PicLocata

Label and sort your photos by British or Irish grid location, using a GPX track file from a GPS.

PicLocata is free software, under the GPL open source licence.

Contents

Introduction

Features

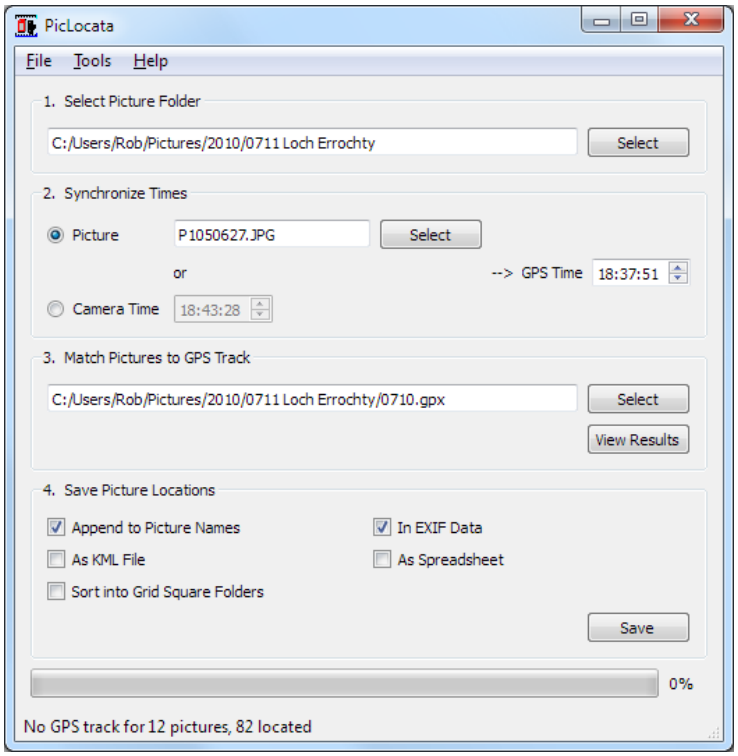
- Match pictures against a GPS track.
- Generate British National Grid, Irish Grid or Irish Transverse Mercator references.
- Save picture locations as:
    - Geotag in picture EXIF data.
    - Grid reference added to picture name.
    - Spreadsheet-compatible CSV file.
    - Google Earth KML file.
- Sort pictures into grid square folders.
- Accurate synchronisation between camera time and GPS time.
- Supports up to 4 cameras.
- Supports raw image files.
- Precise conversion from GPS WGS84 position to grid reference using the definitive methods specified by OSGB, OSi and OSNI.
- Configurable limit on position accuracy.
- Runs on all versions of Windows from XP onwards.
- Works on MacOS versions prior to Catalina, with PlayOnMac.

How to Use PicLocata

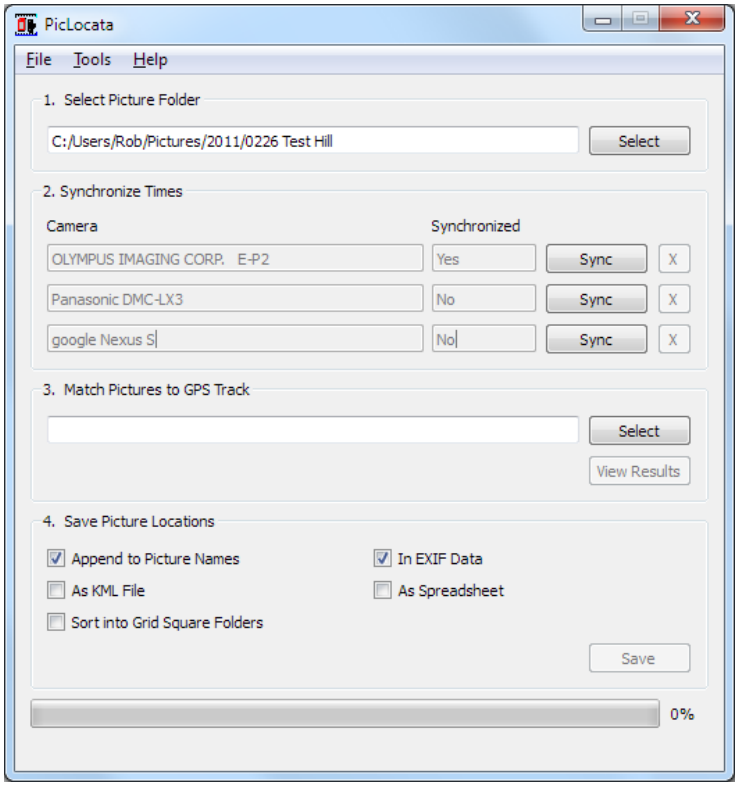
- Keep your GPS switched on while you are taking pictures.
- Synchronise your camera clock by taking a picture of a GPS screen showing the time.
- Upload your GPS track to a GPX file.
- Run PicLocata to tag, label and sort your pictures.

Screenshots

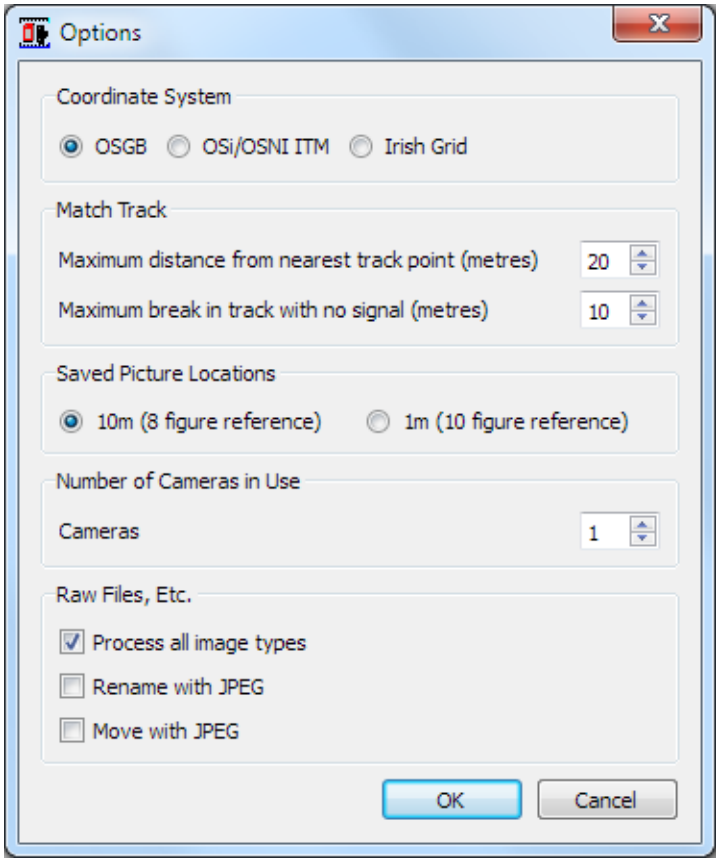
Main Screen (Single Camera)



Main Screen (Multiple Cameras)



Options


Options
Coordinate System
OSGB
OSi/OSNI ITM
Irish Grid
Match Track
Maximum distance from nearest track point (metres)
20
Maximum break in track with no signal (metres)
10
Saved Picture Locations
10m (8 figure reference)
1m (10 figure reference)
Number of Cameras in Use
Cameras
1
Raw Files, Etc.
Process all image types
Rename with JPEG
Move with JPEG
OK
Cancel

User Guide

Installation

To use PicLocata, first download the file **PicLocata-1-5.exe** and run it to install the program on your PC. The installation file runs on all versions of Windows from XP to Windows 10.

It also runs on MacOS versions prior to Catalina. using PlayOnMac. It does not run on later versions because 32-bit applications are not supported.

Using Your GPS

Piclocata works with any GPS that is capable of recording a track and saving it in GPX format (see below). It has been tested with Garmin eTrex models.

Synchronising Your Camera

Differences between your camera's clock and the GPS time will cause errors in the picture position. Many cameras allow the clock to be set only to the nearest minute. However they record the time of each picture to the nearest second.

Fortunately, there is an easy way to correct for differences in time. When you go out, switch your GPS to a screen that shows the current time, and then take a picture of the GPS with your camera. PicLocata provides a way to use that picture later to correct for time differences.

Note that:

- Camera clocks sometimes drift over time. But if you take a synchronisation picture at any time during the day (or next day should you forget) that will be more than sufficient.
- There is no need to change the camera's clock, unless you wish too. PicLocata can compensate for a difference of an hour or more. So it doesn't matter if, for example, you leave your camera's clock on GMT during the summer.

You may need to change a setting on your GPS to see the time. On my eTrex Legend:

- The time is shown on the backlight/battery status screen that appears when the power button is pressed briefly.
- To get a larger time that is easier to read in a picture, I set the page sequence ("Main Menu / Setup / Page Seq") to include the Trip Computer. Then on the Trip Computer page I changed one of the larger fields to show Time of Day. (While the screen is displayed, press "Menu / Change Data Fields", then scroll to one of the fields and press the joystick button.)

Taking Pictures

PicLocata works with any digital cameras that records the time when a picture is taken. As far as I know, that is *all* digital cameras.

The main requirements are that you keep your GPS switched on while taking pictures, and that it maintains a good signal during this time. My GPS works well if I keep it in the lid of my rucksack, or clipped to the rucksack strap in front of my shoulder. It should also be fine hung round your neck, and it is easy to check the signal at intervals that way.

My GPS didn't work as well kept in my hip pocket, and there were occasional large errors in the track. Note that recent eTrex models have a high-sensitivity receiver that may work better than my older model.

No GPS works effectively indoors, so PicLocata is really just for outdoor photography. However it can handle short breaks in the GPS signal, such as when you might stand under a bridge to take a picture.

When you have finished, upload your pictures to your PC. Put the pictures in a single folder until you have processed them with PicLocata.

Note that:

- You may switch the GPS off when not taking pictures. Breaks in the track are accepted.
- PicLocata will work with a batch of pictures taken over multiple days. However your GPS may compress the track, making it less accurate, if you let it run for too long. Most of my testing has been done with batches of pictures taken in a single day.

Creating a GPX Track File

This version of PicLocata requires a GPS track in GPX format (GPS eXchange Format). Future versions may support other formats; contact me if you need something different.

To save the track from a Garmin GPS:

- Connect your GPS to your PC
- Run the Garmin MapSource program supplied with your GPS. (The latest version can be downloaded from the Garmin website.
- Use the MapSource command "Transfer / Receive from Device" to upload the track.
- Use the MapSource command "File / Save As", and select "GPS eXchange Format" as the file type, to save the track.

If you have another make of GPS, or if you don't have MapSource, TopoGrafix EasyGPS is free and works well.

It's convenient to save the track in the same folder as your pictures, but this isn't essential.

After you have uploaded the track, I recommend you reset the current track in your GPS. Some models may reduce the accuracy of the track if it becomes too long, and I have seen one case where GPS locked up occasionally, and the problem seemed to be cured by resetting the track after a few days use.

Processing Your Pictures

Run PicLocata, for example by Start - All Programs - PicLocata. The program shows a single window where you perform all the main functions. There are just four steps to follow.

1. Select the folder of your pictures.
2. Select the synchronisation picture, showing the time on your GPS. PicLocata will read the camera time automatically, but you will need to input the corresponding GPS time as shown in your picture. If you do not have a synchronisation picture, you can input a camera time manually too.
3. Select the GPS track recorded while taking pictures. PicLocata will match pictures against the track. If you wish, the View Results button can be used to preview the results.
4. Choose how you wish to save the location information, and press Save.

There are five ways to save location data, and you may use any, or all, of them at the same time:

- The picture location can be added to the picture's EXIF data. This creates a geotagged image that can be used by many photographic databases including Geograph and Picasa. (Note that the EXIF picture location is always recorded as WGS84 latitude, longitude and elevation. Conversion to grid location is not needed.)
- The grid reference, can be appended to each picture name. For example, the picture `P1050573.JPG` might be renamed to `P1050573 NN 6687 6461.JPG`.
- PicLocata can write a CSV file containing location data. This format can be read by many different programs, including OpenOffice Calc and Microsoft Excel. You will be prompted for the name and location of the file if you choose this option.
- PicLocata can write a KML file for Google Earth containing location data. You will be prompted for the name and location of the file if you choose this option.
- PicLocata can create a sub-folder for each 1 Km grid square, and move the pictures into the corresponding folders.

Note that:

- Most operations are performed quickly, but writing picture EXIF data may take several seconds or minutes, depending on the number of pictures and the speed of your PC.
- Next time you run PicLocata, the previous synchronisation times will be remembered. You can reuse these times if you are confident that the clock in your camera has not drifted. The actual times do not matter, just that the *difference* in times is still correct.
- When you select a GPX file, PicLocata will process all the pictures that match tracks in that file. It you have more than one GPX file, just reselect the picture folder to start again.

Accuracy

A GPS track consists of a set of points and times. Generally each picture will be taken part way between two points, and PicLocata estimates position along a line joing the points by assuming the photographer moved at a steady speed between them. This isn't necessarily the case, and so the process introduces a small uncertainty in the position.

However in testing I found that, at walking pace, track points were usually close together. Consequently PicLocata shouldn't introduce an error of more than 5m in the position, which is little worse than the inherent inaccuracy of a consumer grade GPS. Matching test pictures against Google Maps satellite pictures confirmed that the PicLocata position was often more accurate that this.

By default, PicLocata will refuse to set the location of a picture if it is more than 20m from the nearest track point. In practice few pictures taken while walking have failed this test unless the GPS signal was poor. The limit is configurable, and might need to be changed if taking pictures using a cycle, boat, etc.

Using PicLocata with More than One Camera

If you take pictures with more than one camera on a trip:

- Take a synchronisation picture with each camera.
- In the "Tools / Options" menu, set the number of cameras you use. There is a maximum of 4 cameras.
- When you select a picture folder, PicLocata will list each of the cameras used. Set the synchronisation data for each camera.

PicLocata will retain the synchronisation data for each camera, and show how long it has been since you last synchronised that camera. If you stop using a camera, press the corresponding "X" button to remove it from the list.

Support for Raw Image Files

PicLocata can read and process the following raw image formats:

- Adobe (DNG).
- Canon (CR2 and CRW).
- Fujifilm (RAF).
- Minolta (MRW).
- Nikon (NEF).
- Olympus (ORF).
- Panasonic (RW2).
- Pentax (PEF).
- Samsung (SRW).

Raw files can be renamed and sorted into grid square folders, just like JPEG files. However PicLocata does not attempt to modify the EXIF data in raw files.

PicLocata can also handle unrecognised raw files when if your camera is set to record "Raw + JPEG". Any file with the same name as a JPEG, including raw files and sidecar XMP files can be renamed and and sorted into a gridsquare folder.

Processing of raw images is configurable; see Options below.

Using PicLocata with Geograph.org.uk

PicLocata was originally written with Geograph in mind. If you append the picture location to the file name, the Geograph V2 submission process will pick up the location automatically. Similarly, Geograph will automatically pick up the location from the picture's EXIF data.

Geograph uses the location on the file name as the subject position, and the location in EXIF data as the photographer's position.

(There is a minor unavoidable difference between the two methods. The picture name specifies a position with 10m accuracy. The EXIF data specifies a precise GRS80 lat/lon position which Geograph converts to a grid point.)

I find it convenient to sort my pictures into grid squares before submitting them. This allows me to choose the best ones for each square, and check for unnecessary duplications of existing Geograph pictures.

Setting the location in EXIF data works well with Picasa. Picasa can show the picture location in a Google Maps satellite image. In Picasa select "View / Places" and then choose "Satellite" or "Hybrid" in the window on the right. I found this is often helpful in confirming the accuracy of the location and the direction of view.

Options

The "Tools / Options" menu allows these changes:

Coordinate System	• OSGB (for Great Britain). • Irish Transverse Mercator (the new system for Republic of Ireland and Northern Ireland). • Irish Grid (the older system for Ireland).
Maximum distance from nearest track point	Pictures that are too far from a track point will not be assigned a location. The default value is 20m.
Maximum break in track with no signal	PicLocata ignores short breaks in the GPS signal, such as occur when stopping under a bridge, and will assign locations to pictures taken at these points. The default value is 10m; set it to zero to stop breaks from being ignored.
Saved Picture Locations	Select eight-figure grid references (10 metre resolution) or ten-figure grid references (1 metre resolution).
Number of Cameras in Use	Select 2, 3 or 4 if you use multiple cameras during a day. PicLocata will allow you to set separate synchronisation times for each camera.
Process all image types	Reads time information from supported raw files, as well as JPEG files. (Enabled by default.)
Rename with JPEG	When a JPEG file is renamed to include a grid reference, renames any associated raw or XMP files. (Disabled by default.)
Move with JPEG	When a JPEG file is moved to a grid square sub-folder, moves any associated raw or XMP files. (Disabled by default.)

Known Issues

I'm aware of the following limitations and issues with PicLocata. If you find a problem that isn't on this list, please me RobBurke via my Geograph.org.uk account, and I'll do my best to resolve it.

- This version of PicLocata works for pictures taken in Great Britain and Ireland. It cannot process pictures taken in other parts of the world.
- PicLocata does not work with GPX files exported from Anquet Maps. Although Anquet Maps can import a GPS track, it exports the track information as a route not a track. Route data does not include time information with sufficient accuracy for PicLocata to use.
- This version of PicLocata does not read Magellan eXplorist LOG files. However you might use GPSBabel to convert a Magellan track to GPX format, or use TopoGrafix EasyGPS to import track data direct from your Magellan GPS.
- Multi-camera synchronisation requires that each camera records a different manufacturer, model or serial number. So you may not be able to use this feature with identical camera bodies.
- PicLocata does not modify raw image files. The EXIV2 library used by PicLocata is capable of writing location data into some raw file types. However testing has shown that some image processing programs cannot handle the modified files.
- The raw image processing has not been updated since 2011, so it is possible that files from your camera are not supported.
- PicLocata does not run on the current MacOS version (Catalina) because PlayOnMac needs WINE which does not (yet) support 32-bit applications running on 64-bit only MacOS.