

# **How to convert freely available satellite images from Google, Bing etc. into an image for use in Orienteering Mapping Software.**

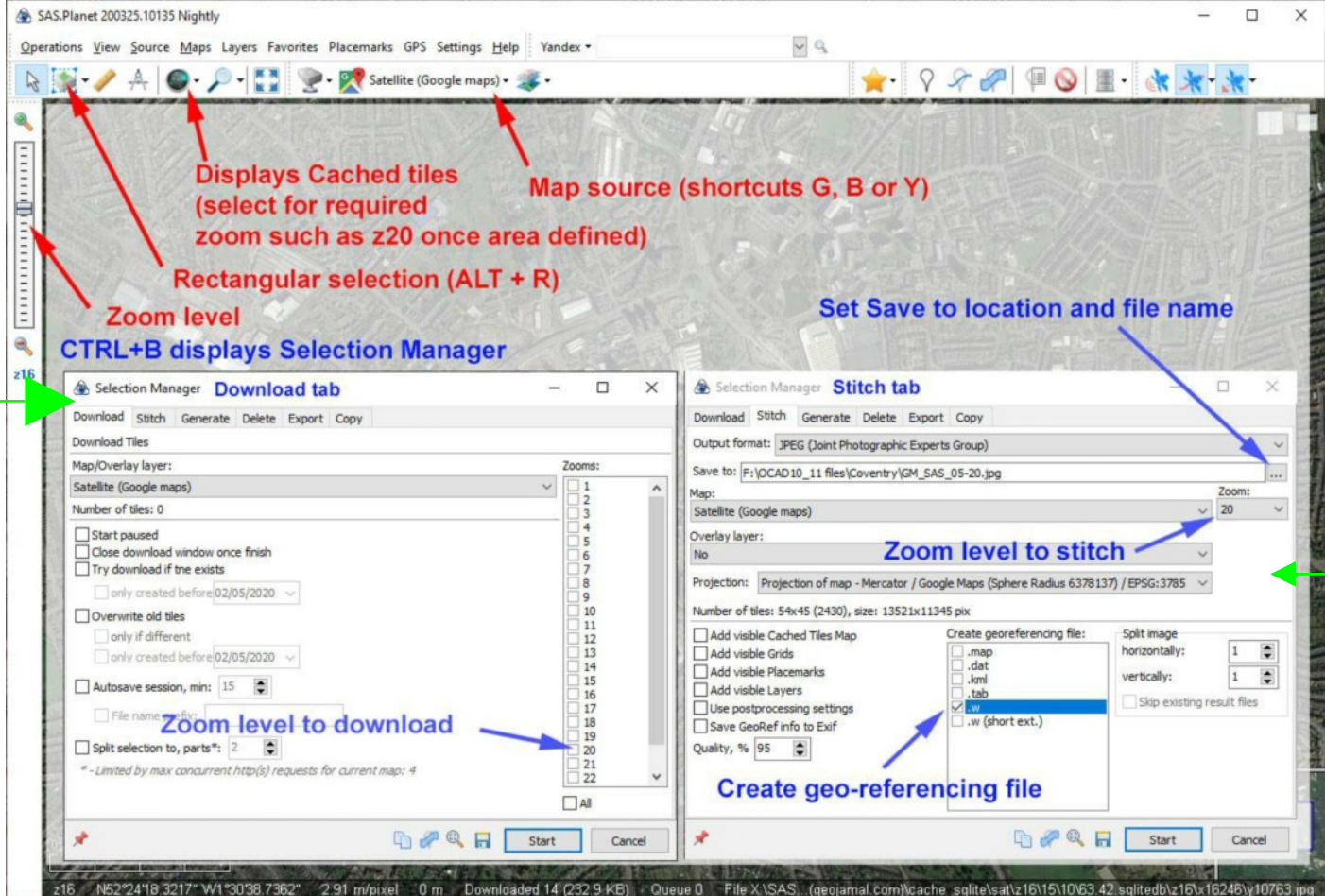
These instructions show how to obtain aerial photos from online sources such as Google and Bing, and convert them to a single image suitable for use as a background map in OCAD or OOM. The procedure uses a program called SASPlanet. Users with versions of OCAD prior to 2018 should refer to the end of this document for details of a second program “gdalwarp.exe” which they will also need to use. It should be noted however that since May 2020 OCAD 2018 users do not need any of these programs. In the latest version of OCAD 2018 one can grab small sections of Google satellite image directly as a background map. This is done via **Background Map >Online Map Service >Load as background map**. In order to get good resolution photos one needs to be zoomed in on the area of interest, so for a complete map one would have to repeat this process many times however it can be useful for a quick check of a smaller area. Also only Google images can currently be chosen. Sometimes Bing has better ones so you may still need to use the following procedure.

## **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.

On the next page you can find out how to use SASPlanet to download a batch of images and stitch them together into a single image.



## Creating an Image

Note, there is now a description of this process on the OCAD blog page as well. Search for “ocad blog sasplanet”. Start the program SASplanet from the folder you stored it in earlier. Refer to the image above for further clarification.

1. Choose either Google (**Shortcut: G**), or Bing (**V**) or Yandex (**Y**) as the source from the top toolbar.
2. Zoom into until the area you require is on the screen. You can use the bar on the left hand side or mouse wheel; click and drag in the window to move
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, Select **Download tab** if not already open. Check it shows required map type as chosen in (1). In the right hand zoom column select required **zoom level** (z19, z20 or possibly z21 for a small area). It then shows the number of tiles it will download and the size of the final image. At z20 this may be between 10000 and 20000 pixels for a large area (Don't go much bigger than 20000 x 20000!).
7. Click Start, the necessary images will be downloaded, to a "Cache" folder. Note that if the **Cache button** is switched to the required zoom - e.g. z20 you can see the download progress visually. When task is complete click on the small  box - in the bottom left window of the download dialog to **reopen the SelectionManager**
8. Select “Stitch” tab and choose
  - 8.1 Output Format , either JPEG or GeoTIFF are recommended
  - 8.2 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.
  - 8.3 **Most important...** Zoom: Change to match the size downloaded , e.g. z20
  - 8.4 If using JPEG output , for “Create georeferencing file:” choose .w
  - 8.5 Projection: Choose Mercator / Google EPSG 3785  
(If using OCAD version earlier than 2018 choose Geographic (Latitude/Longitude) /WGS84 /EPSG:4326 )
  - 8.6 Compression: None
9. Click on Start

## **Opening an aerial photo in OCAD 2018.**

In OCAD 2018 it is possible to open a background 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.

## **Opening an aerial photo in Open Orienteering Mapper**

In OOM go to **Templates> Open Template** to open the aerial photograph you have just created.

## **Troubleshooting**

If you are using OCAD12 and the image doesn't appear when you open it you need to delete the .jpgw file that was created in the SASPlanet Stitch tab (or don't “create georeferencing file” when you stitch the file).

## **Using the aerial photo in your mapping project.**

If the newly created aerial photograph does not align with the existing map you must decide which source you trust. You can either use a trusted third source such as an Ordnance Survey map, or attempt to obtain accurate locations using GPS in the field. If you believe the existing map to be correct then you can adjust the aerial photograph to match the map using the F9 shortcut. Alternatively you can adjust the map to fit the aerial photograph using one of the options under **map>transform**. The most powerful of these is rubbersheeting, but it needs to be used with care because it can cause considerable distortion. This can be particularly noticeable when there are many buildings or other man made objects on the map so it is not suitable for an urban map. It is recommended to save multiple copies of the map when using this tool to make it easier to undo changes.

If you want to know what EPSG codes are about you can look here: <https://www.epsg-registry.org/>.

## Transforming Aerial Photos using GDALWARP

This section is for users of OCAD earlier than 2018. As SAS planet is not able to produce images in the British National Grid coordinate system, and older versions of OCAD can not transform from another format it is necessary to use a second program GDALWARP to perform this operation.

### 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. NOTE. This displays a warning message about making your computer less secure. If you are worried by this, then either:
  - 5.1 Delete the file you created in step 3 immediately after running gdalwarp OR
  - 5.2 Enter the three lines in instruction 3 by hand every time you want to run gdalwarp. You'll need to remember where you installed the gdal software in this case.

The instructions above only need to be executed once.

### Converting Image from WGS84 to British National Grid

Output from SASPlanet is by default in format WGS 84. We need to first convert it to OSGB 36, and then convert to the British National Grid ( see: <https://communityhub.esri.com/geoxchange/2012/3/26/coordinate-systems-and-projections-for-beginners.html> for an explanation). We use the program gdalwarp 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.

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 and also incorporating suggestions from BOF Map Group.  
[alex@finchfamily.org.uk](mailto:alex@finchfamily.org.uk)

Version 7 4/7/2020