

COURSE PLANNING GUIDELINES

References

OA Competition Rules for Foot Orienteering – Appendix on Course Planning

IOF “Principles of Course Planning” (Published separately and as Appendix 2 in IOF “Competition Rules for IOF Foot Orienteering Events”)

Aims Of Course Planner

Primary Aim

The courses are properly planned and suitable for the event type and age groups concerned.

Secondary Aims (more administrative but stop the quality of the course being outweighed by problems on the day of the event)

1. The control stands and flags are correctly placed and the map gives a true picture of the control surrounds.
2. The control descriptions are accurate and correspond to the map.
3. The numbers on all the controls are correct and match the control descriptions for all courses.
4. The courses are printed correctly on all the maps

How to achieve these aims is expanded in more detail below. These notes cover general principles applicable to all types of orienteering courses.

Specific requirements for the different formats – Long, Middle and Sprint etc follow..

Basic Principles

General - “The standard of any course, and in particular, the map reading and route choice problems, should be appropriate to the age, experience and ability of the competitors expected to take part and should follow the IOF publication “Guidelines to Course Planning”. The location of controls and the selection of legs should be such that the element of luck is minimised, and the courses offer a fair test of orienteering skill”

Important Points to Note

- Courses should be correctly designed for their expected abilities of participants, and the results should reflect this. The deciding factor in the results should be orienteering skill. Attention needs to be paid to the competitors’ expected skill, experience, and ability to read and understand the fine detail of the map.
- Orienteering on foot may be characterised by running navigation. Hence the terrain should be runnable and suitable for testing the orienteering skills of competitors.
- Fairness - Course planner needs to ensure that the contest is fair and that all competitors face essentially the same conditions on every part of their course, ie eliminate the element of luck (often reflected in bingo controls)

- Competitor enjoyment - orienteers need to be satisfied with the courses they are given, course planning thus needs to ensure that the courses are appropriate in terms of length, both physical and technical difficulty, control siting etc.
- The course planner needs to be fully acquainted with the terrain before he or she plans to use any control or leg.
- Courses should be set that normally fit competitors can run over most of the course set for their level of ability

Course Planning

Courses are described in terms of their navigational difficulty, namely Very Easy, Easy, Moderate and Hard

Very Easy

- Course must follow major mapped linear features
- Control site needed at every turning point and placed so as to lead the competitor in the right direction
- Control markers should be visible on the approach side
- Large obvious features visible from and close (<25m) to the linear feature can be used
- Flagging cross country legs (but not in thick or steep terrain) is permissible if sufficient linear features are not present
- Controls on these courses should not be used on hard courses (possible exceptions could be where latter use “dummy” drink or radio controls on major linear features)
- these courses can never be too easy, and should be designed so that all competitors are likely to complete them, if there are DNFs on these courses or time taken becomes excessive, then the above guidelines have not been followed through
- Course should be able to be completed without compass bearings
- Remember when checking the course to view the course from a juniors perspective (“bend d knees”)
- Avoid physically difficult control sites
- Don’t be afraid to have lots of controls, generally 10 or more will be needed on this course

Easy

- Control sites must be on or near linear features but preferably not at turning points
- Hence opportunity to follow handrails or cut corners and go cross country
- Short legs along linear features that are not drawn (eg large gullies, well defined spurs) may be included but then catching features are essential
- Control markers should be visible from the approach side by any reasonable route
- Streamers should be used for legs or parts of legs where there are no handrail options
- May include limited contour recognition although this is not the primary technique

Moderate

- Courses should have route choice
- There should be big attack points near controls
- Catching features should be present <100 m behind controls
- Control sites can be fairly small point features but not in areas of complex detail
- Control flags not necessarily visible from the attack point
- Control flags not necessarily visible from direction of approach
- Preferably avoid areas of complex contour detail
- Aim is to provide a technical challenge without allowing serious errors to occur

Hard

- Navigation should be as difficult as possible (but this should not override basic principles of running navigation above)
- Controls on small contour and point features
- No large attack points or handrails nearby
- Route choice should be an element of most legs
- Have variety in the types of navigational and route choice problems set

The Orienteering Course

Orienteering courses are made up of a start, legs, controls and finish, often the emphasis is on developing difficult control sites ie finding the most difficult areas of the map and using them for controls and paying less attention to the routes between these area.

The Start

- Doesn't need to be at/near the Finish
- Consider Very Easy and Easy Courses
- Be prepared to have it away from the Finish/Assembly area if this improves your courses
- A remote Start is much better than a remote Finish
- An uphill walk to a start can help reduce climb on courses

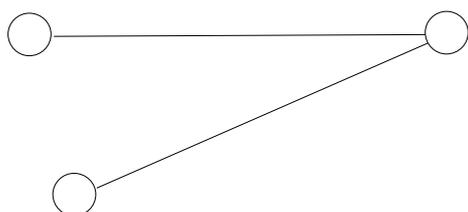
The Finish

- Should be at the Assembly Area
- Do not have remote finishes unless there is absolutely no alternative
- Should be at or close to assembly
- Improve spectator involvement even for minor events
- Avoid unmanned remote finishes except in exceptional circumstances e.g. no suitable parking or assembly on the map

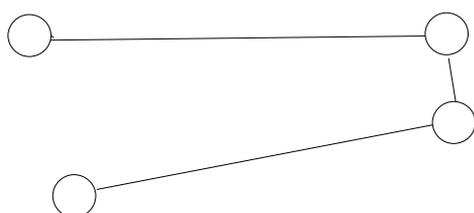
However the legs are the most important elements of the course and the quality of the legs will largely determine course quality (refer copy of article by Max Read in Appendix). Hence in course planning consider the legs before the control sites, keeping in mind the following

- good legs offer competitors interesting map reading problems, allow for alternative individual routes, and hence tend to separate competitors
- try to plan the main legs where the map is rich in details, changeable in character and demanding in map reading ability

- different types of legs should be offered on a course, eg range from intense map reading to sections in which rough orienteering is possible
- variations with respect to length and difficulty to force competitors to use a range of techniques
- the course should give changes in directions for consecutive legs as this forces competitors to reorient themselves frequently
- preferable for a course to have a few very good legs joined by short links to enhance the better legs rather than a larger number of even but lesser quality legs
- good legs with several route choice possibilities tend to split up the field thus reducing “following”
- Use short linking legs to eliminate dog legs eg as in diagram below



Example of dog leg



Use of short linking leg

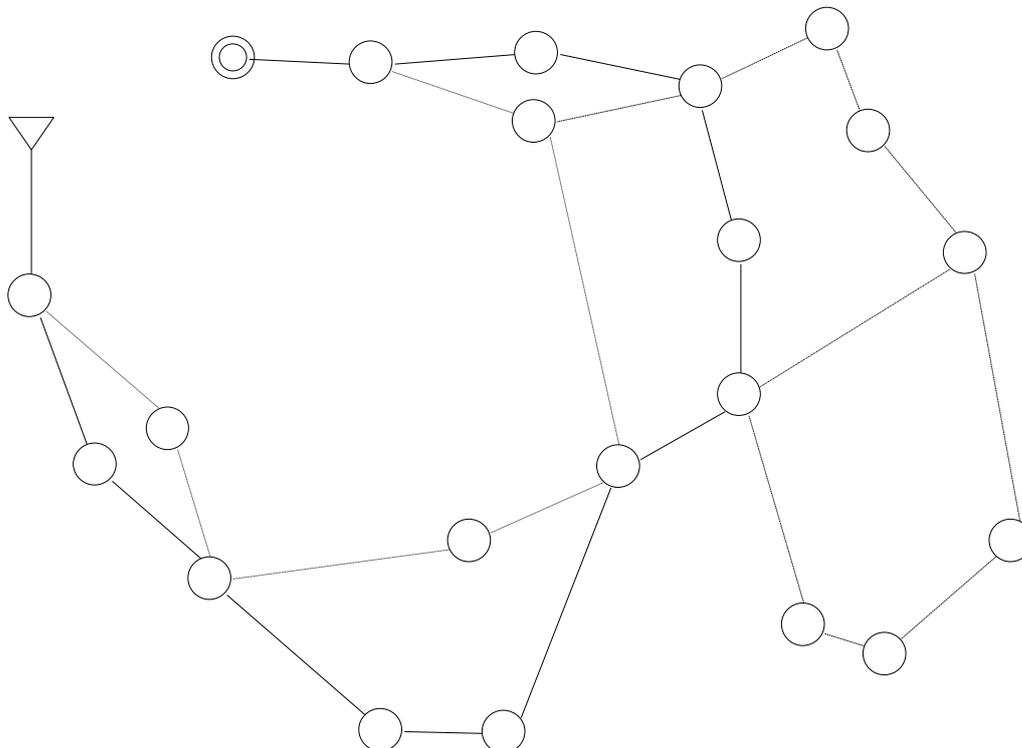
The importance of the leg vs the control site itself is reflected in the series in the Australian Orienteer (1997-98) on “Good Legs”.

At most events there will be several hard courses and possibly two moderate courses. The terrain will sometimes be such that the shortest hard course will in fact be of a shorter distance than the longer moderate course.

To help reduce the effort in select controls and putting them out, shorter courses can be loops within or truncated versions of longer courses of the same degree of difficulty. For example if there are two moderate courses required, the shorter moderate course can be designed to be a loop within the longer one, hence the only extra work in preparing two courses is in the control description and course map for the second courses.

Likewise for hard courses, make the most of the good legs you have designed by using them on several courses, although be careful that the courses for the older orienteers don't have controls placed in locations eg bottom of high cliffs or in steep gullies, that are no problem for an elite orienteer to leap into, but more of a problem for a older age groups. Cross overs also enables optimum use to be made of the planned legs and control sites and can confine the longer courses to a smaller area thus minimising effort at placing distant controls which will be used by a handful of competitors at most.

The following shows an example of using loops within loops for a set of courses, this minimises the numbers of controls. Note that separate 1st controls are recommended to split runners.



When controls are used on more than one course, competitors on different courses should not be approaching controls from opposite directions, so the control is not revealed as easily to incoming orienteers by an outgoing competitor.

Courses should be designed so that competitors finish from a common direction, having a common last control facilitates this.

The other components of the course are the start and finish. Access and suitability of different parts of the map for the easier courses often control the location of these. Hence when choosing the start-finish area, ensure that the EASY and VERY EASY courses can be set from this location. In colder weather, locating registration, start and finish within close proximity, is generally appreciated by competitors.

Determining Course Lengths

This can potentially be one of the more difficult problems.

Courses should be designed to match the expected abilities of competitors, the results should reflect the competitor's technical and physical abilities (IOF "Principles of Course Planning")

Courses (length, degree of difficulty, climb) need to be planned with the expected winning time in mind, ie expected winning time for each class group is the primary basis for

determining course length. Kilometre rates will be faster in open terrain with only small climbs, and slower in more physically demanding terrain due to steepness, decreased runnability due to thicker vegetation or other obstacles such as rocky areas or fallen timber.

To match course lengths to required winning time, rates per km for the different age categories need to be determined. This can be from previous results in the area, or adjacent similar areas, if available, or in a new area, organiser, course setter and controller should run some of the planned courses to determine kilometre rates.

For events in very hot or cold conditions, reduction of anticipated winning times is recommended.

In summary, factors influencing relative run rates include

- Style of orienteering – long, middle, sprint
- Navigation standard – hard, mod, easy, very easy (calculation for the last 3 is difficult, recommended distance may be more useful for Easy and Very Easy)
- Terrain – open vs green, steepness, obstacles (small, large)
- Level of competition, depth of field

Course Climb

Course climb is calculated by the total metres climbed on the route considered optimum by the course planner, and is expressed in metres. However in order to consider whether climbs are appropriate they will need to be recalculated as a percentage of course distance.

The rules do not specify the amount of climb on a course, however 4% (eg 200m in 5km) is generally accepted as the maximum climb for hard courses (scan of your control descriptions at previous major events will indicate that this is generally the case). However M21A courses often reach 5 %, whilst hard courses for the older age classes should be less, around 3 %. Likewise for the moderate and easy courses, climb should be no more than 3 %. In steeper areas, careful use of the terrain is required ie more legs along the contour and not repeated up and over scenarios. If excessive climbs cannot be avoided due to the nature of the map, then course lengths need to be shortened.

Even in steep areas climb can be minimised by setting legs along the contours, lots of uphill legs or successive up/down legs, just produce a fitness test.

Control Descriptions

These are according to the Australian Edition of the IOF standard, the basic components of a courses control description lists are

- course name
- course length in km, climb in metres
- control descriptions in order
- distance of route from last control to finish
- whether this route is marked or unmarked

The aim of the individual control descriptions is to specify exactly the control feature and the site of the marker in relation to this feature. Controls can only be on mapped features and the control description must match the mapped feature according to the map legend. The description of the control feature should be complete, eg sizes of point features and height of cliffs should always be included, and location of control with respect to feature when necessary.

If a control feature cannot be unambiguously described then it should not be used, eg middle boulder when there are many boulders in the control circle, is not appropriate.

At events when maps of two different scales are used, control descriptions may vary between map scales because more features will fit in circle of 1:15 000 map of 1: 10 000 map. Need to ensure descriptions are correct for both map scales, hence it is essential that course planning is done on same scale of map that the competitors will use.

International control descriptions for hard and moderate courses, English descriptions are required for easy and very easy courses

Additional information, which can be included on control descriptions or printed on the map, include safety bearing and course closure time.

Course Planning Process And Control Checking

- Establish guidelines and requirements before course setting begins (eg courses required, grouping of classes, winning times etc as described above)
- Plan courses on paper, ensure distance climb etc are as required. Time spent here will minimise field checking and subsequent alterations. Plan control numbers at this time, ensure there are no problems with similar numbers on nearby similar controls
- Field check courses and control sites, mark with survey tape or something similar preferably labelled with control number and description, *with tape at proposed site of control*
- During the field check, need to
 - ❖ consider that description of control is correct and complete,
 - ❖ check that map accurately portrays the ground in the vicinity of the control and that direction and distances from all possible angles of approach are correct
 - ❖ check that there are no major hazards likely to be encountered by competitors on any leg (eg dangerous cliffs, areas of mine shafts etc), if so arrange for this to be flagged and or taped off
- If you are having trouble finding control feature or have doubts about its mapped accuracy, then it is better not to use the feature
- Note any relevant map corrections whilst field checking controls
- Check the need to mark any hazardous areas during the field check
- Ensure any changes resulting from field check do not compromise courses
- Finalise courses, check maps for courses, maps for all controls, control description lists

Siting Of, And Visibility Of Control Flags

The control flag should be placed at the feature in accordance with the control description, it should be visible to the competitor when they can see the described position (orienteeing is not a treasure hunt). If this is not the case, then the map is of no further use to the competitor and the only solution is to hunt around until the flag is found result in success becoming a matter of luck and not orienteeing skill. The value of good legs may be lost if a control site at the end of it leads to an significant due to flag being hidden, location or description ambiguous, or even worse misplaced.

If the control is on a linear feature eg watercourse, the control flag should be visible in *either* direction, from a distance which is between 5-10% of the distance from the nearest

attack point, with a minimum of 5m. So don't hide the control behind a bush, especially if this results in the control being more visible from one side than the other.

For broader features eg spur, gully, the control flag should be visible in any direction from a distance that is between 5-10 % from the nearest attack point, with a minimum of 10 m.

Controls on point features must be visible when the competitor is standing at the feature as described on the control description.

Proximity of Controls

Controls on different courses placed too close to one another can mislead runners who have navigated correctly to the control site. Controls should not be sited within **30 m** of each other (**15** metres for map scales of 1:5000 and 1:4000). Further, only when the control features are distinctly different in the terrain as well as on the map, should controls be placed closer than **60** metres (**30** metres for map scales of 1:5000 or 1:4000).

When siting nearby controls on the same or similar features (eg boulder and boulder cluster) use control stands with significantly different number codes. Also controls placed too close on different courses can mislead runners who have correctly navigated to the control site, so ensure that close spaced controls follow the rules above, otherwise the element of luck returns.

Placing controls in a maze of illegible detail, in dark green, or on isolated point features in otherwise featureless terrain should be avoided, these generally become the "bingo controls". Controls are not technically difficult because they are hidden. Controls, which are in greener areas, should have good attack points or other features that assist in defining the location of the control due to the reduced visibility.

Water Controls

Drinking water is to be provided at intervals of 20 mins (according to expected winning time) if the temperature is >20°C or 30 mins in cooler conditions, allowing 200-300 ml per competitor.

Drinks shall be located at controls or compulsory crossing points (hence drink stations on tracks, or other places, where competitors may or may not choose to cross is illegal). The addition of an easy control at relatively accessible location, even if it is on a track will ensure that the competitors visit the drink station, and make it easier for organiser to put water on courses.

Drink controls must be identified in control description list.

Common Problems with Course Setting

- Control site too difficult for inexperienced orienteer eg subtle features, lack of detail
- Control site too easy for more experienced eg little navigation required, on a major features
- Control site is confusing because of map errors or unmapped detail
- Control location is vague
- Marker is hidden eg in a pit, or description is incomplete

- Dog legs are present (competitors lead others to control and go back over same terrain)
- Course lacks variety
- No route choice on more difficult courses
- Lost distance - no navigation needed over most of the legs eg a long run to a major catching feature
- Course is unnecessarily physical for age groups
- Course has not been checked for running feasibility or hazards (eg mine shafts, dangerous cliffs on downhill routes)
- Temptation for competitors to take controls out of order (although at non-championship events, it is sufficient to rely on competitors honesty, the only one they are cheating is themselves by deliberately taking controls out of order)
- Obvious routes too close to out of bounds or unmapped areas
- Control or obvious route very close to edge of map (unless map bounded by distinct large linear feature)
- Temptation to equate technical difficulty with physical difficulty

Long Distance Course Format

- Physically demanding
- Format emphasises route choice, including large scale route choice (splits competitors)
- Control is end point of long leg, may not in itself be difficult
- May include more technical sections characteristic of Middle Distance
- Element is long legs still requiring full concentration on map reading, e.g. 1.5 – 3 km on elite courses, 1 – 1.5 on shorter courses (ensure map reading and conc. still required)
- Don't start with sequence of short legs
- Test all orienteering techniques
- 1:10,000 and 1:15,000 scales

Middle Distance Course Format

- Profile is technical
- Emphasis on detailed navigation
- Requires constant concentration on map reading
- Shifts in running direction out from controls
- Shifts in speed through varied terrain types
- Small and medium scale route choice
- Controls themselves are technical
- Map scale is commonly 1:10,000 scale (map is a strict enlargement of a 1:15 000 scale map)

Sprint Distance Course Format

- Profile is high speed
- Commonly urban
- Tests ability to read complex maps and make route choice decisions and implement them at high speed
- Map scale is 1:5,000 or 1:4,000 scale, ISSOM map specification
- Controls are technically easy and should not set traps, aim is to test ability to choose and complete the best route
- But avoid areas so complex that they can't be interpreted at speed
- Out of bounds areas and features not to be crossed need to be considered in course planning, don't set legs that encourage these to be crossed

Relay Format

- Team competition
- Mixture of technical difficulties
- Elements of Middle and Long – route choice allows separation of runners
- Forking – but ensure fairness
- Last part of legs generally common
- Spectator friendly
- Enjoyable for competitors

Street – Park

- Elements of all formats depending on the map
- Route choice should be the primary focus with elements on Middle/Sprint if map permits
- Navigation limited to Very Easy to Moderate
- Out of Bounds and Un-crossable Features – don't encourage these to be crossed
- Traffic and Major Roads – minimise crossings
- Security of Control sites, but don't hide controls
- Friendly assembly area

Night Courses

- Long distance style but over shorter distance
- Safety considerations important, navigational standards reduced

Score/Scatter

- Format closest to Long
- Dependent on map areas