



Adam Plumley <apsurveying@gmail.com>

OPUS solution : log0130b.jps OP1454338345035

1 message

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

Mon, Feb 1, 2016 at 9:55 AM

FILE: log0130b.jps OP1454338345035

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: log0030s.16o TIME: 14:54:29 UTC

SOFTWARE: page5 1209.04 [master50.pl](#) 022814 START: 2016/01/30 18:38:00
 EPHEMERIS: igr18816.eph [rapid] STOP: 2016/01/30 22:45:00
 NAV FILE: brdc0300.16n OBS USED: 9449 / 10186 : 93%
 ANT NAME: JAVTRIUMPH_2A NONE # FIXED AMB: 52 / 56 : 93%
 ARP HEIGHT: 0.025 OVERALL RMS: 0.016(m)

REF FRAME: NAD_83(2011)(EPOCH:2010.0000) IGS08 (EPOCH:2016.0816)

X:	765721.680(m)	0.010(m)	765720.858(m)	0.010(m)
Y:	-5144667.541(m)	0.021(m)	-5144666.069(m)	0.021(m)
Z:	3679526.433(m)	0.028(m)	3679526.321(m)	0.028(m)

LAT:	35 27 28.63443	0.011(m)	35 27 28.66115	0.011(m)
E LON:	278 27 56.29712	0.011(m)	278 27 56.27348	0.011(m)
W LON:	81 32 3.70288	0.011(m)	81 32 3.72652	0.011(m)
EL HGT:	271.120(m)	0.032(m)	269.770(m)	0.032(m)
ORTHO HGT:	303.018(m)	0.057(m)	[NAVD88 (Computed using GEOID12B)]	

	UTM COORDINATES	STATE PLANE COORDINATES
	UTM (Zone 17)	SPC (3200 NC)
Northing (Y) [meters]	3923961.516	192400.113
Easting (X) [meters]	451511.588	379593.157
Convergence [degrees]	-0.30999226	-1.46275831
Point Scale	0.99962897	0.99987904
Combined Factor	0.99958643	0.99983649

US NATIONAL GRID DESIGNATOR: 17SMV5151123961(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DG7404	NCSH SHELBY CORS ARP	N351653.642	W0812928.115	19960.7
DE8425	GAST GASTON CORS ARP	N351839.791	W0811119.541	35380.0
DM3523	NCHI HICKORY CORS ARP	N354431.010	W0811830.934	37570.3

NEAREST NGS PUBLISHED CONTROL POINT
 FA4968 GRAPE N352809.575 W0813026.808 2749.2

BASE STATION INFORMATION

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 11.0799 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 @ 2016.0816
XYZ	-0.0000	-0.0000	0.0000	+ XYZ ADJUSTMENTS
XYZ	771276.6839	-5155285.3802	3663564.1050	NEW L1 PHS CEN @ 2016.0816
XYZ	771276.6762	-5155285.3268	3663564.0656	NEW ARP @ 2016.0816
XYZ	771276.6762	-5155285.3268	3663564.0656	NEW MON @ 2016.0816
LLH	35 16 53.66905	278 30 31.86091	263.1746	NEW L1 PHS CEN @ 2016.0816
LLH	35 16 53.66901	278 30 31.86092	263.1078	NEW ARP @ 2016.0816
LLH	35 16 53.66901	278 30 31.86092	263.1078	NEW MON @ 2016.0816

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 11.0799 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 @ 2016.0816
XYZ	-0.0000	0.0000	0.0000	+ XYZ ADJUSTMENTS
XYZ	798177.2429	-5149234.2419	3666204.8627	NEW L1 PHS CEN @ 2016.0816
XYZ	798177.2350	-5149234.1886	3666204.8232	NEW ARP @ 2016.0816
XYZ	798177.2350	-5149234.1886	3666204.8232	NEW MON @ 2016.0816
LLH	35 18 39.81835	278 48 40.43563	212.4116	NEW L1 PHS CEN @ 2016.0816
LLH	35 18 39.81831	278 48 40.43564	212.3448	NEW ARP @ 2016.0816
LLH	35 18 39.81831	278 48 40.43564	212.3448	NEW MON @ 2016.0816

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 11.0799 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 @ 2016.0816
XYZ	0.0000	0.0000	0.0000	+ XYZ ADJUSTMENTS
XYZ	783221.8566	-5123520.6996	3705180.0810	NEW L1 PHS CEN @ 2016.0816
XYZ	783221.8488	-5123520.6466	3705180.0411	NEW ARP @ 2016.0816
XYZ	783221.8488	-5123520.6466	3705180.0411	NEW MON @ 2016.0816

LLH 35 44 31.03717 278 41 29.04156 325.0214 NEW L1 PHS CEN @ 2016.0816
 LLH 35 44 31.03713 278 41 29.04157 324.9547 NEW ARP @ 2016.0816
 LLH 35 44 31.03713 278 41 29.04157 324.9547 NEW MON @ 2016.0816

REMOTE STATION INFORMATION

STATION NAME: log0 1

MONUMENT: NO DOMES NUMBER

XYZ 765721.1615 -5144666.1882 3679526.3676 MON @ 2016.0814 (M)
 NEU -0.0028 0.0005 0.0250 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 765721.1705 -5144666.2488 3679526.4112 L1 PHS CEN @ 2016.0816

BASELINE NAME: ncsh log0

XYZ -0.3082 0.1227 -0.0454 + XYZ ADJUSTMENTS
 XYZ 765720.8623 -5144666.1261 3679526.3658 NEW L1 PHS CEN @ 2016.0816
 XYZ 765720.8570 -5144666.0871 3679526.3344 NEW ARP @ 2016.0816
 XYZ 765720.8533 -5144666.0655 3679526.3222 NEW MON @ 2016.0816
 LLH 35 27 28.66126 278 27 56.27331 269.8426 NEW L1 PHS CEN @ 2016.0816
 LLH 35 27 28.66117 278 27 56.27333 269.7923 NEW ARP @ 2016.0816
 LLH 35 27 28.66126 278 27 56.27331 269.7674 NEW MON @ 2016.0816

BASELINE NAME: gast log0

XYZ -0.2978 0.1274 -0.0617 + XYZ ADJUSTMENTS
 XYZ 765720.8727 -5144666.1214 3679526.3495 NEW L1 PHS CEN @ 2016.0816
 XYZ 765720.8674 -5144666.0824 3679526.3181 NEW ARP @ 2016.0816
 XYZ 765720.8637 -5144666.0608 3679526.3059 NEW MON @ 2016.0816
 LLH 35 27 28.66089 278 27 56.27374 269.8306 NEW L1 PHS CEN @ 2016.0816
 LLH 35 27 28.66080 278 27 56.27376 269.7803 NEW ARP @ 2016.0816
 LLH 35 27 28.66089 278 27 56.27374 269.7554 NEW MON @ 2016.0816

BASELINE NAME: nchi log0

XYZ -0.3042 0.1062 -0.0340 + XYZ ADJUSTMENTS
 XYZ 765720.8663 -5144666.1426 3679526.3772 NEW L1 PHS CEN @ 2016.0816
 XYZ 765720.8610 -5144666.1037 3679526.3458 NEW ARP @ 2016.0816
 XYZ 765720.8573 -5144666.0820 3679526.3336 NEW MON @ 2016.0816
 LLH 35 27 28.66124 278 27 56.27337 269.8630 NEW L1 PHS CEN @ 2016.0816
 LLH 35 27 28.66115 278 27 56.27339 269.8128 NEW ARP @ 2016.0816
 LLH 35 27 28.66124 278 27 56.27337 269.7878 NEW MON @ 2016.0816

G-FILES

Axx2016 130 16 130

B2016 1301838 16 1302244 1 page5 v1209.04IGS 126 1 2 27NGS 2016 2 1IFDDPX
 IIGS08_1881 IGS 20160124
 C00090003 55558230 6 -106192614 21 -159622566 16 X0306ALOG0X0306ANCSH
 D 1 2 -5020163 1 3 2842385 2 3 -8420464

Axx2016 130 16 130

B2016 1301838 16 1302244 1 page5 v1209.04IGS 126 1 2 27NGS 2016 2 1IFDDPX
 IIGS08_1881 IGS 20160124
 C00090005 324563713 11 -45681278 25 -133214827 16 X0306ALOG0X0306AGAST
 D 1 2 -7144595 1 3 5441188 2 3 -9267351

Axx2016 130 16 130

B2016 1301838 16 1302244 1 page5 v1209.04IGS 126 1 2 27NGS 2016 2 1IFDDPX
 IIGS08_1881 IGS 20160124
 C00090004 175009915 6 211454354 20 256537075 15 X0306ALOG0X0306ANCHI

D 1 2 -5216832 1 3 5963969 2 3 -8781089

POST-FIT RMS BY SATELLITE VS. BASELINE

	OVERALL	01	03	10	12	14	16	18	22
ncsh-log0	0.017	0.027	0.017	0.015	0.019	0.014	0.016	0.023	0.014
		23	24	25	26	27	29	31	
ncsh-log0	0.021	...	0.018	0.014	0.023	0.018	...		

	OVERALL	01	03	10	12	14	16	18	22
gast-log0	0.016	0.021	0.016	0.013	0.030	0.012	0.017	0.021	0.014
		23	24	25	26	27	29	31	
gast-log0	0.018	...	0.018	0.013	0.025	0.018	...		

	OVERALL	01	03	10	12	14	16	18	22
nchi-log0	0.015	0.026	0.015	0.012	0.018	0.012	0.015	0.021	0.013
		23	24	25	26	27	29	31	
nchi-log0	0.021	...	0.015	0.013	0.029	0.018	...		

OBS BY SATELLITE VS. BASELINE

	OVERALL	01	03	10	12	14	16	18	22
ncsh-log0	3139	189	285	258	106	438	263	127	437
		23	24	25	26	27	29	31	
ncsh-log0	144	...	298	373	30	191	...		

	OVERALL	01	03	10	12	14	16	18	22
gast-log0	3159	142	288	269	138	448	263	139	443
		23	24	25	26	27	29	31	
gast-log0	125	...	288	386	33	197	...		

	OVERALL	01	03	10	12	14	16	18	22
nchi-log0	3151	177	275	268	129	440	261	135	442
		23	24	25	26	27	29	31	
nchi-log0	125	...	288	385	33	193	...		

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

0.0000003311	-0.0000000422	0.0000000200
-0.0000000422	0.0000032400	-0.0000002124
0.0000000200	-0.0000002124	0.0000018711

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

0.0000003819	0.0000002119	-0.0000003195
0.0000002119	0.0000021099	-0.0000005505
-0.0000003195	-0.0000005505	0.0000029505

Horizontal network accuracy = 0.00293 meters.

Vertical network accuracy = 0.00337 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)	
NCSH	771277.49477	-5155286.80352	3663564.18032	2010.00
GAST	798178.05610	-5149235.67326	3666204.93935	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)	
NCSH	771277.49477	-5155286.80352	3663564.18032	2010.00

GAST	798178.05610	-5149235.67326	3666204.93935	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)
NCSH	-0.01320	-0.00030	0.00170
GAST	-0.01360	0.00080	0.00140
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)	
NCSH	5555.81477	-10619.26252	-15962.25268	2010.00
GAST	32456.37610	-4568.13226	-13321.49365	2010.00
NCHI	17500.99322	21145.42529	25653.71780	2010.00

STATE PLANE COORDINATES - U.S. Survey Foot

SPC (3200 NC)	
Northing (Y) [feet]	631232.704
Easting (X) [feet]	1245381.883
Convergence [degrees]	-1.46275831
Point Scale	0.99987904
Combined Factor	0.99983649

** 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: 302.745 (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.