A Beginners Guide to Route Preparation. Version 1.0

It is necessary for you to have a fast broadband connection to access the internet to download documentation, up-dates and DEM data.

It is assumed that you will be conversant with Windows XP or Vista, know how to download and save files from the internet, to extract the files from a '.zip file ' and to run files that need to be installed. A significant amount of file manipulation is required if a real route is to be modelled.. You will need to modify files in a Spreadsheet.

An email address will be required to obtain the registration passwords which are needed to download files from **Rail Simulato**r and other sources.

Sections

Installing Advanced Editor	**Page 2**
Deciding Type of Route.	**Page 2**
A Freelance route.	**Page 3**
A Real Life Route.	**Page 4**
File names used in this guide.	**Page 4**
Downloading DEM data.	**Page 4**
Finding Route Start Latitude and Longitude	**Page 6**
Google Earth	**Page 6**
RS-Tools.	**Page 8**
Asset Editor.	**Page 9**
Creating Route Blueprint.	**Page 9**
Viewing the Template.bin file	**Page 13**
Viewing the route.	**Page 14**
Show Hills	**Page 15**
Plotting your track route.	**Page 16**
Converting *'klm file to *.csv file.	**Page 19**
Modifying *.csv files in Spreadsheet	**Page 20**
Creating Route Markers Blueprint.	**Page 22**
Viewing the Route Markers	**Page 24**
Fault finding	**Page 27**
Track Laying	**Page 28**
Removing Markers – Replacing Markers	**Page 29**

Installing Advanced Editor

If you haven't installed the Advanced editor program do so now.

For this you will have to download from the **Rail Simulator RSDevTools** the ' **Installer** ' and the ' **Docs** ' files.

Installing the Advanced Editor program by running the file
RailSim_2008-02-08-1723_74_3f_DevTools.exe

Install the **Development Documents** (if you haven't already installed them) by running the file
RailSim_2008-02-08-1723_74_3f_DevDocs.exe

A new shortcut should be installed on your desktop to enable this editor to be started easily. Go to the folder **Program Files\Rail Simulator** and create a shortcut for the file **RailSimEditor.exe**

The new **Developer Documents** will be found at
Program\Files\Rail\Simulator\Manuals\Developer Docs

Deciding Type of Route.

Prior to doing anything within Rail Simulator you need to decide if you wish to model a real route or a freelance route. For a real route you need to get as many details as possible about the route you wish to model. Modelling a real route, either past or present, needs considerable research.

For example. I am trying to model the Ashburton Branch line in Devon, running from Totnes to Ashburton via Staverton and Buckfastleigh. Though only the Totnes to Buckfastleigh part of the line remains, as a preserved route, I have a book which gives details of this line as it existed before British Rail closed it in September 1962. It gives very detailed large scale maps, track layouts, gradients, photographs and plenty of written details. In addition, I have photographs of the line that I took many years ago before the northern end was removed to create a new dual carriage road. Online photographs of the line in the past can be found, giving details of buildings, terrain, scenery etc.

I am sure that information of this type is available for most, if not all, past and present routes.
It just needs detailed research to find the information.

Modelling a real route will also involve the creation of many structures, bridges, buildings, etc. which will be needed to create an authentic route.

It could also involve the creation of locomotives, coaches, wagons etc. which are not in plentiful supply as yet for Rail Simulator.

If you are not able to spend the time to carry out this research, or have the skills to produce all the models, then a Freelance route is probably best as no one can criticise the details of your route, track layouts, scenery etc. and you can use whatever assets are available.

The method to be used to prepare the program for a new route depends on whether your route is to be a freelance route, in which case you can use one of the existing routes as a template, or if you are proposing to model a real life route with correct topography and based at the correct Latitude and Longitude

A Freelance route.

Run the **Rail Simulator Editor** program.

Select **Routes**. Select **New Route.**

A list of routes that can be used as a template is displayed . Select the route that has track, roads etc. that are nearest to what you want for the route that you are going to create. Click on **Create** and enter the name of your route

.

Click on **Create**. The **Editor** now opens up with a flat terrain. You have to create your own hills, mountains, rivers etc. as well as all the Track, Scenery etc. However it is relatively straight forward to get to this position.

A Real Life Route.

File names used in this guide.

During the description I am going to use the following **Folder**, **Template** and **Route** names. Replace these with your own as required.

DeveloperName. folder	Kept as DeveloperName
ProductName folder	Kept as ProductName
Template Name	Ashburton_Template
Route Name	Ashburton Branch
Named Markers file	Ashburton_Template_Named.csv
Series Markers file	Ashburton_Template_Series.csv

My Start location is to be Totnes.

Downloading DEM data.

Before you can start you must find the Longitude and Latitude of your start position and the area of your route so you can download the correct DEM files. (Digital Elevation Model. A quantitative model of a topographic surface in digital form. In other words, files that give the height of the land, at 90 metres intervals for the files to be downloaded)

The DEM files are downloaded from Nasa . They are of the form NxxxWyyy.hgt.zip

From NASA documentation

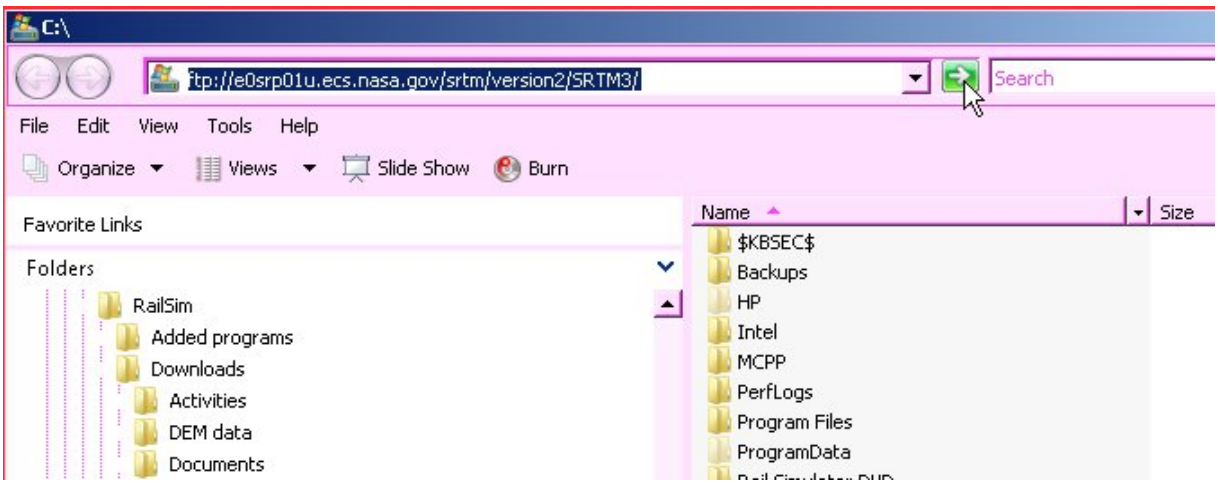
Data are divided into one by one degree latitude and longitude tiles in "geographic" projection, which is to say a raster presentation with equal intervals of latitude and longitude in no projection at all but easy to manipulate and mosaic. File names refer to the latitude and longitude of the lower left corner of the tile - e.g. N37W105 has its lower left corner at 37 degrees north latitude and 105 degrees west longitude. To be more exact, these coordinates refer to the geometric center of the lower left pixel, which in the case of SRTM3 data will be about 90 meters in extent.

To find the files you require for your route (UK) download file http://www.uktrainsim.com/filelib-info.php?form_fileid=7390

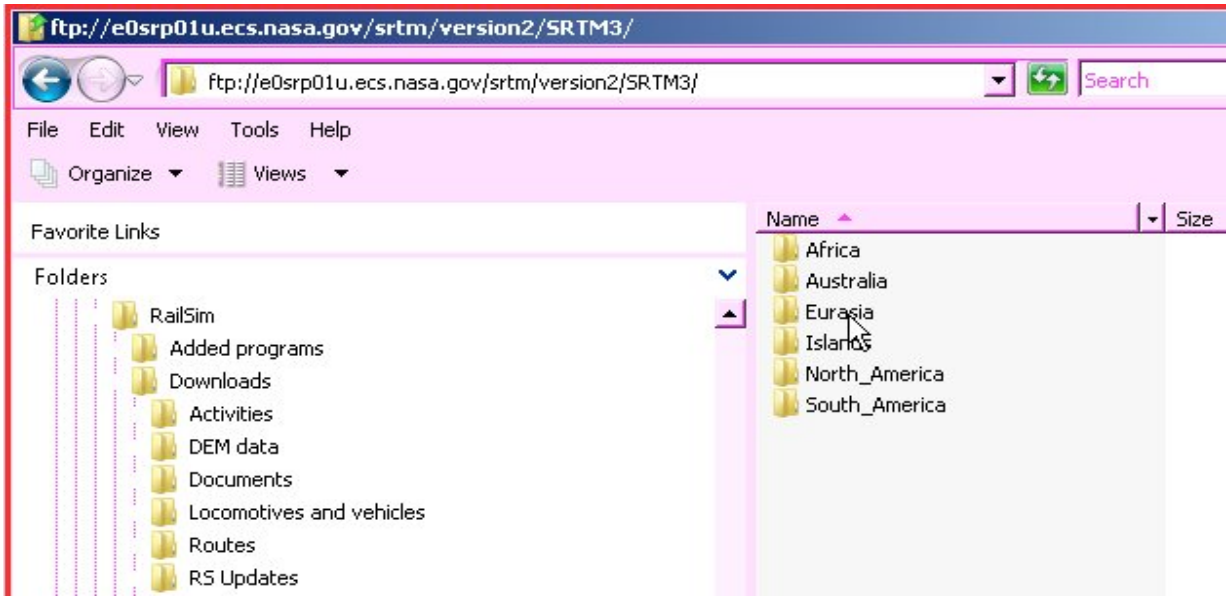
This gives a 1 x 1 degree grid over a map of the UK, so allows you to select the files to download.

For my Ashburton Branch route I need to download the files N50W005, N50W004, N51W005, N51W004

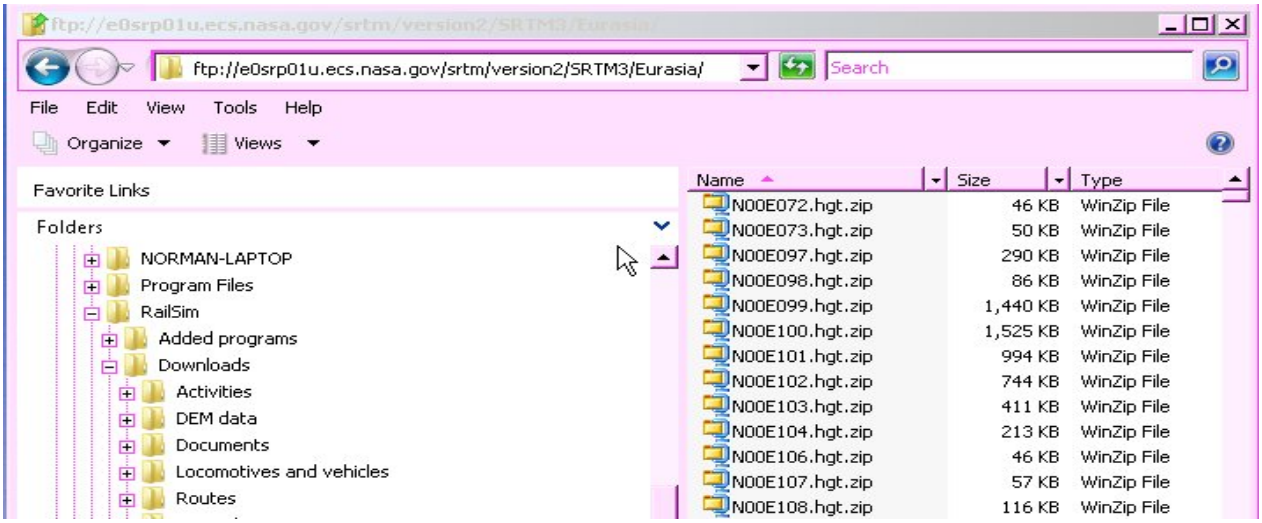
Open Windows Explorer and paste ftp://e0srp01u.ecs.nasa.gov/srtm/version2/SRTM3/ into the address bar.



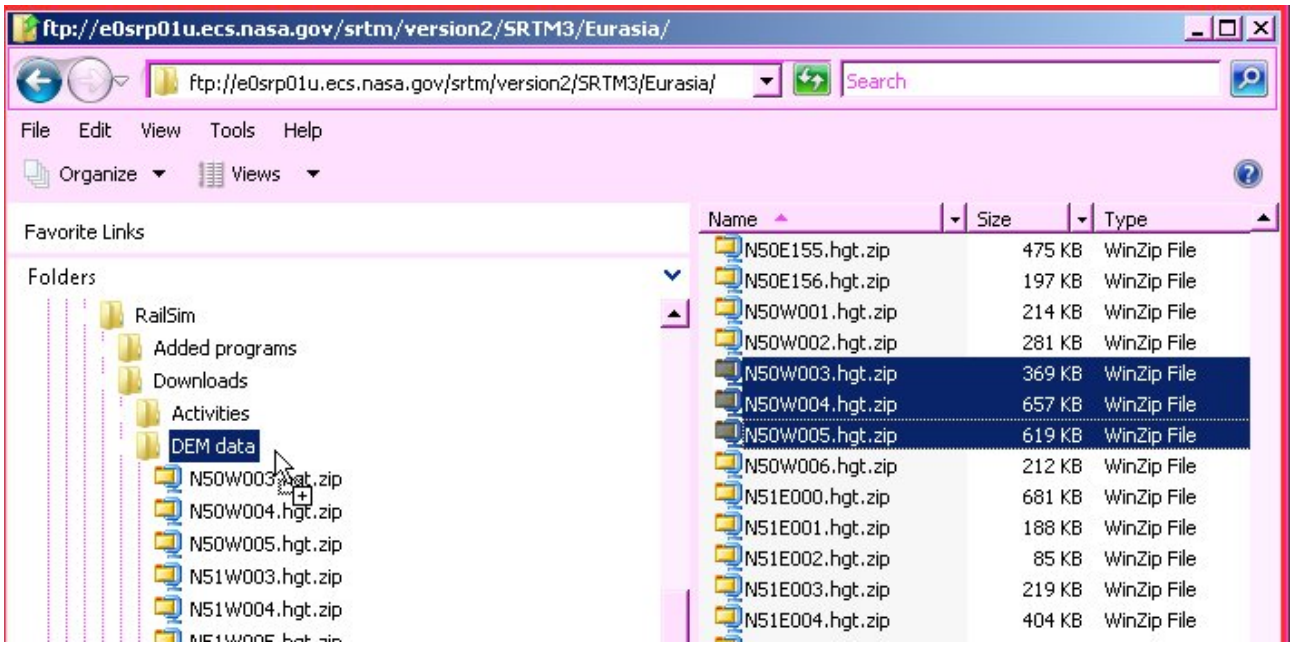
Click on Go To and get



Select your part of the world. I will use Eurasia



Locate the folder the files are to be downloaded into. Select the files to download. (CTRL+left click for multiple selection). Right click on selection and drag then into download folder



If not already present, create the folder **..\Program Files\Rail Simulator\DEM\SRTM**

Unzip the files into the folder **..\Program Files\Rail Simulator\DEM\SRTM**

Prior to creating a new route read the **Development Doc 2.08b Route Blueprints - Freeware .pdf**

Finding Route Start Latitude and Longitude

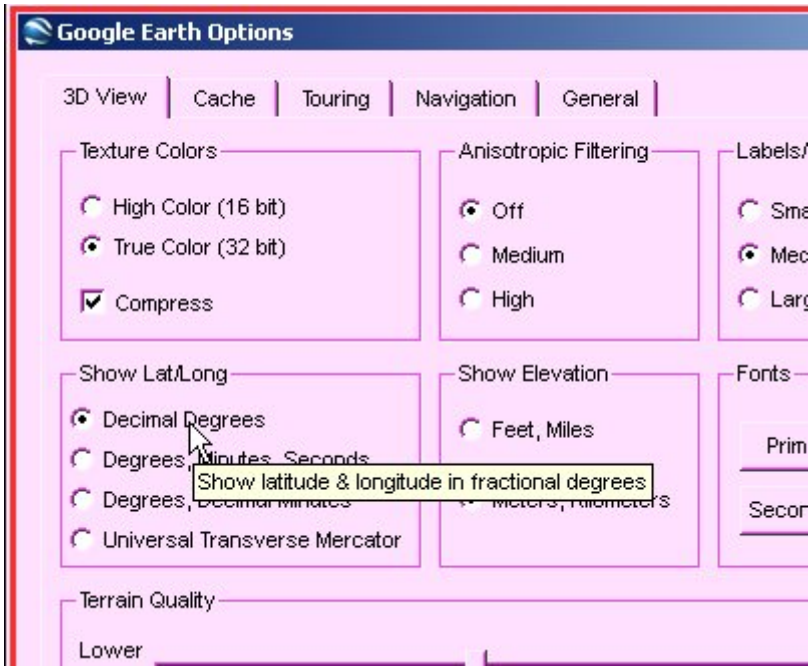
You now need to find the **Latitude** and **Longitude** values for where you would like to start your route. This can be obtained from a map or can be obtained from **Google Earth**

Google Earth

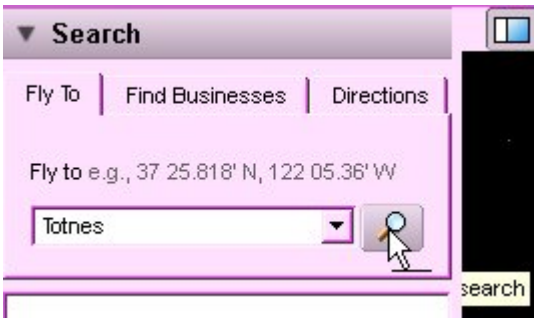
If you don't have **Google Earth** installed, do so now as you will need it later to plot your route. **Google Earth** can be downloaded from

http://earth.google.com/download-earth.html

Install. Run **Google Earth**. Go to **Tools**, **Options** and in **3D view**, Select **Show Lat/long** then **Set Decimal Degrees,** then **Apply**.

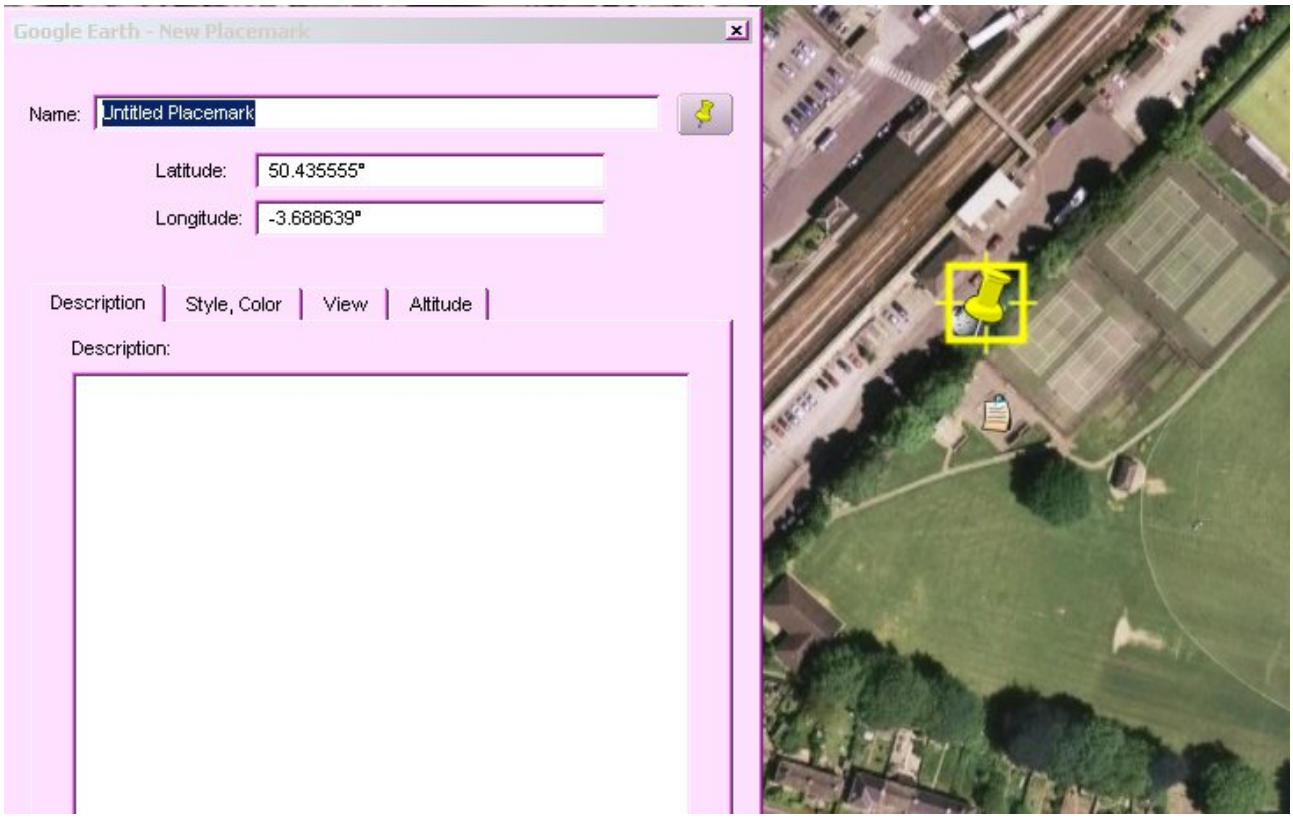


Now enter the nearest town to your start location.



Zoom into the map and find your start location.

Go to **Add**, then **Placemark.** A yellow pin will appear on the map. Drag the pin to your **Start** location.



Note the **Latitude** and **Longitude** values. Exit **Google**.

RS-Tools.

To set up the folders for the route use the program **RS-Tools** by **Mike Simpson** which should be downloaded and installed. It can be downloaded from **UKTrainSim**.

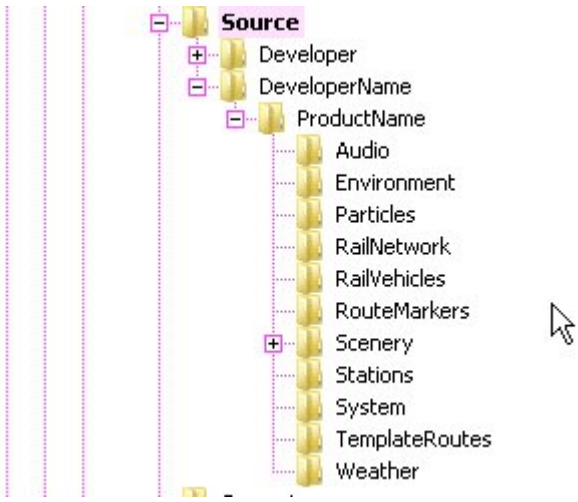
http://www.uktrainsim.com/filelib-info.php?form_fileid=18194

Install the program. Run the program and go to **Tools**, then **Set Up Developer Folder**.

Enter your **Developer Name (** for me **DeveloperName)**. Click on **OK**.

Go to **Tools** then **Set Up Sub-folders**. Select the **Developer** folder just created (**DeveloperName**).

Enter a **Folder** name for Add-on (for me **ProductName**) then **Confirm**.



If you look at folder **...\Program File\Rail Simulator\Source** you will see the folder structure that has been created.

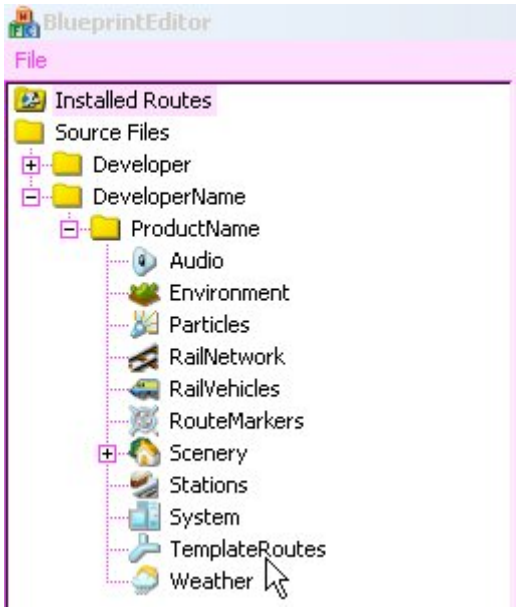
Asset Editor.

You now need to open the **Asset Editor.** This can be found in the **All Programs** list in the **Start Menu.** Find **Rail Simulator Developer Tools – Tools – Asset Editor.** It will be worthwhile creating a shortcut on the desktop as this tool will be used frequently.

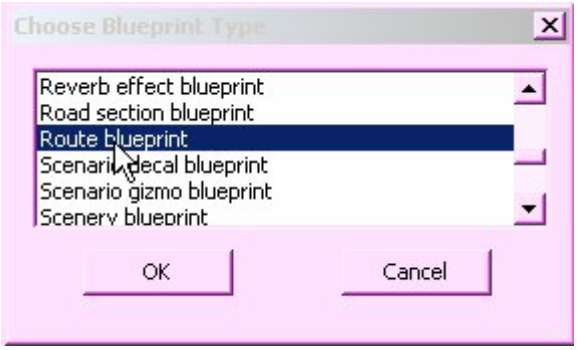
Run the **Asset Editor** (the DVD has to be in the drive)

Route Blueprint.

In the left hand pane go down the folders until you find the folder **DeveloperName\ProductName\ TemplateRoutes.**



Right click on **TemplateRoutes**. Select **New Blueprint** then **Route blueprint** from the list.



Click **OK**.

RouteBlueprint000 is created and will be seen under **TemplateRoutes** in the left hand pane.
Right click on this and **Rename** to your choice (for me **Ashburton_Template**)

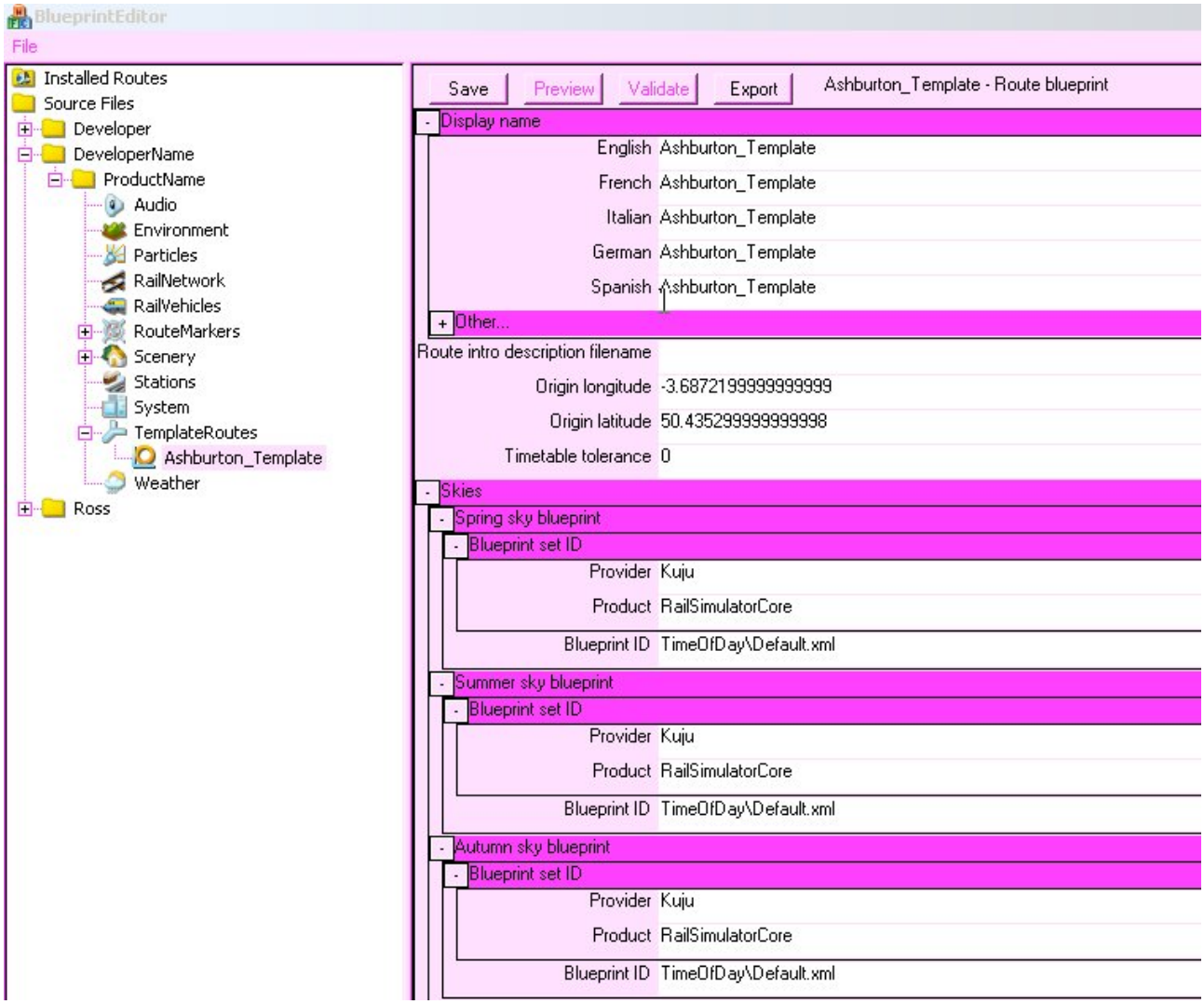
Click on this and the **Route Blueprint** form opens that needs to be filled in.

The data to be entered is given in **Development Doc 2.08b Route Blueprints - Freeware .pdf Section 2.1** onwards.

In the **Display Name** section I have put **Ashburton_Template** for all languages.

My start location is **Totnes** so I have added the **Latitude** and **Longitude** data for **Totnes** station.

The completed form should be as below except for your **Display Name**, **Latitude** and **Longitude**


BlueprintEditor
File
Installed Routes
Source Files
Developer
DeveloperName
ProductName
Audio
Environment
Particles
RailNetwork
RailVehicles
RouteMarkers
Scenery
Stations
System
TemplateRoutes
Ashburton_Template
Weather
Ross
Save
Preview
Validate
Export
Ashburton_Template - Route blueprint
Display name
English Ashburton_Template
French Ashburton_Template
Italian Ashburton_Template
German Ashburton_Template
Spanish Ashburton_Template
Other...
Route intro description filename
Origin longitude -3.6872199999999999
Origin latitude 50.435299999999998
Timetable tolerance 0
Skies
Spring sky blueprint
Blueprint set ID
Provider Kuju
Product RailSimulatorCore
Blueprint ID TimeOfDay\Default.xml
Summer sky blueprint
Blueprint set ID
Provider Kuju
Product RailSimulatorCore
Blueprint ID TimeOfDay\Default.xml
Autumn sky blueprint
Blueprint set ID
Provider Kuju
Product RailSimulatorCore
Blueprint ID TimeOfDay\Default.xml

and

Once the form has been filled in click on **Export** then on **Save**

The information at the bottom of the page shows a successful Build and Save

Exit the **Asset Editor**.

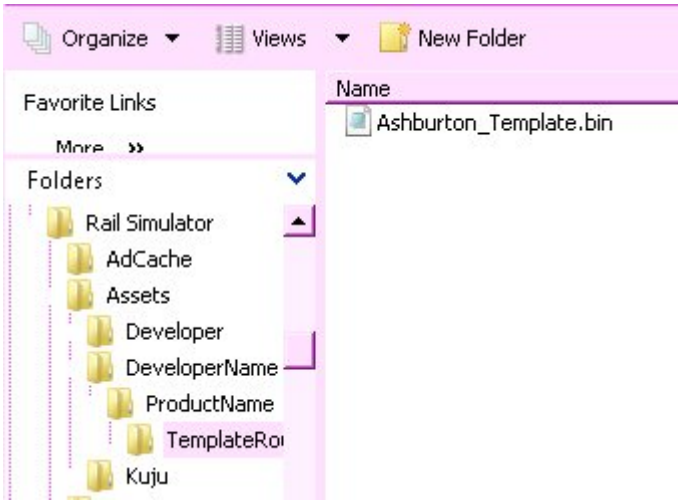
Viewing the Template.bin file

It is possible to check what has been created using **RS-Tools.**

Open the program, click on **Files** then **Open RailSim** file.

Go to **Rail Simulator**, **Assets**, **DeveloperName**, **ProductName**, **TemplateRoutes**.

You should see the template you have just created, in my case **Ashburton_Template.bin**



Click on this and open the file.

You can check that all is correct.

Viewing the route.

Run the **Rail Simulator Editor** program. Select **Routes**. Select **New Route.**

A list of routes that can be used as a template is displayed . Select the **Route Template** that you have created. (for me, **Ashburton_Template**) Click on **Create,** left click on the space where you are to enter the route name and then enter the name of your route. (**Ashburton Branch**) Click on **Create**. The **Editor** now opens up with a flat terrain.

If you are running **Windows XP** you probably have a greyish terrain with grid lines
If in **Vista** you probably have a sky scene. These are a know bug and need to be corrected.

To correct this, click on the **Object Set Filter** button located in the left middle browser panel when in **Object Placement** mode. This is the small Blue Cube with Orange Triangle on it.

When clicked, this will open the **Object Set List** panel on the right hand side of the screen.

From the drop down menu at the top, select **Kuju** and then tick the box next to **RailSimulator**. A very faint green tick should appear.

Exit back to the **Main menu.**

Select **Route** and you should see the route you have just created in the list. Open this route. You should now have a flat scene with green grassy terrain.

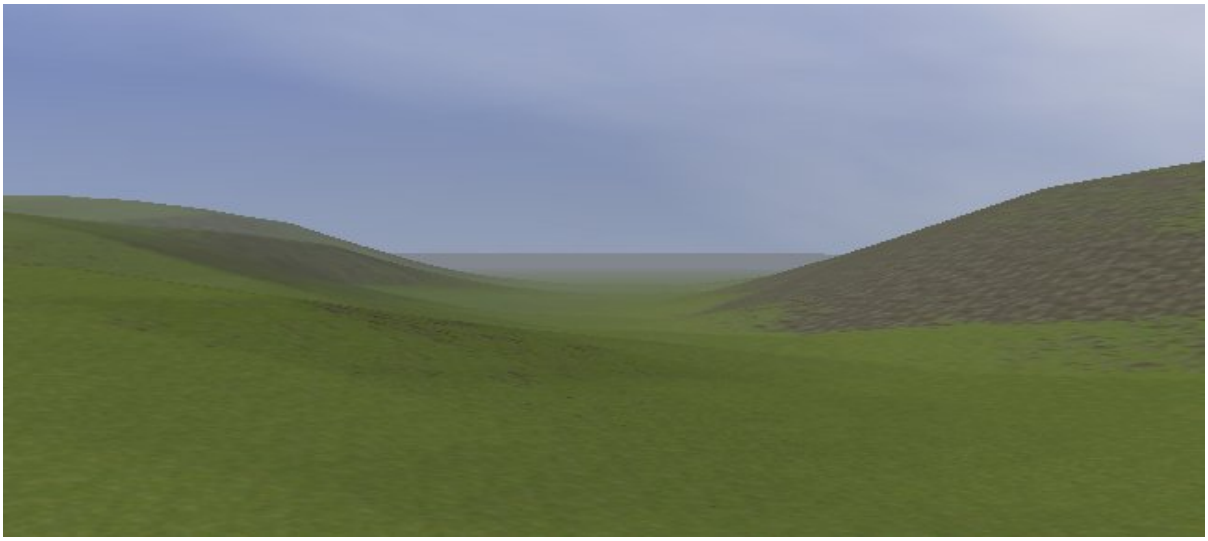
Show Hills etc.

Go into the **World Editor**

and press **T**.

You may find you are below ground level due to the height of the Start point of your route. Change the camera position and you should see hills etc.(**CTRL + Up Arrow**)

The hills are created for a 3 x 3 tile block, the centre tile being at the camera position when **T** is pressed.



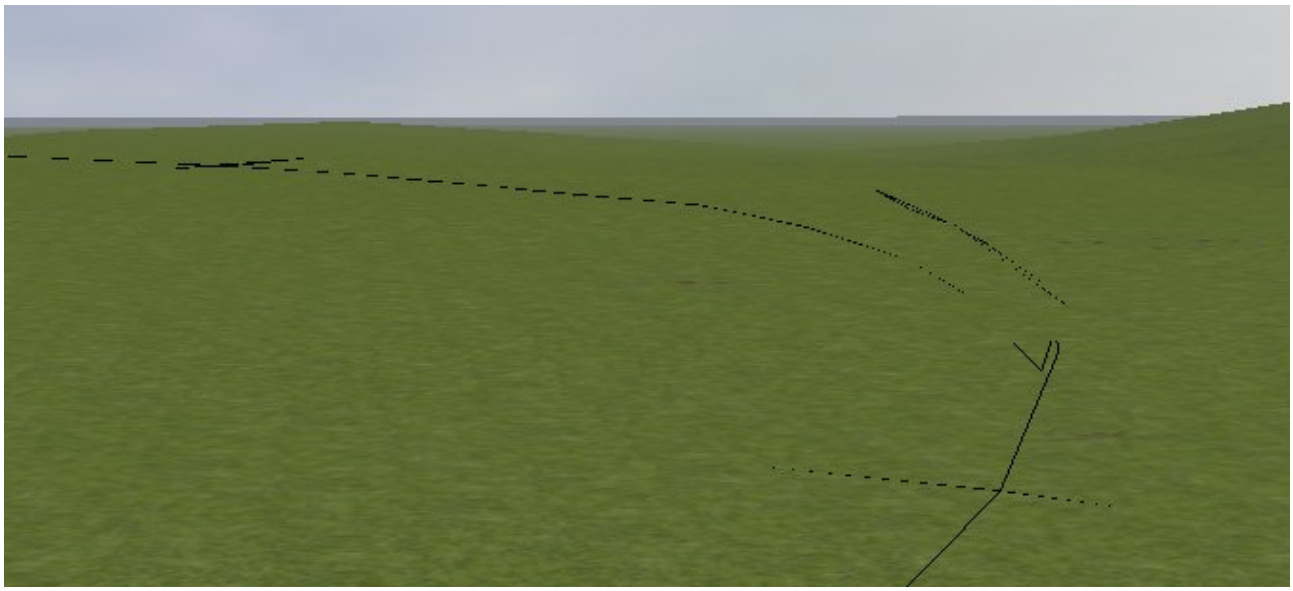
Plotting your track route.

If there is any of your route visible in **Google Earth**, even if only a path that currently follows the route of an old railway line, **Google Earth** can be used to locate the route of the trackwork, roads, rivers and other significant features on your newly created terrain.

Read Development Document **1.03 Track Marker Creation.pdf**

There are two ways, very similar, to do this

The first gives a series of straight lines between points selected in **Google Earth**

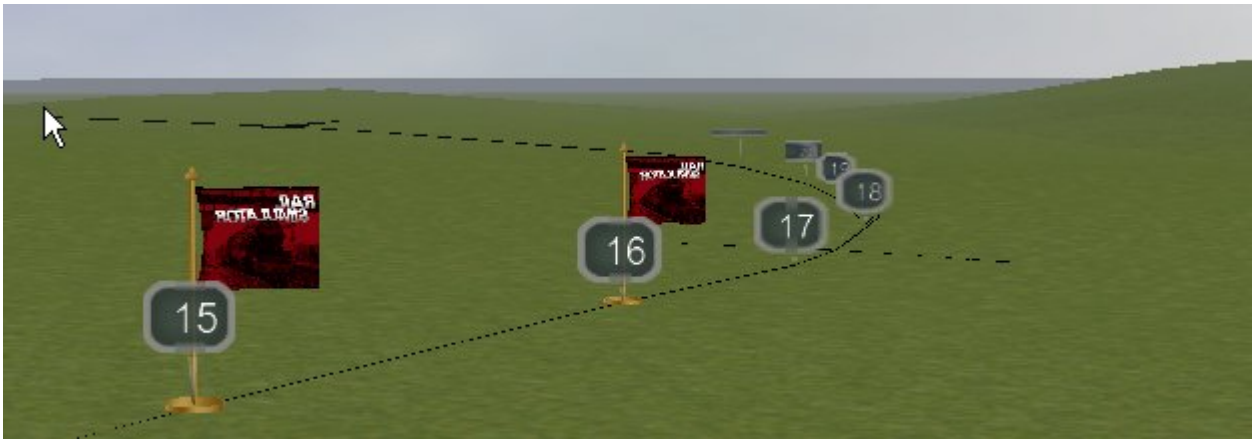


Sometimes this line is difficult to follow as it appears to go below ground level. This method uses ' **Series Markers** '

The second method uses ' **Named Markers** '

These markers are more visible but those in the distance cannot be seen. Names can be given instead of the numbers to locate specific items. i.e. ' Passenger Bridge '

Both can be displayed at the same time to supplement one another.



You can choose which method you prefer, there is very little difference in the amount of work required.

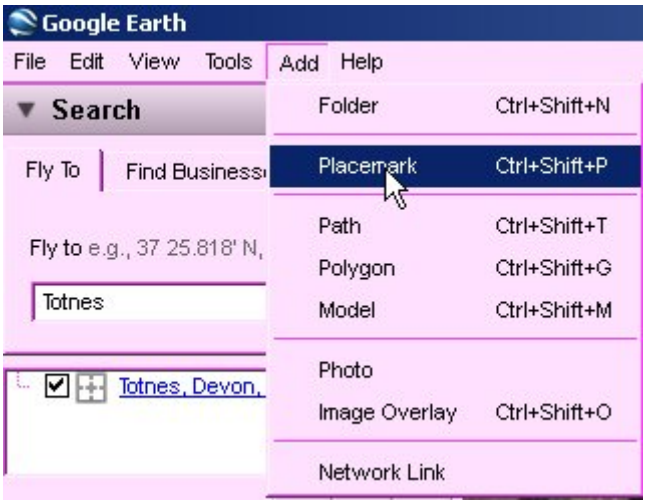
Open **Google Earth.**

In the **Places** section there is a list of places under **Sightseeing** which will be downloaded each time with the places you create. These would have to be removed in a spreadsheet every time you saved another set of Places.

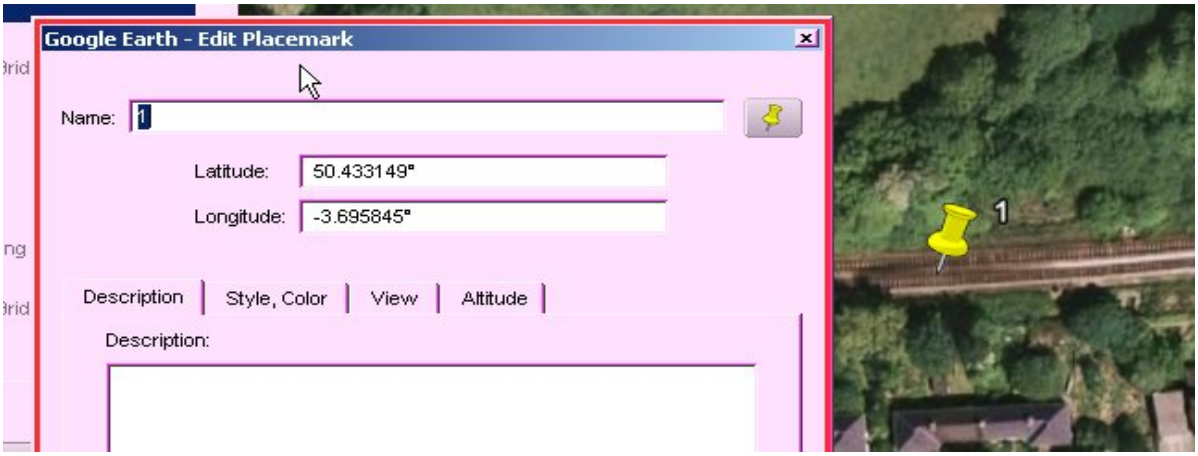
If you don't want these sightseeing places at all, they can be deleted from **Google** by right clicking on **Sightseeing** and then **Delete**. This will save time later. You can also right click and Save before deleting if you might need them.

Now Enter a location on your route in the Search section. Zoom in and select a position on your route as before.

Now go to **Add**, **Placemark**.



A yellow pin will appear on the map. Drag the pin to a point on your track route.

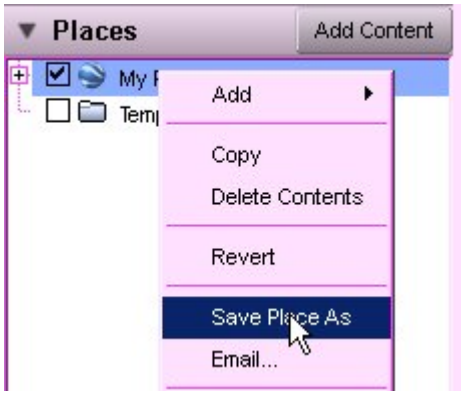


In the **Name** box I have called it **1**.

I have continued adding pins. At the road bridge I have the first pin on the road above the track. This I have named as ' Road Bridge '. The next pin I have located slightly along the road at 4. Another pin at 5 and then a further pin again on the road above the track. This will define the position and orientation of the road.

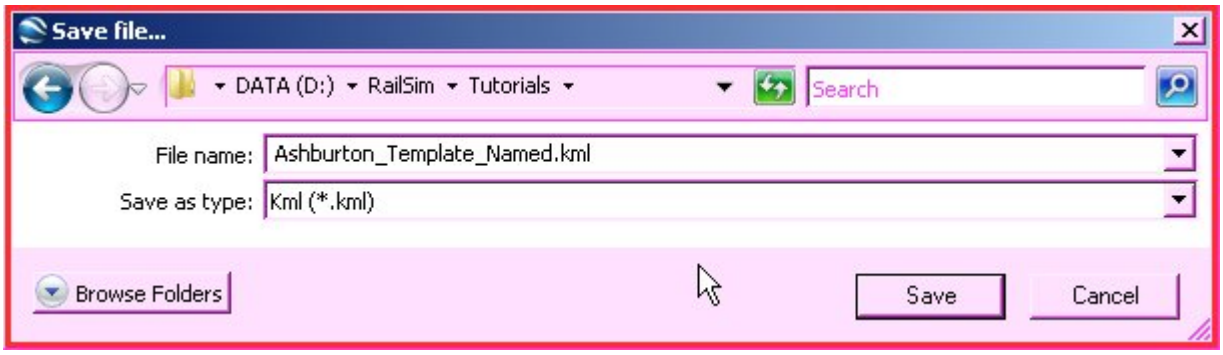
Carry on adding pins as required.

When finished, right click on **My Places** and then click on **Save Place as**



Select where you wish to save file, enter a suitable name and select ' **Save as Type** ' *.kml

For my file I am saving it in ...**RailSim\Tutorials** as file **Ashburton_Template_Named**

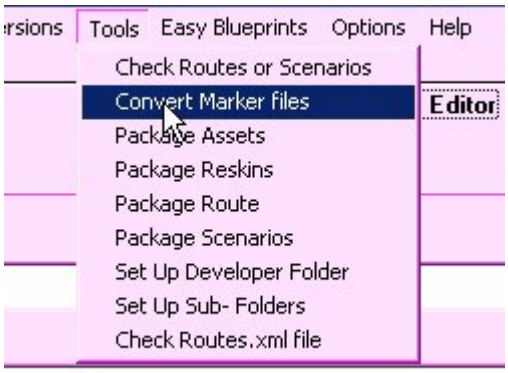


Converting *'klm file to *.csv file.

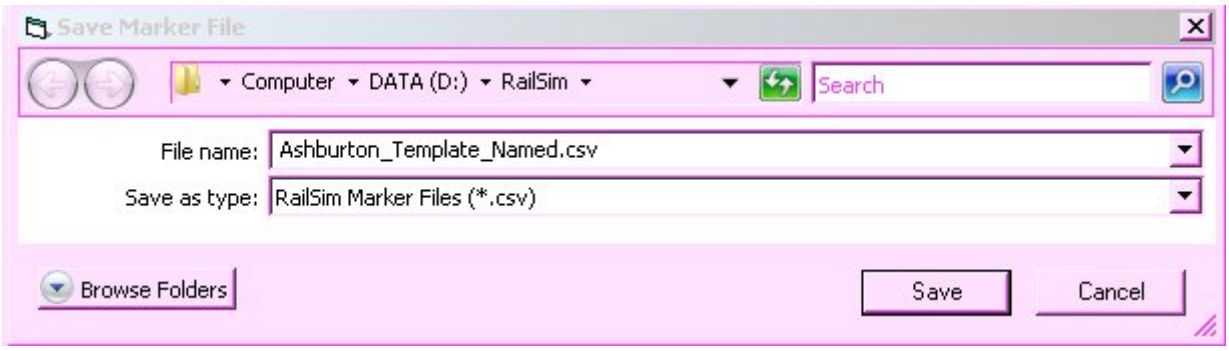
If you have a recent version of **Excel** it is possible to open this file, manipulate the data and produce the files that RailSim wants.

I find an easier way to do part of this manipulation is to use **RS Tools** program.

Run **RS Tools**. Go **Tools**, **Convert Marker Files**

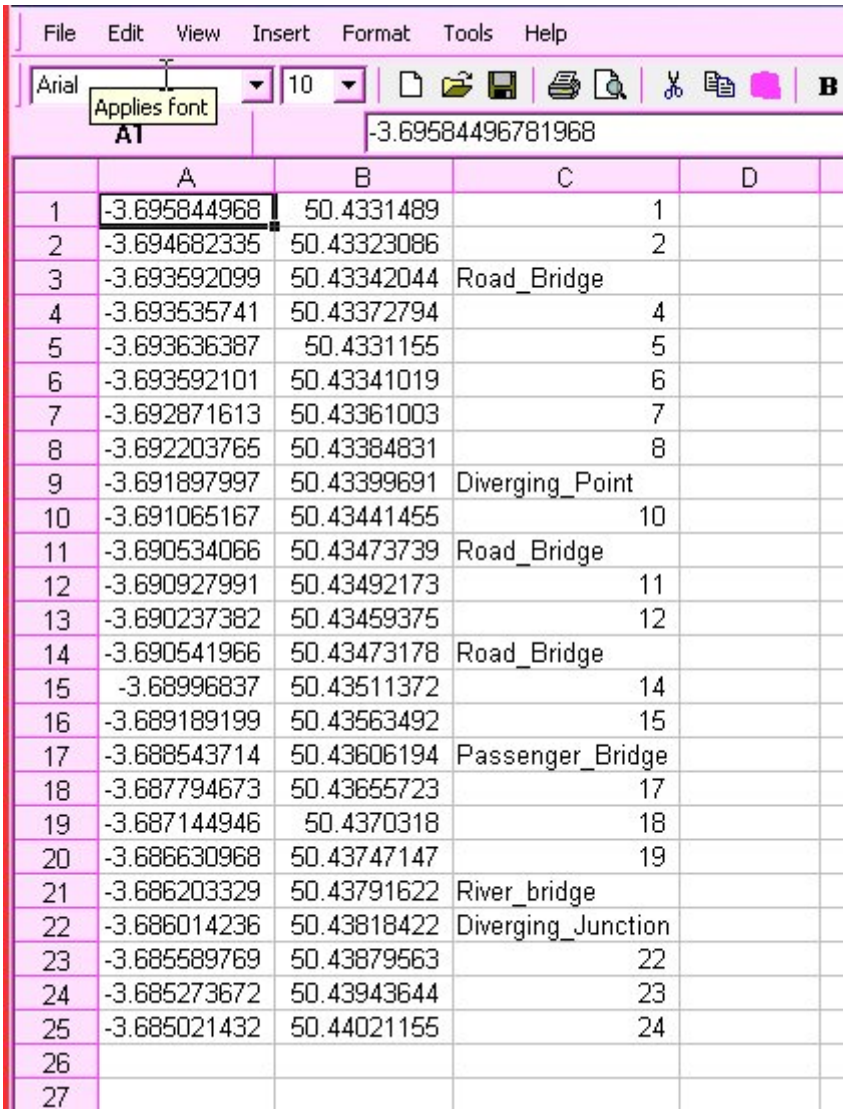


Find the file that has just been created and click on **Open**.



The information has already been entered. Save.

Modifying *.csv files in Spreadsheet



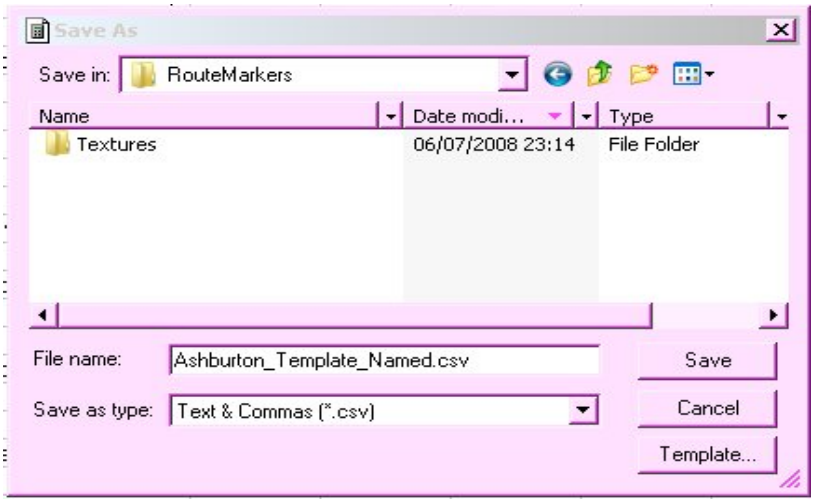
	A	B	C	D
1	-3.695844968	50.4331489	1	
2	-3.694682335	50.43323086	2	
3	-3.693592099	50.43342044	Road_Bridge	
4	-3.693535741	50.43372794	4	
5	-3.693636387	50.4331155	5	
6	-3.693592101	50.43341019	6	
7	-3.692871613	50.43361003	7	
8	-3.692203765	50.43384831	8	
9	-3.691897997	50.43399691	Diverging_Point	
10	-3.691065167	50.43441455	10	
11	-3.690534066	50.43473739	Road_Bridge	
12	-3.690927991	50.43492173	11	
13	-3.690237382	50.43459375	12	
14	-3.690541966	50.43473178	Road_Bridge	
15	-3.68996837	50.43511372	14	
16	-3.689189199	50.43563492	15	
17	-3.688543714	50.43606194	Passenger_Bridge	
18	-3.687794673	50.43655723	17	
19	-3.687144946	50.4370318	18	
20	-3.686630968	50.43747147	19	
21	-3.686203329	50.43791622	River_bridge	
22	-3.686014236	50.43818422	Diverging_Junction	
23	-3.685589769	50.43879563	22	
24	-3.685273672	50.43943644	23	
25	-3.685021432	50.44021155	24	
26				
27				

Find this file and open the *.csv file in a spreadsheet. I am using Microsoft Works. I assume Excel will be suitable as well. OpenOffice spreadsheet will work but more formatting is needed to keep the data with 6 decimal places.

If you did not delete the **Sightseeing** places in **Google** they will show here and must be deleted.

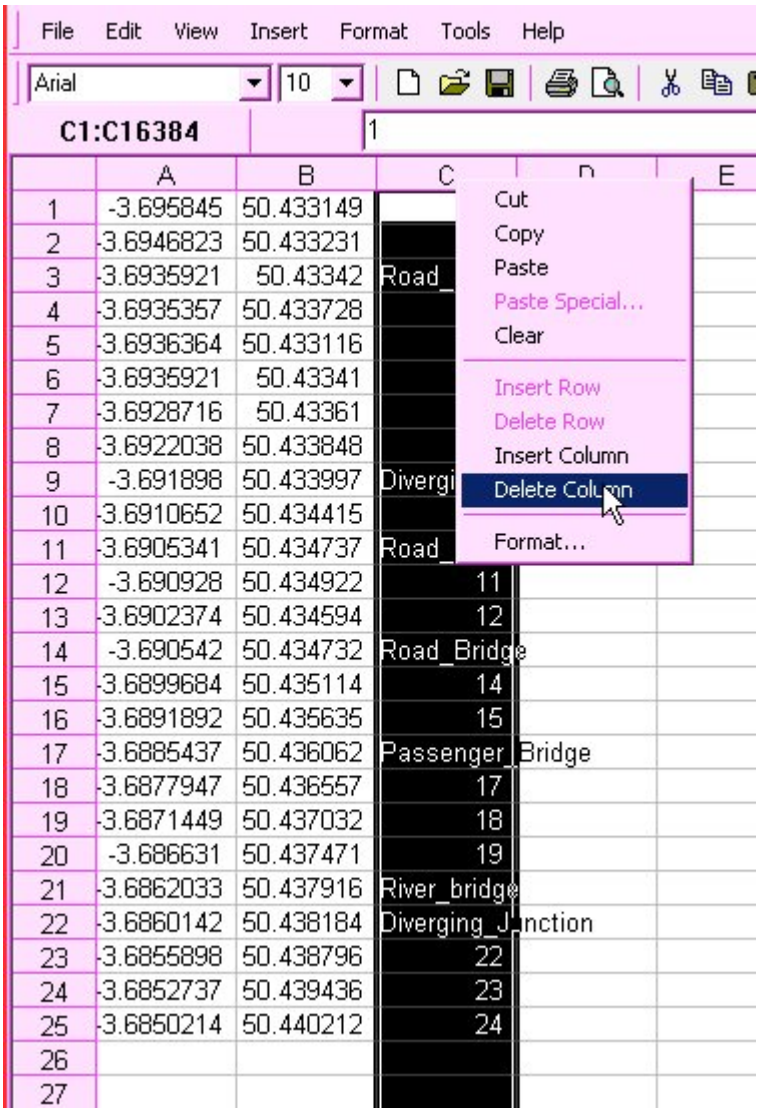
This file is already suitable for the **Named Markers**. It can be saved as *.csv file to the **...\Program Files\Rail Simulator\Source\DeveloperName\ProductName\RouteMarkers** folder.

For my file I am saving it as **Ashburton_Template_Named.csv**



For the **Series Markers** only the first two columns are required.

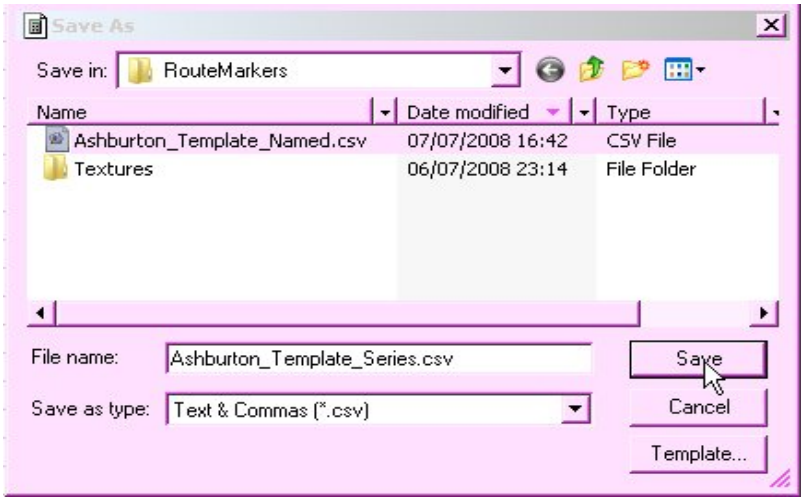
Go to **...\Program Files\Rail Simulator\Source\DeveloperName\ProductName\RouteMarkers** and you should see the file you have just created. Open this to check that it is OK.



Now delete column C.

Then save as *.csv file. In **...\Program Files\Rail Simulator\Source\DeveloperName\ProductName\RouteMarkers** folder

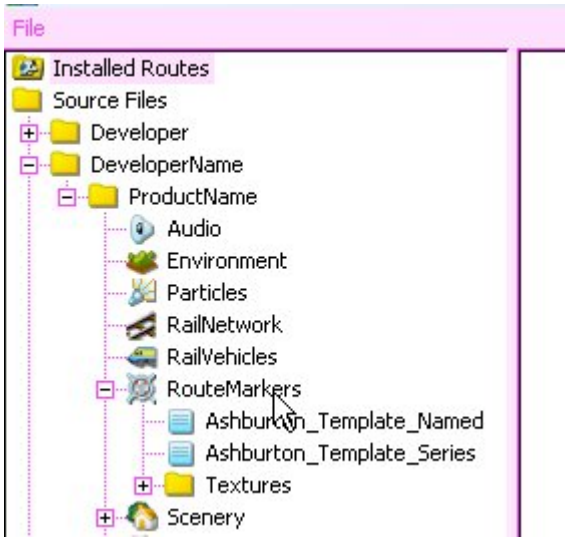
For my file I am saving it as **Ashburton_Template_Series.csv**



Creating Route Markers Blueprint.

Open the **Asset Editor.**

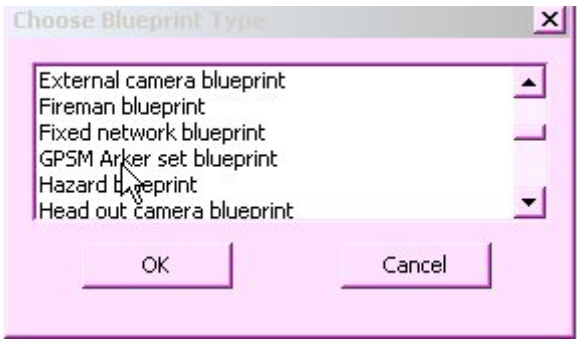
In the left hand pane go down the folders until you find the folder **DeveloperName\ProductName\RouteMarkers**



.

You will see the two *.csv files that you have created.

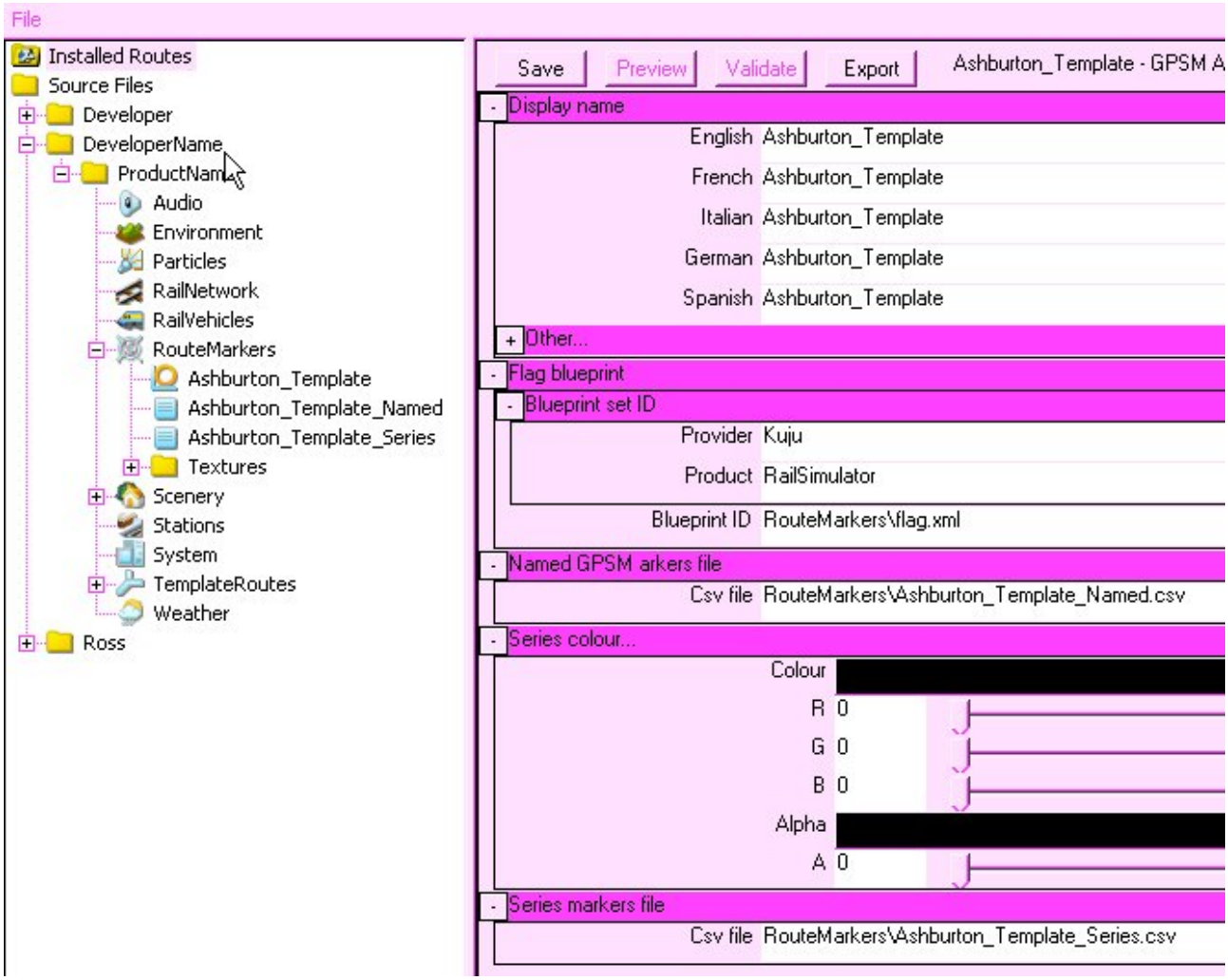
Right click on **RouteMarkers** and select **GPSMarker set blueprint**



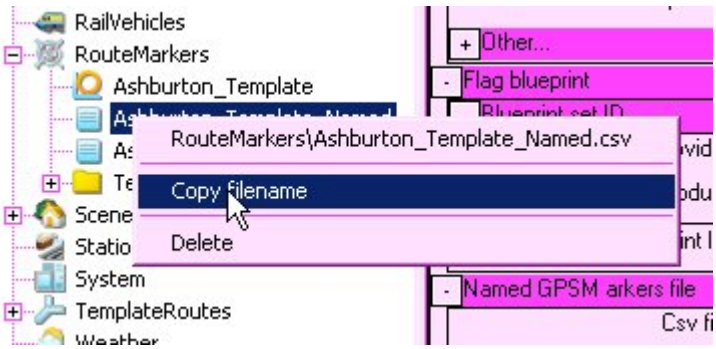
A new blueprint form opens called **GPSMarker set blueprint000.**

Rename. In my case to **Ashburton_Template**

Fill in the blueprint as below



The *.csv files can be copied by right clicking on them, then selecting **Copy Filename**



When the blueprint if filled in Click on **Export** and then **Save**.

If you look in folder **...\Program Files\Rail Simulator\Assets\DeveloperName\ProductName\RouteMarkers** you will see the files created. The *.bin files can be viewed using **RS Tools**
Exit the **Asset Editor.**

Viewing the Route Markers

Run the **RailSimEditor** program.

Open the route and then **World Editor**.

Click on the **Object Set Filter** button located in the left middle browser pane when in **Object Placement** mode. This is the small Blue Cube with Orange Triangle on it.

When clicked, this will open the **Object Set List** panel on the right hand side of the screen.

From the drop down menu at the top, select **DeveloperName** and then tick the box next to **ProductName**. A very faint green tick should appear.

Exit back to the **Main Menu**.

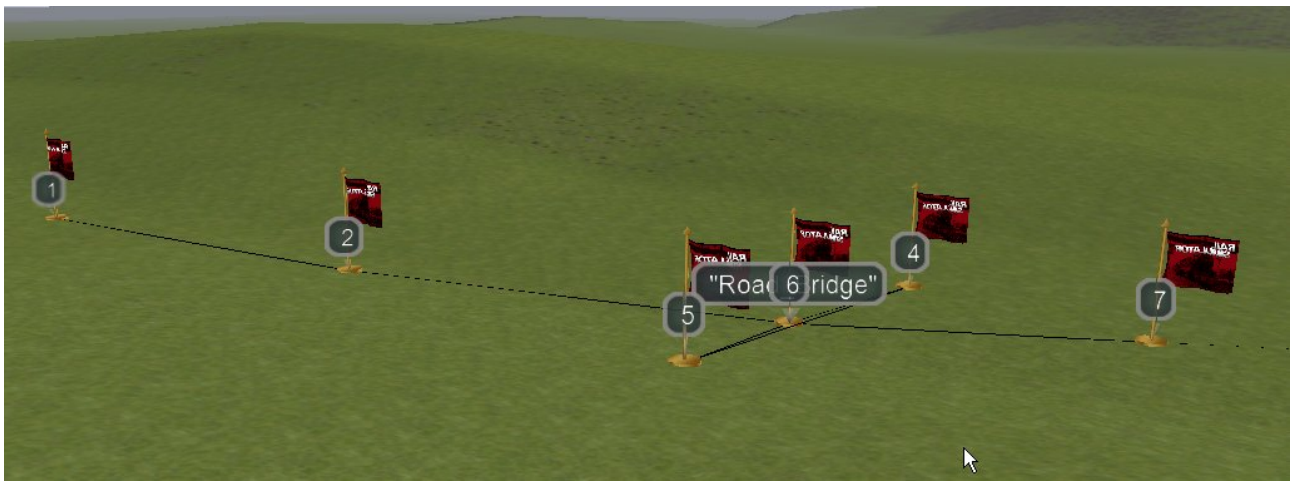
I am not sure that the above has to be done. I have had problems displaying the markers which seems to have been solved by doing the above.

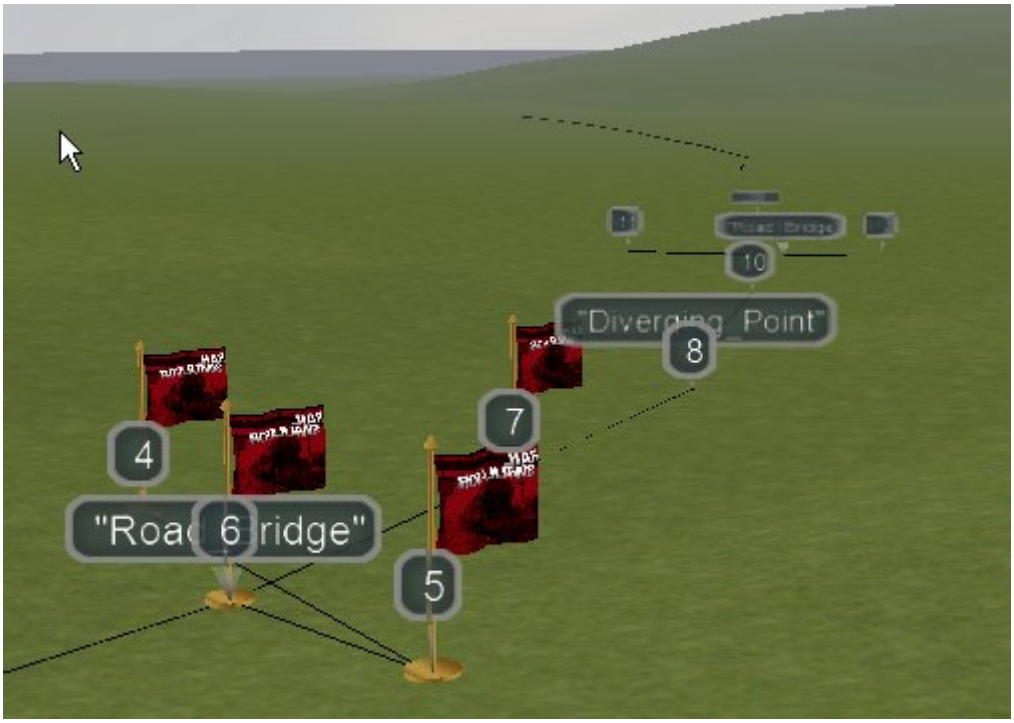
Select **Route** and **Open** your route. Select **World Editor.**

In the bottom Left Panel select the **Route Markers** radio button.

The **Route Markers** should now be displayed, both **Named** and **Series**.

If you don't want the **Named Markers** just don't enter a file ID in the **GPSMarker set blueprint**





Fault finding

If they are not displayed check that the *.csv files are correct. Open in spreadsheet and check

The **Named** file should have three columns, the **Series** file should have two columns.

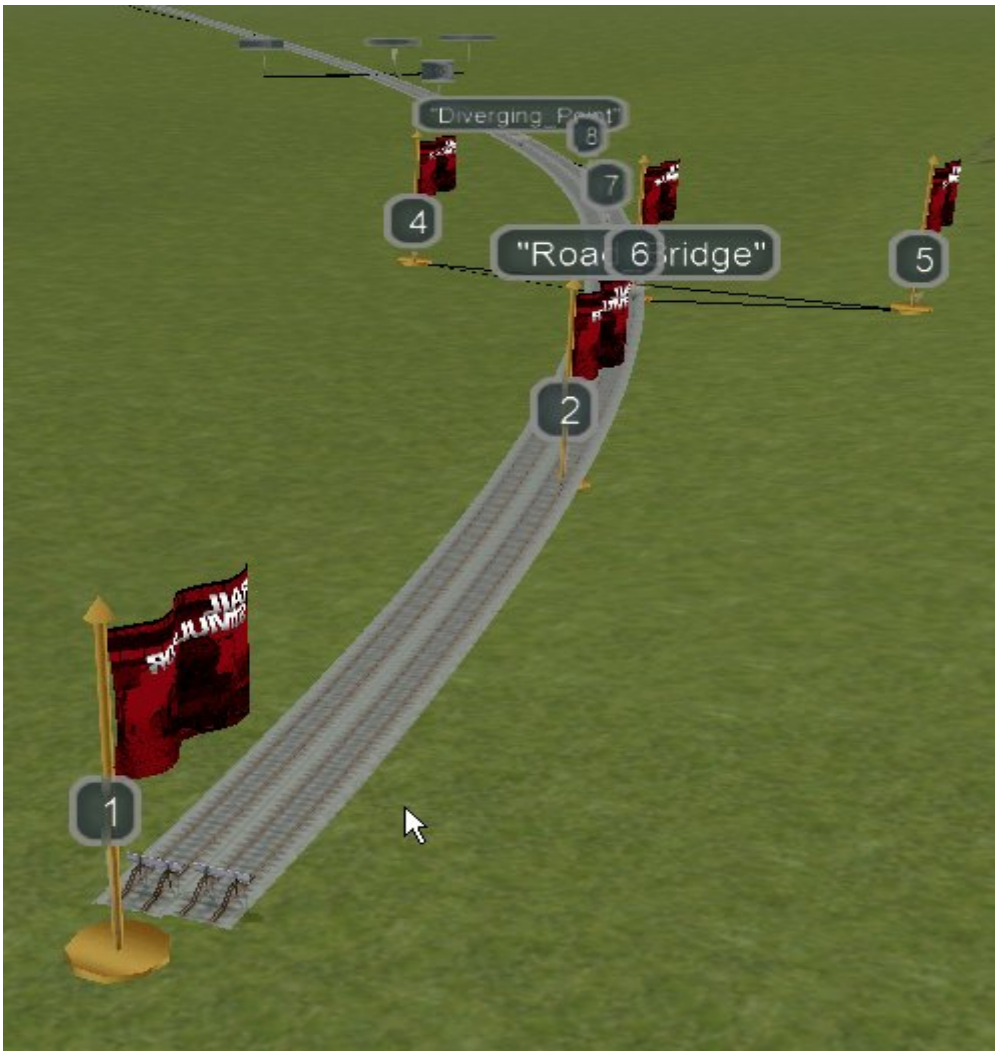
Using **RS Tools** open the *.bin file in
...\Program Files\Rail Simulator\Assets\DeveloperName\ProductName\RouteMarkers.

Check all is OK.

I once spent ages tracing a fault only to find I had a space between Rail and Simulator in the blueprint.

Track Laying

Now you have the route of your track go ahead and lay your main track.



Removing Markers – Replacing Markers

Once you have finished with these markers delete the *.csv files in
...\Program Files\Rail Simulator\Source\DeveloperName\ProductName\RouteMarkers.

and the *.dcsv and *.dcsv.tgt files in
...\Program Files\Rail Simulator\Assets\DeveloperName\ProductName\RouteMarkers.

I would keep the original *.csv file in case you need to re-enter the markers.

To expand your route create another set of *.csv files. Keep same names in the Rail Simulator folders. Run the Asset Editor again. You should not need to modify the entries in the blueprint. Repeat Export and Save.