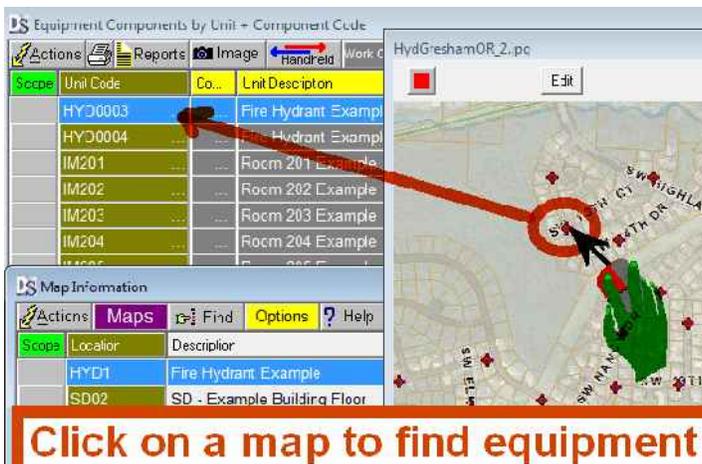**Click on a map to find equipment in the CMMS.**

**GPS coordinates relate to Equipment.**

**Many Map Images are stored in the GPSMaps folder and selected from the Map Information browser.**

Map images can be drawings, where the numbers for GPS coordinate are only a reference and you "Put" location by clicking.



## Map Images

Any JPG image can serve as a map. Typically create a map from a GIS or GPS tracking software. You could also create map images from scanning maps or drawings. Coordinates of the upper left and lower right corners are required as a reference.

## Map Images

Typical map images are about 800 X 600 pixels, maximum recommended about 2048 X 1596. Symbols clicked on the map should be about 14 pixels in diameter.

## Importing GPS Data - Also see the next page: Creating a map image.

You can import GPS coordinates from Excel (XLS) spreadsheets. Save your copies as Excel 2000/XP (.xls). Find original XLS files in ...\DmSystem\Setup\ MapInfo.XLS  EqGPSInfo.XLS  PdMGPSInfo.XLS.

From Map Information, select "Actions, Export/Import, Import Map GPS Coordinates..." to open your copy of MapInfo.XLS with a format as follows:

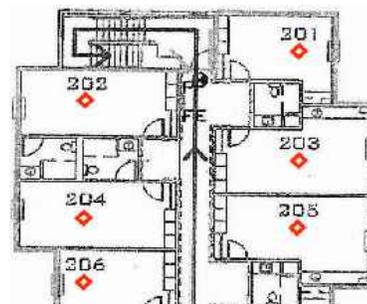| Location | Map File | Latitude Upper Left | Longitude Upper Left | Latitude Lower Right | Longitude Lower Right |
|---|---|---|---|---|---|
| LOC1 | MapofArea.JPG | 31.957558 | 35.938396 | 31.955903 | 35.940765 |

From the Find menu, "Import Equipment GPS Coordinates..." opens your copy of EqGPSInfo.XLS with a format as follows. See  PdMGPSInfo.XLS for PredictMate ®.

| Unit Code | Component | Latitude | Longitude |
|---|---|---|---|
| 1132101 | B | -32.717113 | 25.578487 |

## Building Drawings

As an alternative, the coordinates for equipment can represent a relative location, and identify equipment in Davison CMMS. In this case you "Put" equipment location on the map simply by clicking on the map.

In this case they are not true GPS coordinates, only a reference for upper-left to lower-right corners of the drawing.

A possible set of corner coordinates in Map Information for building drawings:

| Location | Map File | Upper Left | Upper Left | Lower Right | Lower Right |
|---|---|---|---|---|---|
| FLOOR1 | MyDrawing1.JPG | 41.000000 | 91.000000 | 41.200000 | 91.200000 |
| FLOOR2 | MyDrawing2.JPG | 42.000000 | 92.000000 | 42.200000 | 92.200000 |
| FLOOR3 | MyDrawing3.JPG | 43.000000 | 93.000000 | 43.200000 | 93.200000 |

Each image for building drawings should have a separate range of corner coordinates to eliminate the possibility of duplicated equipment coordinates on different drawings.

## Locating equipment with no symbol on the map

It is possible to locate equipment with no symbol on the map. Check the option "Put coordinates from Map". Click on equipment on the map to add GPS Locations to the currently selected equipment record. Symbols might be marked with a mapping software, image editor, or you can put a marker on the map image.

## Putting GPS Coordinates to Equipment

From the Map Information browser, press "Options", "Allow Putting Coordinates from Map". This adds the "Put" option when clicking a map.

The "Put" command compares to a point created in mapping software at about +/- 0.000020 Decimal Degrees (DD) on a map that is about 1.5 km square. The "Put" command is acceptable accuracy and easier to make points on the drawing.

The Put command can put this marker on the map image.
Original image saved to "_"+<file>.



When maps are scanned or copied to JPG files and calibrated, the variation from actual GPS coordinates might be about +/- 0.0001 DD, but you can click to find equipment accurately.

To show all equipment with coordinates for a map:
1) Select "Find, Equipment for this Map" from Map Information.
2) If many equipment are tagged, the "Show" command will temporarily mark all locations on the image.

## Creating a map image

- Create a map image with known GPS coordinates for the Upper-left and Lower-right corners.
- Copy the images to the Maps folder. Select "Find, Click a map - Tools, Open Maps Folder".
  (C:\DmSystem\Data\GPSMaps\)
- Select "Find, Click a map to Find Equipment" and add a record for the map image.
- Check the options "Allow putting..." and "Put markers on Full Map".
- Highlight the equipment record, then click on the map to put a marker on the image and coordinates to that equipment record.
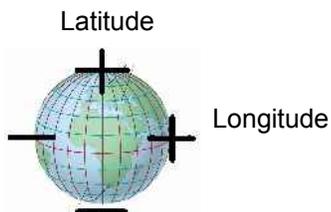
## Software for Creating Maps with GPS Coordinates

We used a GPS Tracking software to create map images from Google ™ Maps:
GPS TrackMaker ®  http://www.trackmaker.com/
This was adequate to create JPG map images with GPS coordinates listed in a table. We could import the GPS coordinates as needed for Davison CMMS. You can use other software for creating map images.

## Decimal Degrees

Decimal degrees (DD) express latitude and longitude geographic coordinates as decimal fractions and are used in many Geographic Information Systems (GIS), web mapping applications such as Google Maps, and GPS devices. Decimal degrees are an alternative to using degrees, minutes, and seconds (DMS). As with latitude and longitude, the values are bounded by ±90° and ±180° respectively.



Positive latitudes are north of the equator, negative latitudes are south of the equator. Positive longitudes are east of Prime Meridian, negative longitudes are west of the Prime Meridian. Latitude and longitude are usually expressed in that sequence, latitude before longitude.