

"Orienteering is the 'go to' outdoor sport for people wanting to test themselves physically and mentally"



An Introduction to the Art & Science of Mapping

Tues 20th April 2021

Natalie Weir (England Development Officer)

Ian Cooper (SYO) & Martin Bagness (WAROC) will join us to present content and we will also be supported by other experienced mapper panellists including Rod Postlethwaite (WRE), Terry Smith (SOC) and David Olivant (NOC)

“Orienteering is the ‘go to’ outdoor sport for people wanting to test themselves physically and mentally”



British Orienteering

More People, More Places, More Podiums

Why are we here?

A complete beginner mapper, an experienced mapper wanting to learn new things, wanting to put something back into the sport, wanting to improve your orienteering

THE MAP - is arguably the most important element in orienteering (apart from using your brain and your legs)!

“It’s like a good book, with several chapters. It has much information for you to selectively use”.

Mapping can include completely new areas, updates of part or all of existing maps, making a few corrections, updating just the cartography and can be forest or urban

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Sharing knowledge

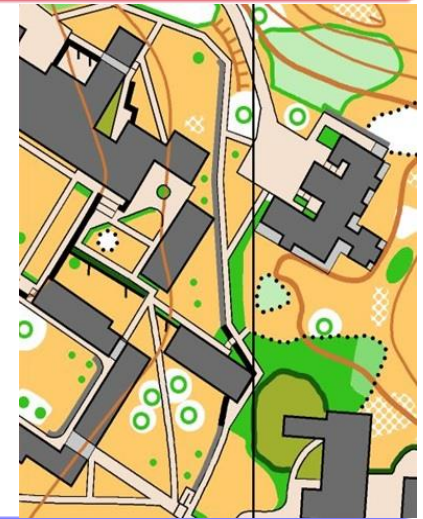
O maps used to be drawn with Rotring pens, using one sheet of engineering drawing film for each colour. Lettering and screens were by Letraset. If you made a mistake it was difficult to correct. And once a map was finalised, that was it for 5 years!



With computers, maps are now quickly drawn and corrected, it's easy to make changes and maps are now regularly updated for events



It's easy to communicate with other mappers about issues. And there is much more information for mapping readily available online



Different mappers have different styles – we are all individuals, even if there are mapping standards.

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- Everything is being recorded and accompanying resources shared via the www.britishorienteering.org.uk/webinars webpage
 - Ask questions in the chat box
 - Have a pencil and paper (potentially a drink handy)
- Second part Tues 4 May – more in-depth exploration on creation of base maps / surveying / software overviews and functionality
 - What makes a good map / map specs sent in pre course SWAY



**Methodology
of updating
existing maps**



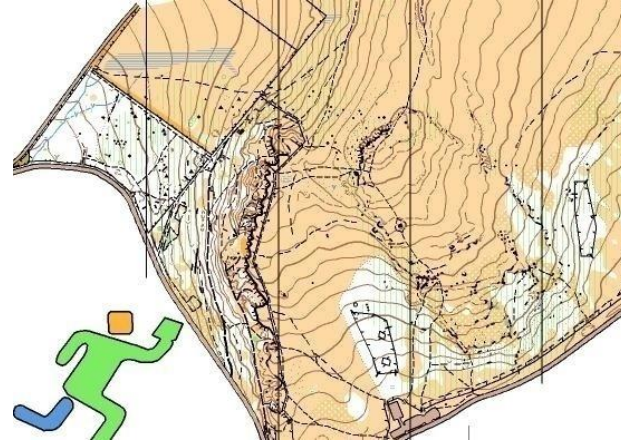
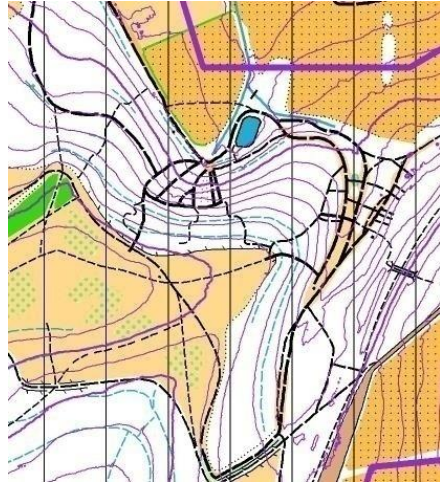
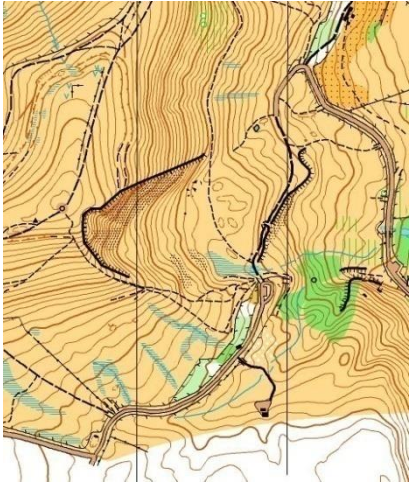
Top Tips



**Quizzes and
drawing exercises**

BOF Mapping Webinair

20th April 2021



Ian Cooper, for those who don't know me

- Started orienteering with HAVOC September 1976
- Completed first map (Thorndon Park) in January 1979
- c.1980 attended 2 day residential Harvey mapping course
- Co-founder member of South African Orienteering Federation and Rand Orienteering Club in 1982
- Completed first 5 colour orienteering map in Africa in 1982
- Joined SYO in 1986, plus IFK Lidingo 1998 – 2003
- Winner of Chichester Trophy in 2010 for best O map (Burbage & Hathersage Moors) by an amateur and Bonington Trophy in 2015 for services to orienteering mapping (now over 41 years)
- Survey and/or cartography for > 100 orienteering maps

The Methodology of Updating an Existing Orienteering Map

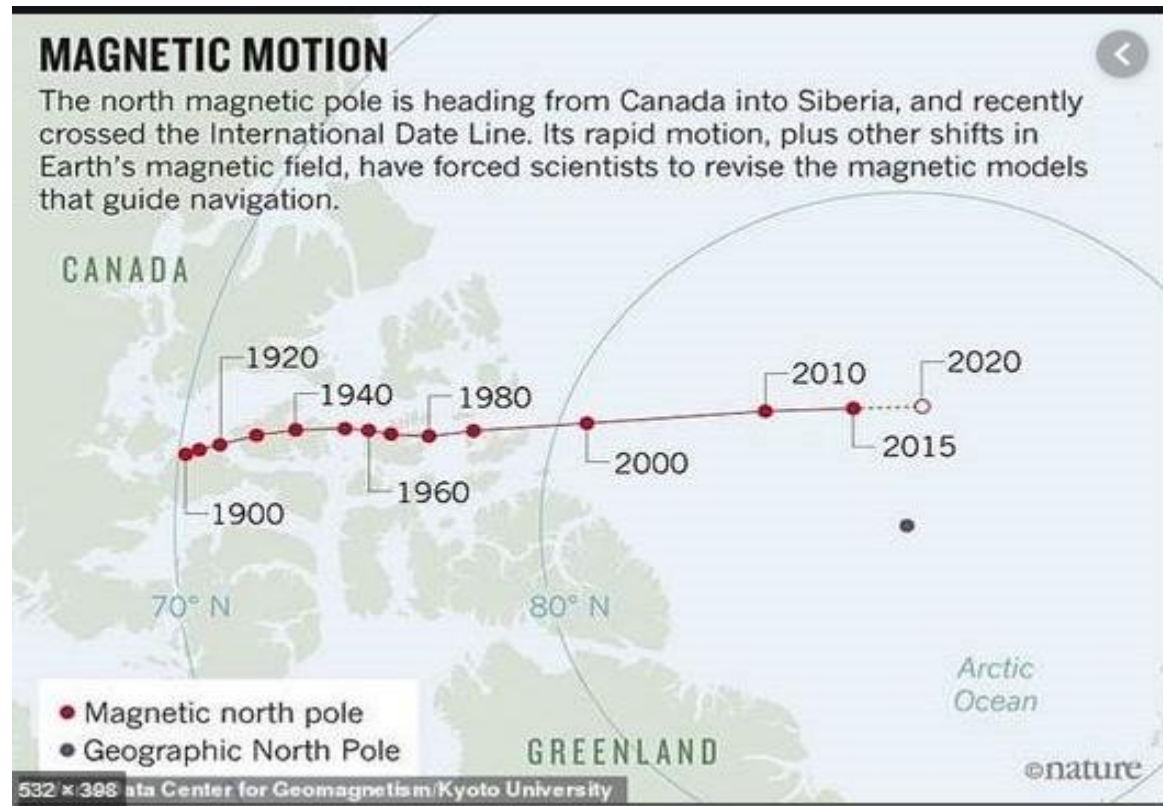
- Following on from Natalie's intro, this briefly covers totally updating an existing O map. You may only do parts of this, such as updating symbol specifications to IOF standards, or just making a few corrections for a specific event.
- This is my approach.
- It may not be best practice but **it is what works for me.**
- As Natalie said, **the map is the most important element in orienteering**, so it's good to get it as right as you can – it will never be 100% perfect.
- And I will identify what makes a good map.

Updating an Existing Map – the Base Map

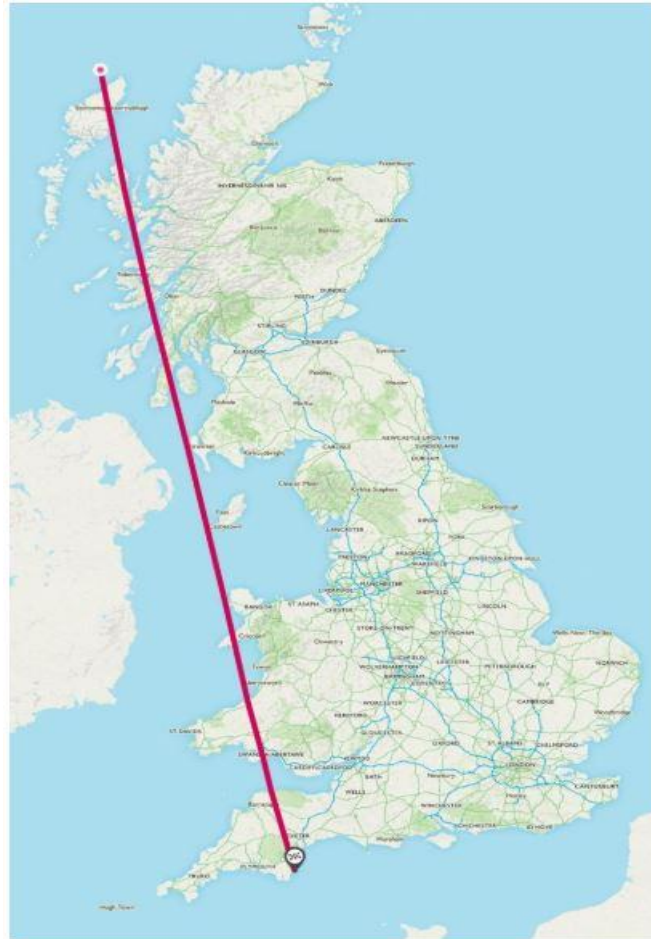
- Ensure your club knows you are doing a map update – version control/audit trail are important.
- Obtain the last map prepared and the latest copy (digital or not).
- See if there is any information about issues with the existing map.
- What's the area to be updated, the whole map or just part of it?
- What's the event and therefore the timetable? Allow sufficient time.
- What software, and which version, are you going to use – OCAD or OMM.
- **Important now to get your base map ready. All the separate bits of information must fit together – errors at this stage will become magnified once you start surveying. Time spent at this stage will pay off later.**
- **Check and update magnetic north. If required, rotate the map to new MN.**
- Collect background maps to be used – Google/Bing aerial photos, LIDAR contours (1m or 2.5m), Forestry Commission maps, local authority maps. Check dates.
- Map scale and contour interval to be used.
- IOF/BOF Symbol set – ISOM 2017-2 or ISSprOM 2019 – update if required. Symbol sizes.
- Any unusual symbols on the existing map.
- BOF/Software colour chart determines the colours and the printing hierarchy.
- Bring in background maps and georeference them and the map to get your base map.
- How to deal with differences between the existing map and the new information – such as old OS contours v lidar. What information are you going to use?

Magnetic Declination

- Magnetic north is moving. In Sheffield it is moving east at about 1 degree in 6 years – so if it is 1 degree west now, it will be 1 degree east in c12 years, BUT

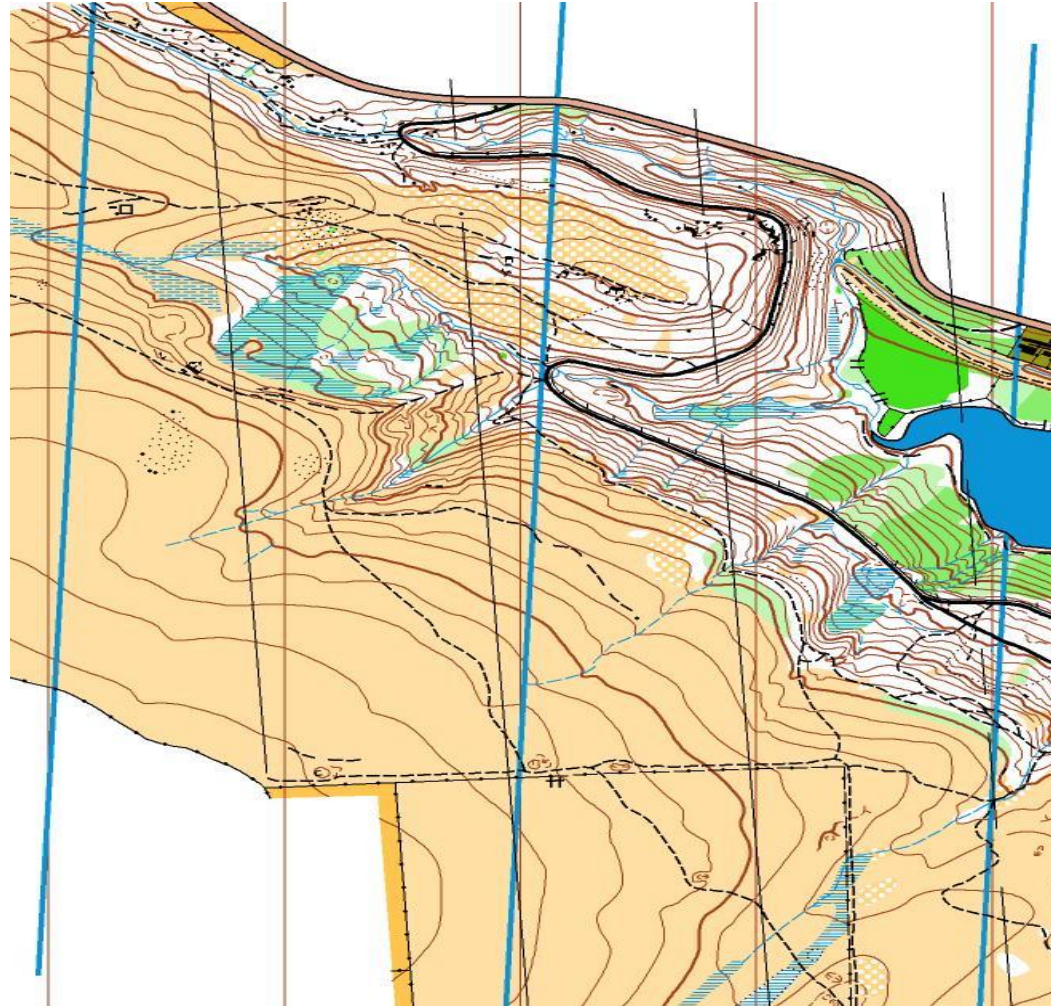


Magnetic Declination – Line shows 0 degrees in 2020, moving east



The line represents the approximate path of where magnetic north currently equals grid north

Rivelin MN Update in 2011 – black = 1997? MN, brown = 2011 MN, blue = grid north



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ISOM 2017-2

502 Wide road (L)
 The width should be drawn to scale, but not smaller than the minimum width (0.3 + 2*0.14 mm - footprint 8.7 m). The outer boundary lines may be replaced with other black line symbols, such as symbol *Fence* (516), *Impassable fence* (518), *Wall* (513) or *Impassable wall* (515) if the feature is so close to the road edge that it cannot practically be shown as a separate symbol.
 The space between the black lines is filled with brown (50%).
 A road with two carriageways can be represented using two wide road symbols side by side, keeping only one of the road edges in the middle.
 Colour: black, brown 50%.

503 Road (L)
 A maintained road suitable for motor vehicles in all weather. Width less than 5 m.
 Colour: black.

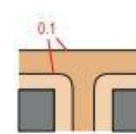
504 Vehicle track (L)
 A track or poorly maintained road suitable for vehicles only when travelling slowly. For distinct junctions the dashes of the symbols are joined at the junction.
 For indistinct junctions the dashes of the symbols are not joined.
 Minimum length (isolated): two dashes (6.25 mm - footprint 94 m).
 Colour: black.

505 Footpath (L)
 An easily runnable path, bicycle track or old vehicle track.
 For distinct junctions the dashes of the symbols are joined at the junction.
 For indistinct junctions the dashes of the symbols are not joined.
 Minimum length (isolated): two dashes (4.25 mm - footprint 64 m).
 Colour: black.

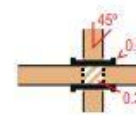
506 Small footpath (L)
 A runnable small path or (temporary) forest extraction track which can be followed at competition speed.
 For distinct junctions the dashes of the symbols are joined at the junction.
 For indistinct junctions the dashes of the symbols are not joined.
 Minimum length (isolated): two dashes (2.25 mm - footprint 34 m).
 Colour: black.

507 Less distinct small footpath (L)
 A runnable less distinct / visible small path or forestry extraction track.
 Minimum length: two sections of double dashes (5.3 mm - footprint 79.5 m).
 Colour: black.

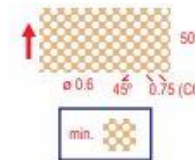
ISSprOM 2019



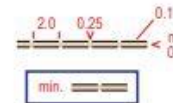
501.1 Step or edge of paved area (L)
 An edge of a paved area.
 Edges within paved areas are generally not represented, unless they serve navigation.
 Colour: black.



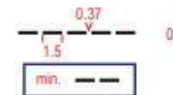
501.2 Paved area in multilevel structures (A)
 Part of a multilevel structure which can be passed at two levels. The angle of the pattern is approximately 45° to the direction of the axis of the paved area.
 Colour: brown 30% or 50%, white (If upper level is covered by other surface, that symbol shall occur with the same pattern).



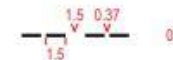
501.3 Paved area with scattered trees (A)
 Area with scattered trees or bushes in a paved area.
 Minimum width: 2.2 mm
 Minimum area: 6.25 mm² (footprint 100 m²)
 Smaller areas must be left out, exaggerated or shown using the symbol *Open land* (401).
 Colour: brown 30% with holes of white.



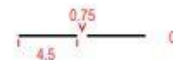
505 Unpaved footpath or track (L)
 An unpaved footpath or rough vehicle track is a way for passing mainly by foot, without a smooth, hard surface. The colour and the line width shall be the same as for the symbols *Paved area* (501) and *Step or edge of paved area* (501.1).
 Colour: black, brown 30%.



506 Small unpaved footpath or track (L)
 A small unpaved footpath or track.
 Minimum length (isolated): two dashes (3.4 mm - footprint 13.6 m).
 Colour: black.



507 Less distinct small path (L)
 A less distinct path or forestry extraction track.
 Minimum length: two sections of double dashes (7.9 mm - footprint 31.6 m).
 Colour: black.

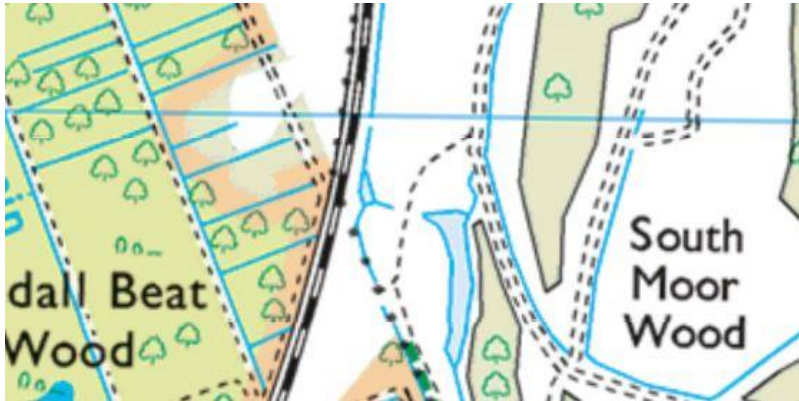


508 Narrow ride (L)
 A distinct ride is a linear break in the forest (usually in a plantation), which does not have a distinct path along it. Where there is a path along a ride, the symbol *Small unpaved footpath or track* (506) shall be used.
 Minimum length: two dashes (9.75 mm - footprint 39 m).
 Colour: black.

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Background Maps (1)



Instructions: Simply right click on the map to find a grid reference at that point. Enter a location search below to zoom to the approximate location.

Zoom All Points | Link for All Points | Auto Show Info | On

Point B

Grid Reference
SE 61857 04038

Grid Reference (6 figure)
SE618040

X (Easting) . Y (Northing)
461857 , 404038

Latitude , Longitude (decimal)
53.529365 , -1.0683131

Latitude , Longitude (degs. mins. secs)
53°31'46"N , 001°04'06"W

What3Words :
pipes.every.simple

Address (near) :
Barton Road, Armthorpe, Doncaster,
Yorkshire and the Humber, England, DN3
Postcode (nearest) :
DN3 3AA

Maps For Point :
[Ordnance Survey](#) | [Google](#) | [Bing](#) | [Streetview](#)

Tools for Point :
[QR Code](#) | [Info](#) | [Zoom here](#)

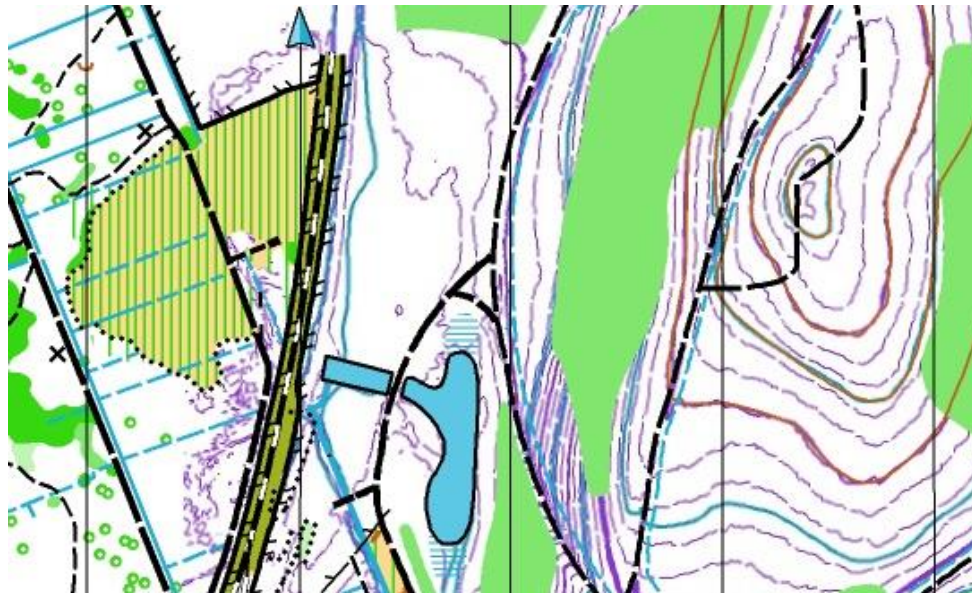
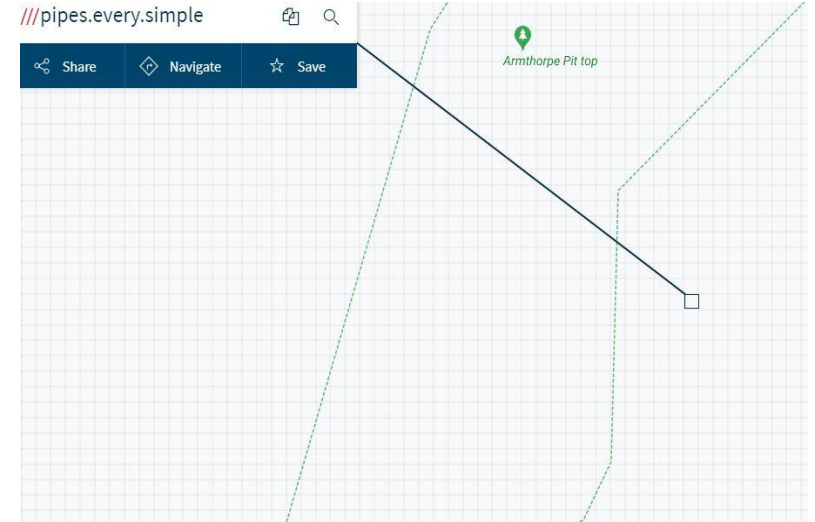
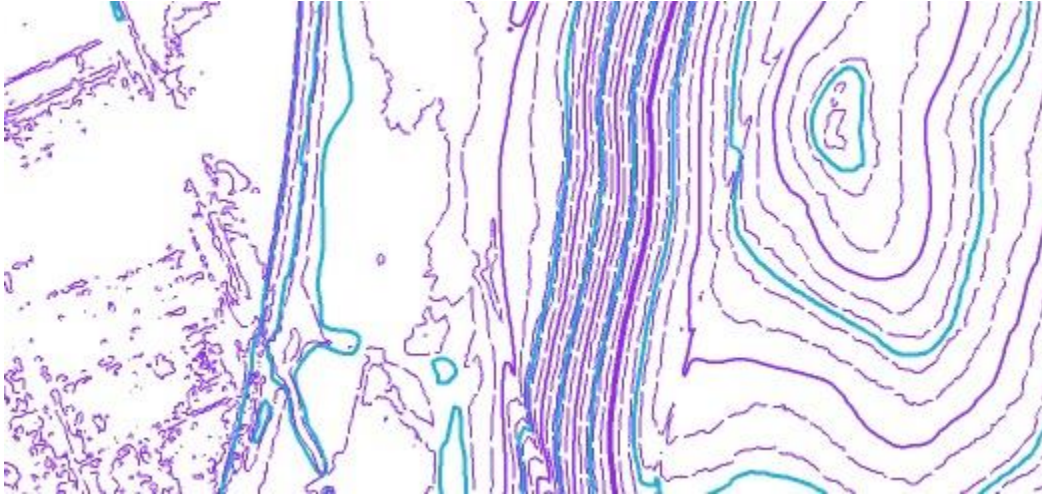
Share :
[Link For Point](#)

Metric

Point B

Background Maps (2)

Georeferencing gets all the 'maps' aligned to the OS Grid



Once the Base Map is Ready

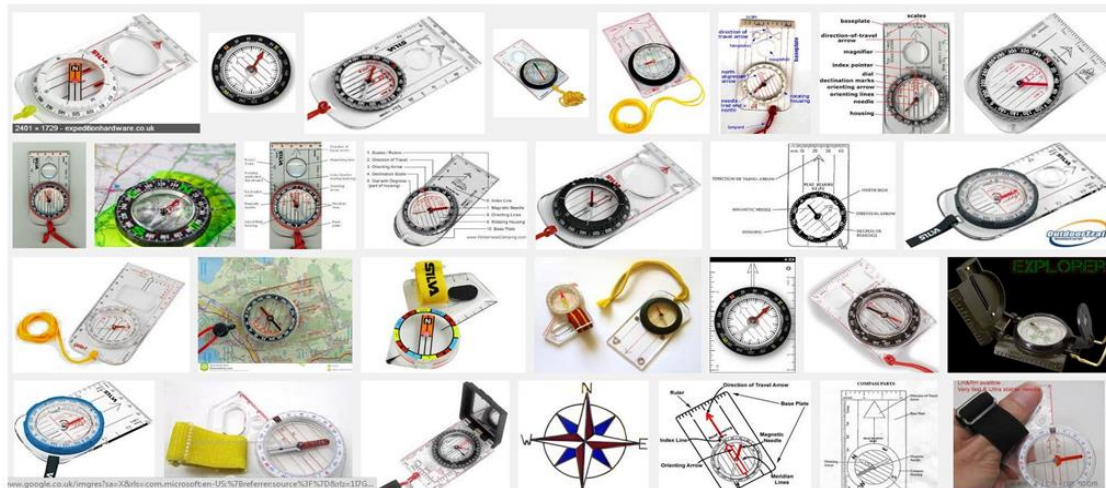
- It's now fieldwork time, BUT.....
- Before you go mapping in an area, you should make sure that your club has **permission**. Not so important in local parks but on private land, moorland etc permission must be available
- Need to know **no-go areas and no-go times** ie shooting or other events.
- O clubs have a **duty of care** to all their officials, but particularly to those aged under 18. Mapping in isolated areas, with little footfall, and even in well frequented areas, has potential risks. Under 18's should be accompanied by an adult. All mappers should let people know where they are going mapping, not just the area but where on the area, and their timing.
- Take a mobile phone – may not be reception, so have a whistle.
- The British Orienteering **Insurance** Policy is for Public Liability Insurance; it provides cover for members against claims for damages, negligence, etc. Such claims are relatively rare but can be expensive. All amateur mappers are advised to be members of British Orienteering in order to have this protection, and landowners are likely to require it.

Ground Survey (1)

- What will you draw with and onto (I use a set of coloured biros/pens and paper copies of the base map, but you can use coloured pencils and tracing film – use what works for you). As well as the base map take a plastic mapcase, the old map, maybe a copy of the lidar contours etc .
- Check the weather!
- GPS (Garmin watch), recorder, distance measurement (paces per 100m), coloured beanie.
- Move to use of tablets in surveying.

Compasses for Mapping

- Baseplate or sighting compass - accuracy
- Ease of use – size, baseplate, bezel, needle, magnifier, scale bar
- Beware of magnetic attraction (keys, railings, rocks)
- How to hold it (navel pancakes)



Ground Survey (2)

- The map must be legible so **unnecessary detail must be avoided**.
- Competitors are interested in **consistency, runnability** (summer v winter) and **barriers** (uncrossable walls/fences/streams, out of bounds).
- You will have to **generalise at times** to avoid too much detail.
- **Difficult to know what you will put on the map and what you will omit – what does a competitor (W10, M21, W75) see.**
- Don't be afraid to have a different view to the previous mapper but be consistent.
- Much more, and smaller, detail on urban maps – forest white 'replaced' by olive private land/OOB.
- Keep your eyes open.
- Draw up survey as soon as you get home – you often have a picture in your mind that fades with time.
- Once drawn, does it look like you remember when surveying.
- **It's not easy, especially at the beginning. You will need to revisit previously surveyed terrain.**

References

- IOF/BOF - <https://orienteering.sport/iof/resources/mapping/>
https://www.britishorienteering.org.uk/mapping_resources
- Magnetic Declination -
http://www.geomag.bgs.ac.uk/data_service/models_compass/gma_calc.html
<http://www.magnetic-declination.com/>
- UK Grid References - <https://gridreferencefinder.com/>
- GeoReferencing -
https://www.britishorienteering.org.uk/images/uploaded/downloads/mappers_geo_referencing.pdf
- Downloading lidar - <https://www.roger-pearse.com/weblog/2019/07/08/tutorial-how-to-download-the-lidar-datasets-from-the-uk-environment-agency-website/>
- OCAD - <https://www.ocad.com/en/>
- OMM - <https://www.openorienteering.org/assets/2013/Mapmaking-first-steps.pdf>
- IOF/BOF Symbol Sets - https://www.britishorienteering.org.uk/mapping_resources
- Other useful links – omaps.worldofo.com, Orienteering Mappers Int. Facebook page, lots on You Tube