TASK BOOK
Ground Team Member 2

24 May 2004
Extracted: 6 Feb 2008

Trainee: _____ Unit: _____

SPECIALTY QUALIFICATION TRAINING RECORD (SQTR)
Ground Team Member – Level 2

NAME (Last, First, MI)	CAPID	DATE ISSUED

Prerequisites

Item	Date Completed
Complete requirements for GTM 3	

The above listed member has completed the required prerequisite training for the ground team member – level 2 specialty and is authorized to serve in that specialty while supervised on training or actual missions.

_____ _____
UNIT/WING/REGION COMMANDER OR AUTHORIZED DESIGNEE'S SIGNATURE — DATE

Familiarization and Preparatory Training
No Additional Training Is Required

Advanced Training

Task	Evaluator's CAPID and Date Completed
Complete Task O-0104 Set up Shelter	
Complete Task O-0202 Measure Distance with Pace Count	
Complete Task O-0203 Navigate past an Obstacle	
Complete Task O-0209 Identify The Major Terrain Features On A Map	
Complete Task O-0210 Identify Topographic Symbols On A Map	
Complete Task O-0211 Determine Elevation On Map	
Complete Task O-0212 Measure Distance On A Map	
Complete Task O-0213 Convert Between Map And Compass Azimuths	
Complete Task O-0215 Determine Azimuths On A Map Using Two Points	
Complete Task O-0216 Orient A Map To The Ground Using Terrain Association	
Complete Task O-0217 Orient A Map To North Using A Compass	
Complete Task O-0420 Perform An Airfield Search (Ramp Check)	
Complete the appropriate portion of CAPT 117, *Emergency Services Continuing Education examinations*	

Exercise Participation

The above listed member satisfactorily participated as a ground team member – level 2 trainee under my direct supervision on mission number _____.

_____ _____
QUALIFIED SUPERVISOR'S SIGNATURE — DATE

The above listed member satisfactorily participated as a ground team member – level 2 trainee under my direct supervision on mission number _____.

_____ _____
QUALIFIED SUPERVISOR'S SIGNATURE — DATE

Unit Certification and Recommendation

The above listed member has completed the requirements for the ground team member – level 2 specialty qualification and is authorized to serve in that specialty on training or actual missions.

_____ _____
UNIT/WING/REGION COMMANDER OR AUTHORIZED DESIGNEE'S SIGNATURE — DATE

TASK BOOK
Ground Team Member 2

Familiarization and Preparatory Training Tasks

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There are no Familiarization and Preparatory Tasks for Ground Team Member 2

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TASK BOOK
Ground Team Member 2

Advanced Training Tasks

O-0104
SETUP SHELTER

CONDITIONS

You are a member of a ground team required to spend the night in the field. You have your field and base gear with you.

OJECTIVES

Setup a shelter considering the terrain and weather within 30 minutes.

TRAINING AND EVALUATION

Training Outline

1. Protecting yourself from the elements when remaining overnight in the wilderness should be a primary concern. The shelter should be placed and constructed to protect you from wind, water, and ground obstacles. Taking the time to ensure that you will have a relatively comfortable night's sleep will make you more alert and efficient for the next day's activities.

2. Shelter site preparation

a. Clear the entire area under the shelter to the bare ground. Remove any rocks, pebbles, branches or roots in the area. If they cannot be removed, find another site. Small bumps under your back at dusk will feel like boulders by dawn. Also check for wildlife such as snakes or insects that might already be there. This will prevent a nasty surprise in the middle of the night.

b. In order to preserve warmth, it is strongly suggested that you re-cover the shelter site with loose leaves, pine needles, etc. and cover with a tarp. A good layer of leaves will act as a mattress and insulation. Remember your body heat is being transferred to the earth while you are sleeping, not the other way around. Insulation will keep you warm and comfortable overnight.

c. Point the opening of the shelter away from or broadside to the wind when constructing it. This will prevent a 'ballooning' effect when the wind gusts. It will also prevent rain from being blown into the shelter opening and onto you.

d. Always suspect heavy rains overnight. Ensure that your shelter is on high ground, not in a dry wash or gully. Dig a four inch deep trench around the perimeter of your shelter with an additional runoff trench pointing down hill. Flowing water will go into the trench and around your shelter instead of under or through it.

Additional Information

More detailed information on this topic is available in Chapter 4 of the Ground Team Member & Leader Reference Text.

Evaluation Preparation

Setup: Ensure the student has his base and field gear. If two students share a shelter, test them together. The students may use any item in his field gear, including this manual, while being tested.

Brief Student: Tell the student to choose a spot nearby and correctly set up their shelter.

Evaluation

Performance measures	Results	
The individual:		
1. Identifies the wind direction in the shelter area	P	F
2. Builds an adequate trench around shelter	P	F
3. Ensures adequate drainage by choosing high ground or digging a trench	P	F
4. Builds shelter with opening away from wind	P	F
5. Completes all steps within 30 minutes (45 if a trench was dug)	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.

O-0202

MEASURE DISTANCE WITH PACE COUNT

CONDITIONS

Your team has been given a point to travel dismounted. You have been designated the pace person. You must ensure that the team travels the required distance and does not overshoot.

OJECTIVES

Successfully move the specified number of meters up along the route using your pace count +/- 50 meters.

TRAINING AND EVALUATION

Training Outline

1. A pace is equal to one natural step, about 30 inches long for an average adult male. In order to measure distance, you must know your pace count, which is the number of paces it takes you to cover 100 meters. You do this by measuring your pace over a pre-measured course.

a. The terrain of the course should be similar to the terrain you will be walking over on the mission. You will cover a lot more distance on a paved road than you will across rough terrain.

b. The course should be between 100 and 600 meters long, in even multiples of 100. (If the course is 600 meters long, divide your total paces by 6 to determine your 100 meter pacecount. If the course is 300 meters long, divide by 3, etc.)

2. To use your pace count:

a. Determine how far you have to travel in meters

b. Calculate how many paces this is.

1) For every hundred meters you must travel, add your pace count.

2) For the last fraction of a hundred meters, use a equal fraction of your pace count.

3) EXAMPLE: If your pacecount was 110 and the distance you had to travel was 325 meters:

110 paces (100 meters)
110 paces (100 meters)
110 paces (100 meters)
\+ 28 paces (25 meters is 1/4 of 100 meters, so 1/4 of your pacecount is about 28)

358 paces (325 meters)

c. Adjust this pace count for the following factors (a shorter pace means more paces in 100 meters).

1) Slopes. Your pace will lengthen on a downslope and shorten on an upgrade. Keeping this in mind, if it normally takes you 120 paces to walk 100 meters, your pace count may increase to 130 or more when walking up a slope.

2) Winds. A head wind shortens the pace and a tail wind increases it.

3) Surfaces. Sand, gravel, mud, snow, and similar surface materials tend to shorten the pace.

4) Elements. Snow, rain, or ice cause the pace to reduced in length.

5) Clothing. Excess clothing and boots with poor traction affect the pace length.

6) Visibility. Poor visibility, such as fog, rain, or darkness, will shorten the pace.

d. Begin walking, and keep track of the distance you travel. Do not try to remember the count in your head; use a technique like one of the following:

1) Put a pebble in your pocket every time you have walked 100 meters according to your pace count.

2) Tie knots in a string.

3) Put marks in a notebook.

4) Pace counter string.

Additional Information

More detailed information on this topic is available in Chapter 5 of the Ground Team Member & Leader Reference Text.

Evaluation Preparation

Setup: Clearly mark a route at least 500 meters long. It is best if this route has sections on different types of terrain. Put a numbered marked at the end point. Then put other numbered markers before and after the end point markers along the route. Keep the exact number and locations of these markers secret.

Brief Student: Put the student at the start point. Show him the route markings, and what the end markers looks like. Give him the distance to the end point, and tell him go that distance, get the number off the marker, and return with that number.

Evaluation

Performance measures	Results	
1. Correctly identifies the end marker, or another marker within 50 meters of the end marker.	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.

O-0203
NAVIGATE PAST AN OBSTACLE

CONDITIONS

Given a compass. You are moving on foot following an azimuth and pace count. You encounter an obstacle that you must go around, while continuing to keep track of your azimuth and pace count.

OBJECTIVE

The team member "boxes" his steps around the obstacle, returns to the same azimuth, and continues to the destination point.

TRAINING AND EVALUATION

Training Outline

1. Spot the obstacle and halt.

2. Record pace count up to this point (hereafter called your traveling pace count)

3. Determine if it is easier to go right or left around the obstacle.

4. If you decide to go right (if you go left, switch all references to left and right):

    a. Using the compass, turn 90 degrees to the right

    b. Walk in that direction, starting a new pace count from zero (called the lateral pace count). Continue walking until you have moved far enough right to get around the obstacle.

    c. Halt and record how far you've walked in this direction.

    d. Turn left back to your original azimuth (the one you were on when you ran into the obstacle).

    e. Look up the pace count you were at when you spotted the obstacle and halted (your traveling pace count).

    f. Start walking along your original azimuth, adding your steps to your traveling pace count pace count.

    g. When you are clear of the obstacle on your left, halt and record your total traveling pace count.

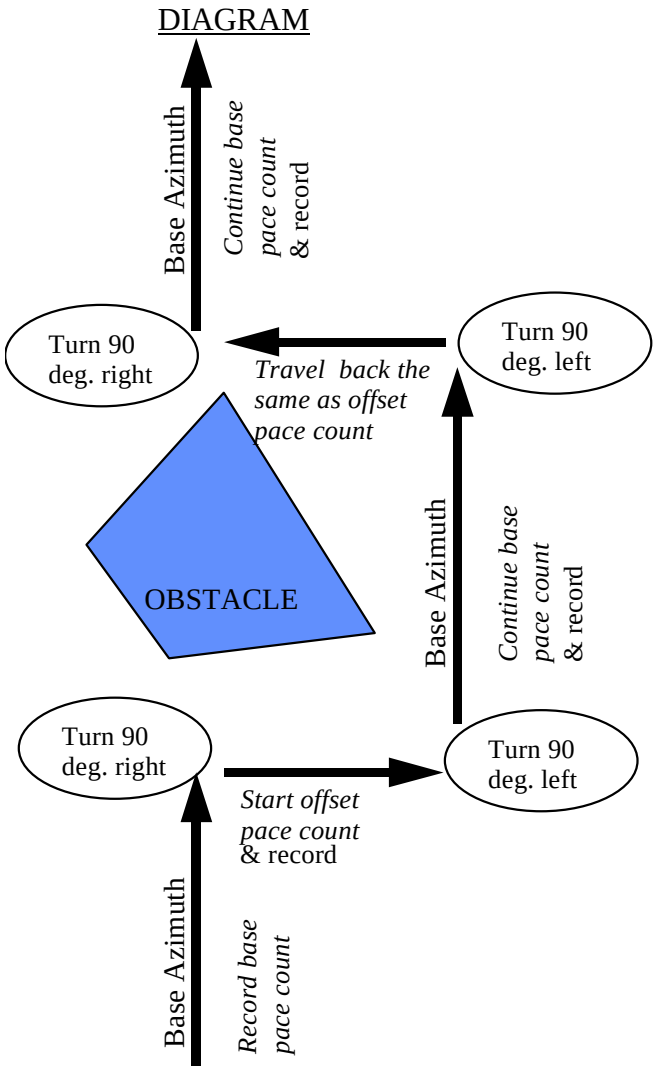
    h. Using the compass, turn left 90 degrees. Look up your lateral pace count (the number of steps you moved to the right of the obstacle).

    i. Walk in this direction, starting a new pace count from zero. When you have walked the same distance as your recorded lateral pace count, halt. You should now be on the direct opposite side of the obstacle from where you started.

    j. Turn right back to your original azimuth.

5. Look up your total traveling pace count.

6. Start walking along your original azimuth, adding your steps to your total traveling pace count. Continue on to your destination.



Example of Bypassing an Obstacle

Additional Information

More detailed information on this topic is available in Chapter 5 of the Ground Team Member & Leader Reference Text.

Evaluation Preparation

Setup: Set up a start and end point at least 400 meters apart in a wooded area. Clearly mark the destination point with a brightly colored coffee-can or similar marker hanging at eye level. Ensure there is point obstacle (pond, building, etc.) along the route of travel. Provide the ground team member with a compass, piece of paper, pencil, and the azimuth and distance to the destination. Ensure there is a point obstacle (pond, building, etc.) along the route of travel.

Brief Team Leader: Tell the team leader to move to the destination point. Warn him that there will be an obstacle along the way that must be navigated around.

Evaluation

Performance Measures	Results	
1. Identifies the obstacle and halts and records pace count.	P	F
2. Turns 90 degrees right (left) and moves clear of the obstacle and records pace count.	P	F
3. Turns 90 degrees to the left (right) to the original azimuth and continues the original pace count until the obstacle is cleared while recording the pace count.	P	F
4. Turns 90 degrees to left (right) and moves the same distance moved in step 2.	P	F
5. Turns 90 degrees and continues from the original pace count. (sum of 1 + 3)	P	F
6. Locates the destination point.	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.

O-0209

IDENTIFY THE MAJOR TERRAIN FEATURES ON A MAP

CONDITIONS

Given a objective topographical map

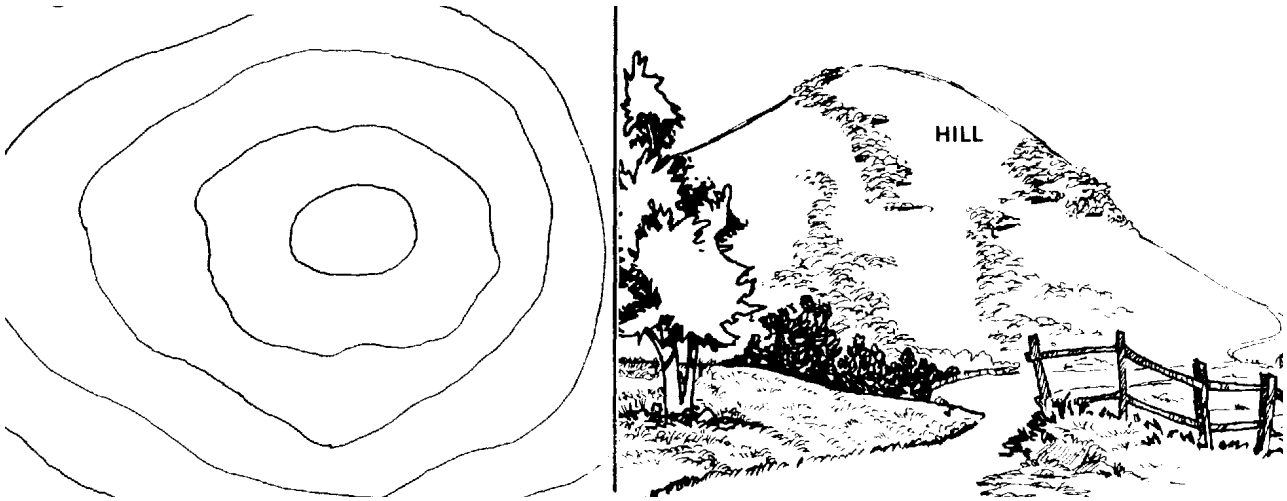
OBJECTIVES

Correctly identify the five major terrain features on the map.

TRAINING AND EVALUATION

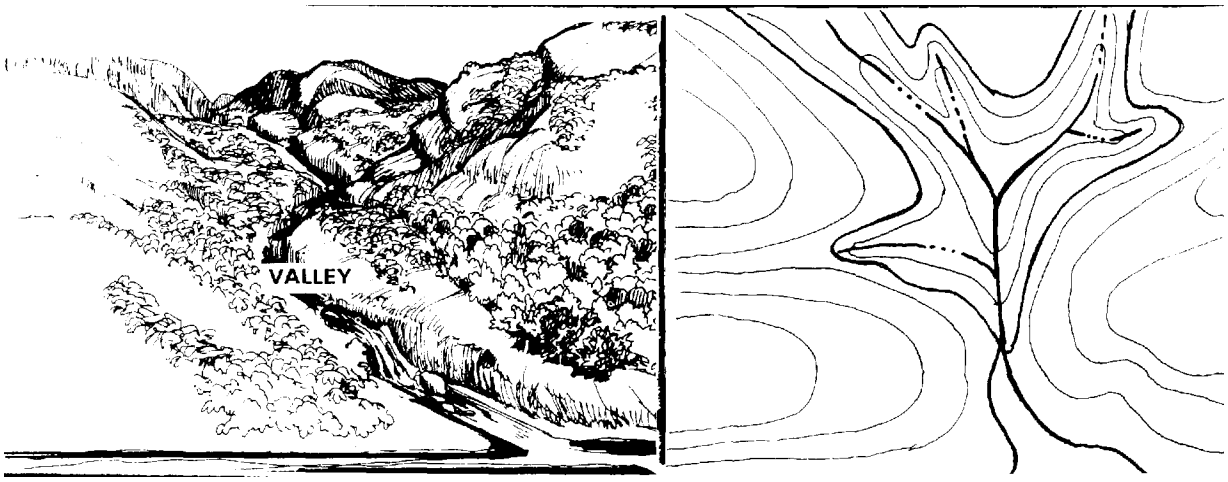
Training Outline

1. Hill -- A point or small area of high ground. From the hilltop, terrain slopes down in all directions. On the map a hill is depicted by contour lines forming concentric circles.

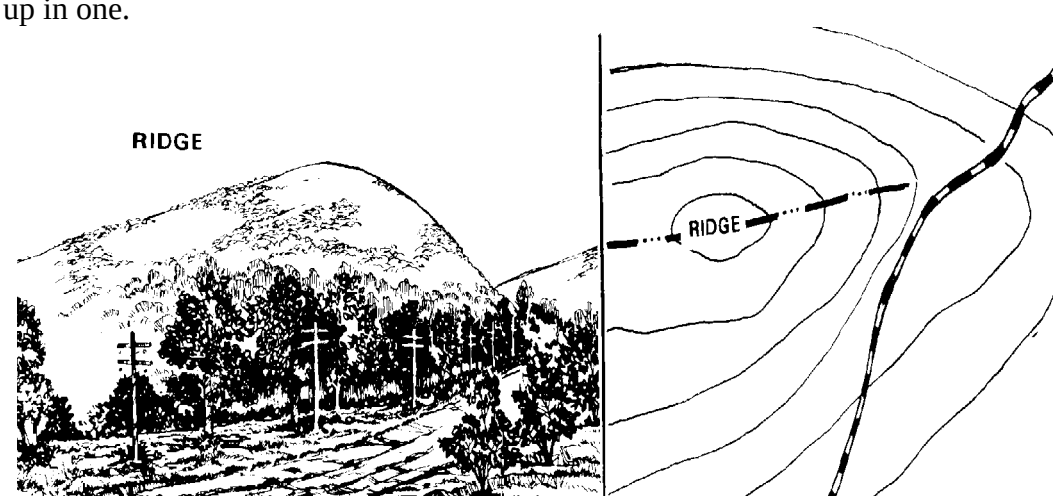


A hilltop on the map (left) and in the wilderness (right)

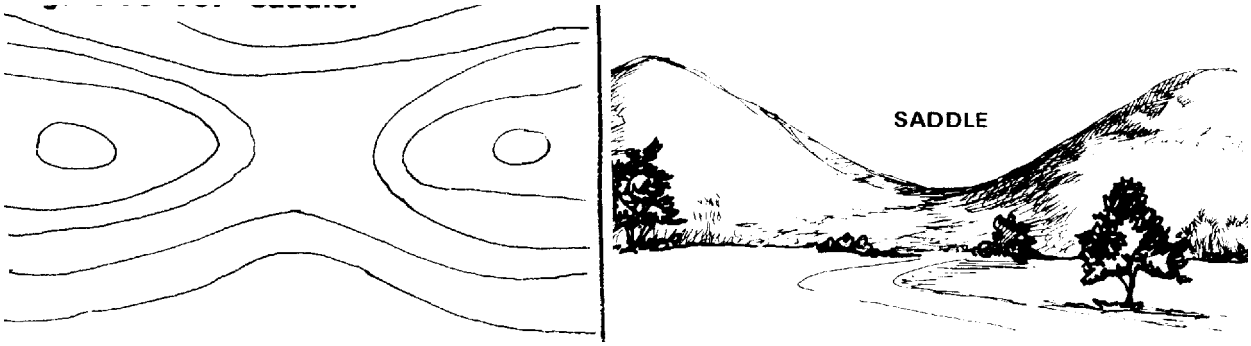
2. Valley -- Terrain goes up in three directions, and down in one, usually a river or a stream flows in it.



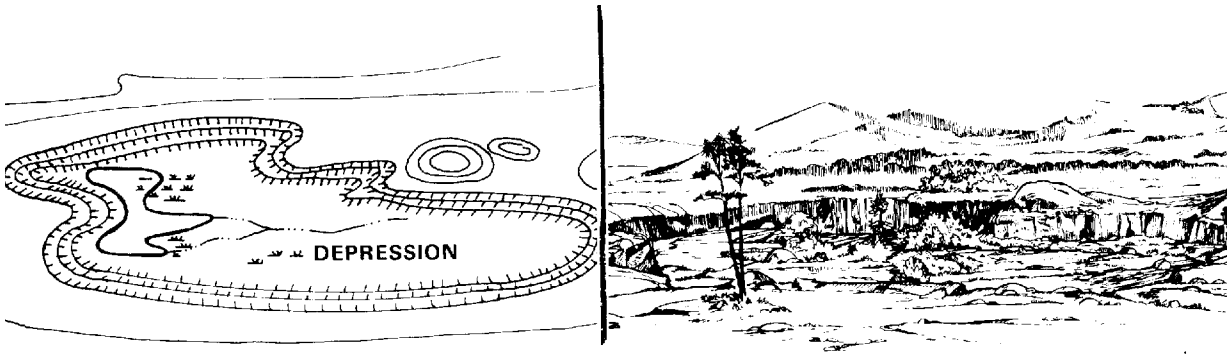
3. Ridge -- A line of high ground with height variations along it's crest. The terrain slopes down in three directions and up in one.



4. Saddle -- A dip or low point, usually along the crest of a ridge. Terrain goes down in two directions and up in the other two.



5. Depression -- A low point or hole in the ground. Terrain goes up in all directions. Hash marks indicate decreasing elevation.



Additional Information

More detailed information on this topic is available in Chapter 5 of the Ground Team Member and Leader Reference Text.

Evaluation Preparation

Setup: On an appropriate topographical map, circle an example of each major terrain feature.

Brief Student: Tell the student to identify the circled items.

Evaluation

Performance measures	Results	
The student correctly identifies the following:		
1. Hill	P	F
2. Valley	P	F
3. Ridge	P	F
4. Saddle	P	F
5. Depression	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.

O-0210

IDENTIFY TOPOGRAPHIC SYMBOLS ON A MAP

CONDITIONS

Given a objective topographical map

OBJECTIVE

Correctly identify the topographical symbols, colors, and marginal information on a map.

TRAINING AND EVALUATION

Training Outline

1. In order to navigate using a map, the ground team member must know how terrain features are depicted on a map.

2. Ideally, every feature on the Earth's surface can be shown on a map in its true shape and size. Unfortunately this is impossible due to the limitations on detail that can be legibly transferred to paper. The amount of detail that can be shown on a map varies as the scale of a map. Small scale map such as 1:24,000 USGS quadrangles will show considerably more detail then 1:500,000 aeronautical sectionals.

3. Symbols are used on topographical maps to show features and details. On most topographic map the following colors are used to classify these symbols.

a. Black -- manmade or cultural features such as buildings, roads, railroads, names and boundaries.

b. Blue is used for water or hydrographic features such as lakes, rivers, canals and swamps.

c. Brown -- used for relief or contour and to show relief features such as cuts, fills, sand dunes, and glaciers.

d. Green -- is used for woodland cover and vegetation such as scrub, vineyards, forests, etc.

e. Red -- emphasizes important roads and highways.

f. Purple -- used to show revisions from previous map editions.

4. The shape and size of an object on the map will indicate it's actual shape and size on the ground. A black solid square is a building and an irregular blue item is a lake or pond. Interpreting symbols is a matter of knowing what color it is and how that relates to the above list, and matching the symbol to the map's legend. The map's legend is table of symbols and what they represent. It is usually located on the bottom of the map sheet in the marginal information or it is published separately for the objective types of topographic maps in use.

5. The marginal information on a map shows the mapsheets relationship to the rest of the Earth. Marginal information includes:

a. The geographic location of the map.

b. The name of the mapsheet and adjoining mapsheets.

c. Agency preparing the map and date of printing.

d. Scale of the map and bar scales for meters, yards, and miles.

e. Contour interval of contour lines.

f. Grid to magnetic north declination diagram, or simply the magnetic variation angle.

Additional Information

More detailed information on this topic is available in Chapter 5 of the Ground Team Member and Leader Reference Text.

Evaluation Preparation

Setup: On an appropriate topographical map, circle an example of each item of marginal information and an item shown on the map by color.

Brief Student: Tell the student to identify the circled items.

Evaluation

Performance measures	Results	
1. Identifies the sheet name	P	F
2. Identifies the contour interval and lines	P	F
3. Identifies the G-M angle declination diagram	P	F
4. Identifies the legend	P	F
5. Identifies the bar scales	P	F
6. Identifies the adjoining sheets reference	P	F
7. Identifies man-made features	P	F
8. Identifies hydrographic (water) features	P	F
9. Identifies vegetation features	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.

O-0211
DETERMINE ELEVATION ON A MAP

CONDITIONS

Given a objective topographical map. Your team is has been ordered to move dismounted to a destination. Before beginning movement, you want to get an idea for the "ups and downs" of the terrain you will be traveling over. Or, your team is having problems contacting mission base, and you wish to find a high point to transmit form.

OBJECTIVE

Correctly identify the elevation of any point on the map +/- 1/2 the contour interval.

TRAINING AND EVALUATION

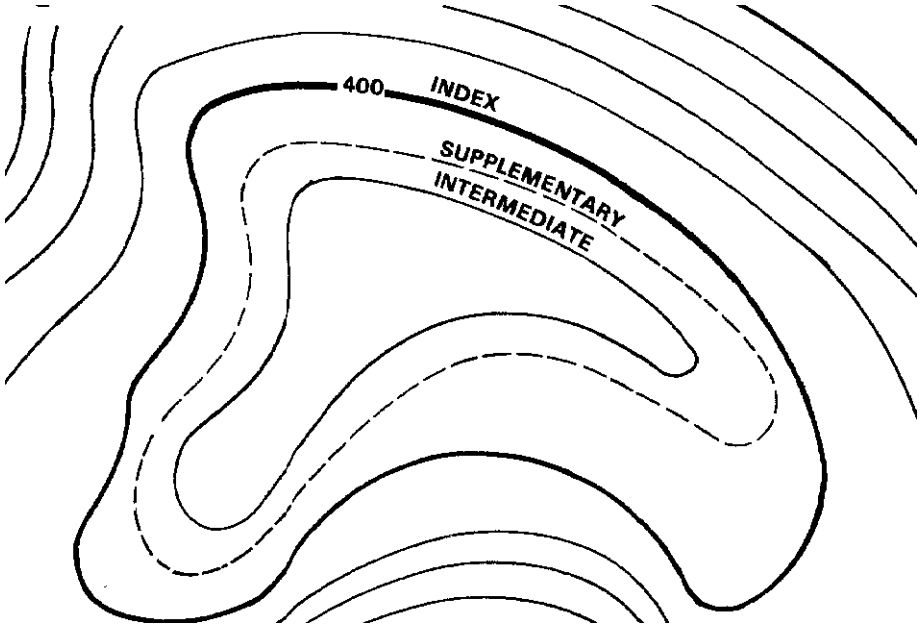
Training Outline

1. Topographical maps depict the elevation of the ground through the use of contour lines. A contour line represents an imaginary line on the ground, above or below sea level connecting points of equal elevation. Contour lines are normally brown. There a three types of contour lines:

a. Index Contour Lines are heavier than other lines, and are labeled with a number. This number is the elevation of that line, in feet, yards or meters. The top of the elevation number always points uphill.

b. Intermediate Contour Lines are the solid lines that fall between Index Contour Lines. These lines do not have the elevation listed on them, but represent increments of the *contour interval* (see 2, below).

c. Supplementary Contour Lines. These contour lines resemble dashes. They show sudden changes in elevation of at least one-half the contour interval.



Index, Intermediate, and Supplementary contour lines. As indicated by the orientation of the "400," the terrain slopes down towards the center of this area.

2. Before you can read the contour lines, you must know the contour interval of the map. The contour interval will be printed in the marginal information, near the map legend. The contour interval is the number of feet, meters or yards that each intermediate contour line represents. (EXAMPLE: if the contour interval is 10 meters, then the Index Contour line marked with "100" is 100 meters above sea level, and each intermediate line above it is 10 more meters)

3. To determine the elevation of a point on the map:

a. Determine the contour interval of the map, and the unit of measure used (feet, meters or yards).

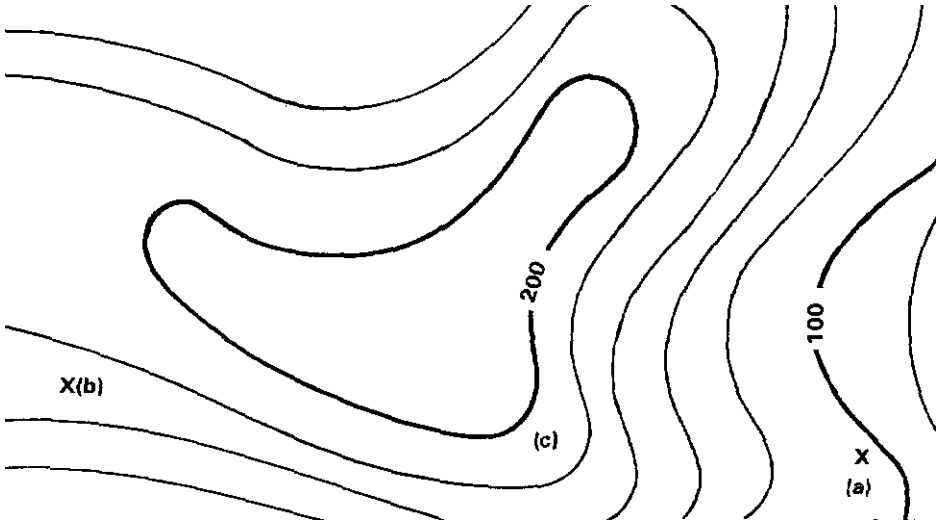
b. Find the numbered index contour line nearest the point.

c. Determine if you are going from lower elevation to higher, or vice versa. For example, if the point was somewhere between the "500" and the "600" Index contour lines, you know the terrain gets higher as it gets closer to the "600" line.

d. Start at the Index contour line below the point (in the above example, the "500" line) and count the number of Intermediate contour lines between the lower Index contour line and the point. For each intermediate line, add the contour interval.

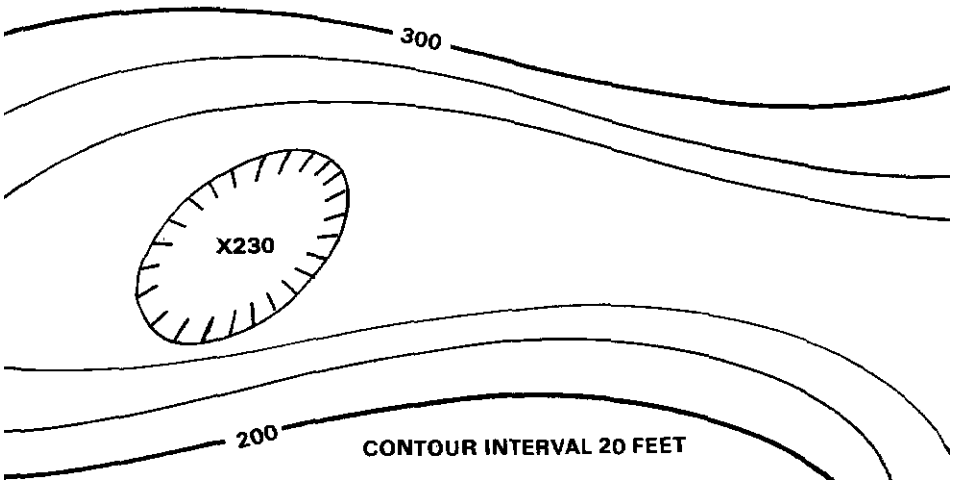
e. If the point is halfway between two contour lines, add half the contour interval.

f. If the point is a hilltop, determine the elevation of the contour line closest to the hilltop and add half the contour interval.



EXAMPLE: If the above map has a contour interval of 20 meters, point (a) is slightly above 100 meters in elevation, point (b) is at approximately 170 meters, and point (c) is at approximately 190 meters.

4. Depressions. Depressions (the opposite of a hilltop) are often marked with small hatchmarks on the contour line pointing inward towards the center of the depression. To determine the depth of the depression, determine the elevation of the innermost contour line of the depression and *subtract* half the contour interval.



Given the contour interval of 20 feet, the rim of the depression is at an elevation of 240 feet, and the center of the depression is at 230 feet.

Additional Information

More detailed information on this topic is available in Chapter 5 of the Ground Team Member and Leader Reference Text.

Evaluation Preparation

Setup: On an appropriate topographical map, mark five points on the map, including one hilltop and one depression.

Brief Team Leader: Tell the team leader to determine the elevation of all five points.

Evaluation

Performance measures	Results	
1. Identifies the elevation of four of the five points +/- 1/2 the contour interval	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.

O-0212
MEASURE DISTANCE ON A MAP

CONDITIONS

Given a objective topographical or aeronautical map with bar scales, a piece of paper, pencil, and straight edge. You are away from mission base, mounted or dismounted, and must move to another location. You have plotted your position on the map, and the position to which you are to move. Now you want to determine the distance you will have to move.

OBJECTIVES

1. Determine the straight-line distance between two points with no more than five percent error, within 2 minutes.

2. Determine the road distance between two points with no more than 10 percent error, within 2 minutes.

TRAINING AND EVALUATION

Training Outline

1. Background information:

a. Distance can be straight line (if you are walking cross country) or along a curved road or path.

b. Distance for mounted travel should be determined in miles, since car odometers are gradiated in miles. Distance for walking should be determined in meters, so you can use your pace count. There are 0.62 miles in a kilometer (1000 meters) and 1600 meters in a mile.

c. All topographical maps are drawn to scale (1:24,000:, 1:62,500:, etc.). This means that a one millimeter of map distance equals 24,000 millimeters (24 meters) ground distance for a objective 1:24,000 USGS quadrangle.

2. Methods of Measuring Straight-line Distance:

a. One method of determining ground distance from a map is to use a ruler to measure the distance between two map points and multiply that by the scale factor. However, this involves doing somewhat complicated multiplication in the field.

b. A simpler way is to use the bar scales located at the bottom of the map. These scales are usually printed in meters, yards, and miles. By taking the ruler or the edge of a piece of paper and mark on it the straight-line distance between the two map points. Then put the ruler or piece of paper under the appropriate bar scale and read the ground distance in the appropriate units.

3. To find the road distance between two points on a map, place a tick mark on edge of the piece of paper and then place the tick mark at the first point. Align the paper with the road edge until you come to a curve, mark the paper and the map at the curve. Pivot the paper so that it continues to follow the road edge to the next curve. Repeat the process until you get to the second point, where you make the final tick mark on the paper. At this point you can take the paper to the appropriate bar scales and determine the ground distance between the first and last tick marks. This will be the road distance between the two points on the map.

Additional Information

More detailed information on this topic is available in Chapter 5 of the Ground Team Member and Leader Reference Text.

Evaluation Preparation

Setup: On an appropriate topographical map, mark two points on the map as A and B (these points should be 3,000 to 4,000 meters apart in ground distance). On a road or trail on the map, mark two points C and D at least 3,000 meters apart ground distance. Give the student the map, a pencil, a strip of paper, and a ruler.

Brief Student: Tell the student to determine the straight-line distance between points A and B to within a 5 percent error and the road distance from C to D to within a 10 percent error.

Evaluation

Performance measures	Results	
The individual calculates the Straight-line Distance:		
1. Measures the straight line distance using the straight edge	P	F
2. Determines the straight-line distance on the bar scale within 5 percent	P	F
3. Completes the above within 2 minutes	P	F
The individual calculates the Road Distance:		
4. Measures the road distance using the piece of paper	P	F
5. Determines the road distance on the bar scale within 10 percent	P	F
6. Completes the above within 2 minutes	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.

O-0213
CONVERT BETWEEN MAP AND COMPASS AZIMUTHS

CONDITIONS

Given a gridded map and an aviation map, each with magnetic variation information.

OBJECTIVES

Perform each of the following within one minute each: convert a magnetic azimuth to a grid azimuth, convert a grid azimuth to a magnetic azimuth, convert a magnetic azimuth to a true azimuth, and convert a true azimuth to a magnetic azimuth.

TRAINING AND EVALUATION

Training Outline

1. In order work with a map and compass, you must understand the concept of *Magnetic Variation (sometimes called declination):*

a. There are 360 degrees in a circle, with 0° (which is also 360°) pointing north, 90° pointing east, 180° pointing south, and 270° pointing west.

b. There are actually three different "norths": true, grid, and magnetic. You must be able to work with all three.

1) True North is the direction along the earth's toward the north pole. Lines of longitude are "true north" lines, since they converge at the north pole. Aviation charts are "True North" maps.

2) Grid North is used by maps that are not gridded in longitude (such a military UTM maps). Grid lines are straight and do not converge at the north pole, so grid north can be different from true north, especially as you get near either pole.

3) Magnetic North is direction along the earth's surface toward the north MAGNETIC pole. This is NOT the same as the north pole -- the north magnetic pole drifts slowly each year, and is never exactly at the north pole. In Maryland, for example, magnetic north is 10° - 11° off of True North. This is important, because your compass will point to magnetic north, but your map will either be drawn to true north or Grid North.

2. Converting from map to compass headings:

a. To convert between Magnetic North and True North on a True North Map:

1) Find the Magnetic Variation (sometimes called declination on non-aviation maps).

a) On an aviation chart, there will be magenta lines running generally from north to south on the chart with degree markings on them (for example "10° W"). Choose the line halfway between the two points you have marked on the chart.

b) On other maps, look to the legend. It should note the magnetic variation, or declination, of the map.

2) Note the number of degrees and whether it labeled East or West

3) To convert True (map) azimuths to Magnetic (compass) azimuths, remember the saying "EAST IS LEAST, WEST IS BEST".

a) If the Magnetic Variation is East, *subtract* the Magnetic Variation from the True azimuth.

b) If the Magnetic Variation is West, *add* the Magnetic Variation from the True azimuth.

4) To convert Magnetic (compass) azimuths to True (map) azimuths, do the opposite of above.

a) If the Magnetic Variation is East, *add* the Magnetic Variation from the True azimuth.

b) If the Magnetic Variation is West, *subtract* the Magnetic Variation from the True azimuth.

b. To convert between Magnetic North and Grid North on a Grid North Map:

1) Find the Magnetic Variation (sometimes called declination on non-aviation maps or the G-M Angle (Grid-Magnetic) on military maps. This should be in the legend, or in a small box near the legend.

2) Note the number of degrees and whether it labeled East or West

3) To convert Grid (map) azimuths to Magnetic (compass) azimuths:

a) If the Magnetic Variation is East, *subtract* the Magnetic Variation from the True azimuth.

b) If the Magnetic Variation is West, *add* the Magnetic Variation from the True azimuth.

4) To convert Magnetic (compass) azimuths to True (map) azimuths, do the opposite of above.

a) If the Magnetic Variation is East, *add* the Magnetic Variation from the True azimuth.

b) If the Magnetic Variation is West, *subtract* the Magnetic Variation from the True azimuth.

Additional Information

More detailed information on this topic is available in Chapter 5 of the Ground Team Member and Leader Reference Text.

Evaluation Preparation

Setup: Provide the student with a gridded topographical map and an aviation map. Ensure each map contains magnetic variation information. Mark a spot on each map. Provide the student with paper and a pencil or pen.

Brief Student: Tell the student that he will have one minute for each of four conversions, and may use paper and pencil for the math. Show the student the marked spot on each map. Tell him that the first two conversions are on the gridded topographical map. Then give the student a magnetic azimuth and ask him to tell you the grid azimuth. Then give him a grid azimuth and ask him to tell you the magnetic azimuth. Now tell him to use the aviation chart. Give him a magnetic azimuth and ask him to tell you the true azimuth. Finally, give him a true azimuth and ask him to tell you the magnetic azimuth.

Evaluation

Performance measures	Results	
1. Correctly converts a magnetic to a grid azimuth within 1 minute.	P	F
2. Correctly converts a grid to a magnetic azimuth within 1 minute.	P	F
3. Correctly converts a magnetic to a true azimuth within 1 minute.	P	F
4. Correctly converts a true to a magnetic azimuth within 1 minute.	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.

O-0215

DETERMINE AZIMUTHS ON A MAP USING TWO POINTS

CONDITIONS

Given a protractor, pencil, straightedge, and a map. You are away from mission base, and must move to another location. You have plotted your position on the map, and the position you are to move to. Now you want to determine the direction to move. Or, you have shot a magnetic bearing to a landmark, and wish to plot this bearing on a map from your position in order to verify the landmark.

OBJECTIVES

Within 2 minutes, the team leader determines the azimuth from one point to another on the map and converts it to the magnetic azimuth. Within 2 minutes, the team member must convert a magnetic azimuth to a grid azimuth and plot it from a known point on a map.

TRAINING AND EVALUATION

Training Outline

1. This task is essential for using a compass and map together. In order to navigate, you must be able to convert a compass heading to a line on a map, and convert a line on a map to a compass heading. Before you train on this task, ensure you can perform task O-0213, Convert Between Map And Compass Azimuths.

2. To determine a magnetic azimuth between two points on a map

a. The objective (protractor) method:

1) Plot both points on a map.

2) Draw a line between the two points (and beyond the second point if necessary to ensure the line is longer than the radius of the protractor).

3) Position a protractor with the center point over the first point (your location), and ensure that the " 0° " mark on the protractor points is aligned with north on the map (called grid north)

4) Read the number off the protractor that is on the line. This is the map (either True or Grid, depending on the map) azimuth.

5) Convert the azimuth to a magnetic azimuth (see separate task O-0213).

b. Alternate method for measuring azimuths without a protractor. First draw the line between the points as described above, and then:

1) With an orienteering (Silva) compass:

(a) Place the compass on the map with one of the baseplate side edges on the line you drew.

(b) While keeping the baseplate still, rotate the compass dial until the "N" on the dial points to grid (or true) north on the map.

(c) Read the number on the compass dial that is in line with "Read Bearing Here" arrow on the baseplate. This is your grid (or true) azimuth).

2. With a lensatic compass (this is less accurate than using a protractor or orienteering compass):

(a) Orient the map to magnetic north (see separate task O-0217)

(b) Place the compass on the map so that the straightedge on the left side of the compass on the line you drew (if your compass does not have a straightedge, use the sighting wire. This is less accurate).

(c) Read the number on the compass dial under the fixed black index line on the glass. This is your magnetic azimuth. If you need a true or grid azimuth, convert as needed (see separate task O-0213).

4. To plot an azimuth on a map.

a. Using a protractor:

1) Ensure you are working with a grid azimuth. If not, convert it (see separate task O-0213).

2) Mark the location you wish to plot the azimuth from on the map.

3) Place the center hole of the protractor on that point, with the 0 degree mark aligned with grid north on the map.

4) Place a mark by the point on the protractor corresponding with the grid azimuth.

5) With a straightedge, connect the two marks.

b. Using an orienteering compass.

1) Ensure you are working with a grid azimuth. If not, convert it (see separate task O-0213).

2) Rotate the compass dial until the azimuth you want to plot is in line with the "Read Bearing Here" line on the base plate.

3) Mark the location you wish to plot the azimuth from on the map.

4) Without rotating the compass dial. Place the center of the compass dial over that point, with the 0 degree (North) mark on the compass dial, oriented with true north.

5) Place a mark on the map at the end of the "Read Bearing Here" line.

6) With a straightedge, connect the two marks.

c. Using a lensatic compass (less accurate):

1. Orient the map to magnetic north (see separate task O-0216)

2. Ensure you are working with a magnetic azimuth. If not, convert it

3) Mark the location you wish to plot the azimuth from on the map.

4). Place one end of the straight edge on the side of the compass on the mark you made on the map.

5) Keeping the straight edge of the compass on the mark, rotate the compass until the index mark lines up with the magnetic azimuth you wish to plot.

6) Draw a line along the compass straight edge. (If your compass does not have a straightedge, you can use the sighting wire, but this is not very accurate).

Additional Information

More detailed information on this topic is available in Chapter 5 of the Ground Team Member and Leader Reference Text.

Evaluation Preparation

Setup: Provide the individual with a protractor, a pencil, a straightedge, and a map with a two points marked on it. Show him which is the start point, and which is the point he wants to go to.

Brief Team Leader: Tell the ground team leader to tell you the magnetic azimuth from the start point to the finish point. Then give him a magnetic azimuth, and instruct him to plot that from the same start point on the map.

Evaluation

Performance Measures	Results	
NOTE: IF THE MAP IS A TRUE NORTH MAP, THE MEMBER SHOULD CONVERT TO AND FROM TRUE NORTH, OTHERWISE, THE MEMBER SHOULD CONVERT TO AND FROM GRID NORTH.		
The individual determines a Magnetic Azimuth:		
1. Determines the correct true (or grid) azimuth from the start to the finish point +/- 2 degrees.	P	F
2. Correctly converts it to a magnetic azimuth	P	F
3. Performs steps 1 and 2 within 2 minutes	P	F
The individual Plots a Magnetic Azimuth:		
4. Correctly converts it to a grid (or true) azimuth	P	F
5. Plots it from the start point +/- 2 degrees	P	F
6. Performs steps 4 and 5 within 2 minutes	P	F

Student must receives a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.

O-0216
ORIENT A MAP TO THE GROUND USING TERRAIN ASSOCIATION

CONDITIONS

Given a objective topographical map in the daylight

OBJECTIVES

Orient the map to North to within 30 degrees within 4 minutes.

TRAINING AND EVALUATION

Training Outline

1. In order to use your map for navigation, you must "orient" the map to the ground. A map is considered oriented when it is in a horizontal position with it's north and south corresponding to north and south on the ground. This allows you to easily see the terrain on the map as it corresponds to the terrain around you. Orienting the map can be quickly done without a compass if there are prominent terrain features nearby.

2. To orient the map:

a. Look at the map and the ground to find two or more terrain features common to both. Examples are hills, saddles, valleys, ridges or cultural features such as buildings or radio towers.

b. Rotates the map until the terrain features are aligned with the map. (For example, if there is a tower to your right and the mountain in front of you, rotate the map until the tower on the map is on the right and the mountain on the map is towards the top). By aligning the terrain features on the map with the same terrain features on the ground, the map is oriented.

c. Whenever possible, use three features, to ensure you do not accidentally orient the map 180 degrees out.

Additional Information

More detailed information on this topic is available in Chapter 5 of the Ground Team Member and Leader Reference Text.

Evaluation Preparation

Setup: Choose an outdoor location with good visibility and readily identifiable terrain features. Provide a map of the area that lists those terrain features to the student.

Brief Student: Tell the student orient the map to the ground. Tell him to describe out loud all the steps he takes.

Evaluation

Performance measures	Results	
1. Identifies three prominent terrain features	P	F
2. Orients the map to north to within 30 degrees	P	F
3. Completes all steps within 4 minutes	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.

O-0217
ORIENT A MAP TO NORTH USING A COMPASS

CONDITIONS

Given a objective topographical map and a compass in the daylight

OBJECTIVES

Orient the map to North to within 10 degrees in less than 4 minutes.

TRAINING AND EVALUATION

Training Outline

1. You want to use your map for navigation. First, you must "orient" the map to the ground. A map is considered oriented when it is in a horizontal position with its north and south corresponding to north and south on the ground. This allows you to easily see the terrain on the map as it corresponds to the terrain around you. Orienting the map with a compass is more accurate than using terrain association, and can be done when there are no visible prominent terrain features.

2. To orient the map using a compass:

a. Hold the map horizontally or place on a flat surface (DO NOT USE THE HOOD OF A VEHICLE OR ANY OTHER METAL SURFACE -- IT MIGHT ATTRACT THE COMPASS NEEDLE)

b. Look at the map and define the north/south grid lines and magnetic variation (see task O-0213 - Convert Between Map And Compass Azimuths). Determine where magnetic north is on the map

c. Hold the compass in front of you such that the north seeking arrow is free to rotate. Rotate your body until the arrow is pointing directly in front of your body.

d. Rotate the map until magnetic north on the map is pointing the same direction as the compass arrow.

e. Verify the map's orientation by checking the location of prominent terrain features.

Additional Information

More detailed information on this topic is available in Chapter 5 of the Ground Team Member and Leader Reference Text.

Evaluation Preparation

Setup: Provide a map of the area and a compass to the student.

Brief Student: Tell the student to orient the map to magnetic north using the compass. Tell him to describe out loud all the steps he takes.

Evaluation

Performance measures	Results	
The individual:		
1. Identifies the magnetic north on the map	P	F
2. Locates magnetic north per the compass	P	F
3. Orients the map to magnetic north within 10°	P	F
4. Checks map orientation with terrain association	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.

O-0420

PERFORM AN AIRFIELD SEARCH (RAMP CHECK)

CONDITIONS

You are leading a ground team that has been tasked to search an airfield and have just arrived at the airfield.

OBJECTIVES

Take all steps necessary to determine if the missing aircraft is at this airport.

TRAINING AND EVALUATION

Training Outline

1. During a missing aircraft search, one of the first priorities of the mission is to investigate airfields in the surrounding area. This investigation is to determine if the missing aircraft may have landed, refueled, or stopped over to avoid weather. Missing planes can be found at the wrong airport for many reasons. The pilot might have landed successfully and gone about his business, not realizing that people are looking for him. Sometimes, aircraft crash near an airport they were trying to land at, or just took off from.

2. Your team may be tasked to search one or more airfields, or you may come across an airfield during a search. In either case, you should follow the following steps:

a. **Contact the Owner**. The first priority is to contact the airfield owner/operator or fixed base operator (FBO). This individual will permit you access to controlled airfields and will also be helpful in obtaining any records. If no FBO is present, you may proceed to search the airfield within the limits of safety and trespassing laws.

b. **Brief your people.** Make sure all your team members know what the missing aircraft looks like, and what it's tail number is. Remind them of possible search clues, including

1) The missing plane itself.

2) Any plane that comes close to the description (it's possible your briefing at mission base contained an error)

3) Any clues that a plane might have crashed near the airport, such as bad weather in the vicinity at the time the plane was lost, trees knocked down, people reporting hearing/seeing something strange, etc. See Task O-0408 - Identify Aircraft Search Clues for more details.

c. **Conduct the search.** Have your team conduct the following search actions (you may divide your team up as you see fit, making sure that inexperienced members are teamed with more experienced members):

1) **Check records.** Check any landing/take-off records at the airport for information on the missing aircraft. Also check any fuel purchase logs. Look for the tail number of the plane you are looking for.

2) **Conduct Interviews**. Interview people at the airport (See Task O-1101 - Conduct Witness Interview). Airport workers, maintenance personnel, or perhaps somebody just 'hanging around' may have seen the missing aircraft or know someone who might have seen it. All of these types of leads must be thoroughly

investigated. Continue to conduct interviews over time - people come and go at airfields all the time, and the person who saw the search target might not be there when you arrive.

3) **Check the flight line**. Have personnel walk down the flight line / tarmac and check the registration numbers on all aircraft parked on the airfield. Look into hangars and check numbers. Each of these should be conducted within regulations and local laws. If on a controlled airport, notify ground control and/or operations before entering operational areas like the ramps and hangars. Use good judgment in deciding to enter hangars or aircraft; you are not normally going to find a person in distress within a hangar or parked airplane, so waiting for law enforcement personnel, the aircraft owner, or the FBO to open it is totally reasonable.

e. **Leave a phone number**. If the search results are negative, leave the mission base phone number and a contact name (normally the incident commander) with the FBO. Request that he continue asking about the missing aircraft to people who come into the airport. Any information that he develops can then be forwarded directly to mission base. **Note: Do not leave the airfield until you receive permission from mission base.**

Additional Information

More detailed information on this topic is available in Chapters 7, 18, and 19 of the Ground Team Member and Leader Reference Text.

Evaluation Preparation

Setup: Prepare a diagram of an airfield (or conduct the test at an actual airfield). Prepare a description of a missing aircraft and its pilot as well as the incident commander's name and phone number. The team leader may use any equipment in his field gear (including this guide).

Brief Team Leader: Verbally brief the team leader on the missing aircraft. Tell him that he has a ground team consisting of himself, one other senior (GTM qualified) and 5 cadets (3 GTM, 2 Trainee). Tell the team leader to describe, in sequence how he will search the airport. Tell him that you will play the role of the FBO. After he has described the search, tell him he did not find the plane, and ask him what he would do now.

Evaluation

Performance measures	Results	
The team leader:		
1. Contacts the FBO and identifies himself and mission	P	F
2. Briefs his team on the missing aircraft and personnel, and what to look for.	P	F
3. Describes how he would use his team to:		
a. Check for landing/takeoff/refueling logs.	P	F
b. Conduct interviews of people at the airport.	P	F
c. Search the flight line and hangers	P	F
4. Does not leave inexperienced team members to operate without supervision.	P	F
5. Requests and receives permission to depart from mission base.	P	F
6. Leaves mission base information with the FBO before departing	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.