SER No	CONTENT

LESSON PLAN : MR 8
SETTING OF A MAP, METHODS OF FINDING NORTH AND FINDING OWN POSITION

Period - Four

Type - Lecture/Practice

Code - MR 8

Term - II

Training Aids

1. Map sheets, Compass, Service Protractor, Pointer, Charts, Black board & Chalk.

Time Plan

1.	(a)	Introduction and Aim	-	05 Min
	(b)	Setting of Map and methods ,	-	35 Min
	(c)	Finding North and finding own position on map		-35 Min
	(d)	Conclusion		-05 Min
	(e)	Practice		-1h 20 Min

AIM

3. The aim of this lecture is to introduce the JD/JW NCC Cadets to the method of setting of maps, and finding own position on map.

PREVIEW.

4. The lecture will be conducted in the following parts:-

(a) Part II - Map setting by various methods

(b) Part III - Finding North and own position on map

PART I: METHODS OF SETTING A MAP

(a)

Setting of Map

(b)

5. A map is said to be set or oriented when it is placed such that it correspcnds directly with the ground i.e. when true NORTH on the map points to true NORTH on theground. Obviously it is easier to read a map when the objects on it are pointing in the same direction as the objects on the ground.

Methods of Setting a Map

6. There are two methods of setting a map - by compass and by objects on the ground.

7. **Setting by Compass** Draw a line showing magnetic NORTH from a point on a grid line. Open the compass and lay it flat on the map over the above drawn diagram, which will show the magnetic variation so that the hair line on the window lies along the magnetic NORTH line on the diagram. Then turn both the map and the compass till the needle points along the hair line. The map is now set, since the magnetic NORTH line on the map is pointing in the direction of magnetic NORTH as indicated by the compass needle.

8. (a) **Without a Compass when Own Position is Known.**

(i) Using a straight edge, for instance railway line.

(ií) Recognise one object on the ground and on the map and join own position to that object. Hold the map so that when looking along the line you see the object on the ground in the same straight line.

(b) **Without a Compass when Own Position is not Known.**

(i) **Parallel Method.** Select two landmarks such as road, railway line and so on which are easily recognizable on the map. If continuous landmarks are not visible, choose two objects and imagine a line joining them. With each landmark, make the corresponding landmark on the map parallel and the map will roughly be set.

(ii) **On/Near Line Joining Two Points**. Identify two nearby objects on the map and the ground. Stand on an imaginary line joining them and set the map.

PART II: FINDING NORTH AND OWN POSITION

Finding North

9. **Without Compass**. The position of NORTH can be discovered by one of the following methods:-

(a) **Watch Method**. Point the hour hand of your watch toward the sun. A line

bisecting the angle between the hour hand and the direction of the 12 O'clock will then point due SOUTH. It must be ensured the the angle bisected must always be that which is less than 180 degrees. It is a rough method and applies only in the northern hemisphere.

(b) **Equal Altitude Method**

(i) Take a fairly large piece of paper or card board and spread it flat on the ground. In the centre fix a pencil or piece of wood perpendicular to the ground. It can be done with the help of a coin fixed at the base of pencil or wood with sealing wax or by directly pushing it in the ground.

(ii) The pencil will throw on the paper a shadow as shown by the dotted line AB of Fig below. Where the shadow ends make a mark B, and then from the base of the pencil draw a circle of radius AB,

(ii) Wait till after mid day until the sun has moved around sufficiently to throw another shadow as indicated by the dotted line AD i.e. of the same length as the original shadow AB.

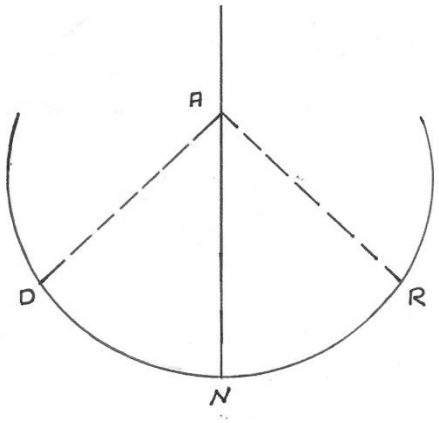

Fig-8

(iv) When this is so, draw a line AN bisecting the angle formed by the two shadow lines. This will point to TRUE NORTH.

(v) This is extremely accurate way of finding north but it is of no use on cloudy or dull day. It is also a very time consuming process as the work should start earlier than mid day.

(c) **By Stars**. In the Northern hemisphere, the Pole star indicates the position of True North to within 2 degree. It is a bright star and it can be found by protruding a line from Great Bear. The pole star will be found slightly off this line on the side remote from the remaining stars of the Great Bear.

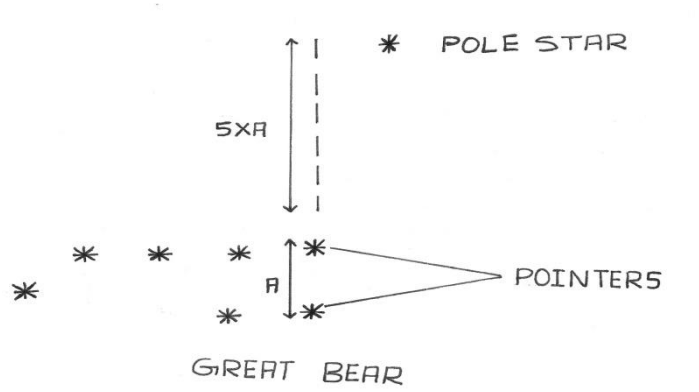

Fig-9

Finding own position on Map

10. **Methods of finding own position on Map**

(a) By resection method or Compass method

(b) By resection method without Compass

(c) By Inspection method.

11. **Resection with Compass method.**

(a) Recognise three prominent features (A, B, C) on map and on the ground as well. These three prominent features must not be more than 180 or less than 30 apart. They should be as far as possible and clearly visible.

(b) The bearing of these points be taken and converted into Grid bearings.

(c) Then, on the map the back bearings from these points must be plotted, and the point of intersection will be the required position.

(d) In order to do an accurate resection, three or more objects are necessary. But in that case if the three rays do not intersect at the same point, a triangle of error is obtained. The center of triangle is the point of your own position.

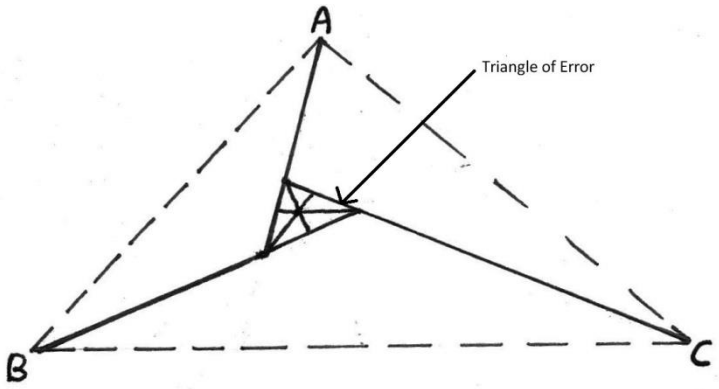

Fig-10

12. **Resection without Compass.** In case compass is not available, resections can still be carried out with the help of a piece of tracing paper. Identify three distant prominent objects on the ground and map. Take a piece of tracing paper and pin it on to a map board, make a point on it to represent position. Then draw a straight line along the straight edge of ruler thought the point and in the direction of one of the three distant prominent objects. Now without moving or disturbing the board, repeat the process for the other two objects. Remove the tracing paper from the board and apply it to the map so that the three rays pass through the corresponding distant objects marked on the map. The point, where three rays intersect each other will be the required position.

13. **By Inspection Method**. By inspections is meant a careful and detailed study of the ground and features both on the map and the ground and features on the map and on the ground. The method consists of:-

(a) Setting the map

(b) Recognition of general area of own position on the map

(c) A close study of the ground details