	0.001449	0.001238	55-36	0.001777
63502	0.001450	0.001242	46-35	0.001796
63504	0.001449	0.001236	52-38	0.001767
63506	0.001455	0.001239	55-33	0.001785
48502	0.001455	0.001244	46-36	0.001803
48504	0.001457	0.001237	52-36	0.001777
48506	0.001462	0.001242	55-29	0.001797
27502	0.001460	0.001247	46-38	0.001818
27504	0.001466	0.001242	52-33	0.001797
27506	0.001469	0.001246	55-23	0.001819
107408	0.001450	0.001224	115-27	0.001773
107410	0.001443	0.001218	121-10	0.001748
107412	0.001450	0.001219	123-56	0.001754
90408	0.001456	0.001224	115-25	0.001772
90410	0.001450	0.001217	121-09	0.001743
90412	0.001458	0.001219	123-55	0.001754
75408	0.001461	0.001225	115-24	0.001775
75410	0.001458	0.001217	121-07	0.001745
75412	0.001465	0.001220	123-53	0.001759
60408	0.001466	0.001226	115-23	0.001780
60410	0.001466	0.001218	121-05	0.001751
60412	0.001473	0.001222	123-50	0.001768
45408	0.001471	0.001227	115-23	0.001789
45410	0.001475	0.001220	121-02	0.001761
45412	0.001480	0.001224	123-46	0.001781
30408	0.001475	0.001230	115-24	0.001799
30410	0.001482	0.001223	120-59	0.001776
30412	0.001486	0.001228	123-42	0.001796
30214	0.001427	0.001183	162-48	0.001529

Station	Semi-Major Axis	Semi-Minor Axis	Azimuth of Major Axis	Elev
30216	0.001428	0.001168	169-22	0.001464
30218	0.001429	0.001168	173-20	0.001462
45214	0.001423	0.001181	162-35	0.001520
45216	0.001421	0.001166	169-07	0.001451
45218	0.001423	0.001165	173-06	0.001448
60214	0.001419	0.001180	162-24	0.001513
60216	0.001413	0.001164	168-55	0.001441
60218	0.001417	0.001163	172-55	0.001436
75214	0.001414	0.001179	162-16	0.001508
75216	0.001406	0.001163	168-49	0.001435
75218	0.001410	0.001161	172-47	0.001427
90214	0.001410	0.001178	162-13	0.001505
90216	0.001399	0.001163	168-49	0.001433
90218	0.001403	0.001160	172-43	0.001422
107216	0.001394	0.001164	168-55	0.001436
107218	0.001397	0.001161	172-44	0.001421
208201	0.001412	0.001180	174-40	0.001446
208203	0.001407	0.001180	174-44	0.001446
208205	0.001401	0.001181	174-48	0.001446
222201	0.001409	0.001173	174-14	0.001419
222203	0.001404	0.001174	174-20	0.001419
222205	0.001398	0.001174	174-25	0.001418
237201	0.001406	0.001167	173-15	0.001393
237203	0.001401	0.001167	173-22	0.001392
237205	0.001396	0.001168	173-28	0.001391
252201	0.001404	0.001162	171-45	0.001372
252203	0.001398	0.001162	171-53	0.001371
252205	0.001393	0.001162	172-00	0.001369
288201	0.001401	0.001158	166-50	0.001353
288203	0.001396	0.001158	166-56	0.001351
288205	0.001391	0.001157	167-02	0.001348
303201	0.001402	0.001159	164-42	0.001360
303203	0.001397	0.001159	164-46	0.001357
303205	0.001391	0.001159	164-51	0.001353
353307	0.001480	0.001375	78-39	0.001926
353309	0.001473	0.001375	78-46	0.001927
353311	0.001467	0.001376	78-54	0.001928
23307	0.001473	0.001346	74-13	0.001843
23309	0.001467	0.001345	74-20	0.001841
23311	0.001460	0.001345	74-28	0.001839
37307	0.001474	0.001347	72-54	0.001846
37309	0.001467	0.001346	73-01	0.001844
37311	0.001461	0.001346	73-08	0.001842
51307	0.001475	0.001351	71-47	0.001858
51309	0.001468	0.001350	71-53	0.001855
51311	0.001461	0.001350	72-00	0.001853
65307	0.001476	0.001358	70-53	0.001877
65309	0.001469	0.001357	70-59	0.001874
65311	0.001463	0.001356	71-04	0.001871
81307	0.001478	0.001366	70-16	0.001901
81309	0.001471	0.001366	70-21	0.001899
81311	0.001465	0.001365	70-26	0.001896
65413	0.001456	0.001242	118-56	0.001645
65415	0.001450	0.001241	119-02	0.001642

Station	Semi-Major Axis	Semi-Minor Axis	Azimuth of Major Axis	Elev
65417	0.001443	0.001241	119-09	0.001640
80413	0.001457	0.001245	117-29	0.001655
80415	0.001450	0.001244	117-34	0.001652
81417	0.001444	0.001244	117-40	0.001650
95413	0.001458	0.001250	116-15	0.001673
95415	0.001451	0.001250	116-19	0.001670
95417	0.001445	0.001249	116-24	0.001668
105413	0.001459	0.001255	115-36	0.001689
105415	0.001453	0.001255	115-40	0.001686
105417	0.001446	0.001254	115-44	0.001683

Relative Error Ellipses (Meters)  
Confidence Region = 95

Stations From	To	Semi-Major Axis	Semi-Minor Axis	Azimuth of Major Axis	Vertical
1009	7614_RM1	0.000691	0.000502	145-10	0.000353
1009	7614_RM2	0.000699	0.000500	147-06	0.000363
1009	BREWSTER_A	0.000635	0.000515	154-05	0.000147
1009	BREWSTER_B	0.000619	0.000499	151-49	0.000147
1009	BREWSTER_C	0.000787	0.000525	149-50	0.000393
1009	BREW_GPS	0.001047	0.000930	69-19	0.000192
23307	BREWSTER_C	0.001432	0.001331	73-15	0.001804
23309	BREWSTER_C	0.001425	0.001330	73-19	0.001802
23311	BREWSTER_C	0.001418	0.001330	73-24	0.001800
27502	BREWSTER_B	0.001422	0.001223	46-23	0.001777
27504	BREWSTER_B	0.001428	0.001218	52-17	0.001755
27506	BREWSTER_B	0.001431	0.001223	55-07	0.001778
30214	7614_RM1	0.001406	0.001157	162-48	0.001517
30216	7614_RM1	0.001406	0.001143	169-22	0.001451
30218	7614_RM1	0.001408	0.001142	173-20	0.001449
30408	7614_RM2	0.001438	0.001205	114-15	0.001757
30410	7614_RM2	0.001444	0.001199	120-15	0.001733
30412	7614_RM2	0.001448	0.001204	123-09	0.001754
37307	BREWSTER_C	0.001432	0.001332	71-51	0.001807
37309	BREWSTER_C	0.001425	0.001332	71-54	0.001805
37311	BREWSTER_C	0.001419	0.001331	71-58	0.001803
45214	7614_RM1	0.001402	0.001155	162-35	0.001507
45216	7614_RM1	0.001399	0.001140	169-07	0.001438
45218	7614_RM1	0.001402	0.001139	173-06	0.001435
45408	7614_RM2	0.001434	0.001203	114-13	0.001746
45410	7614_RM2	0.001436	0.001196	120-17	0.001718
45412	7614_RM2	0.001442	0.001201	123-13	0.001738
48502	BREWSTER_B	0.001417	0.001220	46-21	0.001762
48504	BREWSTER_B	0.001419	0.001213	52-20	0.001735
48506	BREWSTER_B	0.001424	0.001218	55-13	0.001755
51307	BREWSTER_C	0.001433	0.001337	70-38	0.001819
51309	BREWSTER_C	0.001426	0.001336	70-40	0.001817
51311	BREWSTER_C	0.001419	0.001335	70-43	0.001814
60214	7614_RM1	0.001398	0.001154	162-24	0.001500
60216	7614_RM1	0.001392	0.001138	168-55	0.001428
60218	7614_RM1	0.001395	0.001137	172-55	0.001422
60408	7614_RM2	0.001429	0.001201	114-12	0.001738
60410	7614_RM2	0.001428	0.001194	120-18	0.001707

Stations From	To	Semi-Major Axis	Semi-Minor Axis	Azimuth of Major Axis	Vertical
60412	7614_RM2	0.001434	0.001198	123-16	0.001725
63502	BREWSTER_B	0.001412	0.001218	46-20	0.001754
63504	BREWSTER_B	0.001411	0.001210	52-21	0.001725
63506	BREWSTER_B	0.001417	0.001215	55-16	0.001743
65307	BREWSTER_C	0.001435	0.001344	69-36	0.001838
65309	BREWSTER_C	0.001428	0.001343	69-37	0.001836
65311	BREWSTER_C	0.001421	0.001342	69-38	0.001833
65413	7614_RM2	0.001418	0.001217	117-41	0.001598
65415	7614_RM2	0.001411	0.001216	117-45	0.001596
65417	7614_RM2	0.001404	0.001216	117-50	0.001594
75214	7614_RM1	0.001393	0.001153	162-16	0.001495
75216	7614_RM1	0.001384	0.001137	168-49	0.001422
75218	7614_RM1	0.001389	0.001135	172-47	0.001414
75408	7614_RM2	0.001423	0.001200	114-11	0.001732
75410	7614_RM2	0.001419	0.001193	120-18	0.001701
75412	7614_RM2	0.001427	0.001196	123-18	0.001716
77502	BREWSTER_B	0.001408	0.001217	46-19	0.001749
77504	BREWSTER_B	0.001404	0.001209	52-22	0.001720
77506	BREWSTER_B	0.001410	0.001213	55-18	0.001735
81307	BREWSTER_C	0.001436	0.001353	68-48	0.001864
81309	BREWSTER_C	0.001430	0.001353	68-48	0.001861
81311	BREWSTER_C	0.001423	0.001352	68-48	0.001858
92502	BREWSTER_B	0.001403	0.001216	46-19	0.001747
92504	BREWSTER_B	0.001397	0.001210	52-22	0.001719
92506	BREWSTER_B	0.001403	0.001212	55-19	0.001730
105413	7614_RM2	0.001422	0.001230	114-04	0.001644
105415	7614_RM2	0.001415	0.001230	114-04	0.001641
105417	7614_RM2	0.001408	0.001229	114-05	0.001638
107216	7614_RM1	0.001372	0.001138	168-55	0.001423
107218	7614_RM1	0.001376	0.001134	172-44	0.001407
107408	7614_RM2	0.001413	0.001200	114-11	0.001730
107410	7614_RM2	0.001404	0.001194	120-18	0.001705
107412	7614_RM2	0.001411	0.001195	123-19	0.001711
108502	BREWSTER_B	0.001399	0.001217	46-19	0.001748
108504	BREWSTER_B	0.001391	0.001211	52-21	0.001725
108506	BREWSTER_B	0.001397	0.001212	55-19	0.001731
208201	7614_RM1	0.001391	0.001154	174-40	0.001433
208203	7614_RM1	0.001385	0.001155	174-44	0.001433
208205	7614_RM1	0.001380	0.001155	174-48	0.001433
222201	7614_RM1	0.001388	0.001148	174-14	0.001405
222203	7614_RM1	0.001382	0.001148	174-20	0.001405
222205	7614_RM1	0.001377	0.001148	174-25	0.001405
237201	7614_RM1	0.001385	0.001141	173-15	0.001379
237203	7614_RM1	0.001379	0.001141	173-22	0.001378
237205	7614_RM1	0.001374	0.001142	173-28	0.001377
252201	7614_RM1	0.001382	0.001136	171-45	0.001358
252203	7614_RM1	0.001377	0.001136	171-53	0.001357
252205	7614_RM1	0.001371	0.001136	172-00	0.001355
288201	7614_RM1	0.001380	0.001132	166-50	0.001339
288203	7614_RM1	0.001374	0.001131	166-56	0.001336
288205	7614_RM1	0.001369	0.001131	167-02	0.001334
303201	7614_RM1	0.001381	0.001133	164-42	0.001345
303203	7614_RM1	0.001375	0.001133	164-46	0.001342
303205	7614_RM1	0.001370	0.001133	164-51	0.001339

Stations From	To	Semi-Major Axis	Semi-Minor Axis	Azimuth of Major Axis	Vertical
353307	BREWSTER_C	0.001438	0.001363	77-45	0.001889
353309	BREWSTER_C	0.001432	0.001364	77-49	0.001890
353311	BREWSTER_C	0.001425	0.001364	77-52	0.001891
7614_RM1	90214	0.001388	0.001152	162-13	0.001492
7614_RM1	90216	0.001378	0.001137	168-49	0.001420
7614_RM1	90218	0.001382	0.001134	172-43	0.001408
7614_RM1	7614_RM2	0.000237	0.000102	139-53	0.000334
7614_RM1	BREWSTER_A	0.000511	0.000371	139-13	0.000339
7614_RM1	BREWSTER_B	0.000324	0.000222	136-42	0.000330
7614_RM1	BREWSTER_C	0.000321	0.000246	164-00	0.000322
7614_RM1	NW_VLBA	0.000627	0.000505	54-04	0.000314
7614_RM2	80413	0.001419	0.001220	116-07	0.001609
7614_RM2	80415	0.001412	0.001219	116-10	0.001606
7614_RM2	81417	0.001405	0.001219	116-13	0.001603
7614_RM2	90408	0.001418	0.001199	114-11	0.001729
7614_RM2	90410	0.001411	0.001193	120-18	0.001700
7614_RM2	90412	0.001419	0.001195	123-19	0.001711
7614_RM2	95413	0.001420	0.001225	114-46	0.001628
7614_RM2	95415	0.001414	0.001225	114-48	0.001625
7614_RM2	95417	0.001407	0.001224	114-49	0.001622
7614_RM2	BREWSTER_A	0.000522	0.000374	143-00	0.000353
7614_RM2	BREWSTER_B	0.000338	0.000225	143-48	0.000338
7614_RM2	BREWSTER_C	0.000324	0.000235	163-39	0.000262
BREWSTER_A	BREWSTER_B	0.000435	0.000378	131-54	0.000130
BREWSTER_A	BREWSTER_C	0.000631	0.000410	150-41	0.000383
BREWSTER_A	BREW_GPS	0.001148	0.000767	79-50	0.000153
BREWSTER_A	NW_VLBA	0.000696	0.000572	84-20	0.000378
BREWSTER_B	BREWSTER_C	0.000481	0.000295	153-01	0.000372
BREWSTER_B	BREW_GPS	0.001138	0.000767	82-11	0.000153
BREWSTER_B	NW_VLBA	0.000659	0.000526	67-18	0.000379
BREWSTER_C	NW_VLBA	0.000687	0.000552	33-33	0.000420

Elapsed Time = 00:00:00

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01 00000001 Top of File  
01 00000005 Summary of Files Used and Option Settings  
02 00000008 Project Folder and Data Files  
02 00000014 Project Option Settings  
02 00000031 Instrument Standard Error Settings  
03 00000033 Project Default Instrument  
01 00000047 Summary of Unadjusted Input Observations  
02 00000050 Entered Stations  
03 00000052 Partially Fixed Coordinates  
02 00000057 Distance Observations  
02 00000263 Zenith Observations  
02 00000469 Differential Level Observations  
02 00000483 Direction Observations  
02 00000781 Azimuth/Bearing Observations  
01 00000786 Adjustment Statistical Summary  
01 00000811 Adjusted Coordinates  
01 00000925 Adjusted Observations and Residuals

02 00000928 Adjusted Coordinate Observations  
02 00000936 Adjusted Distance Observations  
02 00001142 Adjusted Zenith Observations  
02 00001348 Adjusted Differential Level Observations  
02 00001362 Adjusted Direction Observations  
02 00001660 Adjusted Azimuth/Bearing Observations  
01 00001665 Adjusted Bearings and Horizontal Distances  
01 00001795 Error Propagation  
02 00001798 Station Coordinate Standard Deviations  
02 00001911 Station Coordinate Error Ellipses  
02 00002026 Relative Error Ellipses  
01 00002154 End of File  
00022242  
STAR\*NET  
0003B74E

## B. Abstract of Leveling Observations

TRANSLEV Version 4 . 16 . 0

Fri Jul 29 16:42:56 2011

-\*- FIELD ABSTRACT -\*-

110720-110722 L99999 3.0 MM ORDER 1 CLASS 1 PAGE 1  
 IERS SITE SURVEY, BREWSTER, WA

SSN	PID	MARK DESIGNATION	STARTING DATE	START TIME	START TEMP	DIST (KM)	ELEV DIFF (METERS)	-(F+B) CODE	FIELD ELEV (METERS)	PUB ELEV (METERS)	I	S	L
1001	TP1394	NW VLBA 1990							256.30900	256.3090			
1001	TP1394	NW VLBA 1990	20110720	08:38 F	20.4	0.035	-0.18115 *	0.09	-0.18111				1 P
1002		7614 RM1	20110720	11:36 B	26.1	0.035	0.18106 *						1 P
						0.035		0.09	256.12789				
1002		7614 RM1	20110720	08:50 F	22.1	0.084	-0.70982 *	0.21	-0.70968				1 P
1003		BREWSTER C	20110720	11:22 B	26.4	0.079	0.70946 *						1 P
			20110720	11:45 F	29.5	0.080	-0.70975 *						1 P
			20110720	11:55 B	28.8	0.080	0.70970 *						1 P
						0.114		0.30	255.41821				
1003		BREWSTER C	20110720	09:12 F	22.1	0.045	-0.31161 *	-0.13	-0.31168				1 P
1004		7614 RM2	20110720	11:16 B	26.4	0.045	0.31174 *						1 P
						0.159		0.17	255.10654				
1004		7614 RM2	20110720	09:24 F	23.6	0.091	1.75804 *	-0.04	1.75802				1 P
1005		BREWSTER B	20110720	10:57 B	26.2	0.097	-1.75800 *						1 P
						0.250		0.13	256.86456				
1005		BREWSTER B	20110722	08:48 F	22.6	0.015	0.15003 *	0.01	0.15004				1 P
1009		BREW TP	20110722	08:51 B	21.6	0.015	-0.30513 R*						1 P
			20110722	09:04 B	21.1	0.015	-0.15004 *						1 P
						0.265		0.14	257.01459				
1009		BREW TP	20110722	09:00 B	21.2	0.015	0.30514 *	0.00	-0.30514				1 P
1006		BREWSTER A											
						0.280		0.14	256.70945				
1005		BREWSTER B	20110720	09:42 F	24.6	0.014	-0.15511 *	0.00	-0.15511				1 P
1006		BREWSTER A	20110720	10:50 B	25.3	0.013	0.15511 *						1 P
			20110722	08:55 B	21.4	0.016	0.15511 *						1 P
						0.263		0.13	256.70945				

1005	BREWSTER B	20110722 09:21 F	24.8	0.008	1.43048	*	-0.01	1.43048	1 P
1008 DK4088	BREW GPS ARP	20110722 09:27 B	25.4	0.008	-1.43047	*			1 P
				0.258			0.12	258.29503	
--- --									
1008 DK4088	BREW GPS ARP	20110722 09:35 F	21.6	0.005	-1.58541	*	0.00	-1.58541	1 P
1006	BREWSTER A	20110722 09:39 B	23.7	0.005	1.58541	*			1 P
				0.263			0.12	256.70962	
--- --									
1001 TP1394	NW VLBA 1990	20110720 09:51 B	24.8	0.080	-0.40063	*	0.12	0.40057	1 M
1006	BREWSTER A	20110720 10:40 F	25.1	0.080	0.40051	*			1 M
				0.080			0.12	256.70957	

ELEVATION REJECTION AND ERROR CODES

\* - The section elevation difference does not include rod and orthometric corrections

INSTRUMENT CODE	INSTRUMENT	RODS	
1	243 - 332228	396 - 30721	396 - 30721

The shortest path between starting and ending points is:  
1001 1006

The shortest distance between starting and ending points is:  
0.08 km.

SEGMENT(S) & RUNNING ORDER

--- Survey point numbers ---

FROM	TO	length	S	L
1001	1002 1003 1004 1005	0.250	P	
1005	1009 1006	0.030	P	
1005	1006	0.013	P	
1005	1008 1006	0.013	P	
1001	1006	0.080	M	

FROM	TO	N. LATITUDE	W. LONGITUDE	FIELD DISTANCE	VS. COMPUTED
1001	1002	480751	1194059	0.04	0.02
1002	1003	480752	1194103	0.08	0.09
1003	1004	480753	1194102	0.05	0.04
1004	1005	480754	1194058	0.09	0.09
1005	1009	480754	1194059	0.02	0.02
1009	1006	480754	1194057	0.02	0.04
1005	1006	480754	1194057	0.01	0.02
1005	1008	480753	1194057	0.01	0.04
1008	1006	480754	1194057	0.01	0.03
1001	1006	480754	1194057	0.08	0.09



## C. Summary of GPS Baseline Processing

Brewster Site Survey  
GPS Baseline Solutions (TGO v 1.63)

B Session start date/time, end date/time (UTC)

C From/to, dX, dX SD, dY, dY SD, dZ, dZ SD (units in tenths of mm)

D Matrix: Row index number, column index number, correlation, etc.

```

B201107251611 201107252214
C 7614 RM1 - BREWSTER C   -501111    3    482877    5    144064    6
D 1 2 009317137 1 3 -08889952 2 3 -09266281
B201107251629 201107252226
C 7614 RM2 - BREWSTER C   -266910    4    -219310    7    -285063    8
D 1 2 009320806 1 3 -08720680 2 3 -09273811
B201107251629 201107252238
C BREWSTER B - 7614 RM2   -785662   11    388276   16    -69991   19
D 1 2 009526808 1 3 -09028901 2 3 -09360105
B201107251623 201107252248
C BREW GPS - BREWSTER B   -51427    5    43910    8    -7724   11
D 1 2 009411197 1 3 -09165702 2 3 -09504600
B201107281542 201107282204
C BREWSTER B - 7614 RM2   -785667    3    388272    4    -69981    5
D 1 2 009383854 1 3 -08983896 2 3 -09333313
B201107281525 201107282219
C 7614 RM2 - BREWSTER C   -266908    3    -219310    4    -285062    5
D 1 2 009319955 1 3 -08928515 2 3 -09313516
B201107281542 201107282204
C BREW GPS - BREWSTER B   -51421    5    43911    8    -7725   10
D 1 2 009399868 1 3 -09079657 2 3 -09446560
B201107281442 201107282241
C BREW GPS - 7614 RM1     -602892    5    -269999    8    -506844   10
D 1 2 009335336 1 3 -09043158 2 3 -09418074
B201107291541 201107292205
C BREW GPS - 7614 RM1     -602887    5    -270008    8    -506837   10
D 1 2 009295609 1 3 -08994176 2 3 -09358896
B201107291541 201107292205
C 7614 RM1 - BREWSTER C   -501112    3    482873    4    144069    5
D 1 2 009331622 1 3 -08919809 2 3 -09285796
B201107291602 201107292237
C BREW GPS - BREWSTER B   -51419    6    43922    9    -7740   11
D 1 2 009377130 1 3 -08926370 2 3 -09256901
B201107291602 201107292228
C BREWSTER B - 7614 RM2   -785666    3    388274    5    -69980    6
D 1 2 009383702 1 3 -08869925 2 3 -09148042

```

## D. Leveling Data Adjustment Results (StarNet vertical LST file)

MicroSurvey STAR\*NET-DEMO Version 7.1.0.5

Licensed for Demo Use Only

Run Date: Thu Dec 08 2011 11:31:43

### Summary of Files Used and Option Settings

=====

#### Project Folder and Data Files

Project Name BREW LEVELS  
Project Folder C:\ISS PROGRAM\FY12\STARNET TEST\LEVEL ADJUSTMENT  
Data File List 1. brew levels.dat

#### Project Option Settings

STAR\*NET Run Mode : Adjust with Error Propagation  
Type of Adjustment : Lev  
Project Units : Meters  
Input/Output Coordinate Order : North-East  
Create Coordinate File : Yes

#### Instrument Standard Error Settings

Project Default Instrument  
Differential Levels : 0.001000 Meters / Km

### Summary of Unadjusted Input Observations

=====

Number of Entered Stations (Meters) = 1

Fixed Stations	Elev	Description
2	255.7353	

Number of Differential Level Observations (Meters) = 10

From	To	Elev Diff	StdErr	Length
1	2	-0.1811	0.0002	35
2	3	-0.7097	0.0003	84
3	4	-0.3117	0.0002	45
4	5	1.7580	0.0003	91
5	9	0.1500	0.0001	15
9	6	-0.3051	0.0001	15
5	6	-0.1551	0.0001	14
5	8	1.4305	0.0001	8
8	6	-1.5854	0.0001	5
6	1	-0.4006	0.0003	80

Adjustment Statistical Summary

=====

Number of Stations = 8  
 Number of Observations = 10  
 Number of Unknowns = 7  
 Number of Redundant Obs = 3

Observation	Count	Sum Squares of StdRes	Error Factor
Level Data	10	1.397	0.682
Total	10	1.397	0.682

The Chi-Square Test at 5.00% Level Passed  
 Lower/Upper Bounds (0.268/1.765)

Adjusted Elevations and Error Propagation (Meters)

=====

Station	Elev	StdDev	95
(2) BREWSTER 7614 RM 1	255.7353	0.000000	0.000000
(1) NW VLBA	255.9164	0.000177	0.000347
(3) BREWSTER C	255.0256	0.000252	0.000493
(4) BREWSTER 7614 RM 2	254.7140	0.000283	0.000555
(5) BREWSTER B	256.4720	0.000279	0.000547
(9) BREW TP	256.6221	0.000288	0.000565
(8) BREW GPS ARP	256.3170	0.000276	0.000541
(6) BREWSTER A	257.9024	0.000280	0.000550

Adjusted Observations and Residuals

=====

Adjusted Differential Level Observations (Meters)

From	To	Elev Diff	Residual	StdErr	StdRes	File:Line
1	2	-0.1811	0.0000	0.0002	0.0	1:16
2	3	-0.7097	0.0000	0.0003	0.0	1:17
3	4	-0.3117	0.0000	0.0002	0.0	1:18
4	5	1.7580	0.0000	0.0003	0.0	1:19
5	9	0.1501	0.0000	0.0001	0.3	1:20
9	6	-0.3051	0.0000	0.0001	0.3	1:21
5	6	-0.1550	0.0001	0.0001	0.7	1:22
5	8	1.4304	-0.0001	0.0001	0.7	1:23
8	6	-1.5854	-0.0000	0.0001	0.5	1:24
6	1	-0.4006	0.0000	0.0003	0.0	1:25

## E. AXIS Output File, OUTPUT.AXS

axis: Axis and IVP Estimation, Frame Alignment & SINEX Software  
Geoscience Australia  
version 1.07

++++  
1. SOFTWARE OPTIONS  
++++

ELLIPSOIDAL AE : 6378137.0000  
ELLIPSOIDAL FLAT : 0.0033528106811823  
REFERENCE MARK : 7614\_RM1  
CONVERGENCE LIMIT : 0.0000050  
MAXIMUM ITERATIONS : 18  
TIME STAMP (YYYY:MM:DD) : 2011:07:28  
SINEX FILE : NGSBREW1107GA.snx  
INPUT VCV FILE : Brewster.dmp  
INPUT VCV SYSTEM : LOCAL  
INPUT VCV FORMAT : STARNET  
COMPUTE ALIGNMENT : BEFORE

USE TARGET : 201  
USE TARGET : 203  
USE TARGET : 205  
USE TARGET : 307  
USE TARGET : 309  
USE TARGET : 311  
USE TARGET : 502  
USE TARGET : 504  
USE TARGET : 506  
USE TARGET : 408  
USE TARGET : 410  
USE TARGET : 412  
USE TARGET : 214  
USE TARGET : 216  
USE TARGET : 218

IVP NAME : IVP\_1  
IVP PRIMARY AXIS NAME : 201  
IVP SECONDARY AXIS NAME : 408  
IVP NAME : IVP\_2  
IVP PRIMARY AXIS NAME : 201  
IVP SECONDARY AXIS NAME : 502  
IVP NAME : IVP\_3  
IVP PRIMARY AXIS NAME : 201  
IVP SECONDARY AXIS NAME : 214

CONSTRAIN OFFSET : IVP\_1 TO IVP\_2  
CONSTRAIN UIVP : IVP\_1 TO IVP\_2  
CONSTRAIN ORTHOG : 201 - 408 TO 201 - 502  
CONSTRAIN ENORMAL : 201 TO 203  
CONSTRAIN ENORMAL : 203 TO 205  
CONSTRAIN ENORMAL : 205 TO 307  
CONSTRAIN ENORMAL : 307 TO 309  
CONSTRAIN ENORMAL : 309 TO 311  
CONSTRAIN NNORMAL : 201 TO 203  
CONSTRAIN NNORMAL : 203 TO 205  
CONSTRAIN NNORMAL : 205 TO 307  
CONSTRAIN NNORMAL : 307 TO 309  
CONSTRAIN NNORMAL : 309 TO 311  
CONSTRAIN UNORMAL : 201 TO 203  
CONSTRAIN UNORMAL : 203 TO 205  
CONSTRAIN UNORMAL : 205 TO 307  
CONSTRAIN UNORMAL : 307 TO 309  
CONSTRAIN UNORMAL : 309 TO 311  
CONSTRAIN ECENTRE : 201 TO 203  
CONSTRAIN ECENTRE : 203 TO 205  
CONSTRAIN ECENTRE : 205 TO 307

```

CONSTRAIN ECENTRE      : 307 TO 309
CONSTRAIN ECENTRE      : 309 TO 311
CONSTRAIN NCENTRE      : 201 TO 203
CONSTRAIN NCENTRE      : 203 TO 205
CONSTRAIN NCENTRE      : 205 TO 307
CONSTRAIN NCENTRE      : 307 TO 309
CONSTRAIN NCENTRE      : 309 TO 311
CONSTRAIN UCENTRE      : 201 TO 307
CONSTRAIN UCENTRE      : 203 TO 309
CONSTRAIN UCENTRE      : 205 TO 311
CONSTRAIN RADIUS       : 201 TO 307
CONSTRAIN RADIUS       : 203 TO 309
CONSTRAIN RADIUS       : 205 TO 311
CONSTRAIN ENORMAL      : 502 TO 504
CONSTRAIN ENORMAL      : 504 TO 506
CONSTRAIN NNORMAL      : 502 TO 504
CONSTRAIN NNORMAL      : 504 TO 506
CONSTRAIN UNORMAL      : 502 TO 504
CONSTRAIN UNORMAL      : 504 TO 506
CONSTRAIN ENORMAL      : 408 TO 410
CONSTRAIN ENORMAL      : 410 TO 412
CONSTRAIN NNORMAL      : 408 TO 410
CONSTRAIN NNORMAL      : 410 TO 412
CONSTRAIN UNORMAL      : 408 TO 410
CONSTRAIN UNORMAL      : 410 TO 412
CONSTRAIN ENORMAL      : 214 TO 216
CONSTRAIN ENORMAL      : 216 TO 218
CONSTRAIN NNORMAL      : 214 TO 216
CONSTRAIN NNORMAL      : 216 TO 218
CONSTRAIN UNORMAL      : 214 TO 216
CONSTRAIN UNORMAL      : 216 TO 218
CONSTRAIN RADIUS       : 502 TO 408
CONSTRAIN RADIUS       : 504 TO 410
CONSTRAIN RADIUS       : 506 TO 412
CONSTRAIN RADIUS       : 408 TO 214
CONSTRAIN RADIUS       : 410 TO 216
CONSTRAIN RADIUS       : 412 TO 218

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+++++
1.1 APRIORI PARAMETER/CONDITION/CONSTRAINT STANDARD DEVIATIONS
+++++

```

```

NORMAL   PARAMETER NORTH : 0.0000e+00
NORMAL   PARAMETER EAST  : 0.0000e+00
NORMAL   PARAMETER UP    : 0.0000e+00
CENTRE   PARAMETER NORTH : 0.0000e+00 METRE
CENTRE   PARAMETER EAST  : 0.0000e+00 METRE
CENTRE   PARAMETER UP    : 0.0000e+00 METRE
RADIUS   PARAMETER       : 0.0000e+00 METRE
IVP      PARAMETER       : 0.0000e+00 METRE
TOUCH    PARAMETER       : 0.0000e+00 METRE
INTERSECT PARAMETER      : 0.0000e+00 METRE

IVP      CONDITION       : 1.0000e-05 METRE
TOUCH    CONDITION       : 1.0000e-05 METRE
INTERSECT CONDITION      : 1.0000e-05 METRE

UNIT NORMAL CONSTRAINT   : 1.0000e-08

IVP      TIE             : 1.0000e-06 METRE
INTERSECT TIE            : 1.0000e-05 METRE
CDIST    TIE             : 1.0000e-05 METRE
RADIUS   TIE             : 1.0000e-05 METRE
CENTRE   TIE             : 1.0000e-05 METRE
NORMAL   TIE             : 1.0000e-06 METRE
ORTHOGONAL TIE          : 1.0000e-06
CENTRE TO CENTRE TIE    : 1.0000e-05 METRE
OFFSET   TIE             : 1.0000e-05 METRE
OANGLE   TIE             : 1.0000e-07

```

+++++  
 1.2 USER INPUT SINEX INFORMATION  
 +++++

SINEX STATIONS :

```

7614_RM1 <<<>>> BRM1 A ----- 1 BREWSTER 7614 RM 1 NS
BREWSTER_C <<<>>> BREC A ----- 1 BREWSTER C NS

7614_RM2 <<<>>> BRM2 A ----- 1 BREWSTER 7614 RM 2 NS
BREWSTER_B <<<>>> BREB A ----- 1 BREWSTER B NS

BREWSTER_A <<<>>> BREB A ----- 1 BREWSTER A NS

BREW_GPS <<<>>> BREW A 40473M001 1 Divot on a SCIGN mount
IVP_1 <<<>>> 7614 A 40473S001 1 25-M VLBA ANTENNA REFE
  
```

+++++  
 1.3 USER INPUT ALIGNMENT STATIONS  
 +++++

FRAME : GLOBAL (OR REFERENCE SET)  
 ALIGNMENT STATIONS : CARTESIAN COORDINATES - EARTH CENTRE ORIGIN (METRES)

SITE	X(M)	Y(M)	Z(M)
7614_RM1	-2112067.5309	-3705378.8250	4726776.4168
7614_RM2	-2112090.9511	-3705308.6063	4726819.3297
BREWSTER_B	-2112012.3843	-3705347.4334	4726826.3278
BREWSTER_C	-2112117.6421	-3705330.5374	4726790.8235

+++++  
 1.4 TARGET TO TARGET DISTANCE CONSTRAINTS  
 +++++

```

CDIST CONSTRAINT 1. : 201 203 205
CDIST CONSTRAINT 2. : 307 309 311
CDIST CONSTRAINT 3. : 502 504 506
CDIST CONSTRAINT 4. : 408 410 412
CDIST CONSTRAINT 5. : 214 216 218
  
```

	TARGET1 -	TARGET2	TARGET3 -	TARGET4	DISTANCE(1-2)	DISTANCE(3-4)	DIFFERENCE
1.	208201 -	208203	222201 -	222203	0.6414	0.6415	-0.0001
2.	208201 -	208203	237201 -	237203	0.6414	0.6414	-0.0000
3.	208201 -	208203	252201 -	252203	0.6414	0.6413	0.0001
4.	208201 -	208203	288201 -	288203	0.6414	0.6418	-0.0004
5.	208201 -	208203	303201 -	303203	0.6414	0.6418	-0.0003
6.	208201 -	208205	222201 -	222205	1.3199	1.3201	-0.0002
7.	208201 -	208205	237201 -	237205	1.3199	1.3199	-0.0000
8.	208201 -	208205	252201 -	252205	1.3199	1.3204	-0.0006
9.	208201 -	208205	288201 -	288205	1.3199	1.3241	-0.0042
10.	208201 -	208205	303201 -	303205	1.3199	1.3245	-0.0046
11.	353307 -	353309	23307 -	23309	0.6415	0.6413	0.0003
12.	353307 -	353309	37307 -	37309	0.6415	0.6418	-0.0003
13.	353307 -	353309	51307 -	51309	0.6415	0.6417	-0.0002
14.	353307 -	353309	65307 -	65309	0.6415	0.6417	-0.0002
15.	353307 -	353309	81307 -	81309	0.6415	0.6417	-0.0002
16.	353307 -	353311	23307 -	23311	1.3196	1.3201	-0.0005
17.	353307 -	353311	37307 -	37311	1.3196	1.3206	-0.0010
18.	353307 -	353311	51307 -	51311	1.3196	1.3202	-0.0006
19.	353307 -	353311	65307 -	65311	1.3196	1.3205	-0.0009
20.	353307 -	353311	81307 -	81311	1.3196	1.3200	-0.0004
21.	108502 -	108504	92502 -	92504	5.7271	5.7271	-0.0000
22.	108502 -	108504	77502 -	77504	5.7271	5.7270	0.0001
23.	108502 -	108504	63502 -	63504	5.7271	5.7266	0.0005
24.	108502 -	108504	48502 -	48504	5.7271	5.7268	0.0002
25.	108502 -	108504	27502 -	27504	5.7271	5.7263	0.0008
26.	108502 -	108506	92502 -	92506	8.3957	8.3962	-0.0005
27.	108502 -	108506	77502 -	77506	8.3957	8.3959	-0.0002
28.	108502 -	108506	63502 -	63506	8.3957	8.3961	-0.0004

29.	108502 -	108506	48502 -	48506	8.3957	8.3960	-0.0003
	TARGET1 -	TARGET2	TARGET3 -	TARGET4	DISTANCE (1-2)	DISTANCE (3-4)	DIFFERENCE
30.	108502 -	108506	27502 -	27506	8.3957	8.3953	0.0004
31.	107408 -	107410	90408 -	90410	5.7270	5.7274	-0.0004
32.	107408 -	107410	75408 -	75410	5.7270	5.7268	0.0002
33.	107408 -	107410	60408 -	60410	5.7270	5.7269	0.0001
34.	107408 -	107410	45408 -	45410	5.7270	5.7265	0.0005
35.	107408 -	107410	30408 -	30410	5.7270	5.7258	0.0012
36.	107408 -	107412	90408 -	90412	8.3960	8.3966	-0.0006
37.	107408 -	107412	75408 -	75412	8.3960	8.3962	-0.0002
38.	107408 -	107412	60408 -	60412	8.3960	8.3966	-0.0006
39.	107408 -	107412	45408 -	45412	8.3960	8.3964	-0.0004
40.	107408 -	107412	30408 -	30412	8.3960	8.3940	0.0020
41.	90214 -	90216	75214 -	75216	5.7280	5.7275	0.0005
42.	90214 -	90216	60214 -	60216	5.7280	5.7277	0.0002
43.	90214 -	90216	45214 -	45216	5.7280	5.7276	0.0003
44.	90214 -	90216	30214 -	30216	5.7280	5.7262	0.0017
45.	90214 -	90218	75214 -	75218	8.3924	8.3923	0.0001
46.	90214 -	90218	60214 -	60218	8.3924	8.3924	-0.0000
47.	90214 -	90218	45214 -	45218	8.3924	8.3933	-0.0009
48.	90214 -	90218	30214 -	30218	8.3924	8.3941	-0.0017

+++++  
2. INPUT SOLUTION  
+++++

+++++  
2.1 SOLUTION PARAMETER SUMMARY  
+++++

SOLUTION VARIANCE FACTOR : 1.0000  
NUMBER OF PARAMETERS : 327  
NUMBER OF STATIONS : 109  
NUMBER OF STATION PARA : 327  
DEGREES OF FREEDOM : 0  
NUMBER OF AUXILLARY PARA : 0  
VCV REFERENCE SYSTEM : LOCAL  
CRD REFERENCE SYSTEM : LOCAL

LOCAL COORDINATES - REFERENCE MARK ORIGIN (METRES)

SITE	EAST	NORTH	UP	SEAST	SNORTH	SUP	TARGET	SEQUENCE
7614_RM1	-0.0000	0.0000	0.0000	+/-	0.0001	0.0001	0.0001	
7614_RM2	-55.1197	65.4334	-1.0212	+/-	0.0001	0.0001	0.0002	
BREWSTER_C	-67.4475	22.3761	-0.7097	+/-	0.0001	0.0002	0.0002	
BREWSTER_B	32.3651	73.9574	0.7368	+/-	0.0002	0.0002	0.0002	
BREWSTER_A	43.0501	74.4256	0.5817	+/-	0.0002	0.0002	0.0002	
BREW_GPS	39.0081	73.5274	2.1589	+/-	0.0005	0.0003	0.0002	
108502	-6.4870	36.8575	13.5058	+/-	0.0006	0.0005	0.0009	108
108504	-9.4364	41.7067	12.7407	+/-	0.0006	0.0005	0.0009	108
108506	-11.2389	43.7786	13.4399	+/-	0.0006	0.0005	0.0009	108
92502	-6.4310	36.9047	14.0296	+/-	0.0006	0.0005	0.0009	92
92504	-9.2507	41.8653	13.5387	+/-	0.0006	0.0005	0.0009	92
92506	-11.1952	43.8161	14.2077	+/-	0.0006	0.0005	0.0009	92
77502	-6.4800	36.8636	14.5325	+/-	0.0006	0.0005	0.0009	77
77504	-9.2320	41.8823	14.3382	+/-	0.0006	0.0005	0.0009	77
77506	-11.3008	43.7259	14.9320	+/-	0.0006	0.0005	0.0009	77
63502	-6.6191	36.7442	14.9890	+/-	0.0006	0.0005	0.0009	63
63504	-9.3625	41.7698	15.0949	+/-	0.0006	0.0005	0.0009	63
63506	-11.5357	43.5247	15.5782	+/-	0.0006	0.0005	0.0009	63
48502	-6.8523	36.5443	15.4018	+/-	0.0006	0.0006	0.0009	48
48504	-9.6483	41.5251	15.8144	+/-	0.0006	0.0005	0.0009	48
48506	-11.9032	43.2092	16.1494	+/-	0.0006	0.0005	0.0009	48
27502	-7.2883	36.1700	15.8108	+/-	0.0006	0.0006	0.0009	27
27504	-10.2503	41.0078	16.5935	+/-	0.0006	0.0005	0.0009	27
27506	-12.5646	42.6405	16.6906	+/-	0.0006	0.0005	0.0009	27
107408	-6.8442	43.7526	13.5255	+/-	0.0006	0.0005	0.0009	107
107410	-10.2888	39.2400	12.7707	+/-	0.0006	0.0005	0.0009	107
107412	-11.5532	36.8017	13.4702	+/-	0.0006	0.0005	0.0009	107
90408	-6.9030	43.7839	14.1006	+/-	0.0006	0.0005	0.0009	90

90410	-10.5072	39.3556	13.6500	+/-	0.0006	0.0005	0.0009	410	90
90412	-11.5921	36.8218	14.3109	+/-	0.0006	0.0005	0.0009	412	90
	SITE	EAST	NORTH	UP	SEAST	SNORTH	SUP	TARGET	SEQUENCE
75408	-6.8298	43.7448	14.6024	+/-	0.0006	0.0005	0.0009	408	75
75410	-10.5034	39.3541	14.4528	+/-	0.0006	0.0005	0.0009	410	75
75412	-11.4450	36.7440	15.0330	+/-	0.0006	0.0005	0.0009	412	75
60408	-6.6433	43.6459	15.0699	+/-	0.0006	0.0005	0.0009	408	60
60410	-10.3153	39.2541	15.2333	+/-	0.0006	0.0005	0.0009	410	60
60412	-11.1360	36.5797	15.6921	+/-	0.0006	0.0005	0.0009	412	60
45408	-6.3572	43.4940	15.4650	+/-	0.0006	0.0005	0.0009	408	45
45410	-9.9559	39.0637	15.9289	+/-	0.0006	0.0005	0.0009	410	45
45412	-10.6884	36.3424	16.2360	+/-	0.0006	0.0005	0.0009	412	45
30408	-5.9903	43.2981	15.7634	+/-	0.0006	0.0005	0.0009	408	30
30410	-9.4492	38.7945	16.4969	+/-	0.0006	0.0005	0.0009	410	30
30412	-10.1297	36.0476	16.6317	+/-	0.0006	0.0005	0.0009	412	30
30214	-12.9787	41.9468	15.7641	+/-	0.0005	0.0006	0.0008	214	30
30216	-7.5579	40.2530	16.4963	+/-	0.0005	0.0006	0.0007	216	30
30218	-4.7453	40.5612	16.6316	+/-	0.0005	0.0006	0.0007	218	30
45214	-13.0359	41.5348	15.4660	+/-	0.0005	0.0006	0.0008	214	45
45216	-7.6350	39.6849	15.9291	+/-	0.0005	0.0006	0.0007	216	45
45218	-4.8324	39.9360	16.2371	+/-	0.0005	0.0006	0.0007	218	45
60214	-13.0792	41.2145	15.0698	+/-	0.0005	0.0006	0.0008	214	60
60216	-7.6898	39.2819	15.2330	+/-	0.0005	0.0006	0.0007	216	60
60218	-4.9015	39.4337	15.6924	+/-	0.0005	0.0006	0.0007	218	60
75214	-13.1078	41.0057	14.6046	+/-	0.0005	0.0006	0.0008	214	75
75216	-7.7190	39.0710	14.4560	+/-	0.0005	0.0006	0.0007	216	75
75218	-4.9490	39.0879	15.0361	+/-	0.0005	0.0006	0.0007	218	75
90214	-13.1194	40.9233	14.1007	+/-	0.0005	0.0006	0.0008	214	90
90216	-7.7194	39.0668	13.6499	+/-	0.0005	0.0006	0.0007	216	90
90218	-4.9717	38.9223	14.3116	+/-	0.0005	0.0006	0.0007	218	90
107216	-7.6916	39.2692	12.8702	+/-	0.0005	0.0006	0.0007	216	107
107218	-4.9682	38.9479	13.5679	+/-	0.0005	0.0006	0.0007	218	107
208201	-3.7454	40.0929	15.1157	+/-	0.0005	0.0006	0.0007	201	208
208203	-3.7008	40.1633	14.4797	+/-	0.0005	0.0006	0.0007	203	208
208205	-3.6560	40.2327	13.8063	+/-	0.0005	0.0006	0.0007	205	208
222201	-3.9235	38.8207	15.1161	+/-	0.0005	0.0006	0.0007	201	222
222203	-3.8634	38.8784	14.4800	+/-	0.0005	0.0006	0.0007	203	222
222205	-3.8035	38.9347	13.8064	+/-	0.0005	0.0006	0.0007	205	222
237201	-4.4498	37.5506	15.1161	+/-	0.0005	0.0006	0.0007	201	237
237203	-4.3768	37.5907	14.4800	+/-	0.0005	0.0006	0.0007	203	237
237205	-4.3045	37.6294	13.8065	+/-	0.0005	0.0006	0.0007	205	237
252201	-5.2869	36.4582	15.1161	+/-	0.0005	0.0006	0.0007	201	252
252203	-5.2057	36.4779	14.4802	+/-	0.0005	0.0006	0.0007	203	252
252205	-5.1267	36.4966	13.8059	+/-	0.0005	0.0006	0.0007	205	252
288201	-8.1875	34.9793	15.1179	+/-	0.0005	0.0006	0.0007	201	288
288203	-8.1104	34.9478	14.4815	+/-	0.0005	0.0006	0.0007	203	288
288205	-8.0349	34.9160	13.8042	+/-	0.0005	0.0006	0.0007	205	288
303201	-9.5629	34.9433	15.1181	+/-	0.0005	0.0006	0.0007	201	303
303203	-9.4966	34.8930	14.4818	+/-	0.0005	0.0006	0.0007	203	303
303205	-9.4314	34.8424	13.8040	+/-	0.0005	0.0006	0.0007	205	303
353307	-9.5634	34.9438	15.1163	+/-	0.0006	0.0006	0.0010	307	353
353309	-9.4971	34.8935	14.4802	+/-	0.0006	0.0006	0.0010	309	353
353311	-9.4318	34.8429	13.8072	+/-	0.0006	0.0006	0.0010	311	353
23307	-13.9945	38.4678	15.1163	+/-	0.0006	0.0006	0.0009	307	23
23309	-14.0125	38.3861	14.4805	+/-	0.0006	0.0006	0.0009	309	23
23311	-14.0309	38.3037	13.8069	+/-	0.0006	0.0006	0.0009	311	23
37307	-14.2689	39.8161	15.1167	+/-	0.0006	0.0006	0.0009	307	37
37309	-14.3072	39.7416	14.4804	+/-	0.0006	0.0006	0.0009	309	37
37311	-14.3460	39.6670	13.8069	+/-	0.0006	0.0006	0.0009	311	37
51307	-14.2022	41.0977	15.1166	+/-	0.0006	0.0006	0.0009	307	51
51309	-14.2573	41.0347	14.4804	+/-	0.0006	0.0006	0.0009	309	51
51311	-14.3128	40.9718	13.8071	+/-	0.0006	0.0006	0.0009	311	51
65307	-13.8275	42.3257	15.1169	+/-	0.0006	0.0006	0.0010	307	65
65309	-13.8964	42.2783	14.4807	+/-	0.0006	0.0006	0.0010	309	65
65311	-13.9652	42.2307	13.8070	+/-	0.0006	0.0006	0.0010	311	65
81307	-13.1644	43.4282	15.1164	+/-	0.0006	0.0006	0.0010	307	81
81309	-13.2428	43.3989	14.4802	+/-	0.0006	0.0006	0.0010	309	81
81311	-13.3211	43.3694	13.8070	+/-	0.0006	0.0006	0.0010	311	81



+++++  
2.2 SOLUTION VARIANCE COVARIANCE MATRIX REDUCTION  
+++++

SOLUTION REDUCTION : 327 x 327 >> 285 x 285

VARIANCE-COVARIANCE PARAMETER LIST

1.	NORTH	7614_RM1
2.	EAST	7614_RM1
3.	HEIGHT	7614_RM1
4.	NORTH	7614_RM2
5.	EAST	7614_RM2
6.	HEIGHT	7614_RM2
7.	NORTH	BREWSTER_C
8.	EAST	BREWSTER_C
9.	HEIGHT	BREWSTER_C
10.	NORTH	BREWSTER_B
11.	EAST	BREWSTER_B
12.	HEIGHT	BREWSTER_B
13.	NORTH	BREWSTER_A
14.	EAST	BREWSTER_A
15.	HEIGHT	BREWSTER_A
16.	NORTH	BREW_GPS
17.	EAST	BREW_GPS
18.	HEIGHT	BREW_GPS
19.	NORTH	108502
20.	EAST	108502
21.	HEIGHT	108502
22.	NORTH	108504
23.	EAST	108504
24.	HEIGHT	108504
25.	NORTH	108506
26.	EAST	108506
27.	HEIGHT	108506
28.	NORTH	92502
29.	EAST	92502
30.	HEIGHT	92502
31.	NORTH	92504
32.	EAST	92504
33.	HEIGHT	92504
34.	NORTH	92506
35.	EAST	92506
36.	HEIGHT	92506
37.	NORTH	77502
38.	EAST	77502
39.	HEIGHT	77502
40.	NORTH	77504
41.	EAST	77504
42.	HEIGHT	77504
43.	NORTH	77506
44.	EAST	77506
45.	HEIGHT	77506
46.	NORTH	63502
47.	EAST	63502
48.	HEIGHT	63502
49.	NORTH	63504
50.	EAST	63504
51.	HEIGHT	63504
52.	NORTH	63506
53.	EAST	63506
54.	HEIGHT	63506
55.	NORTH	48502
56.	EAST	48502
57.	HEIGHT	48502
58.	NORTH	48504
59.	EAST	48504
60.	HEIGHT	48504
61.	NORTH	48506
62.	EAST	48506
63.	HEIGHT	48506
64.	NORTH	27502
65.	EAST	27502

66. HEIGHT	27502
VARIANCE-COVARIANCE PARAMETER LIST	
67. NORTH	27504
68. EAST	27504
69. HEIGHT	27504
70. NORTH	27506
71. EAST	27506
72. HEIGHT	27506
73. NORTH	107408
74. EAST	107408
75. HEIGHT	107408
76. NORTH	107410
77. EAST	107410
78. HEIGHT	107410
79. NORTH	107412
80. EAST	107412
81. HEIGHT	107412
82. NORTH	90408
83. EAST	90408
84. HEIGHT	90408
85. NORTH	90410
86. EAST	90410
87. HEIGHT	90410
88. NORTH	90412
89. EAST	90412
90. HEIGHT	90412
91. NORTH	75408
92. EAST	75408
93. HEIGHT	75408
94. NORTH	75410
95. EAST	75410
96. HEIGHT	75410
97. NORTH	75412
98. EAST	75412
99. HEIGHT	75412
100. NORTH	60408
101. EAST	60408
102. HEIGHT	60408
103. NORTH	60410
104. EAST	60410
105. HEIGHT	60410
106. NORTH	60412
107. EAST	60412
108. HEIGHT	60412
109. NORTH	45408
110. EAST	45408
111. HEIGHT	45408
112. NORTH	45410
113. EAST	45410
114. HEIGHT	45410
115. NORTH	45412
116. EAST	45412
117. HEIGHT	45412
118. NORTH	30408
119. EAST	30408
120. HEIGHT	30408
121. NORTH	30410
122. EAST	30410
123. HEIGHT	30410
124. NORTH	30412
125. EAST	30412
126. HEIGHT	30412
127. NORTH	30214
128. EAST	30214
129. HEIGHT	30214
130. NORTH	30216
131. EAST	30216
132. HEIGHT	30216
133. NORTH	30218
134. EAST	30218
135. HEIGHT	30218
136. NORTH	45214
137. EAST	45214

138.	HEIGHT	45214
139.	NORTH	45216
VARIANCE-COVARIANCE PARAMETER LIST		
140.	EAST	45216
141.	HEIGHT	45216
142.	NORTH	45218
143.	EAST	45218
144.	HEIGHT	45218
145.	NORTH	60214
146.	EAST	60214
147.	HEIGHT	60214
148.	NORTH	60216
149.	EAST	60216
150.	HEIGHT	60216
151.	NORTH	60218
152.	EAST	60218
153.	HEIGHT	60218
154.	NORTH	75214
155.	EAST	75214
156.	HEIGHT	75214
157.	NORTH	75216
158.	EAST	75216
159.	HEIGHT	75216
160.	NORTH	75218
161.	EAST	75218
162.	HEIGHT	75218
163.	NORTH	90214
164.	EAST	90214
165.	HEIGHT	90214
166.	NORTH	90216
167.	EAST	90216
168.	HEIGHT	90216
169.	NORTH	90218
170.	EAST	90218
171.	HEIGHT	90218
172.	NORTH	107216
173.	EAST	107216
174.	HEIGHT	107216
175.	NORTH	107218
176.	EAST	107218
177.	HEIGHT	107218
178.	NORTH	208201
179.	EAST	208201
180.	HEIGHT	208201
181.	NORTH	208203
182.	EAST	208203
183.	HEIGHT	208203
184.	NORTH	208205
185.	EAST	208205
186.	HEIGHT	208205
187.	NORTH	222201
188.	EAST	222201
189.	HEIGHT	222201
190.	NORTH	222203
191.	EAST	222203
192.	HEIGHT	222203
193.	NORTH	222205
194.	EAST	222205
195.	HEIGHT	222205
196.	NORTH	237201
197.	EAST	237201
198.	HEIGHT	237201
199.	NORTH	237203
200.	EAST	237203
201.	HEIGHT	237203
202.	NORTH	237205
203.	EAST	237205
204.	HEIGHT	237205
205.	NORTH	252201
206.	EAST	252201
207.	HEIGHT	252201
208.	NORTH	252203
209.	EAST	252203

210.	HEIGHT	252203
211.	NORTH	252205
212.	EAST	252205
VARIANCE-COVARIANCE PARAMETER LIST		
213.	HEIGHT	252205
214.	NORTH	288201
215.	EAST	288201
216.	HEIGHT	288201
217.	NORTH	288203
218.	EAST	288203
219.	HEIGHT	288203
220.	NORTH	288205
221.	EAST	288205
222.	HEIGHT	288205
223.	NORTH	303201
224.	EAST	303201
225.	HEIGHT	303201
226.	NORTH	303203
227.	EAST	303203
228.	HEIGHT	303203
229.	NORTH	303205
230.	EAST	303205
231.	HEIGHT	303205
232.	NORTH	353307
233.	EAST	353307
234.	HEIGHT	353307
235.	NORTH	353309
236.	EAST	353309
237.	HEIGHT	353309
238.	NORTH	353311
239.	EAST	353311
240.	HEIGHT	353311
241.	NORTH	23307
242.	EAST	23307
243.	HEIGHT	23307
244.	NORTH	23309
245.	EAST	23309
246.	HEIGHT	23309
247.	NORTH	23311
248.	EAST	23311
249.	HEIGHT	23311
250.	NORTH	37307
251.	EAST	37307
252.	HEIGHT	37307
253.	NORTH	37309
254.	EAST	37309
255.	HEIGHT	37309
256.	NORTH	37311
257.	EAST	37311
258.	HEIGHT	37311
259.	NORTH	51307
260.	EAST	51307
261.	HEIGHT	51307
262.	NORTH	51309
263.	EAST	51309
264.	HEIGHT	51309
265.	NORTH	51311
266.	EAST	51311
267.	HEIGHT	51311
268.	NORTH	65307
269.	EAST	65307
270.	HEIGHT	65307
271.	NORTH	65309
272.	EAST	65309
273.	HEIGHT	65309
274.	NORTH	65311
275.	EAST	65311
276.	HEIGHT	65311
277.	NORTH	81307
278.	EAST	81307
279.	HEIGHT	81307
280.	NORTH	81309
281.	EAST	81309

282. HEIGHT	81309
283. NORTH	81311
284. EAST	81311
285. HEIGHT	81311













A00000000000000000000000000000000 -- 261.  
A00000000000000000000000000000000 -- 262.  
A20000000000000000000000000000000 -- 263.  
A00000000000000000000000000000000 -- 264.  
A00000000000000000000000000000000 -- 265.  
A20000000000000000000000000000000 -- 266.  
A00000000000000000000000000000000 -- 267.  
A00000000000000000000000000000000 -- 268.  
A20000000000000000000000000000000 -- 269.  
A00000000000000000000000000000000 -- 270.

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A000000000000000 -- 271.
A200000000000000 -- 272.
A000000000000000 -- 273.
A000000000000000 -- 274.
A200000000000000 -- 275.
A000000000000000 -- 276.
A000000000000000 -- 277.
A200000000000000 -- 278.
A000000000000000 -- 279.
A000000000000000 -- 280.
A200000000000000 -- 281.
A000000000000000 -- 282.
A000000000000000 -- 283.
A200000000000000 -- 284.
A000000000000000 -- 285.

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+++++
3. APRIORI FRAME ALIGNMENT
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+++++
3.1 USER INPUT ALIGNMENT STATIONS
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FRAME : GLOBAL (OR REFERENCE SET)
ALIGNMENT STATIONS : CARTESIAN COORDINATES - EARTH CENTRE ORIGIN (METRES)

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SITE	X(M)	Y(M)	Z(M)
7614_RM1	-2112067.5309	-3705378.8250	4726776.4168
7614_RM2	-2112090.9511	-3705308.6063	4726819.3297
BREWSTER_B	-2112012.3843	-3705347.4334	4726826.3278
BREWSTER_C	-2112117.6421	-3705330.5374	4726790.8235

```

ALIGN FRAME: VECTOR 7614_RM1 TO 7614_RM2 IS (-55.1195 65.4331 -1.0195) ENU METRES
INPUT FRAME: VECTOR 7614_RM1 TO 7614_RM2 IS (-55.1197 65.4334 -1.0212) ENU METRES

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ALIGN FRAME: AZIMUTH 7614_RM1 TO 7614_RM2 IS 130.1101 DEGREES
INPUT FRAME: AZIMUTH 7614_RM1 TO 7614_RM2 IS 130.1101 DEGREES

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ALIGN FRAME: CENTROID IS ( -2112072.1271 -3705341.3505 4726803.2244) ENU METRES
INPUT FRAME: CENTROID IS ( -4.5958 37.4751 26.8070) ENU METRES

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SOLUTION VARIANCE FACTOR : 1.0000
NUMBER OF PARAMETERS : 285
NUMBER OF STATIONS : 109
NUMBER OF STATION PARA : 327
DEGREES OF FREEDOM : 0
NUMBER OF AUXILLARY PARA : 0
VCV REFERENCE SYSTEM : LOCAL
CRD REFERENCE SYSTEM : GEOCENTRIC

```

GEODETTIC COORDINATES (DMS,DMS,METRES)

SITE	LONGITUDE	LATITUDE	HEIGHT	SEAST	SNORTH	SUP	TARGET	SEQUENCE
7614_RM1	-119 40 59.3719 48	7 51.1039	236.4463 +/-	0.0001	0.0001	0.0001		
7614_RM2	-119 41 2.0376 48	7 53.2223	235.4256 +/-	0.0001	0.0001	0.0002		
BREWSTER_C	-119 41 2.6338 48	7 51.8283	235.7370 +/-	0.0001	0.0002	0.0002		
BREWSTER_B	-119 40 57.8067 48	7 53.4983	237.1836 +/-	0.0002	0.0002	0.0002		
BREWSTER_A	-119 40 57.2899 48	7 53.5134	237.0286 +/-	0.0002	0.0002	0.0002		
BREW_GPS	-119 40 57.4854 48	7 53.4844	238.6057 +/-	0.0005	0.0003	0.0002		
108502	-119 40 59.6856 48	7 52.2972	249.9523 +/-	0.0006	0.0005	0.0009	502	108
108504	-119 40 59.8283 48	7 52.4542	249.1871 +/-	0.0006	0.0005	0.0009	504	108
108506	-119 40 59.9154 48	7 52.5212	249.8863 +/-	0.0006	0.0005	0.0009	506	108
92502	-119 40 59.6829 48	7 52.2987	250.4760 +/-	0.0006	0.0005	0.0009	502	92
92504	-119 40 59.8193 48	7 52.4593	249.9851 +/-	0.0006	0.0005	0.0009	504	92
92506	-119 40 59.9133 48	7 52.5225	250.6542 +/-	0.0006	0.0005	0.0009	506	92
77502	-119 40 59.6853 48	7 52.2974	250.9789 +/-	0.0006	0.0005	0.0009	502	77
77504	-119 40 59.8184 48	7 52.4598	250.7846 +/-	0.0006	0.0005	0.0009	504	77
77506	-119 40 59.9184 48	7 52.5195	251.3784 +/-	0.0006	0.0005	0.0009	506	77
63502	-119 40 59.6920 48	7 52.2935	251.4354 +/-	0.0006	0.0005	0.0009	502	63

SITE		LONGITUDE		LATITUDE		HEIGHT		SEAST		SNORTH		SUP	TARGET SEQUENCE
63504	-119	40 59.8247	48	7 52.4562		251.5413 +/-		0.0006		0.0005		0.0009	504 63
63506	-119	40 59.9298	48	7 52.5130		252.0247 +/-		0.0006		0.0005		0.0009	506 63
48502	-119	40 59.7033	48	7 52.2870		251.8482 +/-		0.0006		0.0006		0.0009	502 48
48504	-119	40 59.8385	48	7 52.4483		252.2609 +/-		0.0006		0.0005		0.0009	504 48
48506	-119	40 59.9476	48	7 52.5028		252.5959 +/-		0.0006		0.0005		0.0009	506 48
27502	-119	40 59.7244	48	7 52.2749		252.2572 +/-		0.0006		0.0006		0.0009	502 27
27504	-119	40 59.8676	48	7 52.4315		253.0399 +/-		0.0006		0.0005		0.0009	504 27
27506	-119	40 59.9795	48	7 52.4844		253.1371 +/-		0.0006		0.0005		0.0009	506 27
107408	-119	40 59.7029	48	7 52.5204		249.9720 +/-		0.0006		0.0005		0.0009	408 107
107410	-119	40 59.8695	48	7 52.3743		249.2171 +/-		0.0006		0.0005		0.0009	410 107
107412	-119	40 59.9306	48	7 52.2954		249.9166 +/-		0.0006		0.0005		0.0009	412 107
90408	-119	40 59.7057	48	7 52.5214		250.5471 +/-		0.0006		0.0005		0.0009	408 90
90410	-119	40 59.8800	48	7 52.3780		250.0964 +/-		0.0006		0.0005		0.0009	410 90
90412	-119	40 59.9325	48	7 52.2960		250.7574 +/-		0.0006		0.0005		0.0009	412 90
75408	-119	40 59.7022	48	7 52.5201		251.0489 +/-		0.0006		0.0005		0.0009	408 75
75410	-119	40 59.8799	48	7 52.3780		250.8993 +/-		0.0006		0.0005		0.0009	410 75
75412	-119	40 59.9254	48	7 52.2935		251.4794 +/-		0.0006		0.0005		0.0009	412 75
60408	-119	40 59.6932	48	7 52.5169		251.5164 +/-		0.0006		0.0005		0.0009	408 60
60410	-119	40 59.8708	48	7 52.3748		251.6797 +/-		0.0006		0.0005		0.0009	410 60
60412	-119	40 59.9105	48	7 52.2882		252.1386 +/-		0.0006		0.0005		0.0009	412 60
45408	-119	40 59.6793	48	7 52.5120		251.9115 +/-		0.0006		0.0005		0.0009	408 45
45410	-119	40 59.8534	48	7 52.3686		252.3754 +/-		0.0006		0.0005		0.0009	410 45
45412	-119	40 59.8888	48	7 52.2805		252.6824 +/-		0.0006		0.0005		0.0009	412 45
30408	-119	40 59.6616	48	7 52.5057		252.2099 +/-		0.0006		0.0005		0.0009	408 30
30410	-119	40 59.8289	48	7 52.3599		252.9433 +/-		0.0006		0.0005		0.0009	410 30
30412	-119	40 59.8618	48	7 52.2709		253.0781 +/-		0.0006		0.0005		0.0009	412 30
30214	-119	40 59.9996	48	7 52.4619		252.2106 +/-		0.0005		0.0006		0.0008	214 30
30216	-119	40 59.7374	48	7 52.4071		252.9427 +/-		0.0005		0.0006		0.0007	216 30
30218	-119	40 59.6014	48	7 52.4171		253.0780 +/-		0.0005		0.0006		0.0007	218 30
45214	-119	41 0.0023	48	7 52.4486		251.9125 +/-		0.0005		0.0006		0.0008	214 45
45216	-119	40 59.7411	48	7 52.3887		252.3756 +/-		0.0005		0.0006		0.0007	216 45
45218	-119	40 59.6056	48	7 52.3968		252.6835 +/-		0.0005		0.0006		0.0007	218 45
60214	-119	41 0.0044	48	7 52.4382		251.5162 +/-		0.0005		0.0006		0.0008	214 60
60216	-119	40 59.7438	48	7 52.3757		251.6794 +/-		0.0005		0.0006		0.0007	216 60
60218	-119	40 59.6089	48	7 52.3806		252.1388 +/-		0.0005		0.0006		0.0007	218 60
75214	-119	41 0.0058	48	7 52.4315		251.0511 +/-		0.0005		0.0006		0.0008	214 75
75216	-119	40 59.7452	48	7 52.3688		250.9024 +/-		0.0005		0.0006		0.0007	216 75
75218	-119	40 59.6112	48	7 52.3694		251.4825 +/-		0.0005		0.0006		0.0007	218 75
90214	-119	41 0.0064	48	7 52.4288		250.5472 +/-		0.0005		0.0006		0.0008	214 90
90216	-119	40 59.7452	48	7 52.3687		250.0963 +/-		0.0005		0.0006		0.0007	216 90
90218	-119	40 59.6123	48	7 52.3640		250.7580 +/-		0.0005		0.0006		0.0007	218 90
107216	-119	40 59.7439	48	7 52.3752		249.3166 +/-		0.0005		0.0006		0.0007	216 107
107218	-119	40 59.6122	48	7 52.3648		250.0144 +/-		0.0005		0.0006		0.0007	218 107
208201	-119	40 59.5530	48	7 52.4019		251.5621 +/-		0.0005		0.0006		0.0007	201 208
208203	-119	40 59.5509	48	7 52.4042		250.9261 +/-		0.0005		0.0006		0.0007	203 208
208205	-119	40 59.5487	48	7 52.4064		250.2527 +/-		0.0005		0.0006		0.0007	205 208
222201	-119	40 59.5616	48	7 52.3607		251.5625 +/-		0.0005		0.0006		0.0007	201 222
222203	-119	40 59.5587	48	7 52.3626		250.9264 +/-		0.0005		0.0006		0.0007	203 222
222205	-119	40 59.5558	48	7 52.3644		250.2528 +/-		0.0005		0.0006		0.0007	205 222
237201	-119	40 59.5871	48	7 52.3196		251.5625 +/-		0.0005		0.0006		0.0007	201 237
237203	-119	40 59.5836	48	7 52.3209		250.9265 +/-		0.0005		0.0006		0.0007	203 237
237205	-119	40 59.5801	48	7 52.3222		250.2529 +/-		0.0005		0.0006		0.0007	205 237
252201	-119	40 59.6276	48	7 52.2842		251.5625 +/-		0.0005		0.0006		0.0007	201 252
252203	-119	40 59.6237	48	7 52.2849		250.9266 +/-		0.0005		0.0006		0.0007	203 252
252205	-119	40 59.6198	48	7 52.2855		250.2523 +/-		0.0005		0.0006		0.0007	205 252
288201	-119	40 59.7679	48	7 52.2364		251.5643 +/-		0.0005		0.0006		0.0007	201 288
288203	-119	40 59.7641	48	7 52.2353		250.9279 +/-		0.0005		0.0006		0.0007	203 288
288205	-119	40 59.7605	48	7 52.2343		250.2506 +/-		0.0005		0.0006		0.0007	205 288
303201	-119	40 59.8344	48	7 52.2352		251.5645 +/-		0.0005		0.0006		0.0007	201 303
303203	-119	40 59.8312	48	7 52.2336		250.9282 +/-		0.0005		0.0006		0.0007	203 303
303205	-119	40 59.8280	48	7 52.2319		250.2504 +/-		0.0005		0.0006		0.0007	205 303
353307	-119	40 59.8344	48	7 52.2352		251.5627 +/-		0.0006		0.0006		0.0010	307 353
353309	-119	40 59.8312	48	7 52.2336		250.9266 +/-		0.0006		0.0006		0.0010	309 353
353311	-119	40 59.8280	48	7 52.2319		250.2536 +/-		0.0006		0.0006		0.0010	311 353
23307	-119	41 0.0487	48	7 52.3493		251.5627 +/-		0.0006		0.0006		0.0009	307 23
23309	-119	41 0.0496	48	7 52.3467		250.9269 +/-		0.0006		0.0006		0.0009	309 23
23311	-119	41 0.0505	48	7 52.3440		250.2533 +/-		0.0006		0.0006		0.0009	311 23
37307	-119	41 0.0620	48	7 52.3930		251.5632 +/-		0.0006		0.0006		0.0009	307 37
37309	-119	41 0.0638	48	7 52.3905		250.9268 +/-		0.0006		0.0006		0.0009	309 37
37311	-119	41 0.0657	48	7 52.3881		250.2533 +/-		0.0006		0.0006		0.0009	311 37
51307	-119	41 0.0587	48	7 52.4344		251.5631 +/-		0.0006		0.0006		0.0009	307 51
51309	-119	41 0.0614	48	7 52.4324		250.9268 +/-		0.0006		0.0006		0.0009	309 51

51311	-119	41	0.0641	48	7	52.4304	250.2535 +/-	0.0006	0.0006	0.0009	311	51
65307	-119	41	0.0406	48	7	52.4742	251.5634 +/-	0.0006	0.0006	0.0010	307	65
SITE		LONGITUDE		LATITUDE		HEIGHT		SEAST	SNORTH	SUP	TARGET	SEQUENCE
65309	-119	41	0.0440	48	7	52.4727	250.9271 +/-	0.0006	0.0006	0.0010	309	65
65311	-119	41	0.0473	48	7	52.4711	250.2535 +/-	0.0006	0.0006	0.0010	311	65
81307	-119	41	0.0086	48	7	52.5099	251.5629 +/-	0.0006	0.0006	0.0010	307	81
81309	-119	41	0.0123	48	7	52.5089	250.9266 +/-	0.0006	0.0006	0.0010	309	81
81311	-119	41	0.0161	48	7	52.5080	250.2535 +/-	0.0006	0.0006	0.0010	311	81

LOCAL COORDINATES - REFERENCE MARK ORIGIN (METRES)

SITE	EAST	NORTH	UP	SEAST	SNORTH	SUP	TARGET	SEQUENCE
7614_RM1	0.0000	0.0000	0.0000 +/-	0.0001	0.0001	0.0001		
7614_RM2	-55.1197	65.4334	-1.0212 +/-	0.0001	0.0001	0.0002		
BREWSTER_C	-67.4475	22.3761	-0.7097 +/-	0.0001	0.0002	0.0002		
BREWSTER_B	32.3651	73.9574	0.7368 +/-	0.0002	0.0002	0.0002		
BREWSTER_A	43.0501	74.4256	0.5817 +/-	0.0002	0.0002	0.0002		
BREW_GPS	39.0081	73.5274	2.1589 +/-	0.0005	0.0003	0.0002		
108502	-6.4870	36.8575	13.5058 +/-	0.0006	0.0005	0.0009	502	108
108504	-9.4364	41.7067	12.7407 +/-	0.0006	0.0005	0.0009	504	108
108506	-11.2389	43.7786	13.4399 +/-	0.0006	0.0005	0.0009	506	108
92502	-6.4310	36.9047	14.0296 +/-	0.0006	0.0005	0.0009	502	92
92504	-9.2507	41.8653	13.5387 +/-	0.0006	0.0005	0.0009	504	92
92506	-11.1952	43.8161	14.2077 +/-	0.0006	0.0005	0.0009	506	92
77502	-6.4800	36.8636	14.5325 +/-	0.0006	0.0005	0.0009	502	77
77504	-9.2320	41.8823	14.3382 +/-	0.0006	0.0005	0.0009	504	77
77506	-11.3008	43.7259	14.9320 +/-	0.0006	0.0005	0.0009	506	77
63502	-6.6191	36.7442	14.9890 +/-	0.0006	0.0005	0.0009	502	63
63504	-9.3625	41.7698	15.0949 +/-	0.0006	0.0005	0.0009	504	63
63506	-11.5357	43.5247	15.5782 +/-	0.0006	0.0005	0.0009	506	63
48502	-6.8523	36.5443	15.4018 +/-	0.0006	0.0006	0.0009	502	48
48504	-9.6483	41.5251	15.8144 +/-	0.0006	0.0005	0.0009	504	48
48506	-11.9032	43.2092	16.1494 +/-	0.0006	0.0005	0.0009	506	48
27502	-7.2883	36.1700	15.8108 +/-	0.0006	0.0006	0.0009	502	27
27504	-10.2503	41.0078	16.5935 +/-	0.0006	0.0005	0.0009	504	27
27506	-12.5646	42.6405	16.6906 +/-	0.0006	0.0005	0.0009	506	27
107408	-6.8442	43.7526	13.5255 +/-	0.0006	0.0005	0.0009	408	107
107410	-10.2888	39.2400	12.7707 +/-	0.0006	0.0005	0.0009	410	107
107412	-11.5532	36.8017	13.4702 +/-	0.0006	0.0005	0.0009	412	107
90408	-6.9030	43.7839	14.1006 +/-	0.0006	0.0005	0.0009	408	90
90410	-10.5072	39.3556	13.6500 +/-	0.0006	0.0005	0.0009	410	90
90412	-11.5921	36.8218	14.3109 +/-	0.0006	0.0005	0.0009	412	90
75408	-6.8298	43.7448	14.6024 +/-	0.0006	0.0005	0.0009	408	75
75410	-10.5034	39.3541	14.4528 +/-	0.0006	0.0005	0.0009	410	75
75412	-11.4450	36.7440	15.0330 +/-	0.0006	0.0005	0.0009	412	75
60408	-6.6433	43.6459	15.0699 +/-	0.0006	0.0005	0.0009	408	60
60410	-10.3153	39.2541	15.2333 +/-	0.0006	0.0005	0.0009	410	60
60412	-11.1360	36.5797	15.6921 +/-	0.0006	0.0005	0.0009	412	60
45408	-6.3572	43.4940	15.4650 +/-	0.0006	0.0005	0.0009	408	45
45410	-9.9559	39.0637	15.9289 +/-	0.0006	0.0005	0.0009	410	45
45412	-10.6884	36.3424	16.2360 +/-	0.0006	0.0005	0.0009	412	45
30408	-5.9903	43.2981	15.7634 +/-	0.0006	0.0005	0.0009	408	30
30410	-9.4492	38.7945	16.4969 +/-	0.0006	0.0005	0.0009	410	30
30412	-10.1297	36.0476	16.6317 +/-	0.0006	0.0005	0.0009	412	30
30214	-12.9787	41.9468	15.7641 +/-	0.0005	0.0006	0.0008	214	30
30216	-7.5579	40.2530	16.4963 +/-	0.0005	0.0006	0.0007	216	30
30218	-4.7453	40.5612	16.6316 +/-	0.0005	0.0006	0.0007	218	30
45214	-13.0359	41.5348	15.4660 +/-	0.0005	0.0006	0.0008	214	45
45216	-7.6350	39.6850	15.9291 +/-	0.0005	0.0006	0.0007	216	45
45218	-4.8324	39.9360	16.2371 +/-	0.0005	0.0006	0.0007	218	45
60214	-13.0792	41.2145	15.0698 +/-	0.0005	0.0006	0.0008	214	60
60216	-7.6898	39.2819	15.2330 +/-	0.0005	0.0006	0.0007	216	60
60218	-4.9015	39.4337	15.6924 +/-	0.0005	0.0006	0.0007	218	60
75214	-13.1078	41.0057	14.6046 +/-	0.0005	0.0006	0.0008	214	75
75216	-7.7190	39.0710	14.4560 +/-	0.0005	0.0006	0.0007	216	75
75218	-4.9490	39.0879	15.0361 +/-	0.0005	0.0006	0.0007	218	75
90214	-13.1194	40.9233	14.1007 +/-	0.0005	0.0006	0.0008	214	90
90216	-7.7194	39.0668	13.6499 +/-	0.0005	0.0006	0.0007	216	90
90218	-4.9717	38.9223	14.3116 +/-	0.0005	0.0006	0.0007	218	90
107216	-7.6916	39.2692	12.8702 +/-	0.0005	0.0006	0.0007	216	107
107218	-4.9682	38.9479	13.5679 +/-	0.0005	0.0006	0.0007	218	107
208201	-3.7454	40.0929	15.1157 +/-	0.0005	0.0006	0.0007	201	208
208203	-3.7008	40.1633	14.4797 +/-	0.0005	0.0006	0.0007	203	208

SITE	LONGITUDE	LATITUDE	HEIGHT	SEAST	SNORTH	SUP	TARGET	SEQUENCE
208205	-3.6560	40.2327	13.8063	+/-	0.0005	0.0006	0.0007	205 208
222201	-3.9235	38.8207	15.1161	+/-	0.0005	0.0006	0.0007	201 222
222203	-3.8634	38.8784	14.4800	+/-	0.0005	0.0006	0.0007	203 222
222205	-3.8035	38.9347	13.8064	+/-	0.0005	0.0006	0.0007	205 222
237201	-4.4498	37.5506	15.1161	+/-	0.0005	0.0006	0.0007	201 237
237203	-4.3768	37.5907	14.4800	+/-	0.0005	0.0006	0.0007	203 237
237205	-4.3045	37.6294	13.8065	+/-	0.0005	0.0006	0.0007	205 237
252201	-5.2869	36.4582	15.1161	+/-	0.0005	0.0006	0.0007	201 252
252203	-5.2057	36.4779	14.4802	+/-	0.0005	0.0006	0.0007	203 252
252205	-5.1267	36.4966	13.8059	+/-	0.0005	0.0006	0.0007	205 252
288201	-8.1875	34.9793	15.1179	+/-	0.0005	0.0006	0.0007	201 288
288203	-8.1104	34.9478	14.4815	+/-	0.0005	0.0006	0.0007	203 288
288205	-8.0349	34.9160	13.8042	+/-	0.0005	0.0006	0.0007	205 288
303201	-9.5629	34.9433	15.1181	+/-	0.0005	0.0006	0.0007	201 303
303203	-9.4966	34.8930	14.4818	+/-	0.0005	0.0006	0.0007	203 303
303205	-9.4314	34.8424	13.8040	+/-	0.0005	0.0006	0.0007	205 303
353307	-9.5634	34.9439	15.1163	+/-	0.0006	0.0006	0.0010	307 353
353309	-9.4971	34.8935	14.4802	+/-	0.0006	0.0006	0.0010	309 353
353311	-9.4318	34.8429	13.8072	+/-	0.0006	0.0006	0.0010	311 353
23307	-13.9945	38.4678	15.1163	+/-	0.0006	0.0006	0.0009	307 23
23309	-14.0125	38.3861	14.4805	+/-	0.0006	0.0006	0.0009	309 23
23311	-14.0309	38.3037	13.8069	+/-	0.0006	0.0006	0.0009	311 23
37307	-14.2689	39.8161	15.1167	+/-	0.0006	0.0006	0.0009	307 37
37309	-14.3072	39.7416	14.4804	+/-	0.0006	0.0006	0.0009	309 37
37311	-14.3460	39.6670	13.8069	+/-	0.0006	0.0006	0.0009	311 37
51307	-14.2022	41.0977	15.1166	+/-	0.0006	0.0006	0.0009	307 51
51309	-14.2573	41.0347	14.4804	+/-	0.0006	0.0006	0.0009	309 51
51311	-14.3128	40.9718	13.8071	+/-	0.0006	0.0006	0.0009	311 51
65307	-13.8275	42.3257	15.1169	+/-	0.0006	0.0006	0.0010	307 65
65309	-13.8964	42.2783	14.4807	+/-	0.0006	0.0006	0.0010	309 65
65311	-13.9651	42.2307	13.8070	+/-	0.0006	0.0006	0.0010	311 65
81307	-13.1644	43.4282	15.1164	+/-	0.0006	0.0006	0.0010	307 81
81309	-13.2428	43.3989	14.4802	+/-	0.0006	0.0006	0.0010	309 81
81311	-13.3211	43.3694	13.8070	+/-	0.0006	0.0006	0.0010	311 81

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4. LEAST SQUARES ESTIMATION  
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LEAST SQUARES SOLUTION

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# OF TARGETS           :           15
# OF IVP ESTIMATES     :              3
# OF COORDINATE-OBSERVATIONS :         285
# OF UNKNOWNNS        :           129
# OF CONDITIONS       :           226
# OF CONSTRAINTS      :              39
# OF ADD. CONSTRAINTS :              58
# OF CONSTRAINTS TOTAL :              97
DEGREES OF FREEDOM    :           479

ITERATION              :              1
ITERATION              :              2

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4.1 PARAMETER ACCURACY (CONDITION NUMBERS)  
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PARAMETER	CONDITION	ACCURACY LOSS (DIGITS)
1. ENORMAL	201 1.87e+03	3.3
2. NNORMAL	201 7.55e+03	3.9
3. UNORMAL	201 1.13e+00	0.1
4. ECENTRE	201 6.70e+02	2.8
5. NCENTRE	201 1.92e+03	3.3
6. UCENTRE	201 4.25e+03	3.6
7. RADIUS	201 2.87e+02	2.5
8. ENORMAL	203 2.20e+03	3.3
9. NNORMAL	203 3.58e+03	3.6
10. UNORMAL	203 1.13e+00	0.1

11. ECENTRE	203	2.38e+02	2.4
12. NCENTRE	203	7.12e+02	2.9
13. UCENTRE	203	6.06e+02	2.8
14. RADIUS	203	2.86e+02	2.5
PARAMETER	CONDITION	ACCURACY LOSS	(DIGITS)
15. ENORMAL	205	2.20e+03	3.3
16. NNORMAL	205	3.58e+03	3.6
17. UNORMAL	205	1.13e+00	0.1
18. ECENTRE	205	2.38e+02	2.4
19. NCENTRE	205	7.11e+02	2.9
20. UCENTRE	205	6.04e+02	2.8
21. RADIUS	205	2.85e+02	2.5
22. ENORMAL	307	2.19e+03	3.3
23. NNORMAL	307	3.59e+03	3.6
24. UNORMAL	307	1.13e+00	0.1
25. ECENTRE	307	2.38e+02	2.4
26. NCENTRE	307	7.11e+02	2.9
27. UCENTRE	307	6.08e+02	2.8
28. RADIUS	307	2.87e+02	2.5
29. ENORMAL	309	2.19e+03	3.3
30. NNORMAL	309	3.59e+03	3.6
31. UNORMAL	309	1.13e+00	0.1
32. ECENTRE	309	2.39e+02	2.4
33. NCENTRE	309	7.12e+02	2.9
34. UCENTRE	309	6.06e+02	2.8
35. RADIUS	309	2.86e+02	2.5
36. ENORMAL	311	1.10e+03	3.0
37. NNORMAL	311	1.80e+03	3.3
38. UNORMAL	311	1.13e+00	0.1
39. ECENTRE	311	1.20e+02	2.1
40. NCENTRE	311	3.57e+02	2.6
41. UCENTRE	311	6.04e+02	2.8
42. RADIUS	311	2.85e+02	2.5
43. ENORMAL	502	4.13e+07	7.6
44. NNORMAL	502	4.13e+07	7.6
45. UNORMAL	502	1.48e+04	4.2
46. ECENTRE	502	1.53e+04	4.2
47. NCENTRE	502	9.19e+03	4.0
48. UCENTRE	502	7.92e+03	3.9
49. RADIUS	502	1.42e+04	4.2
50. ENORMAL	504	4.13e+07	7.6
51. NNORMAL	504	4.13e+07	7.6
52. UNORMAL	504	1.28e+04	4.1
53. ECENTRE	504	1.74e+01	1.2
54. NCENTRE	504	1.46e+01	1.2
55. UCENTRE	504	4.83e+00	0.7
56. RADIUS	504	1.30e+04	4.1
57. ENORMAL	506	4.13e+07	7.6
58. NNORMAL	506	4.13e+07	7.6
59. UNORMAL	506	6.63e+03	3.8
60. ECENTRE	506	2.47e+01	1.4
61. NCENTRE	506	2.75e+01	1.4
62. UCENTRE	506	2.60e+01	1.4
63. RADIUS	506	1.54e+04	4.2
64. ENORMAL	408	3.00e+07	7.5
65. NNORMAL	408	3.00e+07	7.5
66. UNORMAL	408	1.47e+04	4.2
67. ECENTRE	408	1.37e+04	4.1
68. NCENTRE	408	9.56e+03	4.0
69. UCENTRE	408	7.90e+03	3.9
70. RADIUS	408	2.85e+04	4.5
71. ENORMAL	410	3.00e+07	7.5
72. NNORMAL	410	3.00e+07	7.5
73. UNORMAL	410	1.28e+04	4.1
74. ECENTRE	410	1.93e+01	1.3
75. NCENTRE	410	1.09e+01	1.0
76. UCENTRE	410	4.50e+00	0.7
77. RADIUS	410	2.59e+04	4.4
78. ENORMAL	412	3.00e+07	7.5
79. NNORMAL	412	3.00e+07	7.5
80. UNORMAL	412	6.60e+03	3.8
81. ECENTRE	412	4.38e+01	1.6



PARAMETER	CONDITION	ACCURACY LOSS (DIGITS)
82. NCENTRE	412 8.64e+00	0.9
83. UCENTRE	412 2.49e+01	1.4
84. RADIUS	412 3.08e+04	4.5
85. ENORMAL	214 3.18e+06	6.5
86. NNORMAL	214 3.21e+06	6.5
87. UNORMAL	214 1.39e+04	4.1
88. ECENTRE	214 3.28e+03	3.5
89. NCENTRE	214 1.39e+04	4.1
90. UCENTRE	214 1.38e+04	4.1
91. RADIUS	214 1.42e+04	4.2
92. ENORMAL	216 3.18e+06	6.5
93. NNORMAL	216 3.22e+06	6.5
94. UNORMAL	216 1.88e+04	4.3
95. ECENTRE	216 5.90e+00	0.8
96. NCENTRE	216 2.17e+01	1.3
97. UCENTRE	216 4.46e+00	0.6
98. RADIUS	216 1.30e+04	4.1
99. ENORMAL	218 3.18e+06	6.5
100. NNORMAL	218 3.20e+06	6.5
101. UNORMAL	218 9.62e+03	4.0
102. ECENTRE	218 3.93e+00	0.6
103. NCENTRE	218 5.23e+01	1.7
104. UCENTRE	218 2.14e+01	1.3
105. RADIUS	218 1.54e+04	4.2
106. TSCALAR	IVP_1 7.56e+03	3.9
107. SSCALAR	IVP_1 2.92e+03	3.5
108. EIVP	IVP_1 2.43e+02	2.4
109. NIVP	IVP_1 4.82e+02	2.7
110. UIVP	IVP_1 3.26e+05	5.5
111. EIVP_Q	IVP_1 1.76e+04	4.2
112. NIVP_Q	IVP_1 4.24e+03	3.6
113. UIVP_Q	IVP_1 2.60e+03	3.4
114. TSCALAR	IVP_2 7.56e+03	3.9
115. SSCALAR	IVP_2 2.55e+03	3.4
116. EIVP	IVP_2 2.15e+02	2.3
117. NIVP	IVP_2 5.63e+02	2.8
118. UIVP	IVP_2 3.26e+05	5.5
119. EIVP_Q	IVP_2 1.18e+04	4.1
120. NIVP_Q	IVP_2 7.91e+03	3.9
121. UIVP_Q	IVP_2 2.60e+03	3.4
122. TSCALAR	IVP_3 1.82e+04	4.3
123. SSCALAR	IVP_3 5.78e+03	3.8
124. EIVP	IVP_3 1.37e+02	2.1
125. NIVP	IVP_3 3.95e+02	2.6
126. UIVP	IVP_3 8.31e+03	3.9
127. EIVP_Q	IVP_3 4.86e+03	3.7
128. NIVP_Q	IVP_3 1.19e+04	4.1
129. UIVP_Q	IVP_3 4.45e+03	3.6

OVERALL CONDITION NUMBER : 3.82e+08

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4.2 SOLUTION STATISTICS  
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LEAST SQUARES SOLUTION

# OF TARGETS	:	15
# OF IVP ESTIMATES	:	3
# OF COORDINATE-OBSERVATIONS	:	285
# OF UNKNOWNNS	:	129
# OF CONDITIONS	:	226
# OF CONSTRAINTS	:	39
# OF ADD. CONSTRAINTS	:	58
# OF CONSTRAINTS TOTAL	:	97
DEGREES OF FREEDOM	:	479
ITERATIONS TO COMPLETE	:	2
MAXIMUM RESIDUAL (METRE)	:	0.00224

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VARIANCE (CONDITIONS)      :          0.22535
VARIANCE (CONSTRAINTS)    :          0.00011
VARIANCE (APRIORI)        :          0.00000
VARIANCE FACTOR           :          0.22546
SIGMA                     :          0.47482

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4.3 POST-FIT CIRCLE RESIDUALS
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RESIDUALS TO CIRCLE ARCS IN SPACE (MM)
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SITE	IN-PLANE	OUT-OF-PLANE	TOTAL	TARGET	SEQUENCE
208201	-0.1	0.5	0.5	201	208
222201	0.3	0.2	0.4	201	222
237201	-0.2	0.3	0.4	201	237
252201	0.4	0.4	0.6	201	252
288201	0.6	-1.1	1.3	201	288
303201	0.3	-1.2	1.3	201	303
208203	-0.1	0.4	0.4	203	208
222203	0.0	0.2	0.2	203	222
237203	-0.3	0.2	0.4	203	237
252203	0.6	0.2	0.6	203	252
288203	0.4	-0.9	1.0	203	288
303203	-0.0	-1.0	1.0	203	303
208205	-0.0	-0.7	0.7	205	208
222205	-0.1	-0.8	0.8	205	222
237205	-0.5	-0.8	0.9	205	237
252205	-0.2	-0.1	0.2	205	252
288205	0.2	2.0	2.0	205	288
303205	0.0	2.2	2.2	205	303
353307	-0.3	0.5	0.6	307	353
23307	-0.5	0.7	0.9	307	23
37307	-0.5	0.2	0.6	307	37
51307	-0.2	0.3	0.3	307	51
65307	0.3	-0.1	0.3	307	65
81307	-0.3	0.3	0.4	307	81
353309	-0.4	0.5	0.7	309	353
23309	-0.2	0.4	0.5	309	23
37309	-0.5	0.4	0.7	309	37
51309	-0.2	0.4	0.4	309	51
65309	0.6	-0.0	0.6	309	65
81309	0.0	0.4	0.4	309	81
353311	-0.4	-1.0	1.0	311	353
23311	0.6	-0.5	0.8	311	23
37311	0.0	-0.5	0.5	311	37
51311	0.2	-0.8	0.8	311	51
65311	0.6	-0.8	1.0	311	65
81311	0.1	-0.9	1.0	311	81
108502	0.2	0.1	0.3	502	108
92502	0.0	-0.6	0.6	502	92
77502	-0.2	0.1	0.2	502	77
63502	-0.2	0.1	0.2	502	63
48502	-0.2	0.2	0.3	502	48
27502	0.1	0.2	0.3	502	27
108504	0.2	0.3	0.4	504	108
92504	0.2	-0.4	0.4	504	92
77504	0.0	0.2	0.2	504	77
63504	-0.0	-0.2	0.2	504	63
48504	-0.2	0.2	0.3	504	48
27504	-0.6	-0.2	0.6	504	27
108506	0.2	-0.1	0.2	506	108

92506	-0.1	-0.3	0.3	506	92
77506	0.2	0.0	0.2	506	77
63506	-0.4	0.3	0.5	506	63
48506	-0.4	0.4	0.5	506	48
27506	0.1	-0.4	0.4	506	27

SITE	IN-PLANE	OUT-OF-PLANE	TOTAL	TARGET	SEQUENCE
107408	0.2	-0.3	0.3	408	107
90408	-0.0	-0.4	0.4	408	90
75408	-0.4	-0.2	0.4	408	75
60408	-0.1	-0.2	0.2	408	60
45408	0.0	-0.0	0.0	408	45
30408	0.3	1.1	1.2	408	30
107410	-0.3	0.1	0.3	410	107
90410	0.0	0.2	0.2	410	90
75410	0.1	-0.2	0.2	410	75
60410	0.3	-0.0	0.3	410	60
45410	0.0	-0.3	0.3	410	45
30410	-0.0	0.2	0.2	410	30
107412	-0.3	-0.2	0.4	412	107
90412	-0.1	0.2	0.3	412	90
75412	0.1	0.0	0.1	412	75
60412	0.2	0.4	0.5	412	60
45412	0.4	0.4	0.5	412	45
30412	0.9	-0.9	1.3	412	30
30214	-0.1	-0.5	0.5	214	30
45214	0.3	0.5	0.5	214	45
60214	-0.6	-0.1	0.6	214	60
75214	-0.1	-0.1	0.1	214	75
90214	0.4	0.2	0.5	214	90
30216	-0.7	0.8	1.0	216	30
45216	-0.2	0.2	0.3	216	45
60216	-0.1	-0.2	0.2	216	60
75216	0.4	0.1	0.4	216	75
90216	0.1	-0.3	0.3	216	90
107216	0.1	-0.6	0.6	216	107
30218	0.4	-1.7	1.7	218	30
45218	0.5	-0.0	0.5	218	45
60218	0.0	0.4	0.4	218	60
75218	0.1	0.5	0.5	218	75
90218	-0.2	0.5	0.6	218	90
107218	-0.5	0.3	0.6	218	107
MEAN	0.0	-0.0	0.5	#89	
RMS	0.3	0.6	0.7	#89	

+++++  
4.4 RESIDUALS  
+++++

RESIDUALS FROM LSE (MM)

SITE	EAST	NORTH	HEIGHT	TARGET	SEQUENCE
7614_RM1	0.0	0.0	0.0		
7614_RM2	-0.0	0.0	-0.1		
BREWSTER_C	-0.0	-0.1	-0.0		
BREWSTER_B	-0.0	-0.0	0.1		
BREWSTER_A	0.0	0.0	0.0		
BREW_GPS	0.0	0.0	0.0		
108502	-0.1	-0.2	0.0	502	108
108504	0.1	-0.3	0.3	504	108
108506	-0.2	-0.1	-0.0	506	108
92502	-0.4	0.5	0.0	502	92
92504	-0.3	0.2	0.2	504	92
92506	-0.1	0.3	-0.1	506	92
77502	0.2	0.1	-0.1	502	77
77504	0.1	-0.2	-0.2	504	77
77506	-0.2	-0.2	0.1	506	77
63502	0.1	0.0	0.1	502	63

63504 SITE	-0.2 EAST	0.2 NORTH	0.1 HEIGHT	504 TARGET	63 SEQUENCE
63506	0.4	-0.1	0.2	506	63
48502	0.2	-0.1	0.2	502	48
48504	0.3	-0.1	0.1	504	48
48506	0.4	-0.2	0.4	506	48
27502	0.1	-0.3	-0.0	502	27
27504	0.1	0.3	0.5	504	27
27506	-0.2	0.2	-0.1	506	27
107408	0.0	-0.3	0.1	408	107
107410	-0.1	0.2	-0.3	410	107
107412	-0.4	0.0	0.1	412	107
90408	-0.2	-0.4	-0.1	408	90
90410	0.2	0.2	-0.2	410	90
90412	0.0	0.3	0.3	412	90
75408	-0.4	-0.0	0.3	408	75
75410	-0.0	-0.2	0.1	410	75
75412	0.0	0.0	-0.2	412	75
60408	-0.1	-0.1	0.1	408	60
60410	0.2	-0.2	-0.0	410	60
60412	0.2	0.4	-0.3	412	60
45408	-0.0	-0.0	-0.0	408	45
45410	-0.1	-0.3	-0.0	410	45
45412	0.3	0.2	-0.3	412	45
30408	0.6	0.9	-0.3	408	30
30410	0.1	0.2	-0.0	410	30
30412	-0.1	-1.0	-0.9	412	30
30214	-0.4	0.2	0.1	214	30
30216	0.7	-0.5	0.5	216	30
30218	-1.7	0.4	-0.3	218	30
45214	0.5	0.3	-0.1	214	45
45216	0.2	-0.3	0.1	216	45
45218	-0.0	0.2	-0.5	218	45
60214	-0.2	-0.4	0.5	214	60
60216	-0.2	-0.0	0.0	216	60
60218	0.4	-0.0	0.0	218	60
75214	-0.1	-0.1	-0.1	214	75
75216	0.1	0.3	-0.1	216	75
75218	0.5	-0.0	-0.0	218	75
90214	0.2	0.4	-0.5	214	90
90216	-0.2	0.1	0.1	216	90
90218	0.5	-0.3	0.2	218	90
107216	-0.6	0.2	-0.0	216	107
107218	0.2	-0.5	-0.0	218	107
208201	0.1	0.1	0.5	201	208
208203	0.1	0.1	0.4	203	208
208205	0.0	-0.2	-0.7	205	208
222201	-0.3	0.2	0.2	201	222
222203	-0.0	0.0	0.2	203	222
222205	0.1	-0.1	-0.8	205	222
237201	0.1	-0.2	0.3	201	237
237203	0.2	-0.2	0.2	203	237
237205	0.4	-0.2	-0.8	205	237
252201	-0.4	0.2	0.4	201	252
252203	-0.6	0.3	0.2	203	252
252205	0.5	0.2	-0.1	205	252
288201	-0.2	0.5	-1.1	201	288
288203	-0.1	0.4	-0.9	203	288
288205	0.1	0.2	2.0	205	288
303201	0.1	0.3	-1.2	201	303
303203	0.1	-0.0	-1.0	203	303
303205	-0.2	0.0	2.2	205	303
353307	-0.5	-0.2	0.5	307	353
353309	-0.4	-0.4	0.5	309	353
353311	0.7	-0.5	-1.0	311	353
23307	-0.4	-0.3	0.7	307	23
23309	-0.2	-0.3	0.4	309	23
23311	0.4	0.5	-0.5	311	23
37307	-0.5	-0.3	0.2	307	37
37309	-0.5	-0.0	0.4	309	37
37311	-0.0	0.3	-0.5	311	37
51307	-0.2	-0.1	0.3	307	51

51309	-0.2	0.0	0.4	309	51
51311	0.2	0.1	-0.8	311	51
SITE	EAST	NORTH	HEIGHT	TARGET	SEQUENCE
65307	0.3	0.0	-0.1	307	65
65309	0.5	-0.3	-0.0	309	65
65311	0.6	-0.2	-0.8	311	65
81307	-0.2	0.2	0.3	307	81
81309	0.0	-0.1	0.4	309	81
81311	0.1	-0.0	-0.9	311	81
MEAN	0.0	-0.0	-0.0	#95	
RMS	0.3	0.3	0.5	#95	

RESIDUALS FROM LSE TARGETS ONLY (MM)

SITE	EAST	NORTH	HEIGHT	TARGET	SEQUENCE
208201	0.1	0.1	0.5	201	208
222201	-0.3	0.2	0.2	201	222
237201	0.1	-0.2	0.3	201	237
252201	-0.4	0.2	0.4	201	252
288201	-0.2	0.5	-1.1	201	288
303201	0.1	0.3	-1.2	201	303
208203	0.1	0.1	0.4	203	208
222203	-0.0	0.0	0.2	203	222
237203	0.2	-0.2	0.2	203	237
252203	-0.6	0.3	0.2	203	252
288203	-0.1	0.4	-0.9	203	288
303203	0.1	-0.0	-1.0	203	303
208205	0.0	-0.2	-0.7	205	208
222205	0.1	-0.1	-0.8	205	222
237205	0.4	-0.2	-0.8	205	237
252205	0.5	0.2	-0.1	205	252
288205	0.1	0.2	2.0	205	288
303205	-0.2	0.0	2.2	205	303
353307	-0.5	-0.2	0.5	307	353
23307	-0.4	-0.3	0.7	307	23
37307	-0.5	-0.3	0.2	307	37
51307	-0.2	-0.1	0.3	307	51
65307	0.3	0.0	-0.1	307	65
81307	-0.2	0.2	0.3	307	81
353309	-0.4	-0.4	0.5	309	353
23309	-0.2	-0.3	0.4	309	23
37309	-0.5	-0.0	0.4	309	37
51309	-0.2	0.0	0.4	309	51
65309	0.5	-0.3	-0.0	309	65
81309	0.0	-0.1	0.4	309	81
353311	0.7	-0.5	-1.0	311	353
23311	0.4	0.5	-0.5	311	23
37311	-0.0	0.3	-0.5	311	37
51311	0.2	0.1	-0.8	311	51
65311	0.6	-0.2	-0.8	311	65
81311	0.1	-0.0	-0.9	311	81
108502	-0.1	-0.2	0.0	502	108
92502	-0.4	0.5	0.0	502	92
77502	0.2	0.1	-0.1	502	77
63502	0.1	0.0	0.1	502	63
48502	0.2	-0.1	0.2	502	48
27502	0.1	-0.3	-0.0	502	27
108504	0.1	-0.3	0.3	504	108
92504	-0.3	0.2	0.2	504	92
77504	0.1	-0.2	-0.2	504	77
63504	-0.2	0.2	0.1	504	63
48504	0.3	-0.1	0.1	504	48

27504

0.1

0.3

0.5

504

27

SITE	EAST	NORTH	HEIGHT	TARGET	SEQUENCE
108506	-0.2	-0.1	-0.0	506	108
92506	-0.1	0.3	-0.1	506	92
77506	-0.2	-0.2	0.1	506	77
63506	0.4	-0.1	0.2	506	63
48506	0.4	-0.2	0.4	506	48
27506	-0.2	0.2	-0.1	506	27
107408	0.0	-0.3	0.1	408	107
90408	-0.2	-0.4	-0.1	408	90
75408	-0.4	-0.0	0.3	408	75
60408	-0.1	-0.1	0.1	408	60
45408	-0.0	-0.0	-0.0	408	45
30408	0.6	0.9	-0.3	408	30
107410	-0.1	0.2	-0.3	410	107
90410	0.2	0.2	-0.2	410	90
75410	-0.0	-0.2	0.1	410	75
60410	0.2	-0.2	-0.0	410	60
45410	-0.1	-0.3	-0.0	410	45
30410	0.1	0.2	-0.0	410	30
107412	-0.4	0.0	0.1	412	107
90412	0.0	0.3	0.3	412	90
75412	0.0	0.0	-0.2	412	75
60412	0.2	0.4	-0.3	412	60
45412	0.3	0.2	-0.3	412	45
30412	-0.1	-1.0	-0.9	412	30
30214	-0.4	0.2	0.1	214	30
45214	0.5	0.3	-0.1	214	45
60214	-0.2	-0.4	0.5	214	60
75214	-0.1	-0.1	-0.1	214	75
90214	0.2	0.4	-0.5	214	90
30216	0.7	-0.5	0.5	216	30
45216	0.2	-0.3	0.1	216	45
60216	-0.2	-0.0	0.0	216	60
75216	0.1	0.3	-0.1	216	75
90216	-0.2	0.1	0.1	216	90
107216	-0.6	0.2	-0.0	216	107
30218	-1.7	0.4	-0.3	218	30
45218	-0.0	0.2	-0.5	218	45
60218	0.4	-0.0	0.0	218	60
75218	0.5	-0.0	-0.0	218	75
90218	0.5	-0.3	0.2	218	90
107218	0.2	-0.5	-0.0	218	107
MEAN	0.0	0.0	-0.0	#89	
RMS	0.3	0.3	0.5	#89	

RESIDUALS TO CIRCLE ARCS IN SPACE (MM)

SITE	IN-PLANE	OUT-OF-PLANE	TOTAL	TARGET	SEQUENCE
208201	-0.1	0.5	0.5	201	208
222201	0.3	0.2	0.4	201	222
237201	-0.2	0.3	0.4	201	237
252201	0.4	0.4	0.6	201	252
288201	0.6	-1.1	1.3	201	288
303201	0.3	-1.2	1.3	201	303
208203	-0.1	0.4	0.4	203	208
222203	0.0	0.2	0.2	203	222
237203	-0.3	0.2	0.4	203	237
252203	0.6	0.2	0.6	203	252
288203	0.4	-0.9	1.0	203	288
303203	-0.0	-1.0	1.0	203	303





SITE	IN-PLANE	OUT-OF-PLANE	TOTAL	TARGET	SEQUENCE
208205	-0.0	-0.7	0.7	205	208
222205	-0.1	-0.8	0.8	205	222
237205	-0.5	-0.8	0.9	205	237
252205	-0.2	-0.1	0.2	205	252
288205	0.2	2.0	2.0	205	288
303205	0.0	2.2	2.2	205	303
353307	-0.3	0.5	0.6	307	353
23307	-0.5	0.7	0.9	307	23
37307	-0.5	0.2	0.6	307	37
51307	-0.2	0.3	0.3	307	51
65307	0.3	-0.1	0.3	307	65
81307	-0.3	0.3	0.4	307	81
353309	-0.4	0.5	0.7	309	353
23309	-0.2	0.4	0.5	309	23
37309	-0.5	0.4	0.7	309	37
51309	-0.2	0.4	0.4	309	51
65309	0.6	-0.0	0.6	309	65
81309	0.0	0.4	0.4	309	81
353311	-0.4	-1.0	1.0	311	353
23311	0.6	-0.5	0.8	311	23
37311	0.0	-0.5	0.5	311	37
51311	0.2	-0.8	0.8	311	51
65311	0.6	-0.8	1.0	311	65
81311	0.1	-0.9	1.0	311	81
108502	0.2	0.1	0.3	502	108
92502	0.0	-0.6	0.6	502	92
77502	-0.2	0.1	0.2	502	77
63502	-0.2	0.1	0.2	502	63
48502	-0.2	0.2	0.3	502	48
27502	0.1	0.2	0.3	502	27
108504	0.2	0.3	0.4	504	108
92504	0.2	-0.4	0.4	504	92
77504	0.0	0.2	0.2	504	77
63504	-0.0	-0.2	0.2	504	63
48504	-0.2	0.2	0.3	504	48
27504	-0.6	-0.2	0.6	504	27
108506	0.2	-0.1	0.2	506	108
92506	-0.1	-0.3	0.3	506	92
77506	0.2	0.0	0.2	506	77
63506	-0.4	0.3	0.5	506	63
48506	-0.4	0.4	0.5	506	48
27506	0.1	-0.4	0.4	506	27
107408	0.2	-0.3	0.3	408	107
90408	-0.0	-0.4	0.4	408	90
75408	-0.4	-0.2	0.4	408	75
60408	-0.1	-0.2	0.2	408	60
45408	0.0	-0.0	0.0	408	45
30408	0.3	1.1	1.2	408	30
107410	-0.3	0.1	0.3	410	107
90410	0.0	0.2	0.2	410	90
75410	0.1	-0.2	0.2	410	75
60410	0.3	-0.0	0.3	410	60
45410	0.0	-0.3	0.3	410	45
30410	-0.0	0.2	0.2	410	30
107412	-0.3	-0.2	0.4	412	107
90412	-0.1	0.2	0.3	412	90
75412	0.1	0.0	0.1	412	75
60412	0.2	0.4	0.5	412	60
45412	0.4	0.4	0.5	412	45
30412	0.9	-0.9	1.3	412	30

SITE	IN-PLANE	OUT-OF-PLANE	TOTAL	TARGET	SEQUENCE
30214	-0.1	-0.5	0.5	214	30
45214	0.3	0.5	0.5	214	45
60214	-0.6	-0.1	0.6	214	60
75214	-0.1	-0.1	0.1	214	75
90214	0.4	0.2	0.5	214	90
30216	-0.7	0.8	1.0	216	30
45216	-0.2	0.2	0.3	216	45
60216	-0.1	-0.2	0.2	216	60
75216	0.4	0.1	0.4	216	75
90216	0.1	-0.3	0.3	216	90
107216	0.1	-0.6	0.6	216	107
30218	0.4	-1.7	1.7	218	30
45218	0.5	-0.0	0.5	218	45
60218	0.0	0.4	0.4	218	60
75218	0.1	0.5	0.5	218	75
90218	-0.2	0.5	0.6	218	90
107218	-0.5	0.3	0.6	218	107
MEAN	0.0	-0.0	0.5	#89	
RMS	0.3	0.6	0.7	#89	

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4.5 PARAMETER ESTIMATES, APRIORI VALUES AND TOTAL CORRECTIONS  
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	TARGET	ENORMAL	NNORMAL	UNORMAL	ECENTRE	NCENTRE	UCENTRE	RADIUS
ESTIMATE	201	0.0000688	0.0000505	1.0000000	-9.0134	40.1837	15.1166	5.2689
APRIORI	201	0.0000739	0.0000327	1.0000000	-9.0134	40.1837	15.1166	5.2689
DELTA	201	-0.0000051	0.0000178	-0.0000000	0.0000	-0.0000	-0.0000	0.0000
ESTIMATE	203	0.0000688	0.0000504	1.0000000	-9.0134	40.1837	14.4804	5.3127
APRIORI	203	0.0000739	0.0000327	1.0000000	-9.0134	40.1837	14.4805	5.3127
DELTA	203	-0.0000051	0.0000177	-0.0000000	0.0000	-0.0000	-0.0001	0.0000
ESTIMATE	205	0.0000688	0.0000504	1.0000000	-9.0134	40.1837	13.8059	5.3576
APRIORI	205	0.0000739	0.0000326	1.0000000	-9.0134	40.1837	13.8059	5.3576
DELTA	205	-0.0000051	0.0000178	-0.0000000	0.0000	-0.0000	0.0000	-0.0000
ESTIMATE	307	0.0000688	0.0000503	1.0000000	-9.0134	40.1837	15.1166	5.2689
APRIORI	307	0.0000739	0.0000326	1.0000000	-9.0134	40.1837	15.1166	5.2689
DELTA	307	-0.0000051	0.0000177	-0.0000000	0.0000	-0.0000	-0.0000	-0.0000
ESTIMATE	309	0.0000688	0.0000503	1.0000000	-9.0134	40.1837	14.4804	5.3127
APRIORI	309	0.0000740	0.0000325	1.0000000	-9.0134	40.1837	14.4805	5.3127
DELTA	309	-0.0000052	0.0000178	-0.0000000	0.0000	-0.0000	-0.0001	0.0000
ESTIMATE	311	0.0000689	0.0000503	1.0000000	-9.0134	40.1837	13.8059	5.3576
APRIORI	311	0.0000741	0.0000325	1.0000000	-9.0134	40.1837	13.8059	5.3576
DELTA	311	-0.0000052	0.0000178	-0.0000000	0.0000	-0.0000	0.0000	-0.0000
ESTIMATE	502	0.6514614	-0.7586818	0.0001215	-7.9167	35.6298	14.0370	1.9577
APRIORI	502	0.6514649	-0.7586788	0.0001537	-7.9167	35.6298	14.0368	1.9577
DELTA	502	-0.0000035	-0.0000030	-0.0000322	-0.0000	-0.0000	0.0002	-0.0000
ESTIMATE	504	0.6514614	-0.7586818	0.0001215	-11.5648	39.8789	14.0359	3.0898
APRIORI	504	0.6514649	-0.7586788	0.0001537	-11.5647	39.8789	14.0356	3.0898
DELTA	504	-0.0000035	-0.0000030	-0.0000322	-0.0001	-0.0000	0.0003	0.0000
ESTIMATE	506	0.6514614	-0.7586818	0.0001215	-13.3545	41.9622	14.0361	2.8513
APRIORI	506	0.6514649	-0.7586788	0.0001537	-13.3544	41.9622	14.0357	2.8512
DELTA	506	-0.0000035	-0.0000030	-0.0000322	-0.0001	0.0000	0.0004	0.0001
ESTIMATE	408	0.4684666	0.8834812	0.0000511	-5.1745	42.8669	14.0365	1.9577
APRIORI	408	0.4684827	0.8834727	0.0000166	-5.1745	42.8668	14.0367	1.9577
DELTA	408	-0.0000161	0.0000085	0.0000345	-0.0000	0.0001	-0.0002	-0.0000



	TARGET	ENORMAL	NNORMAL	UNORMAL	ECENTRE	NCENTRE	UCENTRE	RADIUS
ESTIMATE	410	0.4684666	0.8834812	0.0000511	-7.7986	37.9196	14.0358	3.0898
APRIORI	410	0.4684826	0.8834727	0.0000166	-7.7986	37.9195	14.0361	3.0898
DELTA	410	-0.0000160	0.0000085	0.0000345	0.0000	0.0001	-0.0003	0.0000
ESTIMATE	412	0.4684666	0.8834812	0.0000510	-9.0848	35.4926	14.0365	2.8513
APRIORI	412	0.4684826	0.8834727	0.0000166	-9.0848	35.4925	14.0369	2.8512
DELTA	412	-0.0000160	0.0000085	0.0000344	0.0000	0.0001	-0.0004	0.0001
ESTIMATE	214	0.9908082	-0.1352742	-0.0002063	-12.8545	42.8624	14.0383	1.9577
APRIORI	214	0.9908071	-0.1352820	-0.0002045	-12.8545	42.8624	14.0383	1.9577
DELTA	214	0.0000011	0.0000078	-0.0000018	0.0000	0.0000	0.0000	-0.0000
ESTIMATE	216	0.9908082	-0.1352742	-0.0002063	-7.3048	42.1044	14.0363	3.0898
APRIORI	216	0.9908071	-0.1352820	-0.0002045	-7.3048	42.1044	14.0363	3.0898
DELTA	216	0.0000011	0.0000078	-0.0000018	-0.0000	0.0000	-0.0000	0.0000
ESTIMATE	218	0.9908082	-0.1352742	-0.0002063	-4.5874	41.7339	14.0371	2.8513
APRIORI	218	0.9908071	-0.1352819	-0.0002045	-4.5874	41.7338	14.0371	2.8512
DELTA	218	0.0000011	0.0000077	-0.0000018	-0.0000	0.0001	0.0000	0.0001

SCALARS		PRIMARY					SECONDARY				
S	T	IVP-NAME	PRIMARY	SECONDARY	EAST	NORTH	UP	EAST	NORTH	UP	
ESTIMATE		IVP_1	201	408	-9.0134	40.1836	14.0367	-7.1278	39.1833	14.0363	-
4.1694	-1.0798										
APRIORI		IVP_1	201	408	-9.0135	40.1837	14.0370	-7.1277	39.1834	14.0366	-
4.1692	-1.0796										
DELTA		IVP_1	201	408	0.0001	-0.0001	-0.0003	-0.0001	-0.0001	-0.0003	-
0.0002	-0.0002										
ESTIMATE		IVP_2	201	502	-9.0134	40.1836	14.0367	-10.6332	38.7933	14.0365	-
4.1698	-1.0798										
APRIORI		IVP_2	201	502	-9.0135	40.1837	14.0366	-10.6333	38.7935	14.0362	-
4.1700	-1.0801										
DELTA		IVP_2	201	502	0.0001	-0.0001	0.0001	0.0001	-0.0002	0.0003	
0.0002	0.0003										
ESTIMATE		IVP_3	201	214	-9.0134	40.1836	14.0383	-8.7254	42.2987	14.0375	
4.1673	-1.0782										
APRIORI		IVP_3	201	214	-9.0135	40.1837	14.0383	-8.7254	42.2987	14.0375	
4.1674	-1.0784										
DELTA		IVP_3	201	214	0.0001	-0.0001	0.0000	-0.0000	-0.0000	-0.0000	-
0.0001	0.0002										

+++++  
4.6 CIRCLE PARAMETER VALUES AND THEIR PRECISION  
+++++

	TARGET	ENORMAL	NNORMAL	UNORMAL	ECENTRE	NCENTRE	UCENTRE	RADIUS
ESTIMATE	201	0.0000688	0.0000505	1.0000000	-9.0134	40.1837	15.1166	5.2689
ESTIMATE	+/ -	0.0000157	0.0000201	0.0000000	0.0001	0.0001	0.0001	0.0001
ESTIMATE	203	0.0000688	0.0000504	1.0000000	-9.0134	40.1837	14.4804	5.3127
ESTIMATE	+/ -	0.0000157	0.0000201	0.0000000	0.0001	0.0001	0.0001	0.0001
ESTIMATE	205	0.0000688	0.0000504	1.0000000	-9.0134	40.1837	13.8059	5.3576
ESTIMATE	+/ -	0.0000157	0.0000201	0.0000000	0.0001	0.0001	0.0001	0.0001
ESTIMATE	307	0.0000688	0.0000503	1.0000000	-9.0134	40.1837	15.1166	5.2689
ESTIMATE	+/ -	0.0000157	0.0000201	0.0000000	0.0001	0.0001	0.0001	0.0001
ESTIMATE	309	0.0000688	0.0000503	1.0000000	-9.0134	40.1837	14.4804	5.3127
ESTIMATE	+/ -	0.0000157	0.0000201	0.0000000	0.0001	0.0001	0.0001	0.0001
ESTIMATE	311	0.0000689	0.0000503	1.0000000	-9.0134	40.1837	13.8059	5.3576
ESTIMATE	+/ -	0.0000157	0.0000201	0.0000000	0.0001	0.0001	0.0001	0.0001



	TARGET	ENORMAL	NNORMAL	UNORMAL	ECENTRE	NCENTRE	UCENTRE	RADIUS
ESTIMATE	502	0.6514614	-0.7586818	0.0001215	-7.9167	35.6298	14.0370	1.9577
ESTIMATE	+/-	0.0000469	0.0000402	0.0000380	0.0005	0.0004	0.0003	0.0006
ESTIMATE	504	0.6514614	-0.7586818	0.0001215	-11.5648	39.8789	14.0359	3.0898
ESTIMATE	+/-	0.0000468	0.0000402	0.0000380	0.0005	0.0004	0.0003	0.0005
ESTIMATE	506	0.6514614	-0.7586818	0.0001215	-13.3545	41.9622	14.0361	2.8513
ESTIMATE	+/-	0.0000468	0.0000402	0.0000380	0.0004	0.0005	0.0003	0.0006
ESTIMATE	408	0.4684666	0.8834812	0.0000511	-5.1745	42.8669	14.0365	1.9577
ESTIMATE	+/-	0.0000555	0.0000294	0.0000379	0.0005	0.0003	0.0003	0.0006
ESTIMATE	410	0.4684666	0.8834812	0.0000511	-7.7986	37.9196	14.0358	3.0898
ESTIMATE	+/-	0.0000555	0.0000294	0.0000379	0.0005	0.0003	0.0003	0.0005
ESTIMATE	412	0.4684666	0.8834812	0.0000510	-9.0848	35.4926	14.0365	2.8513
ESTIMATE	+/-	0.0000555	0.0000294	0.0000379	0.0006	0.0003	0.0003	0.0006
ESTIMATE	214	0.9908082	-0.1352742	-0.0002063	-12.8545	42.8624	14.0383	1.9577
ESTIMATE	+/-	0.0000085	0.0000626	0.0000460	0.0002	0.0006	0.0004	0.0006
ESTIMATE	216	0.9908082	-0.1352742	-0.0002063	-7.3048	42.1044	14.0363	3.0898
ESTIMATE	+/-	0.0000085	0.0000626	0.0000460	0.0002	0.0006	0.0003	0.0005
ESTIMATE	218	0.9908082	-0.1352742	-0.0002063	-4.5874	41.7339	14.0371	2.8513
ESTIMATE	+/-	0.0000085	0.0000626	0.0000460	0.0002	0.0006	0.0004	0.0006

CIRCLE ARC PARAMETER LIST

- 1. ENORMAL 201
- 2. NNORMAL 201
- 3. UNORMAL 201
- 4. ECENTRE 201
- 5. NCENTRE 201
- 6. UCENTRE 201
- 7. RADIUS 201
- 8. ENORMAL 203
- 9. NNORMAL 203
- 10. UNORMAL 203
- 11. ECENTRE 203
- 12. NCENTRE 203
- 13. UCENTRE 203
- 14. RADIUS 203
- 15. ENORMAL 205
- 16. NNORMAL 205
- 17. UNORMAL 205
- 18. ECENTRE 205
- 19. NCENTRE 205
- 20. UCENTRE 205
- 21. RADIUS 205
- 22. ENORMAL 307
- 23. NNORMAL 307
- 24. UNORMAL 307
- 25. ECENTRE 307
- 26. NCENTRE 307
- 27. UCENTRE 307
- 28. RADIUS 307
- 29. ENORMAL 309
- 30. NNORMAL 309
- 31. UNORMAL 309
- 32. ECENTRE 309
- 33. NCENTRE 309
- 34. UCENTRE 309
- 35. RADIUS 309
- 36. ENORMAL 311
- 37. NNORMAL 311
- 38. UNORMAL 311
- 39. ECENTRE 311
- 40. NCENTRE 311
- 41. UCENTRE 311
- 42. RADIUS 311

43. ENORMAL	502
CIRCLE ARC PARAMETER LIST	
44. NNORMAL	502
45. UNORMAL	502
46. ECENTRE	502
47. NCENTRE	502
48. UCENTRE	502
49. RADIUS	502
50. ENORMAL	504
51. NNORMAL	504
52. UNORMAL	504
53. ECENTRE	504
54. NCENTRE	504
55. UCENTRE	504
56. RADIUS	504
57. ENORMAL	506
58. NNORMAL	506
59. UNORMAL	506
60. ECENTRE	506
61. NCENTRE	506
62. UCENTRE	506
63. RADIUS	506
64. ENORMAL	408
65. NNORMAL	408
66. UNORMAL	408
67. ECENTRE	408
68. NCENTRE	408
69. UCENTRE	408
70. RADIUS	408
71. ENORMAL	410
72. NNORMAL	410
73. UNORMAL	410
74. ECENTRE	410
75. NCENTRE	410
76. UCENTRE	410
77. RADIUS	410
78. ENORMAL	412
79. NNORMAL	412
80. UNORMAL	412
81. ECENTRE	412
82. NCENTRE	412
83. UCENTRE	412
84. RADIUS	412
85. ENORMAL	214
86. NNORMAL	214
87. UNORMAL	214
88. ECENTRE	214
89. NCENTRE	214
90. UCENTRE	214
91. RADIUS	214
92. ENORMAL	216
93. NNORMAL	216
94. UNORMAL	216
95. ECENTRE	216
96. NCENTRE	216
97. UCENTRE	216
98. RADIUS	216
99. ENORMAL	218
100. NNORMAL	218
101. UNORMAL	218
102. ECENTRE	218
103. NCENTRE	218
104. UCENTRE	218
105. RADIUS	218





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A43332323332102133252543323133221110122104342210313210022242100222 -- 55.  
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A51603774353477404307744003664533466450106644313220020102200211 -- 58.  
A0322446133244603204463012442321244230004422202460130104501300 -- 59.  
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A3122442321244230004422202340140003501400 -- 80.  
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A68000375700014240003768500068765000688 -- 82.  
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A201100192010 -- 108.  
A01200329001 -- 109.  
A7589300967 -- 110.  
A776011799 -- 111.  
A65012588 -- 112.  
A8000877 -- 113.  
A200966 -- 114.  
A13311 -- 115.  
A2010 -- 116.  
A001 -- 117.  
A67 -- 118.  
A8 -- 119.  
A -- 120.

+ BLOCK DIAGONAL SUB-MATRIX STARTING AT 121,121  
A40004275 -- 121.  
A5009647 -- 122.  
A005810 -- 123.  
A20000 -- 124.  
A0000 -- 125.  
A648 -- 126.  
A01 -- 127.  
A6 -- 128.  
A -- 129.

CIRCLE ARC PARAMETER CORRELATIONS: CIRCLE BY CIRCLE

1. NE ENORMAL
2. NN NNORMAL
3. NU UNORMAL
4. CE ECENTRE
5. CN NCENTRE
6. CU UCENTRE
7. RD RADIUS

TARGET 201

	EN	NN	NU	CE	CN	CU	RD
1.0000	0.2905	-0.2729	-0.0483	0.0305	-0.0454	0.0377	
	1.0000	-0.2635	-0.0229	-0.0988	-0.3433	-0.0376	
		1.0000	0.0150	0.0133	0.0788	-0.0005	
			1.0000	0.3024	-0.0183	0.0966	
				1.0000	0.0268	0.3466	
					1.0000	0.1293	
						1.0000	

TARGET 203

	EN	NN	NU	CE	CN	CU	RD
1.0000	0.2904	-0.2728	-0.0488	0.0305	-0.0362	0.0409	
	1.0000	-0.2633	-0.0230	-0.0989	-0.3383	-0.0320	
		1.0000	0.0151	0.0133	0.0757	-0.0023	
			1.0000	0.3042	-0.0183	0.0953	
				1.0000	0.0273	0.3465	
					1.0000	0.1224	
						1.0000	

TARGET 205

	EN	NN	NU	CE	CN	CU	RD
1.0000	0.2903	-0.2727	-0.0492	0.0304	-0.0270	0.0440	
	1.0000	-0.2629	-0.0231	-0.0990	-0.3335	-0.0268	
		1.0000	0.0152	0.0133	0.0727	-0.0040	
			1.0000	0.3057	-0.0181	0.0941	
				1.0000	0.0280	0.3464	
					1.0000	0.1154	
						1.0000	

TARGET 307

	EN	NN	NU	CE	CN	CU	RD
1.0000	0.2904	-0.2727	-0.0494	0.0304	-0.0466	0.0375	
	1.0000	-0.2630	-0.0230	-0.0990	-0.3430	-0.0377	
		1.0000	0.0152	0.0134	0.0788	-0.0005	
			1.0000	0.3070	-0.0184	0.1045	
				1.0000	0.0268	0.3449	
					1.0000	0.1293	
						1.0000	

TARGET		309					
EN	NN	NU	CE	CN	CU	RD	
1.0000	0.2905	-0.2729	-0.0495	0.0303	-0.0373	0.0409	
	1.0000	-0.2629	-0.0229	-0.0989	-0.3379	-0.0321	
		1.0000	0.0152	0.0133	0.0758	-0.0023	
			1.0000	0.3073	-0.0184	0.1030	
				1.0000	0.0273	0.3449	
					1.0000	0.1224	
						1.0000	

TARGET		311					
EN	NN	NU	CE	CN	CU	RD	
1.0000	0.2905	-0.2732	-0.0495	0.0303	-0.0280	0.0440	
	1.0000	-0.2628	-0.0229	-0.0988	-0.3333	-0.0269	
		1.0000	0.0152	0.0133	0.0728	-0.0041	
			1.0000	0.3065	-0.0181	0.1012	
				1.0000	0.0279	0.3449	
					1.0000	0.1155	
						1.0000	

TARGET		502					
EN	NN	NU	CE	CN	CU	RD	
1.0000	1.0000	0.5032	0.5751	0.2623	0.3113	-0.4198	
	1.0000	0.5033	0.5751	0.2623	0.3114	-0.4198	
		1.0000	0.3071	0.0838	0.5856	-0.2615	
			1.0000	0.8826	0.6922	-0.9519	
				1.0000	0.6406	-0.9327	
					1.0000	-0.7385	
						1.0000	

TARGET		504					
EN	NN	NU	CE	CN	CU	RD	
1.0000	1.0000	0.5033	0.2818	-0.2937	-0.3642	-0.0229	
	1.0000	0.5035	0.2818	-0.2937	-0.3642	-0.0229	
		1.0000	0.2173	-0.1317	-0.3639	-0.0534	
			1.0000	0.7818	0.3602	-0.9285	
				1.0000	0.5799	-0.9057	
					1.0000	-0.4879	
						1.0000	

TARGET		506					
EN	NN	NU	CE	CN	CU	RD	
1.0000	1.0000	0.5035	-0.1863	-0.6057	0.0367	0.3345	
	1.0000	0.5036	-0.1863	-0.6057	0.0367	0.3345	
		1.0000	-0.0927	-0.3934	-0.2757	0.2492	
			1.0000	0.8399	0.7242	-0.9447	
				1.0000	0.5933	-0.9160	
					1.0000	-0.7489	
						1.0000	

TARGET		408					
EN	NN	NU	CE	CN	CU	RD	
1.0000	-1.0000	-0.4905	0.3789	-0.6614	-0.2968	0.4115	
	1.0000	0.4905	-0.3790	0.6614	0.2968	-0.4115	
		1.0000	-0.1602	0.3710	0.5843	-0.2589	
			1.0000	-0.8768	-0.6708	0.9644	
				1.0000	0.6625	-0.8984	
					1.0000	-0.7374	
						1.0000	

TARGET 410

EN	NN	NU	CE	CN	CU	RD
1.0000	-1.0000	-0.4907	-0.1189	-0.5084	0.3670	0.0240
	1.0000	0.4906	0.1189	0.5084	-0.3669	-0.0240
		1.0000	0.0247	0.3456	-0.3671	-0.0512
			1.0000	-0.7290	-0.5176	0.9582
				1.0000	0.1882	-0.8079
					1.0000	-0.4739
						1.0000

TARGET 412

EN	NN	NU	CE	CN	CU	RD
1.0000	-1.0000	-0.4908	-0.5130	-0.1049	-0.0420	-0.3336
	1.0000	0.4907	0.5130	0.1049	0.0420	0.3336
		1.0000	0.3183	0.1167	-0.2750	0.2467
			1.0000	-0.7186	-0.6414	0.9524
				1.0000	0.6861	-0.8119
					1.0000	-0.7462
						1.0000

TARGET 214

EN	NN	NU	CE	CN	CU	RD
1.0000	1.0000	-0.4070	-0.7339	-0.3746	0.0919	-0.3138
	1.0000	-0.4080	-0.7341	-0.3746	0.0925	-0.3140
		1.0000	0.4796	0.1470	-0.6039	0.2818
			1.0000	0.5862	-0.3781	0.5954
				1.0000	-0.5330	0.9408
					1.0000	-0.7008
						1.0000

TARGET 216

EN	NN	NU	CE	CN	CU	RD
1.0000	1.0000	-0.4071	-0.8282	-0.0034	-0.2596	-0.0253
	1.0000	-0.4081	-0.8283	-0.0035	-0.2597	-0.0254
		1.0000	0.4949	0.0837	0.1935	0.0883
			1.0000	0.3442	0.0533	0.3715
				1.0000	-0.5331	0.9735
					1.0000	-0.5598
						1.0000

TARGET 218

EN	NN	NU	CE	CN	CU	RD
1.0000	1.0000	-0.4072	-0.7146	0.4616	-0.0550	0.3542
	1.0000	-0.4082	-0.7149	0.4616	-0.0552	0.3542
		1.0000	0.5454	-0.1949	0.1566	-0.1622
			1.0000	0.0073	-0.1952	0.1058
				1.0000	-0.6575	0.9628
					1.0000	-0.7568
						1.0000

CIRCLE ARC PARAMETER CORRELATIONS > 0.80

PARA1	PARA2	CORRELATION
1.	8.	0.9995
1.	15.	0.9991
1.	22.	0.9986
1.	29.	0.9982
1.	36.	0.9977
2.	9.	0.9997
2.	16.	0.9994
2.	23.	0.9992
2.	30.	0.9989

PARA1	PARA2	CORRELATION
2.	37.	0.9986
4.	11.	0.9958
4.	18.	0.9916
4.	25.	0.9874
4.	32.	0.9833
4.	39.	0.9792
4.	108.	0.9484
4.	116.	0.9484
4.	124.	0.9485
5.	12.	0.9986
5.	19.	0.9972
5.	26.	0.9958
5.	33.	0.9944
5.	40.	0.9930
5.	109.	0.9723
5.	117.	0.9722
5.	125.	0.9723
6.	27.	0.9992
7.	28.	0.9983
8.	15.	0.9995
8.	22.	0.9991
8.	29.	0.9986
8.	36.	0.9982
9.	16.	0.9997
9.	23.	0.9994
9.	30.	0.9992
9.	37.	0.9989
11.	18.	0.9958
11.	25.	0.9916
11.	32.	0.9874
11.	39.	0.9833
11.	108.	0.9446
11.	116.	0.9446
11.	124.	0.9447
12.	19.	0.9986
12.	26.	0.9972
12.	33.	0.9958
12.	40.	0.9944
12.	109.	0.9710
12.	117.	0.9709
12.	125.	0.9710
13.	34.	0.9992
14.	35.	0.9982
15.	22.	0.9995
15.	29.	0.9991
15.	36.	0.9986
16.	23.	0.9997
16.	30.	0.9994
16.	37.	0.9992
18.	25.	0.9958
18.	32.	0.9916
18.	39.	0.9875
18.	108.	0.9408
18.	116.	0.9408
18.	124.	0.9409
19.	26.	0.9986
19.	33.	0.9972
19.	40.	0.9958
19.	109.	0.9696
19.	117.	0.9696
19.	125.	0.9697
20.	41.	0.9992
21.	42.	0.9982
22.	29.	0.9995
22.	36.	0.9991
23.	30.	0.9997
23.	37.	0.9994
25.	32.	0.9958
25.	39.	0.9917
25.	108.	0.9369
25.	116.	0.9369
25.	124.	0.9370

26.	33.	0.9986
26.	40.	0.9972
PARA1	PARA2	CORRELATION
26.	109.	0.9683
26.	117.	0.9683
26.	125.	0.9684
29.	36.	0.9995
30.	37.	0.9997
32.	39.	0.9958
32.	108.	0.9331
32.	116.	0.9331
32.	124.	0.9332
33.	40.	0.9986
33.	109.	0.9670
33.	117.	0.9669
33.	125.	0.9670
39.	108.	0.9292
39.	116.	0.9292
39.	124.	0.9293
40.	109.	0.9656
40.	117.	0.9656
40.	125.	0.9657
43.	44.	1.0000
43.	50.	1.0000
43.	51.	1.0000
43.	57.	0.9999
43.	58.	0.9999
44.	50.	1.0000
44.	51.	1.0000
44.	57.	0.9999
44.	58.	0.9999
45.	52.	0.9999
45.	59.	0.9998
46.	47.	0.8826
46.	49.	-0.9519
46.	67.	-0.9141
46.	68.	0.8768
46.	70.	-0.9519
46.	89.	-0.8909
46.	91.	-0.9519
46.	112.	0.8053
46.	119.	0.8667
47.	49.	-0.9327
47.	67.	-0.9360
47.	70.	-0.9327
47.	82.	0.8230
47.	89.	-0.8881
47.	91.	-0.9326
47.	111.	-0.8986
47.	112.	0.8910
47.	119.	0.9586
47.	120.	0.8647
47.	128.	-0.8634
48.	69.	0.8497
48.	106.	0.9082
48.	110.	0.9448
48.	113.	0.8063
48.	114.	0.9084
48.	118.	0.9448
48.	121.	0.8479
49.	67.	0.9644
49.	68.	-0.8984
49.	70.	1.0000
49.	89.	0.9407
49.	91.	0.9999
49.	111.	0.8507
49.	112.	-0.8590
49.	119.	-0.9034
49.	120.	-0.8066
49.	128.	0.8286
50.	51.	1.0000
50.	57.	1.0000
50.	58.	1.0000



51.	57.	1.0000
51.	58.	1.0000
52.	59.	0.9999
PARA1	PARA2	CORRELATION
53.	56.	-0.9285
53.	74.	-0.8619
53.	75.	0.8572
53.	77.	-0.9284
53.	96.	-0.9019
53.	98.	-0.9284
54.	56.	-0.9057
54.	74.	-0.9011
54.	77.	-0.9057
54.	96.	-0.8842
54.	98.	-0.9056
56.	74.	0.9581
56.	75.	-0.8079
56.	77.	1.0000
56.	96.	0.9734
56.	98.	0.9999
57.	58.	1.0000
60.	61.	0.8399
60.	63.	-0.9447
60.	81.	-0.8854
60.	82.	0.8499
60.	84.	-0.9446
60.	103.	-0.8990
60.	105.	-0.9446
60.	111.	-0.8761
60.	119.	0.8443
60.	120.	0.8811
60.	128.	-0.8431
61.	63.	-0.9160
61.	81.	-0.9163
61.	84.	-0.9160
61.	103.	-0.8962
61.	105.	-0.9160
62.	83.	0.8082
62.	121.	0.8101
63.	81.	0.9524
63.	82.	-0.8119
63.	84.	1.0000
63.	103.	0.9627
63.	105.	0.9999
63.	111.	0.8301
63.	120.	-0.8330
63.	128.	0.8125
64.	65.	-1.0000
64.	71.	1.0000
64.	72.	-1.0000
64.	78.	0.9999
64.	79.	-0.9999
65.	71.	-1.0000
65.	72.	1.0000
65.	78.	-0.9999
65.	79.	0.9999
66.	73.	0.9999
66.	80.	0.9998
67.	68.	-0.8768
67.	70.	0.9644
67.	82.	-0.8319
67.	89.	0.9128
67.	91.	0.9644
67.	111.	0.8883
67.	112.	-0.8982
67.	119.	-0.9234
67.	120.	-0.8444
67.	128.	0.8455
68.	70.	-0.8984
68.	89.	-0.8349
68.	91.	-0.8984
69.	106.	0.8464
69.	110.	0.9531

69.	113.	0.8478
69.	114.	0.8462
69.	118.	0.9531
69.	121.	0.8060
PARA1	PARA2	CORRELATION
70.	89.	0.9408
70.	91.	1.0000
70.	111.	0.8507
70.	112.	-0.8590
70.	119.	-0.9034
70.	120.	-0.8066
70.	128.	0.8286
71.	72.	-1.0000
71.	78.	1.0000
71.	79.	-1.0000
72.	78.	-1.0000
72.	79.	1.0000
73.	80.	0.9999
74.	77.	0.9582
74.	96.	0.9339
74.	98.	0.9581
75.	77.	-0.8079
75.	98.	-0.8079
77.	96.	0.9735
77.	98.	1.0000
78.	79.	-1.0000
81.	84.	0.9524
81.	103.	0.9250
81.	105.	0.9524
82.	84.	-0.8119
82.	105.	-0.8119
82.	111.	-0.8443
82.	119.	0.8281
82.	120.	0.8435
82.	128.	-0.8219
83.	113.	0.8063
84.	103.	0.9627
84.	105.	1.0000
84.	111.	0.8301
84.	120.	-0.8329
84.	128.	0.8125
85.	86.	1.0000
85.	92.	1.0000
85.	93.	1.0000
85.	95.	-0.8281
85.	99.	0.9999
85.	100.	0.9999
86.	92.	1.0000
86.	93.	1.0000
86.	95.	-0.8283
86.	99.	0.9999
86.	100.	0.9999
87.	94.	0.9999
87.	101.	0.9999
87.	123.	0.8454
87.	127.	0.8814
89.	91.	0.9408
89.	111.	0.8224
89.	112.	-0.8190
89.	119.	-0.8661
89.	128.	0.8660
90.	122.	0.9353
90.	126.	0.9777
90.	129.	0.8758
91.	111.	0.8507
91.	112.	-0.8589
91.	119.	-0.9033
91.	120.	-0.8066
91.	128.	0.8286
92.	93.	1.0000
92.	95.	-0.8282
92.	99.	1.0000
92.	100.	1.0000

93.	95.	-0.8283
93.	99.	1.0000
93.	100.	1.0000
94.	101.	0.9999
94.	123.	0.8454
PARA1	PARA2	CORRELATION
94.	127.	0.8813
95.	99.	-0.8282
95.	100.	-0.8283
96.	98.	0.9735
99.	100.	1.0000
101.	123.	0.8454
101.	127.	0.8814
103.	105.	0.9628
103.	128.	0.8128
105.	111.	0.8301
105.	120.	-0.8329
105.	128.	0.8126
106.	110.	0.9161
106.	113.	0.8247
106.	114.	0.9997
106.	118.	0.9161
106.	121.	0.8499
108.	116.	0.9927
108.	124.	0.9927
109.	117.	0.9975
109.	125.	0.9975
110.	113.	0.8966
110.	114.	0.9161
110.	118.	1.0000
110.	121.	0.9149
111.	119.	-0.9221
111.	120.	-0.9240
111.	128.	0.8874
112.	119.	0.8990
112.	120.	0.8194
112.	128.	-0.8050
113.	114.	0.8244
113.	118.	0.8966
113.	121.	0.9704
114.	118.	0.9161
114.	121.	0.8502
116.	124.	0.9927
117.	125.	0.9975
118.	121.	0.9149
119.	120.	0.8655
119.	128.	-0.8852
120.	128.	-0.8695
122.	126.	0.9660
123.	127.	0.8667
126.	129.	0.8119

CORRELATIONS > 0.80 IS 4.1 PERCENT

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 4.7 IVP/TOUCH/INTERSECT PARAMETER VALUES AND THEIR PRECISION  
 ++++

	IVP-NAME	PRIMARY	SECONDARY	PRIMARY			SECONDARY			SCALARS	
				EAST	NORTH	UP	EAST	NORTH	UP	S	T
ESTIMATE	IVP_1	201	408	-9.0134	40.1836	14.0367	-7.1278	39.1833	14.0363	-4.1694	-1.0798
EST +/-	IVP_1	201	408	0.0001	0.0001	0.0003	0.0005	0.0003	0.0002	0.0002	0.0003
ESTIMATE	IVP_2	201	502	-9.0134	40.1836	14.0367	-10.6332	38.7933	14.0365	-4.1698	-1.0798
EST +/-	IVP_2	201	502	0.0001	0.0001	0.0003	0.0004	0.0004	0.0002	0.0002	0.0003
ESTIMATE	IVP_3	201	214	-9.0134	40.1836	14.0383	-8.7254	42.2987	14.0375	4.1673	-1.0782
EST +/-	IVP_3	201	214	0.0001	0.0001	0.0004	0.0003	0.0005	0.0003	0.0003	0.0005
	IVP	EAST	NORTH	UP	OFFSET (M)						
OFFSET	IVP_1	-1.8857	1.0003	0.0005	2.1346 +/-	0.0002					
OFFSET	IVP_2	1.6197	1.3903	0.0002	2.1346 +/-	0.0002					
OFFSET	IVP_3	-0.2880	-2.1151	0.0009	2.1346 +/-	0.0003					

+++++  
 4.8 CORRELATION MATRIX  
 +++++

IVP/TOUCH PARAMETER LIST

- 1. TSCALAR IVP\_1
- 2. SSCALAR IVP\_1
- 3. EIVP IVP\_1
- 4. NIVP IVP\_1
- 5. UIVP IVP\_1
- 6. EIVP\_Q IVP\_1
- 7. NIVP\_Q IVP\_1
- 8. UIVP\_Q IVP\_1
- 9. TSCALAR IVP\_2
- 10. SSCALAR IVP\_2
- 11. EIVP IVP\_2
- 12. NIVP IVP\_2
- 13. UIVP IVP\_2
- 14. EIVP\_Q IVP\_2
- 15. NIVP\_Q IVP\_2
- 16. UIVP\_Q IVP\_2
- 17. TSCALAR IVP\_3
- 18. SSCALAR IVP\_3
- 19. EIVP IVP\_3
- 20. NIVP IVP\_3
- 21. UIVP IVP\_3
- 22. EIVP\_Q IVP\_3
- 23. NIVP\_Q IVP\_3
- 24. UIVP\_Q IVP\_3

IVP PARAMETER CORRELATION

CORRELATION MATRIX (LEGEND: 1=-0.1|0.1, 2=-0.2|0.2,..., A=-1.0|1.0)

- A20096589200966851004365 -- 1.
- A3421202334200001340100 -- 2.
- A201100192010000920000 -- 3.
- A01200329001000290000 -- 4.
- A7589300967941004365 -- 5.
- A776011799750115286 -- 6.
- A65012588651125386 -- 7.
- A8000877940004275 -- 8.
- A200966851004365 -- 9.
- A13311001130100 -- 10.
- A2010000920000 -- 11.
- A001000290000 -- 12.
- A67941004365 -- 13.
- A8751105387 -- 14.
- A740014186 -- 15.
- A40004275 -- 16.
- A5009647 -- 17.
- A005810 -- 18.
- A20000 -- 19.
- A0000 -- 20.
- A648 -- 21.
- A01 -- 22.
- A6 -- 23.
- A -- 24.

IVP PARAMETER CORRELATIONS > 0.80

PARA1	PARA2	CORRELATION
1.	5.	0.9161
1.	8.	0.8247
1.	9.	0.9997
1.	13.	0.9161
1.	16.	0.8499
3.	11.	0.9927
3.	19.	0.9927
4.	12.	0.9975

4.	20.	0.9975
PARA1	PARA2	CORRELATION
5.	8.	0.8966
5.	9.	0.9161
5.	13.	1.0000
5.	16.	0.9149
6.	14.	-0.9221
6.	15.	-0.9240
6.	23.	0.8874
7.	14.	0.8990
7.	15.	0.8194
7.	23.	-0.8050
8.	9.	0.8244
8.	13.	0.8966
8.	16.	0.9704
9.	13.	0.9161
9.	16.	0.8502
11.	19.	0.9927
12.	20.	0.9975
13.	16.	0.9149
14.	15.	0.8655
14.	23.	-0.8852
15.	23.	-0.8695
17.	21.	0.9660
18.	22.	0.8667
21.	24.	0.8119

CORRELATIONS > 0.80 IS 11.0 PERCENT

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4.9 IVP TO CIRCLE PARAMETER CORRELATION  
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IVP	TARGET	ENORMAL	NNORMAL	UNORMAL	ECENTRE	NCENTRE	UCENTRE	RADIUS	
EIVP	IVP_1	201	0.0999	0.1005	-0.0416	0.0057	-0.0003	-0.3827	-0.0453
NIVP	IVP_1	201	-0.2126	-0.1692	0.0797	0.2873	0.4819	0.0404	0.1606
UIVP	IVP_1	201	-0.3509	-0.1103	0.0975	0.9484	0.2729	-0.0033	0.0786
EIVP	IVP_2	201	0.0998	0.1005	-0.0416	0.0057	-0.0003	-0.3827	-0.0453
NIVP	IVP_2	201	-0.2355	-0.0173	0.0540	0.0713	-0.3560	-0.0077	-0.1308
UIVP	IVP_2	201	-0.3508	-0.1103	0.0974	0.9484	0.2729	-0.0033	0.0786
EIVP	IVP_3	201	-0.1200	0.1673	-0.0079	0.0087	-0.0253	-0.2946	-0.0448
NIVP	IVP_3	201	0.2293	0.0260	-0.0544	0.1756	0.0259	-0.0001	0.0144
UIVP	IVP_3	201	-0.3505	-0.1100	0.0973	0.9485	0.2731	-0.0033	0.0787
EIVP	IVP_1	203	0.1000	0.1005	-0.0417	0.0057	-0.0003	-0.0311	0.0014
NIVP	IVP_1	203	-0.2125	-0.1692	0.0796	0.2874	0.4813	0.0384	0.1591
UIVP	IVP_1	203	-0.3508	-0.1103	0.0974	0.9446	0.2732	-0.0058	0.0760
EIVP	IVP_2	203	0.0999	0.1005	-0.0416	0.0057	-0.0003	-0.0311	0.0014
NIVP	IVP_2	203	-0.2354	-0.0173	0.0540	0.0701	-0.3554	-0.0099	-0.1315
UIVP	IVP_2	203	-0.3508	-0.1103	0.0974	0.9446	0.2732	-0.0058	0.0760
EIVP	IVP_3	203	-0.1198	0.1673	-0.0079	0.0088	-0.0253	-0.0692	-0.0145
NIVP	IVP_3	203	0.2292	0.0261	-0.0544	0.1746	0.0260	0.0020	0.0146
UIVP	IVP_3	203	-0.3504	-0.1100	0.0973	0.9447	0.2733	-0.0059	0.0761
EIVP	IVP_1	205	0.1001	0.1005	-0.0416	0.0056	-0.0003	-0.0299	0.0021
NIVP	IVP_1	205	-0.2124	-0.1692	0.0795	0.2875	0.4807	0.0366	0.1577
UIVP	IVP_1	205	-0.3507	-0.1103	0.0973	0.9408	0.2732	-0.0084	0.0735
EIVP	IVP_2	205	0.1000	0.1005	-0.0416	0.0056	-0.0003	-0.0299	0.0021
NIVP	IVP_2	205	-0.2354	-0.0173	0.0539	0.0688	-0.3548	-0.0120	-0.1322
UIVP	IVP_2	205	-0.3507	-0.1103	0.0973	0.9408	0.2732	-0.0084	0.0735
EIVP	IVP_3	205	-0.1197	0.1672	-0.0079	0.0088	-0.0253	-0.0697	-0.0138
NIVP	IVP_3	205	0.2291	0.0261	-0.0544	0.1736	0.0260	0.0041	0.0147
UIVP	IVP_3	205	-0.3503	-0.1100	0.0972	0.9409	0.2734	-0.0084	0.0736
EIVP	IVP_1	307	0.1001	0.1005	-0.0416	0.0056	-0.0003	-0.3824	-0.0453
NIVP	IVP_1	307	-0.2124	-0.1692	0.0795	0.2876	0.4801	0.0404	0.1606
UIVP	IVP_1	307	-0.3506	-0.1103	0.0973	0.9369	0.2731	-0.0032	0.0793
EIVP	IVP_2	307	0.1000	0.1005	-0.0416	0.0056	-0.0003	-0.3824	-0.0453
NIVP	IVP_2	307	-0.2353	-0.0173	0.0539	0.0674	-0.3543	-0.0076	-0.1306
UIVP	IVP_2	307	-0.3506	-0.1103	0.0973	0.9369	0.2731	-0.0032	0.0793
EIVP	IVP_3	307	-0.1195	0.1672	-0.0079	0.0089	-0.0253	-0.2943	-0.0448
NIVP	IVP_3	307	0.2290	0.0261	-0.0543	0.1727	0.0261	-0.0002	0.0145
UIVP	IVP_3	307	-0.3502	-0.1100	0.0972	0.9370	0.2732	-0.0033	0.0794
EIVP	IVP_1	309	0.1001	0.1004	-0.0416	0.0056	-0.0003	-0.0312	0.0014
NIVP	IVP_1	309	-0.2123	-0.1692	0.0795	0.2873	0.4794	0.0385	0.1591

UIVP	IVP_1	309	-0.3505	-0.1103	0.0974	0.9331	0.2728	-0.0057	0.0767
EIVP	IVP_2	309	0.1000	0.1004	-0.0416	0.0056	-0.0003	-0.0311	0.0014
	IVP	TARGET	ENORMAL	NNORMAL	UNORMAL	ECENTRE	NCENTRE	UCENTRE	RADIUS
NIVP	IVP_2	309	-0.2352	-0.0174	0.0540	0.0665	-0.3538	-0.0098	-0.1313
UIVP	IVP_2	309	-0.3505	-0.1103	0.0974	0.9331	0.2728	-0.0058	0.0767
EIVP	IVP_3	309	-0.1194	0.1671	-0.0079	0.0089	-0.0253	-0.0691	-0.0145
NIVP	IVP_3	309	0.2289	0.0261	-0.0544	0.1718	0.0261	0.0019	0.0147
UIVP	IVP_3	309	-0.3501	-0.1100	0.0972	0.9332	0.2730	-0.0058	0.0767
EIVP	IVP_1	311	0.1001	0.1004	-0.0416	0.0056	-0.0003	-0.0299	0.0021
NIVP	IVP_1	311	-0.2122	-0.1692	0.0795	0.2865	0.4788	0.0367	0.1577
UIVP	IVP_1	311	-0.3503	-0.1104	0.0974	0.9292	0.2725	-0.0083	0.0742
EIVP	IVP_2	311	0.1000	0.1003	-0.0416	0.0056	-0.0003	-0.0299	0.0021
NIVP	IVP_2	311	-0.2351	-0.0174	0.0540	0.0659	-0.3533	-0.0119	-0.1320
UIVP	IVP_2	311	-0.3503	-0.1103	0.0974	0.9292	0.2725	-0.0083	0.0742
EIVP	IVP_3	311	-0.1194	0.1670	-0.0078	0.0089	-0.0253	-0.0696	-0.0138
NIVP	IVP_3	311	0.2287	0.0262	-0.0544	0.1710	0.0261	0.0040	0.0149
UIVP	IVP_3	311	-0.3500	-0.1101	0.0973	0.9293	0.2727	-0.0083	0.0743
EIVP	IVP_1	502	0.2452	0.2452	0.4097	0.6629	0.6465	0.9082	-0.7170
NIVP	IVP_1	502	-0.2867	-0.2867	-0.6236	-0.1487	-0.0120	-0.3780	0.1336
UIVP	IVP_1	502	-0.0711	-0.0711	-0.0293	0.0271	0.0607	-0.0501	0.0028
EIVP	IVP_2	502	0.2451	0.2452	0.4097	0.6629	0.6465	0.9084	-0.7171
NIVP	IVP_2	502	-0.2307	-0.2308	-0.5911	-0.2154	0.0949	-0.3610	0.1401
UIVP	IVP_2	502	-0.0711	-0.0711	-0.0293	0.0270	0.0607	-0.0501	0.0028
EIVP	IVP_3	502	0.3191	0.3191	0.2762	0.6198	0.5810	0.5058	-0.6399
NIVP	IVP_3	502	-0.4261	-0.4261	-0.2700	-0.2842	-0.1514	-0.1805	0.2616
UIVP	IVP_3	502	-0.0708	-0.0708	-0.0292	0.0271	0.0606	-0.0501	0.0027
EIVP	IVP_1	504	0.2452	0.2452	0.4098	0.5098	0.3427	0.2359	-0.4723
NIVP	IVP_1	504	-0.2866	-0.2867	-0.6235	-0.1295	0.0736	0.1837	0.0380
UIVP	IVP_1	504	-0.0710	-0.0710	-0.0293	-0.0096	0.0307	-0.0583	0.0005
EIVP	IVP_2	504	0.2451	0.2452	0.4098	0.5098	0.3427	0.2361	-0.4723
NIVP	IVP_2	504	-0.2307	-0.2308	-0.5911	-0.1200	0.0507	0.1774	0.0402
UIVP	IVP_2	504	-0.0710	-0.0710	-0.0293	-0.0096	0.0307	-0.0583	0.0005
EIVP	IVP_3	504	0.3192	0.3192	0.2762	0.4433	0.2480	-0.0044	-0.3763
NIVP	IVP_3	504	-0.4262	-0.4262	-0.2700	-0.1819	0.0682	0.1478	0.0707
UIVP	IVP_3	504	-0.0707	-0.0707	-0.0292	-0.0095	0.0306	-0.0582	0.0005
EIVP	IVP_1	506	0.2452	0.2452	0.4099	0.5147	0.2629	0.5722	-0.4496
NIVP	IVP_1	506	-0.2866	-0.2867	-0.6235	0.0613	0.2367	0.1443	-0.1356
UIVP	IVP_1	506	-0.0709	-0.0709	-0.0293	0.0365	0.0597	-0.0839	0.0028
EIVP	IVP_2	506	0.2451	0.2452	0.4099	0.5147	0.2629	0.5725	-0.4496
NIVP	IVP_2	506	-0.2308	-0.2308	-0.5910	0.0586	0.2091	0.1743	-0.1443
UIVP	IVP_2	506	-0.0709	-0.0709	-0.0293	0.0365	0.0597	-0.0838	0.0028
EIVP	IVP_3	506	0.3192	0.3192	0.2763	0.4146	0.1701	0.3253	-0.3226
NIVP	IVP_3	506	-0.4262	-0.4262	-0.2701	0.0866	0.2711	0.0387	-0.1769
UIVP	IVP_3	506	-0.0706	-0.0706	-0.0293	0.0364	0.0595	-0.0836	0.0027
EIVP	IVP_1	408	-0.2322	0.2322	0.3305	-0.6726	0.6208	0.8464	-0.7170
NIVP	IVP_1	408	0.1724	-0.1723	-0.4935	0.0433	-0.3020	-0.2653	0.1336
UIVP	IVP_1	408	-0.0875	0.0875	0.0400	0.0617	-0.0144	0.0544	0.0029
EIVP	IVP_2	408	-0.2323	0.2323	0.3305	-0.6727	0.6208	0.8462	-0.7171
NIVP	IVP_2	408	0.2648	-0.2648	-0.5947	0.0915	-0.2088	-0.3190	0.1401
UIVP	IVP_2	408	-0.0875	0.0875	0.0400	0.0617	-0.0144	0.0544	0.0029
EIVP	IVP_3	408	-0.3161	0.3161	0.1221	-0.6095	0.5827	0.4424	-0.6399
NIVP	IVP_3	408	0.3981	-0.3981	-0.2757	0.2104	-0.3167	-0.2267	0.2616
UIVP	IVP_3	408	-0.0873	0.0873	0.0398	0.0614	-0.0142	0.0543	0.0028
EIVP	IVP_1	410	-0.2322	0.2322	0.3306	-0.4152	0.5031	0.2447	-0.4723
NIVP	IVP_1	410	0.1724	-0.1724	-0.4935	0.0152	-0.1540	0.2031	0.0380
UIVP	IVP_1	410	-0.0874	0.0874	0.0400	0.0232	0.0336	0.0559	0.0006
EIVP	IVP_2	410	-0.2323	0.2323	0.3306	-0.4152	0.5031	0.2445	-0.4723
NIVP	IVP_2	410	0.2648	-0.2648	-0.5946	0.0003	-0.2027	0.2337	0.0402
UIVP	IVP_2	410	-0.0874	0.0874	0.0400	0.0232	0.0336	0.0559	0.0006
EIVP	IVP_3	410	-0.3161	0.3161	0.1221	-0.3227	0.4549	0.0658	-0.3763
NIVP	IVP_3	410	0.3982	-0.3982	-0.2757	0.0134	-0.2599	0.1226	0.0707
UIVP	IVP_3	410	-0.0872	0.0872	0.0399	0.0231	0.0335	0.0557	0.0005
EIVP	IVP_1	412	-0.2322	0.2322	0.3307	-0.3431	0.5759	0.5757	-0.4496
NIVP	IVP_1	412	0.1725	-0.1725	-0.4934	-0.1294	-0.0485	0.2136	-0.1355
UIVP	IVP_1	412	-0.0873	0.0873	0.0400	0.0673	-0.0179	0.0925	0.0028
EIVP	IVP_2	412	-0.2323	0.2323	0.3307	-0.3431	0.5760	0.5756	-0.4496
NIVP	IVP_2	412	0.2649	-0.2648	-0.5946	-0.1749	-0.0696	0.2005	-0.1443
UIVP	IVP_2	412	-0.0873	0.0873	0.0400	0.0673	-0.0179	0.0924	0.0028
EIVP	IVP_3	412	-0.3162	0.3162	0.1222	-0.2365	0.4684	0.3960	-0.3226
NIVP	IVP_3	412	0.3982	-0.3982	-0.2758	-0.2217	-0.0385	0.0220	-0.1769
UIVP	IVP_3	412	-0.0871	0.0871	0.0399	0.0671	-0.0178	0.0922	0.0028
EIVP	IVP_1	214	0.1960	0.1962	-0.1847	-0.4088	-0.6768	0.5014	-0.7170
NIVP	IVP_1	214	-0.2194	-0.2195	0.1448	0.1907	0.1131	-0.0992	0.1336

UIVP	IVP_1	214	-0.0003	-0.0003	0.0004	0.0013	0.0027	-0.0021	0.0029
EIVP	IVP_2	214	0.1960	0.1962	-0.1847	-0.4088	-0.6768	0.5014	-0.7170
NIVP	IVP_2	214	-0.2317	-0.2318	0.1529	0.2010	0.1185	-0.1040	0.1401
	IVP	TARGET	ENORMAL	NNORMAL	UNORMAL	ECENTRE	NCENTRE	UCENTRE	RADIUS
UIVP	IVP_2	214	-0.0003	-0.0003	0.0004	0.0013	0.0027	-0.0021	0.0029
EIVP	IVP_3	214	0.1254	0.1261	-0.6350	-0.3818	-0.4793	0.9353	-0.6400
NIVP	IVP_3	214	-0.4737	-0.4744	0.8454	0.2642	0.1904	-0.4926	0.2616
UIVP	IVP_3	214	-0.0003	-0.0003	0.0001	0.0012	0.0027	-0.0017	0.0028
EIVP	IVP_1	216	0.1961	0.1962	-0.1848	-0.3389	-0.4637	0.1736	-0.4723
NIVP	IVP_1	216	-0.2194	-0.2195	0.1449	0.2011	0.0338	0.0355	0.0380
UIVP	IVP_1	216	-0.0003	-0.0003	0.0004	0.0005	0.0006	0.0001	0.0006
EIVP	IVP_2	216	0.1961	0.1962	-0.1848	-0.3389	-0.4638	0.1736	-0.4723
NIVP	IVP_2	216	-0.2317	-0.2318	0.1529	0.2124	0.0357	0.0374	0.0402
UIVP	IVP_2	216	-0.0003	-0.0003	0.0004	0.0005	0.0006	0.0001	0.0006
EIVP	IVP_3	216	0.1254	0.1261	-0.6352	-0.3142	-0.3555	0.2592	-0.3763
NIVP	IVP_3	216	-0.4737	-0.4744	0.8454	0.5145	0.0630	0.1839	0.0707
UIVP	IVP_3	216	-0.0003	-0.0003	0.0001	0.0004	0.0005	0.0002	0.0005
EIVP	IVP_1	218	0.1961	0.1962	-0.1848	-0.3934	-0.4033	0.4291	-0.4496
NIVP	IVP_1	218	-0.2194	-0.2195	0.1449	0.1518	-0.1455	0.0568	-0.1355
UIVP	IVP_1	218	-0.0003	-0.0003	0.0004	0.0015	0.0025	-0.0026	0.0028
EIVP	IVP_2	218	0.1961	0.1962	-0.1848	-0.3934	-0.4033	0.4291	-0.4496
NIVP	IVP_2	218	-0.2318	-0.2318	0.1530	0.1598	-0.1547	0.0610	-0.1443
UIVP	IVP_2	218	-0.0003	-0.0003	0.0004	0.0015	0.0025	-0.0026	0.0028
EIVP	IVP_3	218	0.1254	0.1261	-0.6352	-0.4063	-0.2499	0.4383	-0.3225
NIVP	IVP_3	218	-0.4737	-0.4744	0.8454	0.5399	-0.2185	0.1284	-0.1769
UIVP	IVP_3	218	-0.0003	-0.0003	0.0001	0.0014	0.0025	-0.0025	0.0028

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4.10 PARAMETER ESTIMATES, APRIORI VALUES AND TOTAL CORRECTIONS  
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	TARGET	ENORMAL	NNORMAL	UNORMAL	ECENTRE	NCENTRE	UCENTRE	RADIUS
ESTIMATE	201	0.0000688	0.0000505	1.0000000	-9.0134	40.1837	15.1166	5.2689
APRIORI	201	0.0000739	0.0000327	1.0000000	-9.0134	40.1837	15.1166	5.2689
DELTA	201	-0.0000051	0.0000178	-0.0000000	0.0000	-0.0000	-0.0000	0.0000
ESTIMATE	203	0.0000688	0.0000504	1.0000000	-9.0134	40.1837	14.4804	5.3127
APRIORI	203	0.0000739	0.0000327	1.0000000	-9.0134	40.1837	14.4805	5.3127
DELTA	203	-0.0000051	0.0000177	-0.0000000	0.0000	-0.0000	-0.0001	0.0000
ESTIMATE	205	0.0000688	0.0000504	1.0000000	-9.0134	40.1837	13.8059	5.3576
APRIORI	205	0.0000739	0.0000326	1.0000000	-9.0134	40.1837	13.8059	5.3576
DELTA	205	-0.0000051	0.0000178	-0.0000000	0.0000	-0.0000	0.0000	-0.0000
ESTIMATE	307	0.0000688	0.0000503	1.0000000	-9.0134	40.1837	15.1166	5.2689
APRIORI	307	0.0000739	0.0000326	1.0000000	-9.0134	40.1837	15.1166	5.2689
DELTA	307	-0.0000051	0.0000177	-0.0000000	0.0000	-0.0000	-0.0000	-0.0000
ESTIMATE	309	0.0000688	0.0000503	1.0000000	-9.0134	40.1837	14.4804	5.3127
APRIORI	309	0.0000740	0.0000325	1.0000000	-9.0134	40.1837	14.4805	5.3127
DELTA	309	-0.0000052	0.0000178	-0.0000000	0.0000	-0.0000	-0.0001	0.0000
ESTIMATE	311	0.0000689	0.0000503	1.0000000	-9.0134	40.1837	13.8059	5.3576
APRIORI	311	0.0000741	0.0000325	1.0000000	-9.0134	40.1837	13.8059	5.3576
DELTA	311	-0.0000052	0.0000178	-0.0000000	0.0000	-0.0000	0.0000	-0.0000
ESTIMATE	502	0.6514614	-0.7586818	0.0001215	-7.9167	35.6298	14.0370	1.9577
APRIORI	502	0.6514649	-0.7586788	0.0001537	-7.9167	35.6298	14.0368	1.9577
DELTA	502	-0.0000035	-0.0000030	-0.0000322	-0.0000	-0.0000	0.0002	-0.0000
ESTIMATE	504	0.6514614	-0.7586818	0.0001215	-11.5648	39.8789	14.0359	3.0898
APRIORI	504	0.6514649	-0.7586788	0.0001537	-11.5647	39.8789	14.0356	3.0898
DELTA	504	-0.0000035	-0.0000030	-0.0000322	-0.0001	-0.0000	0.0003	0.0000
ESTIMATE	506	0.6514614	-0.7586818	0.0001215	-13.3545	41.9622	14.0361	2.8513
APRIORI	506	0.6514649	-0.7586788	0.0001537	-13.3544	41.9622	14.0357	2.8512
DELTA	506	-0.0000035	-0.0000030	-0.0000322	-0.0001	0.0000	0.0004	0.0001
ESTIMATE	408	0.4684666	0.8834812	0.0000511	-5.1745	42.8669	14.0365	1.9577
APRIORI	408	0.4684827	0.8834727	0.0000166	-5.1745	42.8668	14.0367	1.9577
DELTA	408	-0.0000161	0.0000085	0.0000345	-0.0000	0.0001	-0.0002	-0.0000



ESTIMATE	410	0.4684666	0.8834812	0.0000511	-7.7986	37.9196	14.0358	3.0898
APRIORI	410	0.4684826	0.8834727	0.0000166	-7.7986	37.9195	14.0361	3.0898
DELTA	410	-0.0000160	0.0000085	0.0000345	0.0000	0.0001	-0.0003	0.0000
	TARGET	ENORMAL	NNORMAL	UNORMAL	ECENTRE	NCENTRE	UCENTRE	RADIUS
ESTIMATE	412	0.4684666	0.8834812	0.0000510	-9.0848	35.4926	14.0365	2.8513
APRIORI	412	0.4684826	0.8834727	0.0000166	-9.0848	35.4925	14.0369	2.8512
DELTA	412	-0.0000160	0.0000085	0.0000344	0.0000	0.0001	-0.0004	0.0001
ESTIMATE	214	0.9908082	-0.1352742	-0.0002063	-12.8545	42.8624	14.0383	1.9577
APRIORI	214	0.9908071	-0.1352820	-0.0002045	-12.8545	42.8624	14.0383	1.9577
DELTA	214	0.0000011	0.0000078	-0.0000018	0.0000	0.0000	0.0000	-0.0000
ESTIMATE	216	0.9908082	-0.1352742	-0.0002063	-7.3048	42.1044	14.0363	3.0898
APRIORI	216	0.9908071	-0.1352820	-0.0002045	-7.3048	42.1044	14.0363	3.0898
DELTA	216	0.0000011	0.0000078	-0.0000018	-0.0000	0.0000	-0.0000	0.0000
ESTIMATE	218	0.9908082	-0.1352742	-0.0002063	-4.5874	41.7339	14.0371	2.8513
APRIORI	218	0.9908071	-0.1352819	-0.0002045	-4.5874	41.7338	14.0371	2.8512
DELTA	218	0.0000011	0.0000077	-0.0000018	-0.0000	0.0001	0.0000	0.0001

	IVP-NAME	PRIMARY	SECONDARY	PRIMARY			SECONDARY			SCALARS	
				EAST	NORTH	UP	EAST	NORTH	UP	S	T
ESTIMATE	IVP_1	201	408	-9.0134	40.1836	14.0367	-7.1278	39.1833	14.0363	-4.1694	-1.0798
APRIORI	IVP_1	201	408	-9.0135	40.1837	14.0370	-7.1277	39.1834	14.0366	-4.1692	-1.0796
DELTA	IVP_1	201	408	0.0001	-0.0001	-0.0003	-0.0001	-0.0001	-0.0003	-0.0002	-0.0002
ESTIMATE	IVP_2	201	502	-9.0134	40.1836	14.0367	-10.6332	38.7933	14.0365	-4.1698	-1.0798
APRIORI	IVP_2	201	502	-9.0135	40.1837	14.0366	-10.6333	38.7935	14.0362	-4.1700	-1.0801
DELTA	IVP_2	201	502	0.0001	-0.0001	0.0001	0.0001	-0.0002	0.0003	0.0002	0.0003
ESTIMATE	IVP_3	201	214	-9.0134	40.1836	14.0383	-8.7254	42.2987	14.0375	4.1673	-1.0782
APRIORI	IVP_3	201	214	-9.0135	40.1837	14.0383	-8.7254	42.2987	14.0375	4.1674	-1.0784
DELTA	IVP_3	201	214	0.0001	-0.0001	0.0000	-0.0000	-0.0000	-0.0000	-0.0001	0.0002

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4.11 PARAMETER DELTA CORRECTIONS FROM LAST ITERATION  
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	TARGET	ENORMAL	NNORMAL	UNORMAL	ECENTRE	NCENTRE	UCENTRE	RADIUS
DELTA	201	0.0000000	-0.0000000	0.0000000	-0.0000	0.0000	0.0000	0.0000
DELTA	203	0.0000000	-0.0000000	0.0000000	-0.0000	0.0000	0.0000	0.0000
DELTA	205	0.0000000	-0.0000000	0.0000000	-0.0000	0.0000	0.0000	-0.0000
DELTA	307	0.0000000	-0.0000000	0.0000000	-0.0000	0.0000	0.0000	0.0000
DELTA	309	0.0000000	-0.0000000	0.0000000	-0.0000	0.0000	0.0000	0.0000
DELTA	311	0.0000000	-0.0000000	0.0000000	-0.0000	0.0000	0.0000	-0.0000
DELTA	502	-0.0000000	-0.0000000	0.0000000	-0.0000	-0.0000	-0.0000	0.0000
DELTA	504	-0.0000000	-0.0000000	0.0000000	-0.0000	0.0000	-0.0000	0.0000
DELTA	506	-0.0000000	-0.0000000	0.0000000	0.0000	0.0000	0.0000	-0.0000
DELTA	408	0.0000000	-0.0000000	0.0000000	0.0000	-0.0000	-0.0000	0.0000
DELTA	410	0.0000000	-0.0000000	0.0000000	0.0000	-0.0000	-0.0000	0.0000
DELTA	412	0.0000000	-0.0000000	0.0000000	-0.0000	0.0000	0.0000	-0.0000
DELTA	214	-0.0000000	-0.0000000	0.0000000	0.0000	0.0000	-0.0000	0.0000
DELTA	216	-0.0000000	-0.0000000	0.0000000	0.0000	0.0000	-0.0000	0.0000
DELTA	218	-0.0000000	-0.0000000	0.0000000	0.0000	-0.0000	0.0000	-0.0000



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 4.12 PARAMETER DELTA CORRECTIONS FROM LAST ITERATION  
 ++++

	IVP-NAME	PRIMARY	SECONDARY	PRIMARY			SECONDARY			SCALARS	
				EAST	NORTH	UP	EAST	NORTH	UP	S	T
DELTA IVP	IVP_1	201	408	-0.0000	0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000
DELTA IVP	IVP_2	201	502	-0.0000	0.0000	-0.0000	-0.0000	0.0000	-0.0000	-0.0000	-0.0000
DELTA IVP	IVP_3	201	214	-0.0000	0.0000	-0.0000	0.0000	0.0000	-0.0000	0.0000	-0.0000

+++++  
 4.13 AXIS TO AXIS MINIMUM DISTANCES  
 +++++

TARGET	TARGET	DISTANCE
201	203	0.0000
201	205	0.0001
201	307	0.0000
201	309	0.0001
201	311	0.0001
201	502	2.1346
201	504	2.1342
201	506	2.1348
201	408	2.1346
201	410	2.1339
201	412	2.1346
201	214	2.1346
201	216	2.1343
201	218	2.1348
203	205	0.0000
203	307	0.0000
203	309	0.0000
203	311	0.0001
203	502	2.1346
203	504	2.1343
203	506	2.1349
203	408	2.1345
203	410	2.1339
203	412	2.1346
203	214	2.1345
203	216	2.1342
203	218	2.1347
205	307	0.0001
205	309	0.0001
205	311	0.0000
205	502	2.1347
205	504	2.1343
205	506	2.1350
205	408	2.1345
205	410	2.1339
205	412	2.1345
205	214	2.1345
205	216	2.1342
205	218	2.1347
307	309	0.0000
307	311	0.0001
307	502	2.1346
307	504	2.1342
307	506	2.1348
307	408	2.1346
307	410	2.1339
307	412	2.1346
307	214	2.1346
307	216	2.1343
307	218	2.1348
309	311	0.0001
309	502	2.1346
309	504	2.1343
309	506	2.1349
309	408	2.1345
309	410	2.1339
309	412	2.1346
309	214	2.1345
309	216	2.1342
309	218	2.1347
311	502	2.1347
311	504	2.1343
311	506	2.1350
311	408	2.1345
311	410	2.1339
311	412	2.1345
311	214	2.1345

TARGET	TARGET	DISTANCE
311	216	2.1342
311	218	2.1347
502	504	0.0003
502	506	0.0003
502	408	0.0008
502	410	0.0012
502	412	0.0004
502	214	0.0028
502	216	0.0019
502	218	0.0033
504	506	0.0007
504	408	0.0003
504	410	0.0008
504	412	0.0001
504	214	0.0032
504	216	0.0024
504	218	0.0038
506	408	0.0009
506	410	0.0014
506	412	0.0005
506	214	0.0026
506	216	0.0018
506	218	0.0032
408	410	0.0006
408	412	0.0000
408	214	0.0004
408	216	0.0005
408	218	0.0009
410	412	0.0005
410	214	0.0008
410	216	0.0000
410	218	0.0014
412	214	0.0000
412	216	0.0009
412	218	0.0005
214	216	0.0002
214	218	0.0001
216	218	0.0003

++++  
4.14 AXIAL DEFLECTION, AZIMUTH, ORTHOGONALITY AND OFFSET  
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AXIS AZIMUTH	201	36	16	49.97 (DMS)
AXIS AZIMUTH	203	36	15	23.66 (DMS)
AXIS AZIMUTH	205	36	12	50.31 (DMS)
AXIS AZIMUTH	307	36	12	37.51 (DMS)
AXIS AZIMUTH	309	36	9	57.04 (DMS)
AXIS AZIMUTH	311	36	5	37.60 (DMS)
AXIS AZIMUTH	502	310	39	6.75 (DMS)
AXIS AZIMUTH	504	310	39	6.75 (DMS)
AXIS AZIMUTH	506	310	39	6.75 (DMS)
AXIS AZIMUTH	408	62	3	54.69 (DMS)
AXIS AZIMUTH	410	62	3	54.69 (DMS)
AXIS AZIMUTH	412	62	3	54.69 (DMS)
AXIS AZIMUTH	214	352	13	31.88 (DMS)
AXIS AZIMUTH	216	352	13	31.88 (DMS)
AXIS AZIMUTH	218	352	13	31.88 (DMS)

AXIS DEFLECTION	201	0	0	17.60	(DMS)
AXIS DEFLECTION	203	0	0	17.59	(DMS)
AXIS DEFLECTION	205	0	0	17.58	(DMS)
AXIS DEFLECTION	307	0	0	17.58	(DMS)
AXIS DEFLECTION	309	0	0	17.59	(DMS)
AXIS DEFLECTION	311	0	0	17.60	(DMS)
AXIS DEFLECTION	502	89	59	34.95	(DMS)
AXIS DEFLECTION	504	89	59	34.94	(DMS)
AXIS DEFLECTION	506	89	59	34.94	(DMS)
AXIS DEFLECTION	408	89	59	49.45	(DMS)
AXIS DEFLECTION	410	89	59	49.47	(DMS)
AXIS DEFLECTION	412	89	59	49.47	(DMS)
AXIS DEFLECTION	214	90	0	42.56	(DMS)
AXIS DEFLECTION	216	90	0	42.56	(DMS)
AXIS DEFLECTION	218	90	0	42.55	(DMS)
ORTHOGONALITY	201	203	0	0	0.01 (DMS)
ORTHOGONALITY	201	205	0	0	0.03 (DMS)
ORTHOGONALITY	201	307	0	0	0.03 (DMS)
ORTHOGONALITY	201	309	0	0	0.04 (DMS)
ORTHOGONALITY	201	311	0	0	0.06 (DMS)
ORTHOGONALITY	201	502	89	59	33.61 (DMS)
ORTHOGONALITY	201	504	89	59	33.60 (DMS)
ORTHOGONALITY	201	506	89	59	33.60 (DMS)
ORTHOGONALITY	201	408	89	59	33.61 (DMS)
ORTHOGONALITY	201	410	89	59	33.62 (DMS)
ORTHOGONALITY	201	412	89	59	33.63 (DMS)
ORTHOGONALITY	201	214	90	0	29.91 (DMS)
ORTHOGONALITY	201	216	90	0	29.91 (DMS)
ORTHOGONALITY	201	218	90	0	29.91 (DMS)
ORTHOGONALITY	203	205	0	0	0.02 (DMS)
ORTHOGONALITY	203	307	0	0	0.02 (DMS)
ORTHOGONALITY	203	309	0	0	0.03 (DMS)
ORTHOGONALITY	203	311	0	0	0.05 (DMS)
ORTHOGONALITY	203	502	89	59	33.60 (DMS)
ORTHOGONALITY	203	504	89	59	33.59 (DMS)
ORTHOGONALITY	203	506	89	59	33.59 (DMS)
ORTHOGONALITY	203	408	89	59	33.62 (DMS)
ORTHOGONALITY	203	410	89	59	33.63 (DMS)
ORTHOGONALITY	203	412	89	59	33.64 (DMS)
ORTHOGONALITY	203	214	90	0	29.92 (DMS)
ORTHOGONALITY	203	216	90	0	29.91 (DMS)
ORTHOGONALITY	203	218	90	0	29.91 (DMS)
ORTHOGONALITY	205	307	0	0	0.00 (DMS)
ORTHOGONALITY	205	309	0	0	0.02 (DMS)
ORTHOGONALITY	205	311	0	0	0.04 (DMS)
ORTHOGONALITY	205	502	89	59	33.59 (DMS)
ORTHOGONALITY	205	504	89	59	33.58 (DMS)
ORTHOGONALITY	205	506	89	59	33.58 (DMS)
ORTHOGONALITY	205	408	89	59	33.63 (DMS)
ORTHOGONALITY	205	410	89	59	33.65 (DMS)
ORTHOGONALITY	205	412	89	59	33.65 (DMS)
ORTHOGONALITY	205	214	90	0	29.91 (DMS)
ORTHOGONALITY	205	216	90	0	29.91 (DMS)
ORTHOGONALITY	205	218	90	0	29.91 (DMS)
ORTHOGONALITY	307	309	0	0	0.02 (DMS)
ORTHOGONALITY	307	311	0	0	0.04 (DMS)
ORTHOGONALITY	307	502	89	59	33.59 (DMS)
ORTHOGONALITY	307	504	89	59	33.58 (DMS)
ORTHOGONALITY	307	506	89	59	33.58 (DMS)
ORTHOGONALITY	307	408	89	59	33.63 (DMS)
ORTHOGONALITY	307	410	89	59	33.65 (DMS)
ORTHOGONALITY	307	412	89	59	33.65 (DMS)
ORTHOGONALITY	307	214	90	0	29.91 (DMS)
ORTHOGONALITY	307	216	90	0	29.91 (DMS)
ORTHOGONALITY	307	218	90	0	29.90 (DMS)
ORTHOGONALITY	309	311	0	0	0.02 (DMS)
ORTHOGONALITY	309	502	89	59	33.57 (DMS)
ORTHOGONALITY	309	504	89	59	33.57 (DMS)
ORTHOGONALITY	309	506	89	59	33.56 (DMS)
ORTHOGONALITY	309	408	89	59	33.63 (DMS)
ORTHOGONALITY	309	410	89	59	33.64 (DMS)
ORTHOGONALITY	309	412	89	59	33.65 (DMS)

ORTHOGONALITY	309	214	90	0	29.90 (DMS)
ORTHOGONALITY	309	216	90	0	29.89 (DMS)
ORTHOGONALITY	309	218	90	0	29.89 (DMS)
ORTHOGONALITY	311	502	89	59	33.55 (DMS)
ORTHOGONALITY	311	504	89	59	33.54 (DMS)
ORTHOGONALITY	311	506	89	59	33.54 (DMS)
ORTHOGONALITY	311	408	89	59	33.63 (DMS)
ORTHOGONALITY	311	410	89	59	33.65 (DMS)
ORTHOGONALITY	311	412	89	59	33.66 (DMS)
ORTHOGONALITY	311	214	90	0	29.88 (DMS)
ORTHOGONALITY	311	216	90	0	29.87 (DMS)
ORTHOGONALITY	311	218	90	0	29.87 (DMS)
ORTHOGONALITY	502	504	0	0	0.00 (DMS)
ORTHOGONALITY	502	506	0	0	0.01 (DMS)
ORTHOGONALITY	502	408	111	24	47.94 (DMS)
ORTHOGONALITY	502	410	111	24	47.94 (DMS)
ORTHOGONALITY	502	412	111	24	47.94 (DMS)
ORTHOGONALITY	502	214	41	34	25.14 (DMS)
ORTHOGONALITY	502	216	41	34	25.14 (DMS)
ORTHOGONALITY	502	218	41	34	25.15 (DMS)
ORTHOGONALITY	504	506	0	0	0.00 (DMS)
ORTHOGONALITY	504	408	111	24	47.94 (DMS)
ORTHOGONALITY	504	410	111	24	47.94 (DMS)
ORTHOGONALITY	504	412	111	24	47.94 (DMS)
ORTHOGONALITY	504	214	41	34	25.14 (DMS)
ORTHOGONALITY	504	216	41	34	25.14 (DMS)
ORTHOGONALITY	504	218	41	34	25.15 (DMS)
ORTHOGONALITY	506	408	111	24	47.94 (DMS)
ORTHOGONALITY	506	410	111	24	47.94 (DMS)
ORTHOGONALITY	506	412	111	24	47.94 (DMS)
ORTHOGONALITY	506	214	41	34	25.14 (DMS)
ORTHOGONALITY	506	216	41	34	25.14 (DMS)
ORTHOGONALITY	506	218	41	34	25.15 (DMS)
ORTHOGONALITY	408	410	0	0	0.01 (DMS)
ORTHOGONALITY	408	412	0	0	0.02 (DMS)
ORTHOGONALITY	408	214	69	50	22.82 (DMS)
ORTHOGONALITY	408	216	69	50	22.81 (DMS)
ORTHOGONALITY	408	218	69	50	22.81 (DMS)
ORTHOGONALITY	410	412	0	0	0.01 (DMS)
ORTHOGONALITY	410	214	69	50	22.82 (DMS)
ORTHOGONALITY	410	216	69	50	22.81 (DMS)
ORTHOGONALITY	410	218	69	50	22.81 (DMS)
ORTHOGONALITY	412	214	69	50	22.82 (DMS)
ORTHOGONALITY	412	216	69	50	22.82 (DMS)
ORTHOGONALITY	412	218	69	50	22.81 (DMS)
ORTHOGONALITY	214	216	0	0	0.00 (DMS)
ORTHOGONALITY	214	218	0	0	0.01 (DMS)
ORTHOGONALITY	216	218	0	0	0.00 (DMS)

	IVP	EAST	NORTH	UP	OFFSET (M)
OFFSET	IVP_1	-1.8857	1.0003	0.0005	2.1346
OFFSET	IVP_2	1.6197	1.3903	0.0002	2.1346
OFFSET	IVP_3	-0.2880	-2.1151	0.0009	2.1346

+++++  
4.15 TARGET ARC LENGTH  
+++++

TARGET : 201

208201	5.2680	-0.0908	-0.0009	201	208
222201	5.0899	-1.3630	-0.0005	201	222
237201	4.5636	-2.6331	-0.0005	201	237
252201	3.7265	-3.7255	-0.0005	201	252
288201	0.8258	-5.2043	0.0013	201	288
303201	-0.5496	-5.2404	0.0015	201	303

95.0 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR      208201      303201



TARGET : 203

208203	5.3126	-0.0203	-0.0007	203	208
222203	5.1499	-1.3053	-0.0004	203	222
237203	4.6366	-2.5930	-0.0004	203	237
252203	3.8077	-3.7058	-0.0002	203	252
288203	0.9030	-5.2359	0.0011	203	288
303203	-0.4833	-5.2907	0.0013	203	303

95.0 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR 208203 303203

TARGET : 205

208205	5.3573	0.0490	0.0003	205	208
222205	5.2099	-1.2490	0.0005	205	222
237205	4.7089	-2.5543	0.0006	205	237
252205	3.8867	-3.6871	-0.0000	205	252
288205	0.9785	-5.2677	-0.0018	205	288
303205	-0.4180	-5.3413	-0.0019	205	303

95.0 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR 208205 303205

TARGET : 307

353307	-0.5501	-5.2398	-0.0002	307	353
23307	-4.9812	-1.7159	-0.0003	307	23
37307	-5.2555	-0.3675	0.0001	307	37
51307	-5.1889	0.9140	0.0000	307	51
65307	-4.8142	2.1420	0.0003	307	65
81307	-4.1510	3.2445	-0.0002	307	81

122.0 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR 353307 81307

TARGET : 309

353309	-0.4838	-5.2902	-0.0002	309	353
23309	-4.9991	-1.7976	0.0001	309	23
37309	-5.2938	-0.4421	-0.0001	309	37
51309	-5.2440	0.8510	-0.0001	309	51
65309	-4.8830	2.0946	0.0002	309	65
81309	-4.2294	3.2152	-0.0003	309	81

122.0 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR 353309 81309

TARGET : 311

353311	-0.4184	-5.3408	0.0013	311	353
23311	-5.0175	-1.8800	0.0009	311	23
37311	-5.3326	-0.5167	0.0009	311	37
51311	-5.2995	0.7882	0.0011	311	51
65311	-4.9518	2.0470	0.0011	311	65
81311	-4.3077	3.1857	0.0011	311	81

122.0 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR 353311 81311

TARGET : 502

108502	1.4297	1.2277	-0.5312	502	108
92502	1.4857	1.2749	-0.0074	502	92
77502	1.4367	1.2338	0.4955	502	77
63502	1.2976	1.1144	0.9520	502	63
48502	1.0644	0.9145	1.3648	502	48
27502	0.6284	0.5402	1.7738	502	27

80.7 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR 108502 27502

TARGET : 504

108504	2.1284	1.8278	-1.2952	504	108
92504	2.3141	1.9865	-0.4972	504	92
77504	2.3328	2.0035	0.3023	504	77
63504	2.2023	1.8909	1.0590	504	63
48504	1.9165	1.6462	1.7785	504	48
27504	1.3145	1.1289	2.5576	504	27

80.7 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR 108504 27504

TARGET : 506

108506	2.1156	1.8164	-0.5963	506	108
92506	2.1594	1.8538	0.1716	506	92
77506	2.0537	1.7637	0.8958	506	77
63506	1.8188	1.5625	1.5421	506	63
48506	1.4513	1.2470	2.1132	506	48
27506	0.7900	0.6783	2.6545	506	27

80.7 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR 108506 27506

TARGET : 408

107408	-1.6697	0.8857	-0.5110	408	107
90408	-1.7284	0.9170	0.0641	408	90
75408	-1.6553	0.8779	0.5660	408	75
60408	-1.4688	0.7790	1.0334	408	60
45408	-1.1827	0.6271	1.4285	408	45
30408	-0.8157	0.4312	1.7269	408	30

77.0 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR 107408 30408

TARGET : 410

107410	-2.4902	1.3204	-1.2651	410	107
90410	-2.7086	1.4360	-0.3858	410	90
75410	-2.7048	1.4345	0.4171	410	75
60410	-2.5167	1.3345	1.1975	410	60
45410	-2.1573	1.1441	1.8932	410	45
30410	-1.6506	0.8749	2.4611	410	30

77.0 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR 107410 30410

TARGET : 412

107412	-2.4685	1.3091	-0.5663	412	107
90412	-2.5073	1.3292	0.2744	412	90
75412	-2.3603	1.2515	0.9965	412	75
60412	-2.0513	1.0871	1.6556	412	60
45412	-1.6036	0.8498	2.1995	412	45
30412	-1.0449	0.5550	2.5952	412	30

76.9 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR 107412 30412

TARGET : 214

30214	-0.1242	-0.9157	1.7258	214	30
45214	-0.1814	-1.3276	1.4277	214	45
60214	-0.2247	-1.6479	1.0314	214	60
75214	-0.2533	-1.8567	0.5663	214	75
90214	-0.2649	-1.9391	0.0624	214	90

60.0 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR 30214 90214

TARGET : 216

30216	-0.2530	-1.8514	2.4600	216	30
45216	-0.3302	-2.4195	1.8928	216	45
60216	-0.3849	-2.8225	1.1967	216	60
75216	-0.4142	-3.0334	0.4197	216	75
90216	-0.4145	-3.0376	-0.3864	216	90
107216	-0.3867	-2.8352	-1.1661	216	107

75.0 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR            30216            107216

TARGET : 218

30218	-0.1579	-1.1728	2.5945	218	30
45218	-0.2450	-1.7979	2.2000	218	45
60218	-0.3141	-2.3003	1.6553	218	60
75218	-0.3615	-2.6460	0.9990	218	75
90218	-0.3843	-2.8117	0.2745	218	90
107218	-0.3808	-2.7860	-0.4692	218	107

75.0 DEGREES OF ARC LENGTH BETWEEN TARGET PAIR            30218            107218

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4.16 SOLUTION REDUCTION  
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SOLUTION REDUCTION

REDUCED VARIANCE-COVARIANCE PARAMETER LIST

- 1. NORTH        7614\_RM1
- 2. EAST        7614\_RM1
- 3. UP           7614\_RM1
- 4. NORTH       7614\_RM2
- 5. EAST        7614\_RM2
- 6. UP           7614\_RM2
- 7. NORTH       BREWSTER\_C
- 8. EAST        BREWSTER\_C
- 9. UP           BREWSTER\_C
- 10. NORTH       BREWSTER\_B
- 11. EAST        BREWSTER\_B
- 12. UP           BREWSTER\_B
- 13. NORTH       BREWSTER\_A
- 14. EAST        BREWSTER\_A
- 15. UP           BREWSTER\_A
- 16. NORTH       BREW\_GPS
- 17. EAST        BREW\_GPS
- 18. UP           BREW\_GPS
- 19. NIVP        IVP\_1
- 20. EIVP        IVP\_1
- 21. UIVP        IVP\_1
- 22. NIVP        IVP\_2
- 23. EIVP        IVP\_2
- 24. UIVP        IVP\_2
- 25. NIVP        IVP\_3
- 26. EIVP        IVP\_3
- 27. UIVP        IVP\_3

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 4.17 REDUCED SOLUTION CORRELATIONS  
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CORRELATION MATRIX (LEGEND: 1=-0.1|0.1, 2=-0.2|0.2,..., A=-1.0|1.0)

A00800700600400000200200200 -- 1.  
 A0090070070050000130130130 -- 2.  
 A0050060050050000000000001 -- 3.  
 A20610600400000010010000 -- 4.  
 A0080160150000010010010 -- 5.  
 A008007006000001001000 -- 6.  
 A10310210000200200200 -- 7.  
 A0060040000240240240 -- 8.  
 A006005000010010011 -- 9.  
 A20610400000000000 -- 10.  
 A0160120010010010 -- 11.  
 A009009001001000 -- 12.  
 A204100000000000 -- 13.  
 A012000000000000 -- 14.  
 A009000000000000 -- 15.  
 A000000000000000 -- 16.  
 A000000000000000 -- 17.  
 A000000000000000 -- 18.  
 A20920920 -- 19.  
 A0290290 -- 20.  
 A009004 -- 21.  
 A20920 -- 22.  
 A0290 -- 23.  
 A004 -- 24.  
 A20 -- 25.  
 A0 -- 26.  
 A -- 27.

+++++  
 4.18 COMPUTED SOLUTION PARAMETER SUMMARY  
 +++++

SOLUTION VARIANCE FACTOR : 0.2255  
 NUMBER OF PARAMETERS : 27  
 NUMBER OF STATIONS : 9  
 NUMBER OF STATION PARA : 27  
 DEGREES OF FREEDOM : 479  
 NUMBER OF AUXILLARY PARA : 0  
 VCV REFERENCE SYSTEM : LOCAL  
 CRD REFERENCE SYSTEM : GEOCENTRIC

GEODETTIC COORDINATES (DMS,DMS,METRES)

SITE	LONGITUDE	LATITUDE	HEIGHT	SEAST	SNORTH	SUP	TARGET	SEQUENCE
7614_RM1 -119	40 59.3719 48	7 51.1039	236.4463 +/-	0.0000	0.0000	0.0000		
7614_RM2 -119	41 2.0376 48	7 53.2223	235.4256 +/-	0.0001	0.0001	0.0001		
BREWSTER_C -119	41 2.6338 48	7 51.8283	235.7369 +/-	0.0001	0.0001	0.0001		
BREWSTER_B -119	40 57.8067 48	7 53.4983	237.1837 +/-	0.0001	0.0001	0.0001		
BREWSTER_A -119	40 57.2899 48	7 53.5134	237.0286 +/-	0.0001	0.0001	0.0001		
BREW_GPS -119	40 57.4854 48	7 53.4844	238.6057 +/-	0.0002	0.0002	0.0001		
IVP_1 -119	40 59.8078 48	7 52.4049	250.4832 +/-	0.0001	0.0001	0.0003		
IVP_2 -119	40 59.8078 48	7 52.4049	250.4832 +/-	0.0001	0.0001	0.0003		
IVP_3 -119	40 59.8078 48	7 52.4049	250.4848 +/-	0.0001	0.0001	0.0004		

CARTESIAN COORDINATES - EARTH CENTRE ORIGIN (METRES)

SITE	X	Y	Z	TARGET SEQUENCE	INDEX
7614_RM1	-2112067.5313	-3705378.8256	4726776.4175		0 1 2
7614_RM2	-2112090.9510	-3705308.6056	4726819.3292		3 4 5
BREWSTER_C	-2112117.6421	-3705330.5376	4726790.8234		6 7 8
BREWSTER_B	-2112012.3840	-3705347.4332	4726826.3277		9 10 11
BREWSTER_A	-2112002.8772	-3705352.3317	4726826.5246		12 13 14
BREW_GPS	-2112007.2413	-3705351.8256	4726827.0996		15 16 17
IVP_1	-2112065.1830	-3705356.5044	4726813.6900		18 19 20
IVP_2	-2112065.1830	-3705356.5044	4726813.6900		21 22 23
IVP_3	-2112065.1836	-3705356.5053	4726813.6912		24 25 26

UTM MAP GRID COORDINATES (METRES)

SITE	EAST	NORTH	HEIGHT	ZONE	TARGET SEQUENCE
7614_RM1	300363.0064	15334327.3525	236.4463	11	
7614_RM2	300310.1996	15334394.6720	235.4256	11	
BREWSTER_C	300296.3768	15334352.0685	235.7369	11	
BREWSTER_B	300397.9331	15334400.1398	237.1837	11	
BREWSTER_A	300408.6285	15334400.2351	237.0286	11	
BREW_GPS	300404.5574	15334399.4784	238.6057	11	
IVP_1	300355.3996	15334367.8281	250.4832	11	
IVP_2	300355.3996	15334367.8281	250.4832	11	
IVP_3	300355.3996	15334367.8281	250.4848	11	

CARTESIAN COORDINATES - REFERENCE MARK ORIGIN (METRES)

SITE	X	Y	Z	TARGET SEQUENCE
7614_RM1	0.0000	0.0000	0.0000	
7614_RM2	-23.4197	70.2200	42.9117	
BREWSTER_C	-50.1109	48.2880	14.4059	
BREWSTER_B	55.1473	31.3924	49.9102	
BREWSTER_A	64.6541	26.4940	50.1071	
BREW_GPS	60.2900	27.0000	50.6821	
IVP_1	2.3482	22.3212	37.2725	
IVP_2	2.3482	22.3212	37.2725	
IVP_3	2.3477	22.3203	37.2737	

LOCAL COORDINATES - REFERENCE MARK ORIGIN (METRES)

SITE	EAST	NORTH	UP	SEAST	SNORTH	SUP	TARGET SEQUENCE
7614_RM1	0.0000	0.0000	0.0000	+/-	0.0000	0.0000	0.0000
7614_RM2	-55.1197	65.4333	-1.0213	+/-	0.0001	0.0001	0.0001
BREWSTER_C	-67.4476	22.3759	-0.7098	+/-	0.0001	0.0001	0.0001
BREWSTER_B	32.3651	73.9573	0.7369	+/-	0.0001	0.0001	0.0001
BREWSTER_A	43.0501	74.4255	0.5817	+/-	0.0001	0.0001	0.0001
BREW_GPS	39.0080	73.5274	2.1589	+/-	0.0002	0.0002	0.0001
IVP_1	-9.0135	40.1836	14.0367	+/-	0.0001	0.0001	0.0003
IVP_2	-9.0135	40.1836	14.0367	+/-	0.0001	0.0001	0.0003
IVP_3	-9.0135	40.1836	14.0383	+/-	0.0001	0.0001	0.0004

SOLUTION VARIANCE FACTOR : 0.2255  
 NUMBER OF PARAMETERS : 27  
 NUMBER OF STATIONS : 9  
 NUMBER OF STATION PARA : 27  
 DEGREES OF FREEDOM : 479  
 NUMBER OF AUXILLARY PARA : 0  
 VCV REFERENCE SYSTEM : LOCAL  
 CRD REFERENCE SYSTEM : GEOCENTRIC

GEODETTIC COORDINATES (DMS,DMS,METRES)

SITE	LONGITUDE	LATITUDE	HEIGHT	SEAST	SNORTH	SUP	TARGET SEQUENCE
7614_RM1	-119 40 59.3719	48 7 51.1039	236.4463 +/-	0.0000	0.0000	0.0000	
7614_RM2	-119 41 2.0376	48 7 53.2223	235.4256 +/-	0.0001	0.0001	0.0001	
BREWSTER_C	-119 41 2.6338	48 7 51.8283	235.7369 +/-	0.0001	0.0001	0.0001	
BREWSTER_B	-119 40 57.8067	48 7 53.4983	237.1837 +/-	0.0001	0.0001	0.0001	
BREWSTER_A	-119 40 57.2899	48 7 53.5134	237.0286 +/-	0.0001	0.0001	0.0001	
BREW_GPS	-119 40 57.4854	48 7 53.4844	238.6057 +/-	0.0002	0.0002	0.0001	
IVP_1	-119 40 59.8078	48 7 52.4049	250.4832 +/-	0.0001	0.0001	0.0003	
IVP_2	-119 40 59.8078	48 7 52.4049	250.4832 +/-	0.0001	0.0001	0.0003	

IVP\_3 -119 40 59.8078 48 7 52.4049 250.4848 +/- 0.0001 0.0001 0.0004

CARTESIAN COORDINATES - EARTH CENTRE ORIGIN (METRES)

SITE	X	Y	Z	TARGET SEQUENCE	INDEX
7614_RM1	-2112067.5313	-3705378.8256	4726776.4175		0 1 2
7614_RM2	-2112090.9510	-3705308.6056	4726819.3292		3 4 5
BREWSTER_C	-2112117.6421	-3705330.5376	4726790.8234		6 7 8
BREWSTER_B	-2112012.3840	-3705347.4332	4726826.3277		9 10 11
BREWSTER_A	-2112002.8772	-3705352.3317	4726826.5246		12 13 14
BREW_GPS	-2112007.2413	-3705351.8256	4726827.0996		15 16 17
IVP_1	-2112065.1830	-3705356.5044	4726813.6900		18 19 20
IVP_2	-2112065.1830	-3705356.5044	4726813.6900		21 22 23
IVP_3	-2112065.1836	-3705356.5053	4726813.6912		24 25 26

UTM MAP GRID COORDINATES (METRES)

SITE	EAST	NORTH	HEIGHT	ZONE	TARGET SEQUENCE
7614_RM1	300363.0064	15334327.3525	236.4463	11	
7614_RM2	300310.1996	15334394.6720	235.4256	11	
BREWSTER_C	300296.3768	15334352.0685	235.7369	11	
BREWSTER_B	300397.9331	15334400.1398	237.1837	11	
BREWSTER_A	300408.6285	15334400.2351	237.0286	11	
BREW_GPS	300404.5574	15334399.4784	238.6057	11	
IVP_1	300355.3996	15334367.8281	250.4832	11	
IVP_2	300355.3996	15334367.8281	250.4832	11	
IVP_3	300355.3996	15334367.8281	250.4848	11	

CARTESIAN COORDINATES - REFERENCE MARK ORIGIN (METRES)

SITE	X	Y	Z	TARGET SEQUENCE
7614_RM1	0.0000	0.0000	0.0000	
7614_RM2	-23.4197	70.2200	42.9117	
BREWSTER_C	-50.1109	48.2880	14.4059	
BREWSTER_B	55.1473	31.3924	49.9102	
BREWSTER_A	64.6541	26.4940	50.1071	
BREW_GPS	60.2900	27.0000	50.6821	
IVP_1	2.3482	22.3212	37.2725	
IVP_2	2.3482	22.3212	37.2725	
IVP_3	2.3477	22.3203	37.2737	

LOCAL COORDINATES - REFERENCE MARK ORIGIN (METRES)

SITE	EAST	NORTH	UP	SEAST	SNORTH	SUP	TARGET SEQUENCE
7614_RM1	0.0000	0.0000	0.0000	+/-	0.0000	0.0000	0.0000
7614_RM2	-55.1197	65.4333	-1.0213	+/-	0.0001	0.0001	0.0001
BREWSTER_C	-67.4476	22.3759	-0.7098	+/-	0.0001	0.0001	0.0001
BREWSTER_B	32.3651	73.9573	0.7369	+/-	0.0001	0.0001	0.0001
BREWSTER_A	43.0501	74.4255	0.5817	+/-	0.0001	0.0001	0.0001
BREW_GPS	39.0080	73.5274	2.1589	+/-	0.0002	0.0002	0.0001
IVP_1	-9.0135	40.1836	14.0367	+/-	0.0001	0.0001	0.0003
IVP_2	-9.0135	40.1836	14.0367	+/-	0.0001	0.0001	0.0003
IVP_3	-9.0135	40.1836	14.0383	+/-	0.0001	0.0001	0.0004

CORRELATION MATRIX (LEGEND: 1=-0.1|0.1, 2=-0.2|0.2,..., A=-1.0|1.0)

```

A00800700600400000200200200 -- 1.
A0090070070050000130130130 -- 2.
A00500600500500000000000001 -- 3.
A20610600400000010010000 -- 4.
A0080160150000010010010 -- 5.
A0080070060000001001000 -- 6.
A10310210000200200200 -- 7.
A0060040000240240240 -- 8.
A006005000010010011 -- 9.
A206104000000000000 -- 10.
A0160120010010010 -- 11.
A009009001001000 -- 12.
A20410000000000 -- 13.
A01200000000000 -- 14.
A00900000000000 -- 15.
A00000000000000 -- 16.
A00000000000000 -- 17.
A0000000000 -- 18.
A20920920 -- 19.
A0290290 -- 20.
A009004 -- 21.
A20920 -- 22.
A0290 -- 23.
A004 -- 24.
A20 -- 25.
A0 -- 26.
A -- 27.

```

+++++  
5. GEOCENTRIC VCV TRANSFORMATION  
+++++

TRANSFORM VARIANCE-COVARIANCE MATRIX Q(NEH) TO Q(XYZ)

CARTESIAN COORDINATES - EARTH CENTRE ORIGIN (METRES)

SITE	X	Y	Z		SX	SY	SZ
7614_RM1	-2112067.5313	-3705378.8256	4726776.4175	+/-	0.0001	0.0001	0.0001
7614_RM2	-2112090.9510	-3705308.6056	4726819.3292	+/-	0.0001	0.0002	0.0002
BREWSTER_C	-2112117.6421	-3705330.5376	4726790.8234	+/-	0.0001	0.0002	0.0002
BREWSTER_B	-2112012.3840	-3705347.4332	4726826.3277	+/-	0.0001	0.0002	0.0002
BREWSTER_A	-2112002.8772	-3705352.3317	4726826.5246	+/-	0.0002	0.0002	0.0002
BREW_GPS	-2112007.2413	-3705351.8256	4726827.0996	+/-	0.0004	0.0003	0.0003
IVP_1	-2112065.1830	-3705356.5044	4726813.6900	+/-	0.0002	0.0003	0.0004
IVP_2	-2112065.1830	-3705356.5044	4726813.6900	+/-	0.0002	0.0003	0.0004
IVP_3	-2112065.1836	-3705356.5053	4726813.6912	+/-	0.0003	0.0006	0.0007

++++++  
6. SINEX GENERATION  
++++++

REDUCED VARIANCE-COVARIANCE PARAMETER LIST

- 1. STAX 7614\_RM1
- 2. STAY 7614\_RM1
- 3. STAZ 7614\_RM1
- 4. STAX BREWSTER\_C
- 5. STAY BREWSTER\_C
- 6. STAZ BREWSTER\_C
- 7. STAX 7614\_RM2
- 8. STAY 7614\_RM2
- 9. STAZ 7614\_RM2
- 10. STAX BREWSTER\_B
- 11. STAY BREWSTER\_B
- 12. STAZ BREWSTER\_B
- 13. STAX BREWSTER\_A
- 14. STAY BREWSTER\_A
- 15. STAZ BREWSTER\_A
- 16. STAX BREW\_GPS
- 17. STAY BREW\_GPS
- 18. STAZ BREW\_GPS
- 19. STAX IVP\_1
- 20. STAY IVP\_1
- 21. STAZ IVP\_1



CORRELATION MATRIX

```

1.000 0.000-0.027 0.741 0.026 0.018 0.890-0.028-0.025 0.771-0.005 0.024 0.548 0.000-0.000 0.000 0.000 0.000 0.181 0.012 0.076
  1.000-0.015 0.063 0.670-0.002-0.017 0.699 0.006-0.036 0.591-0.006-0.000 0.465-0.000 0.000 0.000 0.000-0.090 0.070 0.051
    1.000 0.006-0.003 0.693-0.002-0.015 0.642 0.013 0.008 0.598 0.000 0.000 0.503 0.000 0.000 0.000 0.076 0.081 0.021
      1.000 0.116-0.139 0.832 0.034-0.257 0.726-0.007-0.120 0.527-0.027-0.107 0.000 0.000 0.000 0.158-0.106-0.070
        1.000-0.095 0.149 0.740-0.203 0.126 0.429-0.187 0.079 0.304-0.154 0.000 0.000 0.000 0.081 0.138 0.027
          1.000-0.209-0.230 0.778-0.048-0.231 0.521-0.013-0.182 0.398 0.000 0.000 0.000-0.020 0.023 0.106
            1.000 0.179-0.333 0.732 0.074-0.278 0.554 0.021-0.176 0.000 0.000 0.000 0.120 0.091-0.082
              1.000-0.296 0.167 0.695-0.207 0.064 0.498-0.131 0.000 0.000 0.000 0.033 0.120-0.129
                1.000-0.162-0.236 0.759-0.107-0.134 0.544 0.000 0.000 0.000-0.147-0.150 0.144
                  1.000 0.033-0.259 0.639 0.061-0.262 0.289 0.049-0.177 0.147 0.078-0.066
                    1.000-0.113 0.073 0.756-0.148 0.036 0.507-0.104 0.098 0.107-0.108
                      1.000-0.225-0.144 0.843-0.087-0.090 0.644-0.096-0.139 0.145
                        1.000-0.082-0.125 0.268 0.002-0.135 0.000 0.000 0.000
                          1.000 0.121-0.013 0.529 0.006 0.000 0.000 0.000
                            1.000-0.089 0.014 0.621 0.000 0.000 0.000
                              1.000-0.377 0.203 0.000 0.000 0.000
                                1.000 0.321 0.000 0.000 0.000
                                  1.000 0.000 0.000 0.000
                                    1.000 0.822-0.636
                                      1.000-0.795
                                        1.000

```

+++++  
 6.1 USER INPUT SINEX INFORMATION  
 +++++

SINEX STATIONS :

```

7614_RM1 <<<>>> BRM1 A ----- 1 BREWSTER 7614 RM 1 NS
BREWSTER_C <<<>>> BREC A ----- 1 BREWSTER C NS

7614_RM2 <<<>>> BRM2 A ----- 1 BREWSTER 7614 RM 2 NS
BREWSTER_B <<<>>> BREB A ----- 1 BREWSTER B NS

BREWSTER_A <<<>>> BREB A ----- 1 BREWSTER A NS

BREW_GPS <<<>>> BREW A 40473M001 1 Divot on a SCIGN mount
IVP_1 <<<>>> 7614 A 40473S001 1 25-M VLBA ANTENNA REFE
  
```

CARTESIAN COORDINATES - EARTH CENTRE ORIGIN (METRES) - VARIANCE-COVARIANCE

SITE	X	Y	Z	SX	SY	SZ
7614_RM1	-2112067.5313	-3705378.8256	4726776.4175	0.0000	0.0000	0.0000
BREWSTER_C	-2112117.6421	-3705330.5376	4726790.8234	0.0001	0.0001	0.0001
7614_RM2	-2112090.9510	-3705308.6056	4726819.3292	0.0001	0.0001	0.0001
BREWSTER_B	-2112012.3840	-3705347.4332	4726826.3277	0.0001	0.0001	0.0001
BREWSTER_A	-2112002.8772	-3705352.3317	4726826.5246	0.0001	0.0001	0.0001
BREW_GPS	-2112007.2413	-3705351.8256	4726827.0996	0.0002	0.0002	0.0001
IVP_1	-2112065.1830	-3705356.5044	4726813.6900	0.0001	0.0002	0.0002

SOLUTION VARIANCE FACTOR : 0.2255

CARTESIAN COORDINATES - EARTH CENTRE ORIGIN (METRES) - COFACTOR

SITE	X	Y	Z	SX	SY	SZ
7614_RM1	-2112067.5313	-3705378.8256	4726776.4175	0.0001	0.0001	0.0001
BREWSTER_C	-2112117.6421	-3705330.5376	4726790.8234	0.0001	0.0002	0.0002
7614_RM2	-2112090.9510	-3705308.6056	4726819.3292	0.0001	0.0002	0.0002
BREWSTER_B	-2112012.3840	-3705347.4332	4726826.3277	0.0001	0.0002	0.0002
BREWSTER_A	-2112002.8772	-3705352.3317	4726826.5246	0.0002	0.0002	0.0002
BREW_GPS	-2112007.2413	-3705351.8256	4726827.0996	0.0004	0.0003	0.0003
IVP_1	-2112065.1830	-3705356.5044	4726813.6900	0.0002	0.0003	0.0004

WARNING: sinex output request is without apriori data

Normal Termination

## F. SINEX File NGSBREW1107GA.SNX

```

%=SNX 1.00 AUS 12:094:60756 AUS 11:209:00000 11:210:00000 C 00021 2 X
+FILE/REFERENCE
DESCRIPTION      Terrestrial Survey Tie
OUTPUT           SSC SINEX
CONTACT
SOFTWARE         axis version 1.07
HARDWARE
INPUT            Terrestrial Survey Solution
-FILE/REFERENCE
+FILE/COMMENT
* axis software by John Dawson Geoscience Australia
-FILE/COMMENT
+SITE/ID
BRM1  A  ----- C BREWSTER 7614 RM 1 NS  -119 40 59.4  48  7 51.1  236.4
BREC  A  ----- C BREWSTER C NS          -119 41   2.6  48  7 51.8  235.7
BRM2  A  ----- C BREWSTER 7614 RM 2 NS  -119 41   2.0  48  7 53.2  235.4
BREB  A  ----- C BREWSTER B NS          -119 40 57.8  48  7 53.5  237.2
BREA  A  ----- C BREWSTER A NS          -119 40 57.3  48  7 53.5  237.0
BREW  A 40473M001 C Divot on a SCIGN mount -119 40 57.5  48  7 53.5  238.6
7614  A 40473S001 C 25-M VLBA ANTENNA REFE -119 40 59.8  48  7 52.4  250.5
-SITE/ID
+SITE/DATA
BRM1  A    1 BRM1  A    1 11:209:00000 11:210:00000 --- 11:209:43200
BREC  A    1 BREC  A    1 11:209:00000 11:210:00000 --- 11:209:43200
BRM2  A    1 BRM2  A    1 11:209:00000 11:210:00000 --- 11:209:43200
BREB  A    1 BREB  A    1 11:209:00000 11:210:00000 --- 11:209:43200
BREA  A    1 BREA  A    1 11:209:00000 11:210:00000 --- 11:209:43200
BREW  A    1 BREW  A    1 11:209:00000 11:210:00000 --- 11:209:43200
7614  A    1 7614  A    1 11:209:00000 11:210:00000 --- 11:209:43200
-SITE/DATA
+SOLUTION/EPOCHS
BRM1  A    1 C 11:209:00000 11:210:00000 11:209:43200
BREC  A    1 C 11:209:00000 11:210:00000 11:209:43200
BRM2  A    1 C 11:209:00000 11:210:00000 11:209:43200
BREB  A    1 C 11:209:00000 11:210:00000 11:209:43200
BREA  A    1 C 11:209:00000 11:210:00000 11:209:43200
BREW  A    1 C 11:209:00000 11:210:00000 11:209:43200
7614  A    1 C 11:209:00000 11:210:00000 11:209:43200
-SOLUTION/EPOCHS
+SOLUTION/STATISTICS
VARIANCE FACTOR          2.254563925707999e-01
SQUARE SUM OF RESIDUALS  1.079936120414132e+02
NUMBER OF OBSERVATIONS           500
NUMBER OF UNKNOWNNS              21
-SOLUTION/STATISTICS
+SOLUTION/ESTIMATE
  1 STAX  BRM1  A    1 11:209:43200 m    2 -2.11206753126919e+06  9.69063e-05
  2 STAX  BRM1  A    1 11:209:43200 m    2 -3.70537882561075e+06  9.72110e-05
  3 STAX  BRM1  A    1 11:209:43200 m    2  4.72677641750999e+06  9.69512e-05
  4 STAX  BREC  A    1 11:209:43200 m    2 -2.11211764213565e+06  1.40584e-04
  5 STAX  BREC  A    1 11:209:43200 m    2 -3.70533053761380e+06  1.66033e-04
  6 STAX  BREC  A    1 11:209:43200 m    2  4.72679082337353e+06  1.69601e-04
  7 STAX  BRM2  A    1 11:209:43200 m    2 -2.11209095099327e+06  1.20352e-04
  8 STAX  BRM2  A    1 11:209:43200 m    2 -3.70530860564837e+06  1.53954e-04
  9 STAX  BRM2  A    1 11:209:43200 m    2  4.72681932920696e+06  1.62671e-04
 10 STAX  BREB  A    1 11:209:43200 m    2 -2.11201238401245e+06  1.41212e-04
 11 STAX  BREB  A    1 11:209:43200 m    2 -3.70534743322831e+06  1.72640e-04
 12 STAX  BREB  A    1 11:209:43200 m    2  4.72682632767037e+06  1.70402e-04
 13 STAX  BREA  A    1 11:209:43200 m    2 -2.11200287718815e+06  1.88388e-04
 14 STAX  BREA  A    1 11:209:43200 m    2 -3.70535233165453e+06  2.21080e-04
 15 STAX  BREA  A    1 11:209:43200 m    2  4.72682652463717e+06  2.04867e-04
 16 STAX  BREW  A    1 11:209:43200 m    2 -2.11200724129061e+06  4.48639e-04
 17 STAX  BREW  A    1 11:209:43200 m    2 -3.70535182557570e+06  3.38598e-04
 18 STAX  BREW  A    1 11:209:43200 m    2  4.72682709962058e+06  2.79060e-04
 19 STAX  7614  A    1 11:209:43200 m    2 -2.11206518304644e+06  2.35985e-04
 20 STAX  7614  A    1 11:209:43200 m    2 -3.70535650441062e+06  3.48437e-04
 21 STAX  7614  A    1 11:209:43200 m    2  4.72681369004207e+06  4.45951e-04
-SOLUTION/ESTIMATE

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+SOLUTION/MATRIX\_ESTIMATE U COVA

1	1	9.39082516099070e-09	2.01715294697795e-12	-2.49140042852970e-10
1	4	1.00981290089750e-08	4.19714995516943e-10	3.01913465513474e-10
1	7	1.03817276382102e-08	-4.19457770763135e-10	-3.96671609848295e-10
1	10	1.05441209232140e-08	-8.32094401169093e-11	3.95225841849515e-10
1	13	9.9999999932322e-09	1.00937876075801e-13	-5.78480386824049e-14
1	16	0.00000000000000e+00	0.00000000000000e+00	0.00000000000000e+00
1	19	4.13482580810522e-09	3.96554469212477e-10	3.26736208352997e-09
2	2	9.44998546156556e-09	-1.44749711102085e-10	8.56319067899023e-10
2	5	1.08133466320542e-08	-3.02997126272621e-11	-1.94826453522287e-10
2	8	1.04629145714180e-08	9.60533026434922e-11	-4.89980731477231e-10
2	11	9.91111783531667e-09	-9.98305215385192e-11	-1.00938463004793e-13
2	14	9.9999999897561e-09	-1.01487710290176e-13	0.00000000000000e+00
2	17	0.00000000000000e+00	0.00000000000000e+00	-2.06698544920098e-09
2	20	2.35649256604733e-09	2.22347411784442e-09	
3	3	9.39954167773184e-09	8.21523849464596e-11	-4.74742251167693e-11
3	6	1.13967015047023e-08	-2.41146289707688e-11	-2.21217569788688e-10
3	9	1.01311414598763e-08	1.76853941346086e-10	1.36313973411081e-10
3	12	9.87319791838000e-09	5.78470143628987e-14	1.01488294283403e-13
3	15	9.9999999931776e-09	0.00000000000000e+00	0.00000000000000e+00
3	18	0.00000000000000e+00	1.73709894128716e-09	2.72815242627537e-09
3	21	9.17152221473075e-10		
4	4	1.97638859849465e-08	2.71856875207472e-09	-3.31204899123495e-09
4	7	1.40746013572830e-08	7.32399940895586e-10	-5.87552813899759e-09
4	10	1.44135146693081e-08	-1.62726544914317e-10	-2.87066245029554e-09
4	13	1.39540290160631e-08	-8.40183361719758e-10	-3.09113378677961e-09
4	16	0.00000000000000e+00	0.00000000000000e+00	0.00000000000000e+00
4	19	5.25012149985672e-09	-5.21402464155748e-09	-4.38702347673084e-09
5	5	2.75671227949957e-08	-2.66493928739368e-09	2.96833471472559e-09
5	8	1.89062599550857e-08	-5.49132184664064e-09	2.95427664107506e-09
5	11	1.22934255383917e-08	-5.30392434504606e-09	2.47046063995094e-09
5	14	1.11653006392812e-08	-5.23841306439573e-09	0.00000000000000e+00
5	17	0.00000000000000e+00	0.00000000000000e+00	3.18368116401980e-09
5	20	7.98905487014015e-09	2.00585920113727e-09	
6	6	2.87646564911356e-08	-4.26729265173407e-09	-5.99727544832850e-09
6	9	2.14738950813666e-08	-1.14885220259370e-09	-6.75746019254802e-09
6	12	1.50497199890831e-08	-4.02680780374491e-10	-6.81726318726901e-09
6	15	1.38461505257990e-08	0.00000000000000e+00	0.00000000000000e+00
6	18	0.00000000000000e+00	-7.88026833810001e-10	1.36899041966376e-09
6	21	8.04915206528118e-09		
7	7	1.44845187753267e-08	3.30936777936231e-09	-6.52468266411912e-09
7	10	1.24394003189412e-08	1.52948932090512e-09	-5.70703034098001e-09
7	13	1.25662599778963e-08	5.53338406267899e-10	-4.34045908767310e-09
7	16	0.00000000000000e+00	0.00000000000000e+00	0.00000000000000e+00
7	19	3.41730560634651e-09	3.82311357831861e-09	-4.42456170297450e-09
8	8	2.37019023859842e-08	-7.40617653374101e-09	3.62930190916137e-09
8	11	1.84782699239047e-08	-5.43832924877447e-09	1.85383704315572e-09
8	14	1.69577095962469e-08	-4.12001944500561e-09	0.00000000000000e+00
8	17	0.00000000000000e+00	0.00000000000000e+00	1.18141403330354e-09
8	20	6.41103095451571e-09	-8.88853446479687e-09	
9	9	2.64620018190026e-08	-3.71240691110951e-09	-6.61973022594253e-09
9	12	2.10440165785418e-08	-3.26607195765960e-09	-4.80227585420192e-09
9	15	1.81262606245275e-08	0.00000000000000e+00	0.00000000000000e+00
9	18	0.00000000000000e+00	-5.66200411493191e-09	-8.51162294801072e-09
9	21	1.04790813003835e-08		
10	10	1.99409278375235e-08	7.92731920770485e-10	-6.22662325923771e-09
10	13	1.70053470462914e-08	1.89704671884057e-09	-7.58360400986054e-09
10	16	1.83119518966635e-08	2.36388159184367e-09	-6.96162745037194e-09
10	19	4.90971620048288e-09	3.85515924361914e-09	-4.15575036446066e-09
11	11	2.98046422077197e-08	-3.33534463858081e-09	2.36662883472591e-09
11	14	2.88727048879658e-08	-5.23434632853009e-09	2.79294966169044e-09
11	17	2.96515727401539e-08	-4.99612049269089e-09	4.00087945986698e-09
11	20	6.46465236161922e-09	-8.34454355892546e-09	
12	12	2.90368128797258e-08	-7.21021296653675e-09	-5.43973747280719e-09
12	15	2.94437509632655e-08	-6.62082679884627e-09	-5.18743428870330e-09
12	18	3.06160888111089e-08	-3.86246671620078e-09	-8.22774431090621e-09
12	21	1.10200431007422e-08		
13	13	3.54900577343813e-08	-3.39896327573699e-09	-4.81954104650004e-09
13	16	2.26831994470134e-08	1.07992939352490e-10	-7.11087334158292e-09
13	19	0.00000000000000e+00	0.00000000000000e+00	0.00000000000000e+00
14	14	4.88764899258533e-08	5.48348837819599e-09	-1.28195379912962e-09
14	17	3.96229170479222e-08	3.68888953555337e-10	0.00000000000000e+00
14	20	0.00000000000000e+00	0.00000000000000e+00	

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15 15 4.19705307824616e-08 -8.19559757382276e-09 9.83708685350373e-10
15 18 3.54911204872408e-08 0.00000000000000e+00 0.00000000000000e+00
15 21 0.00000000000000e+00
16 16 2.01277120537944e-07 -5.72866367868036e-08 2.54120362310497e-08
16 19 0.00000000000000e+00 0.00000000000000e+00 0.00000000000000e+00
17 17 1.14648799109976e-07 3.03323503127306e-08 0.00000000000000e+00
17 20 0.00000000000000e+00 0.00000000000000e+00
18 18 7.78746737285577e-08 0.00000000000000e+00 0.00000000000000e+00
18 21 0.00000000000000e+00
19 19 5.56891165769885e-08 6.76092759440077e-08 -6.69777721726550e-08
20 20 1.21408093462092e-07 -1.23587005546908e-07
21 21 1.98872299889724e-07
-SOLUTION/MATRIX_ESTIMATE U COVA
%ENDSNX

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## G. GPS Covariant Terms

### Covariant Terms Adjustment performed in **ITRF2008 (2011/07/28)**

From Point	To Point	Components	A-posteriori Error (2.58s)	Horiz. Precision (Ratio)	3-D Precision (Ratio)
BREWSTER B	7614 RM2	Az. 264°26'07.2440" DHt. -1.7577m Dist 87.8954m	0°00'00.6985" 0.0015m 0.0002m	1:484274	1:484274
BREWSTER B	BREW GPS	Az. 93°41'35.9257" DHt. 1.4224m Dist. 6.6557m	0°00'11.6371" 0.0022m 0.0002m	1:27829	1:27829
7614 RM2	BREWSTER C	Az. 195°58'37.0913" DHt. 0.3106m Dist. 44.7856m	0°00'00.9146" 0.0017m 0.0003m	1:141680	1:141680
BREWSTER C	7614 RM1	Az. 108°21'10.2032" DHt. 0.7084m Dist. 71.0598m	0°00'00.8360" 0.0015m 0.0002m	1:381120	1:381120
BREW GPS	7614 RM1	Az. 207°56'47.3546" DHt. -2.1611m Dist. 83.2313m	0°00'00.7271" 0.0023m 0.0004m	1:210462	1:210462

# H. IERS ITRS Product Center SINEX File

=SNX 1.00 IGN 12:17:00000 IGN 11:209:00000 00:000:00000 C 12 2 X V

-----  
 FILE/REFERENCE

DESCRIPTION IGN/ENSG/LAREG: IERS ITRS Product Center  
 OUTPUT ITRF2008 station positions and velocities  
 CONTACT Zuheir Altamimi (altamimi@ensg.ign.fr)  
 SOFTWARE CATREF  
 INPUT ITRF2008 solution

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 FILE/REFERENCE

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 FILE/COMMENT

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 FILE/COMMENT

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 SITE/ID

CODE	PT	DOMES	T	STATION DESCRIPTION	APPROX_LON	APPROX_LAT	APP_H
7614	A	40473S001	BR-VLBA	VLBA at Brews	240 19 0.1	48 7 52.4	250.5
BREW	A	40473M001	Brewster,	USA	240 19 2.5	48 7 53.4	238.6

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 SITE/ID

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 SOLUTION/ESTIMATE

INDEX	TYPE	CODE	PT	SOLN	REF_EPOCH	UNIT	S	ESTIMATED VALUE	STD_DEV
1	STAX	7614	A	1	11:209:00000	m	2	-.211206518460134E+07	.91655E-03
2	STAY	7614	A	1	11:209:00000	m	2	-.370535650054477E+07	.10948E-02
3	STAZ	7614	A	1	11:209:00000	m	2	.472681368525323E+07	.11253E-02
4	VELX	7614	A	1	11:209:00000	m/y	2	-.146163649764825E-01	.54990E-04
5	VELY	7614	A	1	11:209:00000	m/y	2	.485633362646867E-03	.72517E-04
6	VELZ	7614	A	1	11:209:00000	m/y	2	-.728198205663067E-02	.86603E-04
7	STAX	BREW	A	1	11:209:00000	m	2	-.211200724207058E+07	.75872E-03
8	STAY	BREW	A	1	11:209:00000	m	2	-.370535182485362E+07	.86947E-03
9	STAZ	BREW	A	1	11:209:00000	m	2	.472682710082430E+07	.10039E-02
10	VELX	BREW	A	1	11:209:00000	m/y	2	-.147974565878393E-01	.47676E-04
11	VELY	BREW	A	1	11:209:00000	m/y	2	.407196603096009E-04	.64452E-04
12	VELZ	BREW	A	1	11:209:00000	m/y	2	-.702469125984587E-02	.78469E-04

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 SOLUTION/ESTIMATE

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 SOLUTION/MATRIX\_ESTIMATE L COVA

PARA1	PARA2	PARA2+0	PARA2+1	PARA2+2
1	1	.840078766851520E-06		
2	1	.615370626611164E-08	.119880044589320E-05	
3	1	-.852210902658328E-07	-.449874015897405E-06	.126640639111849E-05
4	1	.321981112967704E-07	.140007332779988E-07	-.205101587558502E-07
4	4	.302393718538500E-08		
5	1	.138847390771404E-07	.581043874591471E-07	-.449965846871967E-07
5	4	.132961512461808E-08	.525879782515703E-08	
6	1	-.202500740000722E-07	-.454099163906780E-07	.795646093422695E-07
6	4	-.180703300596000E-08	-.409101078882455E-08	.750008968734451E-08
7	1	.387202178574853E-06	.107737212358170E-06	-.208790530164569E-07
7	4	.155911629953217E-07	.102526914211368E-07	-.131747493933176E-07
7	7	.575657023254572E-06		
8	1	.732390789462452E-07	.483738131073824E-06	-.265482508513306E-06
8	4	.883797620866098E-08	.281806720953564E-07	-.272304223485393E-07
8	7	.217321367899109E-06	.755982243248962E-06	
9	1	.184489573376551E-07	-.232304709991833E-06	.730738021341350E-06
9	4	-.103006361981293E-07	-.249485527888491E-07	.464379725787024E-07
9	7	-.994879634833109E-07	-.449805821387266E-06	.100790948849008E-05
10	1	.157977765591310E-07	.100726870519486E-07	-.130694656229289E-07
10	4	.163828480469548E-08	.927647693851237E-09	-.123348021797044E-08
10	7	.205712763080362E-07	.147520021100119E-07	-.167196465640031E-07

10	10	.227307018993514E-08			
11	1	.884540785112223E-08	.282544347393380E-07	-.273271244210928E-07	
11	4	.824901682414758E-09	.279776854123811E-08	-.261893054304999E-08	
11	7	.149828751796138E-07	.378632081320734E-07	-.341903942017809E-07	
11	10	.160468637813901E-08	.415412156340397E-08		
12	1	-.101781151561014E-07	-.253196674940645E-07	.468121992813068E-07	
12	4	-.955547255488034E-09	-.240884521865238E-08	.463771374063560E-08	
12	7	-.171747946669427E-07	-.344035341364580E-07	.561082145759073E-07	
12	10	-.185077058187429E-08	-.372182744512901E-08	.615748702720247E-08	

SOLUTION/MATRIX\_ESTIMATE L COVA  
ENDSNX



## I. NRAO Captured Meteorological Data

For period of survey observations on the elevation axis of the radio telescope at Brewster (7614 VLBA) beginning on 27-July-2011 at 1612 hrs UTC (0912 local) and ending at 2334 hrs UTC (1634 local) of the same day.

*SC: station code*

*DT: data type (WEAther)*

*Tmp: temperature (°Celsius)*

*DP: dew point (°Celsius)*

*Press: barometric pressure (millibars)*

*WS: average wind speed (kilometers per hour)*

*G: wind gust (kilometers per hour)*

*Dir: wind direction (azimuth from North)*

*P: daily accumulated precipitation*

SC	Date	Time	DT	Tmp	DP	Press	WS	G	Dir	P
	yyyymmdd	hhmmss		°C	°C	mbar	k/h	k/h		
BR	20110727	160832	WEA 7F	22.1	7.4	986.0	1.2	1.4	226.0	0.0
BR	20110727	161704	WEA 7F	22.5	7.1	985.9	0.9	1.4	218.0	0.0
BR	20110727	162536	WEA 7F	21.1	6.6	985.9	1.4	1.8	167.0	0.0
BR	20110727	163408	WEA 7F	21.6	6.9	986.0	1.2	1.9	138.0	0.0
BR	20110727	164240	WEA 7F	21.9	6.7	986.1	1.2	2.1	127.0	0.0
BR	20110727	165112	WEA 7F	22.0	6.7	986.1	1.3	2.1	157.0	0.0
BR	20110727	165944	WEA 7F	21.8	6.7	986.1	0.9	1.8	164.0	0.0
BR	20110727	170816	WEA 7F	23.1	6.7	986.0	2.1	2.3	359.0	0.0
BR	20110727	171648	WEA 7F	23.0	6.5	986.1	1.5	2.8	56.0	0.0
BR	20110727	172520	WEA 7F	23.7	6.3	985.9	0.8	2.5	230.0	0.0
BR	20110727	173352	WEA 7F	23.0	6.7	985.9	1.2	2.1	90.0	0.0
BR	20110727	174224	WEA 7F	24.4	7.1	985.9	1.0	1.8	359.0	0.0
BR	20110727	175056	WEA 7F	24.7	6.9	985.9	1.5	3.0	312.0	0.0
BR	20110727	175928	WEA 7F	24.1	6.8	985.9	1.0	1.8	49.0	0.0
BR	20110727	180800	WEA 7F	23.5	6.9	985.8	1.2	2.8	108.0	0.0
BR	20110727	181632	WEA 7F	24.2	6.4	985.6	1.4	2.5	157.0	0.0
BR	20110727	182504	WEA 7F	24.4	6.9	985.6	2.4	3.2	42.0	0.0
BR	20110727	183336	WEA 7F	24.5	6.6	985.6	2.8	3.2	51.0	0.0
BR	20110727	184208	WEA 7F	25.2	6.8	985.5	1.5	3.2	121.0	0.0
BR	20110727	185040	WEA 7F	25.1	7.6	985.6	2.2	3.5	359.0	0.0
BR	20110727	185912	WEA 7F	25.3	6.9	985.4	0.7	2.8	227.0	0.0
BR	20110727	190744	WEA 7F	25.3	6.8	985.5	1.0	2.5	339.0	0.0
BR	20110727	191616	WEA 7F	25.4	7.1	985.4	2.5	3.2	357.0	0.0
BR	20110727	192448	WEA 7F	25.8	7.3	985.4	3.1	3.2	336.0	0.0
BR	20110727	193320	WEA 7F	25.6	7.1	985.4	2.0	3.5	64.0	0.0
BR	20110727	194152	WEA 7F	25.5	6.8	985.3	1.3	3.5	86.0	0.0
BR	20110727	195024	WEA 7F	25.4	6.9	985.4	3.2	3.9	359.0	0.0
BR	20110727	195856	WEA 7F	26.3	7.3	985.3	0.5	3.0	304.0	0.0
BR	20110727	200728	WEA 7F	26.7	7.7	985.1	2.6	3.5	236.0	0.0
BR	20110727	201600	WEA 7F	26.5	8.5	985.1	3.6	4.6	265.0	0.0
BR	20110727	202432	WEA 7F	26.5	8.2	985.0	0.4	4.2	270.0	0.0
BR	20110727	203304	WEA 7F	26.8	8.8	985.0	1.7	3.3	297.0	0.0
BR	20110727	204136	WEA 7F	26.7	8.0	985.0	2.1	4.6	270.0	0.0
BR	20110727	205008	WEA 7F	26.2	8.5	985.0	2.1	4.6	233.0	0.0
BR	20110727	205840	WEA 7F	26.6	9.2	985.0	4.8	4.9	261.0	0.0

SC	Date	Time	DT		Temp	DP	Press	WS	G	Dir	P
	yyyymmdd	hhmmss			°C	°C	mbar	k/h	k/h		
BR	20110727	210712	WEA	7F	26.4	7.6	985.1	1.8	5.3	301.0	0.0
BR	20110727	211544	WEA	7F	27.2	7.9	985.0	3.1	3.5	232.0	0.0
BR	20110727	212416	WEA	7F	27.4	8.2	985.0	2.7	3.9	258.0	0.0
BR	20110727	213248	WEA	7F	27.2	8.6	985.1	3.0	4.6	238.0	0.0
BR	20110727	214120	WEA	7F	27.1	7.4	985.1	2.0	3.5	226.0	0.0
BR	20110727	214952	WEA	7F	27.5	7.8	985.0	1.6	3.5	248.0	0.0
BR	20110727	215824	WEA	7F	27.4	7.9	984.9	2.0	4.4	184.0	0.0
BR	20110727	220656	WEA	7F	27.6	7.7	985.0	1.9	4.2	312.0	0.0
BR	20110727	221528	WEA	7F	27.6	8.9	984.8	1.8	3.9	254.0	0.0
BR	20110727	222400	WEA	7F	27.4	8.1	984.8	1.5	3.7	242.0	0.0
BR	20110727	223232	WEA	7F	27.5	7.7	984.8	2.8	3.2	227.0	0.0
BR	20110727	224104	WEA	7F	27.7	7.9	984.7	1.7	4.2	231.0	0.0
BR	20110727	224936	WEA	7F	27.8	7.4	984.7	2.9	3.2	260.0	0.0
BR	20110727	225808	WEA	7F	27.8	7.1	984.6	2.5	3.5	244.0	0.0
BR	20110727	230640	WEA	7F	28.1	8.2	984.6	2.1	3.2	203.0	0.0
BR	20110727	231011	WEA	7F	28.3	8.5	984.6	2.2	2.8	237.0	0.0
BR	20110727	231512	WEA	7F	28.5	8.0	984.6	2.2	2.5	248.0	0.0
BR	20110727	232344	WEA	7F	28.5	7.5	984.6	0.9	2.5	256.0	0.0
BR	20110727	233216	WEA	7F	28.6	7.6	984.5	1.5	2.8	229.0	0.0
BR	20110727	234048	WEA	7F	28.9	6.5	984.5	0.3	2.1	200.0	0.0

Average air temperature = 25.7