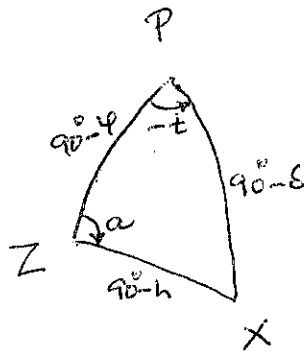

φ ... latitude
δ ... declination
h ... altitude
t ... local hour angle
a ... azimuth

$$\frac{\sin(-t)}{\sin(90^\circ-h)} = \frac{\sin a}{\sin(90^\circ-\delta)} \Rightarrow \sin t = -\sin a \cos h \sec\delta$$

longitude ... $\lambda = t - GHA$

$$\cos(90^\circ-\delta) = \cos(90^\circ-\varphi)\cos(90^\circ-h) + \sin(90^\circ-\varphi)\sin(90^\circ-h)\cos a$$

$$\sin\delta = \sin\varphi \sin h + \cos\varphi \cos h \cos a =$$

$$= \sin h \left(\sin\varphi + \cos\varphi \underbrace{\cot h \cos a}_{\cot\psi}\right) =$$

$$= \sin h \csc\psi \left(\sin\varphi\sin\psi + \cos\varphi\cos\psi\right) =$$

$$= \sin h \csc\psi \cos(\varphi-\psi)$$

$$\cos(\varphi-\psi) = \sin\delta \csc h \sin\psi \quad ; \cot\psi = \cot h \cos a$$

$$\varphi = (\varphi-\psi) + \psi$$