

Part 3: Navigation with a map and compass **Using them together**



(Reference: The original of this document was sourced from: www.chasetrek.org.uk (with permission) and has since been adapted and added to by Helen Pickering and Andrew Nash)

Using both the map and compass together is the big step in navigation and is most rewarding, since this will eventually enable you to go to places you have never seen before. It is worth the effort though, so read on...

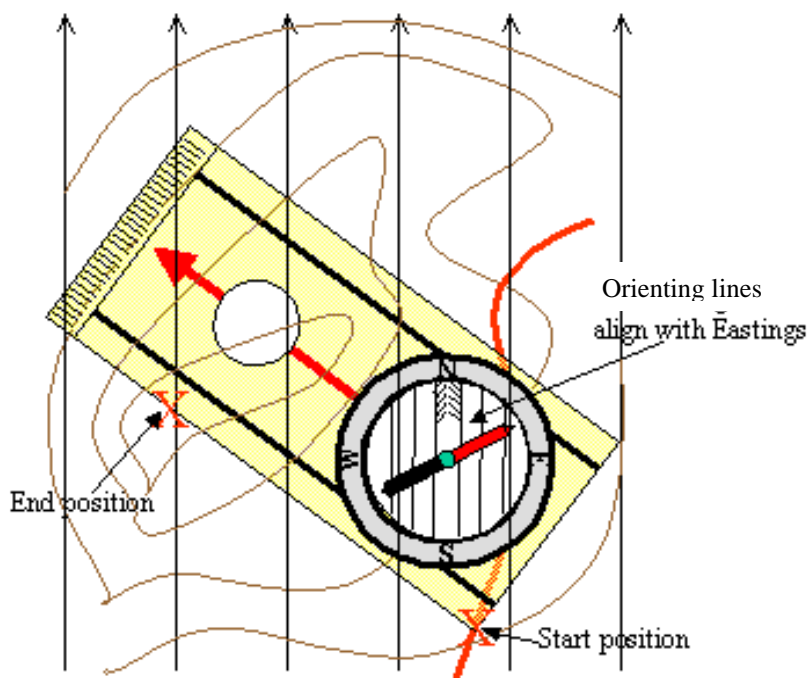
The map contains a scale 'picture' of our surroundings. The compass informs us which way is North. By putting the two together we can align the map to the real world and so make sense of what a map is telling us.

Alignment of the map

Although not strictly necessary, it is often very useful, helping you ensure that you are going to head off in the correct direction when you have set your compass.

- To set the map, lay it on a flat surface. It does not need to be taken from its protective cover if you are using one.
- Place the compass on the map and align the orienting arrow in the **housing** of the compass with the vertical grid lines
- Holding the compass firmly on the map, turn both until the **RED** end of the **needle** is on top of the **orienting arrow**.
- It does not matter at this stage where the base plate is pointing. The map is now aligned with the real world. Keep it that way for the next part.

Bearing setting



Place the compass on the map in the direction you wish to go (look at the arrow on the **base plate**), so that the edge of the compass passes through both the starting point and the destination point.

Turn the compass **housing** until it lines up with the grid lines (Eastings).

Read off the compass bearing. (the number on the top dial which is next to the direction arrow)

Add the **magnetic offset** (declination, as discussed in part 1).

Simple. You have now set the compass to the bearing you needed. If you now make sure the **north arrow** and **orienting arrow** of the compass are lined up together, then **the direction of travel arrow** will be pointing in the way you want to go.

Check

Spending 30 seconds or 1 minute checking that you have set everything correctly will save a lot of time when compared to getting lost or taking the wrong route.

To check the work done so far, pick up the compass and turn the whole compass until the **RED** end of the needle is over the top of the orienting arrow in the housing. Now look and see where it points.

Look at the map and see what is near the start position - tracks, streams, bridges, hills etc. Since we have oriented the map, the position of these items should be visible in the same direction as indicated on the map.

Now ask your self some questions.

- Should you be walking along a path, road or stream?
- Should you be walking up or down the hills, or on the flat?
- Can you see any streams or bridges near by?
- Are there any other things that you can check to make sure that you are going to follow the compass in the right direction?

Common mistakes include: using the wrong end of the needle (Red points North, not white); turning the housing so that the orienting arrow points down the map rather than to the top of the map; and using the base of the compass to point from your destination to the start (rather than the other way around which is correct).

Estimating distance

To solve this problem we'll bring in another piece of high tech gear: The Watch. By timing how long you have walked along a route it is possible to work out how far you have travelled.

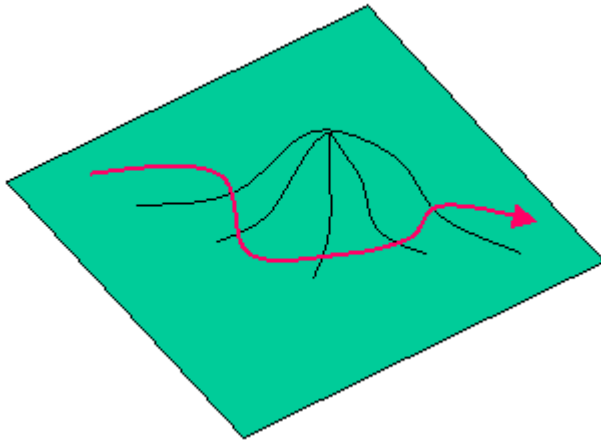
Firstly though, we need to know how fast you are travelling. Your fitness, the terrain and how much you are carrying, will determine how fast you walk. An adult walking along a good flat path can keep up a pace of around 6 kilometres per hour or about one kilometre every 10 minutes. However this can drop to 3 kilometres per hour with a pack on your back and walking along a forest path. As you can see from these figures, there is a wide variation. This variation gets worse if one is climbing up and down hills. The following table gives some ideas as to speeds over various terrains.

| | | |
|--|---------------|--------------------------|
| No pack to carry on flat well made paths | 6 km per hour | 10 minutes per kilometre |
| Carrying a pack on good forest paths | 4 km per hour | 15 minutes per kilometre |
| Carrying a pack on poor forest paths | 3 km per hour | 20 minutes per kilometre |

A general rule you could follow is Naismith's rule: "3 miles an hour, and half an hour for every 1,000ft of climb", which equates to "5km per hour and 10 minutes for every 100m of climb". This rule is good for a group of reasonably fit ramblers on reasonable terrain. **However, your experience will be the best guide in the long term, and note that the group averages around 3 miles an hour taking into account breaks, stiles, etc.**

Navigation Methods

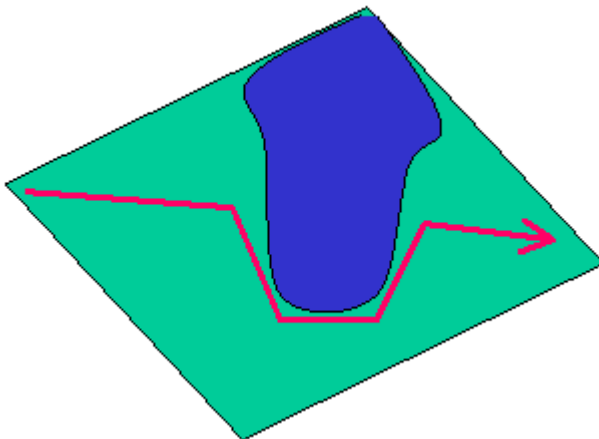
Contouring



You can waste a lot of energy when following a compass bearing that involves repeatedly climbing up hills and then losing height.

The technique of contouring uses the compass only as a general direction reference point. In practice you follow a contour on the map, staying at the same height as you negotiate the hills between you and your objective.

Detouring

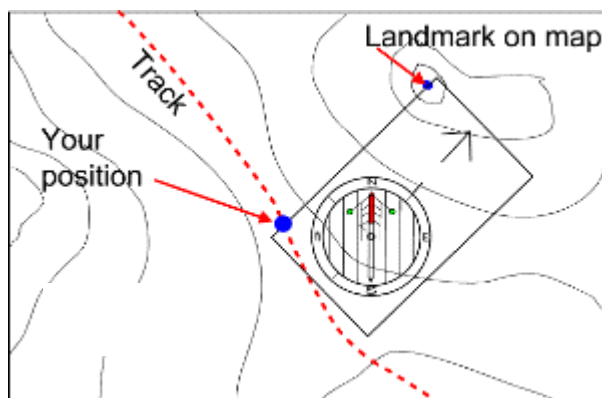


Detouring takes you off your direct compass bearing, to avoid a large obstacle such as a bog, that may not be accurately marked on the map, or is simply in the way.

While detouring, keep the direct bearing to your objective set on your compass and as you skirt around the obstacle, measure the distance you have taken away from the bearing. Once past the obstacle, return to your bearing traversing the same distance to return you to the original line

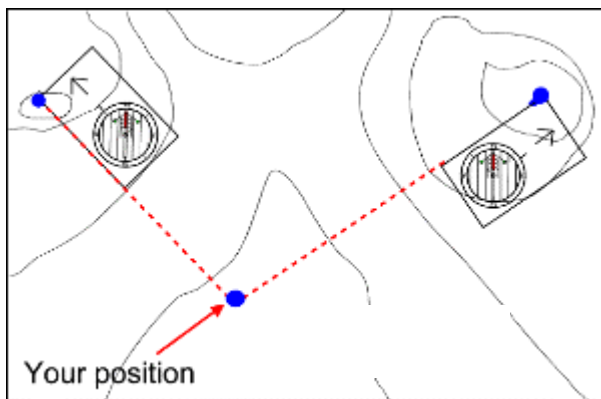
Finding your position

You can find your position along a track, ridge, stream or any prominent linear feature using the method below.



First orientate your map North/South, then lay one long edge of the base plate along a line intersecting your rough position and a prominent landmark.

Rotate the housing until the orienting arrow aligns with the North/South lines on the map and the needle rests in line with the orienting arrow. If one end of the base plate rests on the landmark, your position must lie along the line of the long edge of the base plate. The figure will make this clear, I hope!



If you can identify two landmarks, then you don't even need to be following a terrain feature.

Simply take a bearing off one, and pencil in your line of position on the map.

Then take a bearing off the second, and pencil in that line of position. Your location is the intersection of the two lines. The figure shows how this works.

If you can take a bearing off a third landmark and pencil in that line of position, so much the better.

Your true position should lie somewhere inside the triangle formed by the three lines of position (because unless you are a truly whizzo navigator, there will always be a slight, er, discrepancy!)

Once you have identified your location with lines of position, perform a 'reality check'. If the lines cross at a stream, and you are standing on a ridge, something is definitely wrong!

A cardinal rule of navigation and map reading is this - never make the map fit your readings or vice versa! If in doubt, take your readings again - and again - until you are sure of them - and only then follow them!

Hints on how not to get lost

| | |
|-----------------------------|--|
| Always believe your compass | It is too easy when walking through a forest or along track to lose your sense of direction. Providing that you operate the compass away from metal objects it will always tell you the truth...You will also need a good map to work out how the land lies (unfortunately, maps are not always accurate! but a recent map is preferable). |
| Time your distance | Understanding how far you have travelled and when you are supposed to reach the next visible reference point, should warn you of when you are on the wrong route. |
| Check your position | Whenever you come to an easily recognisable feature in the terrain, for example a bridge over a stream, check you position on the map. |
| Can you see the Sun? | Remember that the sun rises in the east, moves through the south and sets in the west. Although not covered in this tutorial, check that the direction you have been walking in is correct. If you want to walk North it is no good if the sun is in your face. |
| Uphill or down dale | Are you walking up or down hill? Look at the map and check if this agrees. |
| Water | Remember water always flows down hill (assuming that the laws of gravity have not been repealed). On the map the source of water will be on the higher ground, nearer the top of the hills. |
| When lost | When lost stay where you are and take stock of the information you have. Where were you last sure of your location? How far have you walked since then? Redo the compass bearing and see if you made a mistake there. Above all else do not admit to taking a navigation course! |

Did you know?

- The SOS distress signal was discontinued in February 1999