Digital
maps to go

Like map-traps and Landrangers, mobile mapping devices put navigation where you need it: on your handlebars.
Anthony Cartmell explores your options

I f you've bought a digital mapping program for your computer (see last issue), you will want to take the maps with you on your bike. While you can print them out onto paper, there are gadgets that allow you to take digital maps with you. They include GPS receivers, so they can pinpoint your location on the map and record where you've been. They can also display a pre-planned route and guide you along it. There are lots of GPS units available. This overview is limited to those that can display a map as a background to your route.

There are two general types of gadget you can use: purpose-built mobile mapping devices, or multi-purpose ones such as smartphones or PDAs, onto which you install mapping software. We're looking at both types.

All of these devices, apart from the Garmin Edge, display the detailed Ordnance Survey maps that cyclists find so useful. The Garmin will only display maps made up of lines (vector

Top, L to R: Anquet, MemoryMap, Quo. Bottom, L to R, shows Anquet, MemoryMap and Quo at maximum zoom. Like ViewRanger the zoomed out MemoryMap is still useful, whereas Anquet and Quo show small areas badly pixelated

maps), and so displays less information about the area you're cycling through.
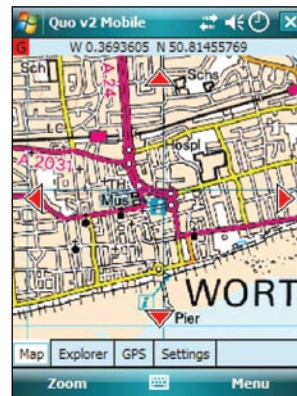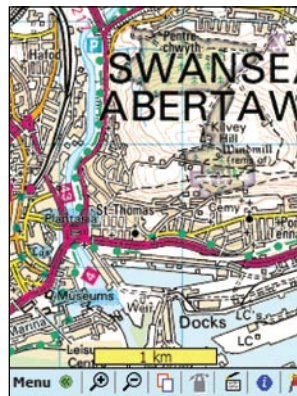
For use outside Great Britain you are limited to using Garmin's vector maps, ViewRanger on a Symbian device, or MemoryMap's Pocket Nav software running on a Windows Mobile device.

Going digital

Mobile mapping has no additional cost if you already have a suitable Windows Mobile device and Anquet, Quo or MemoryMap on your PC. You simply install the mobile version of the program and copy the maps across. Users of Tracklogs will have to invest in new digital maps to take them on rides.

Owners of Symbian mobile phones with GPS receivers, such as the Nokia E71, can buy ViewRanger software and maps to use with it. The software costs £15, and mapping prices are comparable to the desktop programs, the whole of Britain costing £150.

Dedicated mapping devices currently cost in the range of £250 to £400, depending on the features and accessories that they come with. The Satmap Active 10 costs around £300 with another £30 for its well-designed

bike mount. The Garmin Edge 705 costs around £370 including bike mount – but there are cheaper Garmin models available.

Reading Maps

All the devices have screens much smaller than even a folded Ordnance Survey map. This isn't a problem if you just want to see the map of the immediate area as you cycle along, as the GPS location will move the map as you move. But being able to zoom out is useful to get a feel for the overall route, and to move around the map quickly.

There are two screen types in these devices: the Garmin works without its backlight in bright conditions, and is very clear even in direct sunlight. The other devices rely on the backlight in all conditions, and are difficult to read in direct sunlight even with the backlight turned up to its brightest level (which reduces battery life). Shading the screen with a hand improves visibility, but isn't easy on the bike.

The larger screens aren't necessarily clearer: the Satmap, Mio and the smaller E71 all have the same 320 by 240 pixels with which to display maps and data. Maps appear sharper on the E71 because its pixels are smaller, but long-sighted riders may prefer the larger screens.

Following routes

None of the devices will give turn instructions like a car-based satellite

navigation system, unless you use Garmin's automatic routing system. This potentially-useful feature has a reputation for planning routes that aren't very good for cycling.

The programs tested will indicate the direction and distance to the next waypoint, but you aren't told which way to turn at a junction until you are actually there – unless you place waypoints just before junctions, which looks odd and takes a lot of work.

A major benefit of having a GPS device that can display maps is that you can follow highlighted routes. This gives a much better feel for where you are, and where you need to go next. The Satmap, Garmin, and ViewRanger will even rotate the map so that the direction you are heading in is at the top.

Dedicated devices

The dedicated devices tested are the Satmap Active 10 and the Garmin Edge 705. Both are designed for outdoor use, and have well-designed bicycle mounts available. The Satmap unit is the largest and heaviest of all the devices here, while the Edge is the smallest and lightest. Both devices are rugged and waterproof.

The Satmap has a large screen, and displays Ordnance Survey maps that have to be purchased for the machine. The Garmin also has its own maps, but these are not OS ones and the lack of detail may be missed by some. Neither displays maps bought for use with PC mapping software.

Main image & overleaf: courtesy of www.satmap.com

Satmap Active 10

The Satmap Active 10 is chunky and well designed. It comes with a belt-mounting carry case and a shoulder strap.

The display is large but not as readable in direct sunlight. The mapping is smoothed so it stays readable when you zoom out to view larger areas. Unlike the other programs, the Satmap has continuous zoom, so you are not limited to zooming in steps. It can display the map with your direction of travel towards the top of the screen, which even works when stationary using the built-in electronic compass.

The Active 10 can be powered by three AA batteries, giving around 5-8 hours of continuous use, or by a rechargeable, removable lithium battery. It is charged via the USB socket, either with a supplied travel charger or when connected to a PC.

The mapping software is built into the device, so it works as soon as you take it out of its box. Maps are supplied on SD memory cards, so they also slot in for use very easily. You only need a PC for saving copies of your routes, or to make use of other peoples routes. Routes have to be transferred or converted using a custom program that is provided with the unit as the Satmap has its own data format and won't read GPX files.

Summary: The Satmap Active 10 is ideal if you want a rugged device that's easy to set up and use. Its design and features are particularly useful for walkers. It has a good bike mount, although you may feel that it looks rather large on your handlebars. You will need to buy digital maps for it even if you already own other mapping software, but you could use the Satmap without a PC. More details: www.satmap.com.

Garmin Edge 705

The Garmin is like an oversized bike computer, and comes with everything you need to mount it on a bike. It has the smallest screen of all those tested, but it is by far the best to read in direct sunlight and you can turn the backlight off to increase battery life. The screen only has 220 by 176 pixels, compared to the 320 by 240 of the other devices, so you don't get as much information displayed at once. The buttons work much like a normal cycle computer, so it doesn't take long to learn how to operate. It has prominent start/stop and lap buttons on the top, showing its bias towards competitions and training.

The Garmin is powered by a rechargeable battery, charged via the USB socket just like the Satmap. The battery is built-in and can't be replaced, so keeping a spare isn't

"All the devices have screens much smaller than even a folded Ordnance Survey map"

possible. It comes with a neat mains charger with adapters for foreign sockets.

The main drawback of the Garmin is that it won't display Ordnance Survey maps, instead showing much-less-detailed maps provided by Garmin. The unit has built-in automatic routing, much like a car Sat-Nav, but it makes very odd route choices. This feature also means that you have to load routes onto the device in a particular format to stop the Garmin messing it up with its auto-generated routes. The Garmin can display the maps with your direction of travel towards the top.

The Garmin is designed to connect to a PC much like a portable disk drive. Without needing to install any software, the unit appears as a disk drive in Windows when you connect it, making it easy to copy route files to and from the device.

The Edge 705 comes with dedicated Training Center (sic) software that will run on Mac OS X as well as Microsoft Windows. This allows you to transfer data to and from the Edge, plan training schedules etc.

Summary: If you don't mind the lack of familiar OS maps, then the Garmin Edge 705 is worth investigating. It is designed as a bike computer and doesn't look out of place on

your handlebars. You could use the Garmin without a PC or Mac, although you'd miss out on the performance monitoring. More details: www.garmin.com.

Multi-purpose devices

Mapping software was tested on a Nokia E71 smartphone and a Mio Digiwalker P560 pocket computer. The E71 uses the Symbian operating system, and so the ViewRanger program works on it. The Mio is a Windows Mobile device and so can run mobile versions of Anquet, MemoryMap and Quo.

A major drawback of using multi-purpose devices is that they aren't usually waterproof, or designed to resist being dropped. It can also be awkward finding a way to mount them on your bike. But on the plus side, if you are using a smartphone then you will also have emergency telephone and camera.

Windows Mobile: Anquet, MemoryMap and Quo

These are 'mini' versions of their PC desktop equivalents, with similar, but cut-down, menus and options. All of these programs install quite easily from their PC desktop parent programs along with copies of the required areas of map. You can transfer
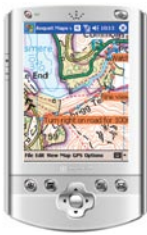
routes in a similar way, or by copying GPX files across.

You will need a recent device to display maps without annoying pauses: the Mio Digiwalker P560, now nearly two years old, was sometimes slow. The map sizes below are for a 320 by 240 pixel screen found on Pocket PC type devices: some mobile phones will also run these programs but with smaller screens.

MemoryMap is the fastest Windows Mobile program to display the map when panning around to look at different areas. It also zooms out to display up to 19km by 25km of 1:50,000 map for a route overview. For navigating it can display a direction arrow in a pop-up window on top of map, but the arrow doesn't update until you've arrived at the waypoint – okay if you're walking, but usually too late for a faster-moving cyclist. Another window gives the distance to next point, but obscures yet more of the map area.

Anquet's navigation mode shows a full-screen compass rose and arrow pointing towards the next waypoint. This replaces the map view, so you have to choose between following the line on the map or watching the direction arrow. Map zoom is limited to 200, 100, 50 and 25%, the most zoomed out rendering the map almost unreadable. Maximum area of 1:50,000 map is just over 4.5km by 5km. Scrolling the map is also less responsive than the other two Windows Mobile programs: the map is drawn in squares, and you have to wait for them all to be drawn.

Quo redraws the map as you pan around reasonably quickly, although sometimes the re-draw went wrong, leading to a jagged map image. Its navigation mode usefully gives the distance to the next waypoint, but the text is quite small to read. It has various zoom levels, from 400% to 50%. The maximum area of 1:50,000 map in one screen is just over 4km by 5km, like Anquet.

Summary: If you already have a Windows Mobile device then these pocket versions of your PC mapping software can be installed and used for no additional cost. You can install them all as trial versions, just like their parent PC-based programs. MemoryMap is the most functional of the three tested, with Anquet and Quo having similar features. You will need a PC to install the programs and maps. More details: www.memory-map.co.uk, www.mapyx.com, www.anquet.co.uk.

Symbian: ViewRanger

ViewRanger has more features and capabilities than the Windows Mobile programs or the dedicated devices. You have to buy ViewRanger-specific maps, but you can transfer routes as GPX files to the phone's memory or a card.
ViewRanger's map display is fast, at least on the

E71, and it has an excellent zoom: the maximum area of 1:50,000 map is 25km by 19km on a 320 x 240 display. This is similar to pocket MemoryMap, but with better smoothing of the map, making it more readable.

Its navigation mode has waypoint and off-route alarms, and displays an arrow showing the direction to next waypoint in the top-left corner of the map view. It is clever enough to allow you to take a shortcut that means that you miss waypoints, directing you to the correct next waypoint when you pick up the route again.

Summary: ViewRanger has many potentially useful features, and an excellent map display that allows you to zoom out to see a wide area of map. If you have a Symbian smartphone then you should download the trial version to see what it can do. You could use ViewRanger without a PC. More details: www.viewranger.com.

Other options

Smart mobile phones can run often free mapping software such as Google Maps, but these will need a mobile connection to work and a payment contract that allows lots of data transfer.

The iPhone will run the free iOSMaps software (downloadable from the iTunes Store), which displays Ordnance Survey 1:50,000 mapping. But this again needs a data connection. The latest iPhone comes with an electronic compass, so it always knows which way it's pointing.

Some people are working on making OpenStreetMap maps available for the Garmin Edge. This could be most interesting in future, as the OSM maps can include cycle-related routes and facilities missing from other maps.

Summary

If you require an easy-to-set-up device that doesn't need fiddling to get going with, then the Satmap Active 10 and the Garmin Edge are both worth investigating. The former is probably the best choice if good Ordnance Survey mapping is important to you, the latter if you want a smaller unit and you are keen on fitness training. If you don't need this or OS mapping, then Garmin's cheaper units (e.g. eTrex Vista HCx) offer big savings and better run-times.

Owners of suitable smartphones could save hundreds of pounds by using mapping software that will run on them. That's particularly true if it's a Windows Mobile device that will run the pocket version of mapping software (MemoryMap, Anquet or Quo) you may already have on your PC.

Owners of Symbian mobile phones should investigate ViewRanger. While you will need to buy digital mapping specifically for it, the program has many features that the other devices don't have.

For a PDF of the previous article, visit http://www. ctc.org.uk/resources/Magazine/digitalmapping.pdf. Or call CTC National Office for a printout.

GPS: care and feeding

The Satmap and Garmin devices have decent bike mounts and the units are waterproof. To protect Windows Mobile or Symbian devices from the rain you'll need a waterproof case, such as an Ortlieb GPS Cover (£18.90 from www. ctcshop.org.uk – see below) or an Otterbox case (www.otterbox. com). The former will mount to a bar bag. Some multipurpose devices have bike mounts, but most are basic and you'll still need weather protection.

GPS devices of all kinds present another problem on tour: running out of power. Most devices will last for single-day events quite happily, but you do need to remember to fully charge them before you leave. The Satmap will run on three AA batteries, or you could take pre-charged Satmap lithium batteries for tours up to a week in duration.

We measured the continuous run-time of each device – using its rechargeable battery – with the screen at 50% brightness and GPS running but stationary. In the real world, the screen would be off some of the time so each device would last longer.
- **Mio P560: 6.5 hours**
- **Nokia E71: 14 hours**
- **Garmin 705: 14 hours**
- **Satmap: 15 hours**