UNITED STATES MARINE CORPS
THE BASIC SCHOOL
MARINE CORPS TRAINING COMMAND
CAMP BARRETT, VIRGINIA 22134-5019

NIGHT NAVIGATION
B283376

Night Navigation

Introduction

The darkness of night produces a special kind of friction that often works to turn simple tasks into complex ones, small sounds into gunfire, and a simple night movement into a clumsy, loud, chaotic, and often ineffective exercise. Success with any undertaking at night or during periods of reduced visibility (i.e., fog, whiteout, etc.) depends totally on the amount of time invested in training under those conditions. To gain and maintain proficiency in night operations (all military operations entail some sort of movement), you must invest the time.

Importance

The land navigation package at The Basic School is designed to develop an ability to navigate both in daylight and in darkness. Although the number of hours directly devoted to night navigation initially seems very few, note that all the skills associated with daytime navigation apply directly to navigation at night. Additionally, the skills you learn to navigate at night will be reinforced at every field exercise that follows.

In This Lesson

This lesson covers the following topics:

Learning Objectives

Terminal Learning Objective

0300-PAT-1003: Given periods of daylight or darkness, a route card, lensatic compass, designated points, and protractor, while wearing a fighting load, navigate with a compass to arrive within 100m of each designated checkpoint.

Night Navigation (Continued)

Learning Objectives (Continued)

Enabling Learning Objective

MCCS.18.02b Given individual field equipment, an azimuth, and designated distance, explain how to utilize the bezel ring to navigate in darkness.

Land Navigation Review

Terrain Association

Associating the terrain with the map is the most preferred method of navigation. Proficiency in this skill results in a smooth, confident movement with Marines sure of their location at all times. This skill is best developed during daylight, but the techniques learned apply directly to movement at night. Knowledge and awareness of direction, slope (steepness and type), distance, and landforms will reduce the friction associated with night navigation and help accomplish the mission. In short, applying the techniques and principles of terrain association is not only possible at night, it is a necessity!

Dead Reckoning

Dead reckoning, strictly defined, is a technique that requires little knowledge or awareness of terrain -- it is simply following a designated compass azimuth for a specified distance. The ability to dead reckon is a necessary skill that all Marines must master, but it should not be the only skill mastered.

Combination of Dead Reckoning and Terrain Association

Although navigation via terrain association is preferred, it is not practical in many instances. When factors are such that navigation via terrain association is largely impossible, shift the technique slightly; use dead reckoning with partial emphasis still on terrain association. You must temper the reliance placed on the compass with an awareness of terrain. Even on the blackest of nights, you can tell the relative degree and direction of slopes, as well as the types of landforms (i.e., fingers, draws, hills, etc.), you move over. A careful map study (considering relative slope, direction, and distance between features) prior to movement will result in a detailed knowledge of the terrain to be crossed. This combination of following a careful compass azimuth coupled with a thorough knowledge of the intended route will result in the ability to determine a very accurate estimate of a unit's location after only a few moments under a poncho studying the map.

Remember, an inability to rapidly and accurately determine your location at night could endanger mission accomplishment and the lives of your Marines.

Compass Nomenclature Review

Features used at night

- North seeking arrow (luminous).
- Bezel ring.
- Moveable luminous line (rotated by bezel ring).
- Stationary black index line.
- Two luminous dots (inside front cover).

Setting and Using the Compass Without the Aid of Light

Convert Magnetic Azimuth from Degrees into "Clicks"

Remember

- 120 clicks of bezel ring = complete circle (360°).
- Each click = 3° of rotation.
- To figure in the compass calibration value prior to determining number of clicks.
- When computing clicks, always round off to the nearest click.

Set the Azimuth on the Compass

Initial position: turn the bezel ring until the moveable luminous line is directly above the stationary black index line.

While carefully feeling (listening) for each click, rotate the bezel ring one click at a time in the proper direction (clockwise [CW] or counterclockwise [CCW]). Continue to rotate the bezel until you have counted off the correct number of clicks.

Holding the compass firmly in front of your chest (and level), rotate your entire body. Stop when the north-seeking arrow lies under the moveable luminous line. The luminous line will now be pointed toward magnetic north, and the front cover will be pointed in the direction of your magnetic azimuth.

Proceed in the direction of the front cover.

Keep the north-seeking arrow beneath the luminous line.

Use the center-hold method.

Setting and Using the Compass Without the Aid of Light (Continued)

Set the Azimuth on the Compass (Continued)

Sight across the two luminous dots inside the front cover.

The table below lists the steps to convert the magnetic azimuth from degrees into clicks and provides an example.

Step	Action	Examples
1	Divide azimuth by 3 to obtain the correct number of CCW clicks. Counterclockwise rotation can be used for any azimuth, large or small, but is most effective for azimuths of less than 180°.	77° magnetic azimuth 77° ÷ 3 = 25 2/3 = **26 clicks CCW** 163° magnetic azimuth 163° ÷ 3 = 54 1/3 = **54 clicks CCW**
2	For azimuths larger than 180°, a shorter method is to subtract the azimuth from 360° and divide the difference by 3 to obtain the correct number of clockwise CW clicks.	351° magnetic azimuth 360° - 351° = 9° 9° ÷ 3° = **3 clicks CW** 242° magnetic azimuth 360° - 242° = 118° 118° ÷ 3° clicks = 39 1/3 = **39 clicks CW**

Setting and Using the Compass With Aid of Light

- Lightproof yourself. Use poncho, shelter half, raincoat, etc.
- Set the azimuth on the compass
- Turn the body of the compass until the desired azimuth can be read below the stationary index line.
- Keeping the body of the compass stationary, rotate the bezel ring. Stop the movement when the luminous line is above the north-seeking arrow.
- At this time (when the azimuth can be read beneath the stationary index line and the moveable luminous line is above the north-seeking arrow) the compass is set, just as if it had been set by the previous technique.
- Proceed in the direction of the front cover.

Determining Pace at Night

Factors Affecting Pace

- Slope, Surface, Obstacles, Clothing, Stamina, Load, Weather
- Visibility
- Pace at Night = approximately 1.5 x daytime pace

Methods of Keeping a Pace Count

- Ranger beads
- Knotted cord

Avoiding Drift

Factors Affecting Drift

- Drift is a natural tendency to stray from a straight line of march
- Internal tendencies (especially due to right or left handedness)
- Nature of terrain
- Obstacles

Compensating for Drift

The best way to deal with drift is to practice an awareness of individual tendencies.

Safety Precautions

Keep one arm in front of your body (preferably in front of your face) so you can feel most large obstacles before you walk into them.

Review Questions

Map: Margarita Peak, California, 1:50,000, Sheet 2550 IV, Series V795 Edition 9-NGA

Question 1 You have been tasked with conducting a night movement from hill 646 in MS 6195 to hill 459 in MS 5897.

a. What is the grid azimuth (GA) between these points?

b. What is the magnetic azimuth (MA) you would follow?

c. How many "clicks" and in what direction would you move the bezel ring of your compass?

d. What is the distance, in meters, between these points?

e. Using a rough terrain pace count of 60 paces/100m, what is the pace count between these objectives?

Question 2 You reach your objective (hill 459 in MS 5897) and receive orders to continue your night movement. Your new objective is hill 649 in MS 6097. You conduct a quick map study.

a. What is the GA to your new objective?

b. What is the MA to your new objective?

c. How many "clicks" and in what direction would you move the bezel ring?

d. Describe, in detail, the terrain you will cross en route to your objective.

e. Prior to stepping off, you decide to recalibrate your compass. The calibration point azimuth reads 129° while your compass shot 132°. What azimuth would you now follow to your objective?

f. How many "clicks" and in what direction would you now move the bezel ring?

Review Question Answers

Question 1

a. **303° GA**

b. **290° MA**

(1) Utilizing MA ± grid magnetic (GM) = GA:
MA + 13° = 303°
MA = 47°-13°
MA = 290°

(2) Utilizing Left Add Right Subtract (LARS): Start at the grid declination line of the declination diagram and travel to the mag declination line. In this case you go to the right, so you would subtract the GM angle from the GA.

c. **23 clicks CW**
360° - 290° = 70°
70° / 3 = 23° clicks CW

d. **3100m** (± 25m tolerance)

e. **1860 paces**
(3100m)(60paces / 100m) = 1860 paces

Review Question Answers (Continued)

Question 2

a. **72° GA**

b. **59° MA**

c. **20 clicks CCW**

d. **Head downhill from hill 459 crossing multiple intermittent streams, travel across a draw oriented NE to SW before pushing up a uniform steep slope to hill 649**.

e. **62°**
Compass error = +3°
Therefore 59° + 3° = 62°

f. **21 clicks CCW**

Summary

In all previous land navigation classes you were taught the principles of land navigation during the day. During periods of darkness and low visibility these principles remain the same. To be successful you will need to apply these same principles in times of low visibility.

References

Reference Number or Author	Reference Title
FM 3-25.26	Map Reading and Land Navigation

Glossary of Terms and Acronyms

Term or Acronym	Definition or Identification
Bezel ring	Outer rotating portion of lensatic compass face
1 Bezel ring click	Equals 3 degrees
Dead reckoning	Following a designated compass azimuth for a specified distance
Drift	Drift is a natural tendency to stray from a straight line of march
LARS	Left Add Right Subtract
MA±GM=GA	Magnetic Azimuth ± Grid Magnetic = Grid Azimuth

Notes