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	<p style="text-align: center;"><u>LESSON PLAN : MR 7</u> <u>PRISMATIC COMPASS AND ITS USE AND GPS</u></p> <p>Period - Two</p> <p>Type - Lecture/Practice</p> <p>Code - MR-7</p> <p>Term - I&II</p> <hr/> <p><u>Training Aids</u></p> <p>1. Compass Prismatic, GPS, Computer Slides, Pointer, Charts, Black board & Chalk.</p> <p><u>Time Plan</u></p> <table><tr><td>2.</td><td>(a)</td><td>Introduction</td><td>-</td><td>05 Min</td></tr><tr><td></td><td>(b)</td><td>Types of compass, How to take a bearing</td><td>-</td><td>35 Min</td></tr><tr><td></td><td>(c)</td><td>Compass errors and GPS</td><td>-</td><td>35 Min</td></tr><tr><td></td><td>(d)</td><td>Conclusion</td><td>-</td><td>05 Min</td></tr><tr><td></td><td>(e)</td><td>Practice</td><td>-</td><td>40Min</td></tr></table> <p style="text-align: center;"><u>INTRODUCTION</u></p> <p>3. The magnetic compass has been and is being used extensively in ships, aircraft and the various branches of the army to find and maintain direction. The prismatic compass is an accurate and reliable instrument of great value except during a "magnetic storm" or when subject to strong local magnetic field e.g. in polar regions. With the prismatic compass one can measure magnetic bearing on the ground</p> <p style="text-align: center;"><u>AIM</u></p> <p>4. The aim of this lecture is to introduce the cadets to the basics of Compass Bearing, understanding compass errors and use of GPS.</p> <p style="text-align: center;"><u>PREVIEW</u></p> <p>5. The lecture will be conducted in the following parts:-</p>	2.	(a)	Introduction	-	05 Min		(b)	Types of compass, How to take a bearing	-	35 Min		(c)	Compass errors and GPS	-	35 Min		(d)	Conclusion	-	05 Min		(e)	Practice	-	40Min
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- (a) Part I - Type of Compasses and acquiring a bearing
- (b) Part II - Compass errors and Introduction to GPS

(a)

PART I : TYPES OF COMPASS AND TAKING BEARING

Types

6 There are two types of prismatic compass, the dry and liquid filled. Liquid type is easier to use though it is less sensitive.

Description

7. The names of various parts are shown below:-

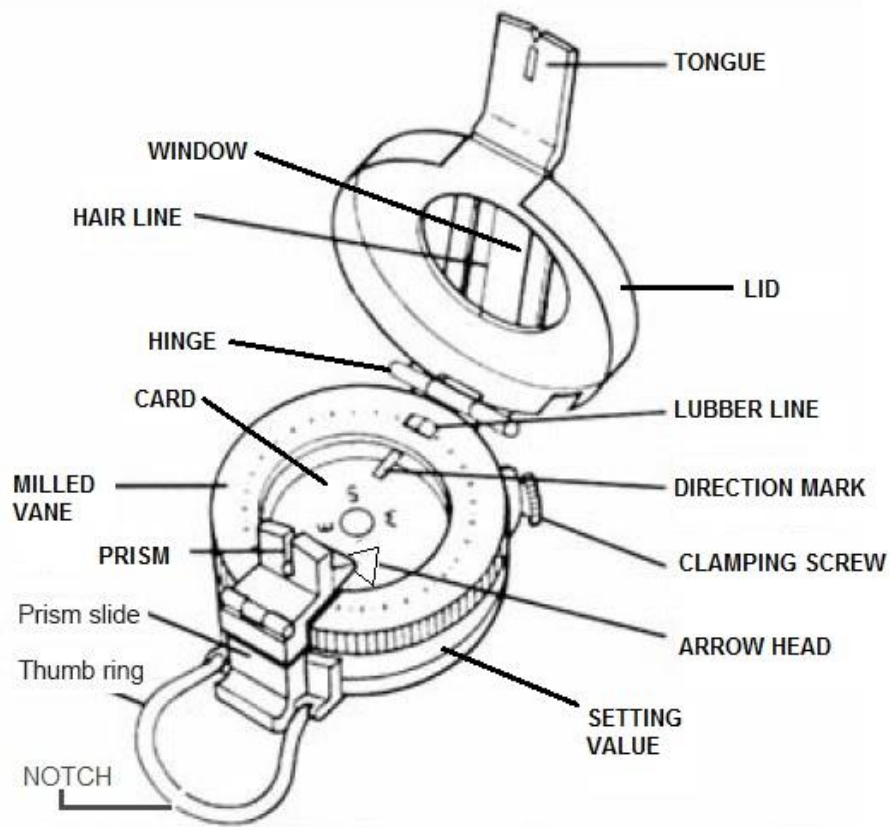


Fig-7

How to Take a Bearing

8. Open the lid so that it is roughly at right angle to the body of the compass.
9. Turn the prism casing over so that it lies flat on the face of the compass. Put your thumb through the ring and your forefinger underneath the compass and hold it so that it attains horizontal level.

10. Bring the prism upto the eye and you will see two things:-

- (a) Above the prism, through the slot on the case, the hair line on the window.
- (b) Through the prism itself, a set of figures.

11. The compass must be held so that the hair line is vertical and cuts the object on to which the bearing is being taken. The reading is determined by noting where the bottom of the hair line cuts the set of figures beneath it.

(b)

PART II :COMPASS ERRORS AND GPS

Compass Error

12. Sometimes due to the presence of imprurities in the material of which a compass is made or other reasons, the magnetic needle may not point toward the magnetic NORTH but a little to the EAST or WEST of it. This deviation of the magnetic needle in the compass from the magnetic NORTH is termed compass error.

- (a) The compass error is said to be 2 degrees EAST if the compass needle points 2 degrees EAST of magnetic NORTH. The compass error is 5 degrees WEST if the compass needle points 5 degrees WEST of magnetic NORTH.
- (b) Always draw a rough diagram showing the magnetic NORTH and the compass NORTH with the error, you will then see whether you have to subtract or add when converting compass bearing into magnetic bearing and vice versa.

Global Positioning System

13. Global Positioning System (GPS) refers to a system of satellites and receivers that allows people and devices to pin point their precise location on the earth. The normal GPS operational constellation consists of 24 satellites that orbit the earth in 12 hours. The satellite orbits repeat almost the same ground track each day. The orbit altitude is such that the satellites repeat the same track and configuration over any point. There are six orbital planes with four space vehicles in each, equally spaced 60 degree apart and inclined about 55 degree with respect to equatorial plane. The constellation provides the user with 5-8 space vehicles visible from any point on the earth. Devices that are equipped with GPS equipment receive transmission from at least a few of the satellites and are able to discern very precise positioning data.

14. The first GPS satellite was launched in 1974 and the 24th was launched in 1994. The new satellites are periodically launched to replace the ageing ones. GPS is funded by and controlled by the United States, Department of Defence.

15. The application of GPS is very broad and number of users is increasing dramatically. With improved technology, small portable GPS receivers have become very handy and accuracy is remarkable. These devices are used by fishermen and hikers to navigate. Today, many vehicles are equipped with GPS to help the drivers to navigate. In the Armed Forces, GPS has made navigation very easy. All aircraft, ships and specialist vehicles are equipped with GPS. In the Army, GPS is commonly used in battle fields and insurgency affected areas. It assists troops to navigate through jungles, mountains and deserts. GPS is also used to guide missiles to pre specified targets.