

Applications

Planimeters are used to measure areas on maps of any kind and scale, as well as plans, blueprints or any scale drawing or plan. They are often used by surveyors, foresters, geologists, geographers, engineers and architects.

Features

The mechanical (non-digital) planimeters we stock have some differences, but all feature a pole arm, tracer arm, tracer magnifier, recording dial and vernier measuring wheel. Some models have adjustable-length pole and tracer arms, while others are fixed-length. All have a reset which returns the measuring dial and vernier scale to zero before the next use. Digital planimeters are computerized. They give a direct reading of the area traced as square inches or centimeters, with some reading directly in any unit of area including acres, square meters, square kilometers, etc. The most advanced units will also store data for downloading into a personal computer. Most digital planimeters have various memory functions which enable you to add areas, accumulate measurements and average multiple measurements. Digital planimeters are available with pole arms or rollers.

Using the Product

To use a mechanical planimeter, a "constant" is first determined by choosing the shortest possible arm length which will cover the area to measure, and tracing the boundary of a known area (2" x 3" business card for example). Once the known area is traced, you can see how many revolutions the dial scale indicates. The known area divided by the dial reading equals the constant. Once the constant is determined, the measuring dial is reset and the boundary is traced by moving the magnifier over the boundary in a clockwise direction. The reading on the dial is multiplied by the constant to give the desired area of the plot. This constant can be used so long as the length of the pole arm is not changed. (For more details, see "Simplified Directions for Use" later in this document.)

Digital planimeters require initial settings for units and scale. There is no need to determine a constant when using any digital planimeter.

Best results are obtained by measuring over smooth, but not glossy surfaces. Photos or laminated maps increase the chances of the measuring wheel slipping, which will result in inaccurate measurements. Folds, seams, tape, or any irregularity on the surface can also cause problems.

Common Questions

- Q.** Is it better to have an adjustable or a fixed tracer arm?
- A.** An adjustable tracer arm allows use on a variety of different maps. They are more accurate because the shortest arm length can be selected for each application, and shorter means more accurate.
- Q.** What is meant by maximum resolution?
- A.** This is the smallest area which can be traced and recorded on the measuring dial and vernier. The smaller the number for resolution, the more precise the measurement will be when tracing small features.
- Q.** Which is better, pole arm or roller?
- A.** Digital planimeters are available in both styles, while mechanical planimeters are only pole style. The roller is easier to use when tracing areas which are very long or tall. This prevents resetting the pole arm in order to make multiple measurements. Many consider a roller type as easier to use, but it's really personal preference.
- Q.** What is the range of the planimeter?
- A.** Range is determined by the length of both the pole arm and tracer arm. It tells the maximum actual area which can be traced at one time.

Mechanical Polar Planimeter

Simplified Directions for Use:

- 1) Begin by drawing a precise known area. In my example, I used a standard business card of 2" x 3" for an area of 6 sq. in.
- 2) Set the tracer arm for the shortest area which will trace the boundary you are working with. The shorter the arm, the more accurate the measurement.
- 3) Place the tracer in the approximate center of the area to be measured and adjust the angle of the pole arm to approximately 90°.
- 4) Place the tracer on the area boundary at the starting point, reset the counter to zero, and trace the area in a clockwise direction.
- 5) Read the number of revolutions from the vernier and the dial. Divide the known area (six in the business card example) by the reading on the vernier to get the con-

stant. (Expressed as sq. in./revolution.)

- 6) Use the same procedure to trace the area on the map or drawing.
- 7) Convert square inches to actual area by using the scale of the map and multiplying.
- 8) The constant can be used for any number of measurements. If you change the tracer arm length, you must calculate a different constant!

Using the Adjustable Arm Planimeter, Ben Meadows # 050385-1:

A tracer arm length of 8.0 gives a constant of one (revolution): 7.594 sq. in. ($0.79=6''$ from business card)
 $6/0.79=7.594$.

A tracer arm length of 10.5 gives a constant of one (revolution): 9.375 sq. in. ($0.64=6''$ from business card)
 $6/0.64=9.375$.

The area of the tracing can be determined by multiplying the dial indicator reading by the constant.

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