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# Creating an InstantAtlas™ Index File for Background Mapping

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## 1. Introduction

To use images for background mapping in InstantAtlas reports, the images must have a corresponding index file (XML format) that provides a lookup for their size and geographic coordinates. Any geo-referenced images can be displayed as background mapping as long as they are accompanied by an index file. The objective of this guide is to help you to construct this index file.

To include a layer of background mapping, you upload an index file into the Publisher. Each layer has a separate index file. An index file is an XML file (.xml) that specifies a size and geographic coordinate for each image that makes up that layer of background mapping. Without this information, InstantAtlas reports would be unable to position background images correctly in the map(s). A sample index file can be found in the 'images' folder created during the installation of your InstantAtlas software. This folder is a convenient place to store all of your background images and index files.



**Note:** It is important that an index file is stored in the same folder as the images that it references.

InstantAtlas supports use of JPEG and PNG image formats for background mapping.



**Note:** An index filename cannot contain spaces or it will not be picked up correctly by the InstantAtlas Publisher. e.g. ("Miniscale Map.xml" should be renamed to "MiniscaleMap.xml")



**Note:** The reports support PNG although the Publisher will NOT copy these files from the source to the output folder when the 'Copy background images to output folder' box is ticked in the 'Choose your background images' page within the publisher. If the box is ticked then it will copy the files to the output folder presuming that they are JPEGs which is the wrong format.

The best way to do this for PNG images is to not tick the box and then once the publishing has been completed these background PNG images will need to be copied into the output folder manually.

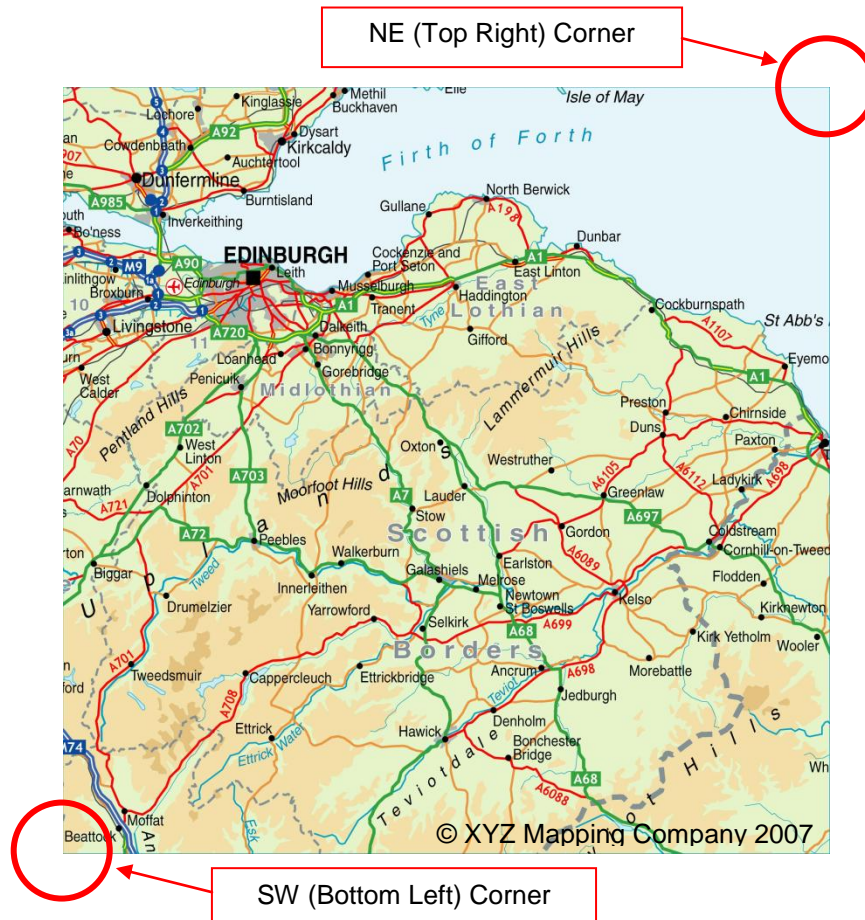
## 2. Acquiring Geographic Coordinates

Images for background mapping in InstantAtlas should be accompanied by either a 'World file' or a 'TAB file'. This section will explain how to get the coordinates required within the index file.

For the index file to run, 2 sets of coordinates are required. These coordinates are for the South-West corner (Bottom Left) and North-East corner (Top Right) of the image.

For the purposes of this document, the image NT.jpg will be used as an example for creating an index file. The coordinates required to construct a working index file are:

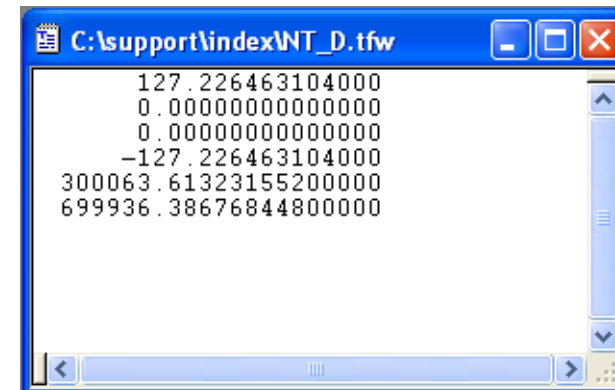




Note: When publishing in InstantAtlas with the Flash templates the maximum width and height of a map image is 2880 pixels. Images with dimensions larger than this will cause problems in the Flash templates. This is not the case when using the HTML templates where an image of any size can be used. However, a large image size can cause performance issues in the final report.

## 2.1. If the Image is Accompanied by a World File

World file - Edinburgh example:



A world file will contain 6 lines of numeric data.

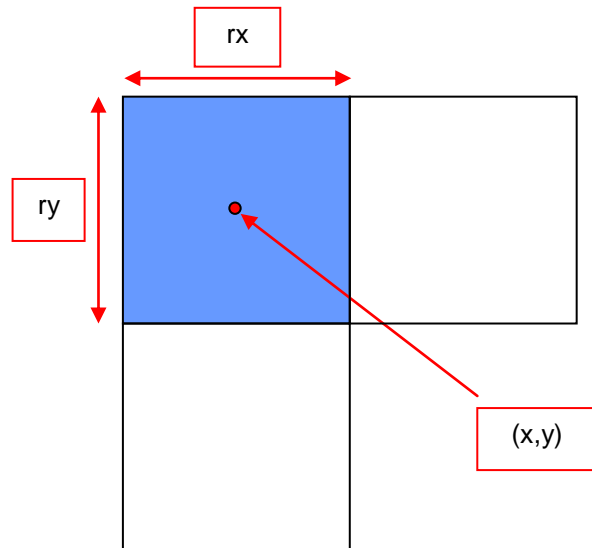
These lines are defined as follows;

- Line 1: rx: pixel size in the x-direction in map units/pixel
- Line 2: rotation about y-axis
- Line 3: rotation about x-axis
- Line 4: ry: pixel size in the y-direction in map units/pixel
- Line 5: x: x-coordinate of the centre of the upper left pixel
- Line 6: Y: y-coordinate of the centre of the upper left pixel

In our Edinburgh example 'NT' we get the following information:

rx = 127.226463104  
 ry = -127.226463104  
 x = 300063.613231552  
 y = 699936.386768448

From the world file above we can see that there is no rotation. Imagine that this box represents 1 pixel – The Top Left pixel of the image.



To calculate the top left and bottom right coordinates of the image you will also need the dimensions in pixels of your image. Most graphics applications (e.g. MS Paint) will give you this information.

Now we have all of the variables which we require to calculate the Bottom Left and Top Right coordinates;

$rx = 127.226463104$   
 $ry = -127.226463104$   
 $x = 300063.613231552$   
 $y = 699936.386768448$   
 $w = 786$   
 $h = 786$

Please refer to the Excel spreadsheet `Worldfile_coord_calc.xls` that accompanies this guide. You can enter your variables into the blue cells **only** and the following equations will be run for you to give you your coordinates instead of manually having to calculate them.

Four values need to be calculated: the Top, Bottom, Left and Right axis of the image.

$$\begin{aligned}
 \text{Left} &= x - (0.5 * rx) \\
 \text{Top} &= y - (0.5 * ry) \\
 \text{Right} &= (x - (0.5 * rx)) + (rx * w) = (\text{Left}) + (rx * w) \\
 \text{Bottom} &= (y - (0.5 * ry)) + (ry * h) = (\text{Top}) + (ry * h)
 \end{aligned}$$

For our example;

$$\begin{aligned}
 \text{Left} &= x - (0.5 * rx) \\
 &= 300063.613231552 - (0.5 * 127.226463104) \\
 &= 300000 \\
 \text{Top} &= y - (0.5 * ry) \\
 &= 699936.386768448 - (0.5 * -127.226463104) \\
 &= 700000 \\
 \text{Right} &= (x - (0.5 * rx)) + (rx * w) = (\text{Left}) + (rx * w) \\
 &= 300000 + (127.226463104 * 786) \\
 &= 400000 \\
 \text{Bottom} &= (y - (0.5 * ry)) + (ry * h) = (\text{Top}) + (ry * h) \\
 &= 300000 + (-127.226463104 * 786) \\
 &= 600000
 \end{aligned}$$

The Left Bottom (SW) coordinates are (300000,600000) and the Right Top (NE) coordinates are (400000,700000).

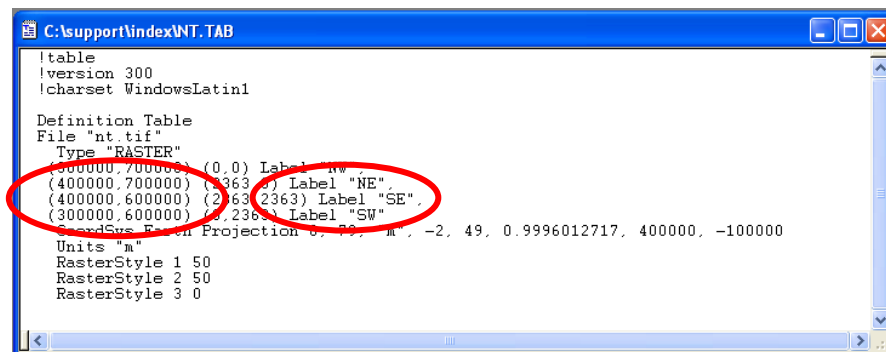
## 2.2. If the Image is Accompanied by a TAB File

In a TAB file the required coordinates have already been calculated. There are a number of ways a TAB file can be formatted. Below are two examples;

When the coordinates are accompanied with a label such as 'NW':

The required coordinates can be found within the first set of brackets on the lines with NE and SW. In this example you can see the Left Bottom (SW) coordinates are (300000,600000) and the Right Top (NE) coordinates are (400000,700000).

TAB File – Edinburgh Example:



```

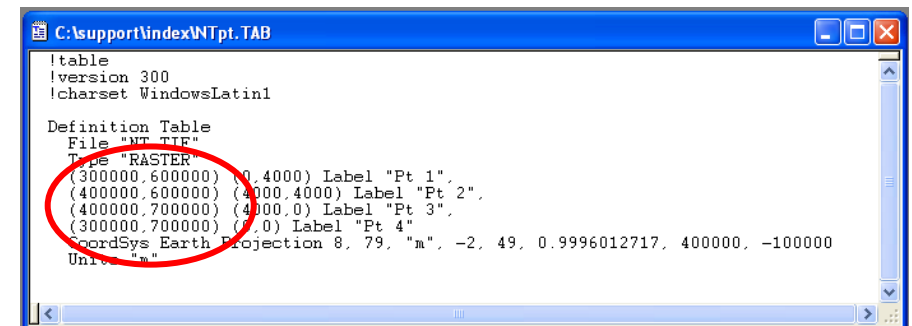
!table
!version 300
!charset WindowsLatin1

Definition Table
File "nt.tif"
Type "RASTER"
(300000,600000) (0,0) Label "NW"
(400000,700000) (2363,0) Label "NE"
(400000,600000) (2363,2363) Label "SE"
(300000,700000) (0,2363) Label "SW"
CoordSys Earth Projection 8, 79, "m", -2, 49, 0.9996012717, 400000, -100000
Units "m"
RasterStyle 1 50
RasterStyle 2 50
RasterStyle 3 0
  
```

When the coordinates are accompanied with a label such as 'PT 1':

With this type of TAB file the coordinates for the Left Bottom and Right Top corners of the image can be found by analysing the coordinates within the

red circle. The coordinate with the lowest x and lowest y values is the coordinate for the Left Bottom corner. The coordinate with the largest x and largest y values is the coordinate for the Right Top corner. In this example you can see the Left Bottom (SW) coordinates are (300000,600000) which can be found on the line with the label 'Pt 1' and the Right Top (NE) coordinates are (400000,700000) which can be found on the line with the label 'Pt 3'.



```

!table
!version 300
!charset WindowsLatin1

Definition Table
File "nt.tif"
Type "RASTER"
(300000,600000) (0,4000) Label "Pt 1"
(400000,600000) (4000,4000) Label "Pt 2"
(400000,700000) (4000,0) Label "Pt 3"
(300000,700000) (0,0) Label "Pt 4"
CoordSys Earth Projection 8, 79, "m", -2, 49, 0.9996012717, 400000, -100000
Units "m"
  
```

### 3. The Index File Script

The XML to copy and paste into a text editor (e.g. Notepad) and save with the extension .xml is the following:

```
<?xml version="1.0" encoding="UTF-8"?>
<FeatureCollection xmlns="http://www.instantatlas.com/xml/layer/data" xmlns:gml="http://www.opengis.net/gml" xmlns:xlink="http://www.w3.org/1999/xlink">
  <FeatureLayer id="IDname" type="RASTER" min-extent="0.0" max-extent="1.0E8">
    <LayerName>Name of Layer</LayerName>
    <LayerFeatureCollection>
      <gml:featureMember>
        <RasterTile fid="fid.1">
          <gml:boundedBy>
            <gml:Box srsName="unknown:0">
              <gml:coordinates>513663.8999635532,177830.2061 527433.8999635532,191600.2061</gml:coordinates>
            </gml:Box>
          </gml:boundedBy>
          <Id>filename.jpg</Id>
        </RasterTile>
      </gml:featureMember>
    </LayerFeatureCollection>
  </FeatureLayer>
</FeatureCollection>
```

## 4. Customising the Script

There are sections of this XML which you will need to define. This chapter will give more details on which sections can and need to be changed for the index file to work.

**This section is generic and you do not need to edit it:**

```
<?xml version="1.0" encoding="UTF-8"?>
<FeatureCollection
  xmlns="http://www.instantatlas.com/xml/layer/data"
  xmlns:gml="http://www.opengis.net/gml"
  xmlns:xlink="http://www.w3.org/1999/xlink">
```

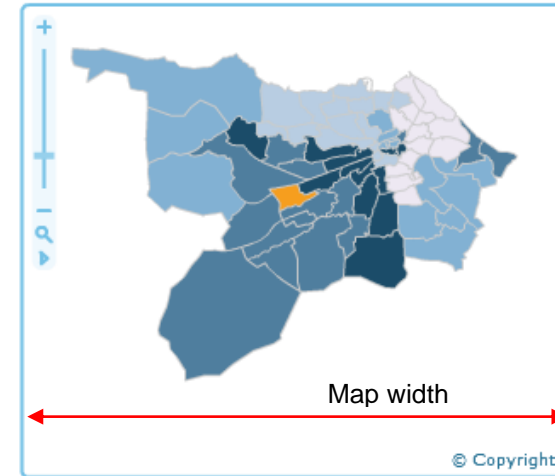
**The following sections require defining.**

### Layer ID, type and extents

```
<FeatureLayer id="ID" type="RASTER" min-extent="0.0"
max-extent="1.0E8">
```

Insert an ID for your feature layer identifier. This ID must be different for each index file.

The min-extent and max-extent values define the range of map widths for which the background layer will be visible in the atlas.



If the map width is smaller than the min-extent value, the layer will not show. If the map width exceeds the max-extent value, the layer will not show. The units will depend on the geographic coordinate system of the map file. For example, the units are metres for map files with a British National Grid coordinate system.

Edinburgh EXAMPLE:

```
<FeatureLayer id="osminiscale" type="RASTER" min-
extent="25000" max-extent="100000">
```

### Layer Name

```
<LayerName>Name of Layer</LayerName>
```

The layer name can be anything which describes the layer. This will be the default name for the layer (although you can edit this at publish time in the Publisher).



**Edinburgh EXAMPLE:**

```
<LayerName>osminiscale_scotland</LayerName>
```

**Raster Tile ID**

```
<RasterTile fid="fid.1">
```

The Raster tile fid can be named anything. It is important however that it does not begin with a number so if your ID is numeric prefix it with an underscore (\_). Also, only use characters which are numeric, letters or an underscore. Ensure that each tile (if more than one included) has a different Raster tile fid.

**Edinburgh EXAMPLE:**

```
<RasterTile fid="NT">
```

**Spatial Reference**

```
<gml:Box srsName="unknown:0">
<gml:coordinates>513663.8999635532,177830.2061
527433.8999635532,191600.2061</gml:coordinates>
</gml:Box>
```

The srsName is where you put the geographic coordinate system details. The srsName for British National Grid for example is EPSG:27700

This section is where you put the coordinates of the bottom left and top right corners of the image.

```
<gml:coordinates>Left,Bottom Right,Top</gml:coordinates>
```

**Edinburgh EXAMPLE:**

```
<gml:Box srsName="EPSG:27700">
<gml:coordinates>300000,600000
400000,700000</gml:coordinates>
</gml:Box>
```

**Image Name**

```
<Id>filename.jpg</Id>
```

The ID needs to be exactly the same as the name of the image you are writing this index file for. The important part is the name and not the file extension (e.g. .jpg). When the index file is read it cuts off any characters to the right of the last dot (.).

**Edinburgh EXAMPLE:**

```
<Id>NT.jpg</Id>
```



## 5. Indexing More Than One Image per Layer

This is an example of an index file referencing 3 images in one feature layer. You can see that a certain section of the code has just been copied and pasted and then re-defined to relate to a different image.

```
<?xml version="1.0" encoding="UTF-8"?>
<FeatureCollection xmlns="http://www.instantatlas.com/xml/layer/data" xmlns:gml="http://www.opengis.net/gml" xmlns:ogc="http://www.opengis.net/ogc">
  <FeatureLayer id="osminiscale" type="RASTER" min-extent="25000" max-extent="100000">
    <LayerName>osminiscale_scotland</LayerName>
    <LayerFeatureCollection>
      <gml:featureMember>
        <RasterTile fid="NT">
          <gml:boundedBy>
            <gml:Box srsName="EPSG:27700">
              <gml:coordinates>300000,600000 400000,700000</gml:coordinates>
            </gml:Box>
          </gml:boundedBy>
          <Id>NT.jpg</Id>
        </RasterTile>
      </gml:featureMember>
      <gml:featureMember>
        <RasterTile fid="NU">
          <gml:boundedBy>
            <gml:Box srsName="EPSG:27700">
              <gml:coordinates>400000.0,600000.0 500000.0,700000.0</gml:coordinates>
            </gml:Box>
          </gml:boundedBy>
          <Id>NU.jpg</Id>
        </RasterTile>
      </gml:featureMember>
      <gml:featureMember>
        <RasterTile fid="NV">
          <gml:boundedBy>
            <gml:Box srsName="EPSG:27700">
              <gml:coordinates>0.0,500000.0 100000.0,600000.0</gml:coordinates>
            </gml:Box>
          </gml:boundedBy>
          <Id>NV.jpg</Id>
        </RasterTile>
      </gml:featureMember>
    </LayerFeatureCollection>
  </FeatureLayer>
</FeatureCollection>
```

**Section 1**

This section is a repeat of section 1 above with the underlined parts redefined

This section is a repeat of section 1 above with the underlined parts redefined

## 6. How to Use the Index File in the IA Publisher

To include a layer of background mapping, you need to upload an index file into the Publisher (rather than the image itself). Below is an example of the Publisher using the Edinburgh index file that has been used as an example throughout this document.



You can see that the default minimum and maximum extents defined in the example index file in this document have automatically picked up by the Publisher. You can modify these values in the Publisher if you wish.

## 7. InstantAtlas Support

You can find IA support resources at [www.instantatlas.com/support.xhtml](http://www.instantatlas.com/support.xhtml). InstantAtlas customers can login to their My InstantAtlas account at [www.instantatlas.com/mia](http://www.instantatlas.com/mia) and download a wide range of support resources and access a searchable knowledgebase. If these resources do not provide a solution, please contact your support provider.