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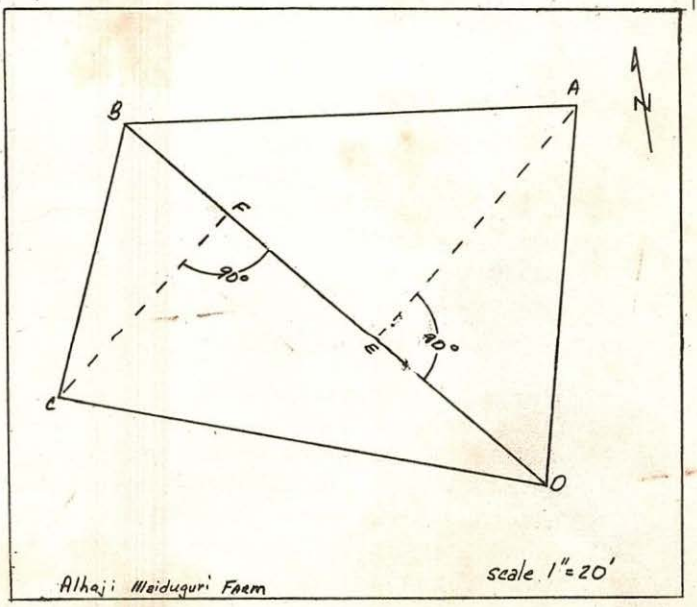
GUIDE TO

SIMPLE MAP MAKING USING



THE PLANE TABLE

EXTENTION GUIDE No 74

series

Engineering ~~Services~~ No 9

GUIDE TO SIMPLE MAP MAKING USING THE PLANE TABLE

INTRODUCTION :

In the performance of his duties the extension worker is often called upon to determine the area of a piece of land. Crop yields, seeding and fertilizer rates, and many other items cannot be calculated unless the area is known or determined. One simple method of mapping a field is by using an improvised plane table (any flat surface). The method is quick, requires a minimum of equipment, and is fairly accurate.

EQUIPMENT REQUIRED :

The equipment necessary consists of the following :

1. A flat surface to which paper is attached.
2. Ruler (fitted with two pins to serve as sights).
3. Tape for measuring distance. (Pacing may be used instead).
4. Paper and pencil.

PROCEDURE FOR MAPPING :

The procedure is as follows :

1. Place the flat surface (plane table) at some point O near the centre of the field (Figure 1). Have the surface as nearly level as possible and make sure all corners of the field are visible.
2. Attach the paper to the plane table. (Pins or masking tape can be used).
3. Place a dot on the paper to represent point O. (Figure 1).
4. Select a scale for the map. Write the scale on the map so it can be referred to later.
5. Place the edge of the ruler on the dot O. (Figure 2).
6. Rotate the ruler around O till the first corner A in the field boundary is viewed. (Figure 2).

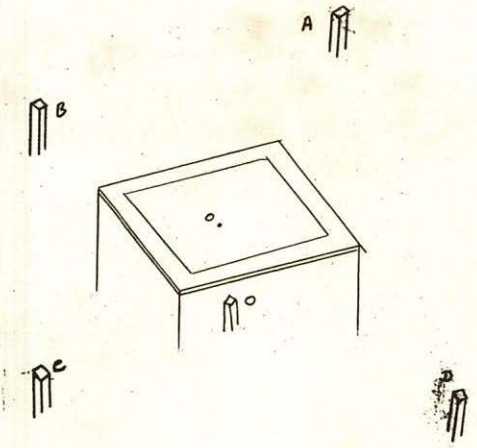


Fig 1

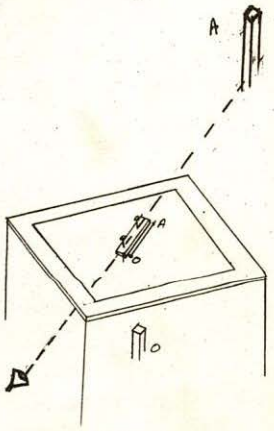


Fig 2

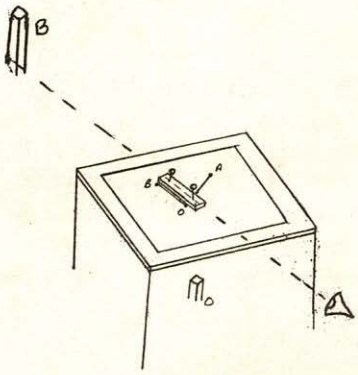


Fig 3

7. From O on the paper draw a line lightly along the edge of the ruler towards the corner (Figure 2).
8. Measure the distance from O to the corner along the ground.
9. Plot this distance to scale along the line on the paper.
10. This point represents the corner of the field on the map.
11. Place the edge of the ruler on point O and rotate the ruler till the next corner in the field is viewed. (Figure 3).
12. Repeat steps 7 to 11 till all the desired points on boundary have been located. (Figures 4 and 5).
13. Connecting the dots on the paper representing adjacent corners results in a map of the field (Figure 6).

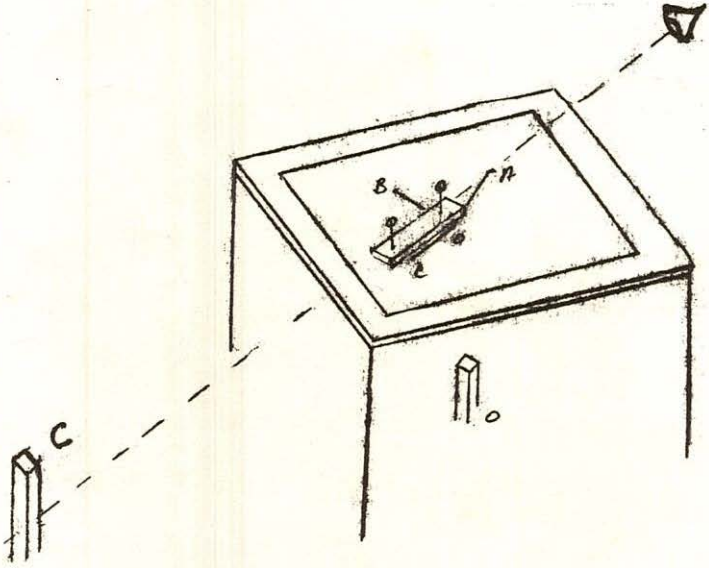


Fig 4

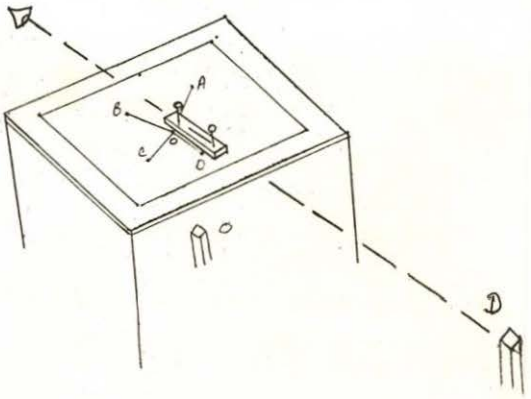


Fig 5

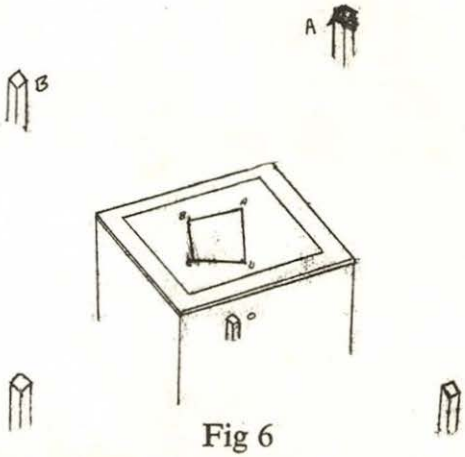


Fig 6

DETERMINING THE AREA :

1. Divide the map into triangles. (Line BO in Figure 7).
2. Construct altitudes in each triangle (Line AE and CF in Figure 7).
3. Measure the length of the base and altitude for each triangle.
4. The area of each triangle can be found using the equation :

   Area = $\frac{1}{2}$(base x altitude).

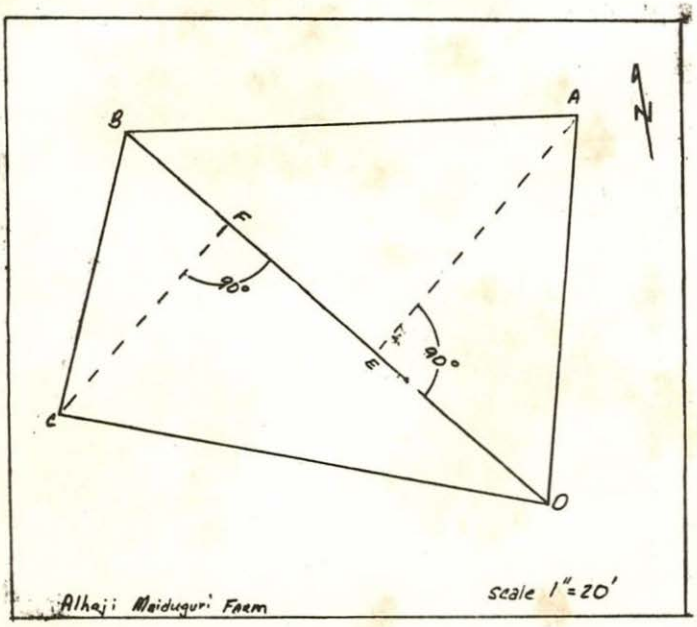


Fig 7

5. Total area is now found by adding the areas of the individual triangles. Remember that one hectare contains 10,000 square metres. One acre contains 43,560 square feet. One hectare equals 2.471 acres.
This method is known as the "radiation method".

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