

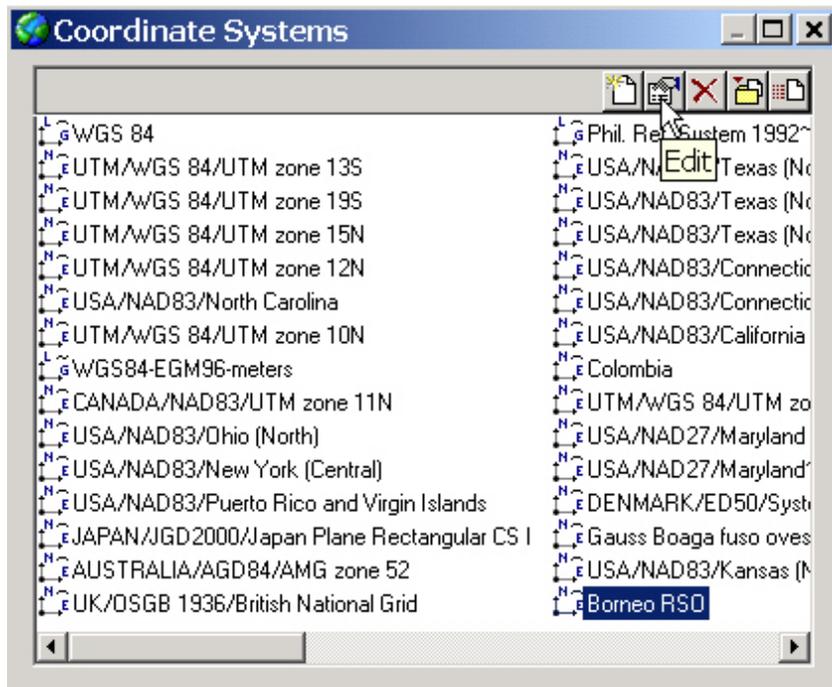
MobileMapper Office Tech Note: Avoiding a common error when creating a datum

30 January 2006

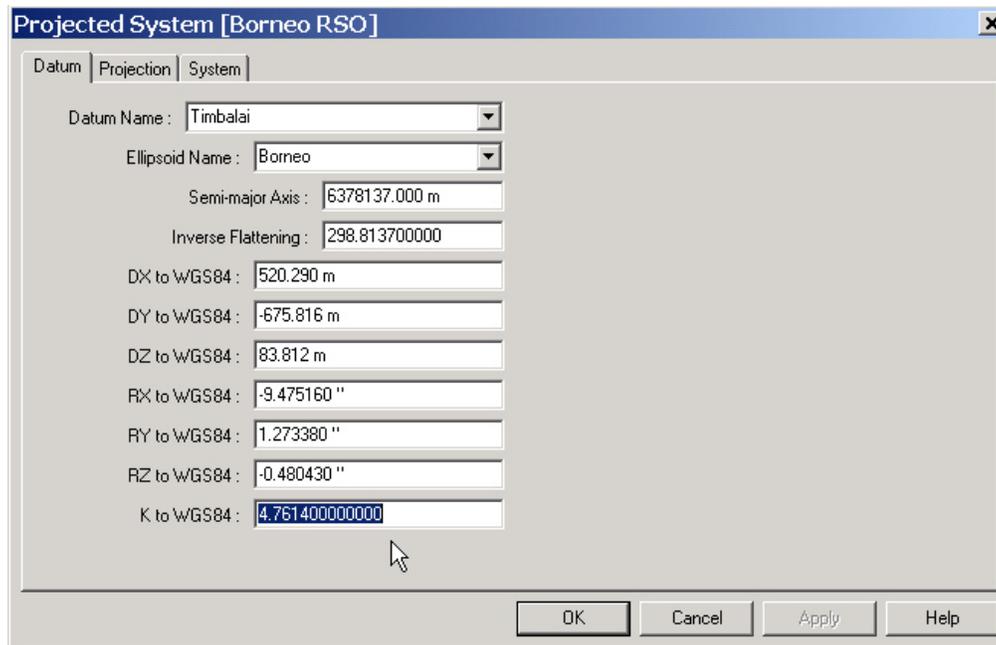
When creating a datum for a new coordinate system in MobileMapper Office, you are asked to input a scale factor – a number that is typically represented by the letter “K” or the expression “K to WGS84.” Because these scale factors are usually very close to 1, e.g., 1.0000023456, some official sources list a parts-per-million (ppm) value, which in this example is 2.3456. If you type in a ppm value instead of a scale factor, you will introduce large errors when transforming your positions to a coordinate system using this new datum. Positions can move thousands of kilometers horizontally and thousands of meters vertically. If you see such gross transformation errors, you probably have input a ppm value instead of a scale factor.

To convert a ppm value to the K to WGS84 scale factor required by MobileMapper Office, divide the ppm value by one million and add 1 to the result. Use the formula $C = (P/1,000,000) + 1$, where “C” = the scale factor you want to input into MobileMapper Office and “P” = the ppm value you obtained from some reliable source. Please note that a ppm value can be a negative number and so will convert to a K to WGS84 scale factor less than one. For example, a ppm value of -1.06002 corresponds to a scale factor of 0.99999893998. Because scale factors are always positive numbers, if the “K” value you obtain is less than one, this is a sure sign that it is a ppm value that you must convert to a proper scale factor. If the “K” value you want to use to define a new datum is < 1 , you know this is really a ppm value that you must convert to a K to WGS84 scale factor.

Once you have converted a ppm value to a scale factor, you can edit the erroneous coordinate system by clicking on the **Options** menu in MobileMapper Office and then **Browse Coordinate Systems**. Highlight the coordinate system that was created using a ppm value and click on the **Edit** icon, as shown in the diagram below.

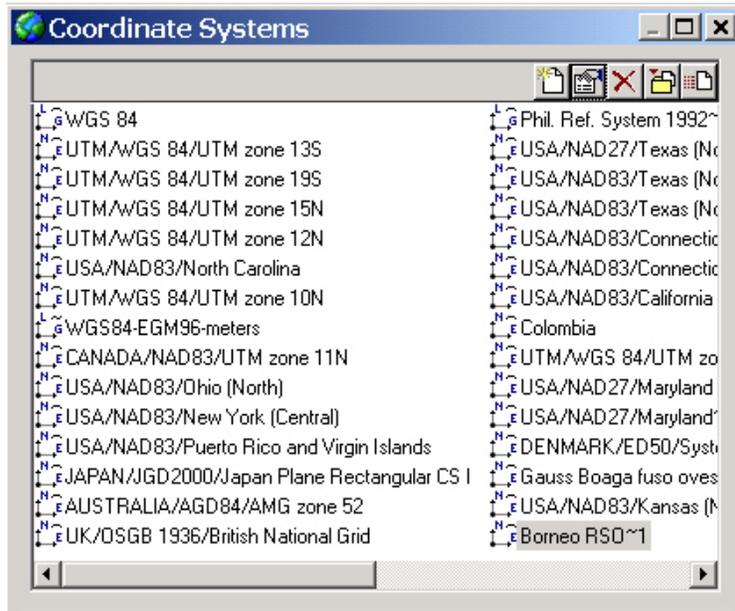


When you click the Edit icon, you will see a window with three tabs: Datum, Projection and System. This is the Coordinate System Properties window (see below). Click on the Datum tab and highlight the value in the K to WGS84 field.



Replace the ppm value with the K to WGS84 number and click **OK**. This action will return you to the Coordinate Systems window.

If you edit the currently selected coordinate system, a copy is made and it is this copy that you actually edit. The copy is marked with a tilde and a 1 to give it a unique file name (see the diagram above). The “~1” indicates that this is the first edited version of a currently selected coordinate system. The original version is retained in case you wish to revert to it without having to recreate it.



If you want to remove the tilde from the file name of the newly created coordinate system, open the Coordinate System Properties dialog box and delete the tilde from the System Name field. Close the dialog box and you can now select the renamed – and tilde-less - coordinate system.

