

Tutorial for the application of the Diamonds Scheme

Purpose: The Diamond Scheme eliminates the ambiguity of the Azimuth estimated with the Azimuth Diagram.

- Example:**
- The following quantities have to be known: LHA, signs of latitude φ (DR position) and declination δ (celestial object) where "+" means "north" and "-" means "south". Furthermore it needs to be known if P1 is on the lower left (LL) or the upper right side (UR) of the limit line for φ (from azimuth diagram).
 - Find the quadrant in which LHA is located. This quadrant defines one of four rows in the Diamonds Scheme. In the example LHA = 315° 56.8'. So it is in the quadrant 270° to 360°, which defines the upper row in the Scheme.
 - Check the signs for the latitude of the DR position and the declination of the celestial object ("+" means "north" and "-" means "south"). Then find the column for which the signs of φ and δ match.

In the example $\varphi = + 36^\circ 29.5'$ (north), so the sign is "+" and $\delta = + 20^\circ 39.3'$ (north) so the sign is also "+". Thus the appropriate column is the second column.

- Locate the rectangular field in the scheme which is in the row from step 2 and the column of step 3. Some of these rectangular fields are subdivided into two triangles with different colors, some of them are not divided and have a single color. If a rectangle is not subdivided, the value for Az can directly be taken from the formula given for the appropriate color using Az' as entry. If a rectangle is subdivided, then it needs to be known if PR1 is LL or UR of the appropriate limit line for φ . Then the appropriate formula for Az is given by the color of this triangle.

The values of the example lead to the second rectangular field in the upper row. This is a field which is divided into two triangles. The red one is indicated by LL and the green one is indicated by UR. As the intercept P1 in the example is LL of the φ -line, the red triangle is the one to go with. That means the **red formula** is to be used to calculate the full circle azimuth **Az = 180° - Az'**. So $Az = 180^\circ - 79.9^\circ = 100.1^\circ$.

Summary: Entries: LHA = 315° 56.8' $\varphi = +$ (north) $\delta = +$ (north) P1: LL Az' = 79.9°
 Result: **Az = 180° - 79.9° = 100.1° (red formula)**

Diamonds Scheme From Quarter Circle to Full Circle Azimuth $A_z' \rightarrow A_z$

