How to convert freely available satellite images from Google and Bing into an image which is georeferenced to the British National Grid.

These instructions show how to obtain aerial photos from online source such as Google and Bing, and convert them to a single image georeferenced to British National Grid (Ordnance Survey) suitable for use as a background map in OCAD. This version (4) includes an update for OCAD 2018 users. It uses two programs, the first called SASPlanet can do the downloading step, but will not output in OS coordinates. The second program gdalwarp.exe performs the necessary coordinate transformation. However this second program is not needed if you are using OCAD 2018, as will be explained later. These instructions first show how do to download and configure the necessary programs, and then how to use them.

Installation and Configuration

Step 1 Download and Install SASPlanet.

1. SASPlanet can be downloaded from: http://www.sasgis.org/programs/sasplanet/nightly.php

2. Extract the contents of the zip archive to somewhere suitable on your computer.

If using OCAD 2018 you can skip the next step.

Step 2 Download and Install gdalwarp.exe.

1. You need to download the GDAL collection of programs. This can be obtained from http://www.gisinternals.com/release.php

2. Extract the contents of the zip archive to somewhere suitable on your computer.

3. Edit the file <home folder>\Documents\WindowsPowerShell\Microsoft.PowerShell_profile.ps1 and add the following lines:
    $env:GDAL_DATA= ";<GDAL folder>\bin\gdal-data"
    $env:Path += ";<GDAL folder>\bin\gdal\apps"
    $env:Path += ";<GDAL folder>\bin"

     You need to replace <home folder> with the location of your home folder and <GDAL folder> with the folder where you stored the gdal package
4. Right click on the Window start button and choose Windows Power Shell.
5. Type in
    Set-ExecutionPolicy -Scope CurrentUser Unrestricted
    in powershell, then close the window.

The instructions above need only to be executed once, on the next page is the procedure to follow every time you want to produce a new aerial photo background image.

Creating an Image

Start the program SASplanet from the folder you stored it in earlier.

1. Choose either Google or Bing satellite as the source from the top toolbar.
2. Zoom into until the area you require is on the screen.
3. Type Alt-R to start creating a rectangular selection of the area you need.
4. Click at the top left of the area you require.
5. Click at the bottom right of the area you require.
6. Selection Manager will now appear, choose Zooms 19 on the Download tab.
7. Click Start, the necessary images will be downloaded, when it finishes click Quit.
8. Type Ctrl-B to reopen the SelectionManager.
9. Select "Stitch" tab and choose
   - 9.1 Output Format GeoTIFF
   - 9.2 Zoom 19
   - 9.3 Geographic (Latitude/Longitude) /WGS84 /EPSG:4326 If using OCAD 2018, choose Mercator / Google EPSG 3785
   - 9.4 Compression: None
   - 9.5 Click on the … next to "Save to" and navigate to the folder where you want the file to end up, and give it a suitable name.
   - 9.6 Click on Start

If you are using OCAD 2018 please go to the section "Opening an aerial photo directly in OCAD 2018.

Output from SASPlanet is in format WGS 84. We need to first convert it to OSGB 36, and then convert to British National Grid (see: https://communityhub.esriuk.com/geoxchange/2012/3/26/coordinate-systems-and-projections-for-beginners.html for an explanation). We use the program gldwarp to modify this file. Start File explorer and navigate to the folder where you just created the aerial photo, then click on File>Open Windows PowerShell and execute the following commands

1. Convert to OSGB 1936 ..
   gdalwarp.exe -t_srs 'EPSG:4277' <FilenameFromSAS> <FilenameforOSGB36formatfile>
   where you   need to substitute in the correct names for the items between <> brackets.
2. Project to National Grid
   gdalwarp.exe -t_srs   EPSG:27700 <FilenameforOSGB36formatfile> <FilenameforBNGformatfile>

You can now open the file <FilenameforBNGformatfile> as a background image in OCAD. It will be correctly georeferenced for the British National Grid.

Opening an aerial photo directly in OCAD 2018.

In OCAD 2018 it is now possible to open a file directly in a different coordinate system to the map. First ensure that the map is defined to be using British National Grid by looking in Map>Set Scale And Coordinate System. Now go to Background Map>Manage>Open, Select the aerial photo you produced above, select "Transform from Other Coordinate System", Choose "Google Mercator" and click OK. I recommend you do this before applying any magnetic declination correction to the map.

If you want to know what EPSG codes are about you can look here: https://www.epsg-registry.org/. I hope you find these instructions useful. Please get in touch if you spot a problem or can suggest an improvement.

Alex Finch (SROC mapping officer) with help from Matthew Pickering of BOK and Gian-Reto Schaad of OCAD
alex@finchfamily.org.uk