

Bob's GPS hints 20-1-2022

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1. Introduction and viewing a .gpx route

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- 1.1. With a growing population of GPS units, in particular Garmin Edge devices being used on our club runs, it has become evident to me that many people are not getting the best out of their GPS units. I hope to be able to improve your confidence in the use of GPS devices, but it's not going to be a quick process and we'll take it in small steps over several weeks.
- 1.2. I will talk about Windows PCs, Android phones and Garmin GPSs, but would be very pleased to receive any relevant information about Apple PCs, phones, or other GPSs.
- 1.3. I find my GPS is a very handy gadget for navigating and I like to record mileages and the amount of climbing that I do. However, I wouldn't want anyone to feel they must have a GPS to take part in, or to lead our rides and it is important not to rely solely on technology that can fail you in many ways – perhaps a flat battery. You should always have a paper map as a backup.

- 1.4. **Tip** - our PCs use a plethora of different files and it's not always easy to see the difference between a spreadsheet file, a word-processor file, or a gpx file? In Windows Explorer, files are often shown with an icon at the beginning of its name, which belongs to the default application used to open the file, but do you always know what the icon represents?
- 1.5. **Tip** - I recommend that in the “View” tab of Explorer you enable “File name extensions” – now file names will be displayed with .xlsx, .docx, or .gpx, etc. on the end, making it totally clear to see what the file is used for. This is particularly useful for gpx files as you will be using them in several different applications by the time we have finished.
- 1.6. **Tip** - how do I look at the route contained in a gpx file attached to an email?
 - 1.6.1. **On your Android phone:**
 - 1.6.1.1. Load up Google Play Store and type “GPX Viewer” in the search box.
 - 1.6.1.2. Click on “Install” and wait for the process to complete.
 - 1.6.1.3. Go to your email and double-click the attached gpx file.
 - 1.6.1.4. You will be shown a list of apps you could use to open the file – select “GPX Viewer” and select “just once”. GPX Viewer will open showing the route on a map background and that’s all there is to it without any extra complications.
 - 1.6.1.5. Spend a bit of time looking at the app as there are other things you can do, like navigating a route and changing the mapping (I recommend CycLOSM). There is, of course, a paid Pro version, which will allow you to record routes, but not necessary to use the basic functionality.
 - 1.6.2. **On your PC:**
 - 1.6.2.1. Open the email containing the gpx file attachment and save the gpx file in a folder where you can find it again.
 - 1.6.2.2. In the url field of your web browser type:
<http://gpxviewer.1bestlink.net/> and press “enter” - good idea to save the url as a "favourite" for future use.
 - 1.6.2.3. Press “Browse” and navigate to the gpx file you saved in the first step.
 - 1.6.2.4. Select the file and press “Open”, which will cause the route to be displayed on a map background.

2. Navigating with a gpx route.

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2.1. There are many **phone apps** you can use

2.1.1. If you ask which is the best, everyone will give you a different answer and I suggest you should do your own research by talking to people or looking on the web. The “free” ones often have a paid for “Pro” mode but it’s probably better to use the app for a while before upgrading to “Pro” so you can tell if the extra features will be useful to you.

2.1.2. Generally, the installation of a phone app will set up a “file association” so that double clicking a .gpx email attachment will cause it to be opened with your chosen app.

2.1.3. Creation of your own routes will be the subject of a later article, but it is much easier to create routes on a PC than on a phone, or GPS unit.

2.1.4. Popular apps are Komoot, OSMAnd and Memory Map. The advantage of using Memory Map is that it has versions for both phones and PC’s, a license allows you to use Memory Map on five different devices and it uses Ordnance Survey Maps instead of the Open Street Maps used by other apps.

2.2. There are a couple of snags to navigating with a phone on a bike:

2.2.1. One is battery life, which may not be sufficient to last the length of a bike ride and can be overcome by carrying a battery backup unit.

2.2.2. Another is the ability to carry a phone and battery backup securely on your handlebars. There are a few brackets on the market, but they aren’t always very effective – have a look at

<https://www.cyclist.co.uk/buying-guides/6455/best-bike-mounted-phone-holders>.

2.3. Use a **dedicated GPS unit**

2.3.1. I use a Garmin unit (there are other less frequently used makes and I will always be pleased to receive information about them: Chairman@CoventryCTC.org.uk). Unsurprisingly, they are designed for the rigours of the job with a reliable handlebar mount; they are waterproof; and the latest ones have extremely good battery life allowing you to ride over 150-miles before needing a re-charge. If this isn’t sufficient you could use a battery backup unit. In the past it was often necessary to turn down the brightness of the screen to have any chance of the battery lasting all day.

- 2.3.2. The thorny issue is how to load a gpx file onto your GPS, which isn't as simple or intuitive as I would hope or expect. How you do it depends to some extent on what you want from your GPS. My needs are very simple – I want to upload a gpx route to follow and to download the record of my rides, including the amount of climbing; also, I want to be able to upgrade the firmware on the GPS from time to time. I do not want it to be a training tool or to compare the stats of a ride with my previous rides, or with other people's rides, which is done automatically by Garmin Connect for phones and Garmin Express for PCs. Connect/Express seems to link with Strava on both platforms. All these apps seem to swallow all your data, give you generalised statistics and not allow you to recover your detailed records in a .gpx file. You can get a .gpx file out of Strava so long as you pay for the Pro features – what a cheek: charging you for your own data.
- 2.3.3. I would be very glad if someone could tell me how to get .gpx files in and out of Garmin Express/Connect. I thought a wi-fi connection between my GPS and PC would be brilliant, avoiding the need to continuously plug in and out with a cable in a fragile plug. So far, I've been thwarted.
- 2.3.4. Moving .gpx files in and out of your GPS can be achieved using Garmin BaseCamp, which is a free to download and use and requires Open Street Maps to give you a map background – I will talk more about that next time, but for now here is the simplest way to load .gpx files onto your GPS:
- 2.3.5. **Tip:** Connect GPS and PC together with a usb lead. It maybe that Garmin Express automatically fires up – you can stop that from happening from the front page of Garmin Express by unchecking “Always keep Garmin Express running in the background” and unchecking “Automatically launch Garmin Express when a Garmin device is connected”.
 - 2.3.5.1. Open Windows Explorer (you can do this by using the “quick key” Windows key-E, pressed together).
 - 2.3.5.2. You may have had a prompt to select what to do when a usb device is connected and I have my PC set up to automatically open an Explorer window.
 - 2.3.5.3. In the left-hand pane you'll see a list of your hard drives and another entry like “Garmin Edge 1030 (F:)”. Double click the Garmin entry and you will see some folder and file names

appear in the right-hand pane. Double-click the folder called “Garmin” to reveal some more folders.

- 2.3.5.4. “Activities” contains all the rides you have done – they are .fit files and I will talk later about converting them to .gpx files.
 - 2.3.5.5. “Courses” contains all the routes you have loaded – also .fit files.
 - 2.3.5.6. .gpx files can contain “Routes” and “Tracks” – never mind about the difference for now, but you can navigate with either, so Garmin call them both “Courses”.
 - 2.3.5.7. “NewFiles” is where we need to be. Open a second Explorer window (you will need to use the quick key Windows-E to do that). Navigate to where you keep your .gpx files and highlight the one (or ones) you want to put on your GPS. Copy it to the clipboard by right-click/Copy, or Ctrl-C. Go back to the GPS Explorer window and in the open NewFiles folder paste the .gpx file by right-click/Paste, or Ctrl-V.
 - 2.3.5.8. Disconnect the GPS from the PC and restart the GPS. You will now find that your .gpx route appears in the Saved Courses window on the GPS. If you reconnect the GPS to the PC, you’ll find that the NewFiles folder is empty.
 - 2.3.5.9. GPSs have limited memory, so it’s a good idea to manage files on it. You can safely delete any files in the Courses folder provided you have a copy on your PC. Similarly, you can safely delete any files in the Activities folder so long as you have a copy on your PC.
 - 2.3.5.10. Garmin GPS units in the Edge family use the NewFiles mechanism, but on others you copy .gpx routes directly into the Garmin/GPX folder and recover them from Garmin/GPX, or Garmin/GPX/Archive. This is because the Edge family uses .fit files, which the GPS creates from .gpx files.
 - 2.3.5.11. The **.fit file** record of a ridden route stores longitude/latitude/elevation data at intervals along your route. It also stores your heart rate, cadence, power, etc provided you’ve got the appropriate monitors implemented.
- 2.3.6. Now we’ve got the .gpx course on our Garmin we can navigate by selecting Navigation/Courses/Saved Courses and tapping on the required course and Ride at the bottom of the screen. You may be

prompted: “You are near the beginning of the course. Would you like to start?”. Click the tick and a big green triangle will be displayed in the centre of the screen and the route ahead will be shown in purple.

2.3.7. When you have ridden a short distance, you should see a green snail trail showing where you have been, which confirms you are recording your route. If you’re not recording you can dab the right-hand bottom button on the GPS, which will cause the green triangle to be displayed and recording will begin.

2.3.8. At the end of the ride, dab the right-hand button to stop recording causing a big red square to be displayed and then you will be prompted to save the course and you can review your statistics.

3. Routable maps

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3.1. Data defining digital maps is stored in many layers: e.g. main roads, minor roads, tracks and paths, land use, feature names, place names by population, and contours. Depending on the function of the map different layers may be selected in the rendition of the map. The layers selected for display are also determined by the scale of the map to avoid clutter and confusion.

3.2. A digital map may also contain *routing information* to enable software to calculate a route between two points and to ‘know’ the category of road/path it’s dealing with. Routing information also includes the direction of one way streets, road names and junction data. When a map has this capability, it is known as “routable” – Open Street Map (OSM) is a generally available routable map. An example of a non-routable map is the Ordnance Survey map, which can only display a route in straight lines linking given points. Give it enough waypoints and it will look as though the route is following a road, but it does not have the capability to know if the waypoints lie on a road.

3.3. Sometimes routability is referred to as “bikeability”. Bikeability is an extension of the routability principal and determines if a route is suitable for cycling by applying greater weight to the needs of a cyclist in calculating routes.

4. Using Garmin’s BaseCamp software

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4.1. BaseCamp is a completely free application from Garmin, which allows you to plan and edit routes and, also, to upload and download routes to your GPS unit. I will talk about route planning next time, but for now we will transfer data to and from your GPS unit.

4.2. To install BaseCamp:

<https://www.garmin.com/en-GB/software/basecamp/>.

Scroll to the bottom of the screen and click on “Download now” and then “Download”, selecting a suitable folder on the way (I suggest *C:\Installations\BaseCamp*).

4.3. At the bottom left of your browser you’ll see the file you’ve just downloaded (BaseCamp_474.exe) and a ^ character. Press it and “Open” to install the BaseCamp software.

4.4. **Run BaseCamp.** There is a load of stuff you can do in BaseCamp but in this session, we’re just going to exchange files between your PC and GPS unit.

4.5. Connect your GPS to your PC with a usb cable (it must be a data cable and not a charging only cable) and wait a few moments until “Devices” are displayed in the left-hand pane. Below that you will see the model’s name of your GPS and below that a list of the maps installed on your GPS.

4.6. Double click on the map of interest and it will be displayed on the right-hand side of BaseCamp – magic.

4.7. Double click on Internal Storage above the map list on the left of BaseCamp and a list of courses will be displayed at the bottom of the left-hand pane. Some of the entries will have a name that is composed of date and time, e.g. 24/10/2021 09:55:42 – these are records of rides you have made. Other entries will have names like “BrandonMarsh-Catthorpe”, which are courses you have loaded into your GPS.

4.8. To send a course to your GPS:

4.8.1. First load the file into BaseCamp by highlighting “My Collection” in the top left panel.

4.8.2. Select “File/Import into my Collection” to display the “Import Dialog”.

4.8.3. Navigate to the required .gpx file on your PC and press “Open”. This will cause the selected file(s) to appear in a “My Collection” panel at the bottom of the screen.

4.8.4. Highlight the required .gpx file the “Device/Send to Device/Send Selection to Device”. Select your device and press OK.

4.8.5. The course is now on your GPS, and you can select it by pressing “Navigation/Courses/Saved Courses” and choosing the required course.

4.8.6. **Tip:** The display of Courses can be sorted in a number of ways: e.g. “Distance to start”, “Name”, “Newest first”, etc. I find “Distance to start” to be most convenient – at the beginning of each day when you’re on a tour today’s course will be at the top of the list. Of course, you can select whatever sort rule suits you best.

4.8.7. On the “Saved courses” screen select “☰” (bottom right) and “Sort”.

4.8.8. **Tip:** Keep a backup of any courses you want to retain on your PC and use Windows Explorer, as described last week, to delete the surplus Courses and Activities from your GPS so that it’s easy to select the Course you want and maximise the amount of free memory on your GPS.

4.9. To save a course to your PC:

4.9.1. Highlight the required course in BaseCamp.

4.9.2. Select File/Export/Export Selection, which will cause the “Export Selection” dialog to be shown.

4.9.3. Choose the folder where you want to save the .gpx file and optionally change the file name, press “Save” and that’s all there is to it.

4.9.4. Changing the file name has no effect on the internal name of the course (the name displayed by your GPS).

4.10. To change the internal name of a Course:

4.10.1. It’s sensible for each course to have a meaningful displayed name on your GPS, but you can’t change the names directly. However, it can be done indirectly...

4.10.2. Right-click the Course to be changed and select “Send To/My Collection”. A copy of the Course will appear under “Unlisted Data”.

4.10.3. Right-click the copy and select “Rename”.

4.10.4. Change the name of the Course, which also changes the internal name.

4.10.5. The changed Course can now be saved on your PC or sent to your GPS.

5. Installing OSM maps into Garmin’s BaseCamp software

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5.1. Important uses of BaseCamp are viewing Courses on a map background, creating new Courses, and editing old ones. It’s not always convenient to connect your GPS to get a map background and it tends to react slowly.

- 5.2. We will download and install an OSM map of England. You can find out more about Open Street Maps by clicking on <https://en.wikipedia.org/wiki/OpenStreetMap>.
- 5.3. It's quite involved to download and process OSM maps into usable maps but, fortunately, some of the complex processing has been done for us by Frikart. This is a Norwegian site, which has map downloads for the whole of Europe. They have been prepared for installing into BaseCamp and also onto Garmin GPS units. We'll talk about GPS mapping in a later article.
- 5.4. We'll install a map of England first, by clicking on <http://www.frikart.no/garmin/index.html> and select "England".
- 5.5. You will be prompted to donate (to a worthy cause), but it's not necessary. Scroll down to "Topo Summer" (The distinction between Summer and Winter is not relevant in England but Summer/Winter maps are significantly different in Alpine countries). Optionally you can select "File for GPS", "Windows installer", or "Mac installer" – for now select the Windows, or Mac option as appropriate.
- 5.6. A download dialog will be displayed for downloading *OSM_Topo_Summer_England.exe* to a folder of your choice – I suggest you create a folder off the root of your hard disk called *C:\Installations\OSM\England* press "Save" and wait for the download to complete.
- 5.7. Make sure BaseCamp is closed down.
- 5.8. At the bottom left of your browser you'll see the file you've just downloaded with a ^ character beside it. Press "^/Open" to install the map. For some reason you will get a "Windows protected your PC" message, but I can assure you this file is perfectly safe to run. So, press "More info" and then "Run anyway". My virus checker (AVG) does a check and pronounces the file safe. Continue and wait until the map has been installed.
- 5.9. You will have seen that there are other European maps on the Frikart site, which you can download and install in a similar way. As an alternative you could go to <https://www.openfietsmap.nl/downloads/europe>. Select [OFM\(EU2021-04-08_pc\).zip](#) and download the whole of Europe. It's a 13Gb file, which expands to 16Gb when installed, so you can choose to use it depending on where you are planning to go, or how much disk space you have on your PC. It takes a long time to download the file, but when it's complete you should navigate to *OFM(EU2021-04-08_pc).zip* in an

Explorer Window, or easier to select “^Show in Folder”, and double click the .zip file to show its contents.

- 5.10. Copy the folder to C:\Garmin\Maps\Europe and then navigate to C:\Garmin\Maps\Europe\OFM(EU2021), scroll down and double-click Install_OFM_EU2021.exe to install the map having made sure BaseCamp is not running. You’ll get the same warning messages as described in 5.8, but it is not a problem.
- 5.11. We need to do a bit of customising before creating .gpx files. In “View/Toolbars” make sure the following items are checked: Activity Profiles, Detail Level, Drawing Tools, Edit Features, Edit, Map Tools, View and Show Select Tool.
- 5.12. Before we look at creating routes there’s one or two things that are worth saying about BaseCamp.
 - 5.12.1. Specify the mode of transport (profile) to be used – this determines the categories of roads and tracks to be used in creating the route. These can be tuned in “Edit/Options/Activity Profile”.
 - 5.12.2. You can specify the units and grid to be used in “Edit/Options/Measurement” – kilometres or miles; metres or feet; National Grid or UTM; etc.
 - 5.12.3. The level of detail to be displayed can be selected – sometimes too much detail can obscure other features – you need to experiment with what suits you.
 - 5.12.4. In “Edit/Options/Display” you can specify the size of text and the thickness of routes and tracks.
 - 5.12.5. BaseCamp is very good at retaining information at the end of a session, but it’s also very easy to get congested with too much old data. You should save any routes you want to keep by using the Export facility and delete unwanted items.
 - 5.12.6. Deleting items from the left-hand panels does not delete corresponding files on your PC, so it’s quite safe to delete stuff from BaseCamp.
- 5.13. **Bonus:** Your GPS may not have maps outside the UK, but... Let’s say we’re going on a tour in Mallorca and need the maps on our GPS.
 - 5.13.1. Go to the Frikart site (<http://www.frikart.no/garmin/index.html>), download and install the OSM Summer Spain map, fire-up BaseCamp and connect your GPS unit.

- 5.13.2. Select 'Maps' and scroll down to 'Install Maps'. Select the Spanish map for installation on onto the GPS and go. Easy!! And we're ready to go.
 - 5.13.3. There used to be an alternative way of getting a GPS map by selecting the "File for GPS" option on the Frikart site with the required map selected. It doesn't appear to be working at present, but we won't worry about it as the BaseCamp mechanism works fine.
 - 5.13.4. Have a look at the Garmin folder on your GPS in Windows Explorer. You will see a file called "OSM Summer Spain.img", which is the Spanish mapping file - .img is the suffix used by Garmin for all mapping files.
- 5.14. Next time we'll look inside .gpx files to give us a bit of background before creating routes and tracks in BaseCamp.

6. .gpx files

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- 6.1. .gpx files can hold a variety of information in addition to the minimum data required for courses. The essential, minimum data is a collection of waypoints, a collection of routes and a collection of tracks – one, or more of these elements may be present in a .gpx file.
- 6.2. **A waypoint** is defined by a longitude/latitude pair; it may also have a name, an elevation (height above sea level), a time, and a symbol to use when displaying the waypoint. It can be useful to have a waypoint on your GPS for 'home', say. Select the waypoint in "Saved Locations" and press "Ride" – the GPS will calculate a route to 'home' from your current location.
- 6.3. **A route** is defined by a series of route-points (like waypoints) with each point having a name. Depending on the app that generated the route there may be additional information with each route-point: a display symbol, elevation, and time. This format was designed for navigating, although some GPSs (eg. Garmin Montana) allow a maximum of only 50 route-points in a route and calculate intermediate points using the routing information in its internal mapping.
- 6.4. **A track**, like a route defined by a series of track points (like waypoints), which are optionally associated with an elevation and time, but without names. This format was designed to be used as a snail trail of where you have been. Most GPSs are just as happy being fed a 'track' to navigate from as a 'route', which is perhaps why Garmin use the neutral term 'course' to refer to either a route or a track.

6.5. We're going to open some .gpx files in a text editor to see what the data looks like. I'm not trying to bamboozle you, or turn you into a geek, but stay with me and all the mystery of .gpx files will disappear.

6.6. Each .gpx file has some header information that looks like this:

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<gpx xmlns="http://www.topografix.com/GPX/1/1" creator="bikehike.co.uk" version="1.1"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.topografix.com/GPX/1/1 http://www.topografix.com/GPX/1/1/gpx.xsd">
  <metadata>
    <bounds minlat="52.294320" minlon="-1.660850" maxlat="52.411554" maxlon="-1.564570" />
  </metadata>
```

6.7. The first thing to notice is every type of data is framed between '<' at the start and '>' at the end and the first item inside the opening bracket tells us what sort of data it is. Frankly, we don't need to concern ourselves with this header data, but you might be interested to see that this data was created by "bikehike".

6.8. The next group of significant data will describe waypoints, routes, or tracks. There may be other control information between the header lines and waypoints, routes, or tracks, but we can ignore that for now.

6.9. **Waypoint data** looks like this:

```
6.9.1. <wpt lat="52.5103641481" lon="-1.5994371662">
      <name>Devitts Green</name>
      <sym>Flag</sym>
      <type>Marks</type>
    </wpt>
```

6.9.2. You can see that a waypoint has a latitude/longitude and a name. The 'symbol' and 'type' information can be used in displaying the waypoint, but the app may ignore it.

6.9.3. The .gpx file may contain several waypoints defined like this.

6.9.4. **Tip:** Some apps use a default "type", but with others you can specify the type – so you could classify bunches of waypoints as "hotels", "cafes", "bike shops", etc. In Memory Map you can show or hide each class of waypoints separately to minimise clutter on the map display.

6.9.5. **Tip:** Accented characters are treated in different ways - some GPSs ignore them, which is not too much of a problem. However, the Montana, for example, just stops reading beyond an accented character. This caused me a problem in France on a tour, so when you're planning a foreign tour use only non-accented characters.

6.10. **Route data** looks like this:

```
6.10.1. <rte>
      <name>Ken-Berkswell</name>
      <rtept lat="52.343650" lon="-1.579684">
        <name>001</name>
      </rtept>
      .
      .
      .
    </rte>
```

- 6.10.2. It starts with a start of route label (<rte>) and the ‘name’ of the route, which will be displayed on your GPS. You can edit the name field if you want.
- 6.10.3. This is followed by route-point (<rtept) information, which as a minimum is a latitude/longitude pair and a name for the route-point.
- 6.10.4. The route-point section is repeated many times – there may be over a thousand route-points defining the route.
- 6.10.5. Finally, there is an end of route label (</rte>). You can have more than one route in a single .gpx file, in which case the <rte> to </rte> block is repeated as many times as necessary.

6.11. **Track data** looks like this:

```
6.11.1. <trk>
        <name>Ken-Berkswell</name>
        <trkseg>
            <trkpt lat="52.343650" lon="-1.579684">
                <ele>88.52</ele>
                <time>2021-11-04T17:15:20Z</time>
            </trkpt>
            .
            .
            .
        </trkseg>
    </trk>
```

- 6.11.2. Like the route, it has a start of track label (<trk>) and a name. A single track can be split into segments (<trkseg>), although I’ve never used the facility.
- 6.11.3. And then there are as many track-point (<trkpt) blocks as necessary. Optionally there is an elevation (height above sea level) and a time associated with the track-point.
- 6.11.4. The end of the track is marked with an end of segment (</trkseg>) and an end of track marker (</trk>).

6.12. Finally, the end of the .gpx file is labelled with an end of marker, (</gpx>).

6.13. That wasn’t too bad, was it?

6.14. To make it seem more complicated some apps use the **extended gpx (gpxx) format** to add more information to the gpx data – like colour, line width, style, and opacity. This is prefixed in the .gpx file with <extensions> and may, or may not be used by the app used to display the route.

6.15. The extended gpx format can be used to instruct the displaying app to calculate a route between adjacent route-points/track-points and you will see a nice bendy line following roads and paths on the underlying map. If the displaying app (eg. Memory Map) doesn’t understand this instruction the route may be displayed as a series of long straight lines, instead of


following the roads as you had probably hoped. The importance of this will become apparent when we talk more about Garmin's BaseCamp software.

- 6.16. **Problem:** When a route is displayed by an app that uses the route-point symbol from the .gpx file (eg. BaseCamp and MemoryMap) the display is overwhelmed by a huge number of overlapping symbols, which obscures all the map detail. **The solution** is to use tracks, rather than routes, as tracks don't use track-point symbols.

7. Creating .gpx files

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- 7.1. **Tip:** Before creating a .gpx file let's have a quick look at the Windows "Send To" facility, which is really handy for running many applications from an Explorer Window. It can also be useful if you want to open .gpx files, say, with different applications according to what you are doing.
- 7.1.1. In Windows Explorer navigate to BaseCamp.exe, which you will find in C:\Program Files (x86)\Garmin\BaseCamp.
- 7.1.2. Press Ctrl-C to copy it to the clipboard (or right-click/copy).
- 7.1.3. In the folder location field at the top of Windows Explorer type "shell:sendto" and press Enter.
- 7.1.4. Right-click in the main body of the Explorer Window and select "Paste Shortcut", which will create a shortcut to BaseCamp.exe. You can rename the shortcut if you want to make it look tidier – say, "BaseCamp".
- 7.1.5. **Test:** In an Explorer Window navigate to one of the folders where you keep .gpx files. Right-click on a gpx file and select "Send To": you will see "BaseCamp" (or whatever you called it). Click on "BaseCamp" and a new BaseCamp session will open with the selected .gpx file already loaded – saves a lot of faffing about with import. Actually, it's better than that: if you highlight a bunch of .gpx files and select "Send to/BaseCamp" they will all be loaded into BaseCamp.
- 7.2. **Start creating a .gpx file here** – let's create a route from WMP, Park and Ride to La Delicia in Balsall Common. The map might not be showing the right area of the country and perhaps the quickest way to get there is to use the Search facility: into the top-right Search box type "War Memorial Park", Enter. A results panel will open, and you can double-click on the best fit result to get WMP in the middle of the map pane. We've finished with the results panel, so you can close it by clicking the cross at top-right.

- 7.3. Alternatively create a waypoint on your home, export it as a .gpx file; open home.gpx in BaseCamp using the SendTo facility; BaseCamp will open with "home" in the centre of the screen.
- 7.4. To navigate around the map, click the hand icon on the tool bar – a highlight box will be displayed round the icon to show it's active and when the cursor is in the map area it will change to a hand. Pressing the left mouse button will change the cursor to a fist and you can drag the map around with the mouse. By rolling the mouse scroll wheel the scale of the map can be increased and decreased.
- 7.5. Adjust the map to get the WMP Park & Ride Bus Stop in a convenient place and scale. Select the "New Waypoint" icon (Flag) and click on the track at the bus stop and click on the Hand icon so you don't scatter waypoints every time you click the mouse button.
- 7.6. When you hover over the waypoint name it underlines and clicking on it allows you to change the name to something more sensible (I suggest "WMP") and you can change the blue flag symbol to anything that grabs your fancy.
- 7.7. Now find La Delicia in Station St., Balsall Common and create another waypoint. If you want to save these waypoints for future use you can highlight them both in the "My collection" panel, then select "File/Export/Export Selection" and choose a suitable name. If they have been deleted from My Collection you can reload them using the Send To facility described above.
- 7.8. In the 'My Collection' panel with the Ctrl key pressed click on the first waypoint and then the last waypoint of the route (WMP & BalsallCommon) to highlight both waypoints. Release Ctrl, right-click on the destination waypoint, and select 'Create route using selected waypoints'. After a momentary pause a route will be displayed in magenta and you can edit the route name if you want – I will call mine 'WMP-BalsallCommon'.
- 7.9. You will immediately see that the route is probably not the way you would choose to go! Also, a floating label 'WMP-BalsallCommon' is obscuring some of the map detail at the start of the route. Clicking on the 'x' will close the label.
- 7.10. I want to go through WMP to Coat of Arms Bridge Road and then over Canley Ford. The first thing to do is to pan (slide around) the map until WMP is in the middle of the screen and zoom (increase the scale of the map) so you can see you're doing.
- 7.11. Select the "Insert" tool by clicking on the '+ ' icon at the left end of the tool bar and then click anywhere on the magenta track (if you've lost the highlight you can click on the route in the 'My Collection' panel). You will

now see a 'rubber band' joining the start of the route, the cursor, and the end of the route. Click on Coat of Arms Bridge Road near its junction with Wainbody Avenue North and to the NW of the junction. The route will now be re-aligned to go through WMP and along Coat of Arms Bridge Road.

7.12. Now get Canley Ford into view and click again on the track section near the ford itself. The route will now re-align along Canley Ford, over the A45 on the pedestrian crossings, and along Charter Avenue. You probably won't want to make any other changes to the route.

7.13. **Tips:**

7.13.1. To move the map about in Inset mode you will need to click on the Pan () icon first, pan and zoom map as necessary and then re-enter Insert mode. The 'rubber band' will show you which section of the route you are working on. It's a bit quirky, but if you want to insert another point earlier in the route you may need to clear the insert mode by clicking on the start point in the 'My Collection' panel, then click back on the route and re-select the "Insert" icon.

7.13.2. To refine the route, you can move any of the waypoints by using the 'Move Point' icon (hovering over the toolbar icons will tell you what they do). Also, you can use 'Erase' to delete any waypoints.

7.13.3. The name you give the route goes into the <name> field in the .gpx file and will be displayed on your GPS unit. Some GPSs will only display the first 15-characters so don't make your name too long.

7.14. The route we have created is in extended gpx format: if you save it on your PC and load it into BikeHike it will display OK but load it into Memory Map, which doesn't understand extended gpx, and you'll get a very crude representation of the route in long straight lines.

7.15. We need to populate the route with a continuous stream of track-points. Highlight the route we have just created in the 'My Collections' panel. Right-click it and select "Create track from selected route". This generates another entry in the panel (with a footprint icon). Save this to your PC by highlighting the track and in the main menu select File/Export/Export Collection and give the file any name you want and save it somewhere sensible.

7.16. **Snag:** The "*OSM Topo Summer England*" for BaseCamp does not include height data in it, but the "*OFM(EU2021-04-08_pc)*" does – this is the whole of Europe map. The track we have just prepared will include height data if you are using the Europe map but will not if you are using the England map.

7.17. **Tip:** To populate the track with height information you can load the .gpx file into BikeHike (<http://www.bikehike.co.uk/mapview.php>) and save it

as a “gpx track” – don’t forget to fill in the “Course title” field, which will populate the track <name> field in the .gpx file.

- 7.18. This track is now ready to be used in any app of your choice or GPS. Importantly the height of every point on the track is also saved in the .gpx file.
- 7.19. **Tip:** The height profile screen on a GPS displays the profile of the route you have ridden so far and displays the profile of the route ahead of you using the elevation data in the .gpx file. Clearly, if there’s no elevation data in the .gpx file you will only see a flat profile at 0m. above sea level ahead of you.
- 7.20. **Tip:** Some GPSs have an ‘upcoming hills’ facility, which warns you of a ‘big’ climb ahead of you and shows your progress as you climb the hill. You need the elevation data for this to work.

8. Download a .gpx file from your GPS

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8.1. Use Basecamp

- 8.1.1. Connect GPS to PC with usb cable.
- 8.1.2. In Basecamp select Device/Receive from device. The name of your GPS (device) will be shown – highlight it and click “OK”.
- 8.1.3. This will cause all waypoints, courses, and tracks on your GPS to be displayed in the lower left-hand panel.
- 8.1.4. Highlight the required info, rename it to a meaningful name (which will be the internal course name) and export it to your PC by selecting File/Export/Export Selection.

8.2. Use BikeHike

- 8.2.1. Connect GPS to PC with usb cable.
- 8.2.2. Load BikeHike into a browser - <http://www.bikehike.co.uk/mapview.php>
- 8.2.3. Select “Load Route/Choose file”.
- 8.2.4. Use the Upload from File option. (“from GPS unit” requires a plugin to be installed, which is no longer available)
- 8.2.5. Navigate to (F:)\Garmin\Activities and select the required .fit file.
- 8.2.6. Fill in the Course Title and save Route as a GPX track.
- 8.2.7. Download route and save in a suitable folder of your own choice.

8.3. Use Plot-a-route

- 8.3.1. Connect GPS to PC with usb cable.
- 8.3.2. Load Plot-a-route into a browser - <https://www.plotaroute.com/routeplanner>
- 8.3.3. Select “Create/Upload a route”.

- 8.3.4. In the Upload a route dialog, click on “Choose file” and navigate to (F:)\Garmin\Activities, select the required .fit file and click on “upload”.
- 8.3.5. Now click on “DLOAD”, enter a name for the course, select File type = GPS, File format = GPX, GPX type=Track and Waypoints=None.
- 8.3.6. Click on “Download” and save in a suitable folder of your own choice.

9. Setting up a Garmin 1030 GPS

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- 9.1. There’s a whole bunch of menus and, frankly, it’s not obvious what each one does, but to improve our experience we really need to go through each menu! Initially we’ll get riding with default settings and gradually change things to suit ourselves.
- 9.2. When you switch on the GPS, you’ll be faced with the last screen you were using. Navigate to a screen that has a circular icon at the top above a label, which may say “Road” and we’ll be ready to go. (We will call this “The Road” screen). The arrows on either side allow you to select different “profiles” – i.e. The type of cycling, walking, or running you are going to do. Let’s assume we’re going out on a Road Ride.
- 9.3. Underneath are buttons for Navigation, Training, History and My Stats. We’ll talk about “Navigation” later. At the bottom is a “≡” for setting up some of the profile data and “IQ” for ‘trailforks’ information – this is an app incorporating a mountain bike trail map.
- 9.4. **Quickstart**
 - 9.4.1. When a .gpx file has been loaded into our GPS, disconnect the usb cable, switch on the GPS and we should be at “The Road” screen.
 - 9.4.2. Tap “Navigation”, “Courses”, “Saved Courses” and select the required course.
 - 9.4.3. The name of the selected course will be displayed at the top of screen and “Ride” at the bottom.
 - 9.4.4. The GPS will probably say “You are near the beginning of the course. Would you like to start?”. I suggest you select “✓”, which will cause a large green triangle to be displayed for a short while on top of the map background. The course you are going to follow should be shown (see later) in magenta with white arrow heads at intervals showing you the direction of travel.
 - 9.4.5. The large green triangle shows you that your route will be recorded as you ride, shown as a green snail trail.

- 9.4.6. Swiping the screen to left, or right repeatedly will cause other screens to be displayed, which we'll look at in a moment, eventually taking you back to the map screen.
- 9.4.7. If you had selected "✘", your route will not be recorded until you give the bottom-right button (stop/start button) on the GPS a short press – you'll know you are now recording your route as the green triangle will be briefly displayed and you will start to see a green snail trail appear on the route you've ridden.
- 9.4.8. When you have finished riding, give the stop / start button a short press, which will cause a red square to be briefly displayed and you will be prompted to save, or discard the ride record.
- 9.4.9. Now give the top-left button a quick press to switch off the GPS.



9.5. Whilst recording a ride

- 9.5.1. Giving the top-left button a quick press will cause the display to be **alternately locked and unlocked** (it will tell you momentarily if the screen is now locked or unlocked). When locked you can scroll into the various information screens, but you cannot change any settings. It's a good idea to lock the screen before you put the GPS in your pocket, when you go into a café, say – it stops unfortunate key combinations being pressed which might change all your settings – real bad news.
- 9.5.2. When you've stopped recording, a quick press of the top-left button will turn off the GPS, but you can't switch the GPS off until you've saved the route or discarded it.
- 9.5.3. At the top of the map screen, you'll see "—" and "+" – pressing either of them will cause the scale to be reduced or increased respectively.
- 9.5.4. If you tap "👉" it will change to "👏" and you can scroll (pan) the map around to see beyond the currently displayed area.
- 9.5.5. Any time you see "↶" in the bottom left of the screen, you can press it to return to the navigation map.
- 9.5.6. Whilst you're closely following the selected course you will see a crude profile of the course along the bottom of the

screen. When it's not there it means you're off-route, but it will return when you get back on your chosen course.

- 9.5.7. As I said earlier, there are several screens you can view when you swipe to left, or right. You might want to see a Dashboard of numerical statistics, or a Profile of the course, or a compass, etc. We'll look now at setting them up.

9.6. Set up the optional screens

- 9.6.1. Tap the middle of the navigation screen to get “<  >” displayed at the bottom of a new screen. Tap  to get to the “Road” screen. Press and hold the circle with “Time” in it at the top of the screen. You will now be looking at the configuration screen for “all things relating to the ‘Road’” activity profile.
- 9.6.2. We'll look at “Data Screens” in a moment, but first we'll look at other options:
- 9.6.3. **Default Ride Type:** Click on it and you can choose the type of activity you use most. When you switch on the GPS this is the activity profile it will use.
- 9.6.4. **Segments** are virtual race courses created by users that rank personal results against others in the Garmin Connect and Strava communities. If this is your bag, you can set this up later, for now we can switch it off.
- 9.6.5. **Climb Pro** can be enabled or disabled according to your own preference. When enabled and you come to a “big hill”, the navigation display changes to an elevation profile of the hill showing you how steep the hill is and how much further you have to climb. Unfortunately, the feature is on or off and there doesn't appear to be a way of defining a “big hill”; the amount of climbing, the steepness, or the distance to be climbed. Anyway, you can experiment with it and turn it off if you don't like it.
- 9.6.6. **Alerts:** you can ask to be warned about all manner of things which, frankly, I don't use – time, distance, calorie, heart rate, cadence, etc.
- 9.6.7. **Auto Features:** Auto Sleep should save battery life by powering the GPS down when you're not moving and Auto Pause stops recording when you're not moving, so average speed is only calculated when you're moving instead of being total distance divided by total time.
- 9.6.8. **Navigation:** under **Map** you can select **Orientation “Track up”**, this causes the map to rotate as you ride so you always ride “up” the map, which is the most convenient way to navigate. **Auto**

Zoom causes the scale of the map to increase as you approach a turn, so it's easier to see where you need to go. **Map Information** allows you to select which maps are enabled. **History Line Colour** allows you to choose the colour of your snail trail. **Draw Contours** allows you to see the contours in your map background – quite useful in mountainous areas. Under **Routing** you can select **Avoidance Setup** where you can choose to avoid A-roads, or off-road, or avoid ferries, etc. Also **Lock on Road**: when enabled the arrowhead showing your current position is clamped onto the nearest road/track to your current position. It doesn't have much of an effect when you're using roads, but if you're off-road when the tracks aren't always shown accurately it can be mis-leading. **Route Recalculation** is used to determine how you want the GPS to respond when you go off route.

- 9.7. **Data Screens** – are the screens you can access by scrolling left and right from the main navigation screen.
- 9.7.1. **Map** – the main navigation screen is always displayed. Map should always be at the top of the list of selected screens because it is the screen displayed by default.
 - 9.7.2. Other screens are optional: **Data Screen** – a dashboard which you can configure to show distances, heights, times, heart rate, etc.
 - 9.7.3. **Compass** – showing north
 - 9.7.4. **ClimbPro** – the screen that displays “big hill” information is a bit different from the other screens as it displays automatically when you get onto a “big hill”.
 - 9.7.5. **Elevation** – a height profile of where you've been and, provided you have elevation data in your course, will show you the climbing still to come.
 - 9.7.6. **eBike Metrics**
 - 9.7.7. Several other screens, which you can select from “**Add New**”
 - 9.7.8. Having selected which data screens you want to see, you can re-order the screens using the ☰ menu at bottom right of the “Data Screens” page.
 - 9.7.9. **Tip:** the screen at the top of the list is the one that is shown by default when the GPS is switched on. Generally, you would pick “Map”. The other screens are selected in turn each time you swipe to the right until the last screen is reached and then it goes back to the top. Swiping to the left takes you to the bottom of the list and works progressively up the list. Re-order the list to


give you most convenient selection swipe order when you are riding.

- 9.8. **Changing Activity Profile** – by clicking on the left or right of “< ○ >” you can select different pre-defined profiles. Unfortunately, you must go through each profile in turn to configure it. We’ll talk about defining our own profiles later.
- 9.9. **System menu** – at the bottom left of the “Road” screen click on the “≡” symbol to reveal the main configuration screen.
 - 9.9.1. Under **Activity Profiles** you can create or delete Profiles and define their properties. This is the list of profiles you can scroll through using the “< ○ >” facility at the top of the "Road" screen.
 - 9.9.2. Under **Sensors** you can add your heart monitor, power monitor, cadence monitor, etc.
 - 9.9.3. Under **Safety & Tracking** you can define parameters associated with your phone emergency contacts, etc.
 - 9.9.4. Under **Connected Features** you can tell your GPS how to connect with Phone, Wi-Fi and Device Transfers. Which is fine if you’re happy to blindly synchronise with Garmin Connect without knowing what’s happening.
 - 9.9.5. Under **System/Display** there are a few settings which can improve battery life.
 - 9.9.6. Under **System/Units** you can set up the units used for distance, elevation, time and position format (longitude/latitude, or Ordnance Survey Grid).
 - 9.9.7. Under **System/Tones** you can switch audible warnings on or off.
 - 9.9.8. Under **System/Language** you specify the language to be used.
 - 9.9.9. Under **System/Device Reset** you can cause yourself a lot of aggravation if you select this option. **Tip:** when the GPS is connected to your PC with a usb cable, in the GPS folder \Garmin\Settings\ the file Settings.fit contains all the settings you have set up, so you should save this file on your PC and if you should lose the settings off your GPS, you can recover your set up by loading it back onto your GPS (copy Settings.fit to Garmin\Settings).

10. **Route Converter**

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- 10.1. I find this a very useful application, that runs on PC, or Mac, for looking at the detail of where a route goes and for tidying up spurious points in

- a .gpx file. I'll explain what I mean and then talk about installing Route Converter (if you want it).
- 10.2. On-line maps are used, so you must have a wi-fi connection to use the system, but several maps are available from Google and Open Street Map – you can decide if you want roads only or want to see footpaths and tracks; contours and/or hill shading can be chosen; or you can have a satellite image instead of a map background.
 - 10.3. There is a plethora of data formats to save your data in. We normally use .gpx being the common standard across all apps, but you could choose .kml/.kmz for input into Google Maps; .tcx is Garmin's proprietary format; and if you wanted to play around with spreadsheets you could save the data as .csv or .xls/.xlsx.
 - 10.4. When you load a .gpx file into Route Converter the course will be displayed on a map background on the left of the screen with a list of data points on the right and an elevation plot at the bottom of the screen (if there is elevation data in your .gpx file). By clicking on the first data point and repeatedly tapping the  button you can step through the whole course with the currently selected point in the centre of the screen. You can change the scale of the map by rolling the scroll button of your mouse.
 - 10.5. I mentioned tidying up spurious points in a .gpx file: as you step through the course you come to points that are in the wrong place – maybe a waypoint added in a route planning app has slightly missed a junction or stepped off to the side. You can delete these rogue points as you go along, or insert points if you missed a bend, say. Then you can finish off by saving the tidied-up file. Now, when you load up your GPS it won't tell you to turn "left", when you're sure it's "right", and then tell you you're "off-course" making you turn round and curse your GPS for taking you the wrong way.
 - 10.6. If you take your GPS with you when you go into a café you find that it's recorded a huge scattering of points all-round the area: you can use Route Converter to delete all these points.
 - 10.7. There's a handy facility in the "Position" menu which deletes duplicate points – you can say "delete all points within 5 metres of their predecessor" (or whatever figure you chose), which will reduce the number of points without significantly affecting the accuracy of the data. This can substantially clean-up the café scatter. There's a couple of other rules you can use for reducing the number of points, but you can investigate them yourself.

- 10.8. Under “Position List” you can convert a track to a route, or a route to a track and you can also reverse the direction of a route but beware it doesn’t allow for the direction of travel on a roundabout.
- 10.9. Now you can’t wait to get this application on you PC. Click on <https://www.routeconverter.com/home/en>. Select Downloads/Stable Releases and Windows, Linux or Mac as appropriate. Select, or create, a suitable folder to store “RouteConverterWindows.exe” and press “Save”. Create a shortcut to this .exe file on your desktop and, if you cast your mind back to section 7, also copy the shortcut into the shell:sendto folder. Now when you right click on a .gps file select “SendTo” and “Route Converter” you will fire-up Route Converter with the .gps course ready loaded.

11. Memory Map

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- 11.1. Is a paid for app with versions for PC, Mac, iPhone and Android. <https://memory-map.com/>
- 11.2. Perhaps its best feature is that it uses an Ordnance Survey background in various scales: 1:50,000; 1:25,000; 1:10,000 Streetmap, which gives the names of all the local roads in towns and villages. Also, a 1:250,000 road map and a 1:1,000,000 outline planning map are thrown in for free.
- 11.3. I normally find the licensing management of paid for apps to be a real pain, but it works very well with Memory Map. I’ve needed to use their email support system a couple of times for licensing issues and other usage problem and found them very quick to respond and helpful.
- 11.4. You can either purchase a lifetime licence, or an annual renewable licence. The advantage of the annual licence is that you get all the map updates included and, with HS2, that’s quite useful round here.
- 11.5. One last thing about licences is that you get the right to use Memory Map on up to 5 devices, which is plenty for most households.
- 11.6. UK maps are available in high-resolution and low-resolution versions – the latter are cheaper, but a bit grainy as you might expect.
- 11.7. IGN maps of France at 1:100,000 and 1:25,000 and there are tools which will allow you to convert other maps for use with Memory Map, although I’ve no personal experience of doing this.
- 11.8. Route creation is a bit crude: a straight-line route between two points can be optimised for walking, cycling, or driving but this is a one click operation and you cannot easily modify the optimised route – not very satisfactory by comparison with Basecamp.

- 11.9. The manual alternative is very straightforward, if somewhat laborious, as it's very easy to drag waypoints, or insert new waypoints, but it's up to you to put in enough waypoints to follow roads sufficiently closely.
- 11.10. This all sounds a bit negative, but a really useful feature of Memory Map is being able to load and display several routes at the same time – either to view end to end routes as one or compare local similar routes. You can change the colour, thickness and line style of each route making it easier to distinguish between the routes.
- 11.11. You can show the elevation profile of any route or track, but MM will not include elevation data when it saves a .gpx file.
- 11.12. My design process for creating a finished route is to create an initial route in Basecamp and save it in a .gpx file with elevation data. Then I load it into Route Converter to tidy up any ragged bits and finally load it into Memory Map so that I can look at the route on an OS map. Memory Map has good printing facilities which I use to produce a paper map to carry with me on the road.
- 11.13. The .gpx route can be transferred to your phone for display in Memory Map on your phone. The Memory Map display on your phone has a small circle showing you where you are and also an arrow showing you which direction you are travelling in and its length shows you how far you will travel at your current speed. As you might expect, you can set it up to start recording at the beginning of your ride and stop recording at the end. You can then download the .gpx record of your journey to use as you see fit.
- 11.14. Don't forget that using Memory Map on your phone allows you to navigate with an OS background map, which few people would disagree is the clearest mapping system available.

12. Cycle Travel – Carla Skinner

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- 12.1. **“In praise of *cycle.travel*”**: You may have noticed that some of our ride leaders have been using *cycle.travel* recently to send out route details for upcoming club rides. I had not come across it before, so I had a look and liked what I saw.
- 12.2. Developer-cyclist, Richard Fairclough, says *cycle.travel* is a route planner not a route plotter. If you just want to commit to map a route you already know this is probably not the best tool. However, it comes into its own in areas which you do not know well when you want to find the optimum cycling route from A to B, or compare different options for routes from A to B. And once you have a route a

couple of clicks at any point on it will give you a feel for the terrain in Google Street View.

- 12.3. The system is based upon Open Street Map (OSM) and it uses slick routing algorithms to create suitable routes using the 'bikeability' criteria embedded in OSM to optimise routes for cyclists - avoid main roads, reduce hills, etc. If a route is not coded in OSM as suitable for cycling, then *cycle.travel* will not route you there. For example, it will not take you through Stoneleigh Park and it took some persuading to pick up all of the off-road section on the 100k Challenge between Newnham and Norton.
- 12.4. It is not quite like any other route planning system I know, and it takes a bit of time to learn to use it efficiently. However, it works flawlessly when you know how. It shows you clearly where a suggested optimum route includes an off-road section, but if you want tarmac all the way it will change the route to find that for you. It is especially good for planning multi-day trips - you can experiment with different overnight stops and easily see the changing day by day mileages and climbs in an elevation graph.
- 12.5. Some people might say that they prefer using an OS base map to OSM and recent upgrades have now made that possible. The routing is still done using OSM because that is the only source of 'bikeability' data, but the result can now be displayed on an appropriately scaled OS map. Unfortunately, that bit does not come free - you need to sign up as a *cycle.travel* supporter to get the OS base map and with that you also get French, Austrian, Spanish, and Swiss base maps (and likely more in the future) for planning trips in those countries.
- 12.6. It is a browser-based system not really suitable for use on the road. A phone app is being developed, initially only for iPhone. This may extend how *cycle.travel* can be used in the future but the current primary use is route planning back at base to produce various format GPS files which you can then import into your favourite route tracker.
- 12.7. Why not take a look: if you visited the site some time ago and were not too impressed then why not have another look? User experience and clever coding is continually improving the product and the site contains many new routes contributed by the *cycle.travel* user community.
- 12.8. Go to <https://cycle.travel> to review what is on offer and to <https://cycle.travel/map> to start planning a route.

13. Using a smartphone for navigation – Sak Wathanasin [top](#)

- 13.1. If, like me, you baulk at buying a dedicated Satnav device when you already have a phone with many times the computing power available to the Apollo astronauts, the following notes might be useful. My experience is on Apple kit (Macs/iPhones/iPads), but the navigation apps are available for Android-based devices and what follows will largely apply to them as well.
- 13.2. The biggest problem with using a navigation app on a phone is it eats battery power like there's no tomorrow. When my phone was new, I was able to get a little under 4 hours before the battery died, but after a couple of years, this has dropped to under 2. A relatively inexpensive (compared to the phone) external battery pack in my rear rack bag mostly solved this problem for me, at least for day rides. On a tour, you'd have to recharge the battery pack every night, which could be an issue.
- 13.3. Rain is the other big problem: newer phones are at least IP67 compliant and can survive most rainstorms, especially if you have a cover. The problem is that water can seep in via the charging port after half an hour or so in a downpour when the battery pack is connected. The phone will report that it has detected liquid in the port and go into a sulk. At that point, the only thing I can do is disconnect the external battery and hope that the rain stops before the phone battery dies. Maybe wireless charging is the answer.
- 13.4. The advantages are:
 - 13.4.1. A phone has a larger colour display than a dedicated GPS, so it's easier to follow a route when bouncing around on our less-than-smooth road surfaces.
 - 13.4.2. It has a much faster CPU with a user interface that you already know.
 - 13.4.3. There is one less item to carry.

14. Komoot – Sak Wathanasin [top](#)

- 14.1. The main app that I use is Komoot. It has a website used to plan routes (including importing GPX files, see below), and an app on the phone that you use for navigating during your ride. Although you can plan

routes using the phone app, it is much easier to use a desktop computer with a much larger screen.

- 14.2. Start by going to <https://www.komoot.com> using your favourite browser and create a new account if you don't have one. It's free to sign up and you get access to one free map of your region (roughly a county), which will cover our short rides. You can then buy additional regional licences for £4 each, or bundles (e.g. Midlands) for £9 or the world for £30. You only pay once, which can make this a cheaper option than subscription-based services.
- 14.3. Buying a map pack gives:
 - 14.3.1. Voice-navigation.
 - 14.3.2. The ability to download maps for offline use on your phone.
 - 14.3.3. Exporting your route to GPS devices.
- 14.4. There's also a "premium" mode (annual subscription) with additional features that I haven't needed to use so far.
- 14.5. Having logged in to the website you can:
 - 14.5.1. **Import a GPX file** by clicking on the "+", or...
 - 14.5.2. **Create a new route** by clicking on "Route Planner". Choose "Bike Touring" for the sport; enter start and destination points; select "round trip" and it will plot a route for you.
- 14.6. Komoot uses the cycle-track data in OpenStreet Maps (routable mapping as previously described) and will use cycle-paths where it can. You can then edit the proposed route by simply clicking a point on the route and dragging it to location you want it to pass through.
- 14.7. **Changing a route with Komoot** is very easy, and the simplest of all the different apps that I have tried so far. Each time you change the route, it will try to plot the best possible route through your selected point using any cycle-paths that it knows about. You can force it to use specific paths and if you want to force it to use a path that it doesn't know about, click to add an additional point, uncheck the "Follow ways" option, and it will add a straight line to the next point. Add as many of these as you need.
- 14.8. When you are happy with the route, save it and it will appear as one of your "planned tours". Routes are private by default, but you can make them public and share them simply by sending a link to others (they don't need an account), or you can export as a GPX file for sending to others.

- 14.9. If you decide to import a GPX route that someone has sent you, you will be asked whether you want to use it as a basis for a new route or if you simply want to save it as a record of a completed ride.
 - 14.9.1. To use it as the basis for a new route you will be guided through the process.
 - 14.9.2. During the import, if it detects a segment that it does not recognize as a rideable path (a bit of off-road, say), it will ask you whether it should retain the original path or replace it.
 - 14.9.3. Then you just need to give the route a name, save it, and it will appear in your list of planned tours.
- 14.10. The Komoot website has an extensive set of guides and help pages that will show you how to use the various features.
- 14.11. Navigating with Komoot on the phone**
- 14.12. Now that you have some routes to follow, how do you use them?
 - 14.12.1. First, download and install the Komoot app on your phone from the Apple or Google app stores.
 - 14.12.2. Launch the app and login using the same credentials as on the website (it should offer to save your credentials, so you never have to enter the password again).
 - 14.12.3. Now tap on “Profile” then under “Tours” tap on “Planned” and pick the route you want to follow.
 - 14.12.4. You will now be shown information on the route - distance, estimated time to complete and lots more.
 - 14.12.5. You will also get a useful option to store the map data on the phone, so you don’t need to be connected to the Komoot server while on the road.
- 14.13. Tap the **“Start navigation”** button to begin the ride.
 - 14.13.1. If you are not at the start point, it will offer to adjust the route to take you to the start.
 - 14.13.2. Tap the “arrow” icon to centre the map at your current location and start pedalling.
 - 14.13.3. Komoot has turn-by-turn navigation though sometimes it gets confused about which way you’re pointing and will tell you to turn left instead of right (or vice versa), so keep checking the map display instead of relying on its directions. [This might be caused by spurious points in the .gpx file,

which you can tidy up using Route Converter as described in section 10 in an earlier instalment.]

- 14.14. The map display shows the planned route in blue with your progress alongside it in red. If you deviate from the planned route, intentionally or otherwise, it will show you the shortest path to the planned route with a dashed line but doesn't annoy you with a flurry of alerts.
- 14.15. As with all mapping apps, you can adjust the scale by zooming in or out, though I have found that when it needs to refresh the display, it goes back to its default scale, which can be annoying.
- 14.16. There is a "controls" button that lets you pause or finish the ride, and it also allows you to turn on voice navigation (not that useful on a bike).
- 14.17. It records the route that you have actually ridden and at the end, you can save this in "Completed tours".
- 14.18. Although Komoot has its foibles, it does the job, and it seems to be actively maintained so that new versions of the app are released regularly.
- 14.19. My main complaint with it is that it doesn't have a "night mode", so that the glare from the display in the dark makes it pretty well unusable and you're much better off with Google Maps or similar.

15. BikeHike – Mike Thomas

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- 15.1. Bike-Hike is wonderfully easy and logical to use with intuitive controls to create routes for cycling and walking, and to view .gpx and other route files you may have been sent. To open the programme simply click onto <https://www.bikehike.co.uk/mapview.php>
- 15.2. I generally use it for creating day rides, but prefer to use Cycle-Travel for linear touring routes, mainly because the editing facility is better, and cafés are identified.
- 15.3. Creating a route
 - 15.3.1. Open <https://www.bikehike.co.uk/mapview.php>. You will see an OS map and an Open Street Map. These can be interchanged by clicking *Toggle Map Sizes*.
 - 15.3.2. Scroll and zoom to navigate to the approximate start location on the map.
 - 15.3.3. Place the cursor precisely on your required start location on the Open Street Map and click onto this. A green marker will then identify your start location.

- 15.3.4. You then have the option to *Follow Road*. Clicking the box will turn this option on by showing a blue box.
- 15.3.5. With the *Follow Road* option selected, progressively work along your chosen route clicking as you go, and your route will be highlighted in blue. At each stage a red marker will identify the current end of your route. By using the *Follow Road* option, you will see that the route precisely follows the roads. This is because the Open Street Map (OSM) is a routable map: the OS mapping does not have this feature.
- 15.3.6. If you want to use a footpath or somewhere not on a recognised road (or you are creating a walking route), un-click the *Follow Road* box, and the route you create will then simply be a series of straight lines linking waypoints. The *Follow Road* feature can be turned on or off anywhere during your route creation, so long as you use the OSM mapping.
- 15.3.7. When you have reached the end of your route click *Save Route*.
- 15.3.8. A dialogue box will then be shown headed *Download Route to PC or GPS*. Use this box to select whether you want to save your route as a *gpx track or tcx*: .gpx is a universal standard, .tcx is proprietary to Garmin – it allows you to store “*coursepoints*”, which you might want to add to highlight key points like a summit, but Bike Hike doesn’t handle them very well. I would always use the “*gpx track*” option which creates a “breadcrumb” trail of your route with elevation data (in the UK); “*gpx route*” can result in unwanted side effects when displaying the route in another application like huge numbers of giant waypoint symbols smothering your route. Give your route a *Course Title*. To save your route onto your PC click on *file* in *Download to*. Click *Download to* and your route will then be saved in your download folder.
- 15.3.9. If you want to send the course directly to your GPS unit: connect your GPS with a USB cable and select “*File*” (ignore the *GPS unit* option) and press “*Download to*”. Navigate to your GPS unit – probably seen as “Garmin Edge ... (D:)” and find the Garmin\NewFiles folder. Save your route here and unplug your GPS unit.

15.4. Editing a route

- 15.4.1. The Drag Edit Mode is not the best feature of BikeHike. To use it you need to *Add Coursepoints* either side of the section of route you want to change, then highlight *Drag Edit Mode*.
- 15.4.2. At any time, you can use *Undo* to remove the last section of the route you have created, and this can be done working back to where you want to change the route.
- 15.4.3. Use *Cut to End*. If you click this box, it will be highlighted yellow. Carefully position the cursor to where you want to delete the section to its end, and a hand marker will appear. Click onto this and the last part of your route will be deleted.
- 15.4.4. If you need to change the route towards its start, you can save time by using *Reverse Route*. In doing this the red and green markers will interchange to identify the reversal. You can then use the *Cut to End* as above, and effectively create your route to the start location. Remember to Reverse Route after this to identify the correct start and end point. Just one warning in doing this, the mapping identifies one-way streets, so take care not to go in a wrong direction when you reverse the route.

15.5. How to open a route

- 15.5.1. If you have been sent a route as an attachment to an email, save this in a convenient place on your PC.
- 15.5.2. Open <https://www.bikehike.co.uk/mapview.php>
- 15.5.3. Click *Load Route*. This opens a dialogue box *Upload GPS route from PC or GPS*.
- 15.5.4. Click *Choose File* this will open your File Explorer and allow you to navigate to the saved file you want to open.

15.6. Other hints

- 15.6.1. You can turn on *full screen* mode by clicking the box at the top right of the Open Street Map map.
- 15.6.2. Toggle Map Sizes switches between the maps. The route will be shown on both. Often the OS mapping is clearer to view, but the full screen view is not available.
- 15.6.3. BikeHike has a good *help* feature.
- 15.6.4. Sometimes when opening Bike Hike you are presented with a map of the UK. To ease the pain of zooming into your required destination, I have created a tiny route called 'home' starting at my home and saved this on my desktop. By opening this it quickly takes me directly to...you guessed it!

16. Garmin Connect/Express – Marina Friend

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- 16.1. The tool that enables to upload routes to a Garmin wirelessly is the Garmin Connect App. (The word "Connect" is important as there are other Garmin apps). A procedure of registering a Garmin and creating a free account on this App is fairly easy. The App records and analyses activities; it also stores all your rides and shows a summary for the last year.
- 16.2. To transfer a route which is either downloaded on the phone (tablet) or is attached to an email (or a WhatsApp message) ensure that:
 - 16.2.1. The Garmin is switched on.
 - 16.2.2. The Bluetooth connection on the phone is enabled.
 - 16.2.3. Make sure the phone and the Garmin have "found" each other.
- 16.3. Tap on the .gpx file.
- 16.4. Choose *Connect* to open the file.
- 16.5. The App will open and show a map of the route.
- 16.6. By pulling the bottom of the screen up you can look at the elevation profile and (re)name the route.
- 16.7. Tap on *Done* in the top right corner and a menu in the same corner will appear with an option *Send to device*.
- 16.8. Tap on it and the name of your Garmin should appear (it should state that the Garmin is connected).
- 16.9. Tap on *the name* to start download. The Garmin should then indicate when the process is complete.
- 16.10. Once I hadn't downloaded a route onto my Garmin before a ride but, thanks to this App, I managed to do it while on the road. Very handy.
- 16.11. It is not possible to transfer a route/ride which is recorded on a Garmin directly to a route plotting site (such as Plot-a-Route) but it could be uploaded onto your Connect App. The App will then analyse your ride (e.g. Show a route map in different colours according to the speed on particular stretches) as well as store it.
- 16.12. **To upload a route from a Garmin to the Connect App**, open the App on your phone (Bluetooth should be ON) and tap on a circle in top right corner. When the route is uploaded a page of stats will appear. The route will be stored for a year.
- 16.13. **Libby Foster says** - To get files into connect I send the gpx. to email. I then tend to use phone to open email and click on the attachment. On

my phone this gives me the choice of which app to 'open with'. if I choose *Connect*, I can set the course up, rename etc. once loaded to courses it should then appear on PC also.

- 16.14. All routes, that I want to keep, are stored in *Connect* under *training/courses*. You can then open them in *Connect* and transfer to GPS by syncing as required. The sync process does not remove them from *Connect*, so you will need to delete from GPS when finished with.
- 16.15. I have had the 'second hand' GPS for 12 years but only started using it this summer. Possibly my method is long winded, but it seems to work. I don't think mine has Wi-Fi or Bluetooth, so cable is the only choice.
- 16.16. Further to this, I use 'Plot-a-Route' to generate, as the routes I ride usually start from my house not the WMP. I then create a .gpx file using 'Plot-a-Route', download to my PC, email to myself, then open with *Connect* on my phone, which puts the route in the *courses* section of *Connect*. This can then be accessed from the PC. It may seem long-winded but at least it works for me.

17. GPXX

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- 17.1. **gpxx** is an extension to the gpx format, used to include extra information like the symbol to use in displaying waypoints; width, colour, line-style, and transparency to be used in displaying the course – Memory Map will use this info, but most apps ignore it.
- 17.2. It can be used define the file as being a breadcrumb trail, or as a list of control points: this requires the app to calculate a route between points using roads, or paths. Garmins and Bike Hike can do this, but Memory Map has a very limited route calculation capability and will plot straight lines between control points.
- 17.3. A “control point” gpxx file loaded into Route Converter will initially display just the control points.
 - 17.3.1. Selecting “*track*” will cause straight lines to be displayed between the control points.
 - 17.3.2. Selecting “*route*” which will cause an on-road route between control points to be calculated and displayed – Route Converter is not keen on taking you off-road.

18. **Viewranger / Outdoor Active** - Nigel Hickman [top](#)
- 18.1. Perhaps the most attractive feature of Viewranger and its successor, Outdoor Active, is that they both use Ordnance Survey background mapping.
 - 18.2. Outdoor Active can be downloaded from <https://www.outdooractive.com/>.
 - 18.3. Nigel says, "I'm still using Viewranger, but there has been speculation about whether it will continue, or in what form. They recently e-mailed to say that it will be shut down in February (very bad news!). So, I don't propose to say much about it at the moment.
 - 18.4. Outdoor Active e-mails me every few days cajoling me to connect my Viewranger account. All the reviews I've read have slated it as pretty poor, unreliable, full of features that people don't want, etc, etc. So, I've been resisting the pressure.
 - 18.5. Because the reviews have been so bad, I've briefly looked into other apps such as Komoot.
 - 18.6. A few days ago, I set up an Outdoor Active account and took a 1-month trial subscription to the Pro version. This gives access to 'TOPO' maps - OS, French IGN, etc, plus the ability to download maps and loads of other things.
 - 18.7. I'm slowly getting the hang of it, but I've lots to learn about the website and the android app.
 - 18.8. **Mike Thomas says**, "All this digital mapping and GPS stuff is so frustrating. I've still got Viewranger on the Blackview phone I use for navigation - it really is superb and dreadfully sad it's going.
 - 18.9. I had a quick try with Outdoor Active by borrowing a phone - I was more impressed with it than with the **Ordnance Survey App** for navigation.
 - 18.10. It was some HF leaders who put me onto the OS App, but it also has grim feedback.
 - 18.11. I find it dreadful that OS cannot make their App work reliably and effectively as a satnav and leave a snail trail of your route. They also send you endless emails advertising all sorts of facilities you didn't know you wanted – e.g. maps for taking your dog for a walk.

19. **Handlebar phone mounts** – try this site for a few ideas: [top](#)
<https://www.cyclist.co.uk/buying-guides/6455/best-bike-mounted-phone-holders>

20. **OSMAAnd** [top](#)
20.1. <https://osmand.net/>