MAP MAKING TUTORIAL

by Dmitry (Veitikka Studios)

1 June 11





Map files

For each map there is a set of files that the game understands:

- map.xlm file where the name of the map is recorded and which files are used for display. If you copy it from another map, then I think by the attribute names you figure out where you need to enter the necessary data.
- defaults.xml the file where the day length, temperature and season type values are recorded depending on the month. Later I will write in more detail how to configure it and what each of the meanings mean, so while temporary you can copy this file for example from the Fulda map for example.
- locations.xml the file where all the names of settlements on the map, the coordinates of the inscription, its size, font type and size are recorded. These inscriptions are created in the map editor of the game, but if you REALLY want, you can do it manually in the table immediately.
- terrain.bmp file with settings for tiles on the map, each pixel has its own color, which belongs to a specific type of tiles. They can be created both in-game editor and in the graphic editor also.
- height.bmp file with a relief on the map, below we will consider how to create it.
- preview.png file used to display the entire map on the farthest zoom
- preview_small.png the file used in the battle editor only, when you select a sector.
- info.png file with the name of settlements, which is used only in the editor of battles.
- lights, png file with lighting during the night. It is created at the very end, in a rather tricky way, but on the whole is not difficult.
- background.png a file with a picture that is used when loading a map. You can use any image to your taste.

Hello, my name is Dmitry and I drew maps for AB and by numerous requests I will tell you how I did that and how to make your own map.

First of all, I would like to briefly tell you about the main points:

Unfortunately, English is not my first language, so I could be mistaken in some formulations due to translation difficulties and make punctuation errors. But I will try to convey thoughts as easy as possible.

This tutorial is based on my experience, so it may well be somewhat inconvenient in some places, so if you know the solutions better, please write it in the comments. I think we all will be grateful to you. I will try to complement the best decisions and some changes in the process in the first post.

If the tutorial is incomprehensible in some places, then I will try to add more detailed descriptions in order to get intelligible material in the end.

The maps in the game are quite large. At a resolution of 30m per pixel and 2048 pixels wide and high, we get 61440x61440 sq m, i.e. just over 60 km in all directions. Technically, the game also supports large sizes, but here it should be think in mind that as the scale increases, the influence of the curvature of the Earth increases, which means that errors accumulate. Nevertheless, errors on such scales can be "acceptable". And I don't speak about the time what it could take.)

The map for scenarios is limited to 15×15 km, which is also not the limit and everything depends on the power of the computer (on my relatively powerful computer I was able to run the scenario in the size of 27×27 km until the game crashed at biggest size).

The game uses a system of tiles in the form of squares, and therefore it is quite difficult to display correctly directions that are slightly different from the axes and diagonals (i.e., the road going under 6.3 degrees will be relatively problematic to display without assumptions). Therefore, the roads in the game are made with some conventionality of ease of use and display. With 100% geographically correct mapping of roads, huge amounts of artifacts arise and the network of roads becomes rather unattractive (I would even say "inconvenient to reading")

The maps use a real height map, but their extraction and preparation for the game have some difficulty (I would even say trickness), but in general, if you figure it out, the main difficulty will be to have enough free time and great desire.

But more on that below.



Relief

Like many realistic simulators, where there is a real height map, as far as I know, they now use the Shuttle Radar Topography Mission (SRTM) dataset that covers about 80% of the land on earth (from 56 $^{\circ}$ S to 60 $^{\circ}$ N .).

The mission itself looked something like this



You can read about this in Wikipedia

But back to the game.

First of all, you need to understand which region will be of interest to you. For an approximate understanding and "guessing" of the sector, I used this site (real relief maps for Cities: Skylines)

On this site, you can visualize the sector at 60x60km (or less) and approximately check if all that you might find interesting will fit into it. Thanks to this, you can easily plan exactly what place you want.

For example, a sector might look something like this (this is just an example)



Unfortunately from this site you can download the elevation map in a fairly low resolution, so that it does not really help, but still.

So. It seems to have dealt with the sector, but where can I get a map? To do this, you can use $\underline{this \ site}$

By registering on this site, you will be able to download elevation maps from different sources, it all depends on the search filter.

This site has tutorials, but we can look at a specific example:

On the left you can see the main panel with tabs, and on the right the map itself.

We will consider in stages.

Search criteria tab

First we need to decide on the coordinates by which the site will look for height maps. Clicking on the map you put points on which you can select a region (or you can use the selection by holding down the left mouse button). You can roughly "by eye" highlight a square sector based on what you selected on the previous site.

ALAUL DER FAUS



Highlighting the sectors, go to the next tab "Data sets" there you need to select: Digital Elevation/SRTM/SRTM I arc-second Global



Now clicking on the Results you can see a list of available data for this criterion.

If you seler	ted more than one data set to sea	the lise the
dropdown I	o see the search results for each s	pecific data set.
Show Resi	ult Controls	7
Data Set	Click here to ex	port your results = 🖒
SRTM 1 Arc-	Second Global	1
	Displaying 1 - 4 of 4 0	Ţ
	Entity ID:SFITM1N52E008V3	1
1000	Publication Date:23-SEP-14 Resolution:1-ARC	
1	Coordinates:52 , 8	
202	" = = = = = O	
	Entity ID:SRTM1N52E009V3	
	Publication Date:23-SEP-14	
2	Resolution:1-AHC	
53.		
- constants	1 E E C -> 4 O	
	Entity ID:SRTM1N53E008V3	
- L	Publication Date:23-SEP-14 Deselution:1, ASC	
3	Coordinates:53 8	
	3 H 4 7 4 8 0	
	Entity ID:SFITM1N53E009V3	
	Publication Date:23-SEP-14	
4	Resolution:1-ARC	
100/	Se of of one is an o	
(man)	7 1 1 1 1 2 3 1 1 0	
		1991 T

Photos will be large enough and will cover a fairly large area, but do not be afraid, we would cut out the sector of this piece.

Push "Download" inter each photo and download each image preferably in GeoTIFF format.

Download O	ptions X
Download	BIL 1 Arc-second (3.4 MB)
Download	DTED 1 Arc-second (12.4 MB)
Download	GeoTIFF 1 Arc-second (12.4 MB)

And so now you have data on the sector of your interest, let's process it.

I used the QGiS program and it seemed to me quite simple and effective. First, download it from <u>this site</u> and install it.

After installation, run the program and create a new project Project -> New Now add our downloaded height maps using Layer> Add New Layer> Add Raster layer...

Project Edit View	Løyer Settings Plugins Vector Data Source Manager Create Layer	Raster Data Ctrl+L	P P A A C B	3 9, 9, 1
🥵 🍋 Vo 🖉 Browser	Add Layer Embed Layers and Groups Add from Layer Definition File	,	V _D Add Vector Layer	Ctrl+Shift+V
Envorites	Copy Style Parts Style		Add PostGISLayers. Add SpatiaLite Layer Add MSSOL SpatiaLite Layer	Ctrl+Shift+D Ctrl+Shift+L Ctrl+Shift+M
Dr\	Copy Layer D Paste Layer/Group		Add DB2 Spatial Layer	Ctrl+Shift+2 Ctrl+Shift+0
SpatiaLite PostGIS MSSQL Gracle DB2	Open Attribute Table Togglu Editing Save Layer Edits Corrent Edits	P5	Add/Edit Virtual Layer Add WMS/WMTS Layer Add WMS/WMTS Layer Add ArrGIS MapServer Layer Add WCS Layer	Ctrl+Shift+W
WMS/WMTS WYZ Tiles WCS WFS OWS ArrGitMapServe	Save As Save As Layer Diffinition File Remove Layer/Group Duplicate Layer(s) Set Scale Visibility of Layer(s)	Ctrl+D	Add WFS Layer.	e;

Highlight the downloaded files and click Add

Now our files look like this.



Do not be afraid that the maps look strange, this is because each sector has different values of the minimum / maximum heights, so now we need to merge them into one big picture. Click Raster> Miscellaneous> Merge... and a dialog box opens in which you need to select our files in the "Input" section

December 100			
inut laws		and the second	11. 10. 10.
Desmints seecond		and the second	10.00
Grab pseudocolor table from first layer		and the second se	Codine 1
Place each input file into a separate band Output date type	0	Multiple selection	
Rost32	- 11	2 in52_e006_1arc_v3 (EPSG 4326)	Select AB
Advanced parameters	1	n52_e009_1axc_v3 (1) (EPSG/4326) 7 n53_e009_1axc_v3 (EPSG/4326)	Clear Selection
Nerged		✓ n53_e009_1avc_v3 (1) [EPS6:4326]	Topple Selector
Open autput file after running algorithm			Add File(o)
GDAL/OCR console call			OK.
plat, mergetan ser Rock21 of traffer 4 o.C.Asex, https://dockaraf.templo prozensorg_Toxeelosty/order/Toxebook2002/774/2007/374/8097/enterbook AppDeta_LocalifTemplo.ccs.ang_ffset0453112/646/ff264.839934600(mergatige/Files.tot			Canos
as cent	-		

Now clicking Run will start the merge process. As a result, you get one layer Merged in which all sectors are merged into one. By the way, at below the layer you can notice the values of the minimum and maximum height in the sector, in this case -43m - 437m (you will need it)



Now let's find the coordinates of the meridians and parallels to cut the desired sector.

Projections.

Now we need to deal with the projection. The correct image of a spherical map on the plane was an eternal problem of cartographers, and we are also faced with this now. In order to avoid this, it is necessary to translate the map into a UTM projection relative to time zones.

Go to Project> Properties> CRS

enter in the line Filter UTM and in the Coordinate reference system of the world, find WGS 84 / UTM zone 32 N at the end of the list.

		10.255 (5.2)
oject Properties CRS		
	Protect Coordinate Reference System (CBS)	
an barr		
eners		
fetadata	Pater _ S. OIM	- 102
	Recently used coordinate reference systems	12.121.12
:RS	Loordinate Reference System	Authority ID
dia trata	W05 44 / 01 M 2018 32N	CPOUSEDS2
ata Sources		
canona (¢	3
snables	Coordinate reference systems of the world	Hide deprecated CRS
ACTON	Coordinate Reference System	Authority ID
	WGS 84 / UTM zone 315	EPSG:32731
GIS Server	WG5 84 / UTM zone 32N	EPSG:32632
- 4246-4247	WGS 84 / UTM zone 325	EPSG:32732
	WGS 84 / UTM zone 33N	EP5G:32633
	WGS 84 / UTM zone 33S	EPSG:32733
	C	>
	Selected CRS WGS 84 / UTM zone 32%	· · · · · · · · · · · · · · · · · · ·
	Exterio 6.09, 9.00, 12.00, 94.00 Front - scop-um izanc-32 Hobsan-WCS84 Hunts-en Hro_defa	
	Detuni Transformations Ask for detuni transformation if several are available (defined in	plotest setting)
	Source CRS Source datum transform Destination CRS	Destination datum transform

** To see what other projections are in the world and how they looks you can use that site

Cutting

And so your map now looks flat and much more correct. Let's cut out the sector we need now.

First, install the QuickMapServices plugin

Go to Plugins> Manage and install Plugins

In the search bar, find quicmapservices and select the found file from the list. Install it by clicking Install plugin

AI	G. quidrage	a
in the second se	DuckMapSenices	QuickMapServices Golection of casy to add basemaps Conversion to a sa href=http://gms.nextgis.com/http://gms.nextg
		Ungrade # Dretal plugn

Plugin installed.

Now you can call it through the menu Web> QuickMapService Let's now add an Open Street Maps Map to our height map. To do this, select OSM>OSM standard

Q tut-QQS Project Edit View Layer Settings Plugins Vector Raster Detablese <u>Web</u> Processing He	elp
□ ■ 目 目 記 図 詳 ② 参 伊 尹 尹 知 □ Massards ● ○ V / 冊 / 月 日 古 次 - 図 回 → <mark>● Guid-MapServer</mark>	C C C C C C C C C C C C C C C C C
	OSM OSM Cycle map Atlas Mos OSM Standard
Evoltes Di Home	Search QMS Add to Search Add to Search C OSM TF Landscape OSM TF Outdoors C OSM TF Tensport Dark
 > CA > DA writter AS 	Set proper scale Set traps Settings Settings About
Spatialite PostGf5 MSS78	And

Now we have a height map and an online OSM map (in fact, it can be any other) as a reference.

Now let's find our sector and cut out what we need. I used a fairly simple guide system to calculate the sector of the desired size and save it separately. There are other options (maybe you have better?)

Guides.

Go to View> Decorations> Grid... and customize the guides with specific parameters. Our sector will be 61440x61440m in size and therefore we need guides of the same scale.

<u></u>					
✓ Enable Grid					
	1		Draw Annotation		
Interval X	61440		Annotation direction	Horizontal	4
Interval Y	61440		Font		·7.
Grid type	Line	~	Distance to man		
Line symbol		 •	frame	0,00	÷
Marker symbol	+	Ψ.	Coordinate precision	0	*
Offset X	0		Update Interval / Off	set from	
Offset Y	o		Canvas Extents	Active Ra:	iter Layer
			-	782.00	11.1

Click on Add and guides will appear on the map. Now every square is a sector that we need in the right size.

Please note that the guides are set in their coordinate system, and we need them to cut a certain sector.



Use Offset Axes and the Update button to visually adjust the region of interest.

And in the end we got something



If we are satisfied with everything, then proceed to the next step - cutting.

We need 2 points of the sector (upper left and lower right).



Approaching close enough to one of them, we need to move the cursor over the crosshairs and write down the coordinate values at that point.

Reter

Do the same with another point.

Now we have the coordinates of the parallels and meridians along each edge of the sector. 460080, 5878800 521520, 5817360

Let's cut our sector to a separate file.

In the Layers tab at the bottom left, select the merged layer and right-click on it and select *Export*> Save As

ALL	8 ×		
出来下与	• II II II		
CISM Star	etiesd		
2 Meruet	Count to Layer Show in Directiew Copy Layer Negame Layer P Zoom to Native Resolution (100 Spetch Using Current Extent	2	
	Euplicate Layer Bernöve Layer Monato Tor		
	Set Layer Scale Visibility Set CRS	,	
	Export		Seve As
	Style: Primeties	*	Save as Layer Definition File Save as DGIS Layer Style File

In the window that appears, select Raw data, GeoTIFF format

	GeoTIFF v Creat						v 🗌 Óre	ste VRT
ie nate	C: Vinera Utrai (Dea	ktop\jat3.6F					4	a] [
ayer name								
RS	Project CRS: EPS	32632 - WQ	584/UTM	zone 32N				
Add saved	file to map							
Extent (current: tst3)							^
		North 587	8900.0000					
West 4000	0000-08				Cast	321520.0000		
		South 581	7360.0000	la -				
Curre	ot Lover Extent	Calcul	late from L		1			
				and the second sec		Map Carlyes	EXERN	
				oper	1	Mapicanives	Exterit.	
r Resolutio	on (current: use	(defined)				Mapicanies	Exterit	
r Resoluti	on (current: user al 30	r defined)	Vertical	30		Mapicanivas	Extent	
 Resolution Horizont Column 	on (current: user al 30	r defined)	Vertical	30		Mapicanies	Layer Hesolutio	
 Resolution Horizont Columns 	on (current: user al 30 2048	r defined)	Vertical Rons	30 2048		Mapicanies	Extent Layer Resolutio Layer Sae	
r Resolutir ○ Horizont ● Columns r □ Creat	on (current: user al 30 2046 te Options	r defined)	Vertical Rons	30 2048		Mapicanies	Extent Layer Resolutio Layer Spe	
Resolutio Horizont O Horizont O Columns Columns Creat Notice Data	on (current: user a) 30 2046 te Options aut:	r defined)	Vertical Rons	30 2048		Mapicanios	Layer Headlabo Layer Stat	
Resolutio Horizont Golumns Creat Tortis Dati	on (current: user al 50 [2048 te Options aut	r defined)	Vertical Rows	.30 2046		Mapicanies	Layer Hessilubo Layer Soe	

- in the file name, choose where to save it and how name it (the browse button on the right)
- CRS choose our UTM from the dropdown list.
- click the Add saved file to map checkbox so that after cutting it is also added to our layers.
- enter our coordinates
- In the "Resolution" tab, select the "columns" and enter our 2048x2048

Now, clicking on the Ok button, we will get the cut out sector from the large image in the size we need.



now you know the height value in this sector (from -4m to 92m)

Now it is necessary to make the game understand this map of heights. At the moment there are 2 ways to do it:

- using QGIS
- using a utility written for this

Before this, a brief explanation of the principle of converting elevation maps

to a file for the game and why it is so red and with gradients.

If we take the color and divide it into 3 parts, we get the RGB color: red, green, blue. Each color has a range from 0 to 255, and the receipt of a particular color will be a unique combination of values for each color.

Gradient - a smooth transition from one color to another. For relief, the game use the value of red and uses blue as a counter between the levels (in fact, no, the game does not use blue, but I use it for convenience).

Suppose that the value at 0 meters is Red: 0, Blue: 0, then for 72 meters of height it will be Red: 0, Blue: 0. Knowing that red cannot be more than 255, then at 256m of height the value of red will be reset to 0 and blue to the next counter, i.e. Red: 0, Blue: 1 and so on. This results in such ring-shaped gradients, the red color goes up by each meter until it reaches the peak and is not reset to the next stage.

I) Build a map using QGIS.

I have already tried to make these gradients in a separate style so you can download THIS style file and apply it to your sector.

- download file
- go to the settings of your layer with the relief
- select "Load style ..." in the bottom menu and select the file with the style



- wala! your sector is repainted.
- now you need to save it using the Export command and instead of RAW data you need to use the Render image

Save Ra	ster Laver as	X
Output mod	e 🔿 Raw data . 🖲 Rendered imane	
Format	GeoTIFF	∽ Create VRT
File name		
Layer <mark>n</mark> ame		
CRS	EPSG: 32632 - WGS 84 / UTM zone 32N	~ 🌏
🗹 Add sav	ed file to map	
♥ Extent	(current: layer)	^
	North 5878800.0000	

• now remains to convert that file to the .bmp format in any graphic editor that can open the tiff file.

2) using software

This program was made by Juha so that you can quickly convert the elevation map in the correct format. The only difficulty is that it is launched through the Windows command line, so if you are not experienced in this matter, then you may have very minor difficulties.

- First you need to download it HERE
- copy into something like C:\1 to some simple folder
- now to launch it, click Win + R and the launch window will open and enter the command "cmd" there so the command line will be launched
- now enter the command C: \l\convertheight.exe or simply drag the downloaded .exe file into the command window
- · if you press enter, then most likely the program will give an error
- Invalid arguments, should be <input> <output>. Optional: -sca <scale> -min <minimum> -smo <smooth>
- This means that after the command you need to add the name of the file that is the source, the name of the file that will be in the end and you can also add the necessary optional attributes:

- -sca the number of transitions of the red channel, that is, how many times the height will pass the mark of 255 meters. To find out, then subtract the minimum height from the maximum height and divide by 255.
- -min the minimum height in the sector to correctly display the height reference point
- -smo level of relief smoothing. SRTM data is often quite noisy, so to get rid of this point, you can add smoothnes. Very useful option
- download your sector-relief image in bmp format to the program root folder.
- now we need to add data and the command will look something like this: C:\I\convertheight.exe file I.bmp height.bmp -sca 7 -min 215 -smo I

Clicking on Enter you start the process and the final file will appear in the folder where the program is located.

Preview

Now you need to make a picture for the map preview. This file will be used when selecting a sector and in the game on the most distant zoom. But the most important thing for mapmakers is that this file can be very conveniently used for drawing real data immediately in in-game editor.

First you need to create it. Here is a couple ways:

A. I used a map with data from the OSM, therefore, since we have already created a map in the file, then we can cut out from it the piece we need in a fairly large size.

- Choose a layer with an OSM map
- Click Export Save As ...
- in the settings select Render image
- select CRS to "Project CRS:..."

- to cut the region we need then in Calculate from layer select your layer with a sector.

A: MUL DER FAUS

Dutput mode	🔿 Raw data 💿 Rend	lered image		
ormat	MS Windows Device Ind	lependent Bitmap	 Create 	VRT
=ile name				
ayer name				
TRS .	EPSG:3857 - WGS 84 /1	Pseudo-Mercator	~	-
Add save	d fle to map			
▼ Extent ((current: layer)			^
	Nor	th 20037508.3428		
West -200	37508.3428	East	20037508.3428	
	SOL	th -20037508.3428		
C			Mar Carrier Estant	
Curr	ent Layer Extent		Map Canvas Extent	
		USIVI standard		
▼ Resolut	ion (current: layer)	ighway		1
Horizon	tal	highway	Layer Resolution	
🔾 Column	s 0	√ r1	Layer Size	
		🗶 tst3		
🔻 🗌 Crea	ite Options			
Profile De	fault		v.	
		Name	Value	
		Ner DE	value	

- in the Columns, you can set an arbitrary (but equal) value. As far as I know the game can open the file in any size and it all depends on the power of your computer. My relatively average computer was able to open a file in the size of 6000x6000 pixels and this helped a lot when creating maps. So experiment and be able to choose the right size for you.
- after that you will get a file on the output (for the game, .png is needed, so you should convert that with the help of a graphical editor)

B. Suggestion by Af1352pasha

Project(menu)-->Import/Export--> Export Map to Image



Similar way but more convenient.

Now that you have a file with a preview,

In in-game editor you can use the T key to switch between the map in the game and the preview file in the game map editor. Very comfortably.

You can also download maps from other services (here you can find a tutorial on how to do this in section No plugin required)

Filling data.

There are several scenarios:

I. export data directly from the OSM and use it in its original form:

- + real data
- + export process is quickly enough
- quite a large number of errors
- does not work well with the tile system (we call it susages-roads)

- The data depends on the occupancy in the OSM. If there is emptiness, then nothing to do with that.

- quite a difficult way but still.
- 2. Draw over other cards with your hands.
- + you can use any existing map of a specific time
- + great detail control

ALAULIDER CAUS

- + the result is the most beautiful for such a system
- + you can do only in-game editor
- + works best with the tile system, but sometimes there are errors with a discrepancy with the relief in favor of readability
- takes a LOT of time
- requires a very large perseverance and attention

3. combination of methods

+ - here are the pros and cons mixed together depending on the proportion of each method.

I. Export data.

So far there is an opportunity to use OSM so we use QuickOSM plugin Opening it you will see something like this.

Quick query	Help with key/value			Reset
Query	Key	tagtneay		
	Value	Query on all values		
	Layer Extent 🗠	2 60		~
Decompose				
raiamesers				
About				
	Advanced.			
	Advanced	Shaw query	Ran query	
	Advanced	Show query	Run query	
	Advanced	Show guery	Ran query	
	Advanced	Show query	Ran query	0%
	Advanced	Show query	Run query	0%
	Advanced	Show avery	Ran query	0%
	Advanced	Show avery	Run guery	0%
	Advanced	Ston autry	Ran query	D%
	Advanced	Stow anty	Run query	97
	Advanced	Show autry	Run query	0%
	Advanced	Show query	Rin gery	0%
	Advanced	Show autry	Run query	0%
	Advarced	Shan quary	Run qurty	0%
	Advanced	Show adry	Run query	0%

Key - here we select the type of data we are interested in (roads, forests, lakes, etc.)

Value - here we select a data subtype (or do not select anything, then it downloads the entire array under one type.

Instead of In we put the Layer Extend and select our layer with the relief. Thus, the data is loaded within this layer and nothing more. After you click the Run query, you will see an array of data of different types (points, lines, areas). What type of data you can choose in Advanced so be guided by what comes out of it.



** If you have an error, then perhaps it is related to the complexity of access to the server. To do this, change the settings in the parameters API and try to use different until it works.

Now we need to export them to raster. The problem is that the program sees these lines as vector objects and it has no idea in what resolution they need to be made.

For this, we will be helped by a layer with a relief that has the resolution we need.

First we give the lines a thickness. To do this, use the command Vector - Geoprocessing Tools – Buffer

ALLEDGREADS

Parametera Log	Buffer
Input layer	burrei
V" hg/wey (IPSG-4328) Selected features only Dictance .00035 Segments 5 5 501 cap style	Comparing the set of the set
Round	offsetting corrers in a line.
Join style	The mitter kmit parameter is only applicable for mitter toin styles, and controls the maximum distance
Round	from the offset curve to use when creating a
Miter limit	mitarieu join.
2,060000	•
Dissolve result Bufferad	
[Greate temporary layer]	221
🗹 Open output file after running algorithm	
	0% Cancel
Purp an Ratch Process	Due Due Hale

In the Distance field, I used the value 0.00015 and this was enough for me for a single-pixel line, but you can experiment on something that will be more convenient for you.

Click Run and wait for the process to end.



You may notice how all the lines have become thick, but at the same time they consist of many segments. Let's combine them all into one.

Use the Vector - Geoprocessing Tools - Dissolve.

Select our buffed road layer and click Run.

Now all roads are combined into one vector layer.



We have to cut it from relief map to get raster lines on the same scale as we need.

Use the menu Raster - Extraction - Clip Raster by mask layer

Input layer - choose our layer with relief

Mask layer - choose our layer with vector roads

🔍 Clip Raster	by Mask Layer			×
Parameters	100			
Input layer				^
F tst3 (EPS)	3: 32632]			~ []
Mask løyer				
Dissolved	[EP5G:4326]		× 6	- 22
Selected fe	abures only incl contains while its puttrait baseds [antipose]]			
Notset	and the second states in the design of the second states			-
Create an	putput alpha band			
Match the	extent of the clipped raster to the extent of the mask layer			
Keep resolu	ution of output raster			
Advance	d parameters			
Clipped (mask)				
[Save to temp	orary fle)			
C Open outp GDAL/DGR.com	ut file after running algorithm sole call			
gdalwarp -of processing_5	GTiff -culine path to_clata_file -dstabha_Cr/Users/Hisi/Desktop/Ist3.6f Cr/Users/Hai/AopData/Local/Temp/ 377246537844e38645ac6709ff5ab70/3xd8xe0034724405a45f6c6a4628xe60/DUTPUT.6f			~
			0%	Cancel
Run as Batch P	iocess.	Run	Close	Help

You now have a raster image of roads.



**



** As you noticed, the lines are interrupted, this is the back side of cutting, when the line was between pixels and the program could not recognize which of the pixels should be taken. Therefore, a small program was developed to close such lines. Here you can read about it.

If you go into the settings of the masked mask, then the symbology and change the Render type to Singleband pseudocolor, then you can repaint the layer to the desired color.

W. Band Bender	ing.				
Render have for	wiebend pers alocal	r v			
Rend	Real Property lies	of a filtrand			
e Ha		in t forest	1 Marcol	6	
clegy > Min / Max	Value Settines		1100	(4	
		lunar .			
sarency interpretori		Liea			
Color ramp					
suffix					
009 Value	Color Lab	od			
ids 🔍					2
d Server					
nd / Genoue					
d Gerve Mode Continu	106 V				Classes 5 2
id Grove Mode Contrau					Classes 5
s Geryer Mode Contenu Caserly _ Cla out-ofr	nue 💉	•			Classer 5 2
d Gerve Mode Content Cacoty Class out of r Class out of r Class out of r	nus 💉	•			Clesser 5 2
d General Mode Controu Caratry Claratofr Claratofr Claratofr	ous V The second secon				Classes 5 2
d Gene Mode Continu Coortin Colo autofr Color Bendo Bendro node ja anjittras	nus V Ange volues rang Kormal		V S) contract	-	Classes 5 2
d Grove Mode Contribu Cooth Clout of Gentry sock Bentry sock Bentry sock Bentry sock Bentry sock	ous V P P P P Wyge vokes ring Kermal		S Contrast	-	Classer 5 5
d Grove Mode Contrac Coorte Clo out of r Clo out of r Saturation Saturation Has	nue V Tem Indues ringe volues termed Colonee	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	v ≩∣ contract ≩∣ contract off gh	-1	Classer 5 2

In order for the game to understand who needs which color, the color codes for each type of surface in the next paragraph.

In the same way, download all the categories you need and in the end you can achieve the map what you need in a rather difficult way.

2. Drawing by hand.

To start the in-game editor, you need to make changes to the game's \data\

scenario\development.cfg file and set

mapEditMode=1

Now if you generate a scenario in the game, you will be taken to the map editor.

You can also use any graphics editor and draw there by using pixel brushes (or a pencil). Just open the terrain.bmp map file, and you can use graphic editors for drawing, if you feel comfortable with them. The terrain type colors can be found in the *docs\terrain_palette.png* file.

Info.png

After preparing all of this files the game would requre info.png (its the labels of cities on the battle generator menu), so you can use that info.png as a placeholder before you finish the map and you'll think about a such cosmetic thing.

Tips, tricks, features.

- I used the fence as a border between Germany, so it displays a rather bright red line. I hope in the future we will introduce a separate group of the fence to make some kind of fencing (although this is more likely a cosmetic type of tile)
- There is a trick when drawing railways. The game automatically draws the connection of the railways when crossing the asphalt road, but if you immediately make a diagonal turn after crossing, the game will break the railway.



Therefore, you should draw an additional pixel forward and only then draw the turn.



• There is also some difficulty with bridges. If you draw 2 bridges nearby, then unfortunately they will unite





Try to avoid such situations. But if such situations occur quite a lot, then we will need to add a separate color for a separate bridge. Tell me if there are difficulties with this.

• Dense building has a bad effect on the movement of units in cities. Some houses can be built in a tile from the road and most likely will block routes that would help overcome obstacles. Heavy units unfortunately can't break through the houses. Try to avoid such things.







That is much better (you can also add the trees and bushes for example)

• Use text. I used different sizes of labels to designate villages/cities or some local sights.

When you press the L button in in-game editor, you will enter the text assignment mode. Clicking on the desired tile opens a window in which you will need to enter the name of the place. Using the F2 key - change the text style; F3 - change font size; F4 - change text color.

Here are the principles I used:

- Large text size I used on the largest cities in the region. It appears on any zoom level.
- The average size I used in settlements that are regional or district centers
- small size I used on very small villages
- I used italics on sights (some artificial places, forest, mountain, lake)
- used colors for the intended purpose (white artificial places; green forest, field; blue - lake, river, etc.)

• The principle of building an autobahn.

Their 3 colors, but they themselves are the same. This amount is necessary so that you can make a road that runs parallel to the other and does not intersect with the next. So you can use all kinds and connect them



To be beautiful, I connected different colors of the autobahn somewhere on a straight part of line.







ALL LADER CAUS

Thus, the player does not see the difference, but the game sees that this is a road and it continues.

• Roads are automatically tied to neighboring tiles; on this, some roads may have a rather strange error. For example, such a connection







In game it will look like this If it suits you, leave as is. If

If it suits you, leave as is. If not, then you can manually clean up from errors

I think while such subtleties are enough to make a map of your dreams!

That's all FOR NOW. I will add new information as communication and suggestions and difficulties.

Thanks to all!

