3-D Coordinate Geometry with BURKORD™

BURKORD™ is a three-dimensional coordinate geometry program which supports manipulation of spatial data using a Global Spatial Data Model (GSDM). By combining horizontal and vertical control information into the same data base, a GSDM preserves the geometrical integrity of all three spatial data components while permitting unlimited derivative uses such as computer displays, visualizations, or plots in addition to listings or hard copy printouts of coordinates or line inverses. The spatial quality of each point is optionally defined by the standard deviation of each 3-D component. The **BURKORD™** computational system is universal, easy to use and equally applicable world-wide.

<u>Input:</u> The 3-D spatial position of a point stored in a **BURKORD™** data base can be determined by:

- Inputting the geocentric X/Y/Z coordinates of the point.
- Inputting the latitude/longitude/height of the point.
- Traversing to a new point from an existing point by:
  1. Using geocentric $\Delta X/\Delta Y/\Delta Z$ components (GPS).
  2. Using geodetic components of $\Delta\phi/\Delta\lambda/\Delta h$.
  3. Using local $\Delta e/\Delta n/\Delta u$ components obtained from:
     a. Design requirements and/or computations.
     b. Total station (survey) observations of:
        1. Slope distance, azimuth, and vertical angle.
        2. Slope distance, azimuth, and zenith angle.
     c. Photogrammetric compilation of stereographic images.

<u>Output:</u> Spatial data from a **BURKORD™** data base can be used in many ways and formats including, but not limited to:

- A listing of coordinate values in systems such as:
  1. geocentric X/Y/Z values (difficult to visualize - impractical).
  2. geodetic latitude/longitude/height values (conventional practice).
  3. UTM or state plane systems (user selected option in a future release).
- Direction and distance between any pair of points giving:
  1. Plane surveying latitudes and departures.
  2. Horizontal distance as local ground distance.
  3. Direction as a true azimuth from instant meridian.
- Listing of points with respect to a local P.O.B.
- Elevations obtained via user supplied geoid height model (future release).
- Computer visualizations of 3-D digital data (interface options in future release).

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