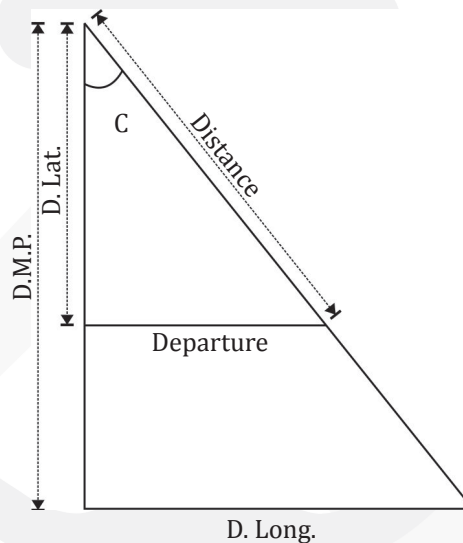


Mercator Sailing

Mercator Sailing is another method of Rhumb Line Sailing. It is used to find the course and distance between two positions that are in different latitudes from the large D. Lat. and distance. It is similar to plane sailing, except that plane sailing is used for small distances. Also, in Mercator sailing, the D. Lat. is expressed in Longitude units, which is the difference of meridional parts (D.M.P.), whereas in plane sailing, the D. Long. is expressed in latitude units or nautical miles. A meridional part for any particular latitude is the length along a meridian on a Mercator chart, measured in units of the longitude scale, between the Equator and the parallel of that particular latitude. It can be extracted from nautical tables. Difference of meridional parts is the difference between the meridional parts for any two latitudes. The rules for finding D.M.P. are the same as for finding D. Lat., i.e., same names, subtract; different names, add.



Procedure to find the course and distance

1. From Norie's Nautical Tables, extract meridional part values for each latitude;
2. Calculate D. Lat., D.M.P. and D. Long.;
3. Calculate the course (C) by using formula:

$$C = \tan^{-1} \left(\frac{\text{D. Long.}}{\text{D.M.P.}} \right)$$

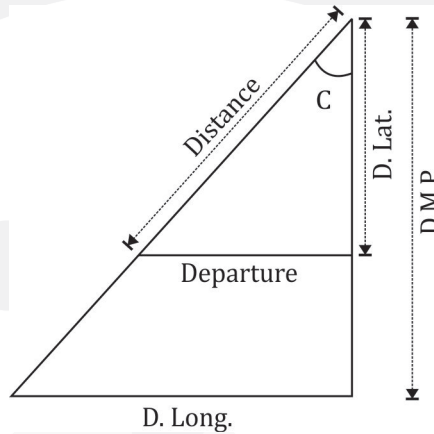
4. Calculate the distance (D) by using formula:

$$D = \frac{\text{D. Lat.}}{\cos C}$$

Example 1 Find the course and distance between:

A: 42°45'N 38°20'W B: 27°30'N 56°15'W

Lat. _A	42°45'N	M.P. _A	2826.73	Long. _A	38°20'W
Lat. _B	27°30'N	M.P. _B	1706.46	Long. _B	56°15'W
D. Lat.	915'(S)	D.M.P.	1120.27	D. Long.	1075'(W)



$$C = \tan^{-1} \left(\frac{\text{D. Long.}}{\text{D.M.P.}} \right)$$

$$= \tan^{-1} \left(\frac{1075'}{1120.27} \right)$$

$$= 43.8^\circ$$

$$D = \frac{\text{D. Lat.}}{\cos C} = \frac{915'}{\cos 43.8^\circ}$$

$$= 1268.13 \text{ miles}$$

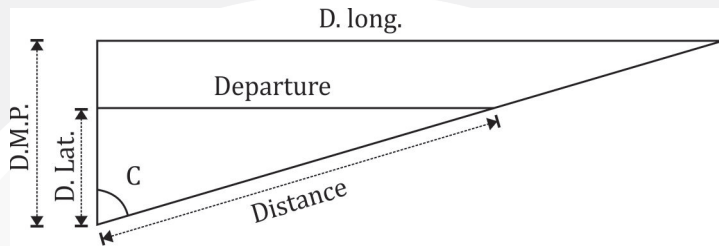
Course = S43.8°W = 223.8°T

Distance = 1268.13 miles

Example 2 Find the course and distance between:

A: $47^{\circ}14.3'S$ $167^{\circ}26'E$ B: $43^{\circ}55'S$ $176^{\circ}34'W$

Lat. _A	$47^{\circ}14.3'S$	M.P. _A	3206.54	Long. _A	$167^{\circ}26'E$
Lat. _B	$43^{\circ}55.0'S$	M.P. _B	2922.63	Long. _B	$176^{\circ}34'W$
D. Lat.	199.3'(N)	D.M.P.	283.91	D. Long.	960'(E)



$$C = \tan^{-1} \left(\frac{D. Long.}{D. M. P.} \right) = \tan^{-1} \left(\frac{960'}{283.91} \right) = 73.5^{\circ}$$

$$D = \frac{D. Lat.}{\cos C} = \frac{199.3'}{\cos 73.5^{\circ}} = 702 \text{ miles}$$

Course = $N73.5^{\circ}E = 073.5^{\circ}T$

Distance = 702 miles