ENTERPRISE

Technical Reference Guide

Software Version 8.1

Reference Guide Edition 4

An electronic version of this document exists.

This User Reference Guide published on 04 March 2014.

Refer to the Online Help for more information.

This User Reference Guide prepared by:

AIRCOM International Ltd
Cassini Court
Randalls Research Park
Randalls Way
Leatherhead
Surrey
KT22 7TW

Telephone:	+44 (0) 1932 442000
Support Hotline:	+44 (0) 1932 442345
Fax:	+44 (0) 1932 442005
Web:	www.aircominternational.com

Change History

This table shows the change history of this guide:

Edition	Date	Reason
1	07 June 2013	First edition.
2	22 July 2013	Update the section on Changes Between XML Versions 8.0 and 8.1.
3	14 November 2013	Amendments to Switching Type values in Traffic Raster TRI File Format.
4	04 March 2014	General Amendments.

Explanation of Symbols

Throughout this guide, where appropriate, some symbols are used to highlight particular pieces of text. Three different symbols are in use, and are explained as follows:

Symbol	Brief Description	Full Description
	Note	Signifies text that should be noted or carefully considered.
	Tip	Signifies text that may help you do something in an easier or quicker way.
	Warning or Important	Signifies text that is intended as a warning or something important.

Contents

CHAPTER 1

Map Data File Formats

This chapter describes the map data file formats that are used in ENTERPRISE.

Except where otherwise mentioned, spaces in text files are treated as delimiters. Therefore, if you have spaces within names of models, antennas, carrier layers and so on, you need to remove them. It is recommended that you replace them with underscores or run the words together, for example, Flat Terrain becomes FlatTerrain. This may mean temporarily changing your existing ENTERPRISE names so that items will match those from the import file. After a successful import, you can change the names back again.

If an export is made from a database that uses spaces, it will not be possible to import without editing the file manually.

Map Data

ENTERPRISE uses well-defined and easily obtainable map data formats that can be ordered from all major digital mapping data suppliers. Conceptually, a pixel represents the average value over the complete pixel. Each pixel is referred to using the lower left co-ordinate.

Slashes in index file paths can be either / or \ to allow easy sharing of data with PC and UNIX based file servers. Although sub-folders are supported with the paths, the up-one-directory symbol is not, for example,"010\..\".

Index files with fractional values (decimals) for the location data are no longer supported by ENTERPRISE and are considered invalid. That is, the location data should all be integers. Please ensure you amend the index.text file appropriately if this is the case. This picture shows an example of valid and invalid data:

Valid ✓	\BACKDROP\2m\258160.tif 255000 260000 157500 162500 2
Invalid ✗	\BACKDROP\2m\258160.tif 255000.0 260000.0 157500.0 162500.0 2

For Height Data and Clutter Data, the difference between the min and max co-ordinates (for example, Eastmax - Eastmin) in the index file must always be a multiple of the pixel size.

In most cases, for Height and Clutter Data, the co-ordinates in index files should be integer multiples of the pixel size. However, 'offset' data can also be used, whereby the difference between the min and max co-ordinates are multiples of the pixel size, but the min values are not. In this case, the offset of all tiles has to be equal.

For Map Backdrops, there are no restrictions, and the resolution can be omitted from the index files if required. If it is omitted, you should use the Map View Visibility Settings . For more information, see the ENTERPRISE User Reference Guide.

Height Data

The height data - digital terrain model (DTM) is stored in a binary format where each element of the data represents the height above sea level in metres for a square area of, for example, 50m x 50m.

Index File

An ASCII text file called index.txt contains positional information about each binary height file. The file contains one row describing each height file. Relative path names can be incorporated within the filename to allow a structured approach to map data directory organisation.

Each row contains the following variables separated by a space:

Field	Description
Filename	Filename of DTM Height file
Eastmin	Minimum Easting value (metres)
Eastmax	Maximum Easting value (metres)
Northmin	Minimum Northing value (metres)
Northmax	Maximum Northing value (metres)
Square Size	Size of each element of the height data (metres)

For example:

```
1m\b56151mh.hgt          564040 566235 5447481 5449675 1
5m\b56155mh.hgt          552500  575550  5442400 5458550 5
10m\B56155MH.10          552500  575550  5442400 5458550 10
20m\B56155MH.20          552500  575540  5442400 5458540 20
50m\B56155MH.50          552500  575550  5442400 5458550 50
100m\B56155MH.100        552500  575500  5442400 5458500 100
200m\B56155MH.200        552500  575500  5442400 5458400 200
```

The final row of the index file is terminated by a carriage return.

 The difference between the min and max co-ordinates (for example, Eastmax - Eastmin) in the index file must always be a multiple of the pixel size.

In most cases the co-ordinates in index files should be integer multiples of the pixel size. However, 'offset' data can also be used, whereby the difference between the min and max co-ordinates are multiples of the pixel size, but the min values are not. In this case, the offset of all tiles has to be equal.

Binary Height Format

Each element is two bytes in size and the most significant byte is stored first. The elements are stored in one continuous array such that the size of the array in the following example would be 500 (wide) x 500 (high) x 2 (bytes per element) = 500,000 bytes.

If there are pixels within the file that are outside the limits of the map, the value -9999 is stored at that location.

Clutter Data

The clutter data is stored in a binary format with each element of the data containing a code corresponding to a category of land usage for a square area of, for example, 50m x 50m.

Index File

An ASCII text file called index.txt contains positional information about each binary clutter file.

The file contains one row describing each clutter file. Relative path names can be incorporated within the filename to allow a structured approach to map data directory organisation.

Each row contains the following variables separated by a space:

Field	Description
Filename	Filename of Clutter file The combination of index filename and path should not exceed 255 characters otherwise ENTERPRISE will truncate it and in the event of a duplication in the truncated names, ENTERPRISE will not add the duplicate.
Eastmin	Minimum Easting value (metres)
Eastmax	Maximum Easting value (metres)
Northmin	Minimum Northing value (metres)
Northmax	Maximum Northing value (metres)
Square Size	Size of each element of the clutter data (metres)

For example:

```
1m\b56151mc.ctr          564040 566235 5447481 5449675 1
5m\b56155mc.ctr          553495 574495 5443035 5457500 5
10m\B56155MC.10          553495  574495  5443035 5457495 10
20m\B56155MC.20          553495  574495  5443035 5457495 20
50m\B56155MC.50          553495  574495  5443035 5457485 50
100m\B56155MC.100        553495  574495  5443035 5457435 100
200m\B56155MC.200        553495  574495  5443035 5457435 200
```

The final row is terminated by a carriage return.

 For Height Data and Clutter Data, the difference between the min and max co-ordinates (for example, Eastmax - Eastmin) in the index file must always be a multiple of the pixel size.

In most cases, for Height and Clutter Data, the co-ordinates in index files should be integer multiples of the pixel size. However, 'offset' data can also be used, whereby the difference between the min and max co-ordinates are multiples of the pixel size, but the min values are not. In this case, the offset of all tiles has to be equal.

Menu File

In addition an ASCII text file called menu.txt contains a table relating the clutter codes stored in the binary clutter file with a text description of the clutter category. Each line contains one code followed by one description, space separated. The code must be an integer between and including 0 and 32767. This file must be in the same directory as the index file.

The text description cannot be more than 128 characters long. If the descriptions are longer than this, they will be truncated. In the event of a duplication in the truncated descriptions, ENTERPRISE will warn you and will not add the duplicate.

For example:

```
0 unclassified
1 urban
2 suburban_residential
3 village
4 isolated dwellings_outbuildings
5 open_rural_land
6 woodland_forest
7 park_recreational
8 industry
9 water
10 airport
11 open_in_urban
12 agricultural land
13 Pylon
14 sea
```

The final row is terminated by a carriage return.

Binary Clutter Format

Each element is two bytes in size and the most significant byte is stored first. The elements are stored in one continuous array such that the size of the array in the following example would be 500 (wide) x 500 (high) x 2 (bytes per element) = 500,000 bytes.

Configuring Map Backdrops

ENTERPRISE supports a number of different file types for map backdrops and aerial photographs:

*.bmp	*.jpeg
*.tiff	*.gif
*.pcx	*.targa

If you use BMP bitmaps, these can be any number of colours (2 bit through to 24 bit) but must not use compression (Run Length Encoding). If uncompressed images are giving you performance problems, it is recommended that you use the NTFS file system with file compression.

You can configure the map backdrop data in a number of different ways, depending on how many layer types (and resolutions within those layer types) you have.

The resolution can be omitted from the index files if required. If it is omitted, you should use the Map View Visibility Settings . For more information, see the ENTERPRISE User Reference Guide.

Viewing Information about the Scale of the current Map View

In the Map Information pane (corresponding to the Map View), there is an option to display the scale value of the current Map View:

This represents the ratio between the pixel size in ENTERPRISE and the screen pixel size. This value can be a useful aid in deciding which resolution to specify against scanmaps in the index file. For a full description of how to use the Map Information pane, see 'Viewing Information About a Specific Pixel' in the ENTERPRISE User Reference Guide.

Configuring Map Backdrops for a Single Layer Type

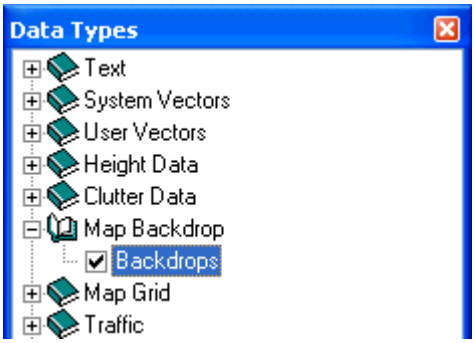
If you are using a single layer type, for example aerial photographs or relief maps, then it is recommended that you set up your map backdrop configuration as follows:

1 Create a single Backdrops folder, which is the one you specify on the Map Data Directories tab of the Modify Project dialog box.

2 In this Backdrops folder, you should store an index file (index.txt) and all of the image files.

For more information on the index file, see About the File Format for Map Backdrops Index Files on page 21.

If you use this map backdrop configuration, it is displayed in the list of data types like this:



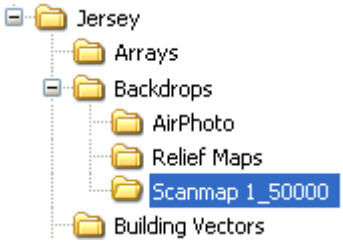
Configuring Map Backdrops for Multiple Layer Types

If you are using multiple layer types (for example aerial photographs and scanmaps) then it is recommended that you set up your map backdrop configuration as follows:

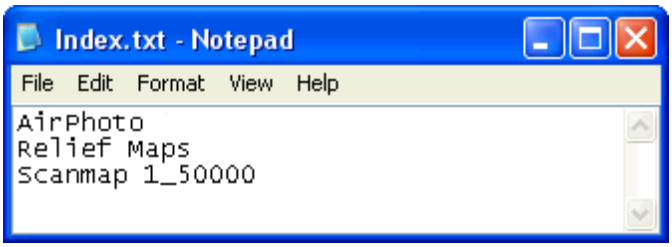
1 Create a main Backdrops folder, which is the one you specify on the Map Data Directories tab of the Modify Project dialog box.

2 In this Backdrops folder, you should store an index file (index.txt) and sub-folders for each layer.

This picture shows an example of the sub-folders you may have:



The top-level index file in the Backdrops folder should just reference all the sub-folders, for example:

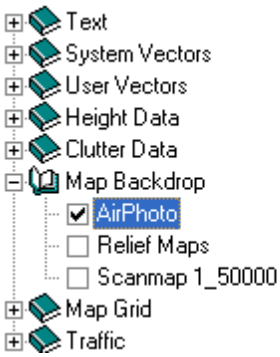


The order of the folders in this index file is the same as that in ENTERPRISE. In this configuration each of the layers would not normally be visible at the same time when displayed at 100% opacity. The folder names in the index file must exactly match those on the disk.

3 In each sub-folder, you should store an index file (index.txt) and all of the image files.

For more information on the index file, see About the File Format for Map Backdrops Index Files on page 21.

If you use this map backdrop configuration, it is displayed in the list of data types like this:



Configuring Map Backdrops for Multiple Layer Types with Multiple Resolutions

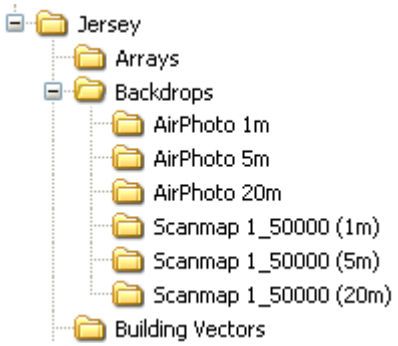
If you are using multiple layer types, for example aerial photographs and scanmaps, that also have files of different resolutions (for example, aerial photographs at 20m resolution and 5m resolution), then it is recommended that you set up your map backdrop configuration as follows:

Please see the note about displaying the scale of the current Map View in Configuring Map Backdrops on page 17.

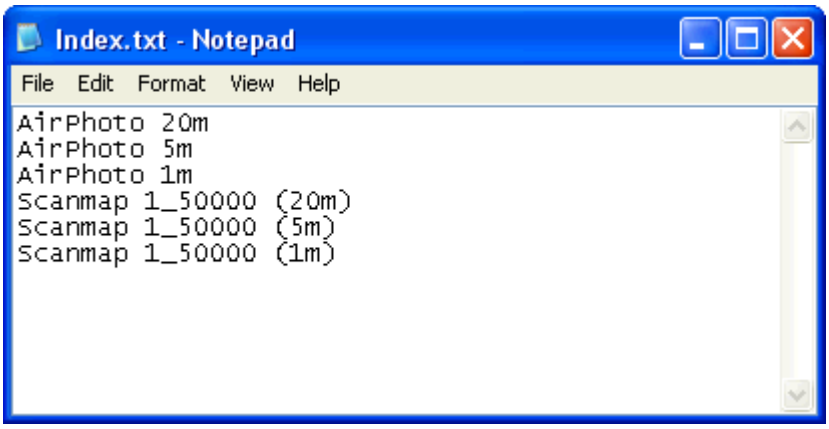
1 Create a main Backdrops folder, which is the one you specify on the Map Data Directories tab of the Modify Project dialog box.

2 In this Backdrops folder, you should store an index file (index.txt) and sub-folders for each layer and resolution combination.

This picture shows an example of the sub-folders you may have:



The top-level index file in the Backdrops folder should just reference all the sub-folders, for example:

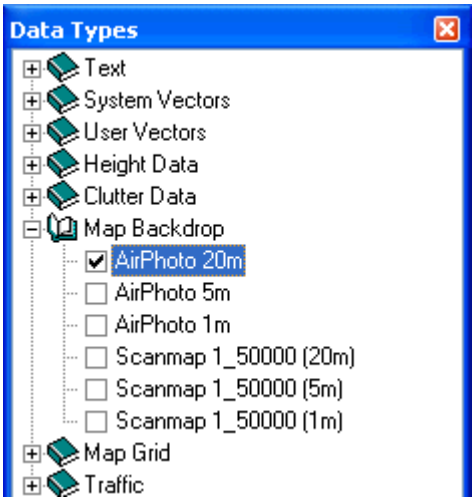


The order of the folders in this index file is the same as that in ENTERPRISE. If multiple folders represent the same layer type but at a different resolution, you should ensure that the highest resolution (lowest metres/pixel value) folders are at the bottom of the list for a particular layer type to ensure the higher resolution images are displayed over the coarser ones. In this advanced case, the layer types are not mutually exclusive as the visibility settings are used to control when certain resolutions are displayed. The folder names in the index file must exactly match those on the disk.

3 In each sub-folder, you should store an index file (index.txt) and all of the image files.

For more information on the index file, see About the File Format for Map Backdrops Index Files on page 21.

If you use this map backdrop configuration, it is displayed in the list of data types like this:



About the File Format for Map Backdrops Index Files

There are two types of index file for map backdrops:

- Top-level index files, stored in the main Backdrops folder
- Image index files, stored in either the main Backdrops folder (for single layer types) or in any number of sub-folders (for multiple layer types)

Top-level Index Files

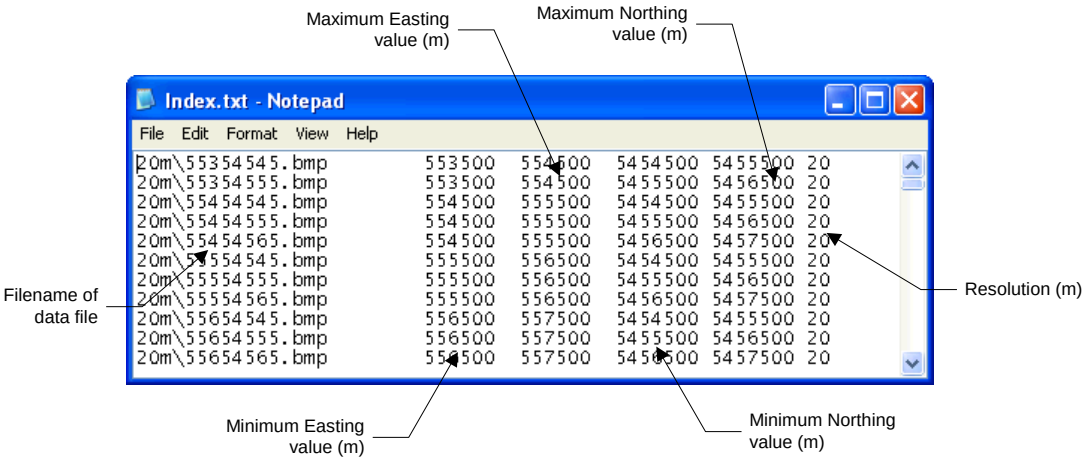
If you are setting up map backdrops for multiple layer types (with or without multiple resolutions), the top-level index file just references all of the sub-folders. For more information on this, see either Configuring Map Backdrops for Multiple Layer Types on page 18 or Configuring Map Backdrops for Multiple Layer Types with Multiple Resolutions on page 19.

If you are just setting up map backdrops for a single layer type, only one index file is needed and is the same format as the one described for the sub-folder index files.

Image Index Files

This index file can refer to multiple image files with one row giving information about one file.

This picture shows an example index.txt file:



Example Map Backdrops Index File

This table shows what is contained in the index.txt file:

Field	Description
Filename	Filename of data file The combination of index filename and path should not exceed 255 characters, otherwise ENTERPRISE will truncate it. In the event of a duplication in the truncated names, ENTERPRISE will not add the duplicate.
Eastmin	Minimum Easting value (metres)
Eastmax	Maximum Easting value (metres)
Northmin	Minimum Northing value (metres)
Northmax	Maximum Northing value (metres)

Field	Description
Resolution	Size of image pixel (metres). This is an optional field: • If a value is present, ENTERPRISE uses it to determine whether or not to display the layer • If no value is present, ENTERPRISE assumes that it should always display the layer. A warning is given, and all files are loaded

Important : Ensure that:

- Each line, even the last line, of any index file, has a carriage return at the end of it otherwise the line will not be read.
- The images in this file are ordered from the least to the most detailed (higher resolution), with the most detailed files at the end of the index.txt file. This means when you have backdrops displayed in the Map View window, the display is built up sequentially, automatically switching between maps and choosing the best file for the zoom level.

You can use image files with different resolutions; when you choose to display the Backdrops data type, by default ENTERPRISE uses an algorithm to automatically select the most appropriate resolution to display. However, if you want to determine the resolution that is displayed, you should follow the appropriate instructions:

If you are configuring map backdrops for	You should ensure that
A single layer type	• You only list the files for one resolution in the index file. • You set the minimum and maximum map view dimensions at which the image for each resolution will display. This is done on the Visibility Settings tab of the Map Backdrops Display Settings dialog box. For more information on how to do this, see the ENTERPRISE User Reference Guide.
Multiple layer types	• You set up your map backdrops files as described in Configuring Map Backdrops for Multiple Layer Types with Multiple Resolutions on page 19. • You set the minimum and maximum map view dimensions at which the image for each resolution will display. This is done on the Visibility Settings tab of the Map Backdrops Display Settings dialog box. For more information on how to do this, see the ENTERPRISE User Reference Guide. Using the Visibility Settings tab to specify ranges for each different layer and resolution combination can be a laborious task, especially across multiple machines. To perform this globally, ENTERPRISE administrators can set project-wide default visibility settings and import these registry settings into a specific database, making them available to all users. For more information on how to do this, see the ENTERPRISE Installation and Administration Guide.

Using Map Backdrops Effectively

This section gives some tips for using map backdrops effectively.

If You Have High Resolution Maps Covering a Large Area

If you have high resolution maps covering a large area, and your image files are too small, there will be hundreds of files and it will take more time to browse and load the files. Therefore, it is recommended that you "tile" the area into files of size 1Mb to 4Mb. Ideally these files should not overlap. Overlapping files are supported, however if you replace files, or reorder the index file, the overlapping sequence could change giving different visual results.

When the Map Backdrop Does Not Appear in the Map View Window

ENTERPRISE determines whether the map backdrop is worth displaying by checking that the image is not reduced too much.

The backdrop will not be displayed if it is compressed by more than a factor of three. When this happens, a frame indicating the map backdrop area is displayed on the map.

Further Advice on Using Map Backdrops Effectively

The following factors have an impact on the proper use of map backdrops:

- The estimated number of metres per pixel is calculated based on the file size and on the assumption that the image is square. Consequently, if your images are very long and thin or short and wide, the visibility algorithm will give differing results for the same metres/pixel images. If you want to use the automatic resolution selection algorithm it is recommended that the images are square rather than rectangular. Alternatively, you could explicitly specify the resolution directly in the index file and/or use the backdrop visibility settings.
- Always use the file naming conventions suggested in the Installation and Administration Guide. In particular:
  - Use relative path names within the image filename to allow a structured approach to map data directory organisation.
  - Arrange the images into directories corresponding to the metres / pixel value – to make life easier when working with multiple resolutions and improve folder browsing speed when many images are present in a folder.

Vector Data

Line/Vector data contains features such as roads, railways, coastlines, and so on. Separate mapping features must be in separate data files, however there can be more than one file for a specific vector.

Building vector data is a specialised version of normal vector data, which contains a particular attribute called 'building' and describes the shapes and heights of buildings in more detail. The application of such data will typically be to provide input for ray-tracing type propagation models, used for the generation microcell coverage within the planning tool.

All vector data now uses a MapInfo *.tab file format.

ENTERPRISE uses a structured index file (index.xml) to organise a collection of vectors and their constituent *.tab files, and register them with the system.

You can create an index.xml file in a number of ways:

- If you have TAB vector files, use the Vector Manager to register the new vectors with ENTERPRISE as it will automatically create/update the index.xml for you. This is by far the most straightforward way. For more information, see the ENTERPRISE User Reference Guide.
- If you have TAB vector files but do not want to use the Vector Manager, see the topics and examples in this section for information on how to create an index.xml manually, or use the GenerateIndexXml power tool to automatically generate an index.xml for a folder hierarchy full of TAB files.
- If you have old format vector files (an index.txt file and *.txt vector files), you can create an index.xml file and convert the vectors to TAB format using the Index2Tab power tool, which is available from Product Support.

For more information on the format of the index.xml file, see About the Vector Index.xml File Format on page 24.

About the Vector Index.xml File Format

The vector index.xml file format has the following characteristics:

- Each file must start with:

  <?xml version="1.0" encoding="utf-8"?>

  <VECTOR-LAYER-LIST VERSION="1.0">

  And end with:

  </VECTOR-LAYER-LIST>
- You can have 0 or more layers, but each VECTOR must have a TAB-FILE-LIST section.

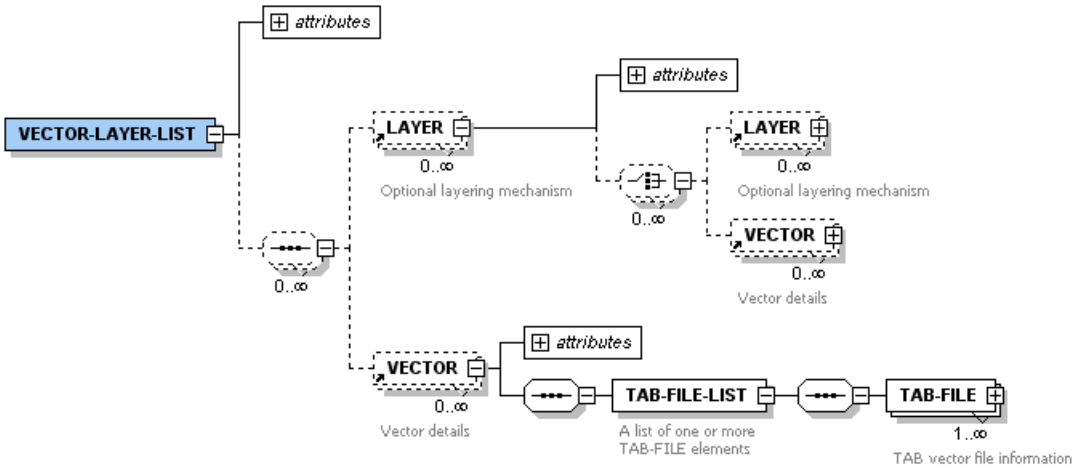
- Each LAYER, VECTOR and TAB-FILE must have a GUID attribute, which uniquely identifies each entity. A GUID is a unique 128-bit number formatted in the following hexadecimal arrangement "00000000-0000-0000-0000-000000000000". If you are creating a new index.xml file, you do not need to specify a value, because ENTERPRISE automatically adds any missing values. If you want to create GUIDs yourself, please see http://tinyurl.com/ygmq9u.

   **Important :**

  - You cannot have duplicate GUID values within each index.xml file
  - Do not modify GUID values after they have been generated
- Each LAYER consists of the following attributes:
  - A NAME attribute, which stores the name of the layer as defined in the Vector Manager
  - A GUID attribute (see above)
  - Any number of VECTOR sections
- Each VECTOR consists of the following attributes:
  - A NAME attribute, which stores the name of the vector as defined in the Vector Manager
  - A GUID attribute (see above)
  - A TAB-FILE-LIST section, which must contain 1 or more TAB-FILE sections.

    For large vectors, you may have multiple TAB-FILE sections in the same TAB-FILE-LIST. For more information, see Using Multiple TAB-FILE Entries in the Same TAB-FILE-LIST on page 27.
- Each TAB-FILE contains the following compulsory attributes:
  - A FILENAME attribute, which identifies the vector *.tab file containing the vector data. This must include the .tab extension, and is relative to the PATH attribute
  - A GUID attribute (see above)
  - Path of the filename relative to the index.xml location, or alternatively a fully qualified path.
  - A PATH attribute, which is usually the path of the vector filename relative to the index.xml location, but can be a fully-qualified path.
  - An ATTRIB-NAME-IDX attribute, which ASSET uses to join *.tab file attribute names together to form a unique name. Leave this blank, or specify a comma-separated list of attribute column numbers starting with 1. For example, to include the first column only, type '1' or to include the first three columns, type '1,2,3'. When ENTERPRISE generates per polygon statistics this compound naming column is used.
- Tab files for building vectors have their own special conditions. For more information, see About TAB Files for Building Vectors on page 26.

This picture shows a graphical representation of the XML schema:



Vector XML Schema

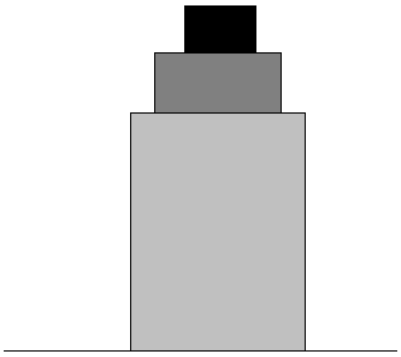
You can obtain this XML schema as an *.xsd file from Product Support.

About TAB Files for Building Vectors

The TAB files for building vectors have their own special conditions:

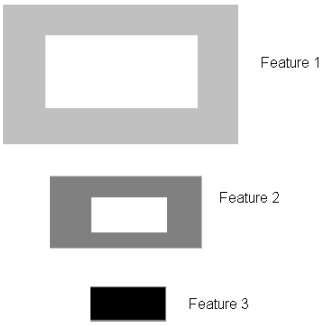
- The TAB-FILE must contain a BUILDING attribute, which stores the height above DTM as a float
- If you are using highly-detailed building data, a single building which has data at various heights will be divided into a number of features, with each one representing a discrete part of the overall building structure.

  For example, consider this tower block:



  Viewed from above, it can be separated into 3 'strata' of height, each represented here by a different colour:

Each of these strata will appear as a separate feature within the overall building feature, each with its own BUILDING value:

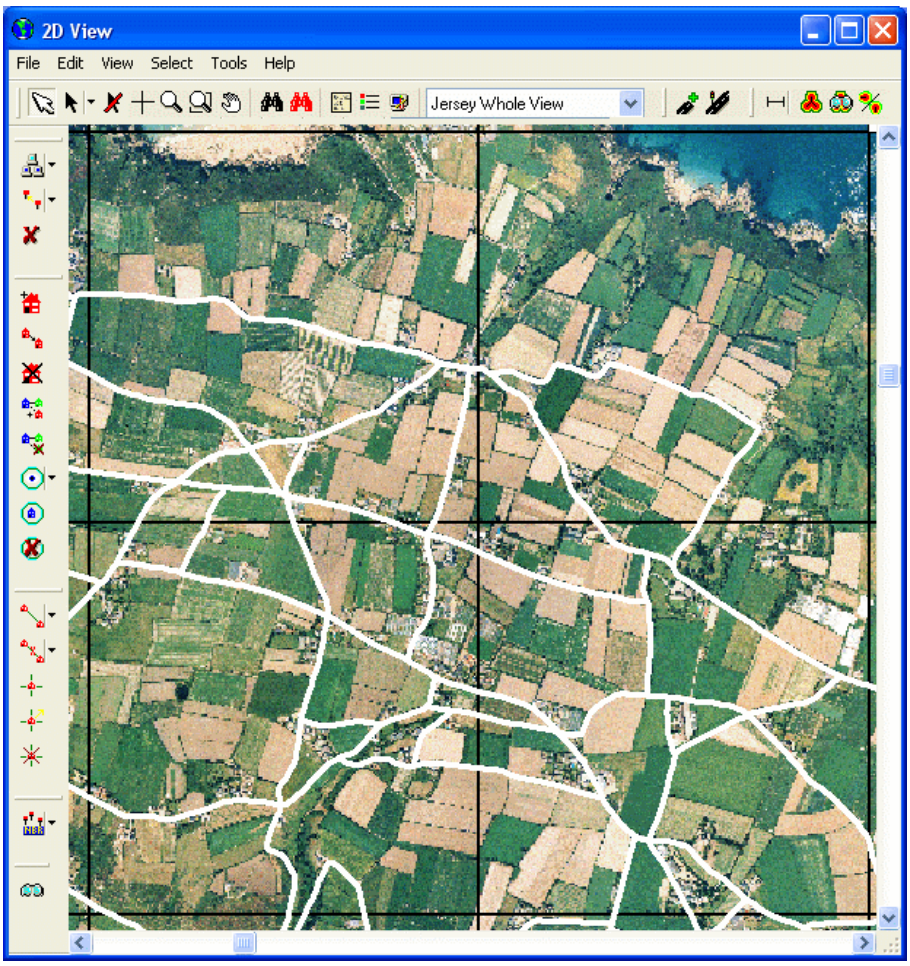


When the building vectors have been imported, if you hover the cursor over a particular point on the building, the height shown will be the height for that particular vector feature.

Using Multiple TAB-FILE Entries in the Same TAB-FILE-LIST

If you have large vectors, you can have multiple TAB-FILE entries in the same TAB-FILE-LIST. In this way, large areas of map data can be 'tiled' into separate sections, then brought together under one VECTOR.

For example, the map data for this location could be split into four sections, each with its own tab file:



Example of map data 'tiled' into separate sections

The tab files could be NW.tab, NE.tab, SW.tab and SE.tab, corresponding with the areas of data they cover.

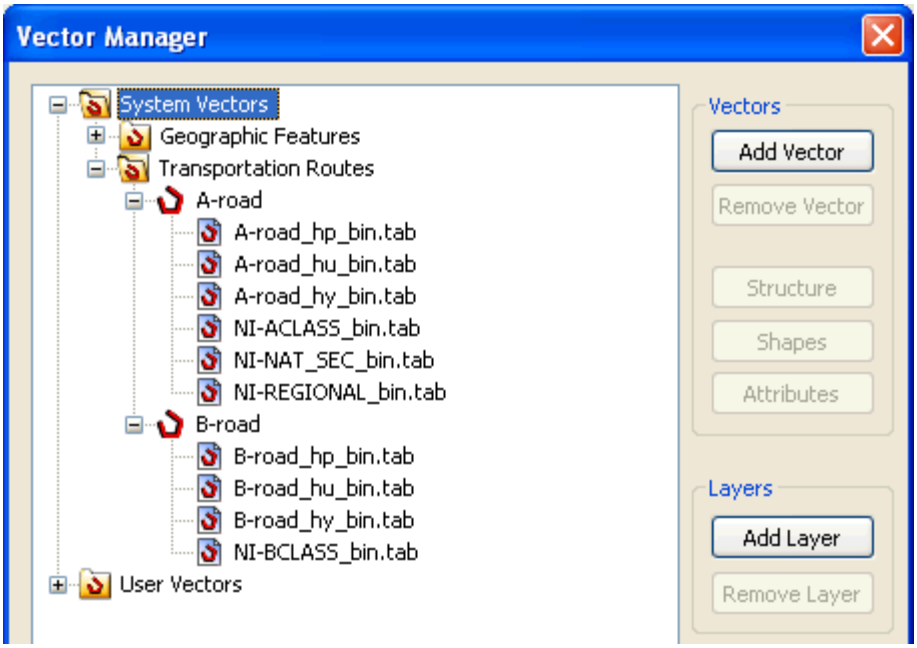
In the index.xml file, they would appear as:

```
<?xml version="1.0" encoding="utf-8"?>
 <VECTOR-LAYER-LIST VERSION="1.0">
  <VECTOR NAME="Large_Region" GUID="0A4E2A65-5F99-4662-8DBF-43975FC2CA40">
   <TAB-FILE-LIST>
    <TAB-FILE FILENAME="NW.tab" GUID="8EB8882E-83C8-4C57-95F4-EB5FFE6B5BF2" PATH="" ATTRIB-
NAME-IDX="" />
    <TAB-FILE FILENAME="NE.tab" GUID="FDD4D6EB-7779-43BF-977F-142CFE9F9CA4" PATH="" ATTRIB-
NAME-IDX="" />
    <TAB-FILE FILENAME="SW.tab" GUID="C066E1CA-149B-436D-8380-89E6212B950A" PATH="" ATTRIB-
NAME-IDX="" />
    <TAB-FILE FILENAME="SE.tab" GUID="38A23C47-B413-492D-AEFA-75ADCF9E0D68" PATH="" ATTRIB-
NAME-IDX="" />
   </TAB-FILE-LIST>
  </VECTOR>
 </VECTOR-LAYER-LIST>
```

You could also use these separate tab files again in four individual vectors, for example NW_Region, NE_Region, SW_Region and SE_Region. If this were the case, they each would be given a new, different GUID. This would be particularly useful if you were mapping a number of large cities in a single region, and wanted to treat the cities as a group and also as separate entities.

Example Vector Index.xml File

This topic describes an example vector index.xml file, which is based on the following structure in the Vector Manager:



Vector Manager structure

Here is the corresponding index.xml:

```
<?xml version="1.0" encoding="utf-8" ?>
<VECTOR-LAYER-LIST VERSION="1">
 <LAYER NAME="Geographic Features" GUID="1689c128-dea1-4072-8644-8ca5db9421fa">
 </LAYER>
 <LAYER NAME="Transportation Routes" GUID="D25EE297-ABC5-4DCE-B3AE-637C3391C98E">
  <VECTOR NAME="A-road" GUID="0A4E2A65-5F99-4662-8DBF-43975FC2CA40">
   <TAB-FILE-LIST>
```

```
      <TAB-FILE FILENAME="A-road_hp_bin.tab" GUID="8EB8882E-83C8-4C57-95F4-EB5FFE6B5BF2" PATH=""
ATTRIB-NAME-IDX="" />
      <TAB-FILE FILENAME="A-road_hu_bin.tab" GUID="FDD4D6EB-7779-43BF-977F-142CFE9F9CA4" PATH=""
ATTRIB-NAME-IDX="" />
      <TAB-FILE FILENAME="A-road_hy_bin.tab" GUID="C066E1CA-149B-436D-8380-89E6212B950A" PATH=""
ATTRIB-NAME-IDX="" />
      <TAB-FILE FILENAME="NI-ACLASS_bin.tab" GUID="63C49B18-5F82-4068-B4A0-39F634167D50" PATH=""
ATTRIB-NAME-IDX="" />
      <TAB-FILE FILENAME="NI-NAT_SEC_bin.tab" GUID="559CFB5D-00B1-49D6-9A22-57281FF38841" PATH=""
ATTRIB-NAME-IDX="" />
      <TAB-FILE FILENAME="NI-REGIONAL_bin.tab" GUID="F91061EE-F375-4CBF-AA27-93929E811C70" PATH=""
ATTRIB-NAME-IDX="" />
    </TAB-FILE-LIST>
   </VECTOR>
   <VECTOR NAME="B-road" GUID="626DC2F0-B2E7-4B49-843B-0F519BB369BD">
    <TAB-FILE-LIST>
      <TAB-FILE FILENAME="B-road_hp_bin.tab" GUID="503C80C8-B56F-4807-BB6A-BCAAB3279334" PATH=""
ATTRIB-NAME-IDX="" />
      <TAB-FILE FILENAME="B-road_hu_bin.tab" GUID="09D6DC5A-94F8-4334-BF08-3321DE0A9BD5" PATH=""
ATTRIB-NAME-IDX="" />
      <TAB-FILE FILENAME="B-road_hy_bin.tab" GUID="AF2CB126-20D3-4B57-8675-63CB0143EEA4" PATH=""
ATTRIB-NAME-IDX="" />
      <TAB-FILE FILENAME="NI-BCLASS_bin.tab" GUID="6750068E-5AD7-4937-8956-F254067DCB8C" PATH=""
ATTRIB-NAME-IDX="" />
    </TAB-FILE-LIST>
   </VECTOR>
  </LAYER>
</VECTOR-LAYER-LIST>
```

Building Raster Data

The DEM format is exactly the same as the DTM except that the height values stored represent building height above ground level, that is, flat earth. Typically the pixel sizes would be in the range of 1m to 10m.

Text Data

Text data consists of features such as town names, city names, and so on. The text data is stored in either ASCII files or in a proprietary binary format. Separate mapping features must be in separate data files, however there can be more than one file for a single feature.

Index File

An ASCII text file called index.txt contains positional information about text. Relative path names can be incorporated within the filename to allow a structured approach to map data directory organisation.

Each row contains the following variables separated by a space:

Field	Description
Filename	Filename of text data file The combination of index filename and path should not exceed 255 characters otherwise ENTERPRISE will truncate it and in the event of a duplication in the truncated names, ENTERPRISE will not add the duplicate.
Eastmin	Minimum Easting value (metres)
Eastmax	Maximum Easting value (metres)
Northmin	Minimum Northing value (metres)

Field	Description
Northmax	Maximum Northing value (metres)
Feature Name	Textual Description of the text data file.

For example:

```
cities.txt 550195 577855 5440785 5460165 Cities
bays.txt 550195 577855 5440785 5460165 Bays
```

The final row is terminated by a carriage return.

ASCII Text Format

Each row contains the following variables separated by a space:

Field	Description
Easting	Easting position of the text (metres)
Northing	Northing position of the text (metres)
Text	Text to be displayed

For example:

```
564838 5448499 St. Helier
560282 5448379 St. Aubin
567304 5447245 St. Clement
558010 5449457 St. Brelade
568742 5448661 Grouville
568096 5453011 St. Martin
567185 5449942 St. Saviour
556241 5455249 St. Ouen
558378 5451291 St. Peter
562919 5452297 St. Lawrence
565498 5452852 Trinity
561730 5454967 St. John
559889 5454599 St. Mary
```

The final row is terminated by a carriage return.

Binary Text Format

Binary format files must have the file extension .bin and can only be created from the text format files using the text2bin.exe program which can be found in the ENTERPRISE program directory. Converting to binary text improves application performance and reduces disk usage requirements.

The format of the binary files is a continuous set of records, one for each entry. Each record contains x and y co-ordinates as 32-bit signed integers followed by a 24 character array containing the text to be displayed. The character string should be NULL terminated.

CHAPTER 2

ENTERPRISE File Formats

Many file formats are supported within the ENTERPRISE suite. This chapter describes many of the file formats that you can use in one or more of the tools in ENTERPRISE.

For information on other formats, see Miscellaneous Vendor and Third Party File Formats on page 63.

 Except where otherwise mentioned, spaces in text files are treated as delimiters. Therefore, if you have spaces within names of models, antennas, carrier layers and so on, you need to remove them. It is recommended that you replace them with underscores or run the words together, for example, Flat Terrain becomes FlatTerrain. This may mean temporarily changing your existing ENTERPRISE names so that items will match those from the import file. After a successful import, you can change the names back again.

 If an export is made from a database that uses spaces, it will not be possible to import without editing the file manually.

Colour Palette File Format

The colour palette file is a text file which contains three tab separated columns. The values detail the RGB values for the colours that are used in your project. 0 0 0 is black and 255 255 255 is white.

For example, this shows an extract of a file:

```
0 255 0
0 0 255
255 0 255
165 42 42
255 105 180
200 200 255
165 165 255
130 130 255
0 0 255
0 0 215
0 0 175
200 255 200
165 255 165
```

Coverage and Interference Arrays

ENTERPRISE can read and write coverage and interference arrays which saves time, particularly when working with large arrays. When you create an array in ENTERPRISE, it is stored in your User folders, as specified in the Modify Project dialog box, in binary format. Each file format has the same header section, followed by a sequential list of array elements.

There is a different array file element format for each type of array supported by this feature. The tables below document both the common file header format and the specific array element formats.

 There are two versions of the header: Version 1 was applicable to ENTERPRISE 4.1 and older, so only Version 2 is listed here.

Index File for Arrays

If you create an index file containing information about your arrays, you can then simultaneously load all of your arrays for a particular area.

The Index file, which is an ASCII text file, contains an entry for each array consisting of the filename followed by four integer values followed by the resolution information. A new line separates each entry.

Each row contains the following variables separated by a space:

Field	Description
Filename	Filename of the array
Eastmin	Minimum Easting value (metres)
Eastmax	Maximum Easting value (metres)
Northmin	Minimum Northing value (metres)
Northmax	Maximum Northing value (metres)
Resolution information	Resolution of array

The final row is terminated by a carriage return.

Coverage Array Header Section - Version 2

The format of the header section for coverage files is as follows:

Field Name	Data Type	Length (bytes)	Description
Header String	CHAR	16	"Coverage File V2"
Delimiter	INT	1	0x0A
Eastmin	CHAR	var	East min. co-ordinate of array (metres)
Delimiter	INT	1	0x20
Eastmax	CHAR	var	East max. co-ordinate of array (metres)
Delimiter	INT	1	0x20
Northmin	CHAR	var	North min. co-ordinate of array (metres)
Delimiter	INT	1	0x20
Northmax	CHAR	var	North max. co-ordinate of array (metres)

Field Name	Data Type	Length (bytes)	Description
Delimiter	INT	1	0x20
Resolution	CHAR	var	Resolution (square size) of array (metres)
Delimiter	INT	1	0x20
Create User	CHAR	var	Name of the person who created the file
Delimiter	INT	1	0x20
Date	CHAR	var	Date when array was created
Delimiter	CHAR	1	"*"
Time	CHAR	var	Time when array was created
Delimiter	INT	1	0x20
Memory Size	CHAR	var	Memory (in Bytes) used by the array
Delimiter	INT	var	0x20
Array type	CHAR	Variable	• String indicating the type of array contained in the file. • BESTSERVER - Best server array • NTHSERVER - nth best server array • WORSTINTRF - Worst interferer array • TOTALINTERFR - Total Interference array • WORSTCONNR - Worst connection (interference) array • AVERAGECON - Average connection (interference) array • TOTRECPOWER - Total Received Power
Delimiter	INT	1	0x20
Max No of Servers	CHAR	var	Maximum number of servers  This applies only to Nth Best Server array types
Delimiter	INT	1	0x0A
Comments	CHAR	var	Your comments on this array
Delimiter	INT	1	0x0A

Structure of Array Data File

An array data file has the following structure:

- Common header section
- (eastmin, northmax), (eastmin+1,northmax), for rest of row...
- (eastmin, northmax -1), (eastmin+1, northmax -1), for rest of row...
- (eastmin, northmax -2), (eastmin+1, northmax -2), for rest of row...
- ...

The size of each array element depends upon the array type defined in the header section. The number of elements can be determined from the geographic region defined in the header section. The total number of elements is calculated as follows:

- Width (rows) = (Eastmax - Eastmin) / resolution
- Height (columns) = (Northmax - Northmin) / resolution
- Number of elements = Width x Height

Best Server Array Data Section

This table shows the format of Best Server array data:

Field Name	Data Type	Length (bytes)	Description
CELLKEY	INT	4	Unique database identifier for the serving cell ID.
LAYERKEY	INT	4	Unique database identifier for cell layer which is serving at this array element.
SIGNAL LEVEL	SHORT	2	Signal level of serving cell (dBm).

Nth Best Server Array Data Section

This table shows the format of the Nth Best Server array data:

Field Name	Data Type	Length (bytes)	Description
SEPARATOR	CHAR	2	The value is 0.
NUMBER OF SERVERS	CHAR	2	The number of Best Servers in the current pixel.
CELLKEY	INT	4	Unique database identifier for the serving cell ID.
LAYERKEY	INT	4	Unique database identifier for the cell layer that is serving at this array element.
SIGNAL LEVEL	SHORT	2	Signal level of the serving cell (dBm).
…			
The fields (including CELLKEY, LAYERKEY and SIGNAL LEVEL) are repeated for a number of times, which is the number of Best Servers.			

Worst Interferer Array Data Section

This table shows the format of Worst Interferer array data:

Field Name	Data Type	Length (bytes)	Description
CELLKEY	INT	4	Unique database identifier for the cell ID which is contributing the most interference at this array element.
LAYERKEY	INT	4	Unique database identifier for the cell layer which is contributing the most interference at this array element.
CI LEVEL	SHORT	2	C/I interference level (dBm).
CARRIER	SHORT	2	Carrier which suffers the worst interference at this array element.

Total Interference Array Section

This table shows the Total Interference array data:

Field Name	Data Type	Length (bytes)	Description
CI LEVEL	SHORT	2	Total Interference.
CONNECTION	SHORT	2	Unused.

Worst Connection Array Data Section

This table shows the format of Worst Connection array data:

Field Name	Data Type	Length (bytes)	Description
CI LEVEL	SHORT	2	Total C/I level (dBm) from all interferers on the connection at this array element.
CONNECTION	SHORT	2	Connection (carrier or hopping group number).

Average Connection Array Data Section

This table shows the format of Average Connection array data:

Field Name	Data Type	Length (bytes)	Description
CI LEVEL	SHORT	2	Average (mean) C/I level (dBm) from each connection at this array element.

Total Received Power Array Data Section

This table shows the format of Total Received Power array data:

Field Name	Data Type	Length (bytes)	Description
LEVEL	SHORT	2	Total Received Power at this array element.
NOT USED	SHORT	2	Not currently used.

File Formats Used in ILSA

ILSA is an optional add-on to ASSET. The file formats described are:

- Exported carrier assignments file
- Handover counts file

Exported Carrier Assignments File

The file format for export of carrier assignments from ILSA is the same regardless of network technology.

Only data that is applicable to the frequency plan is exported from ILSA and the file is in the form of ENTERPRISE XML.

This picture shows an example file:

```
<?xml version="1.0" ?>
- <GSM-CELL-LIST ENTERPRISE-XML-VERSION="2">
  - <GSM-CELL ID="Site24A">
      <PARENT>Site24</PARENT>
      <DTXFAC>0.000000</DTXFAC>
      <DTXSTA>0</DTXSTA>
    - <SUBCELL ID="GSM-Default">
        <HOPSTATE>HoppingOff</HOPSTATE>
        <HOPTYPE>BaseBand</HOPTYPE>
        <TRAF>0.000000</TRAF>
        <TRX-REQ>6</TRX-REQ>
      - <SUB-CELL-CARLD>
        - <CARLAY-DATA ID="TCH">
            <CAR-REQ>5</CAR-REQ>
            <ALLOC />
            <FORBID />
            <FIX />
            <IS-HOP>no</IS-HOP>
          </CARLAY-DATA>
        - <CARLAY-DATA ID="BCCH">
            <CAR-REQ>1</CAR-REQ>
            <ALLOC />
            <FORBID />
            <FIX />
            <IS-HOP>no</IS-HOP>
          </CARLAY-DATA>
        </SUB-CELL-CARLD>
      </SUBCELL>
    </GSM-CELL>
  - <GSM-CELL ID="Site24B">
      <PARENT>Site24</PARENT>
      <DTXFAC>0.000000</DTXFAC>
      <DTXSTA>0</DTXSTA>
    - <SUBCELL ID="GSM-Default">
        <HOPSTATE>HoppingOff</HOPSTATE>
        <HOPTYPE>BaseBand</HOPTYPE>
        <TRAF>0.000000</TRAF>
```

The following table describes the fields that are exported:

Field	Description
GSM CELL ID	The ID of the cell: string
PARENT	The ID of the parent Site: string
DTXFAC	DTX Factor: float
DTXSTA	DTX State, on(1) or off(0): integer
SUBCELL ID	ID of the sub-cell under the Cell: string
HOPSTATE	Hopping on(1) or off(0): integer
HOPTYPE	Hopping Type: integer
TRAF	Traffic on the sub-cell: float
TRX-REQ	Number of TRX required: integer

Field	Description
SUB-CELL-CARLD	List of Carrier Layer Datas under SubCell
CARLAY-DATA ID	ID of the carrier layer data: string
CAR-REQ	Number of carriers required: integer
ALLOC	List of allocated carriers
FORBID	List of forbidden carriers
FIX	List of fixed carrier
IS-HOP	Whether this carrier layer data is hopping (No or Yes).

Handover Counts File

ILSA uses a handover counts file which you can export from OPTIMA or create yourself, following the same format.

The file is comma delimited with this header:

```
SCELL1,SITENAME1,BSC1,DCELL1,SITENAME2,BSC2,HOCNT1,HOSUCC1,HORE
T1,HODROP1,HOCNT2,HOSUCC2,HORET2,HODROP2
```

Each record has its own line with these fields in it. The fields that ILSA is interested in are:

- SCELL1
- DCELL1
- HOCNT1
- HOCNT2

This table shows the contents of the file:

Name	Description
SCELL1	Source cell id.
SITENAME1	Source cell's sitename.
BSC1	Source cell's bsc name.
DCELL1	Neighbouring (destination) cell id.
SITENAME2	Neighbouring cell's sitename.
BSC2	Neighbouring cell's bsc name.
HOCNT1	Attempted handovers (SCELL1 to DCELL1).
HOSUCC1	Successful handovers (SCELL1 to DCELL1).
HORET1	Number of returns to old channel after a failed handover to the neighbouring cell (SCELL1 to DCELL1).
HODROP1	Dropped handovers: HOCNT1-HOSUCC1-HORET1.
HOCNT2	Attempted handovers (DCELL1 to SCELL1).
HOSUCC2	Successful handovers (DCELL1 to SCELL1).
HORET2	Number of returns to old channel after a failed handover to the neighbouring cell (DCELL1 to SCELL1).
HODROP2	Dropped handovers: HOCNT2-HOSUCC2-HORET2.

You can have blank fields for unnecessary data. For example:

```
SCELL1,SITENAME1,BSC1,DCELL1,SITENAME2,BSC2,HOCNT1,HOSUCC1,HORE
T1,HODROP1,HOCNT2,HOSUCC2,HORET2,HODROP2
10A,Helier10,CB2,10A,Helier10,CB2,87,85,2,0,87,85,2,0
10A,Helier10,CB2,10B,Helier10,CB2,226,225,1,0,279,279,0,0
10A,Helier10,CB2,10C,Helier10,CB2,199,197,1,1,157,156,1,0
10A,Helier10,CB2,12B,Helier10,CB3,14,12,2,0,9,9,0,0
10A,Helier10,CB2,416A,Broad Street,CB2,9,8,1,0,,,,
10A,Helier10,CB2,416B,Broad Street,CB2,21,20,1,0,,,,
10A,Helier10,CB2,416C,Broad Street,CB2,897,883,13,1,,,,
10A,Helier10,CB2,438C,Capital Building,CB2,0,0,0,0,,,,
10A,Helier10,CB2,544A,Westminster Sq,CB2,46,43,3,0,,,,
10A,Helier10,CB2,544C,Westminster Sq,CB2,233,223,8,2,,,,
10B,Helier10,CB2,10A,Helier10,CB2,279,279,0,0,226,225,1,0
10B,Helier10,CB2,10C,Helier10,CB2,404,404,0,0,445,439,5,1
10B,Helier10,CB2,19B,Mill Park,CB3,0,0,0,0,0,0,0,0
10B,Helier10,CB2,19C,Mill Park,CB3,1,1,0,0,0,0,0,0
10B,Helier10,CB2,416B,Broad Street,CB2,497,457,34,6,,,,
10B,Helier10,CB2,416C,Broad Street,CB2,680,671,6,3,,,,
10B,Helier10,CB2,438B,Capital Building,CB2,11,8,0,3,,,,
10C,Helier10,CB2,10A,Helier10,CB2,157,156,1,0,199,197,1,1
10C,Helier10,CB2,10B,Helier10,CB2,445,439,5,1,404,404,0,0
10C,Helier10,CB2,14A,Helier10,CB2,5,3,2,0,0,0,0,0
10C,Helier10,CB2,14B,Helier10,CB2,7,7,0,0,1,0,0,1
```

Import and Export File Formats

This table summarises the file formats from which ENTERPRISE can import and export data:

Format	Files	Extensions
ENTERPRISE	Single file that links to *.aid files	.aii
XML	Index file One file for each item selected	index*.xml for example, property-list001.xml
3GPP XML	Single file	.xml
GSM Import	GSM Carriers, GSM Exceptions and GSM Neighbours	.txt
PlaNet/EET	Flags Sites Carriers Carrier Types (layers) Carrier Names Carrier Groups Neighbours Exceptions Antennas	.txt .txt .txt .types .names .groups .txt .txt .txt
Property Data	Single file	.txt
Equipment	Single file	.txt
Live Traffic Formats 2g	See Live Traffic File Formats for 2g Networks on page 49.	.nms, .gts, .tps
Live Traffic Formats 3g, LTE or WiMAX	See Live Traffic File Formats for 3g, LTE or WiMAX Networks on page 50.	.tpc .cbc / .cbd

ENTERPRISE Export File Format

When you perform an ENTERPRISE export, all committed data is exported to a number of *.aid files, for example, `antenna.aid`, `activeflags.aid`, `coordsysdata.aid`, `siteaddress.aid` and so on.

A `phonenumber.aid` file might look like this:

```
268005533    268003379  '01737775700'    1
```

The single file that links these files is named *.aii and contains the database version, the date and time, and the names of all the *.aid files created.

ENTERPRISE XML Export File Format

When you perform an XML export, all committed data is exported to a number of *.xml files such as PROPERTY-LIST001.xml, MSC-LIST001.xml, BSC-LIST001.xml and so on.

An index file is also created which references the other XML files created.

For example, an index file might look like this:

```
<?xml version="1.0"?>
<INDEX><PROPERTY-LIST ENTERPRISE-XML-VERSION="1"
FILENAME="PROPERTY-LIST001.xml"/><MSC-LIST ENTERPRISE-XML-
VERSION="1" FILENAME="MSC-LIST001.xml"/><BSC-LIST ENTERPRISE-
XML-VERSION="1" FILENAME="BSC-LIST001.xml"/><CELL-SITE-LIST
ENTERPRISE-XML-VERSION="1" FILENAME="CELL-SITE-
LIST001.xml"/></INDEX>
```

 For a comprehensive description of all the XML File Formats in ENTERPRISE, see XML File Formats on page 93.

3GPP XML File Formats

This section describes the different file formats used to import and export 3GPP XML data.

 The xsd files are the schema files and are not created by the export, only referenced in the exported XML file.

bulkCmConfigData File

Header File

The following table shows the file format for the Header file:

Name	Type	Description
fileFormatVersion	string	Should be set to 32.615 V4.1
senderName	string	Optional field, stores the name of the sender
vendorName	string	Optional field, stores the name of the vendor

Footer File

The following table shows the file format for the Footer file:

Name	Type	Description
dateTime	string	The date and time field of the form. The format is as follows: YYYY-MM-DDTHH:MM:SSXhh:mm Where: YYYY is the year MM is the month of the year DD is the day of the month HH is the hour of the day MM is the minute of the hour SS is the second of the minute X is either + or - depending on the timezone being ahead or behind UTZ hh is the number of hours ahead or behind UTZ mm is the number of minutes past the hour ahead or behind UTZ

configData File

This table shows the file format for the configData file:

Name	Type	Description
dnPrefix	string	Export Prefix in the RANOS XML Export dialog box
xn:SubNetwork id	string	Sub-Network ID on the General tab of a Logical Network selected in the Site Database
xn:MeContext id	string	MeContext ID on the General tab of a Logical Network selected in the Site Database
xn:ManagedElementid	string	Managed Element ID on the General tab of an RNC node selected in the Site Database
xn:managedElementType	string	The type of element (in this case, this should always be RNC)

 xn:SubNetwork id, xn:MeContext and xn:ManagedElement can be followed by id, and a string as per the table above and/or by a modifier (create, delete or update). The modifier applies to all of the elements parented by the XML element. Elements with create and delete modifiers are ignored for all XML elements except for UtranRelation and GsmRelation.

un:RncFunction File

This table shows the file format for the un:RncFunction file:

Name	Type	Description
rncFunctionId	string	RNC Function ID on the General tab of an RNC node selected in the Site Database
userLabel	string	RNC Identity on the General tab of an RNC node selected in the Site Database
Mcc	number	Mobile Country Code on the General tab of the associated PLMN node selected in the Site Database

Name	Type	Description
Mnc	number	Mobile Network Code on the General tab of the associated PLMN node selected in the Site Database
rncId	number	UMTS RNC Identity on the General tab of an RNC node selected in the Site Database

un:UtranCell File

This table shows the file format for the un:UtranCell file:

Name	Type	Description
utranCellId	number	RDN field, concatenated from the cell ID and the rncId
userLabel	string	The Cell Identity on the General tab of a Cell selected in the Site Database.
cId	number	The UMTS Cell ID on the General tab of a Cell selected in the Site Database.
localCellId	number	The Cell ID on the General tab of a Cell selected in the Site Database.
uarfcnUl	number	The UL UTRA Absolute Radio Frequency Number. This is the UL Channel Number of the carrier assigned to the Cell. You define the uplink channel number in the Carriers dialog box. The Cell Params tab for the cell shows assigned carriers.
uarfcnDl	number	The DL UTRA Absolute Radio Frequency Number. This is the DL Channel Number of the carrier assigned to the Cell. You define the downlink channel number in the Carriers dialog box. The Cell Params tab for the cell shows assigned carriers.
primaryScramblingCode	number	The primary DL scrambling code used by the cell. This is defined in the Scrambling Code field on the Cell Params tab of the Cell in the Site Database.
primaryCpichPower	number	The power of the primary CPICH channel in the cell (the units correspond to 0.1dBm). This is defined in the Pilot Power field on the Cell Params tab for a Cell in the Site Database.
maximumTransmissionPower	number	The maximum transmission power of a cell, DL Power (units correspond to 0.1dBm). This is defined in the Max Tx Power field on the Cell Params tab for a Cell in the Site Database.
primarySchPower	number	The Primary Sync Channel Power (units correspond to 0.1dBm). This is defined in the Primary Synch Channel Power field on the Cell Params tab for a Cell in the Site Database.
secondarySchPower	number	The Secondary Sync Channel Power (units correspond to 0.1dBm). This is defined in the Secondary Synch Channel Power field on the Cell Params tab for a Cell in the Site Database.
bchPower	number	The power of the broadcast channel in the cell and is equivalent to the new Primary Common Control Channel Power field. This is defined on the Cell Params tab for a Cell in the Site Database.
Lac	number	The Location Area Code, defined on the General tab of the Cell in the Site Database.
Rac	number	The Routing Area Code, defined on the General tab for a Cell in the Site Database.
Sac	number	The Service Area Code, defined on the General tab for a Cell in the Site Database.

un:UtranRelation File

The following table shows the format for the un:UtranRelation file:

Name	Type	Description
utranRelationId	number	A reference index into the list of UTRAN neighbours. This is automatically generated by ENTERPRISE. This is not used for anything else.
relationType	string	Defines the neighbour cell relations between UTRAN cells (intrasystem) and between UTRAN cells and GSM cells (intersystem). As well as being intrasystem or intersystem, neighbour cell relations can be intrafrequency or interfrequency, depending on the carrier of the neighbouring cell.
adjacentCell	string	The Distinguished Name (DN) of the Neighbouring UTRAN cell.
uarfcnUl	number	The UL UTRA Absolute Radio Frequency Number. This is determined by looking up the UL Channel Number of the carrier that has been assigned on the Cell Params tab of the UMTS Cell in the Site Database. The UL Channel Number is defined in the Carriers dialog box. Used for EXPORT only
uarfcnDl	number	The DL UTRA Absolute Radio Frequency Number. This is determined by looking up the DL Channel Number of the carrier that has been assigned on the Cell Params tab of UMTS Cell in the Site Database. The DL Channel Number is defined in the Carriers dialog box. Used for EXPORT only
primaryScramblingCode	number	The primary DL scrambling code used by the cell. This is defined in the Scrambling Code field on the Cell Params tab of the UMTS Cell in the Site Database. Used for EXPORT only
primaryCpichPower	number	The power of the primary CPICH channel in the cell (the units correspond to 0.1dBm). This is defined in the Pilot Power field on the Cell Params tab of the UMTS Cell in the Site Database. Used for EXPORT only
Lac	number	The Location Area Code, defined on the General tab of the UMTS Cell in the Site Database. Used for EXPORT only

UtranRelations can only be specified with create or delete modifiers. This means that when you import, unwanted neighbour relations will first be deleted and then the new relations will be created.

gn:GsmRelation File

The following table shows the format for the gn:GsmRelation file:

Name	Type	Description
gsmRelationId	number	A reference index into the list of GSM neighbours. This is automatically generated by ENTERPRISE. This is not used for anything else.
relationType	string	This is set as intersystem:interfrequency.
adjacentCell	string	The DN of the neighbouring GSM cell in the XML schema. This is derived from the sub-network ID and the External GSM Cell identity (RDN).
bcchFrequency	number	This contains the absolute radio frequency channel number of the BCCH channel of the neighbouring GSM cell. It is determined by finding the selected frequency in the control carrier layer of the GSM Cell. Used for EXPORT only
ncc	number	The Network Colour Code, defined on the General tab of the neighbouring GSM Cell in the Site Database. Used for EXPORT only
bcc	number	The Base Station Colour Code, defined on the General tab of the neighbouring GSM Cell in the Site Database. Used for EXPORT only
Lac	number	The Location Area Code. This is derived from the ID of the LAC object associated with the GSM neighbour Cell, defined on the General tab of the cell in the Site Database. Used for EXPORT only

GsmRelations can only be specified with create or delete modifiers. This means that when you import, unwanted neighbour relations will be deleted first and then the new relations will be created.

ExternalUtranCell File

This file informs RANOS of the existence of a cell that is assigned to a different logical network (sub-network) to that being imported or exported.

This data structure should be exported whenever a neighbour relation in a different logical network is exported. However, it should be ignored on import.

The following table shows the format for ExternalUtranCell file:

Name	Type	Description
externalUtranCellId	number	This RDN field is derived by concatenating the sub-Network ID, the managedElement ID, the rncID, and the cell Cid of the neighbour cell.
userLabel	string	The Cell ID of the neighbour cell, defined on the General tab of the neighbouring GSM Cell in the Site Database.
cId	number	The UMTS Cell ID of the neighbour cell, defined on the General tab of the neighbouring GSM Cell in the Site Database.
mcc	number	The Mobile Country Code of the PLMN associated with the neighbour cell's RNC. It is defined on the General tab of the PLMN in the Site Database.
mnc	number	The Mobile Network Code of the PLMN associated with the neighbour cell's RNC. It is defined on the General tab of the PLMN in the Site Database.
rncId	number	The RNC Id of the neighbour cell's RNC, defined on the General tab of the RNC in the Site Database.

Name	Type	Description
uarfcnUl	number	The UL UTRA Absolute Radio Frequency Number. This is determined by looking up the UL Channel Number of the carrier that has been assigned on the Cell Params tab of the Cell in the Site Database. The UL Channel Number is defined in the Carriers dialog box.
uarfcnDl	number	The DL UTRA Absolute Radio Frequency Number. This is determined by looking up the DL Channel Number of the carrier that has been assigned on the Cell Params tab of a Cell in the Site Database. The DL Channel Number is defined in the Carriers dialog box.
primaryScramblingCode	number	The primary DL scrambling code used by the cell. This is defined in the Scrambling Code field on the Cell Params tab of the Cell in the Site Database.
primaryCpichPower	number	The power of the primary CPICH channel in the cell (the units correspond to 0.1dBm). This is defined in the Pilot Power field on the Cell Params tab of the Cell in the Site Database.
Lac	number	The Location Area Code, defined on the General tab of the Cell in the Site Database.
Rac	number	The Routing Area Code, defined on the General tab of the Cell in the Site Database.

ExternalGsmCell File

This data structure is used to inform the RANOS of the existence of an external GSM/EDGE cell, in other words, a GSM cell configured by another device. ENTERPRISE assumes that all GSM devices are configured by a different device to RANOS (for example, TMOS) and so all GSM cells are defined as external.

This data structure should be exported whenever a GSM neighbour relation is exported. However, it should be ignored on import.

The following table shows the format for ExternalGsmCell file:

Name	Type	Description
externalGsmCellId	number	The external GSM cell identity (RDN) is derived by concatenating the GSM MCC, MNC, LAC and GSM ID numbers, taken from the General tab of the GSM Cell in the Site Database.
userLabel	string	The Cell ID, taken from the General tab of the GSM Cell in the Site Database.
cellIdentity	number	The GSM ID, taken from the General tab of the GSM Cell in the Site Database.
bcchFrequency	number	This contains the absolute radio frequency channel number of the BCCH channel of the neighbouring GSM cell. It is determined by finding the selected frequency in the control carrier layer of the GSM Cell.
ncc	number	The Network Colour Code, defined on the General tab of the neighbouring GSM Cell in the Site Database.
bcc	number	The Base Station Colour Code, defined on the General tab of the neighbouring GSM Cell in the Site Database.
Lac	number	The Location Area Code, defined on the General tab of the Cell in the Site Database.

GSM Import

Using the GSM Import from the File menu, you can import:

- GSM Carriers
- GSM Exceptions
- GSM Neighbours

GSM Import Carriers File

The GSM Carriers Import file must be tab separated (spaces will not work) and contain these columns:

Field	Data Type	Description
CELL_ID	CHAR	Name of the cell. **This column heading must be in UPPER CASE.**
ARFCN	INT	Absolute Radio Frequency Channel Number
CarLay	CHAR	Name of carrier layer
ARFCN2	INT	Absolute Radio Frequency Channel Number
CarLay 2	CHAR	Name of carrier layer
ARFCN3	INT	Absolute Radio Frequency Channel Number
CarLay 3	CHAR	Name of carrier layer
ARFCN4	INT	Absolute Radio Frequency Channel Number
CarLay 4	CHAR	Name of carrier layer
ARFCN5	INT	Absolute Radio Frequency Channel Number
CarLay 5	CHAR	Name of carrier layer
ARFCN6	INT	Absolute Radio Frequency Channel Number
CarLay 6	CHAR	Name of carrier layer
Cell Layer Name	CHAR	Name of cell layer
BCC	INT	Base Station Colour Code
TRX Req	INT	Number of transceivers required for the carrier layer. -1 is used to automatically set the transceivers required to the actual number of carriers allocated in the file.
HSN	INT	Hopping sequence number
Hopping Type	CHAR	Choice of these hopping types: • None • Baseband • Synthesized These are case sensitive.
NCC	INT	Network Colour Code, must be in the range 0 - 7

For each subsequent row, after the header row, include the appropriate data.

If you only want to import less than 6 carriers, leave the remaining column pairs empty but retain the tabs. For example, if importing 4 carriers, leave ARFCN5 and CarLay5 and ARFCN6 and CarLay6 empty.

If you need to import more than 6 carriers, start a new row with the same Cell ID and it will add them accumulatively.

Carriers are imported to the carrier layers defined on each row. You can only specify one cell layer per row, so if you want to import to multiple cell layers include multiple rows for the same cell identifier.

 If a cell is referred to in the GSM carriers file, when you import, any existing carrier layer and carrier allocations for that cell are replaced with the information given in the file. Therefore, you cannot use this file to merge.

An example of part of a GSM Carriers File is shown below:

CELL_ID	ARFCN1	CarLay1	ARFCN2	CarLay2	ARFCN3	CarLay3	ARFCN4	CarLay4
Site1A	79	BCCH	3	TCH	11	TCH	22	TCH
Site1B	82	BCCH	7	TCH	13	TCH	21	TCH
Site2A	63	BCCH	6	TCH	14	TCH	18	TCH
Site2B	82	BCCH	7	TCH	10	TCH	20	TCH
Site3A	77	BCCH	6	TCH	17	TCH	22	TCH
Site3B	63	BCCH	4	TCH	14	TCH	19	TCH

GSM Import Exceptions File

The GSM Exceptions file is tab separated and contains:

Field	Data Type
EXC_CELL_FROM	CHAR
EXC_CELL_TO	CHAR
CAR_SEP	INT

Here is an example of a GSM Exceptions File:

EXC_CELL_FROM	EXC_CELL_TO	CAR_SEP
Site02A	Site04A	3
Site02A	Site04B	3
Site02A	Site04C	3
Site02B	Site04B	3
Site03A	Site05A	3
Site03A	Site05B	7
Site03A	Site05C	7

GSM Neighbours Import File

The GSM Neighbours file is tab separated and contains:

Field	Data Type
NBR_CELL_FROM	CHAR
NBR_CELL_TO	CHAR
HO_MARGIN	INT

Properties Export and Import File Format

You can export and import Properties in ENTERPRISE. The file format for Properties is as follows.

One header row lists the fields that are exported for each Property, that is:

- PROPERTY ID
- ADDR1
- ADDR2
- TOWN
- PROVINCE
- POSTCODE
- X and Y or LON and LAT
- GNDHT
- CONTACTFIRST
- CONTACTLAST
- MTTR

Following the header row, there is one line per Property containing these fields separated by tabs.

An example of an exported Properties file containing Easting & Northing co-ordinates is shown here:

```
PROPERTYID  ADDR1          ADDR2             TOWN       PROVINCE POSTCODE X      Y
Property10  The Old Forge  St Savic Road     Townsville                   564022 5450367
PROPERTY1   Unit 4         St Helier Rd      Anytown                      563919 5448483
Property11  Unit 6         Grouville Gardens Anyville                     566323 5449194
Property12  Victory Square St Lawrence Walk  Redtown                      564025 5450475
```

Equipment Export and Import File Format

When you export equipment in ENTERPRISE, the information for the selected equipment is exported into a single text file. This file is tab-separated so you can easily edit it in Microsoft Excel and contains these sections:

- A description of the equipment.
- Header fields that describe each of the columns inside the text file.
- The equipment data itself. This comprises all the fields from the database tables except for the Created and Last Modified fields.

  Refer to the Database Reference Guide for descriptions of each field, for example in the Microwave Antenna section of the file, the field Polarisation Gain specifies the polarisation associated with the antenna, that is, horizontal (0), vertical (1) or cross polar (2) and is the field polarisation from the table MWANTENNATYPE.

 Do not edit the long number strings contained in the file. These tell the software exactly what version of the equipment it is importing. For more tips on modifying the file, see the ENTERPRISE User Reference Guide.

This picture shows an example equipment file:

```
[Name: "Supplier Details" FilterId: {79da9038-46ab-11d4-80b3-00b0d0388bb2}]
ID      Address Email   TelNumber       FaxNumber       Comments

[Name: "Microwave Antennas" FilterId: {40a2f432-50fc-11d4-80b6-00b0d0388bb2}]
ID      Description     Photo File      Filename        Unit Cost       Supplier
26_GHz/0.3m     VHLP1-240, SINGLE POLARISATION                  1300            ANDREW

[Name: "Microwave Antenna Mask Data" FilterId: {0a037051-5281-11d4-80b7-00b0d0388bb2}]
MW Antenna ID   Angle   VV      HH      VH      HV
26_GHz/0.3m     0       0       0       30      30
26_GHz/0.3m     0.5     0.6     0.6     -1      -1
26_GHz/0.3m     1       1.8     1.8     -1      -1
26_GHz/0.3m     1.5     6       6       -1      -1
26_GHz/0.3m     2       9       9       -1      -1
26_GHz/0.3m     2.5     -1      -1      30      30
26_GHz/0.3m     4       9       9       -1      -1
26_GHz/0.3m     5       16.5    16.5    40      40

[Name: "Mast Equipment" FilterId: {79da9035-46ab-11d4-80b3-00b0d0388bb2}]
ID      Description     Photo File      Filename        Unit Cost       Supplier
Mast  32m                               0               32      0
Mast 4m                         0               4       0
Mast 7m                         0               7       0
Mast 25m                                0               25      0
Mast 30m                                0               30      0

[Name: "Feeder Equipment" FilterId: {6162c121-4d0a-11d4-80b6-00b0d0388bb2}]
ID      Description     Photo File      Filename        Unit Cost       Supplier
09_1/2" Hiflex (ACAB1005)       1/2" Hiflex\x0d\x0aRef: 5092\x0d\x0a
09_1/2" (ACAB1003)      1/2" \x0d\x0aRef: 5128\x0d\x0a                  0
09_1 5/8" (ACAB1002)    1 5/8"\x0d\x0aRef: 5438 \x0d\x0a                        0
09_1 1/4"       New feeder type 1-1/4"                  0               0.0288  945
LDF1-50 @ 2000  Andrews LDF1-50 antenna feeder at 2000 MHz                      0
LDF1-50 @ 960   Andrews LDF1-50 antenna feeder at 960 MHz                       0
LDF4-50 @ 960   Andrews Antenna feeeder LDF4-50 @ 960 MHz                       0

[Name: "Contact Persons" FilterId: {db097ae1-53ea-11d4-80b7-00b0d0388bb2}]
Surname Forename        Title   Company Tel Numbers     Fax Numbers     Comments
Schmidt Herman  Mr      PerCom  32475230156
Anders  Jan     Mr      PerCom  32475686351

[Name: "Cell Equipment" FilterId: {c4cbc511-4d19-11d4-80b6-00b0d0388bb2}]
ID      Description     Photo File      Filename        Unit Cost       Supplier
```

Interference Table File Formats

The Interference Table file format can accommodate GSM, Mobile WiMAX and LTE.

You can either create an interference table within ASSET, or load a file into memory. If you need to load a file, you can do this from several sources:

- A previously saved (or externally created) *.ait file
- An externally created ICDM file (this is relevant to GSM only):
  - Ericsson ICDM
  - Huawei ICDM

For detailed descriptions of these formats, see:

- Header Section of *.ait File on page 71 and Data Section of *.ait File on page 71.
- About Ericsson ICDM *.msmt Files on page 75.
- About Huawei ICDM Files on page 76.

For information on how to load these files into ASSET, see the ASSET User Reference Guide.

Live Traffic File Formats for 2g Networks

You can import measured traffic from a text file and use 'live' rather than 'estimated' traffic in traffic spreading. For GPRS, live traffic is the total traffic caused by any GPRS terminal types on sub-cells.

The live traffic file formats supported are:

Format	File Type	Contains
NMS 2000	*.nms	Live NMS2000 traffic information. Can contain circuit-switched, HSCSD* and GPRS traffic. Uses LAC and GSMID.
GSM	*.gts	Live GSM traffic. Can contain circuit-switched, HSCSD* and GPRS traffic. Uses LAC, GSMID and Cell Layer Name.
General Purpose	*.tps	GSM, Analog or PMR/TETRA/iDEN traffic. Can contain circuit-switched, HSCSD* and GPRS traffic. Uses CellID and Cell Layer Name.

HSCSD is no longer supported in ENTERPRISE. Therefore, although the file format remains unchanged, any HSCSD traffic values will be ignored.

NMS File Format (*.nms)

The NMS file format is as shown here:

```
LAC white-space GSMID white-space CSTraffic white-space
HSCSDTraffic white-space GPRSTraffic
```

If there is no data for the CSTraffic or HSCSDTraffic or GPRSTraffic then the column must contain a - (hyphen).

HSCSD is no longer supported in ENTERPRISE. Therefore, although the file format remains unchanged, any HSCSD traffic values will be ignored.

GSM File Format (*.gts)

The GSM file format is as shown here:

```
LAC white-space GSMID white-space Cell Layer Name  white-space
CSTraffic white-space HSCSDTraffic white-space GPRSTraffic
```

If there is no data for the CSTraffic or HSCSDTraffic or GPRSTraffic then the column must contain a - (hyphen).

HSCSD is no longer supported in ENTERPRISE. Therefore, although the file format remains unchanged, any HSCSD traffic values will be ignored.

TPS File Format (*.tps)

The TPS file format is a general purpose format which can contain live traffic for GSM, EGPRS, or PMR/TETRA/iDEN.

This file starts with this header:

```
# AIRCOM V1.0 Live Traffic File
```

And the file contains data in this format:

```
CELLID white-space Cell Layer Name white-space CSTraffic white-space HSCSDTraffic white-space GPRSTraffic white-space EGPRSTraffic
```

The HSCSD Traffic, GPRS Traffic and EGPRS columns may be left blank unless there is data in a later column, in which case they must contain a - (hyphen). This flexibility allows for network types that do not support HSCSD or GPRS, such as PMR/TETRA/iDEN.

 HSCSD is no longer supported in ENTERPRISE. Therefore, although the file format remains unchanged, any HSCSD traffic values will be ignored.

 Ensure there are no spaces at the end of any of the rows (in particular, the header row), otherwise the import will fail.

Live Traffic File Formats for 3g, LTE or WiMAX Networks

You can import measured traffic from files and use 'live' rather than 'estimated' traffic in traffic spreading.

Here are the types of live traffic import files that can be used when creating a Traffic Raster:

Technology	File type
UMTS, CDMA2000, EV-DO, LTE	*.tpc *.cbc and *.cbd (used together)
Fixed WiMAX, Mobile WiMAX	*.tpc

These file types are described in the following sections.

About the *.tpc File Format

The file defines the number of terminals to spread for each cell. This file format is an extension of the ENTERPRISE general purpose live traffic import file (*.tps).

The file format is as follows:

- The first row is the header
- The second row contains the word 'cell' (or 'sector' if the traffic to be spread is CDMA2000 traffic), followed by the word 'Terminals'

- The remaining rows then contain the traffic data to be spread. The format for each technology type are described in this table:

Technology	Format
UMTS	UMTS Cell Name (white-space) UMTS Traffic (Terminals)
CDMA2000	CDMA2000 Sector Name (white-space) CDMA2000 Traffic (Terminals)
EV-DO	EV-DO Sector Name (white-space) EV-DO Traffic (Terminals)
LTE	LTE Cell Name (white-space) LTE Traffic (Terminals)
WiMAX	WiMAX Cell Name (white-space) WiMAX Traffic (Terminals)

Example *.tpc Live Traffic File

An example *.tpc file is shown here:

Traffic Per Cell File V1

Cell	Terminals
Node1a	4.0
Node1b	5.0
Node1c	6.0
Node2a	4.0
Node2b	5.0
Node2c	6.0

 Ensure there are no spaces at the end of any of the rows (in particular, the header row), otherwise the import will fail.

About the Bearer Traffic File Formats (*.cbc / *.cbd)

The bearer file format consists of two files which both share the same filename but differ in file extension. The first extension is a *.cbc (cell bearer configuration) file which defines what is contained in the *.cbd (cell bearer data) file.

The file format is case-insensitive and a version header check is performed for both formats.

When you choose to select a bearer traffic file, you browse for the *.cbc file only.

The *.cbc file chooses between one of two naming methods (String/Number):

- String refers to matching by Cell Identity, for example "NodeB1A".
- Number refers to the combination of RNC ID and UMTS Cell ID from the network combined with a ":" delimiter. For example "1234:4567".

The *.cbc file is necessary to provide a lookup table to map between the name of the bearer from the network and with the planning tool. The *.cbc file format allows a '-' instead of a Bearer ID to mean just ignore that column.

There is an indication of number of bearers that exist in the lookup table:

Cell Bearer Configuration File V1	
Naming Method	String
Bearers	5
Network-bearer1	Bearer1
Network-bearer2	Bearer1
Network-bearer3	Bearer2
Network-bearer4	Bearer2
Network-bearer5	Bearer3

The *.cbd file consists of a table of bearer traffic values for each cell. The *.cbd file is automatically loaded and a check is made to ensure that it exists.

If five bearers are defined in the *.cbc file, then there should be five bearer data columns in the *.cbd file. If the number of bearer data columns do not match the number specified in the *.cbc file, then an error dialog box aborts the import process.

This picture shows an example cbd file:

Cell Bearer Data File V1					
Cell	net-bearer1	net-bearer2	net-bearer3	net-bearer4	net-bearer5
NodeB1a	1.3	1.3	1.3	1.3	1.3
NodeB1b	2.4	2.4	2.4	2.4	2.4
NodeB1c	3.5	3.5	3.5	3.5	3.5
NodeB2a	4.6	4.6	4.6	4.6	4.6
NodeB2b	5.7	5.7	5.7	5.7	5.7
NodeB2c	6.8	6.8	6.8	6.8	6.8
NodeB3a	7.9	7.9	7.9	7.9	7.9
NodeB3b	9.0	9.0	9.0	9.0	9.0
NodeB3c	10.1	10.1	10.1	10.1	10.1

A *.cbd file should contain only be one row per cell.

 Ensure there are no spaces at the end of any of the rows (in particular, the header row), otherwise the import will fail.

During an import:

- If duplication is detected, then a warning appears in the Message Log, for example, “CellXXX: Skipping duplicate bearer traffic data.”
- If missing values are detected, then a value of 0.00 Erlangs is assumed, and a warning appears in the Message Log, for example, “CellXXX: BearerXXX traffic not specified. Defaulting to 0.0”.
- If there are no data values for the bearers, then a value of 0 is assumed, and a warning appears in the Message Log, for example: “CellXXX: BearerXXX traffic not specified. Defaulting to 0”.
- The cell matching criteria will vary according to the Naming Method specified in the *.cbc file.

- If no match occurs between the Cell ID and that in the database, a warning message appears in the Message Log, for example: "CellXXX: Failed to import traffic. Cell does not exist.".
- Because multiple network bearers can map to the same tool bearer, a total for each tool bearer is generated.

As there can be up to 15,000 cells contained in the *.cbd file, a progress bar with an Abort button appears if the processing contains more than XXXX cells. XXXX is determined during testing to appear after 2 seconds.

Measurement Data File Formats

ASSET automatically converts measurement data files to vectors (that is, MapInfo format). The file conversion is performed from a file format-specific loader. The use of measurement data files is explained in the ASSET User Reference Guide.

The file formats explicitly supported are listed in this table, along with the supported technologies:

File Format	GSM	UMTS	LTE	CDMA2000/EV-DO	Fixed WiMAX	Mobile WiMAX
Signia CW (*.hd, *.dat)	✓	✓	✓	✓	✓	✓
TMR (*.tmr)	✓	✓				
TEMS FMT (*.fmt)	✓	✓	✓			
Nemo Outdoor 4.x (*.dt?)	✓	✓				
Nemo Outdoor 5 (*.nmf)	✓	✓	✓			
Nemo Outdoor 6 (*.nmf)			✓			
Rohde Schwarz (*.pro)	✓					
DingLi (*.txt)				✓		
Microsoft Office Access® Database (*.mdb)	✓	✓				

More file formats may be supported within subsequent releases, by adding new loaders.

For more detailed descriptions of the Signia format, see Signia CW Files on page 78.

For more detailed descriptions of the TEMS formats, see TEMS FMT Measurement Files on page 80.

For information about all the other formats, please contact Product Support.

Special Notes about Nemo 4.x:

- For GSM, in the header, the #NT Network Type field must contain at least one of: GSM_900, GSM_1800, GSM_1900, or GSM_850.
- Only handset equipment is supported (file extension must be *.dt? where ? is 1-10); scanner files are *not* currently supported.
- Only measurements that are logged as an RXL event type can be loaded; the dual mode (GSM and UMTS) is *not* currently supported.

Predictions

ENTERPRISE supports masked and unmasked prediction files.

A masked prediction is where the isotropic pathloss is masked with the corresponding antenna pattern for an individual transmitting antenna on a cell.

Unmasked prediction files are generated for propagation models which do not perform antenna masking internally. For certain types of models, unmasked prediction files may also be generated for propagation models that perform their antenna masking internally. In general, ray-tracing microcell models perform their own internal antenna masking.

ENTERPRISE prediction files use the following file extensions:

- Masked prediction files - PLM
- Unmasked prediction files - PLU
- Correction files - PLC

 There is a Prediction Access Module available, which allows programmatic access to the prediction files. For more information, please contact Product Support.

Simulation Array File Formats

There are two types of simulation array file:

- **3gr** file - This is a proprietary file which contains a complete dump of the simulation. This file format is not described here.
- **3ga** file - This file format is described in this topic.

 These formats are applicable to simulations for all technologies, and to coverage arrays for CONNECT.

The advantages and disadvantages of the files are shown below:

3gr Files

Advantages	Disadvantages
The fact that the file contains everything from the simulation means that you can load the file on a PC anywhere and run it, even if it is from a completely different database.	Because the file contains everything, it is large.
Can be loaded and saved from the Array Manager.	You can only have one 3gr file loaded at any one time.

3ga Files

Advantages	Disadvantages
Small file size.	Cannot be used to rerun the simulator.
Simple, published file format.	Only takes a copy of the information, which is useful for comparison purposes.
Can copy to the array clipboard from the Map View window by right-clicking the array name in the Data Types list. This can also be done using the Array Manager.	Copying to the array clipboard does not save the file, but just places it into memory. However, when it is in memory, you can save it using the Array Manager.
Contains information about an individual display, for example, Reasons for Failure.	
You can have multiple files loaded simultaneously.	
Can be loaded and saved from the Array Manager.	

3ga File Format

The following tables give information on the 3g archived array format (*.3ga):

- File Header
- Array Instance Body

 This format is applicable to simulations for all technologies, and to coverage arrays for CONNECT.

File Header (3ga File)

Size	Type	Description	Comments
4 Bytes	int	Magic number	Should be 0x02121975
4 Bytes	int	Version number	Currently 7200
4 Bytes	int	Archive array name length	Includes NULL terminator
	char[ ]	Archive array name	User visible name
4 Bytes	int	Network type (Simulator-related)	Bitfield of a combination of the following: UMTS FDD = 0x00000001 CDMA2000 = 0x00000002 EV-DO = 0x00000004 GSM = 0x00000010 GSM/UMTS = 0x00000020 (The GSM/UMTS bit is set in addition to the GSM and UMTS bits, if they are both set) FIXED WIMAX = 0x00000200 MOBILE WIMAX = 0x00000800 LTE = 0x00002000 MICROWAVE = 0x00004000 WI-FI = 0x00008000 COMPOUND ARRAY RESULTS = 0x00000400
4 Bytes	int	Valid Networks (Cells-related)	Bitfield of a combination of the following: UMTS FDD = 0x00000001 CDMA2000 = 0x00000002 EV-DO = 0x00000004 GSM = 0x00000010 FIXED WIMAX = 0x00000200 MOBILE WIMAX = 0x00000800 LTE = 0x00002000 MICROWAVE = 0x00004000 WI-FI = 0x00008000 COMPOUND ARRAY RESULTS = 0x00000400
4 Bytes	int	Region xMin	
4 Bytes	int	Region xMax	
4 Bytes	int	Region yMin	
4 Bytes	int	Region yMax	
4 Bytes	int	Resolution	
4 Bytes	int	Memory usage	MB
4 Bytes	int	Unique name string length	Includes NULL terminator
	char[ ]	Unique string	GUID
4 Bytes	time_t	Date / Time	
4 Bytes	int	User name string length	Includes NULL terminator

Size	Type	Description	Comments
	char[ ]	User name string	
4 Bytes	int	Comment string length	Includes NULL terminator
	char[ ]	Comment string	
4 Bytes	int	Insertion string list len	
4 Bytes	int	Insertion string len	Section repeated for each insertion string
	char[ ]	Insertion string	
4 Bytes	int	Insertion string2 len (inc NULL Terminator)	
	char[ ]	Insertion string2	
4 Bytes	Int	Current provisions	
4 Bytes	int	Reserved1	
4 Bytes	int	Opaque data block length	
		Opaque data block	Reserved for future. Size specified above.
4 Bytes	int	Array instance count (must be >= 1)	

Array Instance Body (3ga File)

Size	Type	Description	Comments
4 Bytes	int	Magic number	Should be 0x21081970
4 Bytes	time_t	Date / Time	
4 Bytes	int	Generic name string length	Includes NULL terminator
	char[ ]	Generic name string	
4 Bytes	int	Comment string length	Includes NULL terminator
	char[ ]	Comment string	
4 Bytes	int	Instance number	
4 Bytes	int	Carrier/Service name str len	Includes NULL terminator
	char[ ]	Carrier/Service name string	
4 Bytes	int	Server Number	Best server = 0 Next best server = 1 and so on
4 Bytes	int	Data array type	0 = float 1 = enum (see below)
4 Bytes	int	Data array num elements	
8 Bytes	int64	Region X-Min	
8 Bytes	int64	Region Y-Max	
4 Bytes	int	Resolution	
4 Bytes	int	Width in pixels	= (X-Max - X-Min) / Resolution
4 Bytes	int	Height in pixels	= (Y-Max - Y-Min) / Resolution
4 Bytes	int	Z-Dim	Nth layer number

For Data Array Type = 0 (float) only, the following applies:

Size	Type	Description	Comments
(0...)	float[ ]	Data array	

For Data Array Type = 1 (enum) only, the following applies:

Size	Type	Description	Comments
(0...)	int[ ]	Data array	Each element is an index from (0,..., numCats-1) into the Category Array
4 bytes	int	Category Array num elements	numCats
(0...)	CATEGORY[ ]	Category Array data	See table below

For Data Array Type = 1 (enum) only, this supplementary table describes the CATEGORY data type:

Size	Type	Description	Comments
4 bytes	int	String Length (+NULL terminator)	
	char[ ]	String	Category Name
4 bytes	COLOREF	Colour	
4 bytes	int	Cell DB key	AIRCOM-specific info. of no use to third parties.
4 bytes	int	Cell sim index	AIRCOM-specific info. of no use to third parties.

For both Data Array Types (= 0 or 1), the following applies:

Size	Type	Description	Comments
4 bytes	int	Number of thresholds	Obsolete
(0...)	float[ ]	Threshold values	Obsolete
4 bytes	int	Reserved	Always zero
4 bytes	int	Opaque data block length	
		Opaque data block	Reserved for future. Size specified above.

Traffic Raster

A traffic raster consists of two files with the same name but different extensions:

- A .tri file for the geo-reference information
- A .trr file for the actual traffic raster data

TRI File Format

This information is contained in the TRI file:

Field Name	Data Type	Length (bytes)	Description
Header	CHAR	15 (Line Feed)	Traffic File V3
Xmin	INT	4	Space-separated minimum X region co-ordinate
Ymin	INT	4	Space-separated maximum X region co-ordinate
Xmax	INT	4	Space-separated minimum Y region co-ordinate
Ymax	INT	4	Space-separated maximum Y region co-ordinate
Region size	INT	4	Resolution (square size) of array (metres)
Create User	CHAR	32	Name of the person who created the file
Create Date/Time	CHAR	32	Date when array was created
Memory Size			
Switching Type	INT	4	Type of traffic, where: • 2G Circuit switched traffic = 0 • GPRS = 1 • UMTS = 3 • EGPRS = 4 • CDMA2000 = 6 • EV-DO = 7 • GSM/UMTS = 9 • Fixed WiMAX = 12 • Mobile WiMAX TDD = 13 • Mobile WiMAX FDD = 14 • LTE = 15
No of Terminals	INT	4	Number of terminals spread in array
Timestamp	INT	10 (Line Feed)	Date and time when the file was created
MBHCR	Floating Point value	ascii (Line Feed)	Mean Busy Hour Capacity Requirement (used for GPRS and EGPRS only)
Comments	CHAR	255	Optional comments field

This picture shows an example of a TRI file:

```
Traffic File V3
552400 558000 5453000 5458000 200 demouser 2006-03-01*10:00:42 2800 0 898 1141207242
0
comment
```

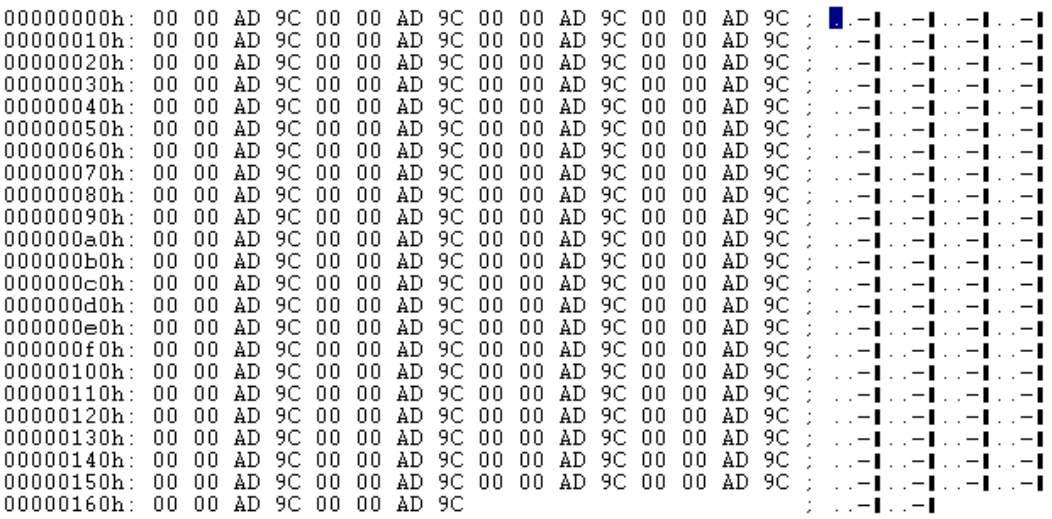
TRR File Format

The TRR file stores raster data in binary format similar to that of height and clutter data. Each item of traffic must be an integer (four bytes):

Field	Description
Traffic data	The Traffic data is in the following units: • 2G (Non-Sim) Circuit Switched traffic is in milli Erlangs per square kilometre. • GPRS and EGPRS traffic is in milli Terminals per square kilometre. • GSM (Sim) Circuit Switched traffic is in milli Terminals per square kilometre. • UMTS, CDMA2000, EV-DO, GSM/UMTS, WiMAX and LTE traffic is in milli Terminals per square kilometre. To convert to terminals per pixel, multiply the area represented by a pixel in square metres by 10^{-9}.

These values are traffic densities per pixel and not absolute traffic per pixel.

This picture shows an example TRR file:



User-Defined Fields

Fields are defined in the Administrator tool. To do this:

In ENTERPRISE Administrator, from the Utilities menu, click Field Definer. Select the project in which you want to create or edit fields and create them as required.

You can also export and import the fields in the Field Definer and the flags.txt file used is described here. In the field file format:

- A format version number begins the file.
- Each group is listed, followed by the type of field it is, and then, if it is a picklist, the different options for it.
- You can import files containing picklist fields without their options, but you cannot commit these types of field until you have added the options.
- Any lines not starting with GROUP, FIELDTYPE, FLAG, Associations, or ASSOCIATION (all case-sensitive) will terminate ANY import and cause an "invalid flag file" error.
- You cannot associate fields with PmP hubs, sectors or carriers.
- You can still import previous file formats.

An example field file is shown below:

```
FORMATVERSION 5.0
GROUP Work Completed
FIELDTYPE 4
GROUP Total Cost
FIELDTYPE 1
GROUP Region
FIELDTYPE 0
FLAG South
FLAG North
FLAG East
FLAG West
FLAG South-East
GROUP Operational Status
FIELDTYPE 0
FLAG Unknown
FLAG Planned
FLAG Completed
FLAG Approved
FLAG Obsolete
FLAG Operational
GROUP Antenna
FIELDTYPE 0
FLAG Unknown
FLAG Rooftop
FLAG Tower
FLAG Existing Mast
FLAG New Mast
Associations
ASSOCIATION Globals:
ASSOCIATION Property: Work Completed,Total Cost,Region,Operational Status,
ASSOCIATION MSC: Work Completed,Total Cost,Region,Operational Status,Antenna,
ASSOCIATION BSC: Work Completed,Total Cost,Region,Operational Status,Antenna,
ASSOCIATION Cell Site: Work Completed,Total Cost,Region,Operational Status,Antenna,
```

The following formats are also supported:

- Planet Flag Format
- Planet Link Format

View Favourites

Favourites are usually defined in the ENTERPRISE Map View user interface, but you can create and edit them programmatically using the file format described as follows.

There are three sections; a header, a display list section and an array section. The first is compulsory, whereas the second and third are optional.

Favourites File Header Section

The header section is compulsory and contains data such as the geographic and screen co-ordinates of the Map View window.

Field name	Data type	Length (bytes)	Description	Byte offset
FILEID	CHAR	10	VIEWFAVRIT	0
FILEVER	CHAR	3	01A	10
FAVNAME	CHAR	128	Name of the favourite	13
FAVCOMMENT	CHAR	512	Descriptive comments (entered by the user)	141
PROJECTNUM	INT	4	ID of the project which favourite belongs to	653
EASTMIN	INT	4	East min. co-ordinate of favourite	657
EASTMAX	INT	4	East max. co-ordinate of favourite	661
NORTHMIN	INT	4	North min. co-ordinate of favourite	665
NORTHMAX	INT	4	North max. co-ordinate of favourite	669
WNDLEFT	INT	4	Left screen co-ordinate of window	673
WNDTOP	INT	4	Top screen co-ordinate of window	677
WNDRIGHT	INT	4	Right screen co-ordinate of window	681
WNDBOTTOM	INT	4	Bottom screen co-ordinate of window	685

Favourites Display List Section

The display list section is optional, but if used, allows the favourite to redisplay any of the display list data types such as vectors, clutter, heights and maps.

Field name	Data type	Length (bytes)	Description	Byte offset
DLNUM	INT	4	Number of display list items stored with this favourite.	689

Then, for each display list item up to the DLNUM value the following section is repeated:

Field name	Data type	Length (bytes)	Description	Byte offset
DLNAME	CHAR	64	Display list name text.	Dynamically calculated
DLPRIORITY	INT	4	Drawing priority (layer) of display list item.	Dynamically calculated

Favourites Arrays Section

The array section is optional, but if used, allows the favourite to redisplay pre-saved arrays.

Field name	Data type	Length (bytes)	Description	Byte offset
ARRAYNUM	SHORT	2	Number of array files stored with this favourite	Dynamically calculated

Then, for each array file list item up to the ARRAYNUM value the following section is repeated:

Field name	Data type	Length (bytes)	Description
ARRAYFNAME	CHAR	255	Array filename (no path)
ARRAYTYPE	INT	4	Type of array stored in file. Currently supported types: • 1 = Coverage • 2 = Interference • 3 = Traffic

CHAPTER 3

Miscellaneous Vendor and Third Party File Formats

Many file formats are supported within the ENTERPRISE suite. This chapter contains information on the miscellaneous vendor formats and third party formats that can be used in ENTERPRISE.

For information on other formats, see ENTERPRISE File Formats on page 31.

 Except where otherwise mentioned, spaces in text files are treated as delimiters. Therefore, if you have spaces within names of models, antennas, carrier layers and so on, you need to remove them. It is recommended that you replace them with underscores or run the words together, for example, Flat Terrain becomes FlatTerrain. This may mean temporarily changing your existing ENTERPRISE names so that items will match those from the import file. After a successful import, you can change the names back again.

 If an export is made from a database that uses spaces, it will not be possible to import without editing the file manually.

Antenna Diagram File Format

ENTERPRISE must first import antenna diagrams before antennas can be used within the application. The antenna file begins with a header section, which as a minimum must contain the antenna name field. The complete list of fields is given below:

Field	Description
NAME	Antenna name
MAKE	Make / manufacturer
FREQUENCY	Frequency (MHz)
H_WIDTH	Horizontal beamwidth (degrees)
V_WIDTH	Vertical beamwidth (degrees)
POLARIZATION	This will be one of: • POL_V (vertical polarisation) • POL_H (horizontal polarisation) • POL_X (cross polarisation)
FRONT_TO_BACK	Front to back ratio (dB)
GAIN	Antenna gain (dBi)  The gain value must be followed by a space, and the space followed by dBi
TILT	Tilt type (ELECTRICAL / MECHANICAL / CROSS POLAR)
COMMENTS	Additional comments up to a maximum of 127 characters.

After the header section there are two sections prefixed with the name of the particular pattern that will be described, that is, HORIZONTAL or VERTICAL, and the number of points. The number of points does not necessarily need to equal 360.

Each successive row then contains the following variables separated by a space:

Field	Description
Angle	Angle of data point from the main forward beam direction – anticlockwise (degrees).
Loss	Relative to the maximum (dB).

Example Antenna File

An example antenna file is shown below:

```
NAME          085_2_18
MAKE          AntennasRUs
FREQUENCY           900
H_WIDTH       85
V_WIDTH       10
FRONT_TO_BACK 0
POLARIZATION  POL_X
GAIN          18    dBi
TILT          MECHANICAL
COMMENTS            Standard 85-degree antenna
HORIZONTAL    360
0.0           0.0
1.0           0.0
2.0           0.0
....
353.0         0.1
354.0         0.1
358.0         0.1
359.0         0.0
VERTICAL            360
0.0           0.4
1.0           0.0
3.0           1.1
...
355.0         25.4
356.0         16.5
359.0         2.3
```

The final row is terminated by a carriage return. No additional data should be present after the pattern section, as this will be ignored.

Carrier Types Database File Formats

The carrier types database is made up of a number of separate ASCII text files - Carrier Names, Carrier Types and Carrier Groups.

Carrier Names File

The carrier names file, carrier_types.names, holds details of the assignment of names to carriers. An example follows:

```
HEADER EET V2.7 Carrier Names File. VERSION 1.0
NAME 1
INDEX 1
NAME 1026
INDEX 2
NAME 2
INDEX 3
...
```

Carrier Types File

The carrier types file, carrier_types.types, holds details of the assignment of carriers to types. An example follows:

```
HEADER EET V2.7 Carrier Types File. VERSION 1.0
NAME cntrl
SYMBOL +
MAX_ALLOCATION 1
REQUIRED 5
CARRIER 1
CARRIER 1025
CARRIER 2
CARRIER 1026
...
NAME tch
SYMBOL -
MAX_ALLOCATION 0
REQUIRED 15
CARRIER 1
CARRIER 1025
CARRIER 2
CARRIER 1026
...
```

Carrier Groups File

The carrier groups file, carrier_types.groups holds the details of the assignment of channels to groups. Each line holds space-delimited data on one group. The format is shown below:

```
Group1 C1 C2 C3 C4 C5 and so on.
Group2 C10 C11 C12 C13 C14 and so on.
```

Group is the group name (CHAR) and C is the channel number (INT). A typical file entry might be:

```
A1 1 5
A2 9 13
A3 17 21
B1 2 6
B2 10 14
B3 18 22
C1 15 7
C2 11 15
C3 19 23
D1 16 8
D2 12 16
D3 20 24
```

Group A1 consists of channels 1 and 5, group A2 consists of channels 9 and 13, and so on.

A maximum of 80 frequency groups and a maximum 71 carriers per group can be included in the carrier groups file - a constraint not of ENTERPRISE but of EET/Planet.

CellOpt AFP File Formats

If you are using ASSET in conjunction with Actix's CellOpt AFP, you can:

- Import GSM carrier data into ASSET from CellOpt AFP
- Export GSM carrier/interference data from ASSET for use in CellOpt AFP

This section describes the file formats used.

Carrier File Format for CellOpt AFP

The carrier file used for importing/exporting carrier data for use with CellOpt consists of:

- Three prefix columns - Mnemonic, Model and Mask
- A series of data columns that correspond to the information in the associated CellOpt iCARF record

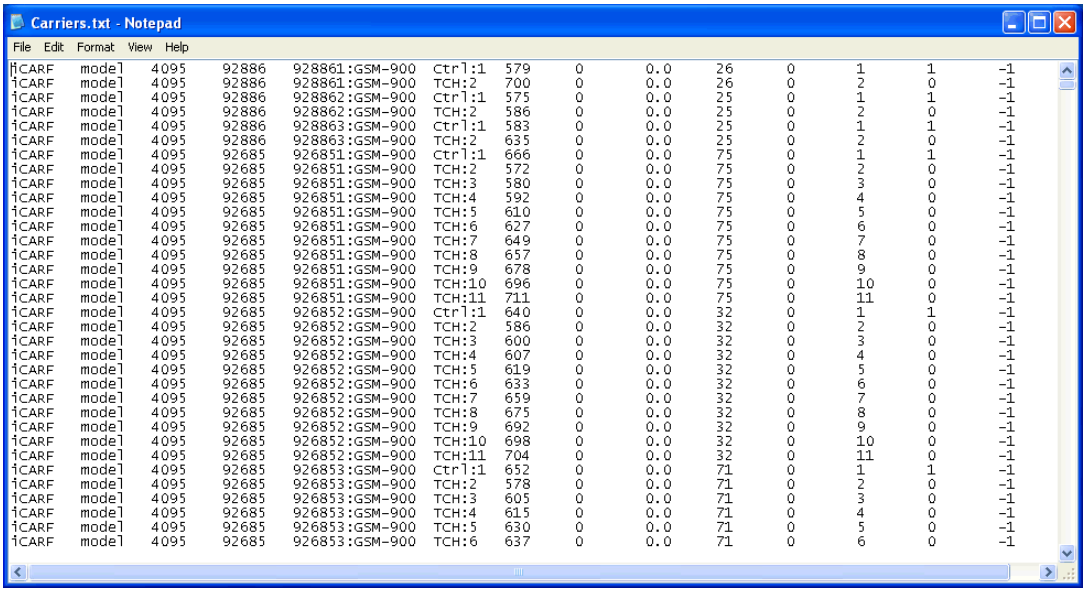
The full file format is listed in the following table:

Actix Reference	ENTERPRISE Reference
Mnemonic	'iCARF'
Model	'model'
Mask	Defines which items in the record are valid for the message: For more information, see About the Mask Structure for Cell and Interference Data Files on page 70.
Site_desc	Site ID
Sector_desc	cellid:subcellid:carrierlayerid If you are exporting carrier data, you must ensure that the Cell ID, Subcell ID and Carrier Layer ID do not contain embedded colons, otherwise the data cannot be exported.
Car_desc	Position of carrier within the carrier layer
Freq	Carrier key
Freq_id	Always 0
Served_traffic	Always 0.0
Code_desc	Two digit value, containing the Cell BSID NCC and BCC
Fix_id	In Carrier, CarriersFixed list
Position	Position of carrier within the carrier layer
Control_id	Carrier layer data IsCtrl 1=BCCH, 0=TCH
HSN	The Hopping Sequence Number (If frequency hopping is enabled) If there is no HSN value, this value will be -1.
MAIO	The Mobile Allocation Index Offset value Only valid for synthesised or site hopping type (If frequency hopping is enabled)

All data fields are separated by a TAB (ASCII 09) character.

No data fields can be left empty; any data field that has no value available must have a dash (-) character, which will be treated as a null value.

This picture shows an example file format:



Example Carrier File Format for CellOpt AFP

Interference File Format for CellOpt AFP

The interference file used for importing/exporting interference data for use with CellOpt consists of two sections:

- The section corresponding to the aLIST record type in Actix, which contains 3 data columns
- The section corresponding to the iCONC record type in Actix, which contains:
  - Three prefix columns - Mnemonic, Model and Mask
  - A series of data columns that correspond to the data in the associated CellOpt record

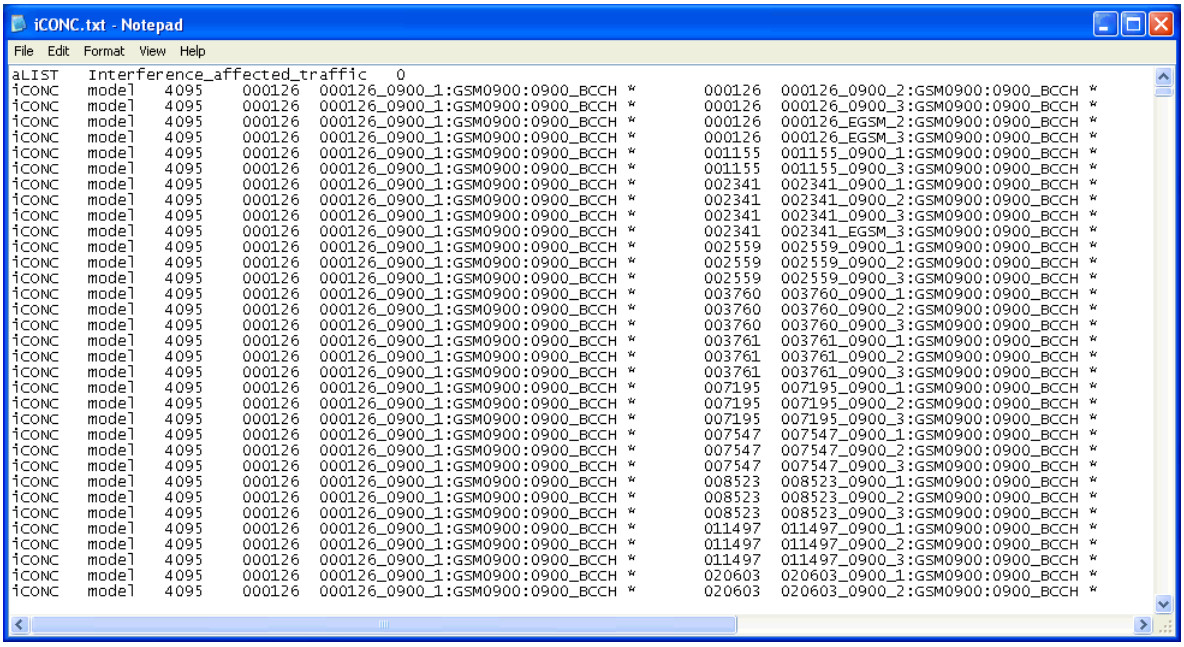
The full file format is as follows:

Record Type	Actix Reference	ENTERPRISE Reference
aLIST	Mnemonic	'aLIST'
	List_desc	Suitable name
	Type_of_penalty	Always 0 (frequency penalties)
iCONC	Mnemonic	'iCONC'
	Model	'model'
	Mask	Defines which items in the record are valid for the message: For more information, see About the Mask Structure for Cell and Interference Data Files on page 70.
	Site_desc	Site ID
	Sector_desc	Cell ID
	Car_desc	Always *
	Site_R_desc	Same as Site_desc, but from the interfering cell
	Sector_R_desc	Same as Sector_desc, but from the interfering cell
	Car_R_desc	Always *
	List_desc	As defined by the aLIST List_desc
	CoStatistic	cochIntfTraffic from interference data
	AdjStatistic	adjchIntfTraffic from interference data
	Sep_req	N/A, because the list is of type 0 (frequency penalties). Set to 2.

All data fields are separated by a TAB (ASCII 09) character.

 No data fields can be left empty; any data field that has no value available must have a dash (-) character, which will be treated as a null value.

This picture shows an example file format:



Example Interference File Format for CellOpt AFP

About the Mask Structure for Cell and Interference Data Files

The carrier and interference files for CellOpt AFP contain a mask column. The Mask column, plus the Mnemonic and Model columns, prefixes the data portion in the file format.

The Mask column defines which items in the record are valid for the message, and includes the Model and Mask column as items, but not the Mnemonic column.

If a bit is turned on (indicated by 1), then that data field's value is used; if the bit is turned off (indicated by 0), then the data field value is not used.

For example, a mask might consist of:

Mnemonic Model Mask Data1 Data2 Data3 Data4 Data5 Data6

If the Model, Mask, Data1, Data3 and Data6 field are used, then the binary mask value will be **10010111**, which is read from right to left as follows:

Model = 1

Mask = 1

Data1 = 1

Data2 = 0

Data3 = 1

Data4 = 0

Data5 = 0

Data6 = 1

This then converts to a decimal value of **151**.

Interference Table File Formats

The Interference Table file format can accommodate GSM, Mobile WiMAX and LTE.

You can either create an interference table within ASSET, or load a file into memory. If you need to load a file, you can do this from several sources:

- A previously saved (or externally created) *.ait file
- An externally created ICDM file (this is relevant to GSM only):
  - Ericsson ICDM
  - Huawei ICDM

For detailed descriptions of these formats, see:

- Header Section of *.ait File on page 71 and Data Section of *.ait File on page 71.
- About Ericsson ICDM *.msmt Files on page 75.
- About Huawei ICDM Files on page 76.

For information on how to load these files into ASSET, see the ASSET User Reference Guide.

Header Section of *.ait File

The format of the header section is:

Line						
1	ASSET Interference Table	<SP>	<TAB>	TIME [HH:MM:SS]	<SP>	DATE [YYYY/MM/DD]
2	Version: V2.1 TYPE: [nn] The [nn] is a technology-specific identifier corresponding to GSM, LTE or Mobile WiMAX.					
3	KEYTYPE: DBKEY or IDNAME This tells ENTERPRISE whether to use the cell names or database key numbers. • If this is DBKEY, ENTERPRISE looks for the cell key or layer key. • If this is IDNAME or anything else, ENTERPRISE looks for the Cell ID or (for GSM only) Sub-cell layer ID. If you are importing a project with XML, use IDNAME as the XML import will always change the keys.					
4	ADJ_CH_OFFSET	<TAB>	[nn]			
5	No_Traffic_Data (this is only needed if there is no traffic data in the file)					

Data Section of *.ait File

This section contains rows describing two different types of objects.

CELL entries describe the cell that is the 'victim' of interference. These rows contain the following tab-separated variables:

Field Name	Type	Description
'SUBCELL' (GSM) 'LTECELL' 'MOBILEWIMAXCELL'	CHAR	Indicates that the information in this row relates to the victim cell.
Cell key	INTEGER	Unique identifier of the cell, used in the database.

Field Name	Type	Description
Cell Layer key (GSM only)	INTEGER	Unique identifier of the layer assigned to the cell. The cell key and layer key together uniquely identify the cell.
Coverage area (km²)	FLOAT	The total coverage area of the cell.
Total traffic (mE)	FLOAT	The total amount of traffic carried by the cell.
Num. Interferers	INTEGER	The number of interfering cells.
Cell ID	CHAR(32)	The name of the cell layer.
Cell Layer ID (GSM only)	CHAR(32)	The name of the cell layer assigned to the cell.

INT entries describe the interferers, and are listed below the corresponding victim cell. These rows contain the following tab-separated variables:

Field Name	Type	Description
'INT'	CHAR	Indicates that the information in this row relates to an interfering cell of the preceding victim cell.
Cell key	INTEGER	Unique identifier of the interfering cell, used in the database.
Cell Layer key (GSM only)	INTEGER	Unique identifier of the layer assigned to the interfering cell. The cell key and layer key together uniquely identify the cell.
Co-channel affected area	FLOAT	Area (km²) of victim cell potentially affected by co-channel interference from this interfering cell.
Co-channel affected traffic	FLOAT	Traffic (mE) of victim cell potentially affected by co-channel interference from this interfering cell.
Adjacent channel area	FLOAT	Area (km²) of victim cell potentially affected by adjacent channel interference from this interfering cell.
Adjacent channel affected traffic	FLOAT	Traffic (mE) of victim cell potentially affected by adjacent channel interference from this interfering cell.
Cell ID	CHAR(32)	The name of the interfering cell layer.
Cell Layer ID (GSM only)	CHAR(32)	The name of the cell layer assigned to the cell.

Normally, each CELL entry will be followed by a number of INT entries.

Example Interference Table (*.ait) Files

Example interference table files are shown below:

GSM

```
ASSET Interference Table      2010-05-11 14:11:02
VERSION: V2.1 TYPE: 10
KEYTYPE: DBKEY
ADJ_CH_OFFSET-18
SUBCELL 5872244   5864149   8.950109   16327.306641   2
SITE0A   GSM-900
INT     5872669   5864149   0.705384   2281.08   0.0231556
72.4271   SITE0B   GSM-900
```

```
INT     5872688   5864149   1.06309   1774.71   0.0337953
74.944   SITE0C   GSM-900
SUBCELL 5872669   5864149   0.869999   4077.367920   2   SITE0B
GSM-900
INT     5872244   5864149   0.343164   1680.06   0.0184273
60.0025   SITE0A   GSM-900
INT     5872688   5864149   0.0406041   150.184   0.00371523
13.8828   SITE0C   GSM-900
SUBCELL 5872688   5864149   2.939998   13597.558594   2
SITE0C   GSM-900
INT     5872244   5864149   0.945788   4906.15   0.0364864
207.94   SITE0A   GSM-900
INT     5872669   5864149   0.0883897   418.186   0.00373612
14.0166   SITE0B   GSM-900
```

LTE

```
ASSET Interference Table                2010-05-05 11:11:33
VERSION: V2.1 TYPE: 80
KEYTYPE: DBKEY
ADJ_CH_OFFSET      -18
No_Traffic_Data
LTECELL 3048464              0.300000   0.000000   2
  eNodeB0A
INT     3048546          0.029255   0     0.00174919 0
  eNodeB0B
INT     3048549          0.0535257  0     0.00202911 0
  eNodeB0C
LTECELL 3048546              0.280000   0.000000   2
  eNodeB0B
INT     3048464          0.0223599  0     0.000409748      0
  eNodeB0A
INT     3048549          0.050215   0     0.00163472 0
  eNodeB0C
LTECELL 3048549              0.350000   0.000000   2
  eNodeB0C
INT     3048464          0.0363732  0     0.000973574      0
  eNodeB0A
INT     3048546          0.145362   0     0.00518468 0
  eNodeB0B
```

Mobile WiMAX

```
ASSET Interference Table      2010-05-05 11:27:58

VERSION: V2.1 TYPE: 96

KEYTYPE: DBKEY

ADJ_CH_OFFSET-18

MOBILEWIMAXCELL    3048219              23.040432  0.000000   5
NodeW0A

INT     3048300          5.36537    0     0.236463   0
  NodeW0B

INT     3048303          3.90563    0     0.143171   0
  NodeW0C

INT     3048306          1.0498     0     0.00608946 0
  NodeW2A

INT     3048324          0.841147   0     0.00171843 0
  NodeW2B

INT     3048327          0.8412     0     0.00171843 0
  NodeW2C

MOBILEWIMAXCELL    3048300              68.426208  0.000000   5
NodeW0B

INT     3048219          5.64836    0     0.193921   0
  NodeW0A

INT     3048303          16.3131    0     0.691835   0
  NodeW0C

INT     3048306          1.39119    0     0.027854   0
  NodeW2A

INT     3048324          3.03981    0     0.0208545  0
  NodeW2B

INT     3048327          5.30434    0     0.103964   0
  NodeW2C
```

The final rows are terminated by a carriage return.

About Ericsson ICDM *.msmt Files

ASSET allows the use of interference matrix data generated by live networks for the purposes of frequency planning. ASSET supports the Ericsson ICDM (Inter-Cell Dependency Matrix) *.msmt file format for this purpose.

When this file is loaded, it is automatically post-processed by ASSET into the *.ait file format.

An example *.msmt file is shown below:

	A	B	C	D	E	F	G	H	I	J	K
1	Cell	Interferer	CoChannel InterferedTraffic(%)	AdjChannel InterferedTraffic(%)	NoSamples	Other BandFactor	CellType	Distance (km)	Notes	Neighbour Order	RecTime(minutes)
2	BSC0/SITE0A	BSC0/SITE0B	0.52	0	161724		normal	0		1st	160
3	BSC0/SITE0A	BSC0/SITE0C	1.89	0	161724		normal	0		1st	160
4	BSC0/SITE0A	UNKNOWN/38-07	0.51	0	161724		normal	7.2		2nd	150
5	BSC0/SITE0A	UNKNOWN/24_02	0	0	150648		normal	5.1		1st	150
6	BSC0/SITE0A	UNKNOWN/44_02	2.79	0	154443		normal	7.9		2nd	150
7	BSC0/SITE0A	BSC0/SITE2A	0.1	0	154443		normal	2.9		1st	150
8	BSC0/SITE0A	BSC0/SITE2B	0.18	0	154443		normal	2.9		1st	150
9	BSC0/SITE0A	BSC0/SITE2C	0.17	0	154443		normal	2.9		1st	150
10	BSC0/SITE0A	BSC0/SITE3A	1.46	0	385289		normal	4.2		1st	405
11	BSC0/SITE0A	BSC0/SITE3B	1.86	0.17	385289		normal	4.2		1st	405
12	BSC0/SITE0A	BSC0/SITE3C	0.11	0	385289		normal	4.2		1st	405
13	BSC0/SITE0A	BSC0/SITE4A	36	1.45	385289		normal	5.1		1st	405

*Example *.msmt file*

The 'Interferer' column (column B) of the file can either contain the BCCH_BSIC combination for the cell (for example, UNKNOWN/38_07), or the cell identity (for example, BSC1/SITE7A).

In the case of the BCCH_BSIC option, to identify the interfering cell in the project, ASSET searches the map data for the nearest instance of a matching BCCH_BSIC within a 10km radius of the victim cell (or within its Primary Prediction Radius if greater).

How Traffic Data is Loaded from an Ericsson ICDM File

This explains how the number of samples from an ICDM *.msmt file is translated into traffic in an ASSET interference table.

This relates to the data in 'NoSamples' and 'RecTime(minutes)' appearing in columns E and K, respectively.

Traffic in ASSET = Max{ (number of samples)/(recorded time in minutes) }

This is across all the rows for a particular victim cell.

For example, if three rows exist in the file for a particular victim cell, corresponding to the following values:

Number of Samples	Recorded time (minutes)	(number of samples)/(recorded time in minutes)
120	4	120/4 = 30
99	3	99/3 = 33
160	8	160/8 = 20

This would mean that the traffic (representing Samples per Minute) in ASSET for this victim cell is 33 (the greatest value).

Subsequently, the affected Co-channel (column C) and Adjacent Channel (column D) traffic percentages are then applied to this value to calculate the affected traffic values for every 'victim-interferer' cell pair.

For information on loading the file into ASSET, see Loading Ericsson or Huawei ICDM Files.

About Huawei ICDM Files

ASSET allows the use of interference matrix data generated by live networks for the purposes of frequency planning. ASSET supports the Huawei ICDM (Inter-Cell Dependency Matrix) file formats (*.txt or *.csv) for this purpose.

When one of these files is loaded, it is automatically post-processed by ASSET into the *.ait file format.

Here is an example of the file (shown in two halves):

	A	B	C	D	E	F	G	H	I	J	K
1	Interference Matrix Report										
2	Task Name:xyz_InterferenceMatrix					Creator:abc					
3	Result Set Begin Time:04/18/2012 00:00:00					Result Set End Time:04/19/2012 00:00:00					
4	BSC Name	Test Cell	Test Cell BCCH	Test Cell MCC	Test Cell MNC	Test Cell LAC	Test Cell CI	Neighboring Cell Name	Neighboring Cell BCCH	Neighboring Cell BSIC	Neighboring Cell MCC
5	Unknown	1A	1	1	1	1	1	2B	2	2	2
6	Unknown	2B	2	2	2	2	2	3A	1	1	1

Example file (columns A-K)

	L	M	N	O	P	Q	R	S	T
1									
2									
3									
4	Neighboring Cell MNC	Neighboring Cell LAC	Neighboring Cell CI	Whether Defined as Neighboring Cell	Percentage of Co-Interferenced Traffic by neighbor (%)	Percentage of Adj-Interferenced Traffic by neighbor (%)	Probable Co-Interferenced Traffic by neighbor	Probable Adj-Interferenced Traffic by neighbor	Distance (km)
5	2	2	2	Defined	1	10	100	1	
6	1	1	1	Defined	1	10	100	1	

Example file (columns L-T)

During the loading process, for each row in the file, ASSET performs the following steps to match the contents with the Site Database:

- To identify a victim cell, it attempts to match the value in Test Cell (column B) to the Cell ID in the Site Database; if that fails, it attempts a CGI match, using the Test Cell's MCC, MNC, LAC, and CI (columns D, E, F, G).
- To identify an interferer cell, it attempts to match the value in Neighboring Cell Name (column H) to the Cell ID in the Site Database; if that fails, it attempts a CGI match, using the Neighboring Cell's MCC, MNC, LAC and CI (columns K,L,M,N). If that also fails, it searches the map data for the nearest instance of a matching BCCH_BSIC within a 10km radius of the victim cell (or its Primary Prediction Radius if greater).

If the victim cell and the interferer cell cannot both be identified using the above checks, the appropriate row is considered invalid and is not imported.

How the Loader Captures Traffic Data from a Huawei ICDM File

This explains how the traffic data is captured during the loading process for the ASSET interference table:

- To determine the total traffic per victim cell, this calculation occurs:
  - Traffic = 100 × (value in column R / value in column P)

    The values are only read from the first row of each victim cell
- To determine the affected traffic per victim cell from each interfering cell:
  - The Co-channel affected traffic and Adj-channel affected traffic are read directly from columns R and S, respectively.

For information on loading the file into ASSET, see Loading Ericsson or Huawei ICDM Files.

Measurement Data File Formats

ASSET automatically converts measurement data files to vectors (that is, MapInfo format). The file conversion is performed from a file format-specific loader. The use of measurement data files is explained in the ASSET User Reference Guide.

The file formats explicitly supported are listed in this table, along with the supported technologies:

File Format	GSM	UMTS	LTE	CDMA2000/EV-DO	Fixed WiMAX	Mobile WiMAX
Signia CW (*.hd, *.dat)	✓	✓	✓	✓	✓	✓
TMR (*.tmr)	✓	✓				
TEMS FMT (*.fmt)	✓	✓	✓			
Nemo Outdoor 4.x (*.dt?)	✓	✓				
Nemo Outdoor 5 (*.nmf)	✓	✓	✓			
Nemo Outdoor 6 (*.nmf)			✓			
Rohde Schwarz (*.pro)	✓					
DingLi (*.txt)				✓		
Microsoft Office Access® Database (*.mdb)	✓	✓				

More file formats may be supported within subsequent releases, by adding new loaders.

For more detailed descriptions of the Signia format, see Signia CW Files on page 78.

For more detailed descriptions of the TEMS formats, see TEMS FMT Measurement Files on page 80.

For information about all the other formats, please contact Product Support.

Special Notes about Nemo 4.x:

- For GSM, in the header, the #NT Network Type field must contain at least one of: GSM_900, GSM_1800, GSM_1900, or GSM_850.
- Only handset equipment is supported (file extension must be *.dt? where ? is 1-10); scanner files are *not* currently supported.
- Only measurements that are logged as an RXL event type can be loaded; the dual mode (GSM and UMTS) is *not* currently supported.

Signia CW Files

Each survey consists of two ASCII text files:

- The header file (survey.hd) details the information for the site being tested and the survey itself (survey.dat).
- The data file (survey.dat) can contain any number of measurements: one line represents one measurement detailing longitude, latitude (decimal degrees) and received level (dBm).

The following topics provide descriptions for each of the above.

Signia Header File

The Signia header file should use the following format:

- The file must be a *.hd file
- The first line should follow the format:

  `DATA_FILENAME <DATfile>.dat`

  Where `<DATfile>` is the name of the corresponding *.dat file.

   The *.hd and *.dat files should have the same filename.
- Numeric values should be given for Site_Longitude & Latitude, Tx_Azimuth, Tx_Power, Feeder_Length, Connector_Loss and Frequency

   The Tx_Power line shows the transmit EiRP in dBm
- Dates should be specified using four numbers, for example 2009
- The values of items should space delimited
- The minimum required data fields are the transmitter location, height and radiated power fields
- The file should be terminated with a carriage return

Here is an example of a header file:

```
DATA_FILENAME SL02081A_Csignia.dat
SITE_ID X1234
SITE_NAME Demo
SITE_LONGITUDE -3.2755
SITE_LATITUDE 51.5829
SITE_TYPE Mast
TX_AZIMUTH 0
TX_TILT 0
TX_HEIGHT 25
TX_POWER 40
ANTENNA_TYPE Unknown
FEEDER_TYPE Unknown
FEEDER_LENGTH 28
CONNECTOR_LOSS 3
FREQUENCY 1800
OPERATOR Name of the operator here
COMMENTS Any comments to be added to the survey
DATE_START 12/4/2008
TIME_START 12:38:17
DATE_END 13/4/2008
TIME_END 14:38:17
```

Example Signia Header File

Signia Data File

The Signia data file should use the following format:

- The file must be a *dat file, with the same filename as the *.hd file
- It can contain any number of measurements, with each line representing one measurement, detailing the longitude (decimal degrees), latitude (decimal degrees) and received signal level (dBm)

  The received signal level for the different technologies corresponds to the parameters in the following table:

Technology	Parameter
GSM	RSS
UMTS	RSCP
CDMA/EV-DO	RSCP
Fixed WiMAX	DL RSS
Mobile WiMAX	Preamble RSS
LTE	RSRP

- The file should be terminated with a carriage return

Here is an example of a data file:

```
-6.262232     53.334252  -60.71     Start
-6.262663     53.334643  -62.85
-6.263292     53.334769  -63.54
-6.263575     53.335141  -78.34
-6.263649     53.335600  -84.59     Tag1
-6.263674     53.336079  -80.66
-6.263678     53.336544  -84.28
-6.263652     53.336861  -85.26
-6.263516     53.337424  -88.24
-6.263655     53.337582  -87.76
-6.263243     53.338007  -91.55     Tag2
-6.262852     53.338436  -90.85
-6.262592     53.338803  -87.45
-6.262284     53.339229  -88.63
-6.261901     53.339582  -89.21     Tag3
-6.260988     53.339910  -91.12
-6.260224     53.339838  -90.32
-6.259497     53.339662  -91.43
-6.25905      53.339759  -91.91
-6.25889      53.340232  -95.71     Finish
```

Example Signia Data File

TEMS FMT Measurement Files

ASSET supports the import of TEMS measurement files in FMT format for:

- GSM
- UMTS
- LTE

Although the parser for each technology is different, the basic algorithm is quite similar. The parser expects certain types of data (technology specific) at specific locations in the FMT file. As long as the data in the FMT file meets the criteria specified below, ASSET should load the files correctly irrespective of the TEMS version they belong to.

Tips:

- Product Support can provide a template file (.TEX) per technology type for the conversion of proprietary TEMS log files into an FMT file format suitable for import into ASSET.
- For convenience, the FMT file can be opened and edited in Excel if required.

The following table lists the information elements (IEs) from TEMS to create an FMT file for a given technology type:

TEMS IEs used per technology type							
GSM (n=0..29)	All-Latitude	All-Longitude	All-Scanned Channels No Of	All-Strongest Scanned ARFCN[n]	All-Strongest Scanned BSIC[n]	All-Strongest Scanned RxLev (dBm)[n]	
UMTS (n=1..10)	All-Latitude	All-Longitude	All-Sc Best No Of SCs	All-Sc Best Aggr Ec (dBm)[n]	All-Sc Best SC[n]		
LTE (n=0..9)	All-Latitude	All-Longitude	All-Sc Best No Of Cell Identities	All-Sc Best RSRP (dBm)[n]	All-Sc Best RSRQ (dB)[n]	All-Sc Best Cell Identity[n]	All-Sc Best EARFCN[n]

Important:

Each valid measurement set can only be imported into ASSET if the following criteria are satisfied:

Technology	File must contain (as a minimum)	For More Information, See
GSM	RxLevel **and** BSIC information	TEMS FMT Format for GSM on page 81.
UMTS	Ec (RSCP) **and** SC (Scrambling Code) information	TEMS FMT Format for UMTS on page 82.
LTE	RSRP **and** PCI (Physical Cell ID) information.	TEMS FMT Format for LTE on page 83.

If the above conditions are not met, the measurement set is ignored during the parsing process.

The following topics provide detailed formats for each of the technologies.

TEMS FMT Format for GSM

This picture shows the structure of a GSM FMT file expected as input to the ASSET loader:

	A	B	C	D	E	F	G	H	I	J	K	L	CR	CS	CT
1						All-Latitude	All-Longitude	All-Scanned Channels No Of	ARFCN [0]	BSIC [0]	POWER [0]		ARFCN [29]	BSIC [29]	POWER [29]
2															
3												.....			
4															

Expected structure of a GSM FMT file

- Technology type is determined by the eighth column (H) header (the above heading is specific to GSM). The other column headers can contain arbitrary names.
- The first five columns (A-E) are ignored by the parser, irrespective of any contents in these columns.
- The sixth and seventh columns (F, G) expect location information (latitude and longitude, respectively).
- Any values in the eighth column (H) are ignored and the parser automatically calculates the number of valid recorded cells that have reported measurements per row. Within ASSET, this column maps to the vector attribute 'NthCoveringCell'.
- The ninth, tenth and eleventh columns (I, J, K) expect ARFCN, BSIC and signal strength information, respectively. From then on, the same pattern (in sets of 3 columns) is repeated for *n* cells (where *n*=0..29). Within ASSET, these columns map to the vector attributes 'ARFCN', 'BSIC' and 'power', respectively.
- Association of a measurement set with a cell is based on finding cells with a matching ARFCN and BSIC, within the specified distance.

ASSET's Table Browser for GSM

In the table browser (relating to the automatically created measurement vector), a new point feature is added for every measurement set reported per row.

These two pictures show an example of a GSM FMT file and the corresponding table browser after importing the FMT measurement file into ASSET.

	F	G	H	I	J	K	L	M	N
1	All-Latitude	All-Longitude	All-Scanned Channels No Of	All-Strongest Scanned ARFCN[0]	All-Strongest Scanned BSIC[0]	All-Strongest Scanned RxLev (dBm)[0]	All-Strongest Scanned ARFCN[1]	All-Strongest Scanned BSIC[1]	All-Strongest Scanned RxLev (dBm)[1]
2	26.46604399	49.80082238	2	990	47	-92	1000	46	-94

Example of a GSM FMT file

try - Copy - Table Browser

Feature#	ARFCN	BSIC	power	NthCoveringCell	Easting	Northing
1	990	47	-92.00	0	380461.000000	2927854.000000
2	1000	46	-94.00	1	380461.000000	2927854.000000

Corresponding information in Table Browser

TEMS FMT Format for UMTS

ASSET only supports measurements for single carrier UMTS networks.

This picture shows the structure of a UMTS FMT file expected as input to the ASSET loader:

	A	B	C	D	E	F	G	H	I	J	K	AA	AB
1						All-Latitude	All-Longitude	All-Sc Best No Of SCs	Signal Strength [1]	SC [1]		Signal Strength [10]	SC [10]
2													
3											.....		
4													

Expected structure of a UMTS FMT file

- Technology type is determined by the eighth column (H) header (the above heading is specific to UMTS). The other column headers can contain arbitrary names.
- The first five columns (A-E) are ignored by the parser, irrespective of any contents in these columns.
- The sixth and seventh columns (F, G) expect location information (latitude and longitude, respectively).
- Any values in the eighth column (H) are ignored and the parser automatically calculates the number of valid recorded cells that have reported measurements per row. Within ASSET, this column maps to the vector attribute 'NthCoveringCell'.
- The ninth and tenth columns (I, J) expect signal strength and scrambling code information, respectively. From then on, the same pattern (in sets of 2 columns) is repeated for *n* cells (where *n*=1..10). Within ASSET, these columns map to the vector attributes 'power' and 'SC', respectively.
- Association of a measurement set with a cell is based on finding cells with a matching SC, within the specified distance.

ASSET's Table Browser for UMTS

In the table browser (relating to the automatically created measurement vector), a new point feature is added for every measurement set reported per row.

These two pictures show an example of a UMTS FMT file and the corresponding table browser after importing the FMT measurement file into ASSET.

	F	G	H	I	J	K	L	M	N
1	All-Latitude	All-Longitude	All-Sc Best No Of SCs	All-Sc Best Aggr Ec (dBm)[1]	All-Sc Best SC[1]	All-Sc Best Aggr Ec (dBm)[2]	All-Sc Best SC[2]	All-Sc Best Aggr Ec (dBm)[3]	All-Sc Best SC[3]
2	34.0629778	-117.2183971	3	-70	20	-80	30	-90	40

Example of a UMTS FMT file

0103_01 - Table Browser

Feature#	SC	power	NthCoveringCell	Easting	Northing
1	20	-70.00	0	1033864.000000	3784256.000000
2	30	-80.00	1	1033864.000000	3784256.000000
3	40	-90.00	2	1033864.000000	3784256.000000

Corresponding information in Table Browser

TEMS FMT Format for LTE

ASSET supports measurements for multiple carrier LTE networks.

This picture shows the structure of an LTE FMT file expected as input to the ASSET loader:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	AU	AV	AW	AX
1								All-Latitude	All-Longitude	All-Sc Best No Of Cell Identities	RSRP[0]	RSRQ[0]	Cell Identity[0]	EARFCN[0]		RSRP[9]	RSRQ[9]	Cell Identity[9]	EARFCN[9]
2															.....				
3																			
4																			

Expected structure of an LTE FMT file

- Technology type is determined by the tenth column (J) header (the above heading is specific to LTE). The other column headers can contain arbitrary names.
- The first seven columns (A-G) are ignored by the parser, irrespective of any contents in these columns.
- The eighth and ninth columns (H, I) expect location information (latitude and longitude, respectively).
- Any values in the tenth column (J) are ignored and the parser automatically calculates the number of valid recorded cells that have reported measurements per row. Within ASSET, this column maps to the vector attribute 'NthCoveringCell'.
- The eleventh, twelfth, thirteenth and fourteenth columns (K, L, M, N) expect reference signal power, quality, cell identity and EARFCN information, respectively. From then on, the same pattern (in sets of 4 columns) is repeated for *n* cells (where *n*=0..9). Within ASSET, these columns map to the vector attributes 'RSRP', 'RSRQ', 'PCI' and 'EARFCN', respectively.
- Association of a measurement set with a cell is based on finding cells with a matching PCI and EARFCN, within the specified distance.

ASSET's Table Browser for LTE

In the table browser (relating to the automatically created measurement vector), a new point feature is added for every measurement set reported per row.

These two pictures show an example of an LTE FMT file and the corresponding table browser after importing the FMT measurement file into ASSET.

	H	I	J	K	L	M	N	O	P	Q	R
1	All-Latitude	All-Longitude	All-Sc Best No Of Cell Identities	All-Sc Best RSRP (dBm)[0]	All-Sc Best RSRQ (dB)[0]	All-Sc Best Cell Identity[0]	All-Sc Best EARFCN[0]	All-Sc Best RSRP (dBm)[1]	All-Sc Best RSRQ (dB)[1]	All-Sc Best Cell Identity[1]	All-Sc Best EARFCN[1]
2	47.1810072	7.410714044	1	-82.92	-10.56	13	3000				
3	47.1810072	7.420714044	2	-83.24	-10.78	16	3000	-82.92	-10.56	13	3000

Example of an LTE FMT file

MC_LTE1_AS27372JerseyLATLON - Table Browser

Feature#	RSRP	RSRQ	PCI	EARFCN	NthCoveringCell	Easting	Northing
1	-82.92	-10.56	13	3000	0	565037.000000	5455957.000000
2	-83.24	-10.78	16	5	0	565037.000000	5455957.000000
3	-82.92	-10.56	13	29	1	565037.000000	5455957.000000

Corresponding information in Table Browser

Miscellaneous Vendors Carriers File Format

ENTERPRISE can import and export EET R2C / Planet 2.5, 2.6, 2.7 and 2.8 GSM carrier databases.

The file formats described here are version 2.8.

The Carriers file is in a simple ASCII space-delimited text format.

EET/Planet GSM Carriers File Format

For GSM, the EET/Planet Carriers file contains these fields. The first three fields are tab-separated and the remaining fields are separated by spaces.

Field	Data Type	Description
Site ID	CHAR	Alphanumeric site identity. This must be the same as the site ID in the Site Database file. This should be followed by a tab.
Sector	INT	Number representing sector (or GSM cell) for cell site. This can be 0. This should be followed by a tab.
Number of Carriers Allocated	INT	Number of carriers allocated (maximum of 80 per cell). This should be followed by a tab.
Carrier1, Carrier2, and so on	INT	Space separated list of channel numbers.
Number of Carriers Required	INT	Number of carriers required for that sector.
LAC	INT	Location Area Code.
Cell ID	CHAR	Alphanumeric cell identity.
BCCH	INT	Broadcast Control Channel.
BSIC	INT	Base Station Identity Code.
-	-	Not used, a - must be placed here.
MCC	INT	Mobile Country Code.
BSC	STRING	Base Station Controller (up to 6 characters).

Field	Data Type	Description
MSC	STRING	Mobile Switching Centre (up to 16 characters).
UDCP	CHAR	This field contains the MNC value.
Carrier Type1, Carrier Type2, and so on	CHAR	Space separated list of carrier types (one per allocated channel).
Number of Carrier Type Demands	INT	The number of carrier types demanded.
Carrier Type1, Demand, Carrier Type2, Demand, and so on	CHAR and INT	Space separated list of carrier type name and carrier type demanded.

The site database files do not export any values in the CELLINFO line other than a set of default values.

Example EET/Planet GSM Carriers File

The following shows an example EET/Planet GSM carriers file:

```
Site1   1     2     6 59 2 13478 Site1A 6 15 - 0 BSC0 MSC0 0
BCCH TCH 2 BCCH 1 TCH 1

Site1   2     1     9 1 13478 Site1B 9 14 - 0 BSC0 MSC0 0 BCCH 2
BCCH 1 TCH 0

Site1   3     1     2 1 13478 Site1C 2 1 - 0 BSC0 MSC0 0 BCCH 2
BCCH 1 TCH 0

Site2   1     1     5 1 13478 Site2A 5 4 - 0 BSC0 MSC0 0 BCCH 2
BCCH 1 TCH 0

Site2   2     2     2 39 2 13478 Site2B 2 1 - 0 BSC0 MSC0 0 BCCH
TCH 2 BCCH 1 TCH 1

Site2   3     2     8 52 2 13478 Site2C 8 2 - 0 BSC0 MSC0 0 BCCH
TCH 2 BCCH 1 TCH 1

Site3   1     2     5 51 2 13478 Site3A 5 3 - 0 BSC0 MSC0 0 BCCH
TCH 2 BCCH 1 TCH 1

Site3   2     2     11 48 2 13478 Site3B 11 7 - 0 BSC0 MSC0 0
BCCH TCH 2 BCCH 1 TCH 1

Site3   3     2     7 58 2 13478 Site3C 7 7 - 0 BSC0 MSC0 0 BCCH
TCH 2 BCCH 1 TCH 1

Site4   1     1     8 1 13478 Site4A 8 1 - 0 BSC0 MSC0 0 BCCH 2
BCCH 1 TCH 0

Site4   2     1     6 1 13478 Site4B 6 12 - 0 BSC0 MSC0 0 BCCH 2
BCCH 1 TCH 0

Site4   3     1     2 1 13478 Site4C 2 17 - 0 BSC0 MSC0 0 BCCH 2
BCCH 1 TCH 0

Site5   1     1     2 1 13478 Site5A 2 13 - 0 BSC0 MSC0 0 BCCH 2
BCCH 1 TCH 0

Site5   2     2     10 49 2 13478 Site5B 10 7 - 0 BSC0 MSC0 0
BCCH TCH 2 BCCH 1 TCH 1

Site5   3     1     4 1 13478 Site5C 4 13 - 0 BSC0 MSC0 0 BCCH 2
BCCH 1 TCH 0
```

Miscellaneous Vendors Exceptions File Format

ENTERPRISE can import and export EET R2C / Planet 2.6 Exceptions databases.

The type of lines that can be considered by ENTERPRISE is shown here in an extract from a sample file:

```
CELL Site11 1 SEPARATIONS
Site12 1 : 2
Site12 2 : 2
```

These indicate that the first sector of Site11 has 2 exceptions, one being the first sector of Site12 and the other, the second sector of Site12.

 Site IDs are case-sensitive.

This table shows the specification of the file format:

Field	Data Type	Description
Header	CHAR	Contains version information.
Optimise_Which	INT	Which threshold to optimise on (only used by optimising algorithms). 0=Absolute Area, 1=Percentage Area, 2=Percentage Traffic
CARRIER_TYPE	CHAR	Carrier type identity.
CARRIER_TYPE COST_FACTOR	FLOAT	Indicates that the following lines are a list of carrier types and their associated cost factor.

Thresholds

Thresholds on the preceding CARRIER_TYPE for:

Field	Data Type	Description
Absolute Area	FLOAT	Absolute affected area in km².
Percent Area	FLOAT	Percent affected area.
Absolute Traffic	FLOAT	Absolute affected traffic in mE.
Percent Traffic	FLOAT	Percent affected traffic.

Spacings

Minimum channel spacings on the preceding CARRIER_TYPE for:

Field	Data Type	Description
Min_Chan_Spacing_Site	FLOAT	Site
Min_Chan_Spacing_Cell	FLOAT	Cell
Min_Chan_Spacing_Neighbour	FLOAT	Neighbour Sites
Min_Chan_Spacing_Neighbour2	FLOAT	2nd Order Neighbours
CELL	CHAR	Site Identity
CELL COST_FACTOR	FLOAT	Indicates that the following line contains a cost factor for CELL.
GLOBAL ILLEGAL CHANNELS	FLOAT	Indicates that the following line contains a list of channels that may not be used anywhere on the network.
SEPARATIONS	CHAR	Indicates that the following lines are a list of cells and separations for the preceding CELL (* means the separation overrides all others).

Field	Data Type	Description
ILLEGAL CHANNELS	CHAR	Indicates that the following line is a space-separated list of illegal channels for the preceding CELL.
BORDER RESTRICTIONS	CHAR	Indicates that the following line is a space-separated list of country borders whose channel restrictions apply to the preceding CELL.

Miscellaneous Vendors Neighbours File Format

ENTERPRISE can import from and export to EET R2C / Planet 2.5, 2.6, 2.7 and 2.8 GSM neighbour files, the specification of these files is as follows.

This is a simple ASCII space separated text format and consists of the following distinct sections - Threshold, Cell, Neighbour, Add and Delete.

Threshold and Cell

This table describes the format of the Threshold and Cell sections:

Field	Data Type	Description
THRESHOLDS	INT	Four integer fields representing Max Neighbours, Min Neighbours, Min Border Squares and Min Border Percentage respectively.
CELL	CHAR	"CELL" indicates that the Site ID following is the serving cell.
Site ID	CHAR	Unique identifier for the site.
Sector (cell)	INT	Sector number.
BSIC	INT	Not used.
BCCH	INT	Not used.
HO RxLev	INT	Not used.
Number of Neighbours	INT	Number of neighbours following in the file.

Neighbour

This table describes the format of the Neighbour section:

Field	Data Type	Description
NBR	CHAR	"NBR" indicates that the Site ID is the neighbour of the last serving cell.
Site ID	CHAR	Unique identifier for the site.
Sector (cell)	INT	Sector number.
HO Margin	INT	Handover Margin
HO RxLev Min	INT	The minimum handover receiver level.
Max Distance	INT	Not used.
RxQual	INT	Not used.

Add and Delete

This table describes the format of the Add and Delete sections:

Field	Description
Added	Lists cells added manually to the neighbour list. Other fields as previously described.
Deleted	Lists cells deleted manually from the neighbour list. Other fields as previously described.

Example Neighbours File

A truncated sample neighbours file for EET/Planet is shown here:

```
THRESHOLDS 10 3 10 5
CELL XY001 1 0 0 0 3
NBR XY001 3 0 -120 100000 0
NBR XY001b 1 0 -120 100000 0
NBR XY011 2 0 -120 100000 0
CELL XY001 2 0 0 0 3
NBR XY001b 2 0 -120 100000 0
NBR XY011 2 0 -120 100000 0
NBR XY006c 2 0 -120 100000 0
ADDED
CELL XY001 1 0 0 0 2
NBR XY002 2 0 -120 100000 0
NBR XY002c 2 0 -120 100000 0
CELL XY001 2 0 0 0 1
NBR XY001b 1 0 -120 100000 0
DELETED
CELL XY019 1 0 0 0 7
NBR XY017h 1 0 -120 100000 0
NBR XY019h 1 0 -120 100000 0
NBR XY019h 2 0 -120 100000 0
NBR XY019h 3 0 -120 100000 0
NBR XY036 1 0 -120 100000 0
NBR XY036 2 0 -120 100000 0
NBR XY036 3 0 -120 100000 0
```

Miscellaneous Vendors Site Database File Format

ENTERPRISE can import and export the EET R2C / Planet 2.5, 2.6, 2.7 and 2.8 simple text site database file format. The specification of these files is as shown in the tables in this section.

An example of a Planet 2.8 site database file is:

```
V2.8 Site Database written on Mon Nov 22 13:42:38 1999
SITE_FORMAT EiRP   : Do not delete this line
SECTOR_FORMAT    : Do not delete this line
CELL_INFO_FORMAT : Do not delete this line
SITE 15A -61.713401 30.192341 7 2 1 6 0 4.21 0 3 Long Bridgeÿÿ
SECTOR 40 55 0.0 60_Sector_PCS_Dapa_DP59200 48.77 URBAN
CELLINFO RBS2201 Non-Balanced 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 35.00
SECTOR 160 55.20 0.0 60_Sector_PCS_Comsat_PCSA090190 48.77
URBAN
CELLINFO RBS2201 Non-Balanced 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 35.00
SECTOR 280 55.32 0.0 60_Sector_PCS_Dapa_DP59200 48.77 URBAN
CELLINFO RBS2201 Non-Balanced 0.00 0.00 0.00 0.00 0.00 0.00
0.00 0.00 35.00
```

Planet 2.5 Site Database Format

The Planet version 2.5 site database file is in a simple ASCII tab-separated text format, designed to be easy to use in Microsoft Excel, and for easy conversion to and from other formats.

All data pertaining to a particular site is on the same line in the file.

Site Data Record (1 per Site)

The site data record is:

Field	Data Type	Description
Site ID	char[32]	Site Identifier
Easting / Longitude	float	The x co-ordinate of the site (metres or decimal degrees).
Northing / Latitude	float	The y co-ordinate of the site (metres or decimal degrees).
Site Status flags	integer [5]	Numeric representation of the site status flags. If you do not have any status flags, you will have 5 zeros in the file.
Ground Height	float	Ground height in metres above sea level (0 indicates that DTM map data value is to be used).
Antenna Height	float	Antenna height in metres above ground level (one value for all sectors).
Hex Radius Flag	integer	0 gives default value.
Sector Count	integer	Number of sectors.
Model Name	char[32]	Propagation model (no spaces allowed) – one per site.

Sector Data Record (1 per Sector)

The number of sector data records is determined by the Sector Count value in the site data record. The sector data record is:

Field	Data Type	Description
Azimuth	float	Direction of sector main beam (degrees).
Power	float	EiRP of sector (dBm).
Tilt	float	Downtilt of sector (degrees) - positive value indicates downtilt.
Antenna Name	char[32]	Type of antenna (no spaces allowed).

Site name (1 per Site)

The site name is:

Field	Data Type	Description
Site Name	char[32]	Name of site. This can contain spaces but cannot contain other characters such as commas.

Planet 2.8 Site Database File Format Header Records

One of each of the following records per file:

The Version record format is:

Field	Data Type	Description
Version Identifier	CHAR	Identifies the version of EET that was used to store the database. For version 2.8 this is "V2.8".
Optional Message	CHAR	The time and date that the database was last stored.

The Site Data record format is:

Field	Data Type	Description
Site Format	CHAR	ERP or EiRP

 The Sector Data and Cell Data record formats are not used by ENTERPRISE but must exist in file.

Planet 2.8 Site Database File Format Data Records

One Site Data Record per site:

Field	Data Type	Description
Keyword	CHAR[4]	"SITE" identifies the record.
Site ID	CHAR[11]	Unique identifier for the site.
Easting/Longitude	FLOAT	The x co-ordinate of the site (metres or decimal degrees).
Northing/Latitude	FLOAT	The y co-ordinate of the site (metres or decimal degrees).
Site Status Flags	INT[5]	Numeric representation of the site status flags.
Ground Height	FLOAT	The height of the site above mean sea level (metres).
Hexagon Flag	INT	Numeric representation of the hexagon radius and type.

Field	Data Type	Description
Site Type Flag	INT	A decimal number of up to three digits that has the site type and number of sectors encoded into it, as follows: • N = Number of Sectors (N in range 1 to 6) • -0- = Macrocell • -3- = Microcell • 1-- = Repeater Site
Site Name	CHAR[23]	Because this is an optional string that can contain anything (including spaces), the delimiter is a special character ÿ. The ASCII code for this is 255.
Site Name 2	CHAR[23]	Because this is an optional string that can contain anything (including spaces), the delimiter is a special character ÿ. The ASCII code for this is 255.
Narrative	CHAR[80]	

Sector Data Record

One per sector of every site:

Field	Data Type	Description
Keyword	CHAR[6]	"SECTOR" identifies this record.
Alignment	FLOAT	Angle from North of sector (degrees).
Power	FLOAT	ERP or EiRP of sector (dBm) depending on the value of the Site Format field in the Header Record. All power values should be consistent (all ERP or all EiRP).
Tilt	FLOAT	Downtilt of sector (degrees).
Antenna Name	CHAR[99]	Name of antenna (no spaces allowed).
Antenna Height	FLOAT	Height of antenna above ground (metres).
Model Name	CHAR[31]	Name of propagation model (no spaces allowed).

Cell Data Record

One per sector of every site.

Field	Data Type	Description
Keyword	CHAR[8]	"CELLINFO" identifies the start of the cell information details.
Equipment Type	CHAR[21]	The equipment type the cell uses.
Balanced Mobile	CHAR[21]	Mobile / CE type the cell is presently balanced for. If the cell is not balanced then defaults to non-balanced.
Equipment Loss	FLOAT	Sum of all the downlink losses / gains from the presently selected cell equipment.
Output Power	FLOAT	Do not change from zero.
Uplink Feeder Loss	FLOAT	The feeder loss applicable to the uplink side.
Downlink Feeder Loss	FLOAT	The feeder loss applicable to the downlink side.
Diversity Gain	FLOAT	The amount of diversity gain from the cell, if applicable.
Uplink Misc. Loss	FLOAT	The amount of misc. losses on the uplink side.
Downlink Misc. Loss	FLOAT	The amount of misc. losses on the downlink side.
Mobile ERP	FLOAT	The peak power of the mobile/ CE type for which the cell is balanced.

Field	Data Type	Description
GSM Range	FLOAT	A user definable range (only applicable in GSM systems). Interference into this cell from other servers will not be considered, because this cell cannot cover beyond this range. However, this cell will still interfere into other cells independent of the range.

CHAPTER 4

XML File Formats

This chapter provides a full and detailed description of the XML file format used in ENTERPRISE as well as a description of the constraints on exporting and importing.

Getting Started with XML

To get you started, the following information gives some helpful pointers of some of the formats used.

General XML Formats

- A standard XML shorthand for indicating that the tag is empty is shown as <antenna/>
- A start tag must have a matching end tag
- There must be no overlapping tags, that is a tag that opens inside another tag must be closed before the containing tag closes

ENTERPRISE Specific XML Formats

- RO in a tag indicates it is read-only and can only be used for export.

  For example, <DTM-RO> is using the DTM from the Map Data, and hence is read-only. However not all tags where this is true have RO in the tag.
- If the tag <ACT-DTM> contains -9999.000000 that indicates that the DTM will be used instead.
- The ENTERPRISE XML format supports the use of extended character sets, for example Chinese, in the file values.

About the XML Index File

The XML Importer recognises the index file as being a file with the word INDEX (capitalized) in its name, for example `myINDEXfile.xml`,`INDEX.xml` and `_INDEX-001.xml`.

This means that any files that contain project or config data should not contain INDEX in the file name. However, lower case or title case variations are allowed, so the following names would be acceptable: `PROPERTY-LIST-index.xml`, `MSC Index.xml` and `CELLS iNdEx.xml`.

The index file is not compulsory to perform the selection of .xml files to import. You can do one of these:

- Select just the INDEX file.
- Select a multiple selection of xml data files.
- Select data files and the INDEX file together.

However, if you do select data files and the index file together, the XML Importer would be expecting the index file to refer to a different selection of files than those data files selected at the same time. Duplicate selections are ignored, for example, if the selection made from the import dialog is this:

PROPERTY-LIST001.xml

MSC-LIST001.xml

BSC-LIST001.xml

INDEX001.xml

And the index file also points to the other 3 files selected, then it will be ignored.

How Do I Reference Data Files in the Index File?

Data files can be referenced by the INDEX file using absolute or relative network path names, for example:

```
<?xml version="1.0"?>
<INDEX>
    <GSM-CELL-LIST FILENAME="johns cells.xml"/>
    <GSM-CELL-LIST FILENAME="c:\xml\mikes cells.xml"/>
    <GSM-CELL-LIST FILENAME="\\steve\share\steves cells.xml"/>
    <GSM-CELL-LIST FILENAME="\\andy\xml\andys cells.xml"/>
</INDEX>
```

Each element within the INDEX element should be named after a data list, being the root tag of an ENTERPRISE XML file, such as:

- GSM-CELL-LIST
- MSC-LIST
- NODEB-LIST

Handling Import Conflicts

All importing data is identified by its unique ID attribute. If this ID already exists in the project into which you are importing, the XML Importer will give you the choice of the following options:

Option	Description
Leave	Skip the import of this particular object.
Merge	Import all object's fields present in the XML file to existing object. Fields not listed will be ignored.
Stop	Terminate import at this point without importing current object.
Replace	Resets existing object's data to default initial values then imports all object's fields present in the XML file to existing object. Fields not present in the XML file will be ignored and will remain as default initial values.  Replace does not delete objects. For example, importing an empty list (for example, <PROPERTY-LIST/>) will NOT remove all Properties.

XML Import Errors

If you encounter any of the errors described in this section, and you choose to ignore them, you will have the option to Apply to All. If you select this option, then all occurrences of the currently conflicting type will be acted upon in the same manner.

The following errors are possible:

Error	Description
Object Missing ID	All importing objects are identified via an ID, which is generally situated as an attribute to the element's root tag, for example: <NODE-B ID="QX_1098LM"> If the ID is omitted, the element will not be imported.
Permission Required	If a user does not have sufficient database privileges granted to edit or create a particular object, then they will also be prevented from importing that object type via the XML Importer.
Database Error	If a database error occurs during the import of an object, you are notified and given the option to stop the import.
Dependency Not Found	If an element's existence in a project is logically or physically dependent upon another parent element, the import might fail if either: • The ID of the parent is omitted from the XML import file • The ID of the parent is not found in the current project

What are the Network Dependencies?

This table describes the network dependencies:

Element	Dependencies
BSC	MSC, Property
Cell Site	BSC, Property
Distribution Node	BSC, Property
GSM Cell	Cell Site
Repeater	GSM Cell, Property
Wideband Repeater	Cell, Property
CDMA Repeater	CDMA Sector, Property
Cell	Node
WMSC, RNC, SGSN	Log Net PLMN, Property
PtP Intercon	Property (End A & End B)
PmP Intercon	Property (End A & End B)
PmP Hub	Property
PtPLinkend	PtPIntercon, Property
PtPHubLinkend	PtPIntercon, Property

Special Character Sets

For languages using characters outside the English character set, the processing instruction should contain an encoding attribute appropriate to the language used within the file. For example, this is the encoding attribute for the majority of European languages:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
```

Examples of special characters are ë, á, å and so on.

Changes Between XML Versions 8.0 and 8.1

This section briefly describes the XML changes between ENTERPRISE versions 8.0 and 8.1.

ASSET XML Changes Between 8.0 and 8.1

The changes to the ASSET XML files between ENTERPRISE versions 8.0 and 8.1 are as follows:

In 8.1, the Property has a new physical antennas element, which contains the antenna's physical attributes as well as port information. In addition it will have four new elements for the four Master Patterns. The antenna device will contain the port definition.

The existing (logical) antennas attached to cells (GSM) or nodes (UMTS, LTE, CDMA2000, EV-DO or WiMAX) will contain a new element for the Inherit Master Pattern field. The existing element for Shared Antenna ID still remains, but now corresponds to the Physical Index stored on the Property.

The changes are explained in the table below.

 For more information on the concept of physical and logical antennas, see the 'Configuring Networks in ASSET' chapter in the ASSET User Reference Guide.

 Also see the 'Important' note in XML Project File Formats on page 105.

This table describes the changes to the ASSET XML files between ENTERPRISE versions 8.0 and 8.1 that relate to the above description about physical antennas:

Object	Change	Field/Tag
Antenna Device (ANTENNA-LIST)	New Tag	PORT-LIST (and associated subtags, including PORT INDEX)
Property (PROPERTY-LIST)	New Tag	PHYSICAL ANTENNA-LIST (and associated subtags, including INDEX, MASTER-PATTERNS, SPATIAL-DIV, CONSTRAINTS, PORT-LIST)
GSM Cell (GSM-CELL-LIST) UMTS Node B (NODEB-LIST) CDMA BS or EV-DO BS (CDMA-BS-LIST) Fixed WiMAX Node (WiMAX-NODE-LIST) Mobile WiMAX Node (MOBILE-WiMAX-NODE-LIST) LTE eNodeB (LTE-NODE-LIST)	New Tags	ANT-INDEX, INHERIT-MASTER-PATTERN
Same list of objects as above row	Changed Meaning	SHARED-ANT-ID now corresponds to the Physical Index stored on the Property.

In addition to the above, this table lists the other general changes to the ASSET XML files between ENTERPRISE versions 8.0 and 8.1:

Object	Change	Field/Tag
Wi-Fi Node	New file	ALL
Wi-Fi Cell	New file	ALL
Wi-Fi Carriers	New file	ALL
LTE MUG LOOKUP	New file	ALL
Terminal Types	New tag	WIFI-PARAMS MC-HSPA-PARAMS HSDPA-CATEGORY HSUPA-CATEGORY
LTE CELL	New tag	REF-SIGNAL-MEAN-POWER-RO TRAFFIC-MEAN-POWER-RO CONTROL-MEAN-POWER-RO SYNC-MEAN-POWER-RO BROADCAST-MEAN-POWER-RO MULTICAST-MEAN-POWER-RO ICIC-PPRE-FACTOR-CC-RO ICIC-PPRE-FACTOR-CE-RO ICIC-SCHEME-METHOD-RO LINE-OF-SIGHT-ENABLED HIGH-SINR-ENABLED SINR-THRESHOLD MUG-NONRAYLEIGH-ADJUSTMENT TRAFFIC-PPRE-RO CONTROL-PPRE-RO SYNC-PPRE-RO BROADCAST-PPRE-RO MULTICAST-PPRE-RO REF-SIGNAL-EPRE-RO MEAN-POWER-RO
LTE CELL	Renamed	REF-SIGNAL-EPRE-RO To REF-SIGNAL-PPRE
UMTS Cell	New tag	MC-HSPA-ENABLED MC-HSPA HSPA-CELL-ID HSPA-ONLY
UMTS Cell Types	New tag	MC-HSPA-ENABLED MC-HSPA-CELL-ID HSPA-ONLY
SERVICES	New tag	BEARER-SELECTION-MODE
Project Settings	New tag	USEDBCACHE
PROPERTY GSM-CELL UMTS-Node CDMA-BS LTE-NODE Repeater LTE-repeater Wi-Max Node Types Repeater Types UMTS Cell RO Types Antenna RO Types Wi-MAX RO Types	New tag	HEIGHT-PRED-OFFSET HEIGHT-PRED
Prediction System RO Types	New tag	VENDOR-SPECIFIC-SECTIONS MODEL-SUPPORTS-UNMASKED MODEL-EXTENDED-SECTION-INFO

Object	Change	Field/Tag
Connection Types	New tag	WIFI
BTS	New tag	MAX-SITE-SPACING MAX-CELL-SPACING
GSM Cell Site	Removed	FREQBAND

CONNECT XML Changes Between 8.0 and 8.1

This table describes the changes to the CONNECT XML files between ENTERPRISE versions 8.0 and 8.1:

Object	Change	Field/Tag
PTP-LINKEND	NAME CHANGE	LOS-STATUS changed to LINK-STATUS
MODULATION-TYPES	NAME CHANGE	INFO changed to DEFAULT-KN MANUFACTURER changed to BITS-PER-SYMBOL
MULTI-RADIO-LIST	REMOVAL	• FROM MULTI-RADIO-LINK TAG: 1. LINK-TYPE 2. LOS-REQUEST-SENT 3. LINK-STATUS 4. DUPLEXMODE 5. PACKETTYPE 6. HEADERSIZE • FROM LINKEND-PTP-LIST TAG: 1. USE-PDHSDH 2. CHANNEL-NUMBER 3. VALUE-PDHSDH 4. ETHERNETIP-VALUE
DUAL-POLAR-LIST	REMOVAL	• FROM DUAL-POLAR-LINK TAG: 1. LINK-TYPE 2. LOS-REQUEST-SENT 3. LINK-STATUS 4. DUPLEXMODE 5. PACKETTYPE 6. HEADERSIZE • FROM LINKEND-PTP-LIST TAG: 1. USE-PDHSDH 2. CHANNEL-NUMBER 3. VALUE-PDHSDH 4. ETHERNETIP-VALUE

Using .XSD Files to Understand the Structure of XML Files

As part of your ENTERPRISE installation, AIRCOM provides a set of .XSD (XML Schema Diagram) files. By default, these files are installed at C:\Program Files\AIRCOM International\ENTERPRISE 8.1\XML Schemas\ENTERPRISE.

These files enable you to understand the structure of your XML files, and provide important information about them.

You can view these files using specialised software, for example Altova XML Spy, or text viewing software, such as PSPad, UltraEdit or Notepad. This picture shows an example section from an .xsd file (UMTS-CELL.xsd) viewed in PSPad:

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema
    elementFormDefault="qualified"
    xmlns:xs="http://www.w3.org/2001/XMLSchema">


  <!-- UMTSCellTypes.xsd file contains the definitions of many simple and
  complex types that would be used by "umts_cell_type" complex type. Hence
  we need to include that. -->
  <xs:include schemaLocation="UMTSCellTypes.xsd"/>
  <xs:include schemaLocation="..\COMMON\UMTSTypes.xsd"/>


  <!-- For UMTS-CELL -->
  <xs:complexType name ="umts_cell_type">
    <xs:all>
      <xs:element name ="PARENT" type ="object_identity_127" minOccurs ="0" maxOccurs="1">
        <xs:annotation>
          <xs:documentation>Parent </xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name ="UMTSCELLNAME" type ="fixed_length_128_string" minOccurs ="0" maxOccurs ="1">
        <xs:annotation>
          <xs:documentation>Cell Name</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name ="UMTSCELLID" type="positive_integer_or_unknown" minOccurs ="0" maxOccurs ="1">
        <xs:annotation>
          <xs:documentation>UMTS Cell Id</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name ="LOCALCELLID" type ="unsigned_integer_or_unknown" minOccurs ="0" maxOccurs ="1">
        <xs:annotation>
          <xs:documentation>Local UMTS Cell Id</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name ="LAC" type ="unsigned_short_or_unknown" minOccurs ="0" maxOccurs ="1">
        <xs:annotation>
          <xs:documentation>LAC</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name ="SAC" type ="unsigned_short_or_unknown" minOccurs ="0" maxOccurs ="1">
        <xs:annotation>
          <xs:documentation>SAC</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name ="RAC" type ="unsigned_short_or_unknown" minOccurs ="0" maxOccurs ="1">
        <xs:annotation>
          <xs:documentation>RAC</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name ="LCR" type ="unsigned_short_or_unknown" minOccurs ="0" maxOccurs ="1">
        <xs:annotation>
          <xs:documentation>LCR</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name ="URA1" type ="unsigned_short_or_unknown" minOccurs ="0" maxOccurs ="1">
        <xs:annotation>
          <xs:documentation>URA1</xs:documentation>
```

Sample .xsd file viewed in PSPad

This section describes how to find key information about an XML file, particularly two important tag types:

- Required tags
- Enumerated tags

Identifying these tags will enable you to ensure your XML files will be valid.

As well as these important tags, you should be aware of other special conditions that apply to certain XML file formats. These are not currently documented within the .xsd files, but are described in Special Conditions for XML File Formats.

Identifying Required Tags

It is important to identify any required tags for an XML file, because without these your XML file will be invalid. A typical required tag is the ID attribute.

Required tags are identified by the 'use' attribute for a tag being set to 'required': This picture shows an example:

```
<xs:attribute name="ID" type="object_identity" use="required">
```

Identifying Enumerated Tags

You must also identify any enumerated tags and the range of possible values, so that you are able to use these tags correctly.

Enumerated tags are identified by a '<restriction>' tag,which has two attributes:

- A 'base' attribute, which identifies the type of restriction - for example "xs:string" or "xs:unsignedByte"
- A series of 'value' attributes, which define the possible values for the tag

This picture shows an example for an Antenna:

```
<xs:simpleType name="polarisation_type">
  <xs:restriction base ="xs:string">
    <xs:enumeration value="HORIZONTAL"/>
    <xs:enumeration value="VERTICAL"/>
    <xs:enumeration value="CROSSPOLAR"/>
  </xs:restriction>
</xs:simpleType>
```

In this example, ‘polarisation_type’ is an enumerated tag, with three possible (string) values: HORIZONTAL, VERTICAL or CROSSPOLAR.

About the XML Filenames for ENTERPRISE Objects

When importing or exporting XML data, it is important to know the correct XML filename for the relevant object. (The objects are listed in the XML Import and XML Export dialog boxes.) The following tables describe the mapping between the ENTERPRISE objects and the corresponding XML filename.

Project XML Files

This table gives the XML filenames for all the Project XML files:

Object	XML Filename
3g Networks	NETWORK-LIST
Property	PROPERTY-LIST
3g Log Node	LOG-NODE-LIST
Neighbours	NEIGHBOUR-LIST
Property Constraints	PROPERTY-CONSTRAINTS-LIST
Cell Site/Node Constraints	SITE-CONSTRAINTS-LIST
GSM MSC	MSC-LIST
GSM BSC	BSC-LIST
GSM Cell Site	CELL-SITE-LIST
GSM Distribution Node	DNODE-LIST
GSM Cell	GSM-CELL-LIST
GSM Repeater	REPEATER-LIST
GSM Exception	GSM-CELL-EXCEPTION-LIST
UMTS WMSC	WMSC-LIST
UMTS SGSN	SGSN-LIST
UMTS RNC	RNC-LIST
UMTS Node B	NODEB-LIST
UMTS Cell	UMTS-CELL-LIST
UMTS Repeater	UMTS-REPEATER-LIST
CDMA MSC	CDMA-MSC-LIST
CDMA BSC	CDMA-BSC-LIST
CDMA BS	CDMA-BS-LIST
CDMA Sector	CDMA-SECTOR-LIST
CDMA Repeater	CDMA-REPEATER-LIST
Fixed WiMAX Node	WiMAX-NODE-LIST
Fixed WiMAX Cell	WiMAX-CELL-LIST
Fixed WiMAX Repeater	WiMAX-REPEATER-LIST
Mobile WiMAX Node	MOBILE-WiMAX-NODE-LIST
Mobile WiMAX Cell	MOBILE-WiMAX-CELL-LIST
Mobile WiMAX Repeater	MOBILE-WiMAX-REPEATER-LIST
LTE SAEGW	SAEGW-LIST
LTE MME	MME-LIST

Object	XML Filename
LTE eNodeB	LTE-NODE-LIST
LTE Cell	LTE-CELL-LIST
LTE Repeater	LTE-REPEATER-LIST
Logical Connection	LOGICAL-CONN-LIST
Logical Cellular Connection	CELLULAR-CONN-LIST
PmP Hub	HUB-PMP-LIST
PmP Sector	SECTOR-PMP-LIST
PmP Carriers	CARRIERS-PMP-LIST
PmP Intercon	PMP-INTERCON-LIST
PmP Hub Linkend	HUB-LINKEND-PMP-LIST
PtP Intercon	PTP-INTERCON-LIST
PtP Linkend	LINKEND-PTP-LIST
Back to Back PRL	PRL-BACKTOBACK-LIST
Reflector PRL	PRL-REFLECTOR-LIST
Multi-radio Link	MULTI-RADIO-LINK-LIST
Dual Polar Link	DUAL-POLAR-LINK-LIST
Unified Routes	UNIFIED-ROUTE-LIST

Configuration XML Files

This table gives the XML filenames for the Configuration XML files:

Object	XML Filename
Propagation Models	MODEL-LIST
Contact Person	CONTACT-LIST
Bearers	BEARERS-LIST
Services	SERVICES-LIST
Terminal Types	TERMINAL-TYPES-LIST
Clutter Parameters	CLUTTER-PARAMETERS-LIST
Compound Array Expressions	COMPOUND-ARRAY-EXPRESSION-LIST
GSM Carriers	CARRIERS-LIST
GSM Carrier Layer	CAR-LAYER-LIST
GSM Cell Layer	CELL-LAYER-LIST
BTS Type	BTS-LIST
BCF Types	BCF-TYPE-LIST
Frequency Hopping Diversity Gain	FREQ-HOP-DIV-GAIN-LIST
Channel to Transceiver Setup	CHAN-TRX-SETUP-LIST
GPRS Data Throughput	GPRS-MCS-CURVE-LIST
EGPRS Data Throughput	EGPRS-MCS-CURVE-LIST
Timeslot Occupancy	TIMESLOT-OCCUPANCY-LIST
GSM BSIC Schemas	BSIC-SCHEMAS-LIST
UMTS Carrier	CARRIER-UMTS-LIST

Object	XML Filename
UMTS Resource	UMTS-RESOURCE-LIST
Node Type	NODEB-TYPE-LIST
UMTS Code Schemas	UMTS-SCHEMAS-LIST
CDMA Carrier	CARRIER-CDMA-LIST
Mobile WiMAX Carrier	MOBILE-WiMAX-CARRIER-LIST
Fixed WiMAX Carrier	WiMAX-CARRIER-LIST
WiMAX Mobile PN Index Schemas	WIMAX-MOBILE-SCHEMAS-LIST
LTE Carrier	LTE-CARRIER-LIST
LTE Frames	LTE-FRAMES-LIST
LTE Frequency Bands	LTE-FREQUENCY-BANDS-LIST
LTE Schemas	LTE-SCHEMAS-LIST
LTE AAS Parameters	LTE-AAS-PARAMETERS-LIST
Equipment Supplier	SUPPLIER-LIST
Antenna	ANTENNA-LIST
Cabin	CABIN-LIST
Cell Equipment	CELL-EQUIP-LIST
Feeder	FEEDER-LIST
Mast	MAST-LISTI
Mast Head Amp	MAST-HEAD-AMPLIFIER-LIST
CI BER Conversion	CI-BER-CONVERSION-LIST
Band Channels	BAND-LIST
Link Term Equipment	LINK-TERMINAL-LIST
Link Type	LINK-TYPE-LIST
MW Antenna	MW-ANTENNA-LIST
Modulation Types	MODULATION-TYPE-LIST
System Ranges	SYSTEM-RANGE-LIST
User Ranges	USER-RANGE-LIST
User Link Status	USER-LINK-STATUS-LIST
Radio Equip	RADIO-LIST
T/I Objectives	TI-OBJECTIVE-LIST
Back-to Back Passive Repeater Link Near Field Effect	BK-BK-PRL-NF-CURVE-LIST
Reflector Passive Repeater Link Near Field Effect	RFL-PRL-NF-CURVE-LIST

ADVANTAGE XML Files

This table gives the XML filenames for the ADVANTAGE XML files:

Object	XML Filename
Plans	PLAN-LIST
Object/Action Costs/Risks	GLOBAL-DESIGN-TARGET-LIST
Array-based RF Metric Targets	PERFORMANCE-DESIGN-TARGET-LIST
Service-based RF Metric Targets	DESIGN-TARGETS-LIST
Clutter RF Array Thresholds	CLUTTER-PARAM-LIST
Vector RF Array Thresholds	VECTOR-THRESHOLD-PARAM-LIST
Problem Cell Thresholds	PROBLEM-CELL-THRESHOLD-LIST
Problem Area Thresholds	PROBLEM-AREA-THRESHOLD-LIST
Action Combinations	ACTION-COMBINATION-OPTIONS-LIST
Max Objects/Actions	MAX-UNITS-ACTIONS-LIST
Metrics Selection/Weights	COST-FUNCTION-WEIGHTS-LIST
Max Degradations	PLAN-REJECTION-OPTIONS-LIST
Metrics Synthesis	COST-SYNTHESIS-LIST
Action-Constraints	ACTION-CONSTRAINTS-TEMPLATE-LIST
Settings	OPTIONS-LIST

XML Project File Formats

This section describes the XML project file formats for the network elements in ENTERPRISE.

 You can view examples of all of these files in the XML Files for ENTERPRISE folder, which is installed by default at C:\Program Files\AIRCOM International\ENTERPRISE 8.1\Samples. You can also download these Sample XML files by following the User Reference Guides link on the AIRCOM Assist website (https://www.aircomassist.com).

 **Important:**

In ASSET 8.0.1 onwards, there is more flexibility in how you configure and manage antennas in the Site Database (they now additionally exist at the Property level, split into physical and logical entities).

This change requires an important new rule affecting the XML Import process. The rule determines how the creation of physical antennas is handled by ASSET when you are importing network element objects that contain logical antennas (such objects would be at the cell level for GSM, and at the node level for all other technologies).

The rule works like this:

- If the logical antenna contains a 'Shared ID', then ASSET will search for a physical antenna on its host Property whose index matches that value.
  - If the physical antenna does not exist, it will be automatically created (assuming the user has permission to modify the Property).
  - If the physical antenna exists, the import will merge any physical attributes (antenna location, device, height, mechanical tilt, azimuth) present on the logical antenna with the physical antenna. This is to maintain backwards compatibility with older releases.

     Any such merged changes to the physical attributes on the physical antenna will affect all logical antennas that are sharing the same index number on that Property.
- If the logical antenna does not contain a 'Shared ID', ASSET will create a new physical antenna with an index number that is unique amongst the current list of antenna indexes.

For more information on the concept of physical and logical antennas on the Property, see the 'Configuring Networks in ASSET' in the chapters in the ASSET User Reference Guide.

Networks XML File Format

The following rules apply to the XML file format for networks:

- <DEFAULT-NET>PLMN0</DEFAULT-NET> describes the default network that new network elements will be added to.

  (PLMN0 is an example)
- MCC & MNC 3 digits maximum 0-9 only.

Property XML File Format

The following rules apply to the XML file format for Properties:

- ADDR1, ADDR2, TOWN and PROV cannot be any longer than 31 characters.
- POSTCODE cannot be any longer than 15 characters.
- The LOCATION block
  - has two attributes :

    TYPE = ABS | REL

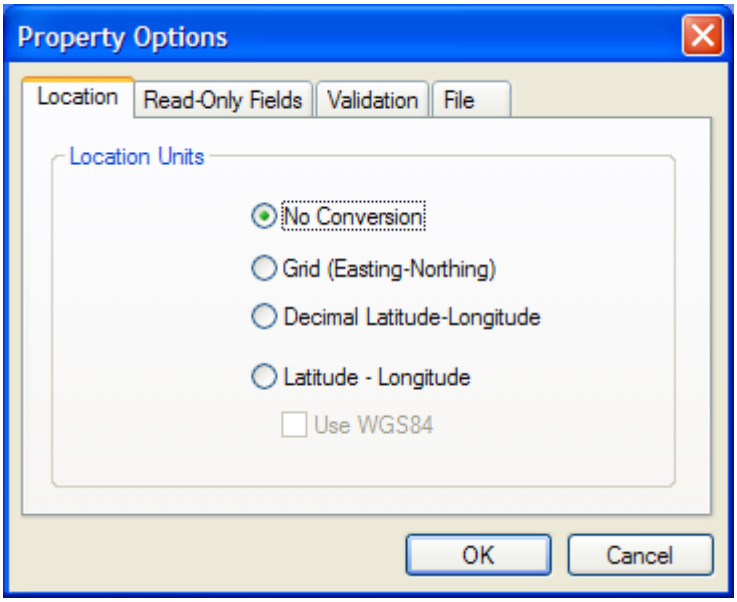
    UNIT = decLL | LL | EN
  - And the X and Y co-ordinates should reflect the units specified.
- The <E> and <N> tags exported by ENTERPRISE Version 4.0 are still supported, hence no change in version number.
- If this block is omitted from the PROPERTY, the default co-ordinates of 0.0,0.0 will be used.
- MAST-MOUNT can be Rooftop (1), Wall (3), Pole (2), Ground (0)

Exporting Projection Datums

If in the Property Options dialog box, the option to export LOCATION data as WGS84 is selected, then all X-Y locations are converted to WGS84 in the XML output if displayed as LL or DLL. When re-imported, if the DATUM attribute exists with the following value in the root element then the XML Importer will attempt to convert from WGS84 to the current project datum:

<PROPERTY-LIST ENTERPRISE-XML-VERSION="1" DATUM="WGS84">

This picture shows the Property Options dialog box:



Property Options dialog box

Neighbours XML File Format

You can import and export neighbours in the same manner as other XML files, but we strongly recommend that you use the Neighbour Analysis, which is designed specifically for this purpose. For more information on this process, see Neighbour Analysis XML File Format on page 107.

Neighbour Analysis XML File Format

You can use the Neighbour Analysis functionality in ASSET to import and export neighbour plans, using the saving and loading options. For more information, see the Neighbour Analysis section in the ASSET User Reference Guide.

All XML files that can be saved or loaded in the Neighbour Analysis are similar, whether they relate to the Prediction-based, Measurement-based or Event-based (Handover Statistics) Neighbour Wizards.

However, the Event-based Neighbour Wizard has the following rows at the start of the file (the anonymous list must be the first part of the file):

```
<NEIGHBOUR-LIST ENTERPRISE-XML-VERSION="6">
  <ANON-DATA-DEF-LIST>
        <ANON-VALUE>HOCNT</ANON-VALUE>
        <ANON-VALUE>HOSUCC</ANON-VALUE>
        <ANON-VALUE>HORET</ANON-VALUE>
        <ANON-VALUE>HODROP</ANON-VALUE>
  </ANON-DATA-DEF-LIST>
```

Example of first part of file for the Event-based (Handover Statistics) File Format

This means that, for each neighbour, one set of these tags should be included. If these tags are missing then the anonymous values will be set to 0. If you want to manually create one of these files, you can use any names you like, or specify what are effectively anonymous tags, and everything will be read into the Neighbour Analysis. The anonymous values must be floating point numbers. An example is shown below:

```
<CELL ID="NodeB2A" TYPE="UMTS">
  <CARRIER>Carrier1</CARRIER>
        <OUTWARD-NBR-LIST>
              <NEIGHBOUR ID="NodeB5B">
                <CELL-NAME />
                 <GSM-UMTS-CELL-ID>14</GSM-UMTS-CELL-ID>
                <UC-ID>268369934</UC-ID>
                <LOCAL-CELL-ID>Unknown</LOCAL-CELL-ID>
                <TECHNOLOGY>UMTS</TECHNOLOGY>
                <NEIGHBOUR-CARRIER>Carrier1</NEIGHBOUR-CARRIER>
                <OVERLAP_PCTG>0.000000</OVERLAP_PCTG>
                <ANON-DATA-LIST>
                      <HOCNT>1900.000000</HOCNT>
                      <HOSUCC>1653.000000</HOSUCC>
                      <HORET>75.000000</HORET>
                      <HODROP>172.000000</HODROP>
                </ANON-DATA-LIST>
              </NEIGHBOUR>
        </OUTWARD-NBR-LIST>
  </CELL>
```

Example of the corresponding rows for cells in the Event-based (Handover Statistics) File Format

GSM MSC XML File Format

The following rules apply to the XML file format for GSM MSCs:

- Relocating - If the PROPERTY element differs from the MSC's property in the project, the MSC will be relocated to the specified Property.

GSM BSC XML File Format

The following rules apply to the XML file format for GSM BSCs:

- Relocating - If the PROPERTY element differs from the BSC's property in the project, the BSC will be relocated to the specified Property.

GSM Cell Site XML File Format

The following rules apply to the XML file format for GSM cell sites:

- Relocating - If the PROPERTY element differs from the CellSite's property in the project, the CellSite will be relocated to the specified Property.

GSM Cell XML File Format

The following rules apply to the XML file format for GSM cells:

- Reparenting - not supported.
- Relocating - not supported.
- Cell Antennas - The order the antennas appear as child-elements of the Cell will be the order they are inserted to the slots. If an empty antenna block precedes a full antenna block, that is:

```
<GSM-CELL ID="CELL01">
<ANTENNA-CONFIG>
        <ANTENNA SLOT="101">
                <TYPE>A</TYPE>
        </ANTENNA>
        <ANTENNA/>
        <ANTENNA SLOT="967">
                <TYPE>B</TYPE>
        </ANTENNA>
</ANTENNA-CONFIG>
 </GSM-CELL>
```

  then the following will occur with the antenna types :

  - NEW or REPLACE IMPORT: A = slot 1, B = slot 2
  - MERGE IMPORT : A = slot 1, B = slot 3 (if slots > 2, else B = slot 2)

  The above data is merged with existing data, then antenna type A will be slot 1, and type B will be slot 3, skipping slot 2.

- Sub-Cell Antenna Configuration - The Antenna-Config block nested within the sub cell does not contain the antenna specifics but only whether they are used. The slot data (ie. '101' and '967') are numerical cross-references used to tie up with the slot configuration on the parent cell. They must not contain any alpha-characters.

```
<ANTENNA-CONFIG>
 <SLOT USE="YES">101</SLOT>
 <SLOT USE="NO">967</SLOT>
</ANTENNA-CONFIG>
```

- Code Schemas - When importing code schemas, if the BCC value is 'Unknown', then the NCC value will automatically be imported with an 'Unknown' value as well, and vice versa.

GSM Distribution Node XML File Format

The following rules apply to the XML file format for GSM distribution nodes:

- Reparenting - not supported
- Relocating - not supported
- MSC not specified - as per cellsite.

GSM Repeater XML File Format

The following rules apply to the XML file format for GSM repeaters:

- Reparenting not supported.
- Relocating as for CELL-SITE.

 For instructions on including antenna CRC data correctly in the exported XML data, please see the Important Warning for Nodes, Cells and Repeaters on page 118.

UMTS WMSC XML File Format

The following rules apply to the XML file format for UMTS WMSCs:

- Relocation to another property is possible.
- <PLMN> must be an existing PLMN.
- If the node is parented directly to the PLMN then <NETWORK> will be the name of the PLMN. If the node is parented to a Logical Network then <NETWORK> will be the name of an existing Logical Network. This network must be a child of the PLMN specified in the <PLMN> element.Relocation to another property is possible

UMTS SGSN XML File Format

The following rules apply to the XML file format for UMTS SGSNs:

- Relocation to another property is possible.
- <PLMN> must be an existing PLMN.
- If the node is parented directly to the PLMN then <NETWORK> will be the name of the PLMN. If the node is parented to a Logical Network then <NETWORK> will be the name of an existing Logical Network. This network must be a child of the PLMN specified in the <PLMN> element.

UMTS RNC XML File Format

The following rules apply to the XML file format for UMTS RNCs:

- Relocation to another property is possible.
- <PLMN> must be an existing PLMN.
- If the node is parented directly to the PLMN then <NETWORK> will be the name of the PLMN. If the node is parented to a Logical Network then <NETWORK> will be the name of an existing Logical Network. This network must be a child of the PLMN specified in the <PLMN> element.
- <UMTSRNCID> - 4 Digits maximum each digit 0-9

UMTS Node B XML File Format

The following rules apply to the XML file format for UMTS Node Bs:

- Relocation to another Property is possible.
- <PLMN> must be an existing PLMN.
- If the node is parented directly to the PLMN then <NETWORK> will be the name of the PLMN. If the node is parented to a Logical Network then <NETWORK> will be the name of an existing Logical Network. This network must be a child of the PLMN specified in the <PLMN> element.
- <NODEBID> - 9 Digits maximum each digit 0-9
- In order to import the carriers on the node the carrier name must exist or have been previously imported.
- In order to import the antennas correctly the antenna must exist and to connect the propagation model this must exist also.
- <ANT-INDEX> is created when the antenna is added and is a static value that does not get updated if antennas are removed. This means that the ANT-INDEX values can be non-sequential.
- <MAX-LOBETILT> is referred to as 'Total Downtilt - Max' in this version of the ADVANTAGE user interface. Previously, it appeared as 'Max Main Lobe Tilt' in the interface.

 For instructions on including antenna CRC data correctly in the exported XML data, please see the Important Warning for Nodes, Cells and Repeaters on page 118.

UMTS Cell XML File Format

The following rules apply to the XML file format for UMTS cells:

- LOCALCELLID Maximum 9 digits each digit 0-9
- LAC Maximum 5 digits each digit 0-9
- RAC Maximum 3 digits each digit 0-9
- SAC Maximum 3 digits each digit 0-9
- LCR Unused
- MAX-TX-POW-FXD, MAX-DL-POW-FXD, CHAN-POW-FXD are ADVANTAGE-related parameters.
- UMTS-CELL-FEEDER:
  - ANT-INDEX must be a valid index to the Parent Node antenna. This is created when the antenna is added and is a static value that does not get updated if antennas are removed. This means that the ANT-INDEX values can be non-sequential.
  - FEEDER-TYPE and MHA-TYPE must exist already or have been imported otherwise these equipment types will not be set.

- MAX-HSDPA-MODULATION:

HSDPA Maximum Supported Modulation	Is Represented by this Value in the XML File
QPSK	1
16QAM	3
64QAM	7

- MODULATION-4PAM-SUPPORT (in V8.1 onwards, this label represents 'HSUPA Maximum Supported Modulation')

HSUPA Maximum Supported Modulation	Is Represented by this Value in the XML File
BPSK	8
4PAM	24
QPSK	25
16QAM	27
64QAM	31

UMTS Repeater XML File Format

 For instructions on including antenna CRC data correctly in the exported XML data, please see the Important Warning for Nodes, Cells and Repeaters on page 118.

CDMA MSC XML File Format

The following rules apply to the XML file format for CDMA MSCs:

- Relocation to another property is possible.
- <PLMN> must be an existing PLMN.
- If the node is parented directly to the PLMN then <NETWORK> will be the name of the PLMN. If the node is parented to a Logical Network then <NETWORK> will be the name of an existing Logical Network. This network must be a child of the PLMN specified in the <PLMN> element.

CDMA BSC XML File Format

The following rules apply to the XML file format for CDMA BSCs:

- Relocation to another property is possible.
- <PLMN> must be an existing PLMN.
- If the node is parented directly to the PLMN then <NETWORK> will be the name of the PLMN. If the node is parented to a Logical Network then <NETWORK> will be the name of an existing Logical Network. This network must be a child of the PLMN specified in the <PLMN> element.

CDMA BS XML File Format

The following rules apply to the XML file format for CDMA BSs:

- Relocation to another property is possible.
- <PLMN> must be an existing PLMN.
- If the node is parented directly to the PLMN then <NETWORK> will be the name of the PLMN. If the node is parented to a Logical Network then <NETWORK> will be the name of an existing Logical Network. This network must be a child of the PLMN specified in the <PLMN> element.
- 0 or more <CDMA2000-CARRIER> elements can exist. The attribute ID value must exist already or have been imported otherwise the BS will fail to import.
- 0 or more <CDMA2000-ANTENNA> elements can exist.
- <ANT-INDEX> is the index to the list of antennas on the BS. On merging, if an antenna is found in the BS with the same index, the import will update that antenna with the XML data.
- <ANT-INDEX> is created when the antenna is added and is a static value that does not get updated if antennas are removed. This means that the ANT-INDEX values can be non-sequential.
- <ANT-TYPE> must exist or have been imported already, otherwise the default value 'Unknown' will be substituted on import.

 For instructions on including antenna CRC data correctly in the exported XML data, please see the Important Warning for Nodes, Cells and Repeaters on page 118.

CDMA Sector XML File Format

The following rules apply to the XML file format for CDMA sectors:

- 0 or more <CDMA2000-SECTORCARRIER> elements can exist.
- 0 or more <CDMA2000-FEEDER> elements can exist.
- <ANT-INDEX> is the index into the list of antennas on the BS. This is created when the antenna is added and is a static value that does not get updated if antennas are removed. This means that the ANT-INDEX values can be non-sequential.
- <CARRIER-NAME> must exist already or have been imported otherwise the sector will fail to import.
- <FEEDER-TYPE> and <MHA-TYPE> must already exist, otherwise the default value 'Unknown' will be substituted on import.

CDMA Repeater XML File Format

 For instructions on including antenna CRC data correctly in the exported XML data, please see the Important Warning for Nodes, Cells and Repeaters on page 118.

Fixed WiMAX Node XML File Format

The following rules apply to the XML file format for Fixed WiMAX Nodes:

- Relocation to another Property is possible.
- <PLMN> must be an existing PLMN.
- If the node is parented directly to the PLMN then <NETWORK> will be the name of the PLMN. If the node is parented to a Logical Network then <NETWORK> will be the name of an existing Logical Network. This network must be a child of the PLMN specified in the <PLMN> element.
- <NODEBID> - 9 Digits maximum each digit 0-9
- In order to import the carriers on the node the carrier name must exist or have been previously imported.
- In order to import the antennas correctly the antenna must exist and to connect the propagation model this must exist also.

 For instructions on including antenna CRC data correctly in the exported XML data, please see the Important Warning for Nodes, Cells and Repeaters on page 118.

Fixed WiMAX Cell XML File Format

The following rules apply to the XML file format for Fixed WiMAX cells:

- LOCALCELLID Maximum 9 digits each digit 0-9
- LAC Maximum 5 digits each digit 0-9
- RAC Maximum 3 digits each digit 0-9
- SAC Maximum 3 digits each digit 0-9
- LCR Unused
- UMTS-CELL-FEEDER
- ANT-INDEX must be a valid index to the Parent Node antenna. This is created when the antenna is added and is a static value that does not get updated if antennas are removed. This means that the ANT-INDEX values can be non-sequential.
- FEEDER-TYPE and MHA-TYPE must exist already or have been imported otherwise these equipment types will not be set.

Fixed WiMAX Repeater XML File Format

 For instructions on including antenna CRC data correctly in the exported XML data, please see the Important Warning for Nodes, Cells and Repeaters on page 118.

Mobile WiMAX Node XML File Format

The following rules apply to the XML file format for Mobile WiMAX nodes:

- Relocation to another Property is possible.
- <PLMN> must be an existing PLMN.
- If the node is parented directly to the PLMN then <NETWORK> will be the name of the PLMN. If the node is parented to a Logical Network then <NETWORK> will be the name of an existing Logical Network. This network must be a child of the PLMN specified in the <PLMN> element.
- <NODEBID> - 9 Digits maximum each digit 0-9
- In order to import the carriers on the node the carrier name must exist or have been previously imported.
- In order to import the antennas correctly the antenna must exist and to connect the propagation model this must exist also.

 For instructions on including antenna CRC data correctly in the exported XML data, please see the Important Warning for Nodes, Cells and Repeaters on page 118.

Mobile WiMAX Cell XML File Format

The following rules apply to the XML file format for Mobile WiMAX cells:

- LOCALCELLID Maximum 9 digits each digit 0-9
- LAC Maximum 5 digits each digit 0-9
- RAC Maximum 3 digits each digit 0-9
- SAC Maximum 3 digits each digit 0-9
- LCR Unused
- MOBILE-WIMAX-CELL-FEEDER
- ANT-INDEX must be a valid index to the Parent Node antenna. This is created when the antenna is added and is a static value that does not get updated if antennas are removed. This means that the ANT-INDEX values can be non-sequential.
- FEEDER-TYPE and MHA-TYPE must exist already or have been imported otherwise these equipment types will not be set.

 For instructions on including antenna CRC data correctly in the exported XML data, please see the Important Warning for Nodes, Cells and Repeaters on page 118.

Mobile WiMAX Repeater XML File Format

 For instructions on including antenna CRC data correctly in the exported XML data, please see the Important Warning for Nodes, Cells and Repeaters on page 118.

LTE eNodeB XML File Format

The following rules apply to the XML file format for LTE eNodeBs:

- Relocation to another Property is possible.
- <PLMN> must be an existing PLMN.
- If the node is parented directly to the PLMN then <NETWORK> will be the name of the PLMN. If the node is parented to a Logical Network then <NETWORK> will be the name of an existing Logical Network. This network must be a child of the PLMN specified in the <PLMN> element.
- <ENODEB-ID> - 9 Digits maximum each digit 0-9
- In order to import the carriers on the node the carrier name must exist or have been previously imported.
- In order to import the antennas correctly the antenna must exist and to connect the propagation model this must exist also.
- <ANT-INDEX> is created when the antenna is added and is a static value that does not get updated if antennas are removed. This means that the ANT-INDEX values can be non-sequential.

LTE Cell XML File Format

The following rules apply to the XML file format for LTE cells:

- LTECELLID Maximum 9 digits each digit 0-9
- CELL-FEEDER
- ANT-INDEX must be a valid index to the Parent Node antenna. This is created when the antenna is added and is a static value that does not get updated if antennas are removed. This means that the ANT-INDEX values can be non-sequential.
- FEEDER-TYPE and MHA-TYPE must exist already or have been imported otherwise these equipment types will not be set.

Logical Cellular Connection XML File Format

The following rules apply to the XML file format for logical cellular connections:

- The import cannot be used to break and make new connections; only existing unconnected nodes can be connected.

PmP Carriers XML File Format

The following rules apply to the XML file format for PmP carriers:

- SYMMETRY-FORWARD and SYMMETRY-REVERSE must add up to 100

PmP Intercon XML File Format

The following rules apply to the XML file format for PmP interconnects:

- If the DUPLEXMODE is not TDD, then the four associated fields (SYMMETRY-FORWARD, SYMMETRY-REVERSE, SYNCHRONIZATION, DELAY) will not be included.

PmP Hub Linkend XML File Format

The following table describes the XML file format for PmP hub linkends:

- The ID is a combination of the Property upon which the Linkend resides and the PmP Intercon for which it belongs to.

PtP Intercon XML File Format

The following rules apply to the XML file format for PtP interconnects:

- If the LINK-TYPE element is omitted, the default type will be used.
- If the DUPLEXMODE is not TDD, then the four associated fields (SYMMETRY-FORWARD, SYMMETRY-REVERSE, SYNCHRONIZATION, DELAY) will not be included.

PtP Linkend XML File Format

The following rules apply to the XML file format for PtP linkends:

- The ID is a combination of the Property upon which the Linkend resides and the PtP Intercon for which it belongs to.
- CENTRE-FREQ is in MHz
- DIV-SPACE-SET can be either 0 (not selected) or 1 (selected).
- OVERRIDE-EIRP can be either 0 (not selected) or 1 (selected).

Back To Back PrL XML File Format

The following rules apply to the XML file format for back to back passive repeater links:

- DIV-SPACE-SET can be either 0 (not selected) or 1 (selected).
- OVERRIDE-EIRP can be either 0 (not selected) or 1 (selected).

Reflector PrL XML File Format

The following rules apply to the XML file format for reflector passive repeater links:

See Back To Back PrL XML File Format on page 117.

Multi-radio Link XML File Format

The following rules apply to the XML file format for multi-radio links:

- If the LINK-TYPE element is omitted, the default type will be used.
- OVERRIDE-EIRP can be either 0 (not selected) or 1 (selected), but for multi-radio links it will always be 0 because you cannot override the EiRP on a multi-radio link.
- DIV-SPACE-SET can be either 0 (not selected) or 1 (selected), but for multi-radio links it will always be 0 because you cannot override the diversity spacing.

Dual Polar Link XML File Format

The following rules apply to the XML file format for dual polar links:

- If the LINK-TYPE element is omitted, the default type will be used.
- The POLARISATION value should be different for each linkend.
- OVERRIDE-EIRP can be either 0 (not selected) or 1 (selected) but for dual polar links it will always be 0 because you cannot override the EiRP on a dual polar link.
- DIV-SPACE-SET can be either 0 (not selected) or 1 (selected), but for dual polar links it will always be 0 because you cannot override the diversity spacing.

Important Warning for Nodes, Cells and Repeaters

 You should not take antenna CRC data (used by the AIRCOM Prediction Access Module) from the model-independent PRED-SYSTEM-INFO-RO/ANTENNA-CRC64 element within the exported XML data.

This is because this element has been deprecated and is only guaranteed to contain the correct value for cells that have older prediction models (without info-grabber support) associated with their primary and secondary prediction settings.

Instead, to ensure that the antenna CRC data is always correct for a target primary or secondary prediction you should take it from the PRED-SYSTEM-INFO-RO/PRIMARY-DATA/ANTENNA-CRC64 or PRED-SYSTEM-INFO-RO/SECONDARY-DATA/ANTENNA-CRC64 XML elements.

XML Configuration File Formats

This section describes the configuration file formats for XML.

 You can view examples of all of these files in the XML Files for ENTERPRISE folder, which is installed by default at C:\Program Files\AIRCOM International\ENTERPRISE 8.1\Samples. You can also download these Sample XML files by following the User Reference Guides link on the AIRCOM Assist website (https://www.aircomassist.com).

Propagation Models XML Configuration File Format

The XML configuration file format for propagation models is model-specific.

As an example, the following rules apply to the XML configuration file format for Standard Macrocell 3:

- When importing, the TYPE element must refer to a model that is registered on the computer with the destination project. The ID is the particular instance of that TYPE of model.
- K values can be from K1 to K40 and do not all have to be listed or in sequence.

Contact Person XML Configuration File Format

The following rules apply to the XML configuration file format for contact person:

- TEL and FAX elements can appear as many times as required and should not contain white space.

Bearers XML Configuration File Format

The following rules apply to the XML configuration file format for bearers:

- The xml exporter will only generate the necessary elements that apply to the technology type or the link direction.
- 0 or more <BEARER> elements can exist. The attribute TECH value must be one of the enumerated values otherwise the bearer will failed to import.
- Some elements only apply to the selected link direction.
- If a service failed to be imported, a message giving the cause of the failure can be found in the Message Log.

EV-DO Bearers:

- The <LINK-DIRECTION> element will indicate the bearer link direction. Importing EV-DO bearers prior to version 3 will be treated as UPLINK bearer if the <LINK-DIRECTION> element cannot be found.

Services XML Configuration File Format

The following rules apply to the XML configuration file format for services:

- The xml exporter will only generate the necessary elements that applied to the technology type or the traffic characteristics.
- 0 or more <SERVICE> elements can exist. The attribute TECH value must be one of the enumerated values otherwise the service will fail to import.
- <CARRIER-PRIORITIES> element list is the supported carriers list, ordered by priority. The ID attribute of element <CARRIER> must matched to the pre-defined carriers 1..32 in the project.
- <UL-BEARER-PRIORITIES> element list is the supported carriers list. Each supported carrier can have a list of supported bearers, ordered by priority. The bearer attribute ID value must exist already or have been imported otherwise the bearer will not be assigned to the carrier on import. The same applies to element <DL-BEARER-PRIORITIES>.
- Some elements only apply to the selected traffic type.
- If a service failed to be imported, a message giving the cause of the failure can be found in the Message Log.

Terminal Types XML Configuration File Format

The following rules apply to the XML configuration file format for terminal types:

- There are several different terminal types that can be exported and this is identified by the TECH attribute. The attribute TECH value must be one of the enumerated values otherwise the terminal will fail to import.
- The xml exporter will only generate the necessary elements that applied to the technology type. There are a number of elements that can apply for a terminal type. They are:
  - Element
  - Technology Type
  - COMMON
  - All technology types
  - CELL-LAYER-LIST
  - [CS | TETRA | GPRS | EGPRS]
  - SERVICE-LIST
  - [UMTS | CMDA2000 | EV-DO | WiMAX FDD | WiMAX TDD]
  - GPRS-EGPRS
  - [GPRS | EGPRS]
  - CDMA2000-PARAMS
  - [CDMA2000 | EV-DO]

- The COMMON element contains the Clutter, Vectors, and Polygon data as element lists. The Mobile Speed data forms part of the Clutter's attributes. The Clutter, Vectors, and Polygon ID attribute must exist already otherwise it will be ignored on import.

   You can improve the import speed of XML files for large terminal types by modifying the XML to ignore any zero value(s) attributed to traffic defined on the Vectors tab (lines, polygons and points) for a terminal type. To do this:

  - Open the XML file in an appropriate editor (for example, Microsoft Notepad or PSPad Editor)
  - Replace the existing <COMMON> tag with <COMMON IGNOREZEROONIMPORT="TRUE"> for each terminal type
- The CELL-LAYER-LIST element contains the list of cells associated to the terminal type. The attribute ID of <CELL-LAYER> must exist already or have been imported otherwise cell layer will be ignored on import.
- The SERVICE-LIST element contains the list of services associated to the terminal type. The attribute ID of <SERVICE> must exist already or have been imported otherwise service will be ignored on import.
- The DATA-RATE attribute ID value must be one of the enumerated values otherwise the data rate value will be ignored on import.
- If a terminal type failed to be imported, a message giving the cause of the failure can be found in the Message Log.

Clutter Parameters XML Configuration File Format

The following rules apply to the XML configuration file format for Clutter Parameters:

- 0 or more <CLUTTER> elements can exist. The attribute TECH value must be one of the enumerated values otherwise it will fail to import.
- If an import of Clutter Parameters failed, a message giving the cause of the failure can be found in the Message Log.

Compound Array Expressions XML Configuration File Format

For information concerning required tags for the XML configuration file format for compound array expressions, please contact Product Support.

GSM Carriers XML Configuration File Format

The following rules apply to the XML configuration file format for GSM carriers:

- Each CARRIER element can contain as many carriers as required.

GSM Cell Layer XML Configuration File Format

The following rules apply to the XML configuration file format for GSM cell layers:

- COLOUR refers to the index in the selected project palette.

BTS Type XML Configuration File Format

The following rules apply to the XML configuration file format for BTS types:

- TX-POWER-MIN and TX-POWER-MAX values in dBm

UMTS Carrier XML Configuration File Format

The following rules apply to the XML configuration file format for UMTS carriers:

- INDEX is the fixed carrier identifier, 0 represents the first carrier, 1 represents the second carrier and so on.
- CARRIER-ADJACENCY ADJACENT CARRIER as for INDEX, but -1 indicates the carrier is not selected' as an adjacent carrier.

UMTS Resource XML Configuration File Format

The following rules apply to the XML configuration file format for UMTS resource:

- INDEX is the fixed resource identifier. 0 represents the first resource, 1 represents the second resource, and so on

CDMA Carrier XML Configuration File Format

The following rules apply to the XML configuration file format for CDMA carriers:

- The narrow band carriers will have a ID value of 0..23, while the wide band carriers will have a ID value of 24..31.
- 1..32 <CARRIER-CDMA2000> elements can exists.

Mobile WiMAX Carrier XML Configuration File Format

The following rules apply to the XML configuration file format for Mobile WiMAX carriers:

- ADJACENT-CARRIER - Accepts 1 (No Carrier), then values 1(Carrier2) to 31 (Carrier32)

Fixed WiMAX Carrier XML Configuration File Format

The following rules apply to the XML file format for Fixed WiMAX Mobile carriers:

- ADJACENT-CARRIER - Accepts 1 (No Carrier), then values 1(Carrier2) to 31 (Carrier32)

LTE AAS Parameters XML Configuration File Format

The following rules apply to the XML file format for LTE schemas:

- Each pair tag corresponds to a [Number of RX Elements]-[Number of TX Elements] pairing from the LTE AAS Parameters tables.

  For example, <Pair 1-5> is the value for 1 RX Element and 5 TX Elements and <Pair 4-11> is the value for 4 RX Elements and 11 TX Elements.

LTE Carrier XML Configuration File Format

The following rules apply to the XML file format for LTE carriers:

- When using ASSET:
  - The FREQUENCY-BAND-ID value will determine the available FREQ-LO and FREQ-HI values.
  - The BANDWIDTH-MHZ value will affect the FFT-SIZE SAMPLING-FACTOR values.

  Therefore care should be taken when modifying these values in the XML file.

LTE Frames XML Configuration File Format

The following rules apply to the XML file format for LTE frames:

- A number of the enumerated values are interdepedant, and cannot be defined separately.
- When using ASSET, the CONFIGURATION value will determine the available CYCLIC-PREFIX values, which in turn determines the available SUBCARRIER-SPACING values.
- Similarly, the TDD-FRAME-CONFIG value will determine the TDD-SUBFRAME-POSITION value.
- Therefore care should be taken when modifying these values in the XML file.

LTE MME XML File Format

The following rules apply to the XML file format for LTE MMEs:

- Relocation to another Property is possible.
- <PLMN> must be an existing PLMN.
- If the node is parented directly to the PLMN then <NETWORK> will be the name of the PLMN. If the node is parented to a Logical Network then <NETWORK> will be the name of an existing Logical Network. This network must be a child of the PLMN specified in the <PLMN> element.

LTE SAEGW XML File Format

The following rules apply to the XML file format for LTE SAEGWs:

- Relocation to another Property is possible.
- <PLMN> must be an existing PLMN.
- If the node is parented directly to the PLMN then <NETWORK> will be the name of the PLMN. If the node is parented to a Logical Network then <NETWORK> will be the name of an existing Logical Network. This network must be a child of the PLMN specified in the <PLMN> element.

Antenna XML Configuration File Format

The following rules apply to the XML configuration file format for antennas:

- Antenna mask angles omitted will not be altered.
- An antenna mask element should contain a comma-delimited pair of numbers, for example:
  - <M> AZIMUTH, GAIN </M>
- FREQUENCY is in MHz.
- By default, all antennas from all filters are exported to the XML file. However, if you just want to export the antennas within a particular filter, click the Options button in the XML Export dialog box for Antenna, and in the dialog box that appears, on the Filter tab, select the required antenna.

Cabin XML Configuration File Format

The following rules apply to the XML configuration file format for cabins:

- LENGTH, WIDTH and HEIGHT in metres
- If the cabin is stored in the current project folder, the FOLDER-PATH is left blank

Feeder XML Configuration File Format

The following rules apply to the XML configuration file format for feeders:

- If the feeder is stored in the current project folder, the FOLDER-PATH is left blank

Mast XML Configuration File Format

The following rules apply to the XML configuration file format for masts:

- Height is in metres.
- Weight in kilogrammes.
- MAST-MOUNT value of 0 represents Ground, 1 represents Rooftop, 2 represents Pole, 3 represents Wall.
- If the mast is stored in the current project folder, the FOLDER-PATH is left blank.

Band Channels XML Configuration File Format

The following rules apply to the XML configuration file format for bands channels:

- If the band is stored in the current project folder, the FOLDER-PATH is left blank
- FREQ values must be between 400MHz and 350,000MHz
- Channel LO-FREQ's must be unique within each band
- Channel NAME's must be unique within band

Link Term Equipment XML Configuration File Format

The following rules apply to the XML configuration file format for link terminal equipment:

- If the link terminal equipment is stored in the current project folder, the FOLDER-PATH is left blank.

Link Type XML Configuration File Format

The following rules apply to the XML configuration file format for link types:

- If the Link Type is stored in the current project folder, the FOLDER-PATH is left blank.

MW Antenna XML Configuration File Format

The following rules apply to the XML configuration file format for MW antennas:

- As per Antenna
- MIN-OPERATING-FREQ and MAX-OPERATING-FREQ are in MHz

Modulation Types XML Configuration File Format

The following rules apply to the XML configuration file format for MW antennas:

- The <FOLDER-PATH> tab indicates whether the modulation type belongs to the All Projects folder or not.

System Ranges XML Configuration File Format

The following rules apply to the XML configuration file format for system ranges:

- The value for the enumerated tag TYPE corresponds to a particular type of link:

  0 = PtP link

  1 = PmP link

  2 = Dual Polar link

  3 = Multi-Radio link

User Ranges XML Configuration File Format

The following rules apply to the XML configuration file format for user ranges:

- The value for the enumerated tag TYPE corresponds to a particular type of link:

  0 = PtP link

  1 = PmP link

  2 = Dual Polar link

  3 = Multi-Radio link

Radio Equip XML Configuration File Format

The following rules apply to the XML configuration file format for radio equipment:

- If the radio is stored in the current project folder, the FOLDER-PATH is left blank.
- SELECTED-AMS-TYPE stores a semicolon-separated list of the modulation schemas that have been made available for this radio equipment.
- The ADAPTIVE-MODULATION-TYPE indicates which of these is currently selected.
- AMC-THRESHOLDS stores the threshold values for each entry in the SELECTED-AMS-TYPE list.

T/I Objectives XML Configuration File Format

The following rules apply to the XML configuration file format for T/I Objectives:

- If the T/I Objective is stored in the current project folder, the FOLDER-PATH is left blank.
- The Victim and Interferer traffic capacities can be defined as channel-based (using the tags VICTIM-TRAFFIC-CHANNEL, VICTIM-PDHSDH and VICTIM-CHANNEL, or the INTERFERER equivalents) or a single value using the VICTIM-SINGLEVALUE (or the INTERFERER equivalent).

XML ADVANTAGE File Formats

This section describes the ADVANTAGE file formats for XML.

 You can view examples of all of these files in the XML Files for ENTERPRISE folder, which is installed by default at C:\Program Files\AIRCOM International\ENTERPRISE 8.1\Samples. You can also download these Sample XML files by following the User Reference Guides link on the AIRCOM Assist website (https://www.aircomassist.com).

Object/Action Costs/Risks XML File Format

The following rules apply to the XML file format for object/action costs/risks:

- An ID of -1 indicates the Max Cost, while a positive integer indicates an action or unit cost.
- In the ADVANTAGE user interface, these parameters exist on the Cost Per Action/Unit tab and the Max Cost tab of the Optimiser Workflow.

Array-based RF Metric Targets XML File Format

The following rules apply to the XML file format for array-based targets:

- The ID is comprised of the COMPONENT-ID, TECHNOLOGY-TYPE, CLUTTER, ADJACENCY and TRAFFIC values.
- In the ADVANTAGE user interface, these parameters exist on the RF Metric Targets (Array-based) page of the Optimiser Workflow.

Service-based RF Metric Targets XML File Format

The following rules apply to the XML file format for service-based targets:

- The SERVERS and CARRIERS are derived from ENTERPRISE.
- The MECHID is always 5 for this type of design target, and the COMPID is based on this value.
- In the ADVANTAGE user interface, these parameters exist on the RF Metric Targets (Service-based) page of the Optimiser Workflow.

Clutter RF Array Thresholds XML File Format

The following rules apply to the XML file format for clutter thresholds:

- The ID must match the mapping data.
- In the ADVANTAGE user interface, these parameters exist on the RF Array Thresholds (Clutter) page of the Optimiser Workflow.

Vector RF Array Thresholds XML File Format

The following rules apply to the XML file format for vector thresholds:

- TYPE refers to the vector type, either system (2) or user (1).
- In the ADVANTAGE user interface, these parameters exist on the RF Array Thresholds (Vector) page of the Optimiser Workflow.

Problem Cell Thresholds XML File Format

The following rules apply to the XML file format for problem cell thresholds:

- The ID is derived from the TECHNOLOGY-TYPE.
- In the ADVANTAGE user interface, these parameters exist on the Problem Cell Thresholds dialog box, accessible from the Tools menu.

Problem Area Thresholds XML File Format

The following rules apply to the XML file format for problem area thresholds:

- The ID is derived from the TECHNOLOGY-TYPE and CLUTTER.
- CLUTTER must match the mapping data.
- In the ADVANTAGE user interface, these parameters exist on the Problem Area Thresholds dialog box, accessible from the Tools menu.

Action Combinations XML File Format

The following rules apply to the XML file format for action combinations:

- There is only 1 entry per project.
- In the ADVANTAGE user interface, these parameters exist on the Action Combination tab of the Optimiser Workflow.

Max Objects/Actions XML File Format

The following rules apply to the XML file format for maximum actions/units:

- The GLOBAL_MAX_CONSTRAINT represents the 'Reject Plans Based on Max Actions/Units' checkbox.
- In the ADVANTAGE user interface, these parameters exist on the Max Actions/Units tab of the Optimiser Workflow.

Metrics Selection/Weights XML File Format

The following rules apply to the XML file format for metrics selection/weights:

- The METRIC-TYPE value of -1 represents the Global Coefficients pane, and the WEIGHT value for this METRIC TYPE represents the % Traffic value.
- In the ADVANTAGE user interface, these parameters exist on the Metric Selection/Weights tab of the Optimiser Workflow.

Max Degradations XML File Format

The following rules apply to the XML file format for maximum degradations:

- The OPTION-TYPE value of -1 represents the 'Reject Plans Based on Metric Degradation' checkbox.
- In the ADVANTAGE user interface, these parameters exist on the Max Degradation tab of the Optimiser Workflow.

Metrics Synthesis XML File Format

The following rules apply to the XML file format for metrics synthesis:

- The CoEfficient-NAME COST-SYNTHESIS represents the Performance Cost Synthesis pane.
- In the ADVANTAGE user interface, these parameters exist on the Metrics Synthesis tab of the Optimiser Workflow.

Action-Constraints Templates XML File Format

The following rules apply to the XML file format for action-constraints templates:

- CONTENT - Holds a large XML string containing all the template values.
- In the ADVANTAGE user interface, these parameters exist on the Action-Constraints Templates Editor, accessible from the Optimiser Workflow.

Settings XML File Format

The following rules apply to the XML file format for settings:

- STATE - Represents a Boolean ON or OFF value.
- In the ADVANTAGE user interface, these parameters exist on the Options tab on the Settings page of the Optimiser Workflow.

CHAPTER 5

Antenna and Diffraction Calculations

This section describes the antenna and diffraction calculations that are used throughout the suite of ENTERPRISE products.

Any calculations and algorithms specific to individual products are described in that product's User Reference Guide.

Antenna Calculations

This section describes the antenna calculations made in the ENTERPRISE suite of products. Additional calculations made by other products are described in that individual product's User Reference Guide.

Calculation of Free Space Loss

The Free Space Loss (FSL) used in antenna algorithms is calculated as follows:

$$FSL = 20\log_{10}(F) + 20\log_{10}(D) + 32.44$$

Where:

- F is the frequency (MHz)
- D is the distance (km)

Calculation of EiRP and ERP

The formula for EiRP and ERP (Effective Radiated Power values) is defined here:

EiRP is calculated as follows:

EiRP = PAPower - cellEquipmentLoss - feederLoss + antennaG + antennaCorrectionFactor + cellCorrection

Where:

- feederLoss is (feederLength * feederLossPerMetre) + feederConnectionLoss
- antennaG is antennaGain (+ 2.14 if the gain is in dBd)

ERP is calculated as follows:

ERP = EiRP - 2.14

Antenna Tilt and Masking Calculations

This section describes the algorithms used to calculate the loss due to the antenna mask and the effects of antenna tilt.

Calculation of Antenna Mask in an Arbitrary Direction

Antenna mask information is generally supplied by manufacturers in the form of a simple text file containing measured loss values relative to the maximum gain of the antenna. The measurements are taken on two sets of points lying on circles in two orthogonal planes. The horizontal mask represents a set of loss values taken at the angle of electrical downtilt, that is the angle at which the vertical masking loss is 0 dB. For example, if the vertical masking pattern has its 0 dB loss at a downward angle of 3 degrees, then the horizontal mask represents a set of measurements taken at points at a downward angle of 3 degrees from the antenna.

The two sets of measured loss values provide only a simplistic representation of the actual radiation from the antenna and some interpretation of these measurements is required to estimate the loss at other angles. This is done as follows:

Horizontal and vertical mask patterns $H(\phi)$ and $V(\theta)$ have their losses measured in dB. The angles ϕ (azimuth) and θ (elevation) are spherical-polar angles measured in degrees and lying in the ranges $-180 \le \phi \le 180$ and $-90 \le \theta \le 90$.

The vertical masking pattern has its 0 dB loss at an angle θ_m (the electrical downtilt).

The horizontal masking pattern has its 0 dB loss at an angle ϕ_m (the horizontal offset).

A masking-loss function $G(\phi,\theta)$ can be constructed that is based on a linear combination of the front and rear ends of the vertical masking pattern, weighted by the azimuth ϕ relative to the horizontal offset ϕ_m.

$$G(\phi,\theta) = \left(1 - \frac{|\phi - \phi_m|}{180}\right) V(\theta) + \frac{|\phi - \phi_m|}{180} V(180 - \theta)$$

This function does not give the correct result on the horizontal plane $\theta = \theta_m$ where $G(\phi,\theta_m) = H(\phi)$ is required. This can be corrected by a simple normalisation as follows:

$$G^{norm}(\phi,\theta) = G(\phi,\theta) - G(\phi,\theta_m) + H(\phi)$$

$$= \left(1 - \frac{|\phi - \phi_m|}{180}\right)\left[V(\theta) - V(\theta_m)\right] + \frac{|\phi - \phi_m|}{180}\left[V(180 - \theta) - V(180 - \theta_m)\right] + H(\phi)$$

Checking the Properties of Gnorm

For points in the plane of the front vertical mask $(\phi = \phi_m)$ the correct result is obtained:

$$G^{norm}(\phi,\theta) = V(\theta) - V(\theta_m) + H(\phi_m)$$
$$= V(\theta)$$

since $V(\theta_m) = H(\phi_m)$.

For points in the plane of the rear vertical mask $(\phi = 180 + \phi_m)$ the correct result is obtained:

$$G^{norm}(\phi,\theta) = V(180 - \theta) - V(180 - \theta_m) + H(180 + \phi_m)$$
$$= V(180 - \theta)$$

since $V(180 - \theta_m) = H(180 + \phi_m)$.

For points at the angle of electrical downtilt $(\theta = \theta_m)$ the correct result is obtained:

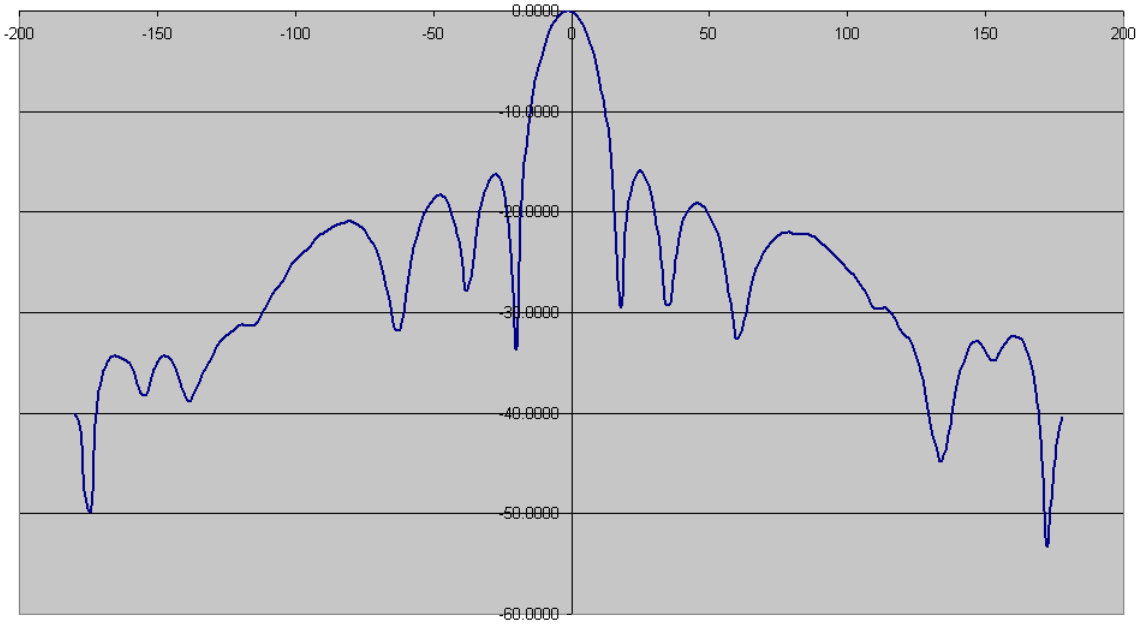
$$G^{norm}(\phi,\theta) = H(\phi).$$

Calculation of Antenna Mask for Symmetrical and Non-symmetrical Mask Styles

If you are using a microwave antenna defined with a symmetrical mask, it is easy to calculate the loss at any point. To do this:

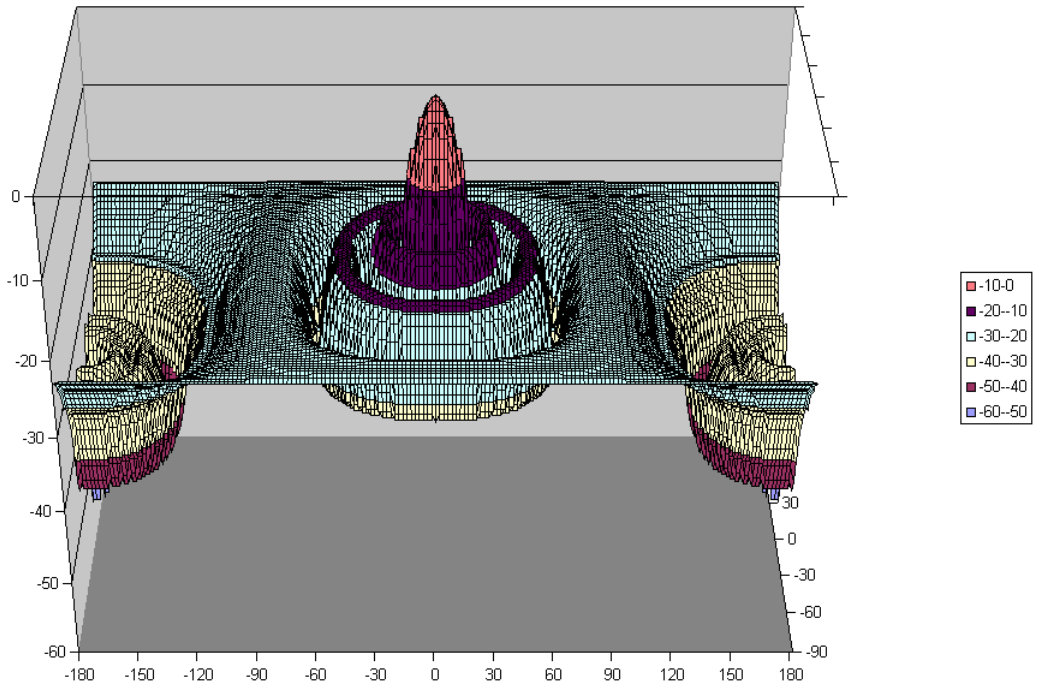
Take the horizontal and vertical angle of an incoming vector, and calculate the 3-dimensional angle between that vector and the direction vector of the antenna.

This is the same as rotating the mask around its y-axis.



Rotating an antenna around its y-axis

Based on this symmetrical antenna mask, the effective 3d pattern would look something like this:



3D Pattern for Symmetrical Antenna Mask

The centre of the graph (from -90 to 90) shows the loss at the front of the antenna and the sides of the graph show the loss at the rear of the antenna.

However, if you are using a microwave antenna defined with non-symmetrical masks, one representing the horizontal plane and one representing the vertical plane, then these must be interpolated to create the 3d mask. This typically happens with sectorised antennas in a point to multi-point system.

The formula used to interpolate these is as follows:

$$L(\phi,\theta) = H(\phi) + \left[1 - \frac{|\phi|}{180}\right] V(\theta) + \left[\frac{|\phi|}{180}\right] [V(180-\theta) - V(180)] \quad (1)$$

Where:

$-180 \le \theta \le 180$ is the horizontal masking angle (+ive is clockwise)

$-90 \le \theta \le 90$ is the vertical masking angle (-ive is down)

$H(\phi)$ is the horizontal mask

$V(\phi)$ is the vertical mask

$L(\phi,\theta)$ is the interpolated mask

And the properties are:

$L(0,0) = 0$

$L(0,\theta) = V(\theta)$

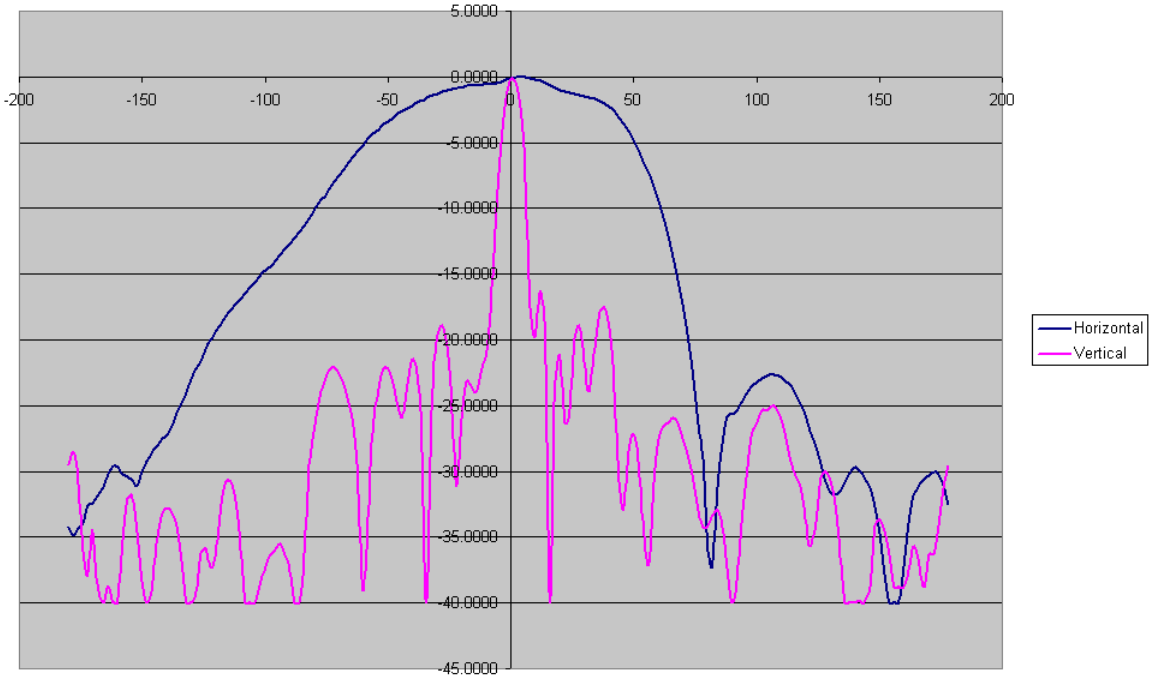
$L(180,\theta) = V(180-\theta)$

This is based on the assumption that the horizontal and vertical masks are consistent and satisfy:

$$H(0) = V(0) = 0$$

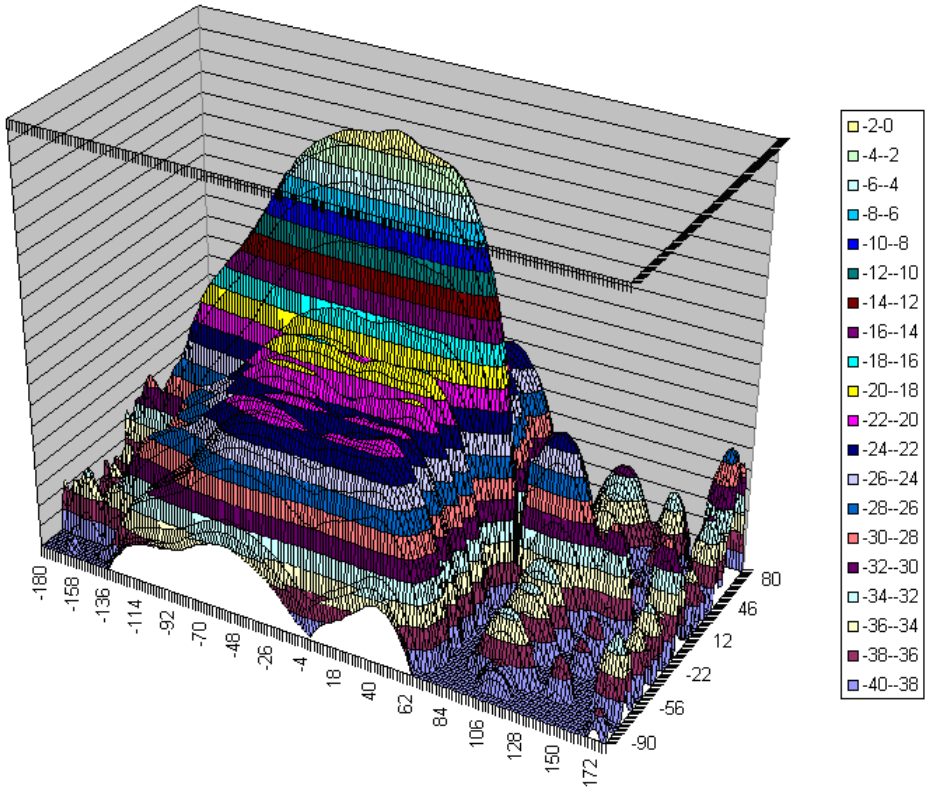
$$H(180) = V(180)$$

For example, consider the following antenna patterns:



Example antenna patterns

The interpolation would produce the following 3d pattern:



3D Pattern for Non-Symmetrical Antenna Mask

Calculation of Tilted Antennas

To correctly calculate the effects of mechanical tilt, the location of the mobile relative to that of the antenna in terms of both vertical and horizontal planes must be considered. It is assumed that if the antenna is electrically tilted then this effect is already included in the antenna pattern supplied, that is, the vertical mask will have a 0 dB loss at some non-zero angle.

Consider a TX antenna at the origin (0, 0, 0) with azimuth angle ϕ_0 and downtilt angle θ_0. Let the world co-ordinate system be (x, y, z) where z = height, and the antenna co-ordinate system (x_A, y_A, z_A). The horizontal and vertical antenna masks are defined in the $x_A y_A$ and $y_A z_A$ planes respectively.

To define spherical polar co-ordinates (r, θ, ϕ) for the world co-ordinate system:

$$x = r\cos\theta\sin\phi$$
$$y = r\cos\theta\cos\phi$$
$$z = r\sin\theta \qquad \textbf{(1)}$$

and a similar system of spherical polar co-ordinates (r, θ_A, ϕ_A) for the antenna co-ordinate system:

$$x_A = r\cos\theta_A\sin\phi_A$$
$$y_A = r\cos\theta_A\cos\phi_A$$
$$z_A = r\sin\theta_A \qquad \textbf{(2)}$$

Cartesian co-ordinates in the two systems are related by the following transformation:

$$\begin{pmatrix} x_A \\ y_A \\ z_A \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & \cos\theta_0 & -\sin\theta_0 \\ 0 & \sin\theta_0 & \cos\theta_0 \end{pmatrix} \begin{pmatrix} \cos\phi_0 & -\sin\phi_0 & 0 \\ \sin\phi_0 & \cos\phi_0 & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} \qquad \textbf{(3)}$$

Substituting **(1)** and **(2)** into **(3)** gives expressions θ_A, ϕ_A relating to θ, ϕ as follows:

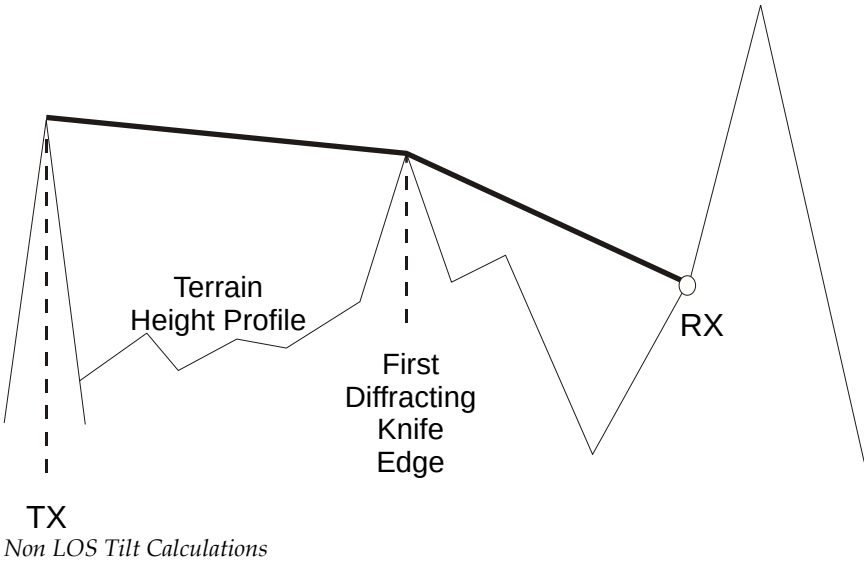
$$\sin\phi_A = \frac{1}{\cos\theta_A}\cos\theta\sin(\phi, -\phi_0)$$
$$\cos\phi_A = \frac{1}{\cos\theta_A}(-\sin\theta\sin\theta_0 + \cos\theta\cos\theta_0\cos(\phi - \phi_0))$$
$$\sin\theta_A = \sin\theta\cos\theta_0 + \cos\theta\sin\theta_0\cos(\phi - \phi_0)$$

Thus given a point (x, y, z) in the world co-ordinate system, you can derive the azimuth and elevation of the point θ_A, ϕ_A in the antenna co-ordinate system.

Line of Sight and Non Line of Sight Paths

For line of sight paths (LOS), antenna masks are applied based on the elevation (θ) of the RX with respect to the TX.

For non-LOS paths, the masks are applied by considering the elevation (θ) of the diffracting peak closest to the TX. This diagram shows non-LOS tilt calculations:



Non LOS Tilt Calculations

Antenna Hopping Calculations

Antenna hopping is a transmit diversity scheme in which consecutive bursts of information are transmitted on different antennas. When antennas are exposed to a different multipath fading, a diversity gain is achieved.

This gain figure is applied to interference calculations in arrays and frequency planning, specifically Worst Connection and Average Connection arrays.

Antenna Hopping Gain Calculation

The antenna gain (G_{AH}) for each subcell is calculated as follows:

$$G_{AH} = G_{FH}(nFH \times nAntenna)$$

Where:

- G_{AH} is the Frequency Hopping gain
- nFH is the number of Frequency Hopping carriers
- $nAntenna$ is the number of antennas used by the subcell, always assumed to be 2

Antenna Hopping Array Calculation

If antenna hopping is enabled in the Array Settings dialog box, then the specified gain figure is applied to the C/I calculation. This changes the calculation to:

$$C/I(i) = \frac{S_{SC(i)}.G_{AH}}{\sum_{K=1}^{N} S_{IC}(K,i).U(K,i)}$$

Where :

- G_{AH} is the Antenna Hopping gain
- $C/I(i)$ is the C/I ratio for a frequency (i)
- $S_{SC(i)}$ is the signal strength from frequency (i) for the serving cell
- K is the interfering cell
- $S_{IC}(K,i)$ is the signal strength from frequency (i) for the interfering cell K

Diffraction Calculations

The extension of a single knife-edge diffraction model to two or more obstacles is not simple. To increase the speed of calculation it is possible to specify a distance under which knife-edges are merged into a single one.

An exact solution is mathematically complex and because of this, a number of different approximations have been developed which are now widely used. You can choose from various diffraction algorithms.

Terrain Averaging

In most cases, terrain averaging gives enough of an accurate estimation for diffraction loss. It gives quite good estimation values when there is a single 'average' obstacle (neither sharp nor rounded) that blocks most of the first Fresnel zone.

The formula that is used in the calculations is:

$$A_d = 10 - 20 * \frac{h}{r_{F1}}$$

Where:

- A_d is the diffraction loss in dB
- *h* is the height difference in metres between most significant path blockage and path trajectory
- r_{F1} is the radius (in metres) of the first Fresnel ellipsoid

This formula gives fairly accurate answers when the blockage is huge (greater than 15 dB, that is the first Fresnel ellipsoid is totally blocked).

More information on terrain averaging can be found in ITU-R P.530-7 recommendation, Propagation Data and Prediction Methods Required for the Design of Terrestrial Line-Of-Sight Systems, 1997, pp. 1-25.

Knife Edge Models

Objects protruding into the first Fresnel zone will cause significant diffraction effects. By using certain models, diffraction loss or gain at the receiver can be calculated. Knife edge models give a more accurate estimation for obstruction loss when the obstacle is sharp and inside the first Fresnel zone.

Use knife edge models when there is more than one obstacle inside the first Fresnel zone (rounded or sharp). Knife edge models will be automatically used to calculate the obstruction loss when the obstacles impede the line of sight.

When the obstacles do not impede the line of sight, the Terrain Averaging method will be automatically used to calculate obstruction loss. When there is only one obstacle, you should use the Terrain Averaging model.

Bullington Method

The Bullington method calculates the diffraction loss over multiple obstructions by considering a single equivalent knife-edge positioned at the point of intersection of the transmitter and receiver horizon paths. The total diffraction loss is taken as that over the equivalent knife-edge obstruction.

Referring to the picture below, the horizon path from transmitter T intersects with obstruction O1 and continues upwards; similarly, the horizon path from receiver R intersects with obstruction O2 and continues upwards. At the point where these two paths intersect, a knife edge is created.

Advantages

This method is simple.

Disadvantages

Significant obstacles can be ignored, which leads to an optimistic estimate of field strength. This method often gives too small values for obstruction loss where there is more than one obstacle inside the first Fresnel zone.

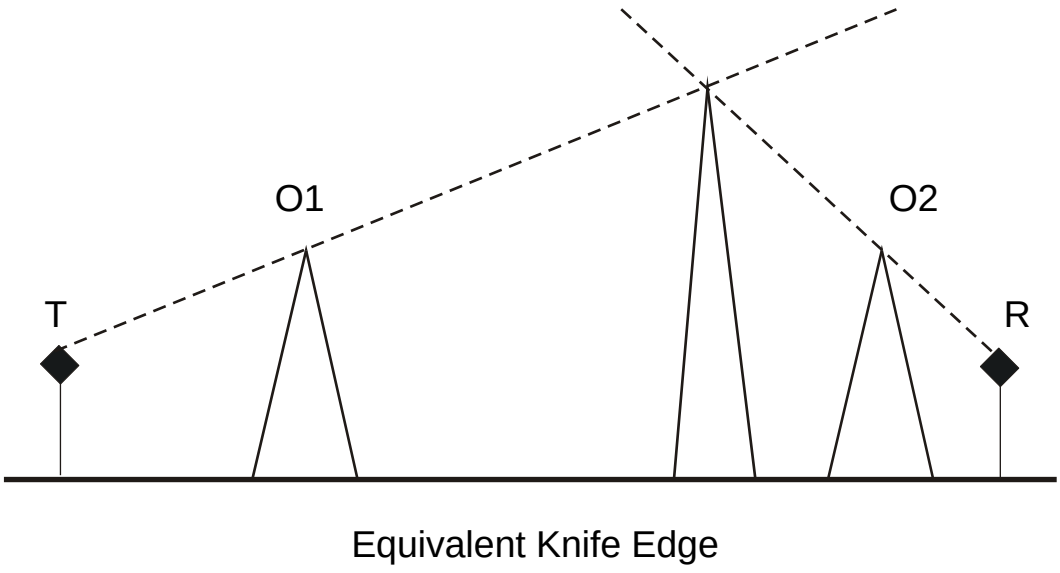


Illustration of Bullington Method

Epstein-Peterson Method

The Epstein Peterson technique is based on the assumption that the total loss can be evaluated as the sum of attenuation due to each respective significant obstruction.

Referring to the picture below, the diffraction loss from the obstacle is calculated by assuming that the receiver is at the second obstruction (T-O1-O2). The loss from the second obstacle is then calculated assuming the transmitter is at the first obstruction and the receiver at the third (O1-O2-O3). Finally, the loss from a transmitter at the second obstacle to the receiver (O2-O3-R) is calculated. The total Epstein-Peterson diffraction loss is given by the sum of all the losses calculated.

Advantages

This method does not ignore important obstacles in the way that the Bullington method might, but to some extent it still suffers from underestimating the path loss.

When the obstacles are widely separated, this method gives more accurate values than Deygout.

Disadvantages

This method often gives too small values for obstructions loss where there are obstacles close to each other and inside the first Fresnel zone.

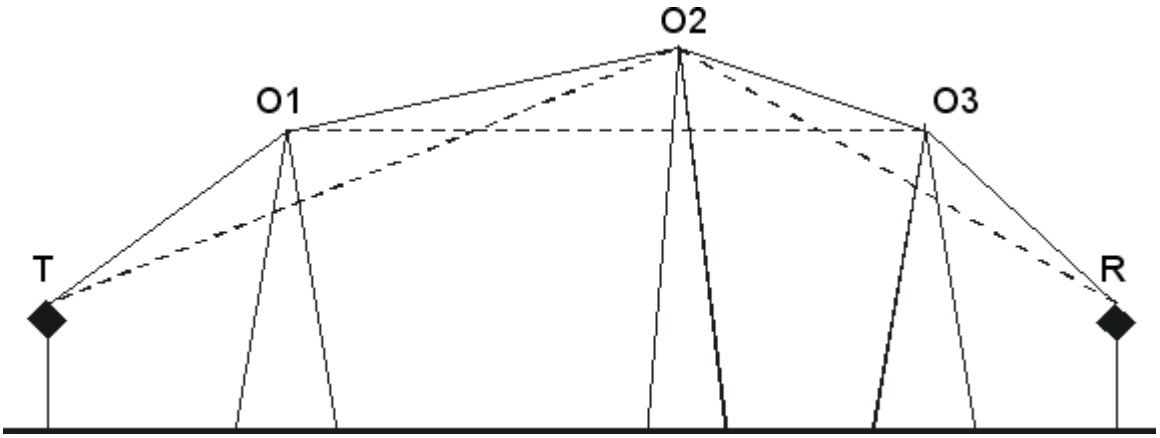


Illustration of Epstein-Peterson Method

Japanese Atlas Method

The Japanese Atlas technique is similar to the Epstein-Peterson method and was proposed by the Japanese postal service. Again it is based on the assumption that the total loss can be evaluated as the sum of attenuation due to each obstruction. However, in contrast to the Epstein-Peterson method, the effective source is not the top of the preceding obstruction but the projection of the horizon ray for the obstruction to a point on the vertical plane through one of the terminals.

Referring to the diagram, the total loss is given by the sum of losses for T-O1-O2, T'-O2-O3 and T''-O3-R.

Advantages

This method gives improved results when the obstructions are closely spaced.

Disadvantages

To some extent this method still suffers from underestimating the path loss.

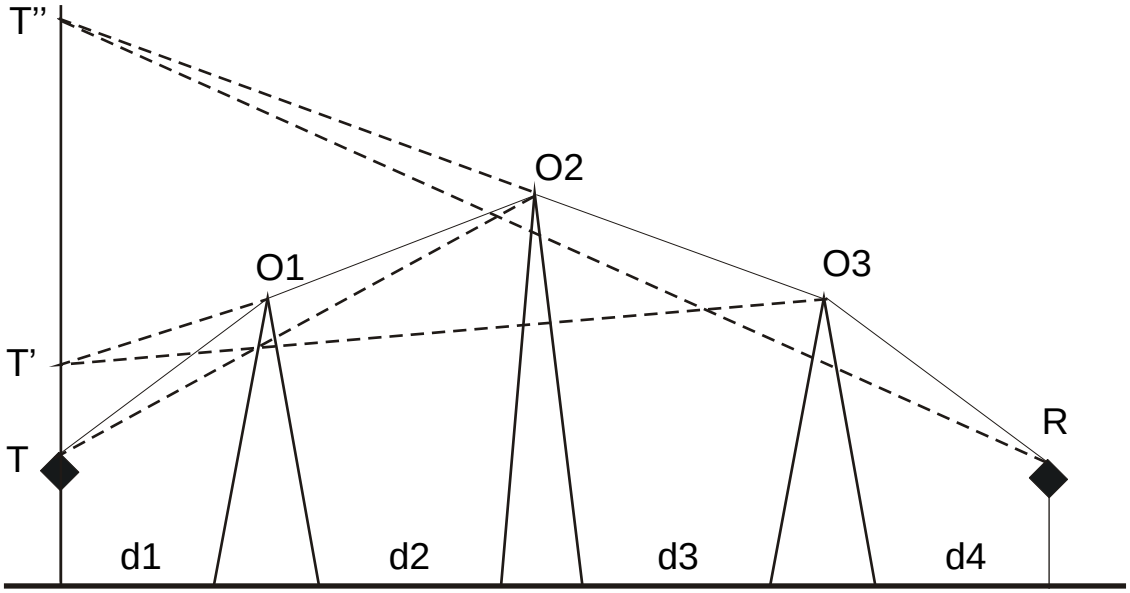


Illustration of Japanese Atlas Method

Deygout Method

The Deygout technique calculates a 'v-parameter' for each edge, the one with the largest is termed the main edge and its loss calculated in the standard way. Additional losses for other obstructions are calculated between the main edge and the obstructed terminal. The total Deygout loss is given by the sum of all losses calculated.

In order to extend the technique to many obstructions, it is necessary to employ sub-main edges. These are the next most significant edges at either side of the main edge. The loss from the sub-main-edge is calculated assuming a hypothetical terminal located at the main-edge (ignoring any less significant edges).

Advantages

This method provides accurate results where there are two obstructions, with one being clearly dominant. For three or four obstructions, the Deygout method gives the best results of any of the approximate methods.

Disadvantages

Where there is no dominant edge, the Deygout method tends to overestimate the loss.

Where there are several equal obstacles inside the first Fresnel zone or close to each other, this method underestimates the obstruction loss.

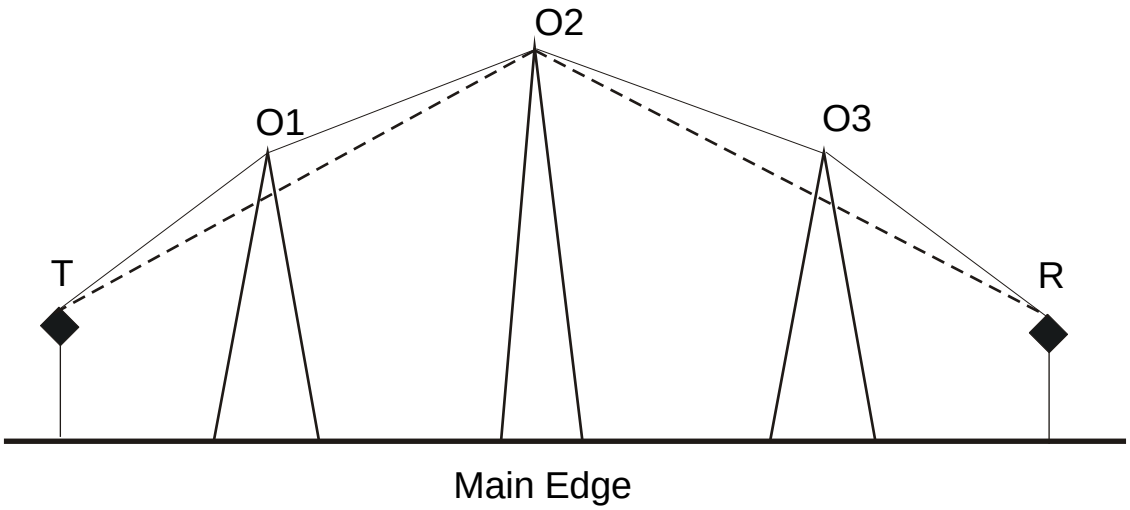
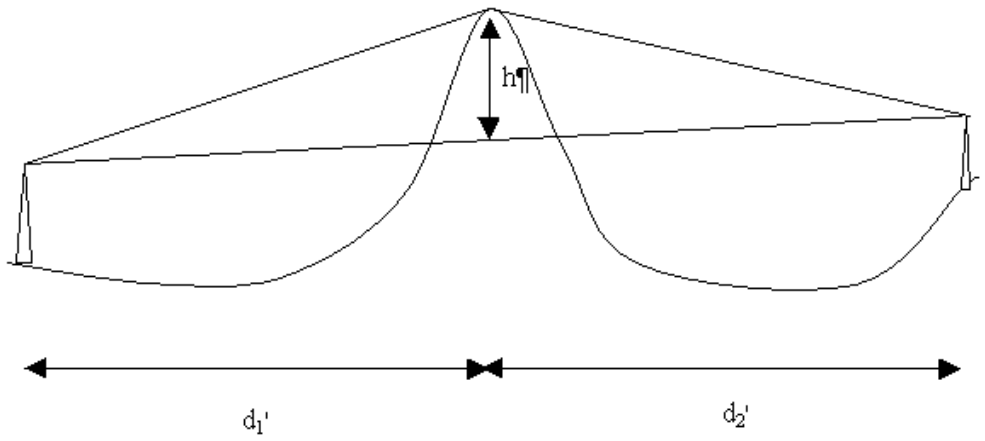


Illustration of Deygout Method

How is Diffraction Loss Calculated for a Single Knife Edge?

This topic describes how diffraction loss is calculated for a single knife edge.



First, the Fresnel-Kirchoff diffraction parameter ν is calculated as follows:

$$\nu = h\sqrt{\frac{2(d_1 + d_2)}{\lambda d_1 d_2}}$$

Where:

λ is the wavelength

The diffraction loss L in dB is then given by:

$$I = 20\log(L)$$

Where:

$L = 1$ for $\nu < -0.8$

$L = 0.5 - 0.62 * \nu$ for $-0.8 \le \nu < 0$

$L = 0.5\exp(-0.95\nu)$ for $0 \le \nu < 1$

$L = 0.4 - \sqrt{0.1184 - (0.38 - 0.1\nu)^2}$ for $1 \le \nu < 2.4$

$L = 0.45/\nu$ for $2.4 \le \nu$

CHAPTER 6

ENTERPRISE Interfaces

Along with the main ENTERPRISE tools, a number of COM interfaces have been developed to provide a level of third-party integration with the ENTERPRISE suite. These interfaces cover a number of key areas of functionality, including:

- Prediction models (to enable third parties to create new models using the model SDK)
- Prediction Access Module (to provide third parties an opportunity to extract existing prediction data and install prediction pathloss correction data (PLC files)
- Loaders (for the Interference Matrix, Measurements and Revenue Maps components)

ENTERPRISE now also includes a number of web services, which form part of the ENTERPRISE Service Oriented Architecture (SOA) and provide public access to selected areas of the ENTERPRISE logic. These include:

- Prediction service (to enable third parties to create pathloss predictions outside of the ENTERPRISE environment)
- ARRAYWIZARD service (to allow third parties to create predictions, coverage arrays, interference matrices, LACs and RACs, cell-polygon assignments and Location Based Services outside of the ENTERPRISE environment)

Documents explaining these APIs and interfaces are available on request from the AIRCOM Product Support team.

CHAPTER 7

Chinese Character Support in ENTERPRISE

A number of ENTERPRISE products support the use of the Chinese character sets.

This chapter describes the user interface locations where you can type Chinese characters, and the associated database tables and fields.

The lists focus on the locations where these characters can be typed, but they do not include the various locations where the same information can be viewed.

For information on configuring ENTERPRISE to support Chinese characters, see the Installation and Administration Guide.

How Special Characters Are Handled

A number of special characters are not supported in the Chinese language, and in ENTERPRISE they are replaced with substitutes.

This table describes the substitutes used:

Symbol Name	Symbol used with English Regional Setting	Symbol used with Chinese Regional Setting
Degree	°	deg
Square	²	^2
Cube	³	^3
Copyright	©	(c)
Beta	β	Beta

ENTERPRISE Fields Supported as Chinese Characters

In ENTERPRISE, the following fields support Chinese characters:

Project Names

Dialog Box	GUI Field(s)	Database Table	Database Field(s)
Modify Project	Project name, and (on Info tab) description and comments	PROJECT	NAME COMMENTS DESCRIPTION

Map Data

The names for the following map data items support Chinese characters:

- Clutter
- Vectors
- Text

In the case of Vectors, the names can also be added or modified within the ENTERPRISE user interface (Vector Manager).

ASSET Fields Supported as Chinese Characters

In ASSET, the following fields support Chinese characters:

Site Database

Network Element	GUI Location	Database Table	Database Field(s)
Network Identity (PLMN)	General tab	PLMN	PLMNNAME
Network Identity (Logical)	General tab	LOGNETWORK	IDNAME USERCOMMENT
Property	Address tab	SITEADDRESS	ADDRESS1 ADDRESS2 TOWN PROVINCE STATE IDNAME FLAGVALUE COMMENTS PRECANDIDATENAME
GSM cell	General tab	gsmcell	IDNAME CELLNAME SEGMENT_NAME
GSM Sub-cell	General tab	CELLAYDATA	SUBCELLID SUBCELLNAME

Network Element	GUI Location	Database Table	Database Field(s)
UMTS cell	General tab	LOGUMTSCELL	IDNAME CELLNAME
CDMA SECTOR	General tab	LOGIS95SECTOR	IDNAME SECTORNAME
Fixed WiMAX cell	General tab	LOGWIMAXCELL	IDNAME CELLNAME
Mobile WiMAX cell	General tab	LOGWIMAXMOBCELL	IDNAME CELLNAME
LTE cell	General tab	LOGLTECELL	IDNAME CELLNAME
Repeater	General tab	REPEATERCELL	IDNAME
Logical Node	General tab	LOGNODE	IDNAME NAME NAME2 USERCOMMENT
All network elements	Status tab (String-type fields only)	FLAGVALUES	STRINGFIELDDATA

Database Menu

Dialog Box	GUI Field(s)	Database Table	Database Field(s)
Filters	Filter name, comments	FILTERS	FILTERID COMMENTS
Contact Persons	Contact Person details	CONTACTPERSON	TITLE SURNAME FORENAME COMPANY COMMENTS

Equipment Menu

Dialog Box	GUI Field(s)	Database Table	Database Field(s)
Cellular Antennas	Antenna Device: Name, description, photofile path, manufacturer	ANTENNADEVICE	IDNAME DESCRIPTION PHOTOFILE MANUFACTURER
	Antenna Pattern: Name, pattern id, manufacturer	ANTENNAPATTERN	IDNAME UNIQUE_PATTERN_ID DESCRIPTION
BTS Equipment	Name, description, photofile path	BTS	IDNAME DESCRIPTION PHOTOFILE

Dialog Box	GUI Field(s)	Database Table	Database Field(s)
Node Types	Name, description, photofile path	LOGNODEBTYPE	IDNAME DESCRIPTION PHOTOFILE
Cell Equipment	Name, description, photofile path	CELLEQUIPMENT	IDNAME DESCRIPTION PHOTOFILE
Mast Head Amplifier	Name, description, photofile path	MASTHEADAMP	IDNAME DESCRIPTION PHOTOFILE
Feeders	Name, description, photofile path	FEEDER	IDNAME DESCRIPTION PHOTOFILE
Masts	Name, description, photofile path	TOWER	IDNAME DESCRIPTION PHOTOFILE
Cabins	Name, description, photofile path	CABIN	IDNAME DESCRIPTION PHOTOFILE
Equipment Suppliers	Name, address, email, comments	EQUIPSUPPLIER	NAME ADDRESS EMAIL COMMENTS
Microwave Antennas (CONNECT Equipment menu)	Antenna name and description	MWANTENNATYPE	IDNAME DESCRIPTION
Channel Editor (CONNECT Options menu)	Band/channel name	BAND	IDNAME

The PHOTOFILE field refers to the fact that the path of the file (stored in the database as a string) supports Chinese folder/file names.

Configuration Menu

Dialog Box	GUI Field(s)	Database Table	Database Field(s)
Propagation Models	Name and comments	PREDICTIONMODEL	IDNAME COMMENTS
Terminal Types	Name	TERMTYPE	IDNAME
Bearers	Name	TGBITRATE	IDNAME
UMTS Carriers	Name	TGCARRIER	IDNAME
Fixed WiMAX Carriers	Name	WIMAXCARRIER	IDNAME
Mobile WiMAX Carriers	Name	WIMAXMOBCARRIER	IDNAME
LTE Carriers	Name	LTECARRIER	IDNAME
LTE Frame Structures	Name	LTEFRAMES	IDNAME

Dialog Box	GUI Field(s)	Database Table	Database Field(s)
LTE Frequency Bands	Name	LTEFREQBANDS	FREQBANDNAME
Frequency Bands (GSM)	Name	FREQBAND	NAME
Frequency Conversion Formulae (GSM)	Formula name	FREQCARRIERCONV	NAME
Carrier Layer Configuration	Name and abbreviation	CARLAY	IDNAME ABBREVIATION
Cell Layer Configuration	Name	CELLAY	IDNAME
Services	Name	TGSERVICE	IDNAME
UMTS Resources	Name	TGRESTYPE	IDNAME
BSIC Schemas	Name	BSICSCHEMA	IDNAME
UMTS Scrambling Code Schemas	Name	UMTSCODESCHEMA UMTSCODE	IDNAME SCHEMANAME
Mobile WiMAX PN Code Index Schemas	Name	PNINDEXSCHEMA	IDNAME
LTE Physical Cell Id Schemas	Name	LTECELLIDSCHEMA	IDNAME
Coverage Schemas (GSM)	Name	COVSCHEMA	IDNAME
	Category label	COVCLASS	NAME
Channel to Transceiver Setup (GSM)	Name	MAPNAMES	IDNAME
Cluster Editor (CDMA)	Cluster name	LOGIS95CLUSTER	IDNAME

Arrays Menu

Dialog Box	GUI Field(s)	Database Table	Database Field(s)
Compound Array Generator	Name of Expression	COMPOUNDARRAYEXP	IDNAME
Traffic Wizard	File location, filename prefix, comments	n/a	n/a
Array Creation Wizard, from Coverage/Interference submenu (GSM Non-Sim)	File location, filename prefix, comments	n/a	n/a

Tools Menu

Dialog Box	GUI Field(s)	Database Table	Database Field(s)
Interference Table Wizard	Comments	n/a	n/a
Model Assignment Calculator	Name of Environment Type	ENVTYPE	IDNAME
BCF Types	Names, address and combiner type	BCFTYPE	IDNAME NAME ADDRESS COMBINERTYPE

ADVANTAGE Fields Supported as Chinese Characters

In ADVANTAGE, the following fields support Chinese characters:

Dialog Box	GUI Field(s)	Database Table	Database Field(s)
Plan Setup, or Optimiser Workflow Renaming option	Name of plan	PLAN	IDNAME
Optimiser Workflow Renaming option	Name of delta plan	DELTAPLAN	IDNAME
Action Constraints Template Manager	Name of template	CONSTRAINTTEMPLATE	IDNAME
RF Metric Target Group	Name of group	DESIGNTARGETGROUP	IDNAME

 ADVANTAGE uses many of the dialog boxes and parameters from ASSET, as well as the Site Database information. For lists of which of these support Chinese characters, please see ASSET Fields Supported as Chinese Characters on page 146.

Administrator Fields Supported as Chinese Characters

In ENTERPRISE Administrator, the following fields support Chinese characters:

Dialog Box	GUI Field(s)	Database Table	Database Field(s)
Configuration External Data Pages	Pages and page info name	EXTERNALHTTPDATA	ID
Add WFS Service	Identity	WFSSERVICES	IDNAME
Database Script Manager	Script file name	SCRIPTSSTORAGE	NAME
Project Defaults Import	Import file name	n/a	n/a
Project Defaults Export	Export file name	n/a	n/a
Create a New User	User Id, password, comment	PRIORUSER	USR USRCOM FIRSTNAME LASTNAME EMAIL_ID ADDRESS
Create a New Group	Name and comment	PRIORGROUPS	GRP GRPCOM
Group Properties - Administrators	Comment	PRIORGROUPS	GRPCOM
Group Properties - All	Comment	PRIORGROUPS	GRPCOM
Group Properties - Power Users	Comment	PRIORGROUPS	GRPCOM
Field Definer	Field name	FLAGGROUPS	FLAGGROUPID
Field Definer	Picklist option name	FLAGS	FLAGID

Index

J

K

L

M

N

P

R

S

T

V

W

X