Adam Plumley <apsurveying@gmail.com>

OPUS solution : log0130b.jps OP1454254043484

opus <opus@ngs.noaa.gov> Sun, Jan 31, 2016 at 10:29 AM
Reply-To: ngs.opus@noaa.gov
To: apsurveying@gmail.com

FILE: log0130b.jps OP1454254043484

2005 NOTE: The IGS precise and IGS rapid orbits were not available
2005 at processing time. The IGS ultra-rapid orbit was/will be used to
2005 process the data.
2005

NGS OPUS SOLUTION REPORT
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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: January 31, 2016
RINEX FILE: log0030s.16o TIME: 15:28:49 UTC

SOFTWARE: page5 1209.04 master92.pl 022814 START: 2016/01/30 18:38:00
EPHEMERIS: igu18816.eph [ultra-rapid] STOP: 2016/01/30 22:45:00
NAV FILE: brdc0300.16n OBS USED: 9027 / 9742 : 93%
ANT NAME: JAVTRIUMPH_2A NONE # FIXED AMB: 46 / 52 : 88%
ARP HEIGHT: 0.025 OVERALL RMS: 0.016(m)

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

X:	765721.681(m)	0.007(m)	765720.859(m)	0.007(m)
Y:	-5144667.523(m)	0.014(m)	-5144666.051(m)	0.014(m)
Z:	3679526.417(m)	0.009(m)	3679526.305(m)	0.009(m)
LAT:	35 27 28.63434	0.006(m)	35 27 28.66106	0.006(m)
E LON:	278 27 56.29727	0.009(m)	278 27 56.27362	0.009(m)
W LON:	81 32 3.70273	0.009(m)	81 32 3.72638	0.009(m)
EL HGT:	271.096(m)	0.014(m)	269.746(m)	0.014(m)
ORTHO HGT:	302.994(m)	0.028(m) [NAVD88 (Computed using GEOID12B)]		

	UTM COORDINATES (Zone 17)	STATE PLANE COORDINATES SPC (3200 NC)
Northing (Y) [meters]	3923961.513	192400.110
Easting (X) [meters]	451511.592	379593.161
Convergence [degrees]	-0.30999223	-1.46275829
Point Scale	0.99962897	0.99987904
Combined Factor	0.99958644	0.99983650

US NATIONAL GRID DESIGNATOR: 17SMV5151123961(NAD 83)

BASE STATIONS USED

PID	DESIGNATION	LATITUDE	LONGITUDE	DISTANCE(m)
DE8425	GAST GASTON CORS ARP	N351839.791	W0811119.541	35380.0

DG7404 NCSH SHELBY CORS ARP N351653.642 W0812928.115 19960.7
DK4043 NCSP SPINDALE CORS ARP N352155.834 W0815457.348 36144.7

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

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 11.0799 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: 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: ncsp a 2 (Spindale; Spindale, North Carolina USA)
MONUMENT: NO DOMES NUMBER

XYZ	732282.1811	-5155561.2376	3671185.0843	MON @ 2005.0000 (M)
XYZ	-0.0145	0.0006	0.0015	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	-0.1605	0.0066	0.0162	VEL TIMES 11.0799 YRS
XYZ	0.0000	0.0000	0.0000	MON TO ARP
XYZ	0.0072	-0.0533	0.0396	ARP TO L1 PHASE CENTER
XYZ	732282.0278	-5155561.2843	3671185.1400	L1 PHS CEN @ 2016.0816
XYZ	0.0000	-0.0000	-0.0000	+ XYZ ADJUSTMENTS

XYZ 732282.0278 -5155561.2843 3671185.1400 NEW L1 PHS CEN @ 2016.0816
XYZ 732282.0206 -5155561.2310 3671185.1005 NEW ARP @ 2016.0816
XYZ 732282.0206 -5155561.2310 3671185.1005 NEW MON @ 2016.0816
LLH 35 21 55.86093 278 5 2.62776 301.4752 NEW L1 PHS CEN @ 2016.0816
LLH 35 21 55.86089 278 5 2.62777 301.4084 NEW ARP @ 2016.0816
LLH 35 21 55.86089 278 5 2.62777 301.4084 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: gast log0
XYZ -0.3000 0.1316 -0.0621 + XYZ ADJUSTMENTS
XYZ 765720.8705 -5144666.1172 3679526.3491 NEW L1 PHS CEN @ 2016.0816
XYZ 765720.8652 -5144666.0782 3679526.3177 NEW ARP @ 2016.0816
XYZ 765720.8615 -5144666.0566 3679526.3055 NEW MON @ 2016.0816
LLH 35 27 28.66096 278 27 56.27369 269.8267 NEW L1 PHS CEN @ 2016.0816
LLH 35 27 28.66087 278 27 56.27370 269.7765 NEW ARP @ 2016.0816
LLH 35 27 28.66096 278 27 56.27369 269.7515 NEW MON @ 2016.0816

BASELINE NAME: ncsh log0
XYZ -0.3074 0.1357 -0.0579 + XYZ ADJUSTMENTS
XYZ 765720.8631 -5144666.1131 3679526.3533 NEW L1 PHS CEN @ 2016.0816
XYZ 765720.8578 -5144666.0742 3679526.3219 NEW ARP @ 2016.0816
XYZ 765720.8541 -5144666.0525 3679526.3097 NEW MON @ 2016.0816
LLH 35 27 28.66117 278 27 56.27342 269.8250 NEW L1 PHS CEN @ 2016.0816
LLH 35 27 28.66108 278 27 56.27344 269.7747 NEW ARP @ 2016.0816
LLH 35 27 28.66117 278 27 56.27342 269.7498 NEW MON @ 2016.0816

BASELINE NAME: ncsp log0
XYZ -0.2999 0.1457 -0.0665 + XYZ ADJUSTMENTS
XYZ 765720.8706 -5144666.1031 3679526.3447 NEW L1 PHS CEN @ 2016.0816
XYZ 765720.8653 -5144666.0641 3679526.3133 NEW ARP @ 2016.0816
XYZ 765720.8616 -5144666.0425 3679526.3011 NEW MON @ 2016.0816
LLH 35 27 28.66111 278 27 56.27377 269.8128 NEW L1 PHS CEN @ 2016.0816
LLH 35 27 28.66102 278 27 56.27379 269.7625 NEW ARP @ 2016.0816
LLH 35 27 28.66111 278 27 56.27377 269.7376 NEW MON @ 2016.0816

G-FILES

Axx2016 130 16 130
B2016 1301838 16 1302244 1 page5 v1209.04IGS 126 1 2 27NGS 2016 131IFDDPX
IIGS08_1881 IGS 20160124
C00090005 324563735 12 -45681320 28 -133214823 18 X0306ALOG0X0306AGAST
D 1 2 -7635137 1 3 5647626 2 3 -9098201

Axx2016 130 16 130
B2016 1301838 16 1302244 1 page5 v1209.04IGS 126 1 2 27NGS 2016 131IFDDPX
IIGS08_1881 IGS 20160124
C00090003 55558222 7 -106192743 22 -159622441 17 X0306ALOG0X0306ANCSH
D 1 2 -6459415 1 3 3476597 2 3 -8043319

Axx2016 130 16 130

B2016 1301838 16 1302244 1 page5 v1209.04IGS 126 1 2 27NGS 2016 131IFDDPX
IIGS08_1881 IGS 20160124
C00090001 -334388410 9 -108951885 25 -83412006 18 X0306ALOG0X0306ANCSP
D 1 2 -4522126 1 3 4477690 2 3 -9363916

POST-FIT RMS BY SATELLITE VS. BASELINE

	OVERALL	01	03	10	14	16	18	22	23
gast-log0|	0.016	0.019	0.017	0.013	0.012	0.017	0.017	0.014	0.018

	24	25	26	27	29	31
gast-log0|	...	0.017	0.014	0.025	0.018	...

	OVERALL	01	03	10	14	16	18	22	23
ncsh-log0|	0.017	0.020	0.018	0.014	0.013	0.016	0.019	0.016	0.021

	24	25	26	27	29	31
ncsh-log0|	...	0.019	0.015	0.022	0.017	...

	OVERALL	01	03	10	14	16	18	22	23
ncsp-log0|	0.016	0.027	0.015	0.012	0.011	0.014	0.014	0.014	0.020

	24	25	26	27	29	31
ncsp-log0|	...	0.015	0.014	0.020	0.017	...

OBS BY SATELLITE VS. BASELINE

	OVERALL	01	03	10	14	16	18	22	23
gast-log0|	3021	142	288	269	448	263	139	443	125

	24	25	26	27	29	31
gast-log0|	...	288	386	33	197	...

	OVERALL	01	03	10	14	16	18	22	23
ncsh-log0|	3033	189	285	258	438	263	127	437	144

	24	25	26	27	29	31
ncsh-log0|	...	298	373	30	191	...

	OVERALL	01	03	10	14	16	18	22	23
ncsp-log0|	2973	175	290	272	424	244	133	442	145

	24	25	26	27	29	31
ncsp-log0|	...	286	384	34	144	...

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

0.0000004689	-0.0000000771	0.0000000355
-0.0000000771	0.0000039667	-0.0000002541
0.0000000355	-0.0000002541	0.0000022511

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

0.0000005223	0.0000002497	-0.0000003569
0.0000002497	0.0000025636	-0.0000006983
-0.0000003569	-0.0000006983	0.0000036008

Horizontal network accuracy = 0.00325 meters.
Vertical network accuracy = 0.00372 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
NCSP	732282.84673	-5155562.70994	3671185.21715	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
NCSP	732282.84673	-5155562.70994	3671185.21715	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
NCSP	-0.01450	0.00060	0.00150

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	32456.37510	-4568.15026	-13321.47765	2010.00
NCSH	5555.81377	-10619.28052	-15962.23668	2010.00
NCSP	-33438.83427	-10895.18694	-8341.19985	2010.00

STATE PLANE COORDINATES - U.S. Survey Foot
SPC (3200 NC)

Northing (Y) [feet]	631232.694
Easting (X) [feet]	1245381.896
Convergence [degrees]	-1.46275829
Point Scale	0.99987904
Combined Factor	0.99983650

** 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: 302.721 (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.