

$$\varphi^* \text{ colatitude} = 79^\circ 52'$$

$$p \text{ polar distance } (= 90^\circ - \delta)$$

$$\delta \text{ declination} = 7^\circ 23'$$

$$z \text{ zenith distance } (= 90^\circ - h)$$

$$h \text{ altitude} = 17^\circ 57'$$

t hour angle

$$\begin{aligned} \operatorname{harc} t &= \frac{\operatorname{harc} z - \operatorname{harc} (\varphi^* - p)}{\operatorname{harc} (\varphi^* + p) - \operatorname{harc} (\varphi^* - p)} = \left\{ \operatorname{harc} x = \frac{1}{2} (1 - \cos x) \right\} = \\ &= \frac{\cos(\varphi^* - p) - \cos z}{\cos(\varphi^* - p) - \cos(\varphi^* + p)} = \left\{ \begin{array}{l} \cos(\varphi^* - p) = \sin(\varphi^* + \delta) \\ \cos(\varphi^* + p) = -\sin(\varphi^* - \delta) \\ \cos z = \sin h \end{array} \right\} = \\ &= \frac{\sin(\varphi^* + \delta) - \sin h}{\sin(\varphi^* + \delta) + \sin(\varphi^* - \delta)} = \frac{\sin(87^\circ 15') - \sin(17^\circ 57')}{\sin(87^\circ 15') + \sin(72^\circ 29')} = \end{aligned}$$

$$= \frac{3000 \cdot \sin(87^\circ 15') - 3000 \cdot \sin(17^\circ 57')}{3000 \cdot \sin(87^\circ 15') + 3000 \cdot \sin(72^\circ 29')} = \frac{2996 - 925}{2996 + 2861} = \frac{2996' - 925'}{2996' + 2861'} =$$

$$= \frac{\frac{49^\circ 56' - 15^\circ 25'}{49^\circ 56' + 47^\circ 41'}}{97^\circ 37'} = \frac{34^\circ 31'}{97^\circ 37'} = \frac{2071'}{5857'} = \frac{2071}{5857}$$

"Arcos"

Table of Logarithms of Sines and Cosines

	Ante	Log.
$8^\circ 0' \text{ or } 80^\circ 0'$	800	0.9031
$12^\circ 56' \text{ or } 82^\circ 3'$	823	0.9830
$43^\circ 39' \text{ or } 136^\circ 21'$	13621	0.9830
$72^\circ 29' \text{ or } 117^\circ 31'$	11731	0.9829
$82^\circ 23' \text{ or } 95^\circ 36'$	9536	0.9829
$82^\circ 15' \text{ or } 97^\circ 45'$	9745	0.9829
$90^\circ 0' \text{ or } 90^\circ 0'$	9000	0.9031