

# Orienteering Level 1

## Orienteering Techniques

### What is Orienteering?

Orienteering is a sport in which orienteers use an accurate, detailed map and a compass to find points in the landscape. It can be enjoyed as a walk in the woods or as a competitive sport.

A standard orienteering course consists of a **start**, a series of **control sites** that are marked by circles, connected by lines and numbered in the order they are to be visited, and a **finish**. The control site circles are centered around the feature that is to be found; this feature is also defined by control descriptions (sometimes called **clues**). On the ground, a control flag marks the location that the orienteer must visit.

To verify a visit, the orienteer uses a punch hanging next to the flag to mark his or her control card. Different punches make different patterns of holes in the paper.

The route between "controls" (refers to the flag or the site) is **not** specified, and is entirely up to the orienteer; this element of route choice and the ability to navigate through the forest are the essence of orienteering.

Most orienteering events use staggered starts to ensure that each orienteer has a chance to do his or her own navigating, but there are several other popular formats, including relays and events in which the orienteer must find as many controls as possible within a specified time.

### A Brief History of Orienteering

The history of orienteering begins in the late nineteenth century in Sweden, where it originated as military training. The actual term "orienteering" was first used in 1886 at the Swedish Military Academy Karlberg and referred to the crossing of unknown land with the aid of a map and a compass. The competitive sport began when the first competition was held for Swedish military officers in May 1893 at the yearly games of the Stockholm garrison. The first civilian competition was held near Oslo, Norway, in October 1897.

At the end of World War I, the first large scale orienteering meet was organized in 1918 by Major Ernst Killander of Stockholm, Sweden. Then President of the Stockholm Amateur Athletic Association, Killander was a Scouting movement leader who saw orienteering as an opportunity to interest youth in athletics. The meet was held south of Stockholm in 1919 and was attended by 220 athletes. Killander is credited with coining the Swedish word *orientering*, from which the word orienteering is derived, in publicity materials for this meet. Killander continued to develop the rules and principles of the sport, and today is widely regarded throughout Scandinavia as the "Father of Orienteering."

## Orienteering an Overview

### The basics

By definition orienteering is a sport involving a map and a compass, but that's not really very helpful for someone new to the sport.

The map is a very detailed map of a section of woods or parkland. Streams, trails, hills, depressions, rocks, etc. are all mapped in great detail and very accurately located.

The goal of orienteering is to complete a course in point-to-point order. Starts are staggered and the person successfully completing the course in the least amount of time is the winner.

A typical orienteering event offers five, six, or seven different courses of varying difficulty. The courses are named using colors:

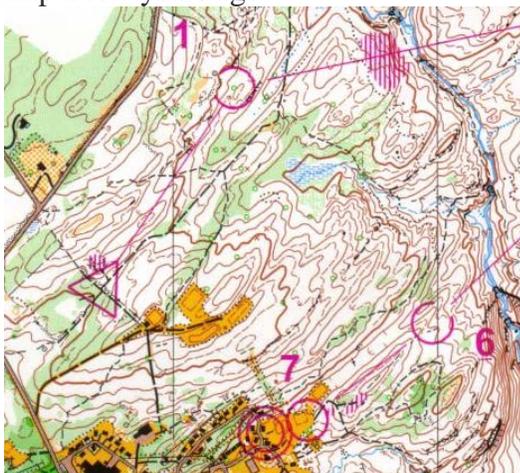
- **White**, beginners (2-3km)
- **Yellow**, advanced beginners (2-3.5km)
- **Orange**, Intermediate (3-5km)
- **Brown**, short advanced (3-4km)
- **Green**, longer advanced (4-5km)
- **Red**, even longer advanced (5-7km)
- **Blue**, really long advanced (8-12km)

Controls are often shared by more than one course. You might see someone at your control and be tempted to follow them, but they could be on a different course!

Although we talked above about the fastest person winning, many people enjoy orienteering for the challenge it offers and are totally uninterested in their time. Likewise, many families go as a group on one of the easier courses.

### Some Details

OK, so what does a map look like? Here's a sample map from an event held on the Stuckey Pond map a few years ago:



First, notice the colors:

- White background indicates open woods. You can walk/run through open woods easily.
- Green background indicates underbrush. The darker the green the harder it will be to get through.
- Orange background indicates open fields. The lighter the orange the easier it will to walk/run through
- Light brown or tan indicates paved areas.
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Next, let's look at some of the features:

- Dashed black lines are trails.
- Blue lines are streams. Generally blue indicates water
- Black dots indicate rocks
- Brown lines are contour intervals (topographic lines)

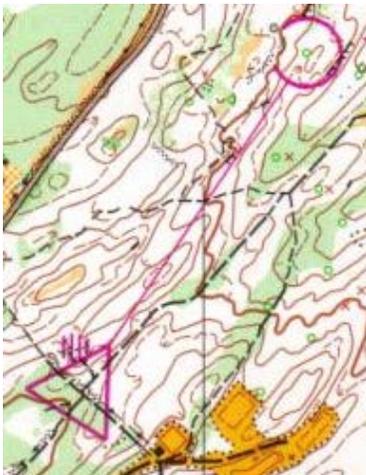
What about the course? Courses are generally drawn in purple although sometimes red is used. Purple is preferred because it is more visible to those with color blindness. The course symbols are:

- Triangle - indicates the start. This is where you will be when you turn the map over at the start
- Circles - indicates a control point. There will be numbers beside the circle indicating the order of controls to visit
- Two concentric circles - indicates the finish.
- Straight lines are used to connect the controls. They are used to show the general course. You do not have to follow the lines. You are free to take any route from one control to the next, but you do have to visit the controls in order.

### Now What?

At the start you will be given a map and assigned a start time. Do not look at the map until your time is called. When your time is announced do the following steps:

- Turn the map over
- Look for the start triangle
- Orient your map to your direction of travel
- Figure out how you're going to get from the start triangle to control #1
- GO!!!!



Go? Go where? To the left is a small section of the map shown above. we'll use the first leg of the course as an example. The first thing to do is look for the start triangle. It's the purple triangle on a trail junction. The obvious route choice is to take the trail heading NorthEast. You could stay on the trail until you reach the junction where two trails come in from the sides. From this point you could follow the trail going towards the Northeast for just a little ways until you get around the Green area. From there you could take a compass bearing and follow that to the control. Or when you get to the trail junction you could continue on until the dogleg to the right. From where the trail bends to the right you could take a compass bearing and head down the hill then up to the control. Or from the start you could follow the main Northeast trail to where the trail first bends to the right. From that point you could then follow the terrain features into the control. As you can see there are many choices. If you talk to orienteers they will give you different (and maybe better) suggestions based on their experience level. Once you find the control either punch the pink card, or if using electronic punching, insert the finger paddle into the control box. Then repeat the above steps to find control #2, #3, etc.

### **Next Steps**

The above is only the barest outline. The real fun and challenge of orienteering is in the route choice. Do I take the long way around on a trail or do I cut straight through the woods directly to the control? Do I go up and over that huge hill or go around it? Through the stream or take the long way around that crosses a bridge? The choices are endless and provide for hours and hours of conversation fodder.

There are many variations to orienteering. We are going to give you the basic skill set to be able to participate in any of the many options available to you in this recreational sport.

## **Section 1 Basics**

### **1. Map setting or orientation.**

Make sure you are holding the map the same way as the ground features. This means if there is a large hill to your left and a paddock to your right on the ground, then the corresponding hill and paddock are on the left and right of where you are on the map. Maps are only held with the writing the right way up when you are facing north as most maps are drawn with north at the top.

You can do this using the ground features as described above, or by using the compass. All you need to do when using the compass is to turn the map so that the magnetic north lines on the map run the same way as the floating north needle in the compass and that the red end of the needle matches the magnetic north arrows on the map. There is no need to turn the compass or the compass housing to do this.

- a must for everyone
- use compass and features
- map and compass in same hand recommended

## 2. Map Folding.

This is often overlooked by people but is essential for a smooth run. It is good to have your map folded small so that you can get your thumb on to the place that you are located. You also need to have a method that allows you to run over the folded bit of the map and not lose your place. I suggest using a double fold so that one fold is beyond a control so that the control is visible, but when you get to the control swap to fold before the control so that the original control is still on the visible bit of map.

- devise a system that complements the way you hold the map and compass
- it needs to be flexible to allow for long legs and courses

## 3. Thumb on map

- Have some means of keeping your location in view on map...compass edge, thumb etc. This requires good map folding.

## 4. System

- Have a system that you apply to every leg, eg **C**ontrol **A**ttack point **R**oute **E**xit

## 5. Relating map to ground

This means looking at all the features around you and seeing if you can pick them up on the map and vice versa.

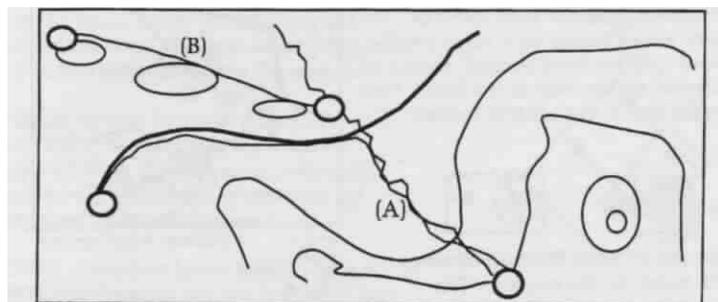
- Do this as often as you can without wasting time
- Beware of relating parallel features which look like the ones on the map but are actually somewhere else.

## 6. Observation

- Relates to above
- Look all around you as often as possible
- Vegetation boundaries often made more visible by looking up (very relevant in European broadleaf forest)

## 7. Handrails

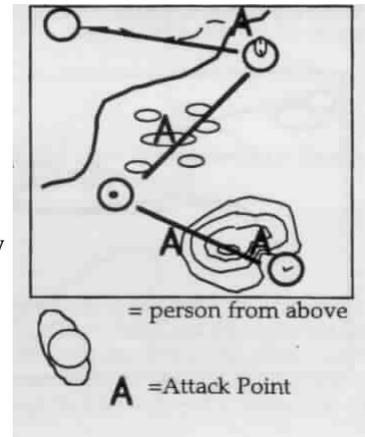
These are an essential part of any route. It is worth going a bit out of your way to follow them for basic and intermediate level orienteering. They can be tracks, edge of vegetation, mapped fences, streams, clearings etc. You can link point features together to make a line.



- easy line features to lead you on your route (A)
- can be lines (e.g. track) or points linked together (B)

## 8. Attack points

- large or obvious features near control
- safest version is the crossing of two handrail features
- advanced example is a special shaped knoll in amongst many knolls
- use as preview to finding control
- advanced technique may use 2 or more attack points e.g. a huge knoll about 1-200m from control, then a reentrant on the side of the knoll, then the pit that is the control feature



## Terminology

- **"A" Meet**  
An event conforming to the highest United States Orienteering Federation standards. Performance in "A" meets counts in determining national rankings of competitive orienteers.
- **"B" Meet**  
An event which conforms to most, but not all, USOF standards Some "B" meets are counted in the rankings.
- **Bike-O or Bike Orienteering**  
A Bike-O is a variation of a normal Orienteering event. Instead of walking or running, you ride a bicycle. Instead of through the woods, you travel on the streets. As with regular orienteering the objective to visit each one of the controls (locations) in the prescribed order, punch or mark a card to verify that you visited that control and when the route is complete, check in at the finish. The Bike-O can be a competitive event or it can be a leisurely afternoon for a family. What makes the Bike-O interesting is that you are given a map that has none of the names of the streets on it. Expert navigation skills are not required, but being able to count how many blocks you should go before you turn right or left really helps.
- **Boulder**  
A free standing rock, large enough to be distinguished from its surroundings. It is mapped as a black dot.
- **"C" Meet**  
A local event which does not count in the rankings.

- **Cliff**  
A vertical or nearly vertical feature. Ordinarily a cliff less than two meters high isn't mapped. A mapped cliff is shown on the map by a black bar with teeth—it looks like a comb.
- **Climb**  
The amount of uphill climbing (ignoring downhill travel) that must be done to complete a course. Some routes may minimize climb, but be quite long. Others may be short, but have a lot of climb. The course description usually states the amount of climb along an optimum route which balances climb and distance.
- **Clue sheet**  
A list of controls to be visited, in the order in which they are to be visited. For each control, the clue sheet specifies the control code, and describes the feature. On beginner and intermediate courses, the descriptions are in words; an international set of symbols is used for advanced courses.
- **Contour line**  
A brown line on the map that is at constant altitude. When you cross a contour line on the map, you are going up or down hill—you must use other evidence to determine which (for example, if you are going toward water, you are usually going down). On some maps, a small tick in the downhill direction tells you. The map always specifies the "contour interval", which is the difference in height from one contour line to the next. If contour lines are close together, the terrain is steep.
- **Control**  
A nylon marker hung at each feature on the course. It has three sides, divided diagonally between white and red (or orange) halves. A punch for marking your control card is attached to the control, or located nearby on a post. Sometimes a control is called a "bag."
- **Control card**  
A card that you carry with you to punch at each control. Since each punch has a unique pattern, the control card is evidence that you have visited all of the controls.
- **Control code**  
Letters or numbers that uniquely identify each control on a course. The control code appears on the clue sheet and the control. Before punching your control card at the control, make sure that the same code appears on the control and the clue sheet for the feature.
- **Dog-leg**  
A control setting in which the orienteer is likely to use the same route leaving a control as approaching it. A dog-leg is a flaw in course design because it may give an approaching orienteer an unfair advantage if, by chance, he/she meets someone leaving the control.
- **Fight**  
An area shown on the map in dark green which is very difficult to get through. Bramble patches and forest areas with low branches or closely spaced trees are examples. Fight usually should be avoided, but because mappers treat fight differently, it is always wise to look at the conditions before deciding to avoid fight. Lighter green indicates "slow run."
- **Form line**  
A brown dashed line on the map which indicates a visible ridge or mound which is not high enough to be shown with the map's contour lines.

- **Knoll**  
A small hill. It should only designate features one contour or less in height, but the term is sometimes casually used to describe larger features. Depending on its size, it is shown on the map as a contour line loop or a brown dot.
- **Leg**  
The part of an orienteering course between two controls, or between the start and the first control, or the last control and the finish.
- **Night-O**  
Orienteering performed in the dark. The standard controls are used but a reflector is usually added. Participants need a flashlight or headlamp. A whistle is also recommended since it is a little easier to get lost in the dark.
- **North**  
In orienteering, always magnetic north. In the Chicago area, magnetic and geographic north nearly coincide. In other parts of the country and the world, they may differ dramatically (20° or more). Orienteering maps always show magnetic north, either by being drawn with magnetic north at the top of the map, or by showing magnetic north meridian lines across the map.
- **Orienteering**  
Navigation through rough terrain using only a map and a compass. A map is essential; a compass very helpful. You can find your way without a compass, paying careful attention to the terrain and the map. Orienteers can run, or walk, or both—it is a sport of navigation, not necessarily navigation on the run.
- **Orienteering course**  
A group of features on a map that are to be visited, usually in a specified order (compare Score-O and Rogaine). A circle on the map identifies each feature, with the feature in the exact center of the circle. A feature must be on the map to be used on the course. The start is shown by a triangle, and the finish by a double circle. In a standard course in which features must be visited in order, straight lines are drawn to connect each feature to the next one to be visited.
- **Pace counting**  
Counting the number of paces you take to estimate the distance you travel. Paces usually are counted one for every left/right combination. You need to determine your standard pace for various conditions (at least one for walking and one for running) on a fixed course of known length. Because the map is flat, it takes more paces to cover the same map distance going up or down hill than on flat terrain.
- **Rankings**  
A system of ranking all competitive orienteers who are members of USOF. The system attempts to give credit for performance on the basis of comparisons of the competitor's finishing time for each day of competition with the finishing time of the fastest competitors. The system has recently been revised, but is still complicated. Rankings do not affect recreational orienteers.
- **Reentrant**  
A small valley, where the contour lines "re-enter" the hill. If you are standing at the bottom facing into a reentrant, the land slopes up in front of you and on both sides, and slopes down behind you. In a shallow reentrant, the slopes on both sides and ahead may

be very gentle, sometimes difficult to see in wooded areas. A reentrant must appear on the map if it is used as a control. It appears as loop or hump in the contour lines.

- **Rogaine**

A long score-O, usually held in a very large area. Often the map is a USGS map, rather than a standard orienteering map, although many recent rogaines have used maps which are similar to standard O maps. Rogaines must be run in teams, usually of two people, and often last up to 24 hours. The word ROGAINE is said to be an acronym for Rugged Outdoor Group Activity Involving Navigation and Endurance. The word may also be a consolidation of the supposed Australian inventors of the idea, something like Rob, Gail and Ned. It has nothing to do with hair.

- **Rootstock**

The root base of a fallen tree. Because most woods have many fallen trees, only very large rootstocks generally are mapped. Mappers have different standards. On CAOC maps, a rootstock is mapped only if the mass of roots is as high as Rich Gaylord's shoulders (about 5 feet).

- **Ruin**

The remains of a manmade structure, often little more than a stone foundation. Ruins usually are made of stone or concrete. Some ruins are more substantial portions of abandoned structures such as dams and other drainage devices or farm outbuildings. Ruins can be hard to find if they are overgrown.

- **Scale**

The size of the map compared to the area which it represents. The usual orienteering map scale is 1:15,000, which means that one millimeter of map corresponds to 15,000 mm (15 meters) of terrain. Most compasses have a scale for measuring distances on the map. Other scales can be used: as the numbers get smaller, the distance on the map for each unit gets larger. A 1:7,500 map shows half as much terrain as a 1:15,000 map.

- **Score-O**

A Score-O is an orienteering event in which the controls may be visited in any order, but time is limited. Controls may have different point values; greater points are assigned to controls that are more difficult to locate or that are greater distance from the start. The orienteer must decide how many controls can be visited within the set time limit. Penalty points are applied to those out for longer than the set time. Longer Score-Os are called Rogaines.

- **Ski-O**

An orienteering event in which competitors navigate courses largely on cross country skis.

- **Sprint and Chase**

The "Sprint-O and Chase" is intended for advanced runners (Red, Green, and strong Orange levels). Orienteers choosing the Sprint-O and Chase will first complete a 3 to 5 km sprint-length course. After all competitors have complete the Sprint-O, the Chase will begin. The fastest orienteer in the Sprint-O will start the Chase first. A runner who was 2 minutes, 45 seconds slower on the Sprint-O will start the Chase exactly 2 minutes, 45 seconds after the first runner. An orienteer who was 14 minutes slower on the Sprint-O will start the Chase exactly 14 minutes after the first orienteer. The Chase is also between 3 and 5 km in length so the total distance is approximately 7 km. As runners

finish the Chase, they will immediately know their placing. The first to finish will have the fastest time of the day.

- **Spur**

A ridge or point of land projecting out into the lower terrain below. Standing at the tip of a spur, the land drops in front of you and on both sides, but is relatively flat behind you. On the map, reentrants and spurs can be difficult to distinguish.

- **String-O**

String orienteering is a form of orienteering designed to be easier than usual for young children. A continuous "string" (actually surveying tape) marks the route to each control. Participants can follow the String through the entire course and thus will not get lost. A simplified map is used; the route of the String and the location of the controls are marked on the map.