

Basic Geodesy

Article 19

October 2010

MSP GeoTrans

Roger Foster and Dan Mullaney (SNAC)

Coordinate System Analysis Branch (CSAT)

Originally, this article was intended to be on the subject of 7 parameter transformations and multiple regression equations. However, a reader asked for specific examples of coordinate transformations and conversions. Therefore, this article is about Mensuration Services Program Geographic Translator (MSP GeoTrans) software.

Figure 1 is an example of both a transformation (transforming coordinates from one datum to a different datum) and a conversion (reprojecting coordinates on the same datum). In this example a latitude and longitude of a point on the Campo Inchauspe 1969 datum (International 1924 ellipsoid) is converted to World Geodetic System 1984 (WGS 84) Universal Transverse Mercator grid coordinates. (This conversion/transformation is accomplished by entering the datum, type of coordinates input, and longitude/latitude of the point of interest in the upper portion of the MPS GeoTrans window, then, in the lower portion of the window, choosing the datum and type of coordinate output desired and clicking on the “Convert Upper-> Lower” button. (We could have chosen to input WGS 84 UTM grid values along with Zone number and Hemisphere in the bottom portion of the window, choosing the datum and type of coordinate output desired in the upper window and clicked on the “Convert Lower-> Upper” button to get the Campo Inchauspe 1969 latitude and longitude coordinates.)

GeoTrans is a very powerful program. In addition to allowing the conversion and/or transformation of individual points, the program allows the entry of a file of points. The format for these files can be found under the Help menu.

The NGANet and SBU links for the MPS GeoTrans program download can be found at the following links, respectively:

<http://www.geoint.nga.ic.gov/products/gandg/geotrans/index.html> (NGANet link)

<http://earth-info.nga.mil/GandG/geotrans/index.html> (SBU link)
(NOTE: Hold down the CTRL key when clicking on the link.)

The program allows many options as can be seen in Figures 2A, 2B, and 2C on the following page.

The screenshot displays the MSP GEOTRANS 3.0 application window. The top window is set for converting from the 'CAMPO INCHAUSPE 1969, Arg.' datum (International 1924 ellipsoid) to the 'World Geodetic System 1984' datum (WGS 84 ellipsoid) using 'Universal Transverse Mercator (UTM)' projection. The input coordinates are Longitude: 61 28 43.4W and Latitude: 36 30 12.8S, with a height of 0. The output shows Easting / X (m) as 636173 and Northing / Y (m) as 5959169. The bottom window is set for converting from 'World Geodetic System 1984' datum (WGS 84 ellipsoid) back to 'CAMPO INCHAUSPE 1969, Arg.' datum (International 1924 ellipsoid) using 'Geodetic' projection. The input coordinates are Longitude: 61 28 43.4W and Latitude: 36 30 12.8S, with a height of 0. The output shows 90% CE: Unk, 90% LE: N/A, and 90% SE: N/A. The 'Sources' dropdown is set to 'Unknown'.

Figure 1

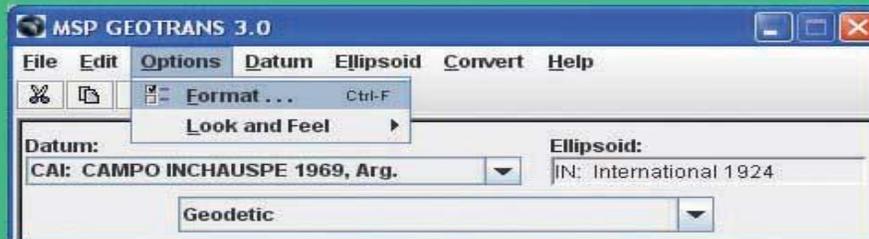


Figure 2A - Options -> Format menu

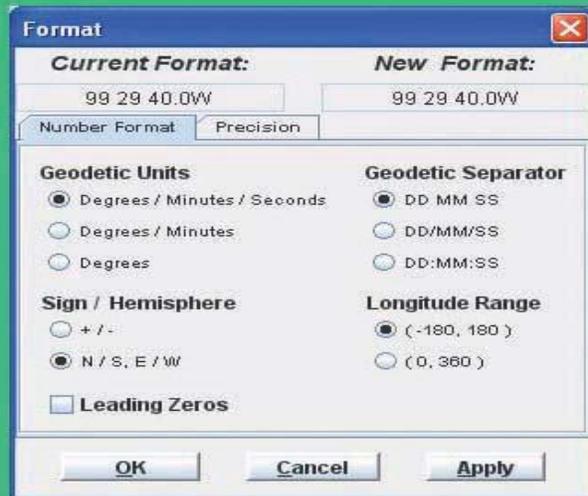


Figure 2B - Number Format options



Figure 2C - Precision options

Format Options

The user can choose various options for the format and precision of the output by clicking **O**ptions on the main menu, then clicking **F**ormat in the drop-down menu. This will bring up the Format dialogue box which has two tabs – a Number Format tab and a Precision tab. Coordinates can be input and output as Degrees/Minutes/Seconds or Degrees and Decimal Minutes, or as Decimal Degrees. In addition, the user can choose to designate the hemisphere with either a – or + sign or with one letter designations (N/S, E/W), separation of the Degrees, Minutes, and Seconds portions of coordinates with a space, a forward slash (/), or a colon symbol (:), and longitudes can be input in the range of 0 degrees to +/- 180 degrees or from 0 degrees to 360 degrees.

The precision tab allows for the input and output to be defined in the range of 100,000m (1 Degree) to 0.001m (0.0001 Second). NOTE: When choosing precision less than a meter, the user will get an error message. Some of the algorithms used limit the precision of the calculations to 1 meter.

Next Article

The next article will demonstrate the format of a list of coordinates input file with and show the converted and/or transformed coordinates output file.

Basic Geodesy Article Archives

NGANet - <http://www.geoint.nga.ic.gov/products/gandg/coordsys/geoarticles/geoarticles.html>

SIPRNet- <http://www.geoint.nga.smil.mil/products/gandg/coordsys/geoarticles/geoarticles.html>

OSIS - <http://osis.nga.mil/GandG/coordsys/geoarticles/geoarticles.html>

WWW - <http://earth-info.nga.mil/GandG/coordsys/geoarticles/geoarticles.html>

(NOTE: Hold down the CTRL key when clicking on the link above.)