

PROCEDURE TO CREATE THE TENERIFE 3D TERRAIN MESH

This tutorial describes the general procedure to get the Tenerife 3d surface base mesh.

This general procedure should apply to any surface base.

Utilities required to create grey scale maps and 3d terrain meshes

1. Plugin for Google Earth srtm3.kmz
http://www.ogleearth.com/2007/07/kings_college_1.html import www.ambiotek.com/topoview
2. MicroDEM Map Tool
<http://www.usna.edu/Users/oceano/pguth/website/microdem.htm>
Download [complete MICRODEM install](#)
3. GIMP for Windows
<http://www.gimp.org/windows/>
or Photoshop with
http://developer.nvidia.com/object/photoshop_dds_plugins.html
4. EasyMapper or EasyTiler by nickd
<http://www.orbithangar.com/download.php?ID=3068>
<http://www.orbithangar.com/download.php?ID=3069>
or
World Wind Tiles download & LevelCreator
<http://getu.heim.at/ww/>
5. Anim8or
<http://www.anim8or.com/main/index.html>
6. Terranim8or
<http://www.biederman.net/leslie/terranim8or/instructions.htm>
7. 3ds2mesh converter by Vinka
<http://users.swing.be/vinka/>

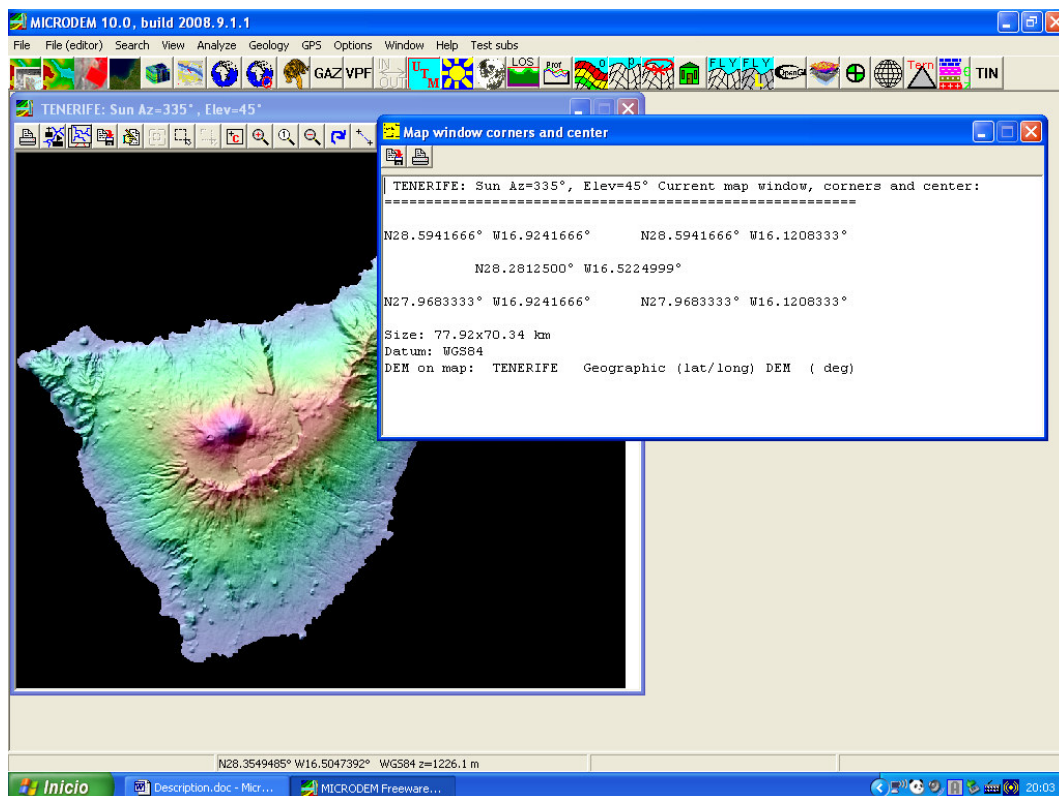
Utilities required to create Surface Tiles Textures and Surface Bases:

1. Surface Tile Calculator by ar81
<http://www.orbithangar.com/searchid.php?ID=2752>
2. Image Splitter by nickd
<http://www.orbithangar.com/searchid.php?ID=2150>
3. UV Mapper
<http://www.uvmapper.com/>
3. DDS Converter
<http://files.filefront.com/DDS+Converter+2+10/;3577988;/fileinfo.html>
4. Surface Base wizard by ar81
<http://www.orbithangar.com/searchid.php?ID=2796>
5. nfarView (recommended to combine surface tiles)
<http://www.irfanview.net/>

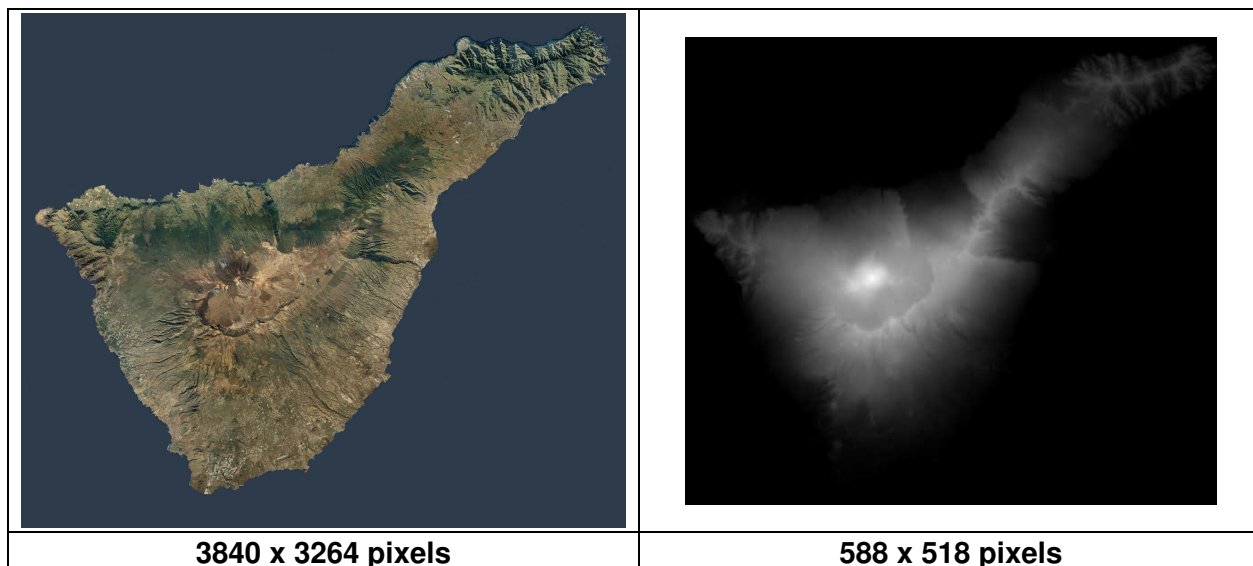
1. GET THE GREYSCALE AND TEXTURE COLOUR MAPS

Reference: add-on 3DTerrainMeshes

Get the elevation map using srtm3.kmz and microDem
Anotate the geographical coordinates and image pixels size



3. Using the geographical coordinates obtain the surface texture using EasyMapper, EasyTiler or World Wind Tiles download. In our case we used EasyMapper at level 13.

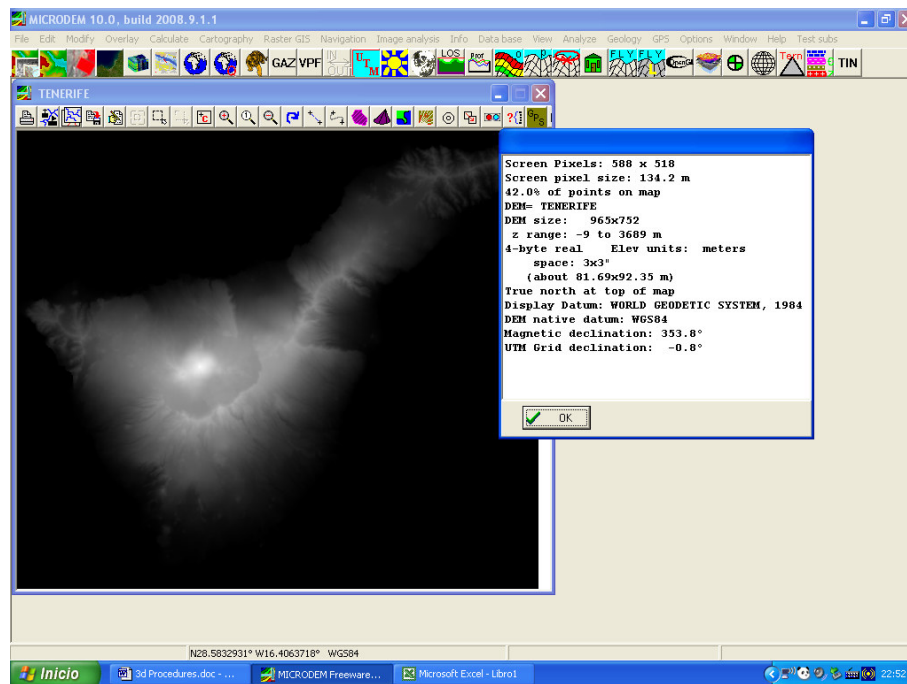


At 13 level we imported a bit map of 3840 x 3264 pixels whereas the grey bit map has 588 x 518 pixels

Bit Map	Texture	Grey	Ratio
Width	3,840	588	6.531
Height	3,264	518	6.301

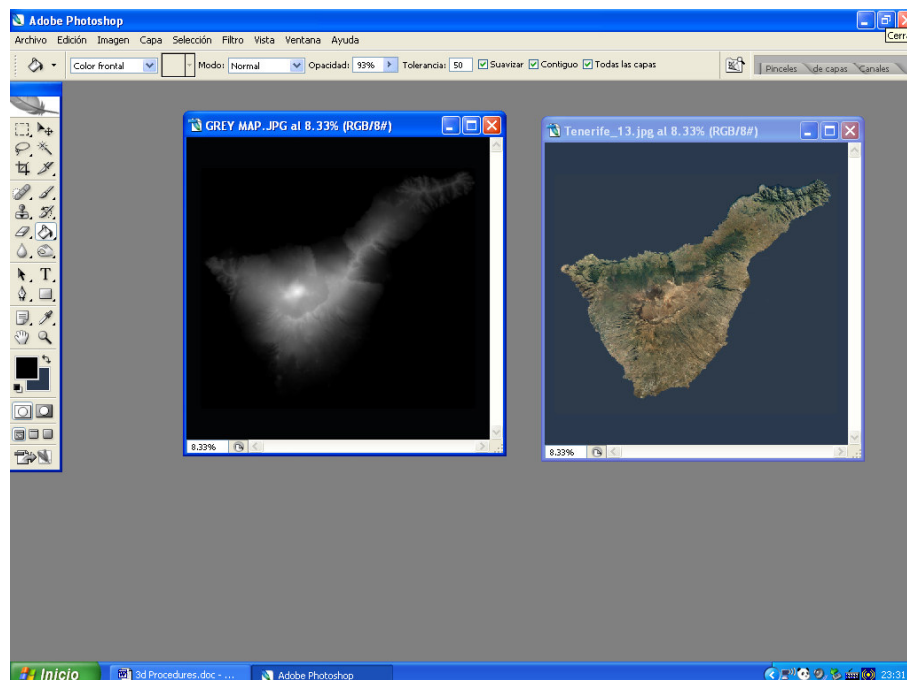
Zoom the grey scale map to a factor of 6.301 so that we obtain the following map sizes

Bit Maps	Texture	Grey	Ratio	Deviation
Width	3,840	3,705	1.036	3.52%
Height	3,264	3,263	1.000	0.03%




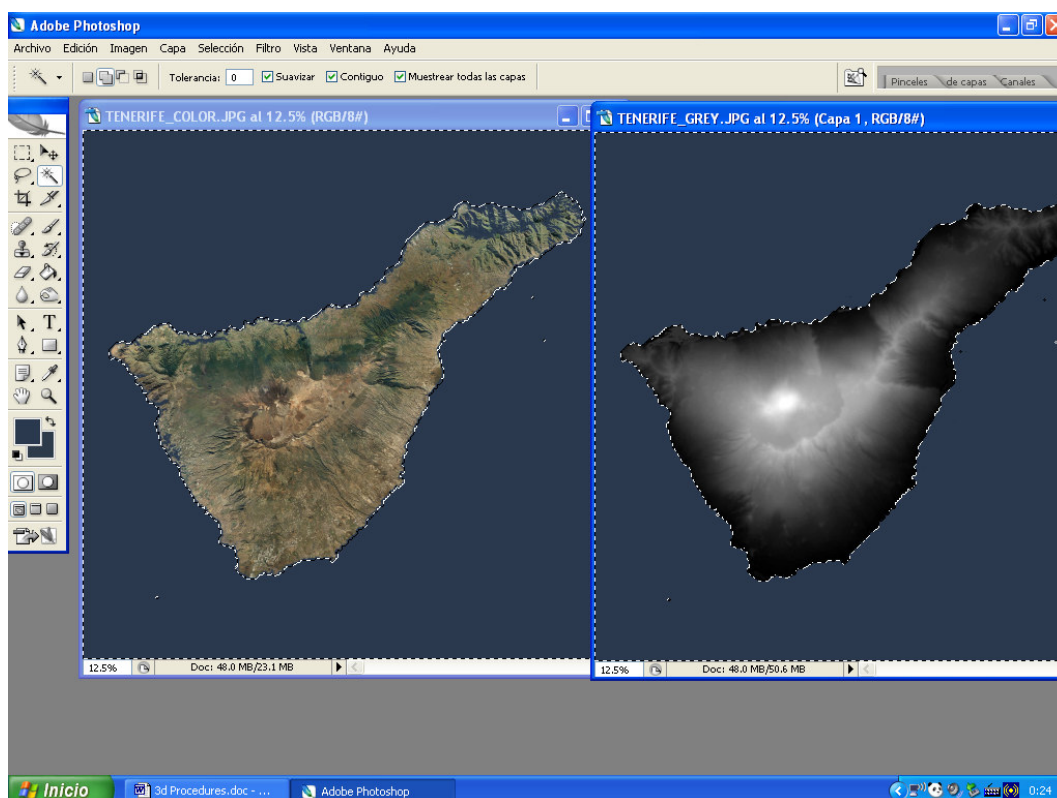
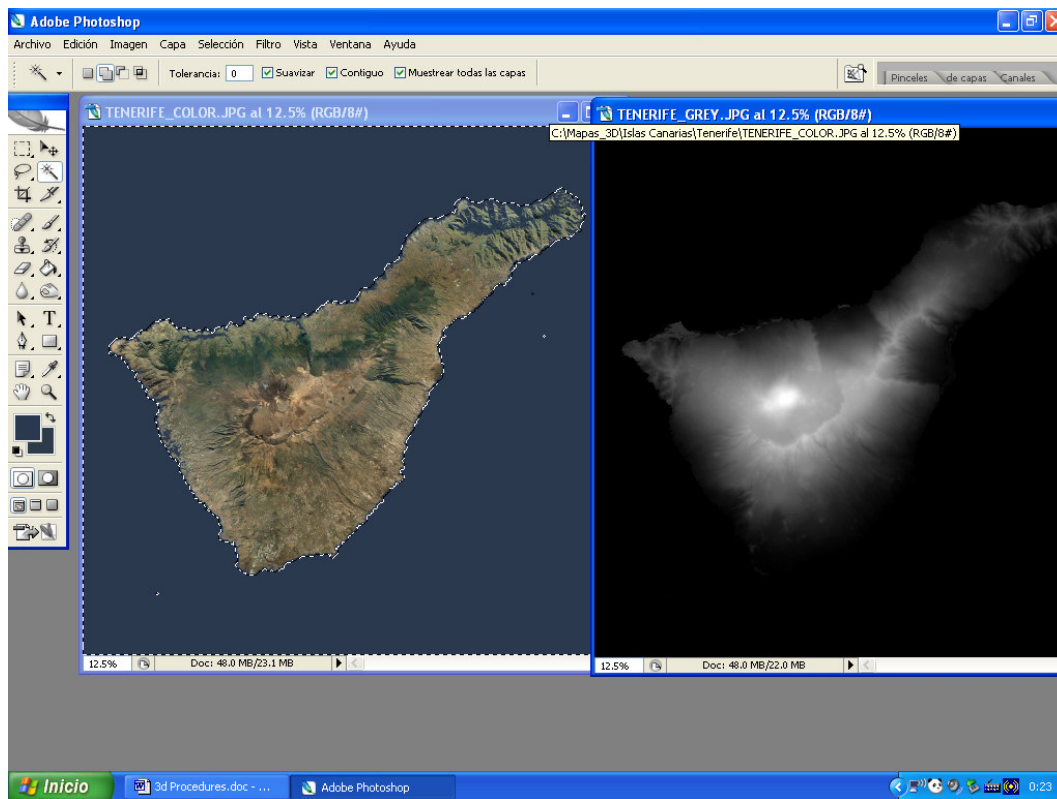
Since our bit maps must be a multiple of 512 pixels (power of 2), we enlarged the **canvas** to 4096 x 4096 pixels.


Image Size	Tile Size	Tiles n ^a
4096	512	8
4096	1024	4

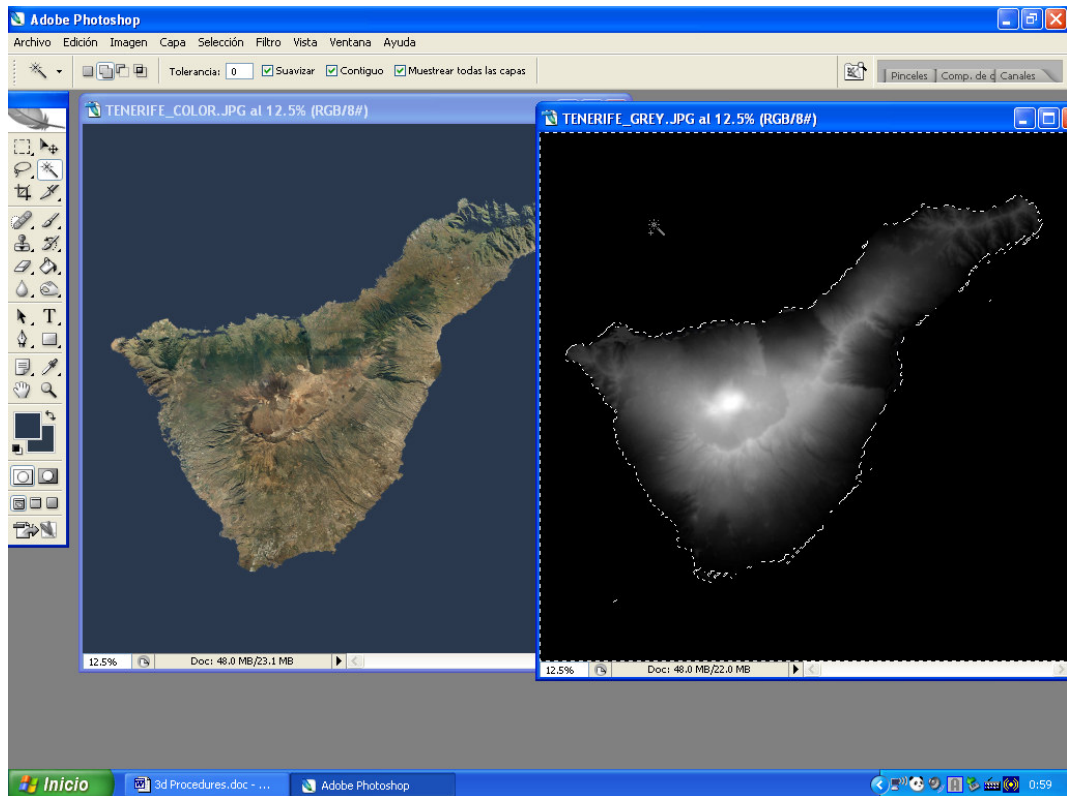


In order to improve the matching between both bit maps, you may do the following:

- Open both colour and grey images.
- With the magic wand  select the uniform area of the colour bit map
- Copy and paste over the grey colour map and adjust the images.



- Retouch if necessary.
- Select the uniform colour area of the grey scale map and with the  paint bucket fill with the black colour.



Note: If your greyscale map don't shows a uniform black colour around its edges you should retouch your image as outlined in the 3DTerrainMeshes add-on.

This way we have prepared both greyscale and mesh texture bit maps

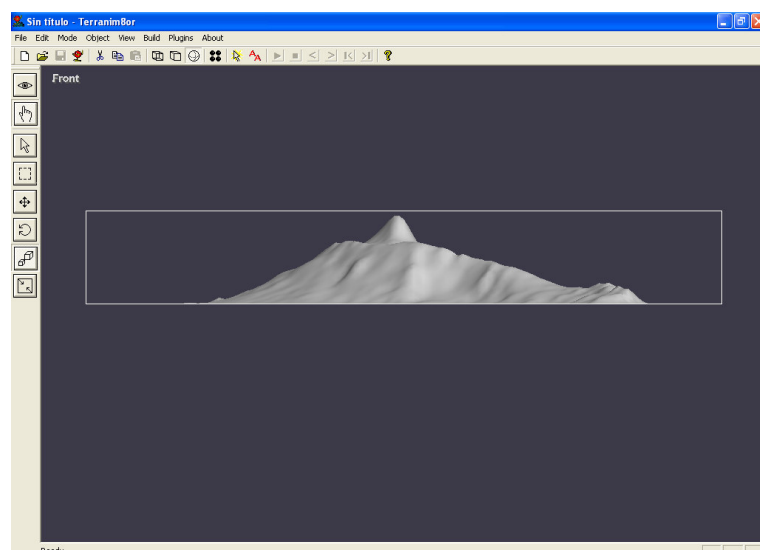
2. GET THE 3D TERRAIN MESH

1. Open Terranim8or

Build → Terrain → From Height Map → Load Image → (select grey map) → set X = 2048 → Z = 2048 → set max height Y to a value 200 – 1000 → OK

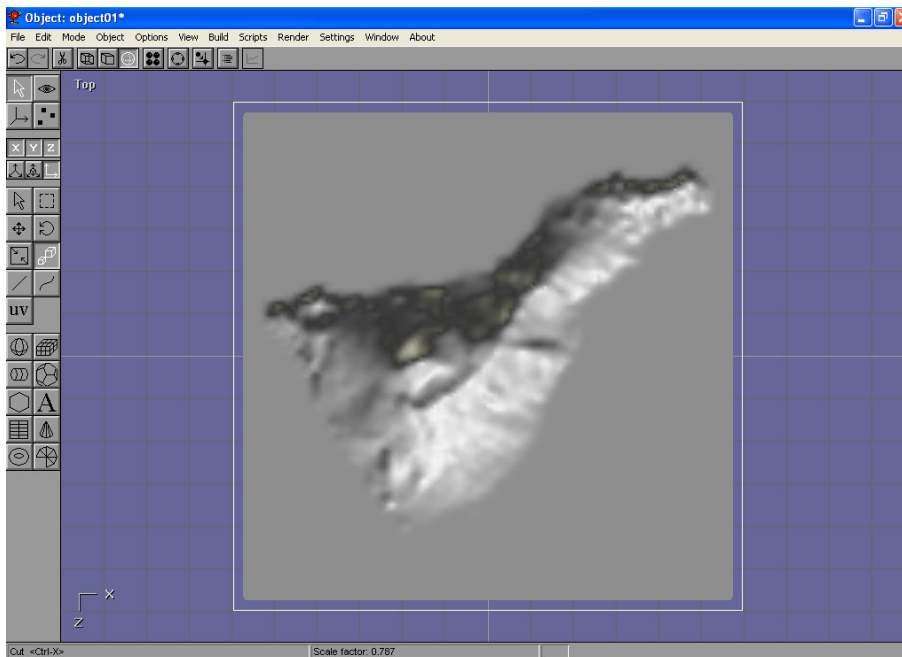
View front and repeat the procedure until you are satisfied with the width / height aspect ratio.

Save as an8 file

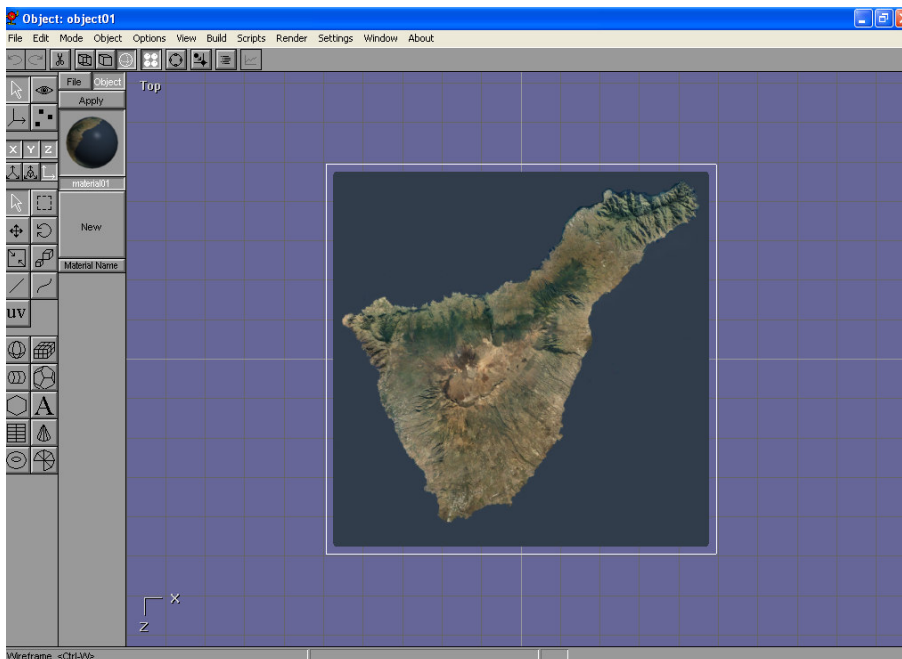


2. Open anim8or

File → Open → (an8 file) → View Top → Select →> Edit → **Rotate** → Y 90



Options → Materials → New → Textures → Diffuse → (load texture... select colour bit map) → OK → OK → Apply → UV → (remove circle by click any button) → (save as an8 file)



Export as dds file

Object → **Export** → select 3ds → OK

3. Open 3ds2mesh

3ds file location → (select 3ds file)

Output file OK

Check S = 50 → Check A = xzy → check F = UV → OK

We have the Orbiter mesh using the colour bit map as texture

4. Open Photoshop or Gimp

Open the mesh texture colour bit map

Image → Rotate Canvas → Flip Horizontal → Save

This makes a mirror version of the mesh texture image

5. Open DDS converter

Select the mesh texture colour image and convert to DDS

We have the Orbiter texture image as dds file

1. Copy the mesh file in the Orbiter - Meshes folder
2. Copy the dds texture file in the Orbiter - Textures folder

3. BUILD THE SURFACE BASE

Note: This item is not a detailed description of how to build a surface base. Is only intended to pinpoint the principal steps. We assume that the reader is familiar with Surface Base Wizard.

This step is required to define the surface base coordinates.

1. Using Tile Calculator (ar81) and Image Splitter (nickd) obtain the following surface tiles

TENERIFE SURFACE TILES							
Width	4096	512	8	Tiles			
Height	4096	512	8	Tiles			
512 x 512 SURFACE TILES							
3-193 325 1	3-192 325 1	3-191 325 1	3-190 325 1	3-189 325 1	3-188 325 1	3-187 325 1	3-186 325 1
3-193 324 1	3-192 324 1	3-191 324 1	3-190 324 1	3-189 324 1	3-188 324 1	3-187 324 1	3-186 324 1
3-193 323 1	3-192 323 1	3-191 323 1	3-190 323 1	3-189 323 1	3-188 323 1	3-187 323 1	3-186 323 1
3-193 322 1	3-192 322 1	3-191 322 1	3-190 322 1	3-189 322 1	3-188 322 1	3-187 322 1	3-186 322 1
3-193 321 1	3-192 321 1	3-191 321 1	3-190 321 1	3-189 321 1	3-188 321 1	3-187 321 1	3-186 321 1
3-193 320 1	3-192 320 1	3-191 320 1	3-190 320 1	3-189 320 1	3-188 320 1	3-187 320 1	3-186 320 1
3-193 319 1	3-192 319 1	3-191 319 1	3-190 319 1	3-189 319 1	3-188 319 1	3-187 319 1	3-186 319 1
3-193 318 1	3-192 318 1	3-191 318 1	3-190 318 1	3-189 318 1	3-188 318 1	3-187 318 1	3-186 318 1

This step is required to:

- Locate the corners of our surface base

- Locate the mid point surface base coordinates, to further locate our 3d terrain mesh
- Locate the runway base coordinates, in our case, is in the tile Earth_3_W0190_N0319.

2. Using WordPad create the definition of your surface base i.e. Tenerife.cfg and place in the folder Orbiter / Config / Earth /Base.

The minimum format of the surface base definition file will be:

BASE-V2.0

Name = Tenerife

Location = -16.676126 28.109834

Size = 6000

BEGIN_OBJECTLIST

END_OBJECTLIST

BEGIN_SURFTILELIST

3 -186 318 1

3 -187 318 1

3 -188 318 1

3 -189 318 1

3 -190 318 1

3 -191 318 1

3 -192 318 1

3 -186 318 1

3 -186 319 1

3 -187 319 1

3 -188 319 1

3 -189 319 1

3 -190 319 1

3 -191 319 1

3 -192 319 1

3 -186 319 1

3 -186 320 1

3 -187 320 1

3 -188 320 1

3 -189 320 1

3 -190 320 1

3 -191 320 1

3 -192 320 1

3 -186 320 1

3 -186 321 1

3 -187 321 1

3 -188 321 1

3 -189 321 1

3 -190 321 1

3 -191 321 1

3 -192 321 1

3 -186 321 1

3 -186 322 1

3 -187 322 1

3 -188 322 1

3 -189 322 1

3 -190 322 1

3 -191 322 1

3 -192 322 1

3 -186 322 1

3 -186 323 1
 3 -187 323 1
 3 -188 323 1
 3 -189 323 1
 3 -190 323 1
 3 -191 323 1
 3 -192 323 1
 3 -186 323 1

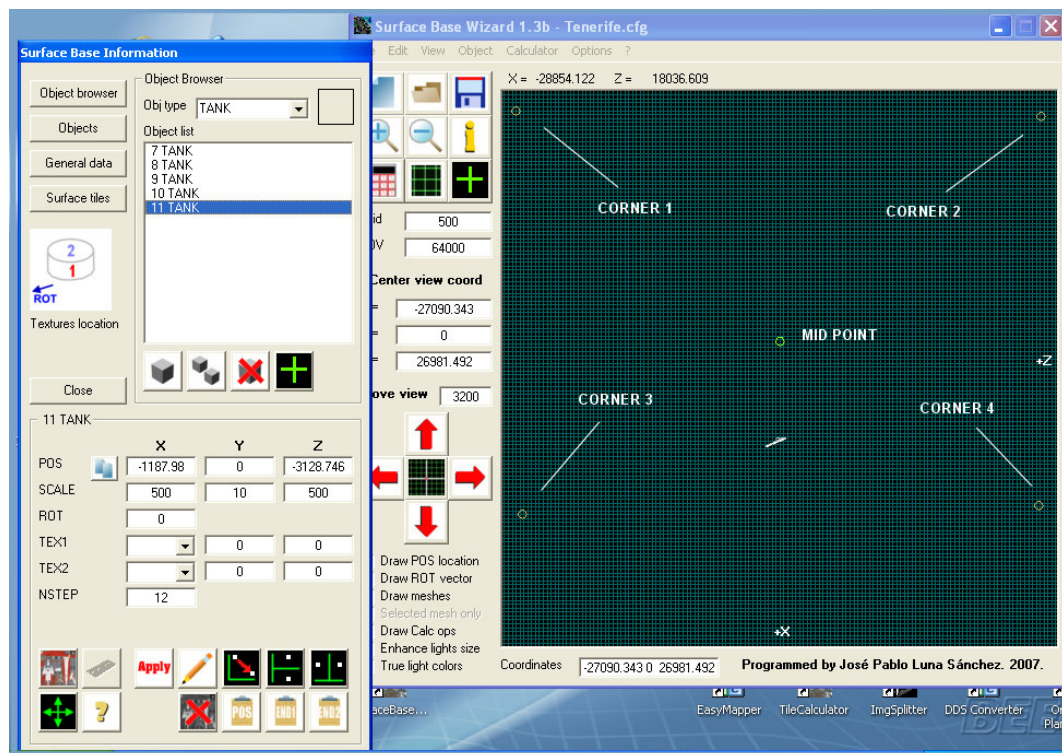
3 -186 324 1
 3 -187 324 1
 3 -188 324 1
 3 -189 324 1
 3 -190 324 1
 3 -191 324 1
 3 -192 324 1
 3 -186 324 1

3 -186 325 1
 3 -187 325 1
 3 -188 325 1
 3 -189 325 1
 3 -190 325 1
 3 -191 325 1
 3 -192 325 1
 3 -186 325 1

END_SURFTILELIST

3. Using the Surface Base Wizard (by ar81) locate the corners of the surface base using, for instance, a tank object as well as the mid point of the surface base.

Include the runway object .



Save the file in the above mentioned folder.

4. Using WordPad create the scenario file i.e. Tenerife.snc

```
BEGIN_DESC
END_DESC

BEGIN_ENVIRONMENT
  System Sol
  Date MJD 54372.4801703935
END_ENVIRONMENT

BEGIN_FOCUS
  Ship GL-01
END_FOCUS

BEGIN_CAMERA
  TARGET GL-01
  MODE Extern
  POS 10 15 -16
  TRACKMODE TargetRelative
  FOV 60.00
END_CAMERA

BEGIN_MFD Left
  TYPE Surface
  SPDMODE 1
END_MFD

BEGIN_MFD Right
END_MFD
BEGIN_PANEL
END_PANEL

BEGIN_SHIPS
GL-01:DeltaGlider
  STATUS Landed Earth
  POS -16.723734 28.011612
  HEADING 66.5834
  PRPLEVEL 0:1.000 1:1.000
  NAVFREQ 402 94 0 0
  XPDR 0
  NOSECONE 0 0.0000
  GEAR 1 1.0000
  AIRLOCK 0 0.0000
END
END_SHIPS

BEGIN_ExtMFD
END
```

Save in the Orbiter / Scenarios folder.

5. Convert all the surface tiles to dds format and save in the Orbiter / Textures2 folder.

6. Run the scenario and correct any possible bugs.

4. BUILD THE 3D SURFACE BASE MESH

With WordPad, open the Tenerife.msh and delete, for the time being

```
TEXTURES 1
TENERIFE_COLOR.dds
```

This way, you will get a white mesh which will help to locate the mesh over the surface base

Open Surface Base Wizard.

File → open Tenerife.cfg → Object → Object Browser → select object type Mesh → New → copy the base mid point coordinate and click POS

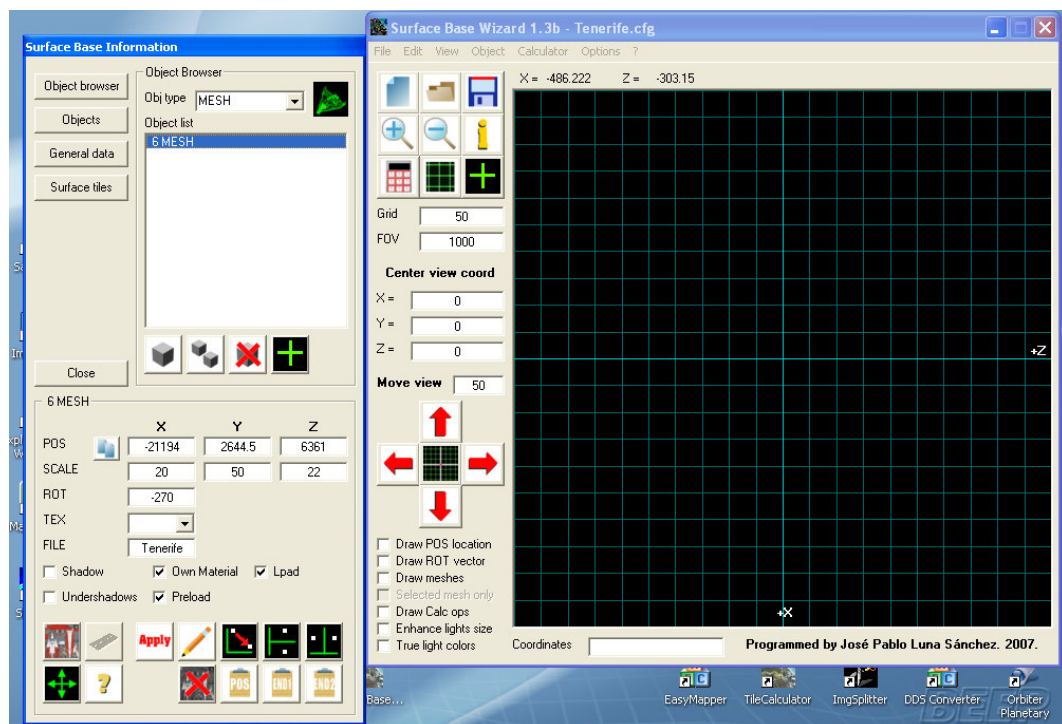
SCALE set to 2 2 2 (should be corrected later by trial and error)

ROT to -270

FILE to Tenerife (mesh file)

Check OwnMaterial, Lpad and Preload

Apply and save your config file.



4. POSITIONING THE SURFACE BASE MESH

We recommend to open wordPad and Orbiter together to easily introduce the following modifications in the configuration file.

Edit your configuration file with wordPad

Open Orbiter and your scenario file

1. Rotate and zoom out your surface base until the 4 corners points are visible.
2. If you don't see the white surface mesh, increase the POS Y until becomes visible.
3. Change the SCALE X, Z values until the four corners of the surface mesh coincide with the corners of the surface base.
4. If required, increase the SCALE Y to get a more realistic height of the surface mesh.

Repeat the above steps until, by trial and error, you obtain the proper size, location and height of the surface mesh.

Once this objective is attained:

- Edit your mesh file and include the texture file Textures 1 Tenerife_Color.dds
- Remove all the texture tiles except the one where your runway is located

YOU SHOULD NOW HAVE A 3D TEXTURED SURFACE BASE

Final Recommendations

To get an accurate fit of the 3d mesh don't forget to:

- Rotate 90° Y the terranim8or an8 file with anim8or
- Export to 3ds the textured anim8or file
- Obtain the mirror of the texture file and export to dds
- Rotate the final mesh -270° in the configuration file

Kwon drawbacks:

- At low altitudes the terrain texture becomes "pixelate",
- Don't fly underground..... no collision detection.
- Flying away from the base, the 3D mesh disappears

Files included:

1. Tenerife.dem
2. Tenerife_13.jpg

Your suggestions and recommendations to improve the procedure, or to develop a better one, will be very much appreciated

Salva