



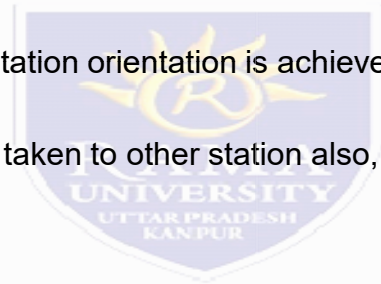
FACULTY OF ENGINEERING AND  
TECHNOLOGY (DEPARTMENT OF  
CIVIL ENGINEERING)

## Lecture -03

# METHODS OF PLANE TABLE SURVEYING

### TRAVERSING

- This method is like a compass or a theodolite traversing. The table is set in each of the stations in succession. A foresight is taken to another station, and the distance is cut into a suitably chosen scale.
- This method is used for locating plane table survey station.
- In this method, ray drawn to next station before shifting the table and distance between the station measured.
- The distance is scaled down and next station is located.
- After setting the plane table at new station orientation is achieved by back sighting.
- To ensure additional check, rays are taken to other station also, whenever it is possible.



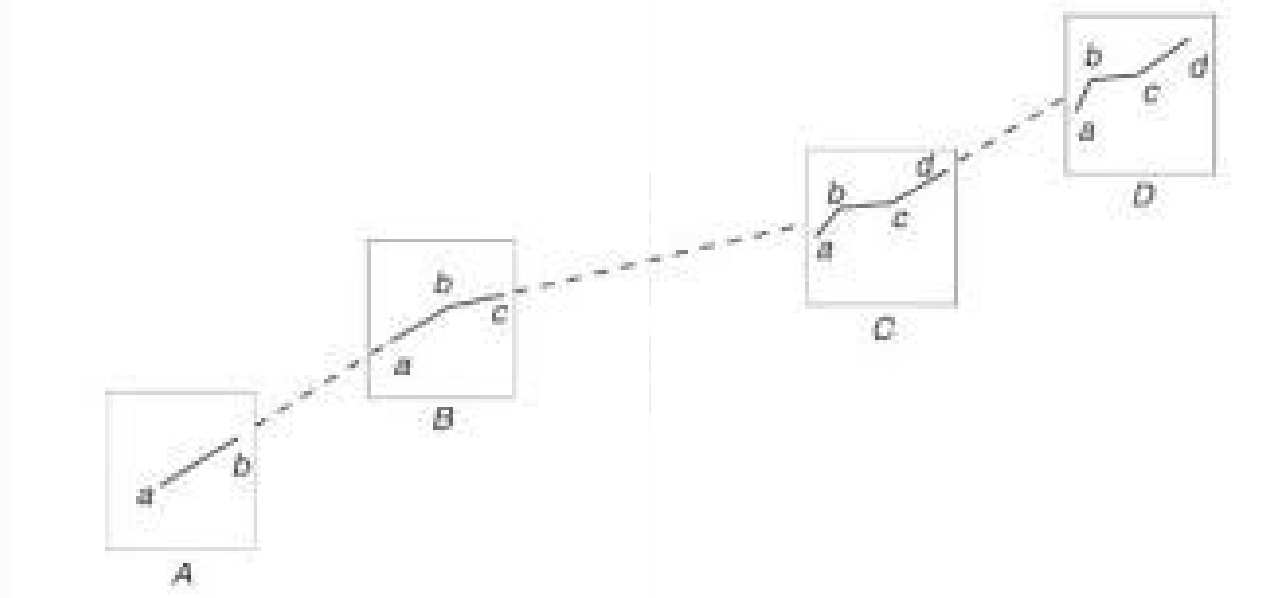
### PROCEDURE

- Set up the plane table at the initial station **A** (as per below figure). Transfer ground station **A** as **an** on the drawing sheet.
- Draw a ray **aB** along the fiducial edge with the alidade pivoted against **a**.
- Cut the distance **ab** to the selected scale. Shift and set up the table at **B**. Orient the plane table.
- Place the alidade at **b** and sight station **C**. Draw a ray **bC** along the alidade and cut the distance **bc** to the selected scale. The procedure is carried out till all the stations are traversed.

# METHODS OF PLANE TABLE SURVEYING

## SUITABILITY

- It's most suited if a narrow strip of this terrain is will surveyed, e.g., a survey of streets, railways, etc.
- This method may be used for traversing the open in addition to close traverses.

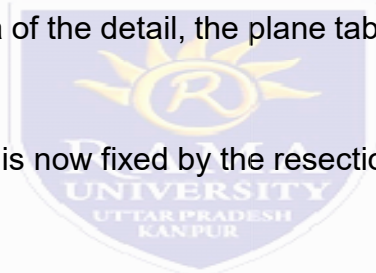


**Traversing with table survey**

# METHODS OF PLANE TABLE SURVEYING

## RESECTION

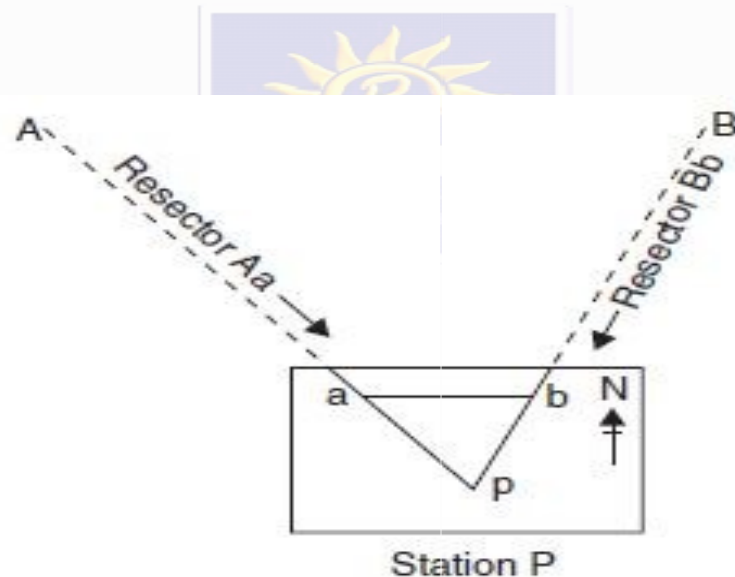
- This is an orientation technique that fixes the position of the plane table station in a plan.
- When a number of points already fixed by plane table or otherwise are available in plan, it is often convenient to set up the plane table at some arbitrary station and pick up detail from there.
- This adds to the flexibility of a plane table survey. Conspicuous points such as temple-tops, church spires, and hilltops already fixed by any method are not convenient points on which a plane table can be set, and from which low-lying detail can be fixed.
- If such points are visible from the area of the detail, the plane table can be set up to pick out the detail from an arbitrary location near it.
- The position of the plane table in plan is now fixed by the resection procedure. A point determined by resection is called a plane table fix.
- The following methods are employed in the method of resection:
  - a) By compass
  - b) By back sighting
  - c) By solving two point problem
  - d) By solving three point problem



# METHODS OF PLANE TABLE SURVEYING

## RESECTION AFTER ORIENTATION BY COMPASS

- Let  $a$  and  $b$  be the plotted positions of  $A$  and  $B$  of two well defined points in the field. Keeping the trough compass along north direction marked on the drawing sheet table is oriented on station  $P$ , the position of which is to be found on paper.
- The resectors  $Aa$  and  $Bb$  are drawn to locate ' $p$ ' the plotted position of station point  $P$ .
- This method gives satisfactory results, if the area is not influenced by local attractions. It is used for small scale mapping only.



**Fig. 14.10.** Resection after orientation with compass

# METHODS OF PLANE TABLE SURVEYING

## Resection after Orientation by Back Sighting

- The scheme of resection after orientation by back sighting. From station A, the position of B is plotted as 'b' and ray has been taken to station P as ap'.
- Then plane table is set at P and oriented by back sighting A, line AP is not measured but the position of P is obtained on the paper by taking resection Bb.

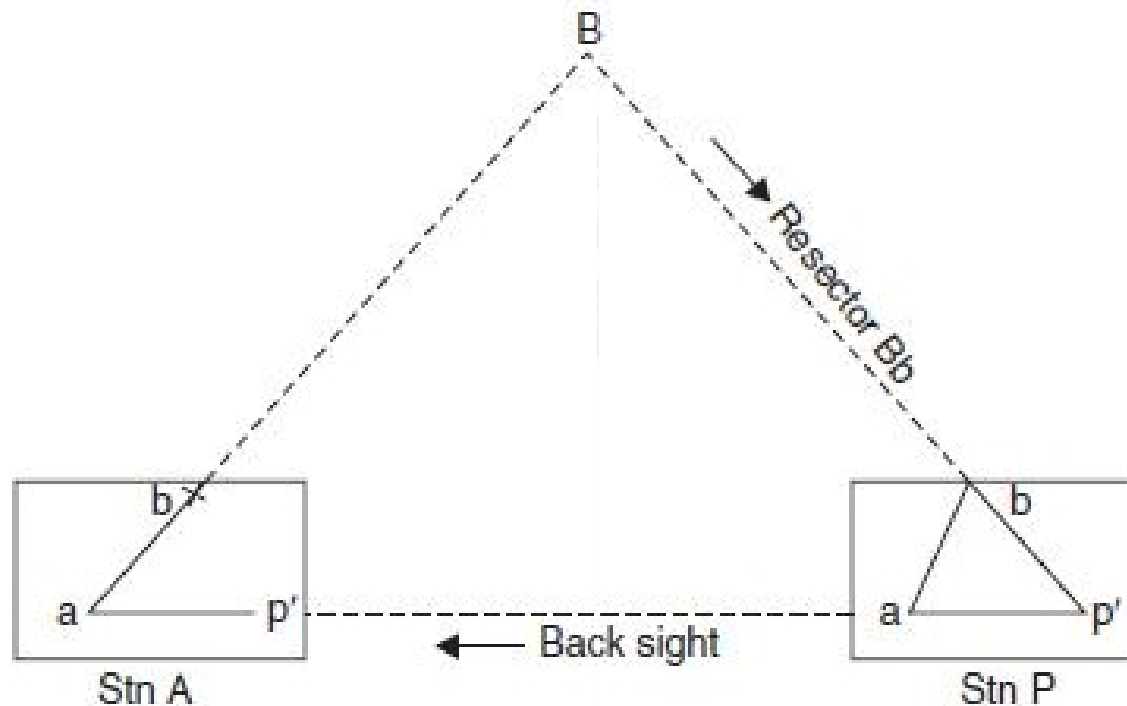


Fig. 14.11. Resection after back sighting

# METHODS OF PLANE TABLE SURVEYING

## RESECTION AFTER SOLVING TWO POINT PROBLEM

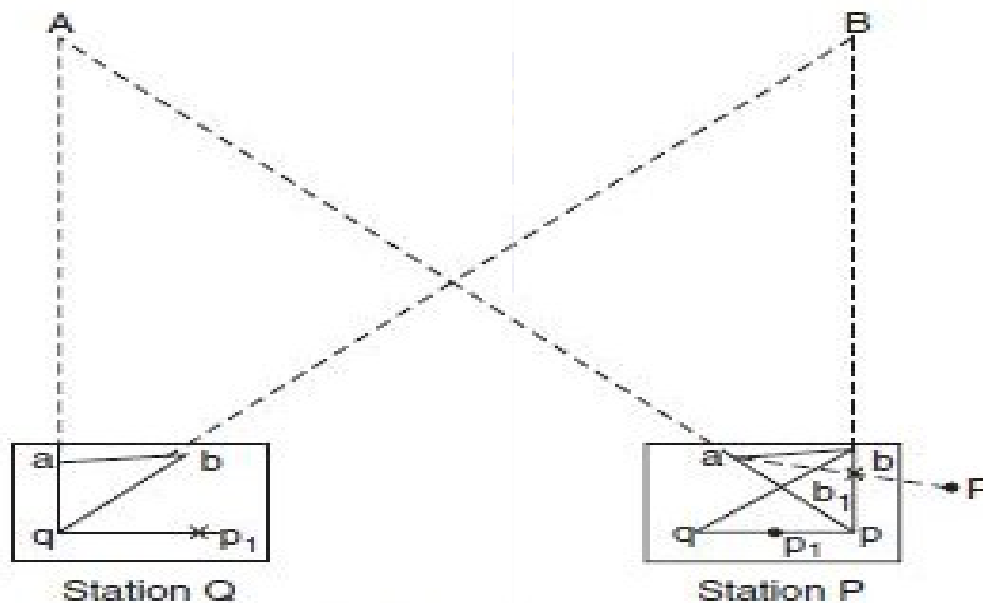
- The problem of finding plotted position of the station point occupied by the plane table with the help of plotted positions of two well defined points is known as solving two point problem.
- Let A and B be two well defined points like lightning conductor or spire of church, the plotted positions a and b already known. Now the problem is to orient the table at P so that by resection its plotted position p can be obtained.

### The following steps may be followed to solve this problems:

- I. Select a suitable point Q near P such that the angles PAQ and PBQ are not acute.
- II. Roughly orient the table at Q and draw the resectors Aa and Bb to get the point 'q'.
- III. Draw the ray qp and locate p1 with estimated distance QP.
- IV. Shift the plane table to P and orient the table by back sighting to Q.
- V. Draw the resector Aa to get 'p'.
- VI. Draw the ray pB. Let it intersect line bq at b1.

# METHODS OF PLANE TABLE SURVEYING

- VII. The points  $b$  and  $b_1$  are not coinciding due to the angular error in the orientation of table. The angle  $bab_1$ , is the angular error in orientation. To correct it,  
\* Fix a ranging rod at  $R$  along  $ab$ , \* Unclamp the table and rotate it till line  $ab$  sights ranging rod at  $R$ . Then clamp the table. This gives the correct orientation of the table which was used in plotting the points  $A$  and  $B$ .
- VIII. The resectors  $Aa$  and  $Bb$  are drawn to get the correct plotted position ' $p$ ' of the station  $P$ .



**Fig. 14.12. Two-point problem**



***THANK YOU***

