STAR IDENTIFICATION

With the observed altitude and azimuth enter the double-page Star Identification Table immediately following the proper latitude section and extract the tabulated values of declination and hour angle. Eye interpolation will suffice for accuracy.

Combine the H. A. with the longitude to determine the G. H. A. of the star, or with the L. S. T. to obtain its R. A. Enter the Nautical Almanac with the declination and G. H. A., or the declination and R. A., and identify the star.

Example 7.—Given: Dead reckoning position { Lat. 30° 12′.0 N. / Long. 135 10.0 W. } Observed altitude (Ho) 21° 36′.3. Azimuth N. 88° E. G. C. T. $2^h\ 11^m\ 01^s$ on November 27, 1940.

SOLUTION

Enter star table with approximate arguments, azimuth 88° and altitude 22°, and find approximate:

Dec. 12° 30′.0 N. *H. A.* 72° E.

To obtain G. H. A.

Longitude	135°	10′.0	W.
L. H. A.	72		E.
G. H. A.	63	10.0	W. (for G. C. T. $2^h\ 11^m\ 01^s$).
N. A. correction	32	50.7	(page 214).
G. H. A.	30	19.3	(for 0^h Nov. 27, 1940).

To obtain R. A.

G. C. T.	2^h	11^m
R. A. M. S. + 12^h	4	23
G. S. T.	6	34
Longitude	9	01 W.
L. S. T.	21	33
H. A.	4	48 E.
R. A.	2	21

Enter the Nautical Almanac with the approximate declination 12° 30′.0 N., and G. H. A. 30° 19′.3 (Nov. 27) or R. A. $2^h\ 21^m$ and the celestial body sought is the planet Jupiter.

GREAT CIRCLE SAILING

Enter that section of the tables corresponding to the latitude of departure and find that declination column which is headed by a value nearest to the latitude of destination. From this column, and opposite that H. A. argument nearest the difference in longitude between the present position and the destination, extract the tabulated values of altitude (alt.), Δd, Δt, and azimuth (az.), and solve for Hc.

Subtract the value of altitude (Hc) from 90° and convert the resultant into minutes of arc to obtain the Great Circle Distance in miles. The azimuth becomes the Great Circle Course and is measured from the elevated pole, east or west, to the destination.

Example 8.—Find the initial course and the Great Circle Distance between Mobile, Ala., and Stockholm, Sweden.

Departure		*Destination*	
Latitude	30° 13′.6 N.	Latitude	59° 20′.5 N.
Longitude	88 01.5 W.	Longitude	18 03.5 E.

SOLUTION

Diff. longitude 106° 05′.0; latitude of departure 30° 13′.6 N.; latitude of destination 59° 20′.5 N.
Enter tables with latitude 30°, H. A. 106°, declination 59° 30′.0 (same name as latitude).

		Alt.	*Δd*	*Δt*	*Az.*
		18° 02′.3	−48	−44	30°.9
Corr. for 9′.5 dec. × 48 =	−4′.5				
Corr. for 5′.0 H. A. × 44 =	−2.2				
Corr. for 13′.6 lat.	+11.6				
Total correction	+4.9	+4.9			
Hc		18 07.2			
		90 00.0 (−)			
Zenith distance		71 52.8 = 4,312.8 nautical miles, Great Circle Distance.			

Great Circle Course 31°.

If the point of departure is 30° 13′.6 S. instead of 30° 13′.6 N., the supplement of the difference of longitude is found (180° − 106° 05′.0 = 73° 55′.0).

Enter table with H. A. 74°, latitude 30°, declination 59° 30′.0 (same name as latitude) and find:

		Alt.	*Δd*	*Δt*	*Az.*
		33° 30′.1	−06	+51	35°.8
Corr. for 9′.5 dec. × 06 =	−0′.5				
Corr. for 5′.0 H. A. × 51 =	+2.6				
Corr. for 13′.6 lat.	+11.0				
Total correction	+13.1	+13.1			
Hc		33 43.2			
		90 (+)			
Zenith distance		123 43.2 = 7,423.2 nautical miles, Great Circle Distance.			

Great Circle Course 36°.

In those cases where the various arguments used cannot be found within the tables, then resort must be had to other means without the tables for solution.