NOTICE TO UNAVCO GPS DATA PRODUCT USERS: FILE FORMAT UPDATE

On 25 March 2013, UNAVCO and the Plate Boundary Observatory GPS Analysis Center Coordinator will implement a file format update to the following data products:

1. GPS station position "POS" file (*e.g.* P067.pbo.final_snf01.pos)
2. GPS velocity "VEL" file (*e.g.* pbo.final_igs08.vel)
3. GPS phase RMS "RMS" file (*e.g.* pbo13936.final_snf01.rms)

The updated file formats include more descriptive header sections as well as column headings. The new header lines fall between the `Start Field Description` and `End Field Description` markers. Additional header lines may be added between these two markers in the future. The new column headings come after the `End Field Description` marker.

Examples of the new formats are provided below. In these examples, the new information appears in bold text.

Please contact us if you have any questions or comments regarding these format changes: support@unavco.org.

1. Example: GPS station position "POS" file (*e.g.* P067.pbo.final_snf01.pos)

```
PBO Station Position Time Series. Reference Frame : SNARF 1.0
Format Version: 1.1.0
4-character ID: P067
Station name  : CleggRanchCS2004
First Epoch   : 20040113 120000
Last Epoch    : 20121013 120000
Release Data  : 20121224 220031
XYZ Reference position :  -2675936.21229 -4452984.41869  3687903.44249 (SNARF)
NEU Reference position :    35.5517541046  238.9970388286  106.99921 (SNARF/WGS84)
Start Field Description
YYYYMMDD      Year, month, day for the given position epoch
HHMMSS        Hour, minute, second for the given position epoch
JJJJJ.JJJJJ   Modified Julian day for the given position epoch
X             X coordinate, Specified Reference Frame, meters
Y             Y coordinate, Specified Reference Frame, meters
Z             Z coordinate, Specified Reference Frame, meters
Sx            Standard deviation of the X position, meters
Sy            Standard deviation of the Y position, meters
Sz            Standard deviation of the Z position, meters
Rxy           Correlation of the X and Y position
Rxz           Correlation of the X and Z position
Ryz           Correlation of the Y and Z position
Nlat          North latitude, WGS-84 ellipsoid, decimal degrees
Elong         East longitude, WGS-84 ellipsoid, decimal degrees
Height (Up)   Height relative to WGS-84 ellipsoid, m
dN            Difference in North component from NEU reference position, meters
dE            Difference in East component from NEU reference position, meters
du            Difference in vertical component from NEU reference position, meters
Sn            Standard deviation of dN, meters
Se            Standard deviation of dE, meters
Su            Standard deviation of dU, meters
```

```
Rne          Correlation of dN and dE
Rnu          Correlation of dN and dU
Reu          Correlation of dEand dU
Soln         "rapid", "final", "suppl/suppf", or "campd", corresponding to products
generated with rapid or final orbit products, in supplemental processing, or in campaign
data processing
End Field Description
*YYYYMMDD HHMMSS JJJJJ.JJJJ      X           Y           Z          Sx        Sy
Sz   Rxy   Rxz   Ryz         NLat        Elong       Height        dN        dE
dU      Sn      Se      Su     Rne   Rnu   Reu  Soln
 20040113 120000 53017.5000 -2675936.12548 -4452984.72731  3687903.15114  0.00524
0.00834  0.00725  0.850 -0.830 -0.907     35.5517508163  238.9970414024  107.00865   -
0.36606   0.23310   0.00944    0.00240  0.00241  0.01175  0.059  0.091  0.055 final
 20040114 120000 53018.5000 -2675936.12884 -4452984.73344  3687903.15659  0.00244
0.00369  0.00297  0.830 -0.782 -0.861     35.5517508196  238.9970414055  107.01750   -
0.36568   0.23338   0.01829    0.00123  0.00116  0.00505  0.052 -0.129 -0.021 final
 …
```

2. Example: GPS velocity "VEL" file (*e.g.* pbo.final_igs08.vel)

```
PBO Velocity file from nmtd_CMB_vel.org Reference Frame : NOAM_I08
Format Version: 1.1.0
Release Date  : 20130224145903
Start Field Description
Dot#         4-character identifier for a given station
Name         16-character station name
Ref_epoch    Date and time at which the station position is as given in ref_XYZ and
ref_NEU.  Also the date and time for which the given velocity is first valid.Format is
YYYYMMDDhhmmss.
Ref_jday     Reference epoch, represented as Modified Julian day
Ref_X        Reference X coordinate in SNARF reference frame at Ref_epoch, meters
Ref_Y        Reference Y coordinate in SNARF reference frame at Ref_epoch, meters
Ref_Z        Reference Z coordinate in SNARF reference frame at Ref_epoch, meters
Ref_Nlat     Reference North latitude in SNARF reference frame WGS-84 ellipsoid, decimal
degrees
Ref_Elong    Reference East Longitude in SNARF reference frame WGS-84 ellipsoid, decimal
degrees
Ref_Up       Referemce Height  in SNARF reference frame WGS-84 ellipsoid, decimal degrees
dX/dt        X component of station velocity, meters/yr
dY/dt        Y component of station velocity, meters/yr
dZ/dt        Z component of station velocity, meters/yr
SXd          Standard deviation of X velocity, meters/yr
SYd          Standard deviation of Y velocity, meters/yr
SZd          Standard deviation of Z velocity, meters/yr
Rxy          Correlation of X and Y velocity, meters/yr
Rxz          Correlation of X and Z velocity, meters/yr
Ryz          Correlation of Y and Z velocity, meters/yr
dN/dt        North component of station velocity, meters/yr
dE/dt        East component of station velocity, meters/yr
dU/dt        Vertical component of station velocity, meters/yr
SNd          Standard deviation of North velocity, meters/yr
SEd          Standard deviation of East velocity, meters/yr
SUd          Standard deviation of vertical velocity, meters/yr
Rne          Correlation of North and East velocity, meters/yr
Rnu          Correlation of North and vertical velocity, meters/yr
Reu          Correlation of East and vertical velocity, meters/yr
first_epoch Epoch of first data used to derive the station velocity, in the same format
as ref_epoch.
last_epoch  Epoch of last data used to derive the station velocity, in the same format as
ref_epoch.
End Field Description
*Dot#       Name          Ref_epoch       Ref_jday       Ref_X          Ref_Y
Ref_Z          Ref_Nlat        Ref_Elong     Ref_Up...     dX/dt    dY/dt   dZ/dt    SXd
SYd     SZd     Rxy     Rxz     Rzy     dN/dt    dE/dt    dU/dt    SNd    SEd    SUd
Rne    Rnu    Reu   first_epoch     last_epoch
 ABMF AeroportduRaiz   20130116115900 56308.4998   2919785.75839 -5383745.01229
1774604.73171   16.2623055757 298.4724640491  -25.56769   -0.00348 -0.02557 -0.02333
0.00690 0.00692 0.00910  0.098 -0.067  0.107   -0.02820 -0.01525  0.01350 0.00917 0.00719
0.00653  0.004  0.062 -0.057 20120429000000 20130120000000
```

```
  AC55 Yentna_RvrAK2006 20130116115900 56308.4998  -2611995.26681 -1402619.01295
5629399.93600  62.3844441652  208.2354163155 1012.20326    0.04013 -0.04513 -0.01826
0.00039 0.00046 0.00056  0.085 -0.541 -0.459    0.00389  0.05875 -0.02268 0.00027 0.00043
0.00064 -0.053 -0.198  0.206 20060910000000 20100724000000
…
```

3. Example: GPS phase RMS "RMS" file (*e.g.* pbo13936.final_snf01.rms)

```
RMS File from  ../CWU_snx/cwu13936.20060923.a.rms ../NMT_snx/nmt13936.20060923.a.rms
Format Version: 1.1.0
Release Date  : 20060924193326
Start Field Description
Dot#       4-character identifier for a given station
PBO_#      Number 30-sec phase epochs in 24-hours for combined RMS calculation
PRMS       Root-mean-square (RMS) scatter of combined phase residuals, mm
CWU_#      Number 30-sec phase epochs in 24-hours for CWU RMS calculation
CRMS       Root-mean-square (RMS) scatter of CWU phase residuals, mm
NMT_#      Number 30-sec phase epochs in 24-hours for NMT or BSL (prior to Feb 2006) RMS
calculation
NRMS       Root-mean-square (RMS) scatter of NMT or BSL phase residuals, mm
A          Coefficient from model fit RMS^2(elev) = A^2 + B^2/sin(elev)^2 where elev is
elevation angle, mm
B          Coefficient from model fit, mm
GPSW       GPS Week for 24-hour processing day
D          GPS Day of week for 24-hour processing day
YYYYMMDD   Year, month, day of month for 24-hour processing day
End Field Description
*Dot# PBO_#    PRMS   CWU_#    RMS    NMT_#   NRMS     A    B  GPSW D YYYYMMDD
 AB07 22344    6.7    22340    7.3    22348    6.0    1.9  2.3 1393 6 20060923
 AB15 22999    9.5    23100   11.4    22899    7.6    0.3  3.0 1393 6 20060923
```