



Adam Plumley <apsurveying@gmail.com>

OPUS solution : log0130a.jps OP1454338612531

1 message

opus <opus@ngs.noaa.gov>
 Reply-To: ngs.opus@noaa.gov
 To: apsurveying@gmail.com

Mon, Feb 1, 2016 at 9:59 AM

FILE: log0130a.jps OP1454338612531

NGS OPUS SOLUTION REPORT
 =====

All computed coordinate accuracies are listed as peak-to-peak values.
 For additional information: <http://www.ngs.noaa.gov/OPUS/about.jsp#accuracy>

USER: apsurveying@gmail.com DATE: February 01, 2016
 RINEX FILE: log0030n.16o TIME: 14:58:30 UTC

SOFTWARE: page5 1209.04 master52.pl 022814 START: 2016/01/30 13:57:00
 EPHEMERIS: igr18816.eph [rapid] STOP: 2016/01/30 14:24:00
 NAV FILE: brdc0300.16n OBS USED: 948 / 1045 : 91%
 ANT NAME: JAVTRIUMPH_2A NONE # FIXED AMB: 17 / 20 : 85%
 ARP HEIGHT: 0.025 OVERALL RMS: 0.012(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2016.0808)

X:	765721.817(m)	0.014(m)	765720.995(m)	0.014(m)
Y:	-5144667.989(m)	0.005(m)	-5144666.517(m)	0.005(m)
Z:	3679525.879(m)	0.017(m)	3679525.767(m)	0.017(m)

LAT:	35 27 28.61107	0.015(m)	35 27 28.63779	0.015(m)
E LON:	278 27 56.29988	0.014(m)	278 27 56.27623	0.014(m)
W LON:	81 32 3.70012	0.014(m)	81 32 3.72377	0.014(m)
EL HGT:	271.176(m)	0.009(m)	269.826(m)	0.009(m)
ORTHO HGT:	303.074(m)	0.021(m)	[NAVD88 (Computed using GEOID12B)]	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 17)	SPC (3200 NC)
Northing (Y) [meters]	3923960.796	192399.392
Easting (X) [meters]	451511.654	379593.209
Convergence [degrees]	-0.30999176	-1.46275787
Point Scale	0.99962897	0.99987904
Combined Factor	0.99958642	0.99983648

US NATIONAL GRID DESIGNATOR: 17SMV5151123960(NAD 83)

BASE STATIONS USED				
PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DE8425	GAST GASTON CORS ARP	N351839.791	W0811119.541	35379.6
DG7404	NCSH SHELBY CORS ARP	N351653.642	W0812928.115	19960.0
DM3523	NCHI HICKORY CORS ARP	N354431.010	W0811830.934	37570.9

NEAREST NGS PUBLISHED CONTROL POINT
 FA4968 GRAPE N352809.575 W0813026.808 2749.4

BASE STATION INFORMATION

STATION NAME: gast a 4 (Gaston; Gastonia, North Carolina, U.S.A.)

MONUMENT: 49561S001

XYZ	798177.3856	-5149234.1978	3666204.8080	MON @ 2005.0000 (M)
XYZ	-0.0136	0.0008	0.0014	VEL (M/YR)
NEU	0.0000	0.0000	0.0000	MON TO ARP (M)
NEU	0.0011	-0.0003	0.0668	ARP TO L1 PHASE CENTER (M)
NEU	0.0001	0.0007	0.0578	ARP TO L2 PHASE CENTER (M)
XYZ	-0.1506	0.0092	0.0152	VEL TIMES 11.0792 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	0.0079	-0.0533	0.0395	ARP TO L1 PHASE CENTER
XYZ	798177.2429	-5149234.2419	3666204.8627	L1 PHS CEN @ 2016.0808
XYZ	-0.0000	-0.0000	-0.0000	+ XYZ ADJUSTMENTS
XYZ	798177.2429	-5149234.2419	3666204.8627	NEW L1 PHS CEN @ 2016.0808
XYZ	798177.2350	-5149234.1886	3666204.8232	NEW ARP @ 2016.0808
XYZ	798177.2350	-5149234.1886	3666204.8232	NEW MON @ 2016.0808
LLH	35 18 39.81835	278 48 40.43563	212.4116	NEW L1 PHS CEN @ 2016.0808
LLH	35 18 39.81831	278 48 40.43564	212.3448	NEW ARP @ 2016.0808
LLH	35 18 39.81831	278 48 40.43564	212.3448	NEW MON @ 2016.0808

STATION NAME: ncsh a 3 (SHELBY; Shelby, North Carolina, U.S.A.)

MONUMENT: NO DOMES NUMBER

XYZ	771276.8226	-5155285.3238	3663564.0465	MON @ 2005.0000 (M)
XYZ	-0.0132	-0.0003	0.0017	VEL (M/YR)
NEU	0.0000	0.0000	0.0000	MON TO ARP (M)
NEU	0.0011	-0.0003	0.0668	ARP TO L1 PHASE CENTER (M)
NEU	0.0001	0.0007	0.0578	ARP TO L2 PHASE CENTER (M)
XYZ	-0.1464	-0.0030	0.0191	VEL TIMES 11.0792 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	0.0077	-0.0533	0.0395	ARP TO L1 PHASE CENTER
XYZ	771276.6839	-5155285.3801	3663564.1050	L1 PHS CEN @ 2016.0808
XYZ	-0.0000	0.0000	0.0000	+ XYZ ADJUSTMENTS
XYZ	771276.6839	-5155285.3801	3663564.1050	NEW L1 PHS CEN @ 2016.0808
XYZ	771276.6762	-5155285.3268	3663564.0656	NEW ARP @ 2016.0808
XYZ	771276.6762	-5155285.3268	3663564.0656	NEW MON @ 2016.0808
LLH	35 16 53.66905	278 30 31.86091	263.1746	NEW L1 PHS CEN @ 2016.0808
LLH	35 16 53.66901	278 30 31.86092	263.1078	NEW ARP @ 2016.0808
LLH	35 16 53.66901	278 30 31.86092	263.1078	NEW MON @ 2016.0808

STATION NAME: nchi a 1 (Hickory; Hickory, North Carolina USA)

MONUMENT: NO DOMES NUMBER

XYZ	783222.0033	-5123520.6382	3705180.0207	MON @ 2005.0000 (M)
XYZ	-0.0140	-0.0008	0.0018	VEL (M/YR)
NEU	0.0000	0.0000	0.0000	MON TO ARP (M)
NEU	0.0011	-0.0003	0.0668	ARP TO L1 PHASE CENTER (M)
NEU	0.0001	0.0007	0.0578	ARP TO L2 PHASE CENTER (M)
XYZ	-0.1546	-0.0084	0.0204	VEL TIMES 11.0792 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	0.0078	-0.0530	0.0399	ARP TO L1 PHASE CENTER
XYZ	783221.8566	-5123520.6996	3705180.0810	L1 PHS CEN @ 2016.0808
XYZ	0.0000	-0.0000	0.0000	+ XYZ ADJUSTMENTS
XYZ	783221.8566	-5123520.6996	3705180.0810	NEW L1 PHS CEN @ 2016.0808
XYZ	783221.8488	-5123520.6466	3705180.0411	NEW ARP @ 2016.0808
XYZ	783221.8488	-5123520.6466	3705180.0411	NEW MON @ 2016.0808

LLH 35 44 31.03717 278 41 29.04156 325.0215 NEW L1 PHS CEN @ 2016.0808
 LLH 35 44 31.03713 278 41 29.04157 324.9547 NEW ARP @ 2016.0808
 LLH 35 44 31.03713 278 41 29.04157 324.9547 NEW MON @ 2016.0808

REMOTE STATION INFORMATION

STATION NAME: log0 1

MONUMENT: NO DOMES NUMBER

XYZ 765720.7839 -5144666.2948 3679526.3254 MON @ 2016.0808 (M)
 NEU -0.0028 0.0005 0.0249 MON TO ARP (M)
 NEU 0.0028 -0.0005 0.0503 ARP TO L1 PHASE CENTER (M)
 NEU -0.0032 0.0019 0.0356 ARP TO L2 PHASE CENTER (M)
 XYZ 0.0037 -0.0216 0.0122 MON TO ARP
 XYZ 0.0053 -0.0390 0.0314 ARP TO L1 PHASE CENTER
 XYZ 765720.7929 -5144666.3554 3679526.3690 L1 PHS CEN @ 2016.0808

BASELINE NAME: gast log0

XYZ 0.2161 -0.2214 -0.5487 + XYZ ADJUSTMENTS
 XYZ 765721.0090 -5144666.5768 3679525.8203 NEW L1 PHS CEN @ 2016.0808
 XYZ 765721.0037 -5144666.5378 3679525.7889 NEW ARP @ 2016.0808
 XYZ 765721.0000 -5144666.5162 3679525.7767 NEW MON @ 2016.0808
 LLH 35 27 28.63804 278 27 56.27643 269.9069 NEW L1 PHS CEN @ 2016.0808
 LLH 35 27 28.63795 278 27 56.27645 269.8566 NEW ARP @ 2016.0808
 LLH 35 27 28.63804 278 27 56.27643 269.8317 NEW MON @ 2016.0808

BASELINE NAME: ncsh log0

XYZ 0.2136 -0.2199 -0.5606 + XYZ ADJUSTMENTS
 XYZ 765721.0065 -5144666.5753 3679525.8084 NEW L1 PHS CEN @ 2016.0808
 XYZ 765721.0012 -5144666.5363 3679525.7770 NEW ARP @ 2016.0808
 XYZ 765720.9975 -5144666.5147 3679525.7648 NEW MON @ 2016.0808
 LLH 35 27 28.63777 278 27 56.27634 269.8984 NEW L1 PHS CEN @ 2016.0808
 LLH 35 27 28.63768 278 27 56.27636 269.8482 NEW ARP @ 2016.0808
 LLH 35 27 28.63777 278 27 56.27634 269.8232 NEW MON @ 2016.0808

BASELINE NAME: nchi log0

XYZ 0.2026 -0.2247 -0.5658 + XYZ ADJUSTMENTS
 XYZ 765720.9955 -5144666.5800 3679525.8032 NEW L1 PHS CEN @ 2016.0808
 XYZ 765720.9902 -5144666.5411 3679525.7718 NEW ARP @ 2016.0808
 XYZ 765720.9865 -5144666.5195 3679525.7596 NEW MON @ 2016.0808
 LLH 35 27 28.63757 278 27 56.27589 269.8979 NEW L1 PHS CEN @ 2016.0808
 LLH 35 27 28.63748 278 27 56.27591 269.8477 NEW ARP @ 2016.0808
 LLH 35 27 28.63757 278 27 56.27589 269.8227 NEW MON @ 2016.0808

G-FILES

Axx2016 130 16 130

B2016 1301357 16 1301423 1 page5 v1209.04IGS 126 1 2 27NGS 2016 2 1IFDDPX
 IIGS08_1881 IGS 20160124
 C00090005 324562350 77 -45676724 197 -133209534 137 X0306ALOG0X0306AGAST
 D 1 2 -6287965 1 3 3817527 2 3 -9514321

Axx2016 130 16 130

B2016 1301357 16 1301423 1 page5 v1209.04IGS 126 1 2 27NGS 2016 2 1IFDDPX
 IIGS08_1881 IGS 20160124
 C00090003 55556788 20 -106188121 98 -159616992 126 X0306ALOG0X0306ANCSH
 D 1 2 2073932 1 3 -6699636 2 3 -7607244

Axx2016 130 16 130

B2016 1301357 16 1301423 1 page5 v1209.04IGS 126 1 2 27NGS 2016 2 1IFDDPX
 IIGS08_1881 IGS 20160124
 C00090004 175008623 14 211458728 81 256542815 61 X0306ALOG0X0306ANCHI

D 1 2 2027700 1 3 -1663276 2 3 -8860184

POST-FIT RMS BY SATELLITE VS. BASELINE

	OVERALL	02	05	10	12	13	14	15	18
gast-log0|	0.012	...	0.017	...	...	0.009	...	...	0.009
	20	21	22	24	25	27	29	31	
gast-log0|	0.010	0.010	...	0.016	...	...	0.013	...	

	OVERALL	02	05	10	12	13	14	15	18
ncsh-log0|	0.011	...	0.013	...	...	0.009	...	...	0.015
	20	21	22	24	25	27	29	31	
ncsh-log0|	0.010	0.010	...	...	...	...	0.011	...	

	OVERALL	05	10	12	13	14	15	18	20
nchi-log0|	0.011	0.015	...	...	0.008	...	...	0.010	0.008
	21	22	24	25	27	29	31		
nchi-log0|	0.008	...	0.016	...	...	0.011	...		

OBS BY SATELLITE VS. BASELINE

	OVERALL	02	05	10	12	13	14	15	18
gast-log0|	324	...	50	...	...	50	...	...	50
	20	21	22	24	25	27	29	31	
gast-log0|	50	50	...	24	...	...	50	...	
	OVERALL	02	05	10	12	13	14	15	18
ncsh-log0|	300	...	50	...	...	50	...	...	50
	20	21	22	24	25	27	29	31	
ncsh-log0|	50	50	...	...	...	...	50	...	
	OVERALL	05	10	12	13	14	15	18	20
nchi-log0|	324	50	...	...	50	...	...	50	50
	21	22	24	25	27	29	31		
nchi-log0|	50	...	24	...	...	50	...		

Covariance Matrix for the xyz OPUS Position (meters^2).

0.0000187467	-0.0000014390	-0.0000012648
-0.0000014390	0.0002383911	-0.0000125238
-0.0000012648	-0.0000125238	0.0001168911

Covariance Matrix for the enu OPUS Position (meters^2).

0.0000230878	0.0000151492	-0.0000267735
0.0000151492	0.0001444620	-0.0000511751
-0.0000267735	-0.0000511751	0.0002064790

Horizontal network accuracy = 0.02419 meters.

Vertical network accuracy = 0.02818 meters.

Derivation of NAD 83 vector components

Position of reference station ARP in NAD_83(2011)(EPOCH:2010.0000).

	Xa(m)	Ya(m)	Za(m)	
GAST	798178.05610	-5149235.67326	3666204.93935	2010.00
NCSH	771277.49477	-5155286.80352	3663564.18032	2010.00
NCHI	783222.67322	-5123522.11571	3705180.15080	2010.00

Position of reference station monument in NAD_83(2011)(EPOCH:2010.0000).

	Xr(m)	Yr(m)	Zr(m)	
GAST	798178.05610	-5149235.67326	3666204.93935	2010.00

NCSH	771277.49477	-5155286.80352	3663564.18032	2010.00
NCHI	783222.67322	-5123522.11571	3705180.15080	2010.00

Velocity of reference station monument in NAD_83(2011)(EPOCH:2010.0000).

	Vx (m/yr)	Vy (m/yr)	Vz (m/yr)
GAST	-0.01360	0.00080	0.00140
NCSH	-0.01320	-0.00030	0.00170
NCHI	-0.01400	-0.00080	0.00180

Vectors from unknown station monument to reference station monument in NAD_83(2011)(EPOCH:2010.0000).

	Xr-X= DX(m)	Yr-Y= DY(m)	Zr-Z= DZ(m)	
GAST	32456.23910	-4567.68426	-13320.93965	2010.00
NCSH	5555.67777	-10618.81452	-15961.69868	2010.00
NCHI	17500.85622	21145.87329	25654.27180	2010.00

STATE PLANE COORDINATES - U.S. Survey Foot

SPC (3200 NC)	
Northing (Y) [feet]	631230.339
Easting (X) [feet]	1245382.053
Convergence [degrees]	-1.46275787
Point Scale	0.99987904
Combined Factor	0.99983648

**** Orthometric Heights Above Future Geopotential Datum.**

Prototype orthometric heights are now being made available as a precursor to the completion of GRAV-D and the replacement of NAVD 88 with a new geopotential reference system. The following height reflects the current best estimate of the true orthometric height, based on the existing gravimetric geoid model. This height is subject to change as data and modeling for the gravimetric geoid change throughout the lifetime of the GRAV-D project, or as new realizations of the ITRF are adopted. However, at the completion of GRAV-D, these heights will supersede the NAVD 88 heights

APPROX ORTHO HGT: 302.801 (m) [PROTOTYPE (Computed using USGG2012,GRS80,IGS08)]

This position and the above vector components were computed without any knowledge by the National Geodetic Survey regarding the equipment or field operating procedures used.