Star Altitude and Azimuth (North Az)

INPUT: Declination (**Dec**) and Right Ascention (**RA**) of the Star,
Latitude (**Lat**), Longitude (**Long**), Greenwich Mean Time (**UT**)
OUPUT: Altitude (**Alt**) and North Azimuth (**Az**) of the Star

Main Equations are:

UT → GMST → LHA = GMST + Long - RA

$$\sin(\text{Alt}) = \sin(\text{Lat}) \cdot \sin(\text{Dec}) + \cos(\text{Lat}) \cdot \cos(\text{Dec}) \cdot \cos(\text{LHA})$$

$$\cos(\text{Az}) = \frac{\sin(\text{Dec}) - \sin(\text{Lat}) \cdot \sin(\text{Alt})}{\cos(\text{Lat}) \cdot \cos(\text{Alt})}$$

if Az < 180 then LHA = 360 – T
if Az > 180 then LHA = T

GHA = GMST – RA
GHA = LHA - Long
SHA = 360 - RA

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