

## Summary of the usage rules for the calculation of position lines by altitude with the F-table

1. Enter the dead reckoning position ( $\varphi_g, \lambda_g$ ), the  $\varphi_g$  at the nearest full degree of latitude  $\varphi_a$  and the observed altitude  $\ast$ .
2. Enter the hour angle calculated in the usual way, rounded down to the next value divisible by  $4^m$  and the  $\delta$ .
3. Calculate  $h_b$  from observed ( $\ast$ ) and total correction (Gb.).
4. Extract P with  $t_a$  and  $\delta$  from Table F I (or Table F XI).
5. Extract U, V, and Gr.  $\delta$  with  $t_a$  and  $\varphi_a$  from Table F I.
6. Determine the quadrant of the Azimuth.

Rule: If  $t_{\delta}$ , then azimuth is East.

If  $t_w$ , then azimuth is West.

If  $t > 6^h$ , then azimuth is from the upper pole.

If  $t < 6^h$ , |  $\delta$  has the same sign as  $\varphi$  and is larger than Gr.  $\delta$ , then azimuth is from the upper pole.

|  $\delta$  has the same sign as  $\varphi$  and is smaller than Gr.  $\delta$ , then azimuth is from the lower pole.

|  $\delta$  has the opposite sign  $\varphi$ , then azimuth is from the lower pole.

7. Designate U.

Rule: If  $t < 6^h$ , then U same as  $\varphi$ .

If  $t > 6^h$ , then U opposite  $\varphi$ .

Generate  $\delta + U$  (add algebraically).

8. Take the log sin from the value calculated after step 7 from table F II and add to V.
9. With this sum take the altitude from table F II.
10. With h and P take azimuth from Table F I. The sought after P-value is located here below the dotted line, for more accurate azimuth determination use Table F XI.
11. Take the hour angle correction (Correction for t) from table F III with  $\varphi_a$ , Az and the seconds neglected in the rounding of the hour angle ( $\Delta t$ ).

Rule: Correction for  $t = +$  if calculated with too great an assumed t,

Correction for  $t = -$  if calculated with too small an assumed t.

12. Plotting position lines.

- a) Without baseline shift:

The starting point for the plotting of all observations is  $\varphi_a$  and  $\lambda_g$  (Examples 1 and 2).

- b) With baseline shift:

Either

for all observations apply to the  $O_a$  [assumed position] of the last observation the corrected latitude difference and signs of the positions established this way

or

take the latitude corrections (Correction for  $\varphi$ ) from Table F IV with Az and  $\varphi_a - \varphi_g$  and apply them to the calculated altitudes, then plot all observations from the dead reckoning position for the last observation made (See Examples 3b and 4b).