

Appendix B: Course Planning

Text in bold below has mandatory status and shall be followed by relevant event officials. Other content refers to material provided for guidance and for information. This Appendix shall be read in conjunction with the British Orienteering Rules and shall have the same authority. They shall be considered as their extension.

1. Introduction

1.1 Purpose

1.1.1 This Appendix provides guidance to planners, advice on best practice and defines the levels of technical difficulty which are used to specify course standards.

1.1.2 The key planning objectives are to produce safe, fair and enjoyable courses that meet the defined requirements for a given event.

1.1.3 This Appendix cannot replace training and previous experience. All planners are encouraged to read relevant literature (see 1.2 Support) and to attend training courses.

1.2 Support

1.2.1 The British Orienteering website contains a large volume of support material aimed at planners; see the *Planners* sub-section within the main *Volunteer Support & Training* section which contains information on *Training* and *Support*

1.2.2 Of particular interest are the British Orienteering *Course Planning Guide* and individual documents on how to plan colour coded courses, e.g. *Advice on planning Orange courses*

2. Planning Courses

2.1 Types of Orienteering Courses

2.1.1 Whilst the fundamentals of course planning are common to all types of event different styles are required for the different formats of the sport:-

2.1.2 Long Distance Orienteering (normal cross-country, often called "classic")

- Emphasis on route choice to test a variety of techniques to include long legs, variety of legs and direction; see Event Guideline B for more details

2.1.3 Middle Distance

- Emphasis should be on continuous map reading in the terrain, technical difficulty, a relatively high density of controls, changes in direction and micro rather than macro route choices. Runnable terrain of technical difficulty 4-5 is suitable, the more technical the better; see Event Guideline C for more details

2.1.4 Sprint Distance

- Normally in urban or semi urban areas and parkland of technical difficult 3 as the technical standard is enhanced by the high rate of decision making. Emphasis on continued thinking, fair controls, map reading, map interpretation and route choice rather than finding controls. All route choices to be tested to ensure viability and map accuracy. A clear and very accurate map and exact controls descriptions are essential Safety is a key consideration where traffic may be encountered. See Event Guideline D for more details

Appendix B: Course Planning

2.1.5 Ultra- Long Distance Orienteering

- Competition over a long distances mostly long legs and complex route choices. There will be a low density of controls. Controls that require high technical skills to find are unlikely to be included. Long Legs will be included. See Event Guideline H for more details

2.1.6 Urban orienteering (sometimes called City Races)

- As per Sprint races but longer course lengths and fewer controls/km; emphasis on Route choices; see Event Guideline E for more details

2.1.7 Night Orienteering

- Attribute is on route choice and successful navigation to controls. Runnable terrain of technical difficulty 4 is suitable as technical standard is enhanced by darkness. Care should be taken over the fairness of control sites and route choices

2.1.8 Relay orienteering

- The aim is to provide head to head racing between teams whilst maintaining sufficient uncertainty that competitors need to continually map read. Parallel courses are planned. All the teams in a particular race need to cover exactly the same courses in total, but not in the same order. Parallel courses need to have the same number of controls and be similar in length and technical difficulty. See Event Guideline F for more details

2.1.9 Score Orienteering

- Emphasis on choice of routes, selecting which controls to visit based on distance and difficulty. The challenge is enhanced if most of the competitors cannot visit all of the controls; see Event Guideline G for more details

2.2 Technical Difficulty

2.2.1 The technical difficulty of a course is based on the skills needed to successfully complete it. The aim of the Planners should be that the courses at an event show clearly the progression of technical difficulty, with each course providing the correct level of technical and physical challenge. The specification of each level of technical difficulty is included in section 5.

2.2.2 A course of a specified technical difficulty shall satisfy the criteria in each of the areas shown in this Appendix.

2.2.3 The technical difficulty of a course is that of its hardest component. For example, a course is of technical difficulty 3 even if it has just one element at that difficulty, even though the rest may be easier. However, a well-designed course of technical difficulty 3 will have most, if not all, of its elements at that difficulty.

2.2.4 It is recognised that many orienteering areas in Great Britain do not allow courses of the higher technical difficulties to be planned on them. In order to allow events to take place whilst still adhering to the Guidelines a compromise has therefore to be accepted. In such areas Planners must plan at the correct level as far as the terrain allows. For example, if the area only allows courses with a technical difficulty up to 4 to be planned, then those courses requiring technical difficulty 1, 2, 3 and 4 can be planned exactly to the Guidelines. Those courses specified as requiring technical difficulty 5 should then be planned at technical difficulty 4, accepting the fact that they will be less than ideal but the best that the terrain will allow.

Appendix B: Course Planning

2.2.5 Key criteria in selecting an area for an event are that it can provide (i) a suitable technical difficulty, (ii) courses of the correct length, (iii) competitors with an enjoyable experience and (iv) support the necessary infrastructure e.g. car parking, assembly etc.

2.3 Physical Difficulty

2.3.1 The nature of the terrain over which the competitors will be running should be considered for all age groups. Areas of dense undergrowth (e.g. rhododendrons) or which are difficult underfoot (e.g. boulder fields), do not test the orienteering skills of 'running navigation' and so should be avoided. Steep descents, whilst acceptable for M/W21, should be kept to a minimum for younger juniors and older veterans. Features such as fences which may provide significant obstacles for younger competitors or less agile age groups should be taken into account.

2.3.2 All courses should avoid offering route choices that may tempt competitors into physical danger or into going out of bounds..

2.4 Planning for Juniors

2.4.1 Competitors in the very younger junior age categories need every encouragement to enjoy the sport, and the feeling of failure engendered by a lengthy spell lost in the forest is a major disincentive to younger competitors. Children are attempting a sport that provides a considerable mental challenge, and the need for courses to match their abilities cannot be over-stressed. Even at large events, designed to find a true champion as the winner, it must be remembered that junior competitors are far more erratic in their performance than seniors. Simple and short Courses planned to the correct technical standards and recommended lengths are the only way to produce an evenly grouped results list whilst still finding the true champion.

2.4.2 Planning the Junior courses is the most difficult task in terms of providing courses of just the right technical and physical level. If conflict between length and technical standard occurs the course shall be to the correct technical standard. The Junior courses should always be taken into account when locating the start and finish of the event to ensure that the these courses are not too long and can be taken through suitable terrain.

2.4.3 White standard courses

- **In some areas (particularly open areas) because of the absence of paths it may still be possible to plan a white course of suitable standard by substituting prominent line features. If competitors are required to cross open ground a taped route shall be used. This shall start and finish at controls**
- See also *Advice on planning white courses* in the *Planners/Support* part of the British Orienteering website's *Volunteer Support & Training* section for further guidance.

2.5 Planning for Seniors

2.5.1 Older orienteers are technically just as capable as the M/W21 competitors. It is therefore totally inappropriate to combine their courses with the technically easier Junior courses just because the recommended course lengths are similar, unless the terrain prevents courses of high technical difficulty being set.

2.5.2 Any restriction on their physical ability relates largely to speed over the ground. One result of this is in the interpretation of the phrase 'control sites far from obvious re-locating features'. A control that may not be considered far from an attack point or obvious relocating

Appendix B: Course Planning

feature by an M21 competitor may impose a significant time penalty for a W55 who has to return to the attack point and make a second approach.

2.6 Deciding how long the courses should be

2.6.1 For Level 1 and larger Level 2 events the required lengths of courses are defined in terms of course length ratios relative to a base course. In general the most reliable method of approach is:

- (i) decide on an appropriate length for one base course (usually M21E or Black) with reference to the expected winning time of that course.
- (ii) use the course length ratios and recommended class combinations given in the appropriate Competition Rule or Event Guideline to calculate the required lengths of all the other courses. (The course length ratios have been calculated from the results of a large number of events over several years.)

2.6.2 Various methods for deciding on the length of the base course are available; all have their pitfalls. The main methods are:

i) Comparison with previous events. Often the most reliable method - most British areas have already been used for orienteering; even new areas usually have similar terrain locally with which they can be compared. Points to watch:

- was the entry representative, or were all the good runners elsewhere?
- runnability changes as vegetation matures
- undergrowth has more effect in the summer/autumn
- was the planning for the previous event unusual in e.g. the amount of climb or track running required? If the problem is climb, calculate a 'corrected' (i.e. flat equivalent) length by adding 1 km to the length for every 100 m of climb – and remember to take it back off again when you plan your own courses.

ii) Test running – planning a course and then running it. This is often difficult to interpret, as

- navigating to a feature is generally much easier in an event, when there is a flag on it
- running solo tends to be slower than running competitively.

2.6.3 Applying the course length ratios – points to watch for:

- M21 probably uses the whole area. The shorter courses use only part of it, and this might be more or less runnable, or steeper/flatter, than the average
- rough terrain has a greater effect on the running speed of younger and older competitors than of M21s
- older competitors are significantly affected by steep terrain, particularly downhill
- older competitors find dense tree growth more of an obstacle – suppleness decreases with age

There is no magic formula for allowing for these variables.

2.6.4 Do not try to adjust the course length to cater for the expected quality of the competitors, e.g. by making a particular course longer because you know that some top orienteers will be entering. Similarly, if the running times on a particular course turn out to be

Appendix B: Course Planning

longer than intended simply because the quality of the entry was low, this does not mean that the course was planned too long!

2.6.5 For other events, the required lengths of courses are as given in the relevant Event Guideline, this depending on the type of event involved (e.g. Middle Distance, Long Distance, etc). Whilst it is possible to go through the above exercise for choosing course lengths based on M21L, it is usually sufficient simply to plan within the range of normal lengths given in the guideline.

2.7 Control Descriptions

2.7.1 Control descriptions need to be prepared for all courses in accordance with the “International Specification for Control Descriptions” (2004 edition) available from the Document Library section of the IOF website (www.orienteering.org) and also from the British Orienteering website.

2.7.2 Note: Particular care needs to be taken with Sprint control descriptions where inaccuracy e.g. on the side of a wall may have a very significant effect on the race.

2.8 Electronic punching

2.8.1 A computer file, which exactly matches the course file, needs to be prepared for input into the electronic punching system. The planner will need to liaise with the results team about the way in which electronic course data is to be transferred to the event software

2.9 Safety, Risk Assessment and Mitigation

2.9.1 Planning shall be in line with Appendix E. In particular, the dangers of a particular type of terrain will generally be known to local inhabitants and to local orienteers so check with them, e.g. for old mine shafts etc. Don't assume that all orienteers will follow the best route between controls; even hazards well away from the expected routes should be thought about.

2.9.2 The Planner must take into consideration all hazards that competitors may encounter (see Rule 1.7.7). Dangerous features should be marked with yellow or yellow and black tape if they are likely to be visited by any competitors and are not already clearly marked as dangerous (see Rule 1.7.8)

2.9.3 The planner's input into the Risk Assessment from should be completed at an early stage, e.g. at the draft planning stage.

3. Planning and the Map

3.1 Course Drawing

3.1.1 Courses may be prepared by computer using a variety of course drawing software packages. Whilst the detail of operation of them may be different the principles remain the same

3.1.2 The courses file is likely to go through several versions in the lead up to the event and the planner and controller should agree on a version control procedure to prevent old versions being mistaken for the current one.

3.1.3 All data, courses for printing, loose control descriptions, maps for control hanging and checking etc. shall be generated from the same version of the same file

Appendix B: Course Planning

3.1.4 Representative courses should be checked independently to ensure that the length generated by the System is correct

3.1.5 Late changes should be avoided. If these are necessary additional overchecks should be included

3.1.6 Care needs to be taken that map detail that is clear on the computer (e.g. at x8 magnification) is clear on the map

3.1.7 Physical checks of maps are still necessary (e.g. overlapping block colours) and the controller may ask to see proof copies of the map before printing is approved.

3.1.8 Rule 5.2.1 applies: course markings on the map are to be as laid down in the 'International Specification for Orienteering Maps 2000', section 4.7 (booklet available from British Orienteering Office (or its website) or to download from the IOF website at <http://www.orienteeering.org> (go to Document Library > Rules and Guidelines > Mapping Standards)

3.1.9 Sprint maps shall be drawn to the "International Specification for Sprint Orienteering Maps" (ISSOM – latest edition is 2007); download from the IOF website at <http://www.orienteeering.org> (go to Document Library > Rules and Guidelines > Mapping Standards); also available from the British Orienteering website.

3.1.10 The courses and map corrections shall be printed in purple (red/violet) colour. All line thicknesses should be 0.35mm. The course drawing software should do this automatically but this should be confirmed nevertheless. Ditto for 3.1.11/12/13 which follow.

3.1.11 The starting point of the course shall be marked by an equilateral triangle of side 7mm which points towards the first control. The centre of the triangle shows the precise position of the start point.

3.1.12 The site of each control shall be shown as the centre of a circle of 6mm diameter. The circle should be broken to avoid obscuring important detail. If the control feature is shown on the map symbolically rather than to scale, the circle should be drawn so that the symbol lies exactly at the centre. For example, this means that if you use the east side of a dot knoll as a control site then the circle should be drawn around the middle of the symbol, not the east side of it. However, a feature such as a knoll shown by a ring contour (i.e. hill) is drawn to scale and the centre of the circle shall be drawn where the control site is (e.g. N side) rather than at the centre of the ring contour.

3.1.13 The position of the finish shall be shown as the centre of two concentric circles of diameter 5mm and 7mm. Where a course uses two or more maps with map exchanges then the finish should be shown on all maps.

3.1.14 If the controls are to be visited in a prescribed order they shall be numbered in that sequence. The numbers shall be printed on a north-south axis, with the top north, and should be positioned so that they do not obscure any important detail. .

3.1.15 Control numbers should be positioned so as to obscure as little map detail as possible but close enough to the circle as to avoid ambiguity. Particular care should be taken when controls are close together e.g. crossovers and there is possibility for confusion e.g. control numbers 6 and 9 are close

3.1.16 If the controls are to be visited in a prescribed order they shall be joined by straight lines. These lines should be broken to avoid obscuring important detail, diverted to meet up with compulsory routes, broken or diverted to indicate compulsory crossing points,

Appendix B: Course Planning

and broken or diverted to avoid lakes, 'out of bounds', or other areas that cannot be crossed by competitors. If necessary lines joining controls along tracks should be offset.

3.1.17 Where lines joining controls cross one another, it is conventional to break the line which joins the controls to be visited later in the course where it crosses the "earlier" line.

3.1.18 The convention for Sprint maps (ISSOM drawn) is that the lines drawn between control circles are not broken or diverted around impassable objects but go straight across them instead.

3.1.19 Any part of the course where the competitor is obliged to follow a compulsory route shall be clearly and precisely indicated on the map by a dashed line.

3.1.20 Forbidden routes (e.g. busy roads, railways) shall be shown by a chain of crosses.

3.1.21 Uncrossable boundaries (ones which it is forbidden to cross and described as "impassable" on Sprint maps) which affect the course should be indicated by overprinting the mapped feature with a solid line, **except on Sprint maps where solid overprinted lines are only used where a boundary has changed from being passable to impassable and the map does not show this. Crossing points shall be indicated by curved brackets.**

- Whether crossing points are mandatory or not needs to be unambiguous both in the event details and on the map
- Where there is only one valid option for crossing an uncrossable boundary, the line between controls should be bent to this point. In this instance there should be no advantage to be gained by not using the crossing point and it is unlikely that the previous control will be more than 100m before the boundary. If in doubt consider placing a control at the crossing point.
- Where there is more than one option for crossing the uncrossable boundary, the line between controls should be broken either side of the boundary. Sufficient crossing points should be provided such that there is an option on all likely route choices and no competitor will gain an advantage by not using a crossing point.

3.1.22 The dimensions of the course overprint symbols on 1:10,000 (or larger scale) maps should be as defined in 3.1.10 to 3.1.13 above. However, for competitions in which both 1:10 000 and 1:15 000 maps are used, the size of the symbols on the 1:10 000 maps may be 150% greater than on the 1:15 000 maps. Factors to consider :

- Symbol enlargement allows the control descriptions to be the same on the 1:15,000 and 1:10,000 maps if both are used at the same event.
- Some courses, such as White, and some types of event, such as Sprint races, may have controls relatively close together. Enlarged circles might overlap to an unacceptable degree.

3.1.23 Editing, which will also include the breaking of control circles and connection lines, should be an important part of the process of preparing the master course overprint file. Time should be allowed for this in the planning timetable.

3.1.24 Maps should be clearly identified by course number and/or title so that competitors can identify their courses.

3.1.25 If maps are not printed on waterproof material they should be protected by a sealed plastic covering of at least 250 gauge (or a heavier gauge if the map unit size exceeds A4) prior to issue to competitors.

Appendix B: Course Planning

3.2 Measurement of Distance and Height Climb

3.2.1 Course length is measured as defined in rule 6.1.2, and quoted to ± 0.1 km (e.g. 5.5km, not 5.50km). This is the shortest route which a competitor could reasonably possibly take, irrespective of whether or not the competitor would be sensible to do so.

3.2.2 Height climb is measured as defined in rule 6.1.3, and quoted to ± 5 m. That is, it is measured "along the shortest sensible route", which may well be longer than the route used for measuring the course length. This is not necessarily the "optimum route", nor is it necessarily the route which the planner would take: it is simply the course length route extended to avoid those hills/valleys etc which all competitors will also avoid. The intention is to give a figure which is representative of the climb which a competitor could actually undertake. As a rule of thumb, if a competitor will go over it, count it in; if you're not sure whether they'll go over it, count it in – only discount it if you are certain that all the competitors will go around it.

3.3 Map Corrections

3.3.1 If corrections have to be made to the map subsequent to map printing, copies of the map showing no information other than any map corrections essential to the competition should be displayed and available for study before the start line or they should be displayed in the start lanes and if possible overprinted on the competitors map. Adequate number of maps detailing the 'map corrections' shall be made available.

3.4 The Start

3.4.1 The position of the centre of the start triangle shown on the map shall be on a mapped feature and identified on the ground by a control banner. For TD1 and 2 courses this feature will need to be a path or similar feature; also it shall not be at a junction or intersection, as this would require the beginners to decide which way to go without knowing where they have just come from.

3.4.2 Where a map exchange is used the position of the start of the next section of the course shall be marked on the ground by a control banner if it is a significant distance away from the previous control site.

3.4.3 The position of the start kite or master maps should be such that competitors waiting to start cannot see or have minimum visibility of the route taken by competitors who have started. The map issue point should be such that all competitors will visit the start kite.

3.4.4 The courses should be designed so that competitors are unlikely to return past the timed start on their way to the first control site.

3.4.5 For larger events, chasing starts etc the Pre- start and start needs to be of sufficient size to accommodate the number of competitors.

3.5 The Finish

3.5.1 It is important to ensure that the Finish is easily located. "Navigate to Finish" should not be used except (sometimes) for score events where the Finish will normally be next to the start. In other cases, there should be an ordinary last control (with description) and then a taped route, which can be just a few metres, to the Finish.

3.5.2 As a minimum the Finish should consist of a punch unit and control flag, preferably with a prominent Finish banner. There should be no possibility of a competitor being unable to find the Finish after they have visited the last control.

Appendix B: Course Planning

3.5.3 The Finish should be manned as it may often be the first place where a competitor can report that an injured competitor needs urgent assistance or a problem with the course.

3.6 Control Site Layout

3.6.1 The control banner should be visible from all directions of approach unless the control description indicates otherwise. Control banners should be sited so that the absence or presence of another competitor does not affect the difficulty of locating the control.

3.6.2 Punching stations should be clearly visible and easily accessible from the control banner.

3.6.3 Marking devices should be positioned in such a way that competitors may endorse a control card attached to any reasonable part of their clothing. **A back up system shall be provided should the electronic system fail.** For SI this is usually a pin punch and for EMIT a paper card in the brick. However, this is optional for level 3 events.

3.6.4 At competitions of Level 2 and above, the layout of the control banner, control code and marking devices should be the same for all controls. (For major races a model control should be displayed at the pre-start.)

3.7 Proximity of Controls

3.7.1 Rules 6.2.3 and 6.2.4 allow some flexibility in how close together controls can be sited. This should be used with caution (and not at all in World Ranking Events: IOF rules have "shall" not "should"): it must always be possible for a competitor to decide from the map which control to go to without needing to rely on the control code, and to do so quickly. If you are going to infringe either limit, you will need a good reason which you are able to justify to competitors. Remember also that it may be necessary to allow for a little drift in the positioning of the circle on the overprint, and that in a detailed part of the map there may be some distortion in order to fit the symbols into the space available – if in doubt, measure the distance on the ground.

3.7.2 There is usually little point in putting controls closer than 30m apart – competitors are, in effect, navigating to the same point. An exception might be e.g. when one control is on a point feature, used by a technical course, the other on a path junction on a yellow course or for a road crossing.

3.7.3 The 60m limit may also be breached for younger junior courses e.g. when two successive decision points come close together on a white course (but this will require the circles to overlap even at 1:10 000, so consider taking the course elsewhere) particularly if the course is not being overprinted).

3.7.4 Be pessimistic when interpreting 'features which appear similar in the terrain', e.g. paths and rides are obvious ones not to mix, but some vegetation boundaries have faint paths along them (or develop them as an event takes place). 'Similar features' does not just mean those mapped with the same symbol: it is not fair, for instance, to use both a fence and a ruined fence. Neither is it acceptable to claim that e.g. 'boulder (2 m) NE side' and 'boulder (1 m) SW side' are different: they are both boulders.

3.7.5 Note that the situation is different for courses on larger scale maps, e.g. Sprint/Urban using ISSOM maps, where minimum separations are smaller.

3.7.6 Other combinations to avoid include

- stream/ditch/linear marsh
- depression/pit/shallow re-entrant

Appendix B: Course Planning

- knoll/spur
- re-entrant/side of a spur
- re-entrant/a feature (e.g. a marsh) in a re-entrant

Essentially, do not use any close combination of controls which could be confused by competitors.

3.8 Control Site Selection

3.8.1 Consideration should be given to the fairness of control sites

- The control site should be uniquely described
- The control feature should be visible from within 10m or 10% of the distance from the nearest attack point. E.g. a lone pit in the middle of a large block of flat forest is unlikely to be fair but if related to the shape of the ground would be.
- For fairness, the visibility of a control should be the same whether or not there is a competitor at the control site. On no account should the control flag be hidden. Thus control flags should normally be placed at the side of pits or small depressions, and not “hidden” at the bottom.
- Particular care should be taken over the fairness of controls in low visibility/ “green” forest
- Spectator controls need to be chosen to give ready visibility to the maximum audience. A return to the Assembly area works well but care needs to be taken that competitors can enter and leave without confusion

Note: Drinks points and road crossings need to be established early in the planning cycle in conjunction with the organiser

4. Running Speed ratios

4.1 In order to obtain appropriate course lengths the running speed ratios for the different age classes need to be known. The table below shows the figures used in calculating the course length ratios for Long distance races in the 2011 Competition Rules:

Age Class	Speed Ratio	Age Class	Speed Ratio	Age Class	Speed Ratio	Age Class	Speed Ratio
M10	0.74	W10	0.73	M40	0.89	W40	0.69
M12	0.70	W12	0.62	M45	0.86	W45	0.67
M14	0.80	W14	0.65	M50	0.82	W50	0.63
M16	0.84	W16	0.67	M55	0.77	W55	0.58
M18	0.90	W18	0.70	M60	0.70	W60	0.53
M20	0.92	W20	0.71	M65	0.64	W65	0.48

Appendix B: Course Planning

M21	1.00	W21	0.82	M70	0.57	W70	0.42
M35	0.92	W35	0.71	M75	0.50	W75	0.35

4.2 Note that M/W10 ratios are for TD2 courses and M/W12 ratios are for TD3 courses.

4.3 Speed ratios for older competitors in Sprint/Urban races tend to be slightly higher due to the less physical nature of the courses.

5. Definition of Technical Difficulty

5.1 Definitions of Terms

5.1.1 ROUTE CHOICE: The option of taking more than one (sensible) route between two controls. This may, for example, be a choice of two different path routes, or one of a long path route versus a direct cross-country route.

5.1.2 DECISION POINT: A point at which you can no longer continue in the same direction, for example being required to turn right at a path junction. A decision point on a leg does not imply a route choice. There may only be one obvious route between controls, but this could require the ability to change direction at a number of decision points.

5.1.3 COLLECTING FEATURE: A large feature beyond a control which, when reached, confirms to the competitor that he has completely passed through an area of ground. (A collecting feature is usually a line feature).

5.1.4 RELOCATING FEATURE: A distinct feature that may be used by a competitor to relocate his position on the map.

5.2 Tables

5.2.1 The tables which follow define the planning requirements for each level of technical difficulty ('TD'), together with the orienteering skills which are to be tested.

Appendix B: Course Planning

TD	Routes and route choice	Numbers of controls	Control sites	Relocation and cost of errors	Skills required (letters refer to the 'Step by Step' skill categories)
1	Route all along tracks and paths. No route choice, including at the start banner.	Controls reasonably close together (200m maximum). A control at every Decision Point.	Paths, tracks – junctions, crossings and bends. Features on paths e.g. bridges, gates, to give variety to the control descriptions. The banner and punches at a control should be sited in the direction of the next control.	Should not be required.	Understand map colours and commonly used symbols. (A) Orient the map using compass and terrain. (A) Orienteer along tracks and paths. (B) Make decisions at 'Decision Points' identified by a control site. (B)
2	Route all along obvious line features such as tracks, paths, fences, walls, rivers, large ditches and very distinct vegetation boundaries. No route choice, including at the start banner.	Controls fairly close together (350m maximum). Leg lengths should not vary greatly. A control is not needed at every Decision Point, but there should be at most two Decision Points per leg.	On the line feature along which the competitor is travelling. Obvious other features close to, with the banner clearly visible from, the line feature, e.g. knolls, boulders.	Generally should not be needed, but can be done by re-tracing the route along line features.	Orienteer along obvious line features (handrails). (C) Make decisions at a 'Decision Point' without the assistance of a control to identify it as such. (C) Leave a line feature to go to a visible control site near to it, then return to that line feature. (D)

Appendix B: Course Planning

TD	Routes and route choice	Numbers of controls	Control sites	Relocation and cost of errors	Skills required (letters refer to the 'Step by Step' skill categories)
3	For controls not on a line feature then a route along line features to an obvious attack point should be possible. Simple route choices.	Relatively frequent controls on short courses, less so on longer ones. Legs of different lengths.	Any line feature. Prominent point or contour features, but these should be easily found from an attack point on a line feature.	There should be a collecting feature close behind all controls that are not on a line feature.	Corner cutting. (E) Basic use of compass to allow short cuts through the terrain between two line features. (F) Navigate a short leg on a rough compass bearing to a control on or in front of a collecting feature. (F) Simplification of legs with several Decision Points. (G) Make simple route choice decisions. (H)
4	Significant route choices.	As few as necessary for good planning based on the length of the course. Legs of different lengths.	Any feature which does not require map reading through complex contour detail.	Collecting features behind all controls. Errors should not be expensive in terms of time lost.	Navigate long legs on a rough compass bearing to a collecting feature. (I) Fine orienteering on short legs using an accurate compass bearing. (J) Navigate for short distances using simple contour features – hills, ridges, large re-entrants and spurs. (K)
5	Significant route choices. Course should force regular changes in technique, e.g. long route choice followed by short intricate legs.	As above.	Any feature, particularly those demanding careful map-reading to locate – but the banner must not be hidden, nor the control excessively isolated (no Bingo controls).	Control sites far from obvious relocating features. Errors can result in a large time loss.	Navigate for long distances using only major contour features – hills, ridges, large re-entrants and spurs. (L) Read and interpret complex contours. (M) Concentration over long distances. (O) Recognition of indistinct features. (O) Use all the different skills and adapt speed and technique to changes in the terrain and orienteering difficulty.