

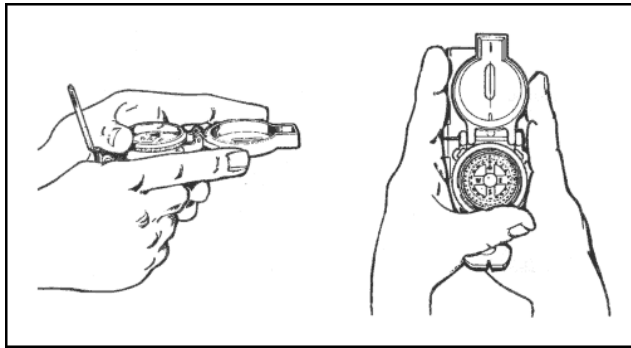
MILITARY CAREER PREPARATION STUDY GUIDE CHAPTER FOUR
COMMON TASK 1A: LAND NAVIGATION CONCEPTS

Refer to www.acefilmco.com/military.html for:

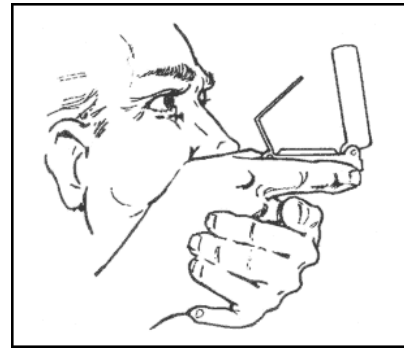
- Study Guide Chapter 2, Topic 4: The Lensatic Compass
- Study Guide Chapter 2, Topic 10: The Topographic Map
- Study Guide Chapter 4, Common Task 1B: Land Navigation Tasks
- USGS Topographic Map Symbols
- Various maps of mission-specific interest

Definitions of some terms used for military land navigation by compass:

- **Compass:** A device that provides a constant, reliable orientation of direction. The needle will point north as it lines up with the earth's magnetic field.



Centerhold Technique



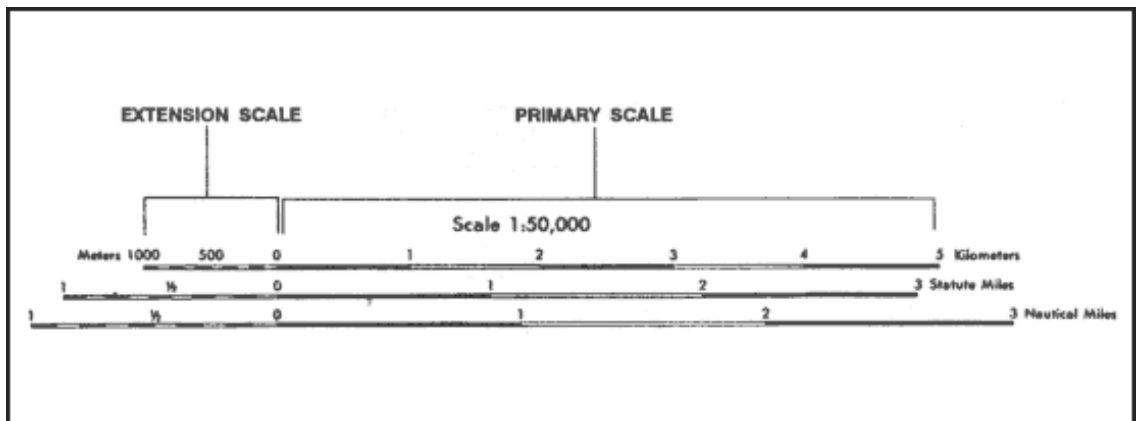
Compass-to-cheek Technique

- **Map:** A representation of a portion of the earth's surface, drawn to scale. Maps use colors, symbols, and lettering to identify features on the surface.
- **Azimuth:** The compass direction to or from a distant object, measured clockwise from north. Due north has an azimuth of 0° (zero degrees), due east 90° , south 180° and west 270° . There are 360 degrees in the full compass circle.
- **Pace Count:** The number of paces (two steps) required by an individual to travel a measured distance (usually 100 yards).

- **Declination:** the difference between the direction that a magnetic compass actually points -- and grid (geographic) north.
- **Declination diagram:** Topographic maps contain information about the declination of the local area. This information is important for obtaining an accurate azimuth, thereby finding your present location and destination.
- **Symbols** on a topographic map represent such features as streets, buildings, streams, and vegetation.
- **Contour lines** are imaginary lines of elevation on the surface of the land. Contours help us measure the height of mountains, and steepness of slopes.



- A **graphic bar scale** is a ruler printed on the map used to convert distances on the map to actual distances. Use the correct scale for the unit of measure desired.



Determining your Pace Count

You will need to use a military pace count course 300 feet (100 yards) in length. Start with your right foot and count every time your left foot hits the ground as 1 pace. Count the number of left footfalls it takes to complete the course, record this number as your individual pace count.

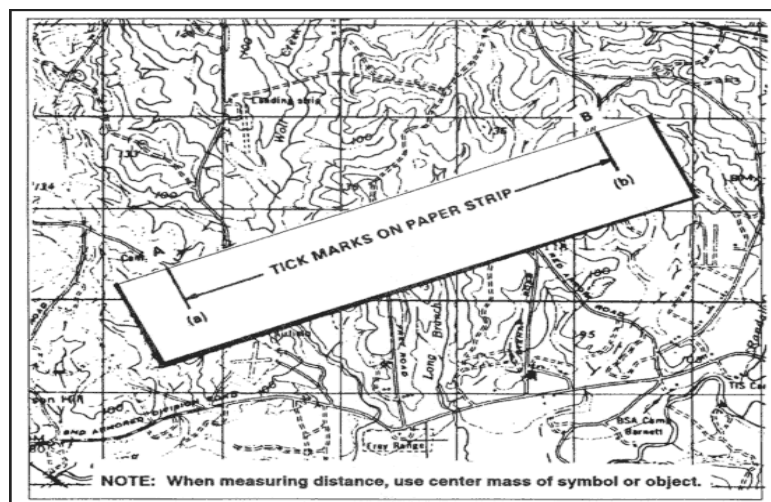
Using your Pace Count

You can use your pace count to keep track of your distance while navigating in the woods. Be aware that your pace will vary with the terrain. You will have the least amount of paces on flat ground. Your paces will be shorter going uphill.

When you know your pace, you can take a compass bearing from your map, set your compass, and head toward your destination. Turn your map (orient it) so that it coincides with the ground in front of you. Your map may be sideways but your destination will be in the right place.

Measuring Distance on a Map

To determine straight-line distance between two locations on a map, lay a straight-edged piece of paper on the map so that the edge of the paper touches both locations. Make a tick mark on the edge of the paper at each location.



Move the paper containing the two tick marks down to the graphic bar scale. Align the first mark (a) with the zero point, the distance shown on the graphic bar scale at the second mark (b) will be the distance between the two locations.

Azimuth

An azimuth is a horizontal angle measured clockwise from a north base line. The azimuth is the most common method used to express direction. When using an azimuth, the point from which the azimuth originates is the center of an imaginary circle. This circle is divided into 360 degrees.

Back Azimuth

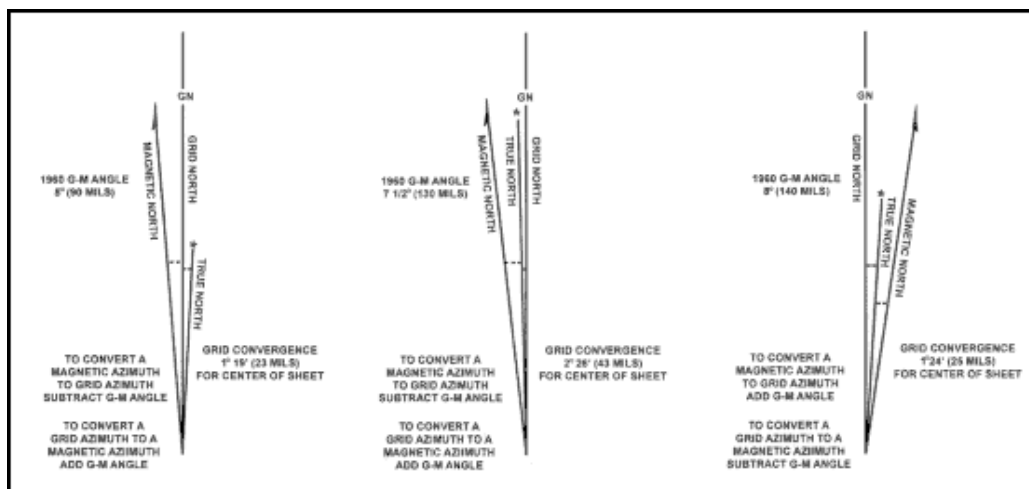
A back azimuth is the opposite direction of an azimuth. It is comparable to doing "about face." To obtain a back azimuth from an azimuth, add 180 degrees if the azimuth is 180 degrees or less, or subtract 180 degrees if the azimuth is 180 degrees or more. The back azimuth of 180 degrees (south) is 0 degrees (north).

Declination

An understanding of declination is important when navigating over long distances of terrain that offers very little other cues about your location. Remember that the direction of magnetic north does not correspond exactly with the grid (geographic) north lines on the map. This difference is known as the G-M angle. Conversion from magnetic to grid or vice versa is needed for critical navigation.

The G-M angle changes as your geographic location changes. The G-M angle for your geographic location should be indicated on the map (the declination diagram).

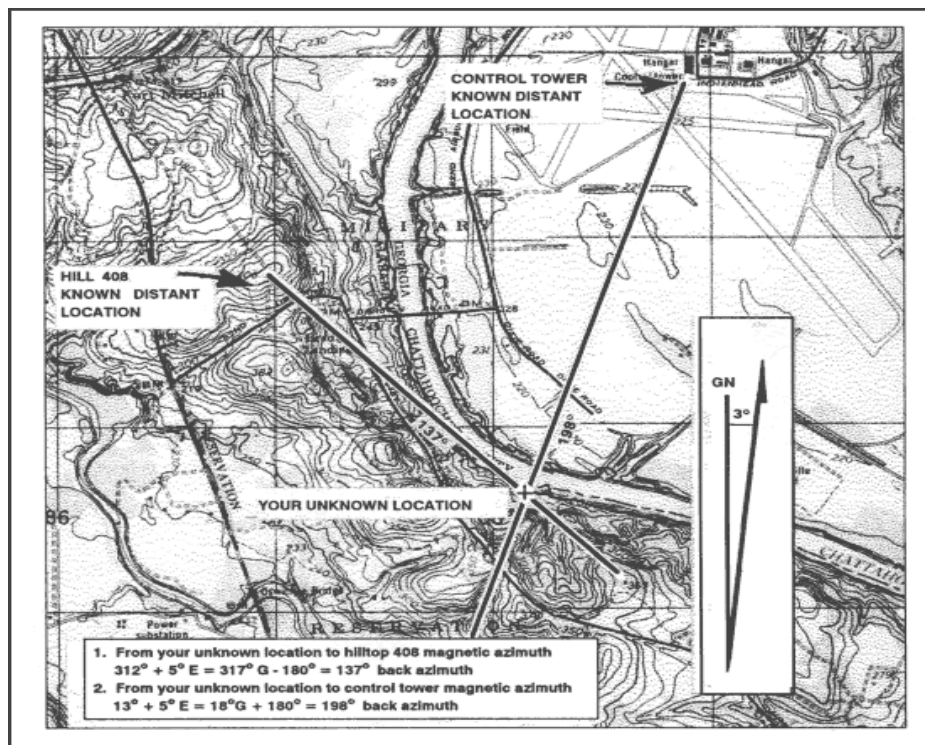
Also refer to the instruction diagram on the map (also shown below) explaining the use of the G-M angle, with instructions for converting magnetic azimuth to grid azimuth; the other, for converting grid azimuth to magnetic azimuth.



Finding your Location by Resection

Resection is the method of locating one's position on a map by determining the azimuth to at least two well-defined locations that can be pinpointed on the map.

- (1) Orient the map using the compass.
- (2) Identify two or three known distant locations on the ground and mark them on the map.
- (3) Measure the magnetic azimuth to one of the known positions from your location using a compass.
- (4) Adjust for declination as per the declination diagram on your map.
- (5) Convert the grid azimuth to a back azimuth. Draw a line for the back azimuth on the map from the known position back toward your unknown position.
- (6) Repeat 2, 3, 4 and 5 for a second position and a third position.
- (7) The intersection of the lines is your location.



Following a Bearing

- While following a bearing and pacing toward your goal, you will want to stay on course and maintain as much of a straight line as possible. To stay on track you need to know where you are, where you've been, and of course where you're going. It is beneficial to develop a sense of direction when in the woods.
- You should always be aware of where you are on the map. Regularly check your position. Carry a note pad with you so that you can record your bearings and paces. It may be useful for you to make a pre-trip sketch of your route. You can roughly sketch out landmarks, distances, and bearings.
- One way to keep as much of a straight line as possible, is to sight on some distant landmark in line with your desired bearing, and then to travel to it. This will keep you from drifting off course. Studies have shown that 'man has a natural tendency to circle.'
- Be aware that the compass can also be affected by the presence of steel, iron, electrical lines, and mineral deposits. So when using a compass, be aware of things that could give you a faulty reading and lead you off course, and try to stay away from them.

