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TYPES OF BEARING AND USE OF SERVICE PROTRACTOR

LESSON PLAN MR 2
(Part 1)

Lt. Dr. A. Edward Samuel, Associate NCC Officer, 1 Coy, 8 TN BN NCC, GAC(A), Kumbakonam

Bearing and its Conversion Methods

Types of Bearing

The clockwise angle formed by a straight line joining two points and direction of NORTH, is called the bearing between the two points. A bearing is always measured clockwise.

They are three types as given below

(a) Grid Bearing

Measured on the map from the Grid North by the help of a protractor
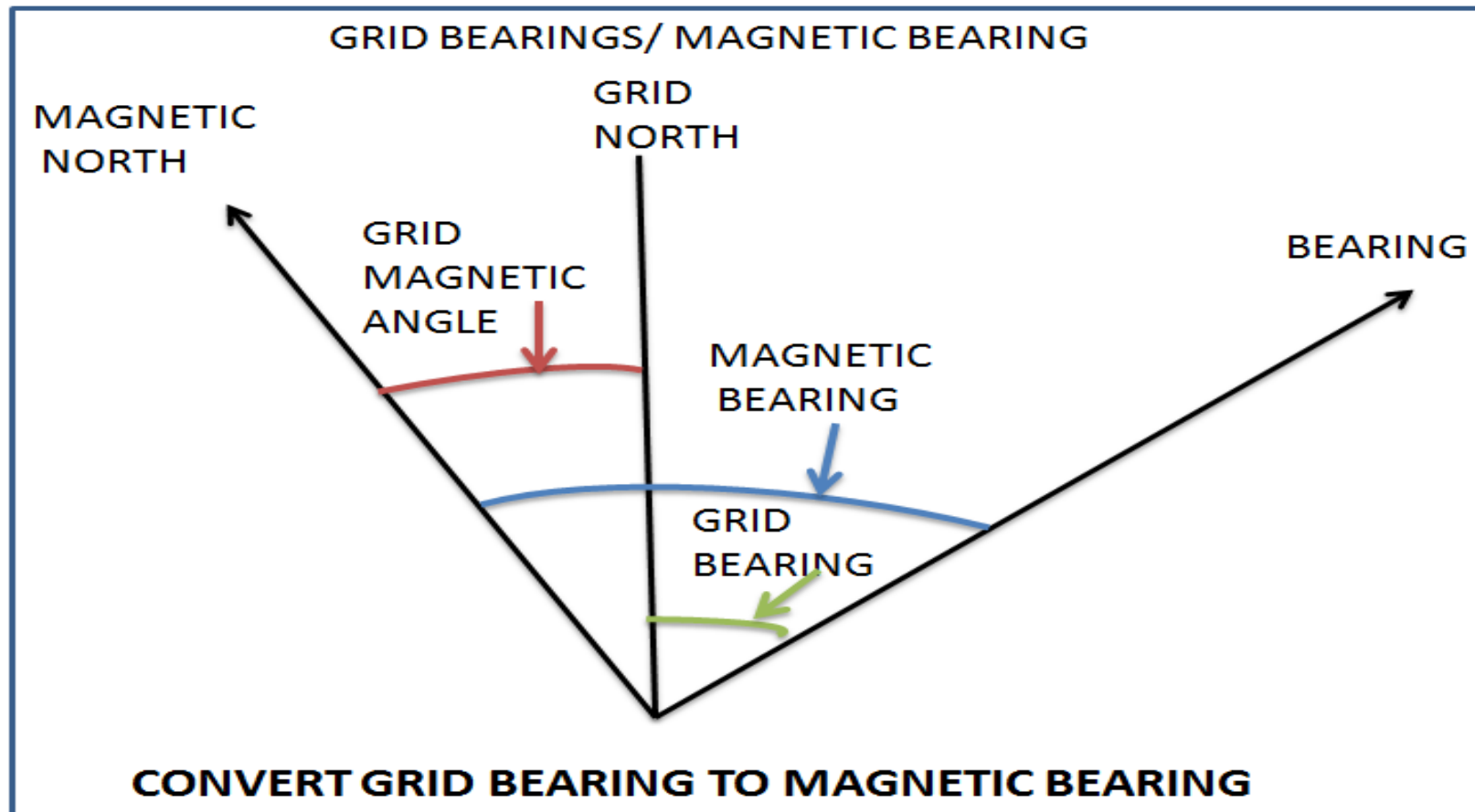
(b) Magnetic Bearing

Measured from Magnetic North by the compass

(c) True Bearing

Calculated by finding out the relation of True NORTH and Grid NORTH or Magnetic NORTH

GRID BEARINGS/ MAGNETIC BEARING

CONVERT GRID BEARING TO MAGNETIC BEARING

To Convert a Magnetic Bearing to a Grid Bearing

Suppose the bearing of a certain point P is measured with a compass and is found to be 160 degrees. To convert this Magnetic Bearing to a True Bearing, follow under mentioned steps:

(a) First find out the Magnetic Variation of the Area. Magnetic Variation is given on the Top Right corner of each Map

(b) Suppose 5 degree is the magnetic variation of the area. Now subtract this Magnetic Variation to the Magnetic Bearing.

(c) The resultant is the Grid Bearing i.e., 155 degree.

To Convert Grid Bearing to Magnetic Bearing

(a) Measure the Grid Bearing of an object on the map with help of the service protractor from your own position.

(b) Suppose the Grid Bearing of the object is 150 degree

(c) Now, find out the Magnetic Variation of the area with the help of Map (Magnetic Variation is given on the Top right corner of the map). Suppose Magnetic Variation of the area is 6 degree
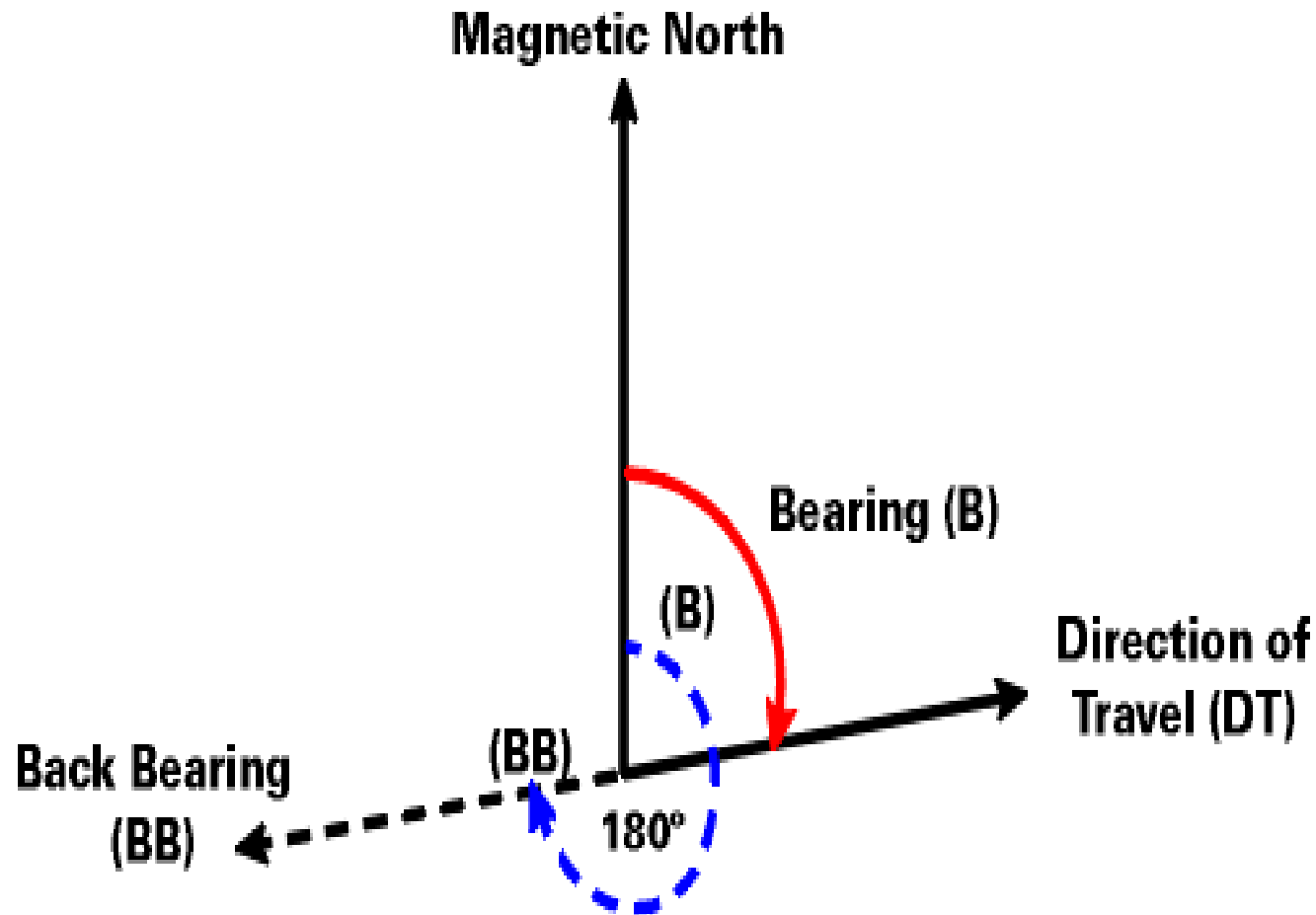
(d) Now, add this Magnetic Variation to the Grid Bearing.

(e) The resultant will be the Magnetic Bearing of the object i.e. 156 degree

Back Bearing

It is the bearing taken from the observation point back on to the original position. In practice it is not necessary to move to the observation point as it can be calculated. The rule is that if the bearing is large enough to have 180 degrees subtracted from it this should be done. If it is smaller this figure should be added.

Back Bearing. It is bearing taken opposite of original position of object. The rule is that if the bearing is less than 180° add 180° and if bearing is more than 180° then subtract 180°

(a) If forward bearing of an object is 240° then its back bearing will be $240^o - 180^o = 60^o$.

(b) If forward bearing of an object is 70° then its back bearing will be $180^o + 70^o = 250^o$.

Lt. Dr. A. Edward Samuel, Associate NCC Officer, 1 Coy, 8 TN BN NCC, GAC(A), Kumbakonam

Magnetic North

Bearing (B)

(B)

Direction of Travel (DT)

Back Bearing (BB)

(BB)

180°

Back Bearing = (180 + Bearing)

Service Protractor and its Uses

The service protractor "A" Mark IV is an instrument used for plotting and measuring bearing on the map. It is an essential link between the compass and the map. With the help of the protractor the magnetic bearings have been converted to grid bearing and transferred to the map.

Description

The protractor is made of cardboard or ivories (flexible material) and it measures 6 inches long and 2 inches wide.

PROTRACTOR, RECTANGULAR, 150mm x 50mm.
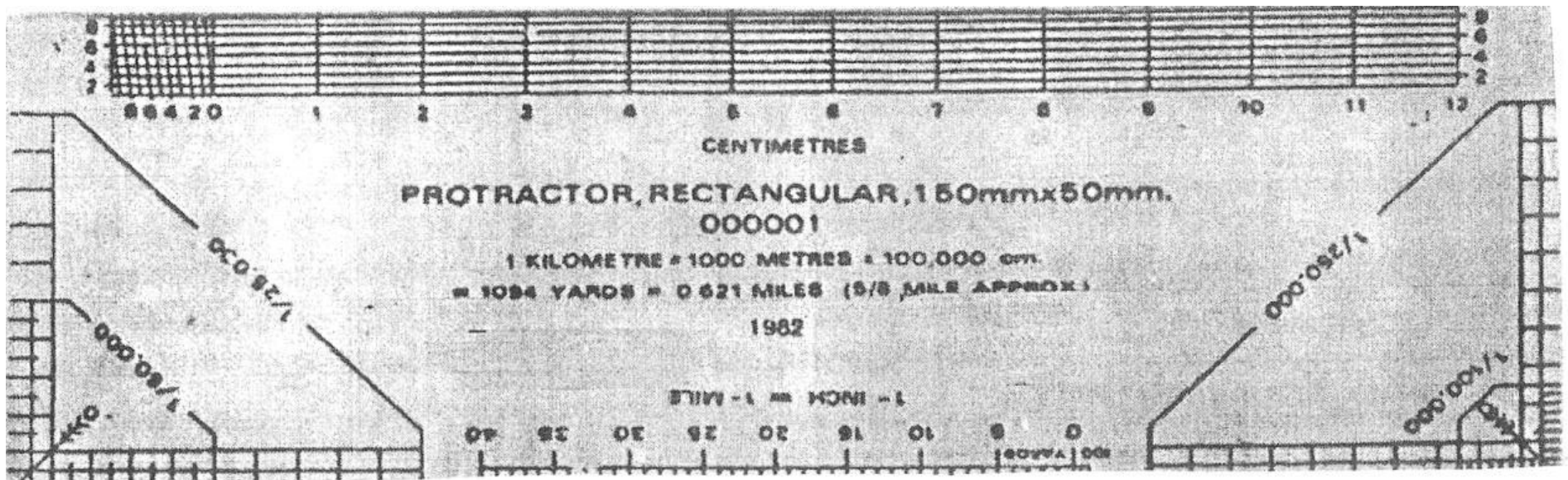
Scale of Protractors

The main purpose of the protractor is to measure angles and bearings as described in the preceding paragraphs. The protractor also shows on both its faces a number of the more common map scales. The respective scale lines are drawn out and divided into primary and secondary divisions in exactly the same way as atthe bottom of the map.

Measuring a Bearing

The angle can be measured by drawing a line from the graduation to the point zero on the protractor. The required angle will be the gap between this line and the line joining the zero.
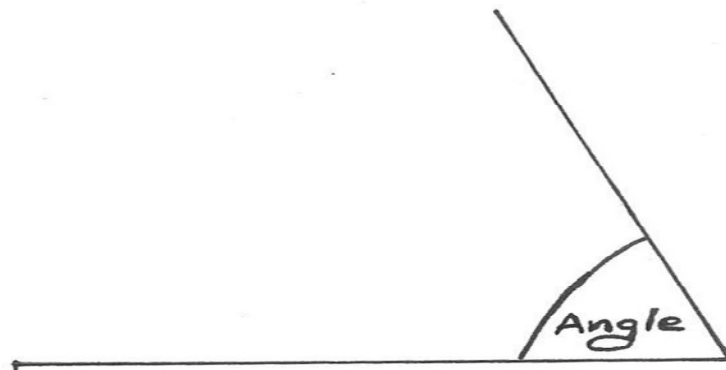
Uses of Protractor

The service protractor is an essential item of Map Reading. With its help one can:

(a) Plot and measure bearing on paper or on a map. For bearing between 0 and 180 degrees their Zero edge must be on the LEFT and for $180^o - 360^o$ it must be on the RIGHT.

(b) Measure distance in inches/cm correct upto $1/100^{th}$.

(c) Measure distance in yards, meters or miles on a map by using the appropriate scale

(d) For using the diagonal scale one must use an intermediate agent. Mark off the distance to be measured on the straight edge of a paper or by means of a divider and then put the paper or divider on the diagonal scale and measure

Conclusion

Taking out correct magnetic bearing of an object is very important. Converting Magnetic bearing into Grid bearing and vice versa should be known to identify object on map and ground. Use service protractor to find out the distance and grid bearing of one object to another on the map should be known for accurate navigation.

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THANK YOU

JAI HIND