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Hill skills: Map basics

Posted by Jon Garside on 05/08/2005



Don't get lost! Photo: Messenger.

Being able to read a map and find your way around the hills is an essential skill for all mountain users. When I first walked in the mountains navigation seemed like a black art I'd never master, and finding my way around often involved a degree of luck. But more time spent in the mountains (and actually getting the map out on a sunny day!) seems to have done the trick, and emphasised that like many skills practice is the real key.

One of the basics of navigation is your map, but for such an essential item, most people probably don't give much thought about their tool of choice. They're not as sexy as a new GPS watch and won't win posing points down the pub. But just spending a few moments to review the way you use maps could save you hours of frustration in the pouring rain.

There are currently two map styles available to British mountain users: Ordnance Survey (OS) and Harvey. OS maps are available at 1:50 000 and 1:25 000 scales and cover the whole of the British Isles. Harvey maps cover many mountain areas and use 1:25 000 and 1:40 000 scales. So, what's the difference?

Contours

The most important and reliable information for the mountain user is provided by the contours. By correctly interpreting contours, a 3-D image of the land can be built in your head, not a natural skill to most, but with practice it becomes easier. There are also a variety of computer programs available that provide 3-D models of maps, which can be useful learning aids.

OS maps are produced to serve a wide range of users, so the information required by hill walkers and mountaineers is not always completely clear. They show a general portrayal of many rock features, so using these symbols as a reference for mountain navigation can be problematic. And some summits have so many rock features portrayed, that the contours can be difficult to see. OS maps also denote many non-physical boundaries (such as parishes), which can be cluttering and confusing.

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On the other hand Harvey maps are specifically produced for mountain users. Using aerial photographs their cartographers ensure that only features present on the land are included in the map. This is especially important for mountain users, as a map that accurately represents the land is essential. This means that the tops of complex rocky summits, such as Scafell Pike, will have significant rock features precisely marked, and the contours clearly displayed. In addition to denote general rocky ground Harvey maps change the contour colour.

Which scale?

A large-scale map (1:25 000) will portray more detail, but cover less area than a smaller scale map (1:50 000). Specifically 1:50 000 will cover four times the area, and a 1:40 000 map over two and a half times the area than a 1:25 000 map of the same dimensions. As a result 1:25 000 is a very popular scale for mountain users but as mentioned, some of the rocky detail on OS maps at this scale is a general portrayal of the land, and other non-essential detail is included. 1:50 000 maps meanwhile have brightly coloured contours to help interpret the land shape, but don't include useful smaller features such as walls and fences. Which leaves 1:40 000, a scale that sits in the middle - large enough to include accurate rock features and physical boundaries, but small enough to cover a large area of land. So don't just stick with one scale or manufacturer, experiment and see which suits you best.

Colour

Colour can be used to dramatic effect on maps. But they don't just make it look pretty, they can be chosen to portray relief and different terrain types - ideal for route planning. Check the map legend for details.

Paper or plastic

For mountain use, a waterproof map or map cover is essential. Some American maps use a lightweight plastic, which is waterproof, tear resistant, and a lot lighter than either paper or laminated maps of the same size, and this idea is beginning to catch on in the UK too.

Looking after it

Once out and about you need to keep your map protected, yet handy. The best map in the world is no use if it's at the bottom of your sac. Store it in an easily available jacket pocket, or stuff it under your waistband or similar. Just make sure it's secure and won't blow away in a sudden gust of wind. You can make it a lot more manageable by trimming it down to the area you're interested in. But don't go overboard, there's nothing quite as bad as literally walking off the edge of the map.

Getting techno

There's a variety of mapping software available now, allowing you to customise your maps, print off any area of choice, and not worry if it's trashed at the end of the day. And with a bit of searching you can even find waterproof printer paper. Moving up the scale of gadgets it's always worth remembering that whilst GPS is amazing, you should always back it up with a traditional map and compass. Otherwise you could be in for a shock in the white out when your batteries die.

As with many mountain skills, it is best to practise when making an error will not have serious consequences. So get your map out on your next sunny walk, and take some time to learn how to use it.

EXPERT Q&A

Our map expert is ex-BMC Technical Officer Ian Hey who also has a secret

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past life as a cartographer for Harvey maps.

Q. Why are some spot heights on 1:25 000 OS maps in brown and others in black?

A. The ones in brown were measured and plotted during the photogrammetry stage from aerial photos, while the black ones were obtained by field survey at a later date. In general the brown spot heights pick out relief features such as knolls, small hills or cols that fall in between contour intervals. Many of the black spot heights appear at relatively arbitrary points along roads and tracks where a field team would have set up station to accurately check any fine detail on the ground such as field boundaries or new housing development.

Q. How do you gauge if a slope is too steep for walkers to comfortably descend?

A. Once off the path and on ground averaging steeper than 30 degrees you're likely to find short steeper sections that require the use of your hands if only for balance. Any steeper than this and most will not feel comfortable at all, especially if it's slippery underfoot. So using the romer on your compass, examine the spacing of the index contours - six index contours in 1cm at 1:50 000 (or three at 1:25 000) represents a slope of 30 degrees. More than that and it's steeper.

Be aware that a quick glance can easily be deceptive since on steeper ground at 1:50 000 some of the individual 10m contours are often omitted for clarity.

Q. Maps abroad are often very different. Is there any reason for this and are there any general standards for the appearance of a map?

A. There are only two main rules of cartography - firstly that it is accurate with features correctly positioned, and secondly that it is easy to use. This is where the 'art' in cartography comes in, and we've all seen accurate maps that just aren't easy on the eye. Other differences creep in from the nature of the land and the background of the mapping organisation. The Ordnance Survey for example grew out of military need, and more recently it's been used heavily for land management where the representation of boundaries and land ownership parcels is critical. Harvey meanwhile started out making maps primarily for orienteering where the runnability of different vegetation types is more important. This is reflected in their original use of colour and very accurate crag features. Looking further afield, in the US the main mapping agency is the USGS United States Geological Survey - more concerned with managing water and resources, then in a very mountainous country like Switzerland clear and accurate representation on relief is all-important.

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