

# Section 1

## ORIENTEERING

### Key Points

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- 1 Understanding Orienteering
- 2 Using a Map
- 3 Finding Your Way
- 4 Orienteering Terms and Techniques

Today, the complexities of tactical operations and deployment of troops are such that it is essential for all Soldiers to be able to read and interpret their maps in order to move quickly and effectively on the battlefield.

FM 3-25.26

## Introduction

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As an officer and a Soldier, one of your most important pieces of equipment will be a map.

Knowing how to read that map, knowing where you are, and knowing where you are going allows you to call for indirect fire (for example, artillery support), close air support (such as Army aviation assets), and medical evacuation. Using that map is critical to your survival, your Soldiers' survival, and the success of your mission.

This section has three goals:

- To introduce you to some basic concepts and techniques of orienteeering
- To introduce you to some basic map-reading and land-navigation skills that will help you find your way in unfamiliar territory, such as your college campus or around your ROTC training area
- To give you a foundation for success as you further develop your map reading and land-navigation skills throughout the ROTC program.

In the following vignette, LTC Robert Ballard studied the terrain features of the French countryside while in flight prior to parachuting into Normandy. His ability to terrain associate and navigate became critical to his survival. As soon as he parachuted to the ground, he compared what he had seen during his flight and descent with his map, determined his location, and continued his mission.

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### On the Ground in Normandy

It had been the practice of Second Battalion [501st Parachute Infantry Regiment, 101 Airborne Division] to use a large bell and a green electric lantern for assembly following the drop. Coming into Normandy [in France, the night before D-Day, 6 June 1944], these two markers were jumped with personnel. But both of the men were lost and so the assembly ground went unmarked.

LTC Robert A. Ballard came to earth right on the drop zone, which put him about 600 yards to the southeast of Les Droueries. His experience was unique among the battalion commanders of 101st Division in that he knew from the beginning that he was in the right spot. He wasn't quite sure why he knew except that the ground looked as he had expected to find it. Too, he had carefully noted the river courses and roads on the flight in, and when he had jumped, he had felt certain that the calculation had been about right.

Now, lying on the ground, he thought back over the drop and he figured he had probably drifted a little bit. But it was still only a question of being a few fields distant from the point he had been seeking. Mortar and machine gun fire was enlivening the neighborhood; the closest shells were dropping 50 to 75 yards away.

Ballard [had] landed within 25 yards of a hedgerow but he didn't crawl to it immediately. He lay perfectly still for about three or four minutes except for getting a grenade ready while thinking out his next move. He had seen tracer fire

follow him during the descent and he strained to know whether he had been spotted. He freed himself at last and ran to a ditch.

There he took out a map and a flashlight and from his reading he knew his location for certain within a few hundred yards; the map checked with what he had remembered of the land picture as he came to earth.

History Section, US Army European Theater of Operations

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## Understanding Orienteering

FM 3–25.26, *Map Reading and Land Navigation*, describes orienteering as:

... a competitive form of land navigation suitable for all ages and degrees of fitness and skill. It provides the suspense and excitement of a treasure hunt. The object of orienteering is to locate control points by using a map and compass to navigate through the woods. The courses may be as long as 10 kilometers (FM 3–25.26).

*The American Heritage Dictionary* defines orienteering as “a cross-country race in which competitors use a map and compass to find their way through unfamiliar territory.”

Orienteering began in Scandinavia in the 19<sup>th</sup> century as a military event and a part of military training. It became a competitive sport in the early 20<sup>th</sup> century in Sweden and came to the United States after World War II.

The object of an orienteering competition is to find a series of specific locations (often called *control points* or *targets*) on the ground. Each participant gets a topographic map with the control points circled. The terrain is usually wooded and uninhabited, and allows for different levels of competition. The course setter (the person who plans the course) tries to keep the course interesting, but not so complicated that the competitors can't complete it.

There are several types of orienteering events. The most common are:

- *Route orienteering.* A master competitor leads a group as it walks a route. Beginners trace the route on the map as they walk it on the ground and circle the control points. In another variation, a route is laid out with markers for individual competitors to follow. The winner is the competitor who has successfully traced the route and accurately plotted the most control points.
- *Line orienteering.* Competitors trace their route from a master map and then walk it, circling the control points as they locate them on the ground. The course usually contains five or more control points.
- *Cross-country orienteering.* This most common type of orienteering event is also called *free* or *point* orienteering. Competitors start at one-minute intervals and visit the control points in the same order. The contestant with the fastest time around the course wins. The course usually contains six to 12 control markers.
- *Score orienteering.* Control points are scattered around the competition area. Those near the start and finish point have a low point value, while those farther away have a higher value. Competitors locate as many control points as they can within a specified time, often 90 minutes. Competitors earn points for hitting the control points and lose points for exceeding the specified time. The contestant with the most points wins.

Like any competitive event, an orienteering competition has officials, scorecards, and a start and finish area. Control points are indicated with markers and have some kind of device so that contestants can prove they have visited the control point. The device may be different-colored crayons, punch pliers, letter or number combinations, or stamps or coupons.

To help develop your map-reading and navigation skills, your ROTC instructor may set up an orienteering course using a combination of orienteering course types and rules in order to cater your orienteering lesson to your campus and to your freshman experience. You and your fellow Cadets, working in teams, should attempt to locate as many control points on your campus map as possible in the time allotted. Below are some of the skills you'll need to successfully complete the course and to prepare for instruction on map reading and land navigation later in your ROTC studies.

## Using a Map

The basic tool of orienteering, of course, is a **map**.

Some of the oldest maps still survive on clay tablets archeologists have unearthed in digs of ancient Babylonian cities—present-day Iraq—and date from 2500 to 2300 B.C.E. Demands for better maps came from military necessity. The first tribes needed to map the lay of the land around their villages so they could defend them from other tribes.

Today, maps are everywhere. But for a map to be useful, you must know how to use it.

### Orient the Map

Your first step is to orient your map to the north. Almost all modern maps, including most tourist maps, display a north arrow somewhere on the map. If a north arrow is not used, as a general rule most maps will show north as “up” or at the top of the map. East is right. West is left. South is “down” or at the bottom of the map. If a north arrow is not used, and the map does not indicate which side of the map is north, then you must orient your map to the lay of the land; that is, you must turn your map so that key buildings, intersections, or terrain features align in the same direction that you are holding your map. This technique is called terrain association, and you will learn more about terrain association in this section as well as in future land-navigation lessons.

1. Unfold your map, preferably on a solid flat surface. Familiarize yourself with the map: its size, scale, features, and colors. Read the legend. Locate the north arrow on your map.
2. Open your **compass** and lay it on top of the map. Let the dial of the compass swing freely. (Many compasses lock as you close them. This protects the moving parts.) The magnetic arrow will point north. Rotate your map under your compass until the map's north arrow points in the same direction as the compass arrow. If you do not have a north arrow on your map, and the map legend indicates that north is to the top of the map, then rotate your map until the side

#### map

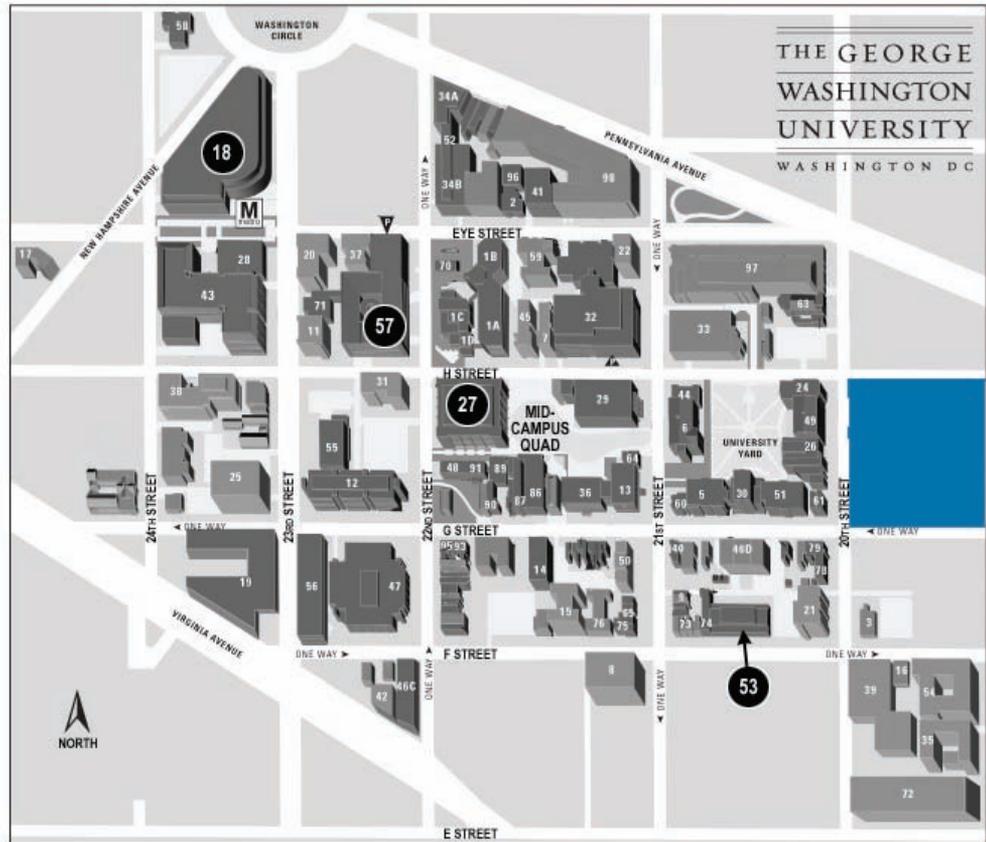
*graphic representation of a portion of the earth's surface drawn to scale, as seen from above—it uses colors, symbols, and labels to represent features found on the ground*

#### compass

*a navigation tool that uses the earth's magnetic field to determine direction*

## Critical Thinking

How does learning about a fun and competitive cross-country sport help prepare you to become a better officer?



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|--|--|--|--|
| <ol style="list-style-type: none"> <li>1. <b>Academic Center</b>, 801 22nd St.<br/>A. Phillips Hall<br/>B. Rome Hall<br/>C. Smith Hall of Art<br/>D. Visitor Center</li> <li>2. <b>John Quincy Adams House</b>, 2129-33 Eye Street</li> <li>3. <b>Alumni House</b>, 1925 F St.</li> <li>4. <b>Horlense Amsterdam House</b>, 2110 G St.</li> <li>5. <b>Bell Hall</b>, 2020 G St.</li> <li>6. <b>Corcoran Hall</b>, 725 21st St.</li> <li>7. <b>Crawford Hall</b>, 2119 H St.</li> <li>8. <b>Dakota</b>, 2100 F St.</li> <li>9. <b>Davis-Hodgkins House</b>, 609 21st St.</li> <li>10. <b>Abba Eban House</b>, 607 22nd St.</li> <li>11. <b>Fulbright Hall</b>, 2223 H St.</li> <li>12. <b>Funger Hall</b>, 2201 G St.</li> <li>13. <b>Government Hall of</b>, 710 21st St.</li> <li>14. <b>GSEHD</b>, 2134 G St.</li> <li>15. <b>Guthridge Hall</b>, 2115 F St.</li> <li>16. <b>The George Washington University Club</b>, 1918 F St.</li> <li>17. <b>The George Washington University Inn</b>, 824 New Hampshire Ave.</li> <li>18. <b>Hospital, GW</b>, 900 23rd St.</li> <li>19. <b>Ivory Towers Residence Hall</b>, 616 23rd St.</li> <li>20. <b>Kennedy Onassis Hall</b>, 2222 Eye St.</li> <li>21. <b>Key Hall</b>, 600 20th St.</li> <li>22. <b>Lafayette Hall</b>, 2100 Eye St.</li> <li>23. <b>Lenthall Houses</b>, 606-610 21st St.</li> </ol> | <ol style="list-style-type: none"> <li>24. <b>Lerner Hall</b>, 2000 H St.</li> <li>25. <b>Lerner Family Health and Wellness Center</b>, 2301 G St.</li> </ol> <p><b>Libraries</b></p> <ol style="list-style-type: none"> <li>26. <b>Jacob Burns (Law)</b>, 716 20th St.</li> <li>27. <b>Melvin Gelman (University)</b>, 2130 H St.</li> <li>28. <b>Paul Himmelfarb Health Sciences (Medical)</b> 2300 Eye St.</li> <li>29. <b>Lisner Auditorium</b>, 730 21st St.</li> <li>30. <b>Lisner Hall</b>, 2023 G St.</li> <li>31. <b>Madison Hall</b>, 735 22nd St.</li> <li>32. <b>Marvin Center</b>, 800 21st St.</li> <li>33. <b>Media &amp; Public Affairs</b>, 805 21st St.</li> <li>34. <b>Medical Faculty Associates</b>, 2150 Pennsylvania Ave.<br/>A. H.B. Burns Memorial Bldg.<br/>B. Ambulatory Care Center</li> <li>35. <b>Mitchell Hall</b>, 514 19th St.</li> <li>36. <b>Monroe Hall</b>, 2115 G St.</li> <li>37. <b>Munson Hall</b>, 2212 Eye St.</li> <li>38. <b>New Hall</b>, 2350 H St.</li> <li>39. <b>Old Main</b>, 1922 F St.</li> <li>40. <b>Quigley's</b>, 619 21st St.</li> <li>41. <b>Rice Hall</b>, 2121 Eye St.</li> <li>42. <b>Riverside Towers Hall</b>, 2201 Virginia Ave.</li> <li>43. <b>Ross Hall</b>, 2300 Eye St.</li> <li>44. <b>Samson Hall</b>, 2036 H St., 729 21st St.</li> <li>45. <b>Schenley Hall</b>, 2121 H St.</li> <li>46. <b>Scholars Village Townhouses</b><br/>A. 619 22nd St.</li> </ol> | <ol style="list-style-type: none"> <li>B. 2208 F St.</li> <li>C. 520-526 22nd St.</li> <li>D. 2028 G St.</li> <li>E. 605-607 21st St.</li> <li>47. <b>Smith Center</b>, 600 22nd St.</li> <li>48. <b>Staughton Hall</b>, 707 22nd St.</li> <li>49. <b>Stockton Hall</b>, 720 20th St.</li> <li>50. <b>Strong Hall</b>, 620 21st St.</li> <li>51. <b>Stuart Hall</b>, 2013 G St.</li> <li>52. <b>Student Health Services</b>, 2150 Pennsylvania Ave.</li> <li>53. <b>Support Building</b>, 2025 F St.</li> <li>54. <b>Thurston Hall</b>, 1900 F St.</li> <li>55. <b>Tompkins Hall of Engineering</b>, 725 23rd St.</li> <li>56. <b>Townhouse Row</b>, 607 23rd St.</li> <li>57. <b>University Garage</b>, 2211 H St.</li> <li>58. <b>Warwick Bldg.</b>, 2300 K St.</li> <li>59. <b>The West End</b>, 2124 Eye St.</li> <li>60. <b>Woodhull House</b>, 2033 G St.</li> <li>61. <b>700 20th St.</b></li> <li>62. <b>812 20th St.</b></li> <li>63. <b>814 20th St.</b></li> <li>64. <b>714 21st St.</b></li> <li>65. <b>600 21st St.</b></li> <li>66. <b>609 22nd St.</b></li> <li>67. <b>613 22nd St.</b></li> <li>68. <b>615 22nd St.</b></li> <li>69. <b>617 22nd St.</b></li> <li>70. <b>837 22nd St.</b></li> <li>71. <b>817 23rd St.</b></li> <li>72. <b>9957 E St.</b></li> <li>73. <b>2033-37 F St.</b></li> <li>74. <b>2031 F St.</b></li> <li>75. <b>2101 F St.</b></li> <li>76. <b>2109 F St.</b></li> <li>77. <b>2147 F St.</b></li> </ol> | <ol style="list-style-type: none"> <li>78. <b>2000 G St.</b></li> <li>79. <b>2002 G St.</b></li> <li>80. <b>2008 G St.</b></li> <li>81. <b>2030 G St.</b></li> <li>82. <b>2106 G St.</b></li> <li>83. <b>2108 G St.</b></li> <li>84. <b>2112 G St.</b></li> <li>85. <b>2114 G St.</b></li> <li>86. <b>2125 G St.</b></li> <li>87. <b>2127 G St.</b></li> <li>88. <b>2129 G St.</b></li> <li>89. <b>2129 G St. (rear)</b></li> <li>90. <b>2131 G St.</b></li> <li>91. <b>2131 G St. (rear)</b></li> <li>92. <b>2136 G St.</b></li> <li>93. <b>2138 G St.</b></li> <li>94. <b>2140 G St.</b></li> <li>95. <b>2142 G St.</b></li> <li>96. <b>2129-2133 Eye St. (rear)</b></li> <li>97. <b>2000 Pennsylvania Ave.</b></li> <li>98. <b>2100 Pennsylvania Ave.</b></li> <li>99. <b>2136 Pennsylvania Ave.</b></li> <li>100. <b>2140 Pennsylvania Ave.</b></li> <li>101. <b>2142 Pennsylvania Ave.</b></li> </ol> |
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All addresses are in Northwest Washington.

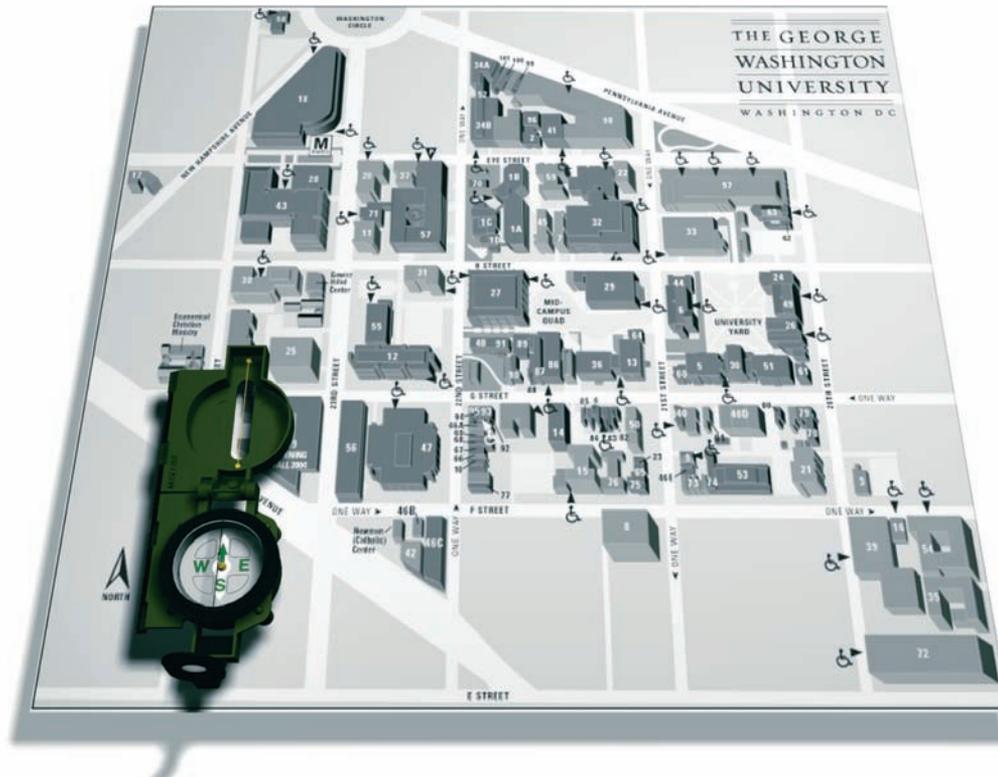
For assistance or information call the GW Information Center (202) 994-GWGW.

For information on accessibility, call (202) 994-8250 (TDDDevice).

**Parking**  
**Marvin Center** (See #32)  
**University Garage** (See #57)

Visitor parking entrance

**Figure 1.1** Map of The George Washington University  
 © George Washington University



**Figure 1.2** Orienting the GWU Map

of your compass is parallel with the side of your map. You have now *oriented* your map to magnetic north. If you have no way of knowing which way on your map is north, then orienting your map to your compass is useless and you must orient your map to the terrain (terrain associate).

Look, for example, at the map of The George Washington University (GWU) in Washington, DC (Figure 1.1). In the lower left-hand corner, you'll see an arrow pointing to north. Using your compass as outlined above, you orient the map so that this north arrow on the map and the compass point in the same direction (see Figure 1.2).

### Find Your Location

Now that you have oriented your map, the next step is to figure out where on the map you are located. Doing so is very similar to how you may have determined your location using the maps provided in an amusement park or a shopping mall.

## Critical Thinking

Your compass points north because Earth's magnetic field attracts it. Sometimes, however, a compass might not point to true north, or might point a few degrees away from true north. Why would that happen? (You will learn more about the three norths in Section 5.)



## Critical Thinking

There are different primitive or “field expedient” methods that you can research on your own as to how to determine your direction both day and night if you do not have a compass. These primitive methods will work, but why is using a compass better?

1. Face north. Look around. Find some identifying features of the area around you. These may be streets and intersections, large buildings (the campus library or the town hall), or hills and streams.
2. Find these identifying features on your map. Spend as much time as you need with this. Be comfortable using the map and finding your location.
3. Compare what you read on the map with what you see on the ground. Locate other features in your area, work from the map to the ground and from the ground to the map. Look in front of you (north). What do you see? What’s on the map? Look to your left (west). What do you see? What’s on the map? Continue this exercise until you’re comfortable with the map and are confident that you have pinpointed your location.

On the GWU map, assume that you have just come up out of the Washington Metro (subway) at the station marked with an “M” in a square—next to Building 18 in the upper left corner of the map. Standing on 23rd Street facing east, you look to your left (north) and see that the building you are looking at is the GWU Hospital. Looking at the legend underneath the map, you see that Building 18 and the GWU Hospital are the same building. Now you know that you are in the northwest corner of the campus. You further confirm your location by correctly identifying that Building 28 is to your south and Building 20 is to your east. You have pinpointed your location as being at the intersection of 23rd and I (Eye) Street.

## Finding Your Way

Once you know where north is and where you are, you’re ready to find where you want to go and determine how to get there.

1. *Identify the control points.* (Control points are your targets or the locations you want to go to.) These may be already printed on your map or on a plastic (or thin paper) overlay. If the control points are on an overlay, transfer the control points to your map. Mark and identify them with a thin-lead pencil or a thin-point pen. (Keeping the map and the overlay together as you move across campus or through town will be cumbersome.) Ensure that you do not mark over important or identifying features on your map. Your control points may also be named or listed on a separate sheet of paper. If so, you must use your map legend or find your control points on the map using building names, street names, etc. Once you have found your named control points, you can mark them on your map with a light circle or X.

Looking at the GWU map, assume your first control point is at the Support Building. That is your control point. Looking at the alphabetical listing of

buildings on campus, you find that it is at 2025 F Street, Building 53. Looking at the map, you find that Building 53 is in the southeast corner of campus. You also notice that the north-south cross streets are numbered ( 20<sup>th</sup>, 21<sup>st</sup>, 22<sup>nd</sup>, etc.) with the numbers increasing as you move west. The east-west cross streets are lettered (F, G, H, etc.) with the letters deeper in the alphabet as you move north. The diagonal streets are named after states (Pennsylvania, Virginia, New Hampshire).

2. *Plan your route.* Most orienteering events will be timed; the individual or team that returns within the prescribed time with the most correct control points will be determined the winner(s). Because of this, it is crucial for you to correctly plot (mark) your control points accurately on your map and determine the most time-efficient route to take to find as many control points as possible, while still allowing time to return within the time limit. In some orienteering competitions, the sequence in which you must locate your control points may be dictated for you. Plan the course you intend to take to get to each of the control points. You can write down the sequence you wish to take, or you can write your route on your map. One technique to prevent confusing the many routes to control points is to number each “leg” of the route.

On the GWU map, you have a number of options. You could take I (Eye) Street east two blocks to 21st Street, then turn right (south) and go three blocks to F Street, turn left (east again) and walk to the Support Building. Or, you could walk three blocks south down 23rd Street to F Street, turn left, and walk two and a half blocks east. (Note that the blocks are not all the same size.)

3. *Consider time, distance, crowds, and traffic.* Weigh straight-line routes against ease of passage. (Cutting across the football field may be a good idea as long as the band isn’t practicing on the field. You may need to go around.) Also keep safety in mind. Crossing a four-lane highway may be the most direct way to reach a control point, but the risk far outweighs the time you will save.

Looking at the GWU map, you see the Mid-Campus Quad on H Street between 21<sup>st</sup> and 22<sup>nd</sup> Streets. You see that you could cut over from H Street through the Quad to 21<sup>st</sup> Street and save yourself a few steps. Note also that some of the streets through the campus are one-way streets. You’ll want to remember that if you have to drive around campus.

4. *Calculate rough distances.* If your map has a graphic bar scale (similar to a ruler), or some other method to measure distance, you can compute the distance on the map to the distance on the ground. This can be useful in deciding which route to take if there are many possible routes to a control point. If your map has no method to scale distance (the map is not to scale), then you will need to terrain associate to get a good feel to the scale of your map compared with the actual terrain.

The GWU map doesn’t have a scale, but after you’ve walked one block, you’ll have a feel for the distance on the ground compared with the distance on the map.

5. *Follow your route.* The fastest way to navigate on an orienteering course is to terrain associate. As you move across the ground, compare your map with key features on the ground and keep your pace with the distance on your map. Compare the buildings and terrain around you with the markings on your map. As you walk across campus, you turn or rotate your map to keep it oriented toward your direction of travel. If you are traveling north, then your map should

be oriented north. If you take a right turn, then you should rotate your map to the right so your map is now oriented east—the direction of your travel. This way, the buildings you see in front of you and alongside will be the same as those shown on the map. The time to use your compass is when you have forgotten to maintain your map's orientation to the lay of the land, or if you are uncertain of your location, or if you simply want to double-check yourself. Pull out your compass and orient your map to your compass just as you did when you first began. Once your map is oriented, you can pick up where you left off. If your map does not have a north arrow, and you are uncertain of your location, you must back track to your last confirmed or known point on the map, or the most prominent feature that you can identify (such as an intersection, bridge, or a major building). Once you have your bearings, continue along your planned route to your next control point.

6. *Locate the control point.* For your ROTC orienteering exercise, your control points may be important campus buildings or facilities that may be easily identifiable as you approach the control point. However, in orienteering competitions, control points aren't always the obvious landmarks that are easily identifiable from a distance. If this is the case with one of your control points, then you must navigate to a landmark or feature—such as a hilltop—as a checkpoint (sometimes called an attack point) to find your nearby control point. Find the control point on your map. Find a nearby checkpoint on your map. Move quickly to the checkpoint, which will be more easily identifiable than the control point. Then find and move to the control point. Checkpoints may be major buildings, stream junctions, bridges, or road intersections.

The Quad itself is a good checkpoint. You can also compare the street signs at each corner with the names of the streets on the map. As you walk east along H Street, check to see that you pass the University Garage (Building 57) on your left. Then, just after you cross 22nd Street, look for the Melvin Gelman University Library (Building 27) on your right. These serve as additional checkpoints. The Quad is just east of the library.

7. *Complete the course and return to the start or rally point.* As described earlier, if your orienteering event is a timed event, you may find yourself in a time crunch and unable to find some of your final few control points. If this is the case, you must adjust your final route(s) in a manner that allows you to find as many of your remaining control points but still arrive back at the finish point within the time limit. In order to adjust your final route(s), you may begin at your last control point, or at an easily identifiable checkpoint. From this location, you must consider distance and time remaining to determine which control points you can find and still return before time runs out. You plan your route (or legs) to those remaining control points that you can find within the prescribed time. You arrive at the Support Building; check the address and the sign outside the building to make sure you've arrived at the right place.

Congratulations—you're an orienteer!

### dead reckoning

a navigation technique by which you travel a set distance (usually in meters) along a set line (usually a compass reading in degrees)

## Orienteering Terms and Techniques

To improve your orienteering skills, learn and use these terms and techniques:

**Dead reckoning** is moving a set distance along a set line. Generally, it involves moving so many yards or meters in a specific direction, usually a compass reading in degrees.

(“Move 350 meters due north” or “Move 1,500 meters on an azimuth [or reading] of 220 degrees.”)

As you move along your set line, you may want to identify **steering marks** to guide you. Find a point in the distance—a building, a hilltop, a large tree—on your line and move toward that point.

Dead reckoning has two advantages: It is easy to teach and learn, and it is an accurate way of moving from one point to another over short distances.

*Handrails.* Find existing linear features—trails, fences, roads, streams, power lines—that parallel your route. Use these “handrails” as a check between control points. On the GWU map, the streets are your handrails.

*Pacing.* You need to know how to measure distance on the ground. Measure out a (or use an established) 100-meter pace course. Walk the course. Count the number of paces it takes for you to walk the 100 meters. This number is your pace count. Some people use a double-pace count: they step off on their left foot and count every time their left foot hits the ground. It is easier to use a double-pace count because you are counting half the number of steps. Everyone’s pace count is different, so never rely on a friend’s pace count. The longer your legs, the shorter your pace count, and vice versa. Your pace count (double-pace count) may be 73; that is you reach 100 meters on the 73rd alternate footstep. Your friend, who may be just a few inches taller, may have a much longer stride and may be able to cover the same 100 meters in just 67 paces. It is also important for you to know your pace count for the fractions of 100 meters, such as 25 meters and 33 meters. Knowing paces for these distances will allow you to easily figure out fractions of 100 meters such as 25, 33, 50, 66, and 75 meters without a lot of mental computing.

**Terrain association** is movement by landmarks. You compare what you see on the ground with what you see on your map as you move. When navigating by terrain association, you must constantly orient your map as you change directions. Moving by terrain association is more forgiving than dead reckoning. If you make a mistake by dead reckoning, many times you must move back to your last known position and begin the dead reckoning over again. With terrain association, you can always quickly find your location by comparing what you see around you with what you see on the map. In most cases, you can identify your location without ever having to backtrack at all. Because of this, terrain association is often less time-consuming than dead reckoning. The example in this section used terrain association to travel across campus using the GWU map.

*Thumbing.* Thumbing is a technique used in terrain association in which you fold your map small enough to put your thumb next to your start point. Do not move your thumb from your start point. To find your new location, look at your map and use your thumb as a reference for your start point. That way, you don’t have to keep looking over the entire map.

### steering marks

*landmarks located on the azimuth to be followed in dead reckoning—steering marks are commonly on or near the highest points visible along the azimuth line and are selected based on what you see on the actual terrain, not from a map study. They may be uniquely shaped trees, rocks, hilltops, posts, towers, and buildings—anything that can be easily identified*

### terrain association

*a navigation technique by which you move from one point to another using landmarks and terrain features*

## Critical Thinking

What do you think are the advantages and disadvantages of dead reckoning compared with the advantages and disadvantages of terrain association?



# CONCLUSION

Orienteering is a fun way to learn the different land navigation methods and techniques available to you. Your ROTC orienteering lesson is an enjoyable way to introduce you to using a map and a compass to navigate from one point to another. Your ROTC orienteering lesson should allow you to become more familiar with offices and organizations on your campus that can help you during your transition as a college student. As you continue with ROTC, you will apply the knowledge from this orienteering lesson to more advanced skills in map reading, navigation, and terrain analysis. If you enjoyed this lesson on orienteering, you may want to consider further research on competitive orienteering that may be available at or near your college or university by visiting <http://www.us.orienteering.org/>

While orienteering can be an enjoyable pastime, the map-reading and land-navigation skills it teaches are important life skills for Soldiers and the officers who lead them. In the vignette at the beginning of this section, LTC Ballard knew that he had drifted from his original drop zone or point. His use of orienteering skills—linking what was on the ground to what was on the map—made a difference in his ability to carry out his mission in the crucial first hours of the D-Day invasion.

## Learning Assessment

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1. Explain how to orient a map to the north.
2. Explain how to relate the points on a map to the points on the ground.
3. Describe how to find a control point on campus, in town, or nearby.

## Key Words

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**map**

**compass**

**dead reckoning**

**steering marks**

**terrain association**

## References

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