IOF TECHNICAL CLINIC

for

TRAIL ORIENTEERING

Rolf Karlsson (Planner) and Sture Sporrong (National Controller) discussing flag positions for the second timed control on Day 2 of WTOC 2004

Västerås, Sweden
September 2004

In association with the first World Championships in Trail Orienteering

INTRODUCTION

This Clinic is about:

- ELITE TRAIL ORIENTEERING

It is a *technical* clinic giving instruction and advice for the setting and taking part in trail orienteering events of high quality, such as world and regional championships.

This is the third clinic, the first having been held in Scotland at WOC 1999 and the second in Finland at WOC 2001. These first two clinics were for Controllers. This clinic is for anyone wishing to improve their understanding of trail orienteering at elite level.

So this Clinic is for those who are, or plan to be, competent and successful as:

- Planners
- Controllers
- Organisers
- IOF Event Advisers
- Competitors at elite trail orienteering competitions.

Trail orienteering was developed as a terrain recognition and map reading activity for disabled orienteers. However, at elite level, it has great potential to appeal to all orienteers.

At this elite level it can an extremely testing and rewarding mental exercise, exploring a whole range of different terrain recognition problems. To be so it has to be fair.

It is easy to set trail orienteering problems which are hard because they are unfair and the answers involve guesswork. It is much harder to set problems which are both fair and difficult, with the answers needing analysis and logical thinking.

CLINIC TOPICS

1. **Terrain Requirements for Elite Trail-O;**
2. **Controlling;**
3. **Mapping;**
4. **Planning;**
5. **IOF Accreditation.**

Although we are going to look at all these essentials of international trail orienteering, the key to successful competition is good control setting.

Therefore most of this clinic will be about the practical issues of control problem setting.

1. TERRAIN REQUIREMENTS for ELITE TRAIL-O

There are very many similarities between setting elite events in Foot Orienteering and Trail Orienteering.

However, there are some important differences. Much more attention has to be given to the quality of the terrain and the conditions of the tracks (trails).

We have to ask two questions.

Is the terrain suitable for Elite Trail Orienteering?

The key to elite Foot-O is high quality terrain; terrain that is detailed, complex, interesting - a pleasure to be in and to run through.

The key to elite Trail-O is high quality terrain; terrain that is detailed, complex, interesting - a pleasure to be in. But there is no running through the terrain.

The best Trail-O terrain is that with complex ground and contour detail demanding skills of map interpretation. The presence of rock, water and vegetation adds variety and further interest.

Man-made features can play a part in elite Trail-O but are generally of secondary value, the best competition being based upon complex natural detail.

Trying to guess from an existing Foot-O map whether the terrain is suitable for elite Trail-O is difficult because the Trail-O competition uses detail which is often too fine to be shown at the Foot-O map. This is certainly so for maps at scales of 1:10000/15000. The new sprint map at 1:5000 is more useful but, even so, the terrain **must** be visited to make sure there are likely to be enough sites of elite standard to support the competition.

Can a wheelchair competitor get round the course?

The IOF Rules for international trail orienteering events tell us

"The terrain must be chosen so that the least mobile competitors, the person confined to and propelling a low fixed wheelchair and the person who walks slowly and with difficulty, can negotiate the course within the maximum time limit, using official assistance where provided." Rule14.2

The Appendix 1 – Principles of Course Planning for Trail Orienteering - to the Rules also gives useful guidance.

The wheelchair competitors need firm surfaces and room to turn. This last point is very important as elite competition often requires the competitors to sight the problem from different positions before making a decision at the viewing point.

The long low wheelchairs need more room to turn.

Appendix 1 recommends that track width should be at least 1m and 3m for passing and turning.

The firmness of the surface has to be carefully considered so that competitors can both get round the course and do so without getting excessively muddy. It may be necessary for sections of the tracks to be repaired.

The gradients of the course may be critical. Appendix 1 says:

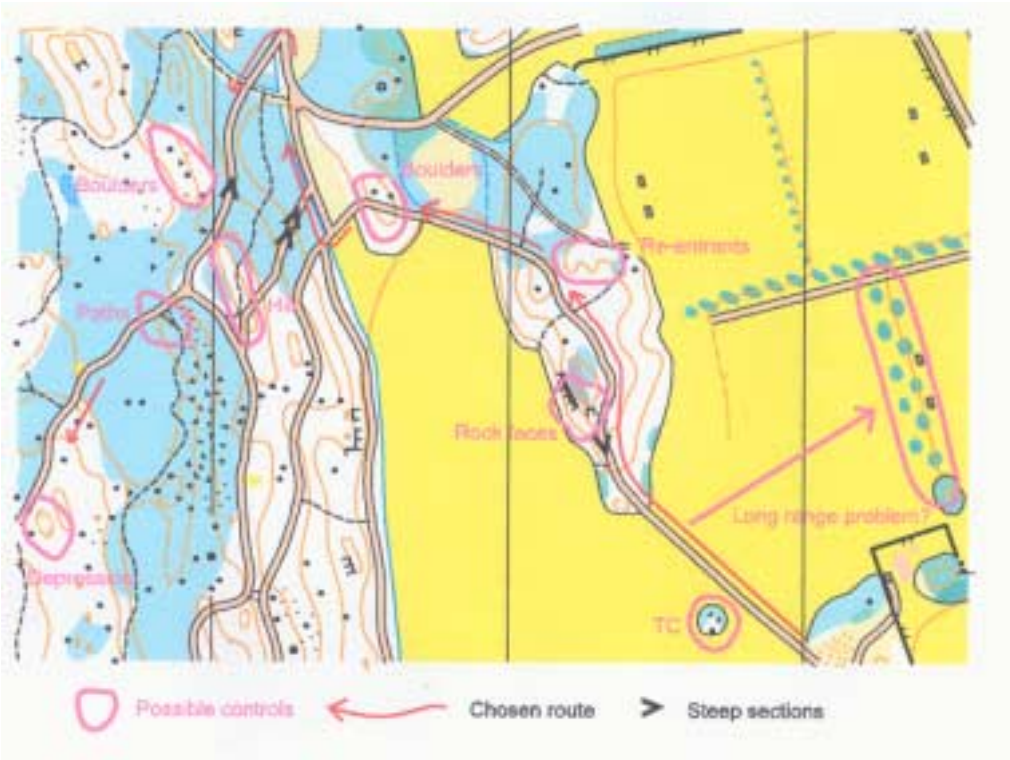
"Maximum slope for unassisted wheelchairs is 14% for no more than 20m. The cross slope should be no more than 8%." (Guideline 3.1)

This guideline may not be as useful than it first appears because most people, including event officials, cannot estimate slopes with any accuracy.

It is recommended to seek the advice of those with practical knowledge of wheelchairs negotiating surfaces and slopes.

Difficult sections need physical assistance from helpers provided by the Organiser.

Here is an example of good elite trail-O terrain with reasonable to good wheelchair access:



If the two questions about terrain quality and wheelchair access can be satisfactorily answered, then you have an elite event in the making. But this requires different procedures from Foot-O in the way the event is administered.

2. CONTROLLING ELITE TRAIL-O

There are important differences between controlling and being an IOF Event Adviser for international events in Foot-O and Trail-O.

These are shown in the simplified diagram 'Elite Controlling Comparison'.

For Foot-O the mapping, planning and organising are largely separate functions. The Mapper makes the map and the Planner uses it. Some map corrections may be fed back to the Mapper. The Organiser needs to know from the Planner where the Start, Finish and drink stations are located. However, there is much communication between the Planner and the Controller arising from examination of the terrain and the courses and selection of the control sites.

The IOF Event Adviser's task in Foot-O is both to confirm that the work of the organiser is carried out according to the rules and good practice and that the competition in the forest is to standard.

All this is well understood.

Elite Trail-O controlling is rather different. There is more interaction between the Mapping and Planning. The Planner cannot produce an elite course without the specially prepared map and the Mapper cannot produce the map without the detailed intentions of the Planner. There is also the need to produce the collection of little maps for the solution sheets.

It is usual for the Planner and Controller to work closely together in producing control problems. The complexity and degree of difficulty in elite trail orienteering problems is such that there is much discussion and adjustment of control flags before each problem is declared suitable for elite competition.

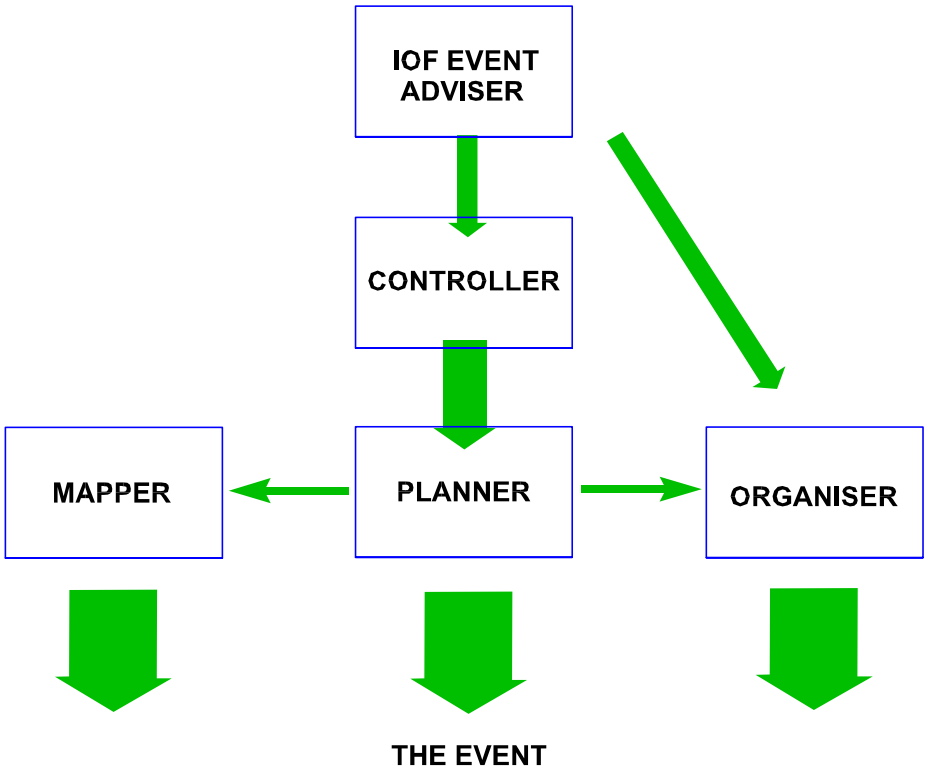
Note also that there is increased communication with the Organiser, arising from more in-forest involvement (pushers, timed control manning, etc.)

The IOF Event Adviser has the same responsibilities as in foot orienteering. However, the extent of technical expertise at international level in trail orienteering is limited at this time and it is currently good practice for the Event Advisor to be closely integrated with the Planner and Controller in the final selection and approval of each control problem.

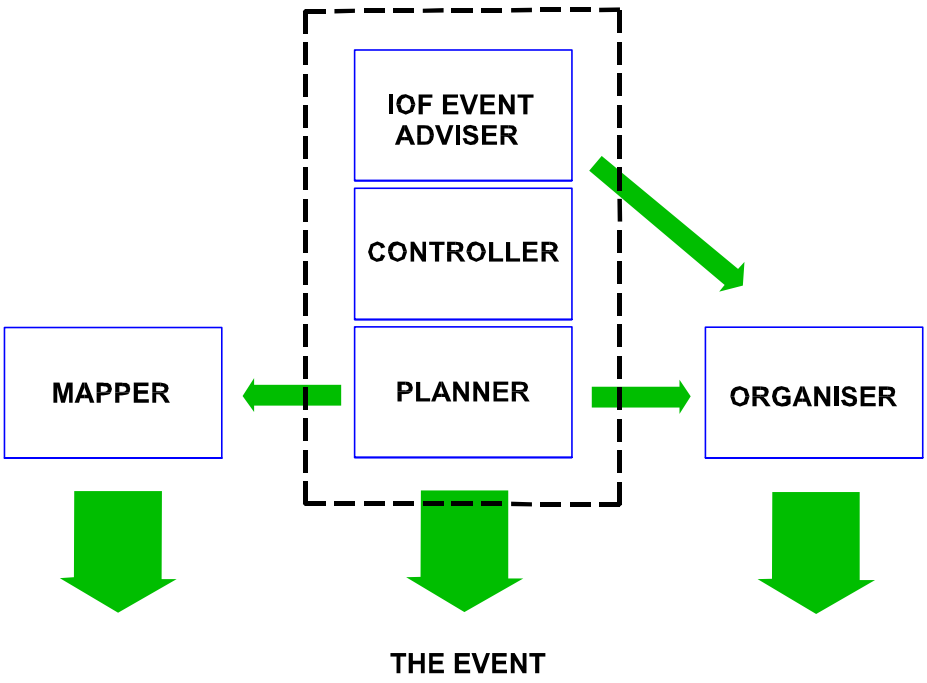
As the extent of technical expertise in elite trail orienteering improves as a result of this and other clinics following further world championships in this discipline the two diagrams may be less different.

ELITE CONTROLLING COMPARISON

Elite Foot Orienteering



Elite Trail Orienteering



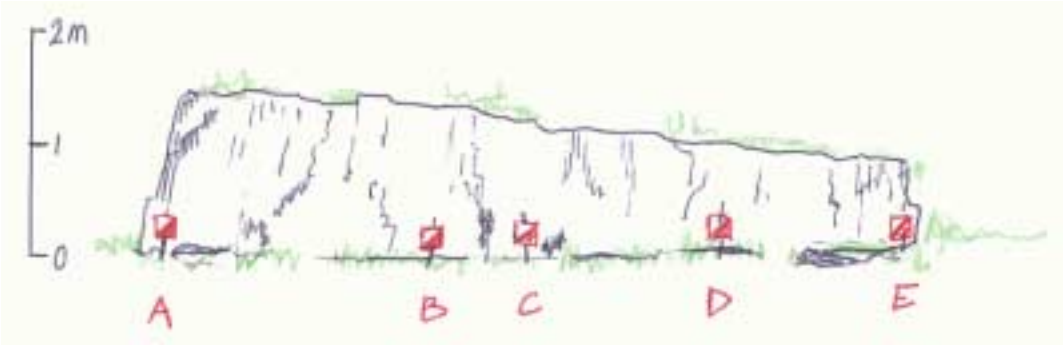
Trail- and Pre-O

Precision orienteering, or Pre-O, is the name given to trail orienteering in Sweden and nearby countries. Although they are the same orienteering discipline, there are some differences in approach which need to be understood.

Precision orienteering, as the name suggests, takes an approach to flag placement and control description that is generally more precise than the problems featured in trail orienteering. At its strictest Pre-O *might* be regarded as unfair by trail orienteering competitors not used to its degree of exactness.

This is not a criticism of precision orienteering, some elements of Pre-O have been included in the WTOC 2004 courses. But it is necessary for Event Advisers to understand that trail orienteering is the international standard and while practically all Pre-O problems make good Trail-O competition, one or two do not.

Try this example of a hypothetical precision control problem:



You are looking north at an E-W rock face.
Which flag is Rock face, W end?
Which flag is Rock face, E end?
Which flag is Rock face?
Answers at foot of page.

It all depends whether the mapper has followed the international specification for the height of mapped features. If so, only that section of the rock face 1m or more in height is mapped. A flag placed at the end of the rock face as marked on the map and described as ‘end’ would not appear to be so on the ground and could cause confusion.

A, D and B

You might be able to estimate the length of the rock face on the map (if more than the minimum symbol) or the height on the ground. You might be able to relate map and ground. Or you might not. You might decide the end of a tapering and part mapped rock face (or any similar linear feature) is unfair. It might still be possible to use the middle of the rock face, where any end error in positioning is halved.

CONTROLLING TECHNIQUES

No tricks

It is important at elite level to set problems that are testing but fair. Trick questions have no place at this level of competition.

An example of a trick question is to have a marker flag at the correct site at the centre of the circle on the map, but there is a mistake in the description.

All flags to count

Avoid placing marker flags simply to make up numbers. Each flag should be positioned so that it has some definite connection with the control description. The best incorrect flags are those which are right in several respects but wrong in one.

Balance of probability

It may be possible with some problems to have a method of solution which yields an answer with 100% certainty but the test of the competitor's skill arises because that method is not instantly obvious.

Other problems may not be answered to 100% certainty without making the problem too easy. In such cases it is permissible to have some uncertainty present. For example, first analysis may show that two solutions appear to be correct. For fairness the correct solution must be significantly more likely to be correct than the alternative, a ratio of 67% to 33% certainty, or better. But beware of making the zero answer a third option.

Zero answers

The zero answer, no marker flag at the centre of the control circle on the map, is a feature of elite trail orienteering. Its use adds an extra dimension to control problem setting but also introduces increased difficulties with marker flag placement. This is because a minor misplacement, real or imagined, of the correct marker could be interpreted as a zero answer.

The solution is to ensure that zero answer problems are clean. Either the centre of the circle with no flag should be clearly identifiable or the flags can be located and shown to be in positions clearly not at the centre.

Zero answer problems should not be overused, perhaps up to three per course.

Compass bearings

A requirement to use a compass as a precise instrument must be avoided. Otherwise competitors with surveying compasses would have an unfair advantage. Additionally, such precision would make it very difficult to map and use an area without excessive controversy.

In general the compass should not be required, most problems being based on terrain recognition.

For some control sites the use of the compass may be permitted. But under the best conditions …

> *…bearing estimation should not be required to better than 5 degrees.*

In other words, from the sighting point the flags shall be 5^{o} or more apart in bearing.

By best conditions we mean that the centre of the circle on the map can be accurately identified (such as a small point feature, not a large feature, part of) and the sighting position can be similarly fixed.

If best conditions are not met then the angular separation should be increased.

Distance estimation

A requirement for over-accurate distance estimation is unfair. In general the accuracy expected in problems where estimation of distance is required should be …

… distance estimation should not be required to better than 25%

For example, for a marker at 40m from the viewer, an estimate in the range 30-50m should be allowed for.

Viewing Window

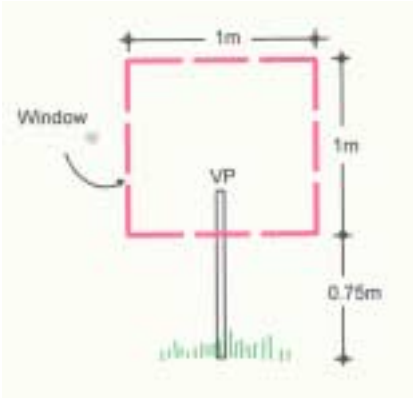
It has been said by some that the viewing point is precisely the point at the top of the viewing point stake. Competition problems have been set where just a small movement to one side away from this point produces a change in the order of the markers. This is not good competition.

It is not good competition because it is over-precise. It is not good because neither the viewing point stake nor the marker flags are usually that rigidly fixed that they can never move about somewhat.

It is good practice for the marker flags and viewing point to be so positioned that a movement by the observer 0.5m either side of the viewing point does not change the answer.

It is also good practice to check that standing competitors do not get significantly improved visibility over low wheelchair users sufficient to give them an unfair advantage. In practice this means checking that the problem appears essentially the same from a height of about 0.75m to about 1.75m.

Therefore, we have a viewing window 1m square rather than a viewing point.



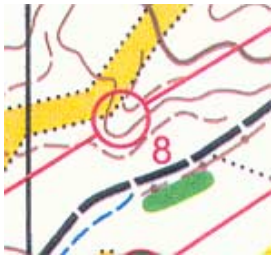
Arguments, Complaints and Protests

"Trail orienteering is a platform for dissension" (*the late Peter Palmer)*

Argument is a normal condition in trail orienteering. This is to be expected in a discipline which uses subjective judgment and shades of meaning. To the credit of trail orienteers it is normal for argument to be settled by the opinion of the Controller.

Sometimes the validity of a control needs to be re-examined after competitors have questioned it. If it is faulty, the Controller has the option of voiding the control. Unlike in Foot-O this can be done without voiding the course. Such action should only be taken if it has unfairly affected most of the competitors equally. Remember that voiding a control that the better competitors get right and the poorer competitors get wrong itself introduces unfairness.

Here is an example of a voided control from WC 1999:



Example: SCO1-8 Spur. The intended solution was an extrapolation of the line of the distinct vegetation boundary. Most competitors did this or used the end of the vegetation boundary as a fixed point for taking bearings. Some competitors, however, took bearings from the ditch end and got the wrong answer. The ditch end was wrongly mapped! Although taking bearings from the ditch end was a poor method, much poorer than bearings from the vegetation boundary end, it was considered a valid technique and the wrong answer for those who used it was not the fault of the competitors. The control was voided.

Interestingly, the same decision may not be taken if that exact problem were to occur today. This is because competitor skills at elite level have increased considerably over the last five years and today elite competitors would be expected to be suspicious about a weak method of solving a problem and look around for something better.

Nevertheless, do remember to check…

If there is more than one way to solve a control problem, make sure they all give the same answer.

Model Event

The purpose of this event is to familiarise the competitors with the nature of the terrain and the way it is used for control setting, particularly for problem setting which may be unfamiliar.

An example of this is the depiction of rock in rocky terrain where, unless the rock is prominent in some way, it is depicted with brown contour lines. Competitors from areas where rock features are scarce tend to associate brown lines with earth features.

It is important for regional differences in terrain and representation to be illustrated in the model.

3. MAPPING for ELITE TRAIL-O

Reference: International Specification for Orienteering Maps (ISOM), IOF 2000, Section 7, Map Specification for Trail Orienteering.

Maps for international trail orienteering are based on foot orienteering mapping specifications and are usually modified versions of foot orienteering maps.

But there can be important differences.

The fact that the competitors in trail orienteering are forbidden to leave the tracks, paths and marked routes (referred to as 'trails') has a number of consequences for trail orienteering mapping.

The competition area is that adjacent to the trails, generally within 50m. Concentrating on this greatly reduced area, compared with foot orienteering, requires a much more detailed terrain representation and consequently an enlarged map scale:

Map scale for international trail orienteering is 1:5000

The enlarged scale demands increased symbol size:

Symbol dimensions to be 50% greater than for 1:15000 foot-O maps

This recommendation about symbol size has changed from previous clinics because we now have the Sprint map specification (ISSOM) to this standard.

(Addition to notes following post-Clinic discussion)
The contour interval should comply with the general principle that it "should correspond with prevailing terrain gradient and compromise between understandable expression of terrain and drawing density". As a guide, a norm of 2.5m contours with 1.25m form lines is suggested.

The map must fairly represent the terrain as seen from the trails and non-visible features may be omitted, if their inclusion would otherwise distort the map.

The concept of runnability cannot apply in trail orienteering and is replaced by those of appearance and visibility.

The precision with which a control flag is positioned in trail orienteering may be to 1m. At a map scale of 1:5000 this is positioning the centre of the control circle to 0.2mm. This means that the control circles MUST be produced as an edition of the map and not overprinted.

Modifying existing maps

This is essential for elite competition. All maps are generalised, in that the mapped detail is a simpler, or smoother, version of the actual terrain. Foot-O map generalisation can be different from that required fro Trail-O. Foot-O competitors pass quickly though the terrain (or hope to!) whilst Trail-O competitors stare at it for some time.

Many of the changes to the map will be made by the mapper without difficulty. These will be modifications to features already on the map, such as adjusting contours, removing tags from rock faces to improve clarity, end so on.

Some of the changes may be resisted by the mapper. These are where the changes conflict with the norm adopted across the map. For example, if the smallest boulder mapped is 1.5m high because there are so many in the terrain, the mapper may be unhappy about specially mapping 1.0m boulders at a Trail-O control site. You then have to persuade the mapper to this is a one-off special version of the map for this competition only, or find another control problem.

Sprint maps in Trail-O

Reference: International Specification for Sprint Orienteering Maps (ISSOM), in draft 2004 available through the IOF web site.

The new Sprint map for international foot orienteering makes an ideal base for international trail orienteering. The main and obvious change from conventional orienteering maps is the representation of roads, tracks and large paths with the same style of symbol, parallel black lines of different width with brown infill. Small paths remain as before – broken black lines.

We now can say to trail orienteering competitors that, unless marked with no-go crosses, all the brown roads, tracks and large paths may be used – **and no other path**.

4. PLANNING for ELITE TRAIL-O

Based on the paper by Caleb Gould (GBR) presented at the first IOF Controllers' Clinic at WC 1999 (SCO) but including further examples from WC 2001 (FIN), WC 2003 (GER) and WTOC 2004 (SWE).

There is a wide range of different problems which can be set by Trail-O planners in their selection of control sites and the placing of flags to give Elite Trail-O competitors the necessary variety and technical level of challenge.

Although this paper attempts to identify and categorise the different types of problem which can be constructed for elite competition, this is difficult. At elite level, control sites usually present a combination of types of problem.

In the examples given the map segments seem very clear but matching the terrain to the map is not always as easy as it looks.

BASIC SKILLS:

Distance estimation
This is usually one element of a more complex solution where distance estimation of features or marker flags in the terrain is compared with distances measured on the map to assist in distinguishing between similar marker positions. Where distance estimation is necessary the '25% rule' applies (See Controlling notes).

Example: FIN 1-4, Re-entrant. The correct re-entrant is identified but has two flags fitting the description (B,C). Distance estimation from the viewing point is suggests the nearer flag. Distance estimation from that flag to the boulder pair further up the re-entrant confirms the choice.

See also SWE M-3 and D1-12

Rough bearing estimation
Rough bearing estimation may be used to help identify which of several well-separated features is the one associated with the control circle on the map.

Example: FIN 2-6, Bare rock, west side. With several areas of bare rock, all with west side flags, two of which are in line with ring contours, there could be uncertainty. The compass quickly confirms which feature is to be concentrated upon.

See also SWE D2-9

More precise bearing estimation may be required, but the marker flags of interest must be separated in angle by at least 5 degrees.

Example: FIN 2-2, Spur. All five marker flags fit the description. The angular separation of the flags from the viewing point is less than 5 degrees so a compass cannot be used from that point. However, bearings from the path end opposite the spur have separations of more than 5 degrees and allow the correct marker flag to be identified.

See also SWE D1-11 and D2-4

Which feature of several?
This is the selection from a number of similar features on the map in a small area. The problem is to identify which feature is the correct one using a choice of techniques, including the description.

Example: SCO 1-T, NE Rock face. All five flags are at the foot of rock faces but the largest, on the map and in the terrain, allows the correct smaller rock face above it to be readily identified. This was a timed control.

See also SWE D2-9.

Example: FIN M-1, Between the middle boulders. This is a very testing problem with boulders everywhere, many smaller ones unmapped. All the flags are between boulders. However, starting with the very large boulders and identifying them on the map, then relating the less large boulders to them until all the mapped boulders have been identified, allows the correct marker flag to be pinpointed.

See also SWE M-6 and D1-15.

Which edge?
A common problem is a single area feature, such as a marsh, and the competitor has to decide which edge is the correct one. The problem can be solved by careful attention to the circle position, description, adjacent features, bearings, etc.

Example: SCO 1-10, Boulderfield, SW edge. In this example there is no flag on the correct position. The viewing direction of the feature is NW which makes describing the flag positions awkward. The flag on the S edge is eliminated last to give a zero result.

No edge description in SWE.

Sometimes a single small feature lends itself to the edge problem.

Example: FIN 2-12, Pit SW edge. The pit, although large, was smaller in the terrain than the map suggests. All five marker flags are clearly on the edge of the pit. The problem was to deduce from the sighting positions available which flag was most likely to be correct. Compass bearings from the track would be unhelpful because the flags were too close together. However, there was an unmapped pair of small knolls on the edge of the pit. One of these was levelled and its material used to raise the other to a height where it could be mapped. This provided a locating feature very close to the flags.

Which side?
Another common problem, useful for NE/NW/SE/SW directions which are more often confused.

Example: FIN 1-T, SE Boulder SW side. The boulders were large, very visible and only a short distance away. The direction of view was SE. Sorting out the NE/SW sides was not difficult. The only problem was that it was a timed control!

See also SWE D1-5.

ADVANCED TERRAIN RECOGNITION:

Which part ?
This is a simple but dangerous description in trail orienteering because ‘part’ is not a point or a line but an area. This could give much uncertainty. However, ‘part’ can be used successfully if there are other key features which allow the flag position to be fixed.

Example: FIN 1-8, Hill W part. This was a flat hill with another ring contour to the north which, from the track, appears to be part of the top of the larger hill. It was not easy to judge the position of the form line on the ground and several flags had to be considered for the W part description. Careful study of the shallow re-entrant allowed the form line to be fitted to the terrain and the correct marker flag selected.

See also SWE M-1, M-3, D1-3, D1-11, D1-12 and D2-11.

Invisible features!

Features (such as pits) which cannot be seen from the viewing point or any other permitted position should NOT be used in elite competition. There may be a temptation to do so if nearby visible features can be used to locate the flags but such procedure is both inelegant and uncertain.

Features (such as ditches and paths) which cannot be seen from the viewing point but are visible from other points along the track can be used for legitimate and testing problems.

Example: GER 2-9, Stream junction. From the viewing point none of the streams were visible because of the vegetation. However, from the track by the knoll it was possible to look along the middle stream and see that there was a flag on it (the marker on the map is misdrawn slightly and should be on the junction). Similarly from a point on the track at the bottom of the map it was possible to look along the other stream and confirm that this flag was on this stream also. Therefore it must be on the junction.

See also SWE D1-8.

Unmapped features

The use of unmapped features can provide useful problems. These features are legitimately unmapped because they fall below the mapping threshold that the surveyor has set, but there is potential for confusion with similar features which are prominent enough to be mapped. Perhaps the most common, but usable feature, is the small boulder, but there are other possibilities.

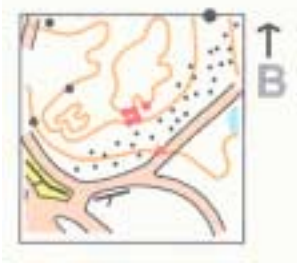
Example: FIN 2-14, Thicket E edge. Here the terrain is not as clearly defined as the map suggests. The four incorrect flags were all on patches of prominent vegetation which are not on the map and these required elimination to identify the edge of the larger area of thicker vegetation which has been mapped. The path junction enabled the correct flag to be confirmed.

See also SWE D2-13, a particularly testing control

Subtle Shapes
These are sites where the ground shapes are less obvious on the ground than the contours which portray them on the map. Recognition of such ground detail may require some skill.

Example: SCO 2-2, Spur, SW side. The form line spur was very low and difficult to see as raised ground. However, in this case, it could be identified from the distinctive edge to the marsh vegetation and the control marker was positively located by the group of trees on the end of the spur.

Black and Brown
In terrains with little rock it is usual to map any rock with the appropriate black or grey symbol. In those areas with much rock it is usual to mark rock terrain with brown line contours, except where the rock is sufficiently prominent to require a distinctive symbol. Recognition of contours across rock can offer useful control problems.



Example: SWE 1-7, Hill S foot. This was a hill whose slopes were rock, some of which had broken away to form boulders less than 1m high. The solution here was to fix the brown line contour using the small re-entrant.

Complex Ground Shapes
Terrain recognition to a high level is required, with the competitor needing to analyse a complex area of ground shapes not always with the use of other fixing features.

Example: FIN M-7, NE Bare rock SW part. An area of many spurs and re-entrants with patches of exposed rock. The problem concentrates on the bare rock but the form line contour detail has to be followed to confirm which bare rock is which.

See also SWE D1-10.

Parallel similar features
The existence of two or more parallel similar features can be used to set testing problems. The intention is invite misidentification of which feature is

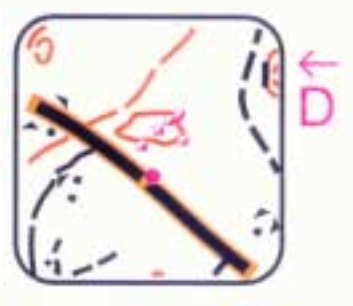
which. These normally are set to give a zero result, the correct feature being unmarked with the parallel feature(s) being flagged.

Example: SCO 2-8, E5 Spur. The competitors approached from the south (bottom of the map). The first of the three spurs was flatter and less prominent. The viewing point was placed beyond the correct spur and the flags on the wrong spur attracted a hasty decision.

See also SWE D1-5.

A variant of this problem is to have an apparently correctly-sited marker flag on the wrong feature and a wrongly-sited marker on the right feature, also leading to a zero result.

Ground Height
The ground height and shape can be deduced from the visible height of the flags (provided the Planner takes care to ensure that all flags are installed at a standard height).



Example: FIN M-5, Hill SE side. Flag B was on the top of the hill, and a compass check showed that flags C and D were SE of this. But the top of flag D was just visible and at the same height as flags A and E, showing that all three were located alongside the contour. Since flag A and E were clearly visible and their descriptions were the W and S sides of the hill, it follows that the D flag has to be as described.

SECONDARY KEY FEATURES:

Back Marker
In some control sites, such as a linear feature, the competitor may see no other feature to help locate the flags. In these circumstances the competitor should turn round and look for a back marker on the other side of the viewing track which locates a point on the track from which the flags can be checked by compass or otherwise identified.

Example: SCO2-14, Fence. The boulder on the hill fixed the viewing point. Bearings picked out flag C and additional confirmation was obtained by checking that this flag was opposite the col on the other side of the track. The flags were well separated to allow this procedure.

See also SWE D1-11 and D1-12.

Extrapolation
This is the extension of a linear feature, typically from the far side of the viewing track, to fix the position of the required flag.

Example: SCO 1-8, Spur. The vegetation boundary on the other side of the track points directly at the required marker.

Not used at WTOC.

Leading marks
These are separated mapped features which, when placed in line, point directly to a marker flag or feature. This can be a valuable technique, allowing flags without nearby confirming features to be precisely located over long distances.

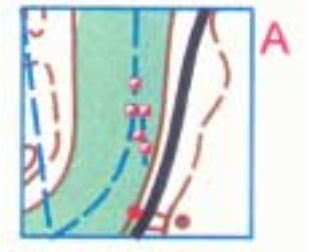
Example: FIN 1-7, Spur. The closer spur is a temporary distractor and attention soon transfers to the distant spur. But how to select one, or none, of the three flags? Two pairs of boulders lined up exactly with flags clearly on the spur. The second of these precisely positioned markers was the correct one.

See also SWE M-1, D1-14, D1-16, D2-5 and D2-16.

The technique is also useful for hidden or dead ground.

Example: FIN M-6, Ditch/path junction. From the viewing point all the flags could be seen to be on the ditch but the path across it was not visible. From further along the track the ditch became invisible also. But from this position the line between the near boulder and the S boulder of the pair, which intersected the ditch/path junction on the map, crossed a flag.

Secondary Viewing Position
A secondary viewing position gives a clear indication of the correct marker flag. The competitor then has to move (back) to the viewing point to select the letter for this flag.



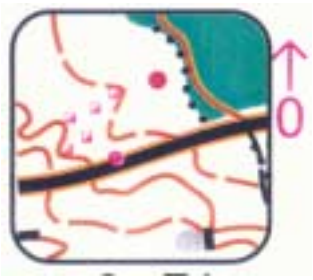
Example: SCO 2-11, Ditch junction. The ditches were visible from the viewing point but not the junction,

which was clearly seen from a point further along the track.

See also SWE M-2, D1-8, D1-14, D1-18, D2-4, D2-6, D2-8 etc.

OTHER PROBLEMS:

Ghost Features
Similar features to that indicated by the control circle appear to be present on the ground but are correctly not shown or shown differently on the map. These 'ghost' features are flagged and the competitor's task is to distinguish between them and the mapped feature.



Example: FIN2-4, Knoll. There were other knoll-like features on the ground, particularly one on the form line spur. The mapped knoll was some distance away and less visible, due to undergrowth, but correctly identified by reference to the nearby vegetation boundary.

See also SWE D1-5 and D2-13

Overlapping Sites (1)
This is where there is deliberate overlapping so that adjacent control sites use one cluster of flags. It is arranged that not all of the flags are visible from each of the viewing points; the disappearance of flags and fresh ones appearing as the competitor moves from one viewing point to the next add interest.

Example: FIN 2-8 and 2-9 Both upper rock face. This was a particularly testing example as the A marker flag from the E9 cluster was some distance away but clearly visible from the E8 viewing point and therefore had to be included as the A flag for E8. This example was legitimate because the forward view at E8 was very limited by the high rock faces with three flags closely in view. The 4th flag had to be to one side.

There were no overlapping problems at WTOC.

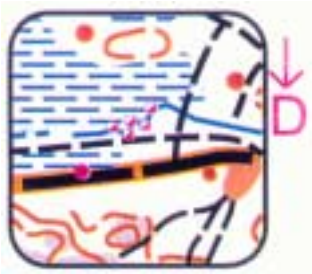
Overlapping Sites (2)
This is when overlapping is not wanted! It occurs where more than the specified number of flags can be seen from a viewing point, the additional flags being close enough to be considered part of the problem. In this case a

line must be drawn on the map to separate the problems and this line marked on the ground with tape.

Example: SCO 2-3, Hill SE side. All five flags of the problem to the W of the line were all visible from the viewing point for this control. Ten flags were also visible from the previous viewing point. The competitors were informed that this procedure was in operation.

Parallax

This is the description for changes in sequence of the flags as the observer changes position. This is particularly useful when secondary viewing points have to be used to identify the correct marker. Having to recognise the chosen flag when returning to the viewing point requires a little skill and adds interest.



Example: FIN 1-13, NE ditch bend. This site had a tight cluster of marker flags which require identification from a secondary viewing point. The correct marker was then viewed again from the viewing point to determine its answer letter.

See also SWE M-7, D1-8, D1-14, D2-4 etc.

TIMED CONTROLS

For timed controls the competitor stays in a fixed position. It is common practice to provide a seat for those not in wheelchairs.

The competitor has one minute only to give an answer. A ten second warning is given at 50 seconds.

To be fair competition the problem should be capable of solution by all competitors in the time allowed. The best outcome for a timed control test is that all competitors give the right answer but the more skilled do so more quickly. Problems which are difficult because of complexity or poor visibility result in guesswork and this distorts the results.

The timed control needs to have clearly visible features and the problem should be straight forward. The zero answer option is not suitable for timed controls.

Example: SCO1-T, NE Rock face. A good timed control. All five flags are at the foot of rock faces but the largest, on the map and in the terrain, allows the correct smaller rock face above it to be readily identified.

ROUTE CHOICE

In competition terrain where route choices are possible between control sites, these should be considered by the Planner.

This does not change the competitive nature of the courses but does add to their general quality.

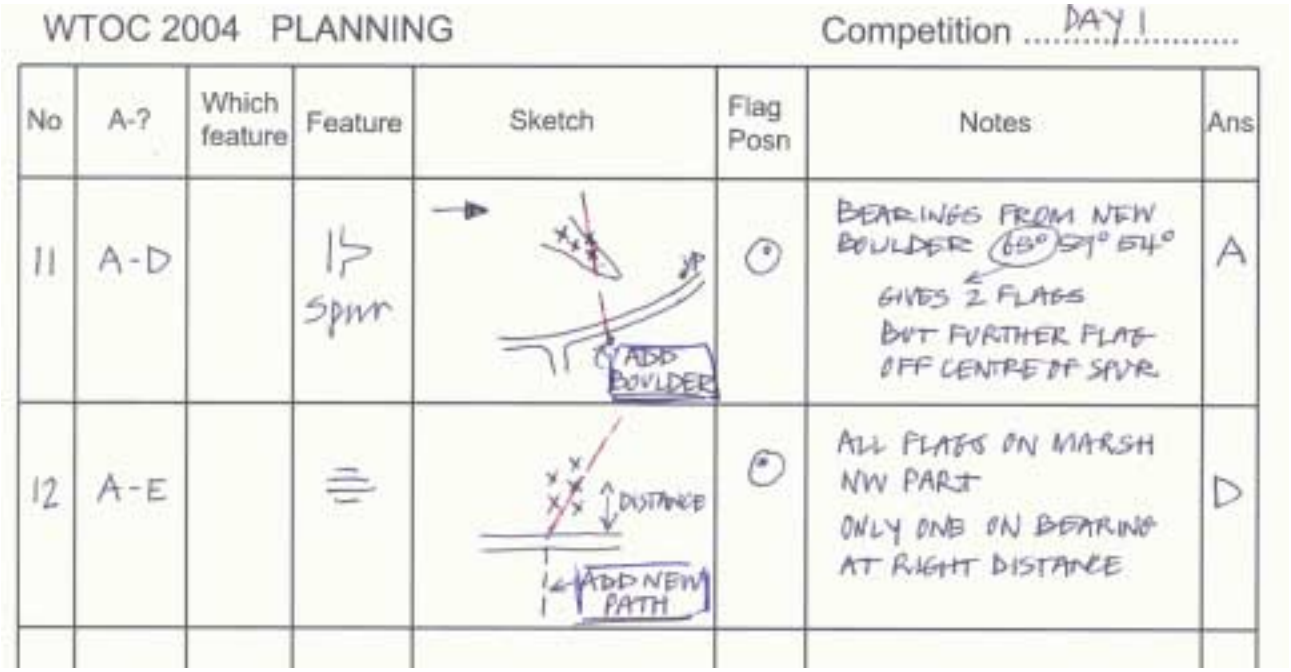
PLANNING SEQUENCE

The first stage of planning is to select a course which is of acceptable quality and length and to identify a suitable number of potentially usable control sites.

The best time to do this is when the visibility is good, not necessarily at the time of year of the competition. Seasonal vegetation can usually be trimmed to give acceptable visibility round the control sites.

The second stage is to work on each site in detail, using flags, to develop a problem of good standard. Map corrections essential to the solution of the problem need to be identified. The positions of the flags and the viewing point need to be marked in the terrain.

All this information is marked on a planning/controlling sheet. An example of the IOF Event Adviser's notes at WTOC 2004 is:



WTOC 2004 PLANNING Competition ..DAY 1..

No	A-?	Which feature	Feature	Sketch	Flag Posn	Notes	Ans
11	A-D		15 spur	ADD BOULDER		BEARINGS FROM NEW BOULDER 63° 51° 54° GIVES 2 FLAGS BUT FURTHER FLAG OFF CENTRE OF SPUR	A
12	A-E			DISTANCE ADD NEW PATH		ALL FLAGS ON MARSH NW PART ONLY ONE ON BEARING AT RIGHT DISTANCE	D

The third stage is to revisit each control site with greatly enlarged segments of the map and plot in the flag positions. This is needed for the answer sheets.

Of course, the actual planning and controlling process will not be that simple! For an international event the Planner will visit the terrain very many times, the Controller will visit many times and the IOF Event Advisor will visit at least twice, at one year and at three months before the event.

PLANNING AIDS

All the usual planning aids associated with Foot-O, plus:

Surveying Compass – if there are control problems requiring bearings to be taken, it makes sense to set them up as accurately as possible to avoid building in a bearing error . The competitors will be using ordinary orienteering compasses and estimating to no better than 5 degrees.

Cutters and saws – for trimming vegetation to clear sighting lines to the features. Such as along ditches.

Camera – for making visual records for map corrections, identification of terrain and features for third parties, vegetation, etc. In general, not for a full record of control sites - trail orienteering control sites do not photograph well unless the visibility is good and the flags are close.

5. IOF ACCREDITATION

Now that we have World Championships and increasing participation in elite trail orienteering we need more licensed IOF Event Advisers around the world.

Licensing is carried out by the IOF Rules Commission on submissions by the Trail Orienteering Commission.

Applications for licensing of individuals are made to the Trail Orienteering Commission by the National Federations.

To be considered for licensing an applicant must demonstrate a wide understanding and ability in elite trail orienteering, have experience of controlling at national level, and have attended an IOF Controllers' or Technical Clinic. In exceptional circumstances the Trail Orienteering Commission may consider equivalent training and experience.

The IOF Clinics consist of two days of world class competition followed by classroom instruction. Those intending to submit applications for IOF EA are required to compete in the two days of competition. This serves two purposes; to gain first hand competitive experience of the control problems set by the Planner and which form the basis for classroom instruction, and to demonstrate ability by scoring well in the competition.

Documentation prepared by Brian Parker (GBR), Sept 2004

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