ProMark3 – display state plane coordinates

The ProMark3 can be configured to display state plane coordinates using these instructions together with the ProMark3 manuals and information from the National Geodetic Survey.

NOAA Manual NOS NGS 5

State Plane Coordinate System of 1983

The NGS 5 manual was downloaded from the web page at

http://www.ngs.noaa.gov/PUBS_LIB/ManualNOSNGS5.pdf

Navigation functions are described in the ProMark3 Getting Started Guide and the ProMark3 Reference Manual. The manuals are available from the ftp server at

ftp://ftp.magellangps.com

This document is not intended as a replacement for the NGS 5 manual or the ProMark3 manuals. These instructions presume familiarity with the referenced manuals. This is intended as an example and an aid to make it work. Prudent professionals will ensure that methods used yield the desired results.

Determine what NAD83 state plane coordinate zone needs to be set up using the web page at

http://www.ngs.noaa.gov/cgi-bin/spc_zones.prl

The examples used will be from Kansas and Missouri. The Kansas example will illustrate the method used for the Lambert projection. The Missouri example will illustrate the method used for the Transverse Mercator projection. Modify the example to set up the User Grid for the area where you are located. The end result will make more sense if it is related to the place where the ProMark3 is being used.

Lambert Projection:

The example will use a NGS survey monument located in Washington County, Kansas with designation Q 112, PID: KF0306

For additional details about this monument please download the data sheet from the web page at

http://www.ngs.noaa.gov/cgi-bin/datasheet.prl

This monument is located in the Kansas North Zone. From Appendix C in the NGS 5 manual the defining constants for the zone include:

 $Bb - Latitude of Origin = 38^{\circ}20'$

 $Lo - Longitude of Origin = 98^{\circ}00'$

Bs – Southern Standard Parallel = $38^{\circ}43'$

Bn – Northern Standard Parallel = $39^{\circ}47'$

Eo - Easting value at the origin = 400,000.0000

Nb – Northing value at grid origin = 0.0000

ProMark3 – User grid setup procedures

Start the Surveying or the Mobile Mapping program

Press the MENU key

Tap Setup on the Menu

Tap MapDatum on the Setup Menu

Tap Primary on the Coord System menu

Tap NAD83 on the Map Datum menu

Tap CoordSystem on the Setup Menu

Tap Primary on the Coord System menu

Tap User Grid on the Coord System menu

Tap Lambertcon on the User Grid / Projection menu

Tap 2StandardPar on the Lambertcon menu

In this example the large arrow key will be used to change the numbers on the User Grid screens. Other methods of changing the numbers may be equally effective. The described procedure will be the one tested during the creation of these instructions.

Tap in the Latitude of origin field and use the arrow key to move right and left through the fields. Use the arrow key up and down to change the values. Dismiss the little virtual keyboard by dragging it up and then tapping the keyboard icon in the bottom right corner of the screen.

Remember to press the ENTER key after completion of data entry in each field.

For the Kansas north central zone:

Latitude of origin: 38°20'00.00000N

Longitude of origin: 098°00'00.00000W

parallel1: 38°43'00.00000N

parallel2: 39°47'00.00000N

Tap the Next button at the bottom of the screen

Scale factor: 1.0000000

Unit to meters conv

For meters: 1.00000000

For SI Feet: 0.30480000

For the US Survey Foot: 0.30480061

False east at origin

| For meters: +00400000.0 | |
|--------------------------|----------------------------|
| For SI Feet: +01312336.0 | = (400000 / 0.3048) |
| For US Feet: +01312333.3 | = ((400000 * (39.37 / 12)) |
| False north at origin | |
| For meters: +00000000.0 | |
| For SI Feet: +00000000.0 | = (0 / 0.3048) |

For US Feet: +00000000.0 = ((0 * (39.37 / 12)))

Tap the Done button at the bottom of the screen

Testing the results:

Q 112 was entered as a waypoint using the NAD83(1997) latitude, longitude, and ellipsoid height.

39°42'56.21666"N 096°55'08.88271"W 1276.080 feet

With the Kansas north zone parameters entered the state plane coordinates displayed on the ProMark3 are

| E 1616394.069 feet | N 505270.566 feet | 1276.080 feet | |
|--------------------|-------------------|---------------|--|
| | | | |

The state plane coordinates from the data sheet are

E 1616394.10 feet N 505270.57 feet 388.95 meters = 1276.080 feet

Transverse Mercator Projection:

The example will use a NGS survey monument located in Camden County, Missouri with designation CAMDENTON, PID: JD2573

For additional details about this monument please download the data sheet from the web page at

http://www.ngs.noaa.gov/cgi-bin/datasheet.prl

This monument is located in the Missouri Central Zone. From Appendix A in the NGS 5 manual the defining constants for the zone include:

Grid Origin Latitude = $35^{\circ}50'$

Grid Origin Longitude = $92^{\circ}30'$

Scale Factor = 1:15,000

Origin Easting = 500,000

Origin Northing = 0

ProMark3 – User grid setup procedures

Start the Surveying or the Mobile Mapping program

Press the MENU key

Tap Setup on the Menu

Tap MapDatum on the Setup Menu

Tap Primary on the Coord System menu

Tap NAD83 on the Map Datum menu

Tap CoordSystem on the Setup Menu

Tap Primary on the Coord System menu

Tap User Grid on the Coord System menu

Tap TransMerc on the User Grid / Projection menu

In this example the large arrow key will be used to change the numbers on the User Grid screens. Other methods of changing the numbers may be equally effective. The described procedure will be the one tested during the creation of these instructions.

Tap in the Latitude of origin field and use the arrow key to move right and left through the fields. Use the arrow key up and down to change the values. Dismiss the little virtual keyboard by dragging it up and then tapping the keyboard icon in the bottom right corner of the screen.

Remember to press the ENTER key after completion of data entry in each field.

Latitude of origin: 35°50'00.00000N

Longitude of origin: 092°30'00.00000"W

Tap the Next button at the bottom of the screen.

Scale factor: 0.99993333 (1-(1 / 15000))

Unit to meters conv

For meters: 1.0000000

For SI Feet: 0.30480000

For the US Survey Foot: 0.30480061

False east at origin:

| For meters: +00500000.0 | |
|--------------------------|----------------------------|
| For SI Feet: +01640419.9 | = (500000 / 0.3048) |
| For US Feet: +01640416.7 | = ((500000 * (39.37 / 12)) |

False north at origin

| For meters: +00000000.0 | |
|--------------------------|-----------------------|
| For SI Feet: +00000000.0 | = (0 / 0.3048) |
| For US Feet: +00000000.0 | = ((0 * (39.37 / 12)) |

Tap the Done button at the bottom of the screen

Testing the results:

CAMDENTON was entered as a waypoint using the NAD83(1997) latitude, longitude, and ellipsoid height.

| 38°00'27.72340"N | 092°44'43.56061"W | 287.45 meters |
|------------------|-------------------|---------------|
| | | |

With the Missouri Central zone parameters entered the state plane coordinates displayed on the ProMark3 are

The state plane coordinates from the data sheet are

E 478446.647 meters N 241315.376 meters 287.45 meters

If you have questions about this document or suggestions for improvements please contact tech support through the web page at

http://pro.magellangps.com/en/support/request.asp

Phil Stevenson May 22, 2007