Scottish Orienteering Association

Orienteering Course Planning – Practical Guidance

Hilary Quick – based on an earlier document by Graham Nilsen

Contents

My thanks go to Graham Nilsen for original text without which this document would have required a lot more thought; also to Ian Turner, Dave McQuillen, Ernie Williams and Colin Matheson for comments in the editing phase, and countless others who have inadvertently given me food for thought across the years.

COURSE PLANNING – a succinct guide to the essentials

This document is based on a variety of sources of information, but mostly Graham Nilsen's "Course Planning" which blazed a trail but is now seriously out of date!

The fine detail of how you do things might vary from one club to another, or indeed from one individual to another, but I aim here to outline the key aspects and point you to the definitive sources of information.

We assume that you are using a computer to do your planning, but Appendix 1 covers aspects that are specific to manual planning; we also assume that you are using electronic punching, but Appendix 2 covers matters that are specific to pin-punching. The final assumption is that you get maps printed on waterproof paper – without that, you'll need polypockets or bags!

When planning on a computer, save your work frequently, and keep previous versions. Identify each version with your initials and the version number. You might also want to keep a log of significant changes, e.g. when you start using a different map file. Some people like to start with a paper map, so they see legs as the competitor will see them. If you're using Condes, you might like to refer to the Condes User Guide, available from
http://www.scottish-orienteering.org/natcen/page/condes-for-course-planning

The core principles of planning apply to all levels of event, though there are of course additional considerations for major championships and other big events. You should always strive to get things right, but the amount of effort and degree of detailed calculation must be proportionate to the event.

Map segments reproduced with thanks to Scottish Orienteering Association/BASOC.

If any of this document contradicts British Orienteering Rules and Guidelines, you must of course obey those.

Introduction – what are you trying to achieve?

As the course planner, your main aims should simply be:

- to give the competitors enjoyment, mental and physical stimulus
- plan courses that are won by the best orienteer on the day

This guide will help you achieve those two aims. We will concentrate on cross-country orienteering as that involves all the aspects that must be considered; aspects specific to urban/sprint events are documented elsewhere.

You will probably find that at various stages you have to make compromises; such is the lot of the planner.

Before you begin

Consider the area – how suitable is it for the level of event? **Don't take on the impossible**.
If you're expected to provide the full range of courses, are you sure the area has enough line features for the easiest courses and enough complexity for the most difficult?

Are you the only planner?

Perhaps you could use a young assistant with little experience but stronger legs? Mentoring an improver can be rewarding on both sides and helps develop expertise in others, but of course you need to ensure you communicate effectively and know how you are splitting responsibilities. In particular, be clear about who will drive things along, and who will be the key contact with the controller – this would normally be the lead planner.

Printing of maps

How much time do you need to allow for maps to be printed? What format do you need to supply to the printer? Will you be adding club or sponsor's logos?

Positions of start(s) and finish(es)

These might be influenced by parking arrangements; discuss early with the organiser. Make sure:

- harder courses have direct access to complex terrain with minimum of dead running
- easiest courses are entirely on line features – including the start triangle

In order to meet these two basic requirements, you might need to have two starts.

Ideally your start will also allow:

- access by vehicle so maps and clocks can be taken there easily
- competitors to approach from car park without difficulty or damage to vegetation – this is the one section where ALL competitors follow the same route!
- sufficient space for warm-up and general standing around
- start layout such that departing runners are not visible to those waiting at pre-start

Avoid chaos at the start caused by competitors going through the start – either for an easy route to their first control, or as a legitimate route choice later in the course.

The position of your finish should be considered alongside the position of download. It's essential that you minimise the chance of runners going back to their car without going to download, so channel people accordingly. Ideally your finish will:

- be fairly close to download and car parking, especially in winter – avoid having cold, wet competitors walking a long way back
- allow download to be close to where you are displaying results
- not be at the bottom of a steep slope – you don't want people racing in and piling on top of each other. A level or slightly uphill approach will ensure a more orderly approach!

- be placed such that all courses approach from a similar direction – if you have a common last control, make sure people won't approach it by going the wrong way through the finish!
- be in a scenic location with space to sit and watch – particularly for relays and big events where people will want to cheer on their club-mates

If the area is steep, use a high start and low finish.

It's easy to forget important aspects of start and finish; potential pitfalls have been described by Rob Hickling in a document available on the SOA website: http://www.scottish-orienteering.org/documents/natcen/Common_Problems_at_the_Start_and_Finish.pdf
This and other relevant documents are available at
http://www.scottish-orienteering.org/soa/page/information-sources-for-event-officials

Despite all your early work, you should always open your mind to the possibility that your original start/finish aren't actually the best in the end. As you progress through the planning process, you might find that the best solution to a particular issue is to move the start or finish.

Technicalities

Make sure you know and understand the technical detail required of each course, as described in the British Orienteering Rules and Guidelines and the page for Planners on the British Orienteering website: https://www.britishorienteering.org.uk/planners
The page https://www.britishorienteering.org.uk/page/handbook_mapping includes links to excellent short articles by Barry Elkington giving examples of good interpretation and application of the Rules. There are also links to David May's advice on good planning of sprint courses.

It is absolutely essential that courses that use the standard colour coded labels comply with these standards. If you want to offer something different (only applicable to lower level events), by all means do, but avoid using the standard nomenclature!

Team work

As early on as possible, establish contact with your controller and organiser, and keep up the communication with them. Agree an outline timetable that is realistic for all of you. The Rules define who is responsible for what, but you might choose to help each other out – the important thing is to make sure that you **work as a team**.

The planner is responsible for everything from the start line to the finish line; a common misunderstanding is who will put the start kite in place – make sure you agree this with your organiser!

Sending electronic event files to your controller is easy, but it's also easy to get in a mess if both of you start changing things. Most controllers leave it to the planner to make changes, perhaps with the exception of last-minute adjustments just before it all goes to the printer. The key point is to agree with your controller how you're going to do things.

Research

Do plenty of research and take guidance from people who genuinely KNOW. Experienced planners and controllers in your club will undoubtedly be forthcoming with opinions – listen to all, but don't be afraid to disagree. Check that what you're told is in line with the current Rules and Guidelines.

If possible, have a look at courses and results from previous events on the area – RouteGadget can be particularly useful. Remember to factor in the possibility that vegetation might be different – either because of seasonal variation, or because things have grown in the intervening years. As well as the winning times, look at the spread of finish times and the times for different legs – which parts of the area created the greatest challenge? Was the challenge fair? Was it physical or technical challenge? Allow for the possibility that those previous courses might not have been ideal.

Know the area

- Visit the whole area, preferably about 12 months before your event, so you can see the vegetation at the correct stage of its growth.
- Take whatever you have by way of a map, and annotate it liberally.
- Take photos of interesting bits and mark them on the map
- Identify the nicest parts to run through, and the bits where vegetation will hide features (e.g. bracken will conceal boulders and mask contours)
- Look for the really nasty bits that you'll want to avoid if you expect to retain any friends
- Find the rough bits that you'll want to avoid particularly for your older competitors
- Look at roads, tracks, public car parks - how busy are they? Where could you sensibly cross? Will you need marshals? a timed crossing?
- How crossable are fences and streams? Will streams vary significantly after heavy rain? Identify where stiles or temporary bridges might be needed. Will these be compulsory or optional?
- Check the likely start and finish points for suitability; walk the proposed route to start and from finish, time the walk and tell the organiser. Are crossing points required? Liaise closely with organiser.
- Find out whether you will have to avoid any parts because of sensitive vegetation or wildlife.
- Find out whether there are plans for forestry work – felling or thinning. Liaise closely with the forester in charge as their plans can change rapidly due to commercial pressures; he/she will also have information on other activities such as deer culling.
- Find out whether there are other conditions of use, e.g. out of bounds areas around housing or fields which will have livestock in them at the time of the event.
- Check whether there will be any restrictions for access before the event for yourself or the controller.
- Check mobile signal coverage, it'll be useful to know for the event.
- Look for evidence of other frequent/recent activity e.g. horse riders, off-road bikers.

Know your customers (and what they want/expect/deserve)

Think through the types of people who will run each course – perhaps with reference to recent results from other events. Consider their

- age
- size (average height of runner in easiest courses?)
- level of orienteering experience
- physical fitness, strength, flexibility, balance

This is particularly important if you are a fit 30-something person who's never been involved with junior orienteers and hasn't started to experience the delights of failing eyesight, dodgy knees and general inflexibility that come after 40, 50 or whenever. You might happily leap over a fallen tree that will present a significant barrier to someone aged 8 or 68. The 8-year-old might not be able to see where the path continues on the other side...

It's sometimes tempting to make the easiest courses "more interesting" – to an adult, a properly planned White course can look extremely boring. But the purpose of this course must surely be to build the youngsters' confidence in being outdoors with a map, to make them want to come orienteering again.

Know what skills you are testing:

Refer to the Step System (British Orienteering version at https://www.britishorienteering.org.uk/images/uploaded/downloads/coaching_support_stepsystem.pdf , colour version available on SOA website via http://www.scottish-orienteering.org/natcen/page/information-and-resources-for-coaches
Make sure you understand the terms used – if you're in any doubt, ask a coach to clarify things.

Course lengths

See British Orienteering Rules Appendix B.

Getting course lengths right is a bit like trying to catch the soap in the bath, especially as you're meant to get them right regardless of who might turn up to run...

- assemble your sources of information – results of events in the same area and results of recent events in similar terrain
- consider how your event might be differently affected by such factors as
    - vegetation (forest growth, thinning, brashing; undergrowth)
    - adverse weather
    - % height gain
    - parts of the area used

The amount of height gain is potentially quantifiable (the preferred values are debatable but 100m of climb is often taken as equivalent to 1km additional length), refer to the Rules for the recommendations. Remember that climb is physically harder when the going is rougher underfoot

and when runners are off paths. Also bear in mind that a rough and/or steep area is probably going to slow older competitors down proportionately more than a fairly flat area covered in short grass.

Avoid the temptation to blindly assume that the previous planner got his/her calculations right, and indeed to assume that rules/guidelines haven't changed!

For higher level events, you should check theoretical course lengths against each other. Tradition has it that course lengths were calculated as a ratio to the length of the M21L course, on the basis that this was the largest class so its results were the most likely to be valid. This is often not the case now, but we still use that ratio. Perhaps we should be a bit more circumspect when using it.

The spread of finishing times will undoubtedly be greater in areas of rough terrain and steeper hills; add increased technical challenge, and you could have a huge spread of finish times.

You can do all sorts of statistical analysis and there will still be some oddities in the results – that's the way it goes. Do reasonableness checks, like looking for sudden jumps in course lengths, or for example M45L being longer than M40L.

Use controls on multiple courses only if the technical difficulty is appropriate; be wary of the possibility of large, energetic M21s approaching a control at speed at the same time as a couple of W8s... this might be unavoidable for a last control, in which case make sure there are plenty of punch units and that they're well spaced out.

Armchair planning

Remember your key aims as previously stated:

- to give the competitors enjoyment, mental and physical stimulus
- plan courses that are won by the best orienteer on the day

This probably means that you want to maximise:

- time in pleasant, runnable forest (make best use of what you've got)
- variety of terrain used (repeated changes are more effective than simply starting in one and finishing in the other)
- variety of leg length and direction
- variety of techniques tested (appropriate to TD level), e.g.
    - route choice
    - cutting corners, aiming off
    - fine map reading, including contours
    - rough compass to collecting feature
    - rough navigation using detail
    - compass and distance judgement

Meanwhile you should try to minimise:

- fight/tussocks/brambles/bracken
- gratuitous climb (e.g. long way up for just one control, then back down)
- many legs of similar length
- path runs requiring little concentration

It's often good to avoid having all the courses going in the same general direction around an area, though sometimes position of start and finish limit choice on this, and if you've got most courses going in roughly the same direction, you'll be able to share more controls across courses.

Technical difficulty

Refer to Appendix B of British Orienteering Rules for detail of the different levels of technical difficulty. Remember that technical difficulty is absolute, not relative. TD5 does not refer to the hardest leg in a given area. You might not even be able to give TD4 and 5 in your area – in which case, do your best and inform your participants. If they go away thinking they've just done really well on what they thought was a "proper" Green course, only to come completely unstuck when they try a **genuine** TD5 course, how will they feel and whose fault is that?

Although the technical difficulty of the whole course is the technical difficulty of the hardest leg, you should still aim to have most of its legs at the required technical difficulty.

Course shapes

As mentioned above, variety of leg length breaks up the competitor's rhythm, thereby enhancing the challenge.

If the straight-line shape of your course has a sharp angle, it's highly likely that you've got a dogleg – people going in and out by the same route. Look at it critically and consider forcing a different approach or adding a control nearby to achieve the turn that you presumably want. See Figure 1. Even a right-angle might mean that a competitor missing the control to one side is led in by another competitor leaving the control, whereas the competitor missing it to the other side doesn't get that advantage. It isn't always possible to avoid this situation.

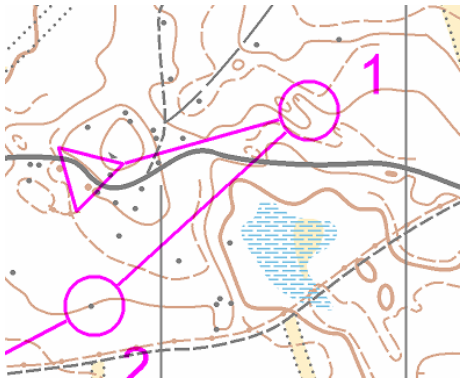

Figure 1 - dogleg

A dogleg can also occur when the land shape creates the situation where the optimum route out is the reverse of the optimum route in – so think carefully about the actual routes you expect competitors to take.

If you have 3 controls in a straight line (4-5-6 in Figure 2), think hard about what function the middle control is performing. Might the course be enhanced by its removal, increasing route choice? Sometimes a line of 3 is perfectly justified to keep runners off a path route.

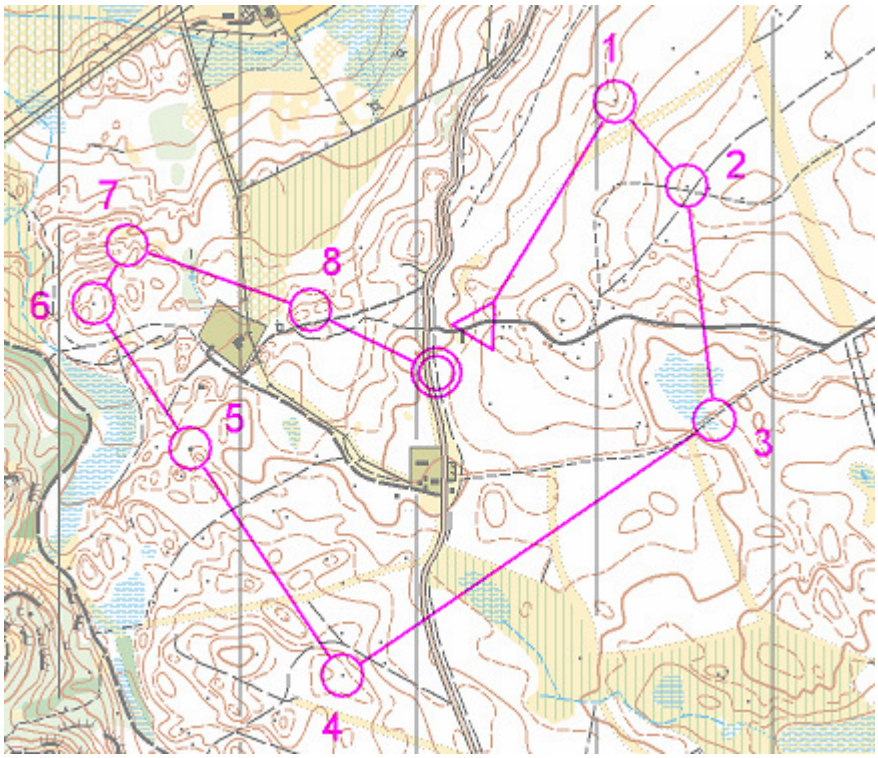

Figure 2 - course shape

Avoid hokey-cokey controls (in – out – in – out either side of path) – these give random advantage depending on whether someone is emerging as the next person is approaching.

Contouring isn't as difficult as a diagonal leg across a slope – particularly a downhill diagonal.

Your runners will derive more enjoyment from going down rather than up, tackling the climb in short bursts rather than a long slog. Avoid long stretches of downhill running, which allow competitors to recover too easily and start to think straight! Also avoid descents so steep as to be hazardous – particularly for older and/or less experienced competitors and those with knee or ankle problems.

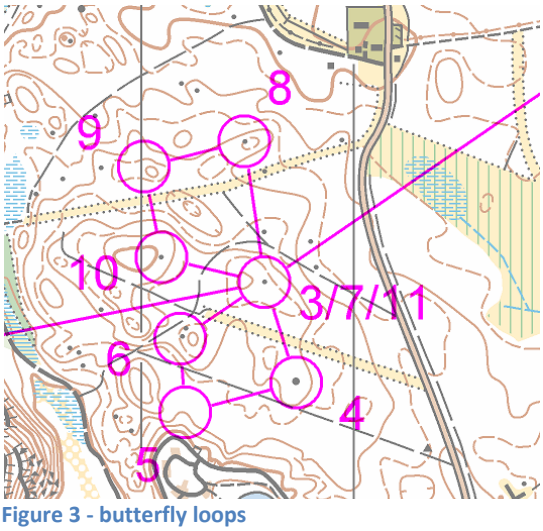

Figure 3 - butterfly loops

Electronic punching allows novelties such as butterfly loops (short loops forming a figure of 8 visiting a common control 2 or 3 times, where all competitors do both loops, but some are required to do the left-hand loop first and others to do the right hand loop first – Figure 3). This can enhance the sense of head-to-head racing and force competitors to think more carefully.

Out of bounds and uncrossable barriers

Always avoid legs where a competitor can gain advantage by crossing an out of bounds area or a fence that is not to be crossed – unless you can be absolutely certain that no-one is going to cheat (deliberately or otherwise)! See Figure 4.

Figure 4 - barrier marked as uncrossable

If a compulsory crossing point is required, try to ensure competitors can find it easily and that it is well marked – finding a compulsory crossing point should not become part of the technical challenge.

If a road is out of bounds (Figure 5), make sure your courses don't tempt competitors to run along it – the leg that crosses the road should do so more or less at right angles. A control immediately before the road crossing should funnel competitors well and ensure that they don't hurl themselves into traffic at full speed. (Note here we have good justification for 3 controls in line. Without no.7, runners would want to cross at various points depending on chosen route.)

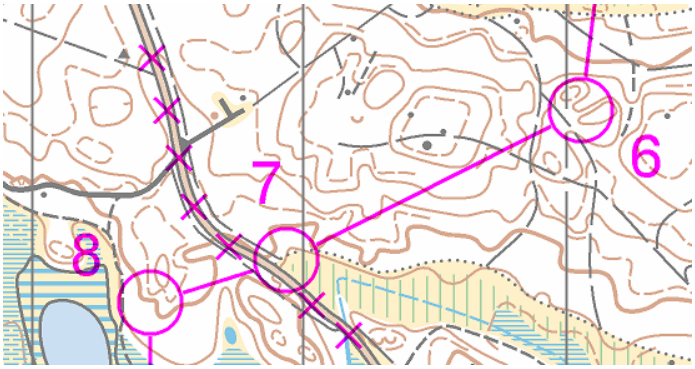

Figure 5 - road crossing

Short legs

These are good at testing fine map reading and (if the area permits it) contour interpretation, as well as compass/distance skills. Short legs steer people through the terrain, perhaps round obstacles; the best routes will generally be straight-line ones, with the challenge being to follow that route.

For the harder courses, short legs should require fine navigation, particularly contour interpretation, with no line features for navigation, and no collecting feature in front of the control (catching feature behind might be unavoidable and is certainly preferable).

Controls requiring compass & distance estimation need particular care: even in open forest this technique is accurate only to around ±5^{o} of the bearing, and this figure worsens as forest gets

denser. The feature should be visible to a person missing it by a distance of around 10% of the distance from the attack point, e.g. visible 20m either side when the control is 200m from the attack point. Failure to stick to this leads to what are referred to as "bingo controls", which should be avoided. Younger competitors are likely to need a larger margin of error, which might influence your choice of control sites on the Orange course. For night events, the range of vision might be less, though reflective controls can be highly visible.

Long legs

What are the attributes of well planned long legs?

- A well planned long leg should offer several possible routes, with the quickest being navigationally the hardest.
- Routes should involve going cross-country over intricate terrain, or linking many different path/track routes together, so mental problems are posed throughout the leg.
- Fairness is crucial – it must be possible to decide between the available routes purely from the information on the map.
- Several choices should be available, allowing competitors to identify the route choice that plays best to their strengths.
- No one leg should introduce a disproportionate influence on the outcome of the race – so the result doesn't hinge on just one decision. But you might have 2 long legs that between them provide a thorough test of route choice.

If you're using crossovers (either because your area is small or you just want to keep it all compact), put the longer legs earlier in the course so that runners don't recognise where they are when they should be rough orienteering (ie. in the long leg). Some schools of thought say you should have a couple of short legs first so competitors have a chance to get used to the map and the area and therefore make valid route choice decisions; others like to adopt the "stun grenade" approach of giving a long leg right at the beginning. Is one approach less fair than the other?

Good long legs are the hardest to plan, so should usually be planned first, with other legs then being built around them. The straight line for a good long leg will usually be perpendicular to line features.

Although TD3 & 4 courses will have some variety of leg length, really long legs should only be used in TD5 courses.

Functions of controls

Each control should have at least one function from these:

1. (most importantly) to provide a good leg – one full of map-reading, route choice etc., through good terrain
2. to move the competitor from the end of one leg to a better starting point for a good leg
3. avoiding doglegs ("turning controls")
4. "collecting" – guiding competitors round an out of bounds area or towards a compulsory crossing point.

It is the navigating between the controls which is important, not the finding of the markers themselves.

Control codes

It's often best to start by using code numbers in a range that you know you won't be using in the event, then changing them all quite late on in the process; save the event file immediately before and immediately after you make the bulk change (save as a different version each time) so you can easily check previous and final codes. However careful you are, if you begin with the number range that you'll be using, you'll inevitably have to change some (see next para) and keeping track of those changes can be perilous!

For practical purposes it is useful to liaise with your club's equipment officer to ensure you have a list of the available control numbers on existing equipment (which may not be consecutive). This will reduce the need to renumber controls in the electronic planning file and avoid the time consuming job of re-labelling control equipment at the last minute.

Control codes should be allocated randomly across the map and within individual courses. Avoid any implication of a relationship between the sequence number and the code (a common error with easy courses), and avoid easily confused numbers near each other or in a sequence on any course.

Control descriptions

If you're using software to plan your courses, generating the control descriptions will be quite straightforward. In Scotland we recommend using IOF pictorial descriptions for all courses, though you might have textual versions available as well. Children tend to have less difficulty interpreting simple symbols than they do reading words like "junction" and "crossing". Their vocabulary of symbols grows as they gain experience.

Work on the ground

Checking control sites

You and the controller both (but separately!) need to visit each control site that you intend to use. Before you get to that stage, you should visit all possible sites to determine their suitability. Check:

- map accuracy from all attack points, including any beyond the expected line of approach. Check with compass from all of them.
- has the feature itself been mapped accurately? are there other similar features nearby that haven't been mapped (e.g. more boulders)?
- if appropriate, decide which side of the feature the control will be placed. Bear in mind that the control is meant to be equally visible whether or not someone is already at it. This might mean a pit should have the kite on an edge rather than inside it; if this means it is visible from too far away, try to use an alternative feature.
- if appropriate, note the dimensions of the feature (e.g. boulder, crag), and check whether further qualifiers are required (e.g. shallow, ruined)

Try not to be over-critical of the map – the competitor, moving at speed, will not notice minor mistakes that the planner sees on his/her walk round. In particular, faults very close to the control may well not be significant – once the competitor sees the kite, that's all (s)he'll notice.

Taping control sites

All intended control sites must be marked with tape, to

1. ensure that planner and controller agree the exact position to be used
2. help the person putting the control out to be certain they're in the right place
3. allow the controller to be confident that the control is at the place previously agreed on

Agree with the controller what tape you will use and whether it will include the control code (if so, the draft code or the final code?). Tape must be resilient and easily visible; a 3cm square of silver tape on a cane is unlikely to be damaged by wind, but it can be extremely difficult to find (and therefore time-consuming and/or error-prone). Good lengths of white tape tied to trees are visible despite vegetation growth. If no trees, use canes or tie tape to lower vegetation so long as grass isn't going to grow and hide it. At rocky control sites, it can be useful to take a probe to check that you'll be able to insert the control stake. Note the tape should be precisely where the control will be, not on the nearest tree!

One problem, still not reliably solved: wildlife and livestock tend to eat tape and plastic pegs.

If you're less than certain of a control site, make a note to visit it with the controller. Tape it only if you're confident you'll find your tape again – having unwanted tapes in wrong places is far from helpful.

Taking a photograph of the tape in position at a control site can be a useful aide memoire and be helpful in discussions with your controller. Repeating this when the control is built can also be useful.

The tape is to help the planner and controller – if your controller prefers to leave tapes in place for the event (useful if control goes missing), make sure the tape is not easier to see than the kite. Some controllers prefer tapes to be brought in when controls are put out.

If an area is to be used for courses on consecutive days (e.g. Individuals and Relays), liaise with the other planner if possible to avoid taping closely adjacent sites on similar features – a competitor finding a tape at an expected feature could be justified in thinking the control was missing.

Some controllers prefer you to avoid numbering the tapes – if the control code number does not match the original tape number and the competitor spots the numbered tape before looking at the control they could assume they were in the wrong place. However, numbered tapes do serve as a cross-check for the person putting out the controls.

Tape start and finish too, and sketch start layout, including where map boxes will be placed. Remember to put the start kite in the middle of the start triangle, preferably out of sight of competitors in pre-start, but visible to those on the start line (or very easily found).

Crossing points

You've probably already got road crossings sorted; look critically now at all stream, fence and wall crossings, and make sure the people (old or young in particular) who will use them will manage OK. Find out whether streams could become impassable after heavy rain – and if so how long after...

Consider "timed out" sections with controls before and after crossings at which the competitor may be subject to hold ups caused by road traffic, rail traffic, queues of competitors waiting to cross narrow bridges, etcetera.

Dangerous features

If there are any dangerous features which competitors could run into/over/off without seeing them coming, make a note to tape them with YELLOW & BLACK tape for the event.

When to tape

Choose when to put out tapes according to your area, how much it is used (and therefore how likely tapes are to go missing), how long the taping will take you, what weather might intervene and undo your good work... If you're writing the control code on the tape, be sure you know what you change it to later. (See note above re. numbering of tapes.)

You might manage with just one site visit, but for a large event you'll probably need several return visits, with adjustments, tweaking and fine-tuning in between.

Back home again

Tweaks and fine-tuning

After your main site visit(s), you will need to make some adjustments. Check particularly for:

- controls that are approached from (nearly) opposing directions by different courses
- too many competitors at particular control sites
- controls too close together
- unnecessary controls (have as few controls as necessary)
- course length & height gain
- lines and circles to be cut
- confusing control codes
- start correctly described
- start & finish correctly marked
- control descriptions complete

and refer to the Rules as required. When fine-tuning your courses, remember to think exactly what route(s) you expect competitors to take on each course. Moving one control a very small distance can dramatically change the balance of a route choice decision.

Check that the scale at which the course is planned matches the scale of the background map. This might sound obvious, but it has been known for this to be wrong!

Once you've got your final control sites, look carefully at all the control circles and break them where necessary to show map detail. Note this doesn't mean you have to break a circle that crosses a path (or other line feature) – the path continues either side, in which case the bit under the circle is insignificant. Also look at all the lines on all the courses; break them at all crossovers and anywhere else where they obscure important detail.

Control numbers (sequence numbers)

Move numbers as necessary for clarity. Generally you tend to have more space on the outside of angles, but the main thing is to leave important information visible. If possible, avoid putting the number in a block of dark green, as this can make it very difficult to see. If this is unavoidable, it is possible to modify the font of the control number to have a white border, making it more visible. Liaise with your printer to check if this causes any issues in the printing process.

Final control codes

If you've started with dummy control codes, you'll need to change all of them now to the codes you're actually going to use; if you think you did use correct codes right from the start, now's the time to check carefully that there's little chance of confusion. In either case, depending on the clarity of your control labels, you might want to avoid having certain pairs close together – e.g. 113 and 118, or 121 and 151... It would be kind on competitors if you also avoided easily confused pairs or sequences within a course, e.g. 121, 112, 122... It used to be common practice to have groups of sequential codes, but this is no longer favoured. Codes should be entirely random.

Good course planning software can automate the task of changing control codes; make sure you save your event file before and immediately after the change (as different versions) so you can refer back if necessary.

If you've written the original control code on the tapes at control sites, you'll need to know what it now translates to!

Drinks point?

If you're going to provide a drinks point for the longer courses, where will it be sited? You'll need vehicular access of course, and it must be marked on all maps. Most events now expect participants to take care of their own need for water during the race.

Control descriptions

Check your control descriptions carefully, especially if you have moved controls.

Remember to add the dimensions that you noted during your site visit.

If you're printing some courses at different scale, what circle size are you using and does this require control descriptions to be changed (e.g. because you now have 2 extra boulders in the circle)? If this is the case, creating two or more event files may be the only practical workaround to avoid conflicting descriptions.

Circle centres

Make sure the control circles are centred accurately. The best software allows you to do this with great precision. Remember that when a control is on a feature that is not mapped to scale (e.g. a boulder), the circle should be centred on the middle of the feature, not to the side where the marker will be placed.

Other markings on the map

Remember to check and adjust any parts marked as out of bounds, making it perfectly clear where gaps or paths exist and offer a valid route choice.

If fences or walls are "not to be crossed", mark them appropriately (solid purple line), and check the crossing points are all marked; if any roads are out of bounds, mark them with plenty of purple crosses. See examples in figures above.

What might go wrong?

As well as contributing to the formal Risk Assessment, you should work out what you'll do if something goes wrong before or during the event, such as:

- control marker goes missing
- bad weather makes (all or) part of the area unsafe, car park unusable, stream uncrossable...
- sudden appearance of irate landowner or tenant from whom someone forgot to ask permission
- your car breaks down on the morning of the event

Printing of maps

British Orienteering Rules/Guidelines specify required quality of printing for different levels of event. Make sure you know well ahead how much time to allow for printing, delivery and checking of maps – and what you'll do if your controller finds the quality inadequate!

Order enough maps to allow some late entries and entry on the day; remember to order several "all controls" maps (perhaps at a larger scale) for yourself and the controller, and some blank maps for the start lanes and perhaps for display in assembly. Have some copies available in case you have to handle an emergency.

Create and get printed several pseudo-courses for control collectors. To save money, you might not have these maps printed professionally.

Putting out controls

Print pseudo-courses – perhaps at larger scale – for putting out controls. Make sure you use the final version of the event file, and print the control descriptions (on each map). Doing it this way is probably easier to get right than if you use an "all controls" map.

Depending on your area, you might be able to put distant controls out well in advance. Can you also put out the electronic punch units early? Remember the controller will want to check them on event day or perhaps the day before.

If you're getting helpers, make sure they know exactly what to do and what they're looking for by way of tape. Ask them to leave tape in place – controller will use that to confirm it's at the approved spot. Be reasonable in what you ask of your helpers – a couple of hours' effort is plenty – and reward them generously with tea, cake etc..

Issuing helpers with an enlarged printout of the control descriptions will allow them space to punch the printout with the back-up pinpunch. Having this information available at the finish in the event of a control box failure can be time saving. It is not uncommon for pin punches to have lost their pins and this step will also identify the need for any replacements before the event.

The event itself

You will probably be up and out extremely early on event day, placing the last few controls, adding punch units or whatever... But once the event gets underway, you can relax. Be accessible for the controller and download team (exchange mobile numbers) – that's where problems will first make themselves known. Stand around near download or at results, talk to people, ask about the routes they took. Don't be coy, accept their praise.

Consider having some runners available to "wake up" controls especially on the elite courses. The first punch at each control can take half a second, which could significantly disadvantage the first runner.

Have a few spares of everything in your car, just in case.

Collecting controls

You should have prepared enough pseudo-courses for control collectors – make sure your team of collectors know where and when to meet you to get their instructions, and allocate each person a group of controls appropriate to them. Ensure that all controls will be collected with no wasted journeys, and that people won't be overloaded. Ideally, get each bundle dropped at a point accessible by vehicle.

If tapes have been left in place, ask collectors to bring them in too, to avoid confusion at future events, and to keep landowners happy.

If you're using the type of electronic punching (SI) where the punch unit is detachable from the stake, get your collectors to detach it before they move through the terrain, and give them a rucksack or length of rope to carry them. They do sometimes detach themselves and hide....

Post-event review

It's tempting to sort the kit, then sit down with a large sigh and a glass of something... and of course you deserve it, but do also take a while to think about the event and your courses, discuss with the organiser and controller. What went well? What will you do differently next time? What can the club as a whole learn from it? How did winning times compare with your expectations? What about the spread of finish times? (Don't be too worried about courses with too few competitors to be statistically significant.) Were there many DNFs? do you know why? (there should be no DNFs/retirals from White or Yellow).

Summary of the steps in the process of planning

Exact timing for each step will depend on many factors, but the more time you give yourself, the better your chance of reducing mistakes and coping better with those that do occur.

- agree timetable with controller
- confirm rough start/finish locations
- draft courses (armchair planning) – get controller's opinion
- examine and tape control sites
- think through how will participants actually go round the course? (look for all possible route choices)
- check all reasonable approaches to control sites
- test-run some long legs and perhaps complete course(s)
- get controller to review updated courses; re-tape if necessary; controller to check tapes
- fine-tune everything
- get maps printed – exactly how many will depend on many factors, but should allow for late entries and entry on the day
- source controls – stakes, kites and electronics, plus back-up pin-punches if required for your level of event
- plan pseudo-courses for putting out and collecting in, print maps

Finally, when you're out there, remember to KEEP YOURSELF SAFE. Don't be too demanding on yourself; when you get tired or the weather turns foul, retreat and go home. You will make mistakes when you're tired.

Make sure someone knows where you are, take your mobile phone (in waterproof case and fully charged!), have food and drink in the car.

And of course, enjoy yourself. Having the area to yourself is a privilege.

Hilary Quick, SOA, July 2016

Appendix 1 – course planning without a computer

Course planning on a computer is infinitely less stressful than doing it manually; free software can be downloaded for basic course planning – it's easy to learn though not as function-rich as the software that's approved by British Orienteering.

If you still have to do it manually... you'll need several copies of the printed map when you're drafting your courses; there are 2 techniques that have been popular:

- pin map to piece of dense foam, e.g. an old camping mattress, use pins and thread to design basic shape of each course and to check the length.
- place acetate (another bit of old technology!) over the map and use water-soluble red pen on it to draft courses.

Other points to remember:

- take great care when allocating control codes – it's all too easy to use one twice. (Software doesn't allow this!)
- you will probably need to use verbal control descriptions, which you will have to create manually
- be careful if/when you move a control, remember to change the control description too

Whether you're over-printing maps with courses or hand-drawing them, it's a pain, takes time and is riddled with pitfalls.

Appendix 2 – considerations when using pin-punches

For most events, pin-punches are used only as backup in case the electronics fail. Remember to make up a master punch-sheet for all controls and give it to results/download team.

Make sure pin-punch patterns are different for controls that are close to each other, and plan your courses so there's no temptation for people to take controls in the wrong order.

Appendix 3 – Planning other types of event

Most of us will complete our planning careers without experiencing these (except as a participant), hence their relegation to an Appendix.

Relays

The simplest way to plan relays (assuming teams of 3) is to have 3 different (but comparable) courses, which the team run in different orders, giving 6 possible permutations. These courses might be different only in their first few controls. However, it's preferable to have some "gaffling" or "forking" – the most commonly used system for this is shown schematically below; by having one common control and splitting the early and latter half across 3 sections, you can have 36 permutations, which is enough for most events. More permutations could be achieved by having more common controls and therefore more branched sections.

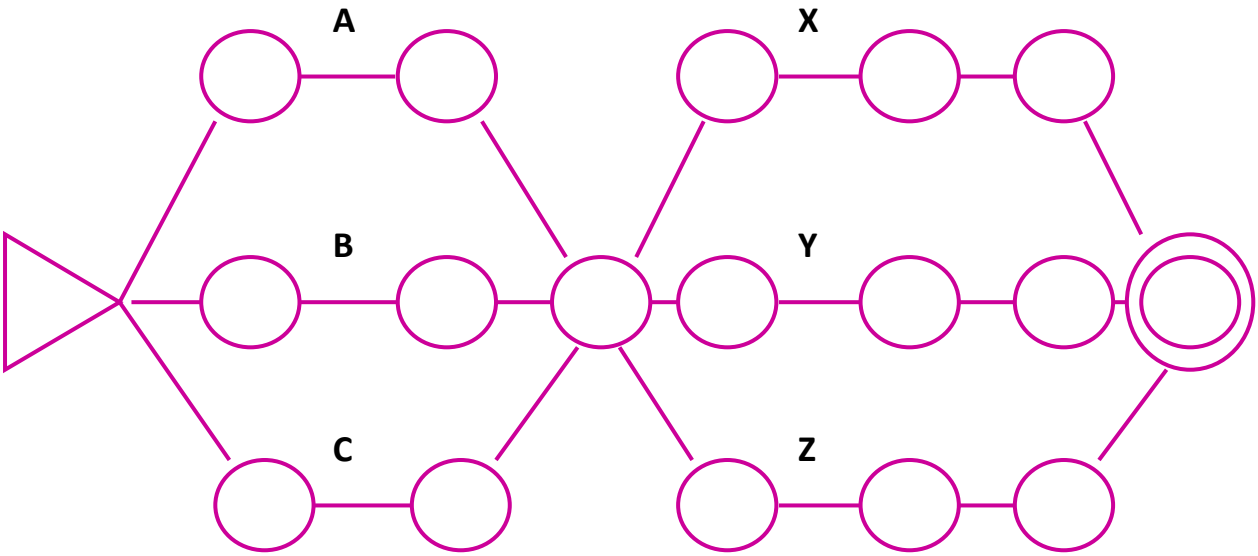

Figure 6 – gaffled relay schematic

The difficulty of course is to have the sections (and therefore all courses) comparable in difficulty, length and height gain, so that each runner in each team is set a similar challenge. Your aim is to force each competitor to do his/her own navigation. Courses should not differ only in their control sites, with competitors running in packs between groups of closely-spaced controls; nor should it be immediately obvious from the start which pack the next runner should go with. Try to have first controls in similar direction but at different distances.

Common controls, and first controls on the first lap (first runner) will be very busy at time, so you might need to double up on punch units.

Think through the changeover carefully, and walk it through several times with critical colleagues. You'll need a sufficiently large waiting pen, with visibility of incoming runners. Use a contorted run if necessary, perhaps with an uphill section; a spectator control visible from the waiting pen and close to the end of the course, or visible from the assembly field and up to about 10 minutes from the end of the course, can allow waiting runners to wear warm clothing until the last moment.

Changeover designs might be contraflow or parallel flow; contraflow allows competitors to get to the waiting area without crossing the paths of incoming/outgoing runners, and is usually the preferred option.

For junior classes, remember to plan appropriately for the youngest eligible competitors.

Technical detail is in British Orienteering Rules Appendix B.

Night events

Orienteering at night immediately increases the technical challenge, though other competitors' headtorches might give useful clues, and reflective control markers can also help – as a planner you could exploit this to make a course easier, though of course making reflective markers visible before the feature is seen gives advantage to those folk with the most powerful headtorches.

Safety is paramount with night orienteering – running in the dark increases the chance of injury, and with smaller numbers of participants, it could take a lot longer to find an injured person. Recovering them is likely to be difficult, not least because participants are unlikely to have sufficient battery power in their headtorch to mount a lengthy rescue operation. Night orienteering most often happens in the winter months, when having anyone out, not moving, for a long time is definitely not desirable.

Areas for night orienteering should therefore have good boundaries and catching features; it would be wise to plan courses to avoid the roughest boulder fields, and large crags should be approached from below not above!

Initially check control sites in daylight – if you can't find them reliably then, they're probably too difficult for night O. Also check paths in the dark, to make sure they're as visible as you expect them to be.

If following a compass bearing in daylight is prone to an error of ±5%, the figure for doing that in the dark is probably more like ±10% (features to sight on must be within headtorch beam range). Distances to be tackled on a bearing should therefore be a lot less than in daylight.

Score events

Score events usually have controls scattered around the area, with the more distant and more difficult ones giving greater points value. As well as considering the individual controls, look at the pairs or small groups, where one control could be the attack point for another. Present your competitors with a difficult decision between one control worth perhaps 30 points and two fairly close together (but further away) worth 20 each. By placing controls in clusters, you can force everyone to have some long legs – if your area is suitable.

You should aim to occupy a fit M21 for the full time available, tempting him to try for all of the controls but ensuring that to succeed at that he will have to plan his tactics well and orienteer at the top of his game. Other competitors should be presented with plenty of choice of control sequence – avoid having one or two obvious routes.

For juniors, have several easier controls near the start/finish, perhaps with some harder ones tantalisingly close to them, to reward the brave navigator who ventures into the terrain.

Participants might be grateful of a supply of red pens at the start, so the less confident ones can quickly mark up their intended sequence of controls.

Urban/sprint events

To quote a competitor at the World Championships in 2015, “urban (sprint) events are about doing simple things very quickly”. Nothing gets beyond TD3, the skill is in the quick decision-making, and implementing the decisions with total accuracy. Good planning revolves around generating good route choice. Doglegs are inevitable, perhaps actually desirable. Refer to British Orienteering Rules Appendix B and David May’s documents as mentioned in the introduction.

Middle distance

The process of planning is as described here, though a middle distance race requires different characteristics of courses. These are well described in British Orienteering Rules Appendix B.