THALES

MobileMapper

Application Note:
ESRI PRJ Files

Components of a shapefile: SHP, DBF and SHX

It is common to refer to an ESRI shapefile as "SHP files." However, shapefiles actually comprise more than just files with the .shp file extension. For each SHP file there also is a DBF and an SHX file. For example a shapefile for a map's road layer will contain road.shp, road.dbf and road.shx. Files with the .shp extension contain information on feature geometry and geographic position. DBF files store feature and attribute information in a database format. SHX files link the SHP file's feature geometries and positions with the DBF file's feature and attribute information.

PRJ projection files

In addition to SHP, DBF and SHX files many shapefiles now contain a fourth component: a PRJ file. PRJ files store spatial reference information, i.e., the coordinate system information for the shapefile. A PRJ file with each shapefile will ensure that when you share your shapefiles, you will be letting everyone know what coordinate system is associated with your data. Not all shapefiles include PRJ files, however, as they are not always required.

MobileMapper Office support for shapefiles

MobileMapper Office can both import and export SHP, SHX and DBF files. When you import a shapefile, MobileMapper Office converts the information contained in the shapefile's SHP, SHX and DBF file into the MobileMapper job file format (an "MMJ" file). Files with all three extensions must be present in the same directory for MobileMapper to complete the conversion to MMJ format. After updating this file in the field with the MobileMapper receiver, MobileMapper Office converts the job file into SHP, SHX, and DBF files and exports them to a target directory using a browsing window. To keep things simple, the browsing window lists just SHP as the file type for export. However, MobileMapper Office also generates the SHX and DBF files automatically and stores them in the same directory selected for the SHP file.

MobileMapper Office and PRJ files
Unlike the other files making up a shapefile, MobileMapper Office cannot read or write PRJ files. PRJ files are current written in a format that is proprietary to ESRI. When ESRI "opens" this file type to the public, as they have done with SHP, SHX and DBF files, Thales Navigation will be able to support them with MobileMapper Office. Exporting PRJ files will save the user from manually modifying some settings, such as the coordinate system and drawing attributes in their ESRI software application.

Creating an ESRI PRJ file
You can create PRJ files in either of the following ways:

• The ESRI Projection Utility method:
The Projection Utility is a stand-alone tool that is installed with ArcView GIS 3.2. This wizard-based tool allows you to project one or more shapefiles into a coordinate system.

• The manual method:
You can create a PRJ file manually using a text editor such as Notepad.

A coordinate system is either geographic (longitude, latitude) or projected (X, Y). The coordinate system is composed of several objects. Each object has a keyword in uppercase (for example, DATUM or UNIT), followed by the defining, comma-delimited parameters of the object in brackets. Some objects can be composed of other objects.

The ESRI Projection Engine stores the metadata for a coordinate system in a string, or in a PRJ file. The string, also known as a PE string, *must be continuous*. A PE string is somewhat complex because many of its pieces are explicitly defined. You can define your own units, datums, and spheroids.

A Sample PRJ file
Here is a sample of the PRJ file. Note that this file is not continuous as it should be but rather lists the various fields in separate lines for clarity.

```
PROJCS["NAD_1983_UTM_Zone_10N",
GEOGCS["GCS_North_American_1983",
DATUM["D_North_American_1983",
SPHEROID["GRS_1980",6378137,298.257222101]],
PRIMEM["Greenwich",0],
UNIT["Degree",0.0174532925199433]],
PROJECTION["Transverse_Mercator"],
PARAMETER["False_Easting",500000.0],
PARAMETER["False_Northing",0.0],
PARAMETER["Central_Meridian",-123.0],
PARAMETER["Scale_Factor",0.9996],
PARAMETER["Latitude_of_Origin",0.0],
UNIT["Meter",1.0]]
```