

EXAMPLE USING TRAVERSE TABLE

The 5228 ft. peak of the island Anjouan was observed from m.v. *British Willow* in a D.R. position 60 miles off. The height of eye was 56 ft. and the sextant angle read 28'8

Index error on the arc:	0'8	Height of peak	5228 ft.
	28'0		
Dip	7'3	Height of eye	56 ft.
	20'7		
Refraction (60 ÷ 12)	5'0	<i>h</i>	5172 ft.
True angle of elevation	15'7	From table 1.06 $\sqrt{h} = 76.2$ n.m.	
From traverse table	Distance	D. Lat	Dep
under 12°	77.9	76.2	16.2
under 11°	77.6	76.2	14.8
Interpolating	77.8	76.2	15.7
	15.7		
True distance off	62.1 n.m.		

It should be noted that the interpolation required in the traverse table is that carried out by ocean navigators when calculating currents.

Captain Mário Gama's Direct Method for Star-sight Reduction

Charles H. Cotter

In a very interesting paper which appeared recently¹ the author, Capitão Mário Gama of the Portuguese Merchant Navy, describes a direct method for computing position lines from star (or planet) observations.

The principal feature of Captain Gama's method is the systematic manner in which he arrives at an intercept to the extent, not only of saving time in sight reduction, but also in reducing the possibility of blundering.

The method employs the *Computed Tables of Altitude and Azimuth* (HD 486) and involves timing a series of star-sights, the ship making headway meanwhile, by means of a stop watch which is set at zero at a noted chronometer time shortly before the observations commence. The following example, given in the original paper, in reducing sights of Vega and Denebola observed during morning twilight of 25 Feb. 1959, in D.R. position Lat. 10°10' S., Long. 73°48' E., will serve to illustrate the method.

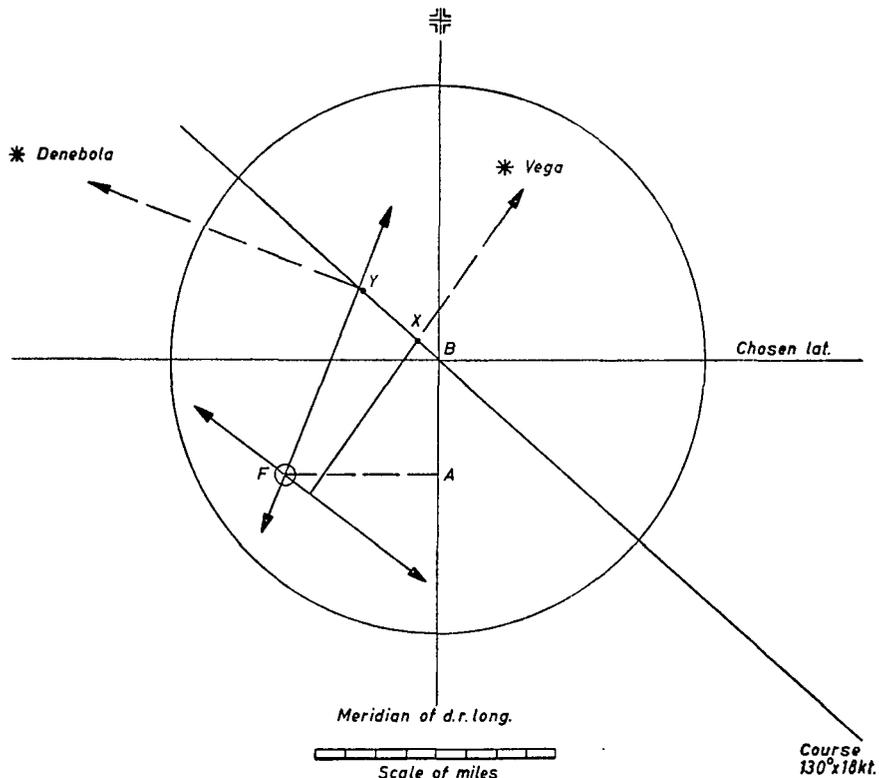


FIG. 1. Method for finding the ship's observed position for the time at which the stop watch was started.

Data

Height of eye		32 ft.
Index Error and Dip		- 7.2
Chosen Lat.		10° S.
Chron. Time		00 ^h 38 ^m 21 ^s
Chron. Error		Slow 21 ^s
<hr/>		
G.M.T.	(25)	00 ^h 38 ^m 42 ^s
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G.H.A. ∇ 00 ^h		154° 06.6
Increment		9° 42.1
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G.H.A. ∇ 00 ^h 38 ^m 42 ^s		163° 48.7
Chosen Long.		73° 48.0 E. (+)
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L.H.A. ∇		237° 36.7
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Course and Speed		130° (T) × 18 knots

Star	Vega	Denebola
Stop watch time	2 ^m 56 ^s	11 ^m 10 ^s
Run (since start watch)	0.9 n.m.	3.3 n.m.
Sidereal angle (from incr. table)	00°44'.1	02°48'.0
L.H.A. φ at start watch	237°36.7	237°36.7
S.H.A.★	82°06.8	183°15.0
L.H.A.★	319°27.6	63°39.7
Dec.★	N 38°44.6	N 14°47.8
Δh , L.H.A. diff. (from HD 486)	+ .58, - 27.6	+ .92, - 20.3
Δd , Dec. diff. (from HD 486)	- .68, + 14.6	+ .30, - 12.2
Tabulated Az.	S. 144°3 E.	S. 110.7 W.
Tabulated Alt (T)	28°16.0	21°50.6
Sextant (S)	28°25.1	22°22.6
(S-T)	+ 9.1	+ 32.0
I.E. and Dip.	- 7.2	- 7.2
Corr. to Alt.	- 1.8	- 2.3
Δd corr. (minus)	+ 9.9	- 3.7
Δh corr. (minus)	- 16.0	- 18.7
Σ (+)	+ 19.0	+ 32.0
Σ (-)	- 25.0	- 31.9
Intercept	- 6.0	+ 0.1
	From 035°.7	To 290°.7

By means of a plotting sheet on which the centre of a printed compass rose represents the chosen position (nearest integral degree of latitude to D.R. latitude and D.R. longitude), it is a simple matter to find the ship's observed position for the time at which the stop watch (initially set to 00^m 00^s) was started.

Lat. B = 10°00' S.	Long. B 73°48' E.
dlat (AB) = 4' S.	dlong (AF) 5' W. (dep (AF) = 5 m.n.)
Lat. F = 10°04' S.	Long. F 73°43' E.

The points X and Y are marked at distances respectively of 0.9 n.m. and 3.3 n.m. (the corresponding distances run in the intervals between the times at which the stop watch was started and the observations made), in a direction *opposite* to that of the heading (130° T.) of the ship. Using these points from which to mark the corresponding intercepts, and hence the position lines, the intersection of the latter at F represents the observed position of the ship at the time the stop watch was started.

The same chosen position is used for each sight of a series, and the L.H.A. of each star, used in determining the tabulated altitudes, applies to a common

L.H.A. φ , which latter corresponds to the time at which the stop watch was started.

The author of this interesting method is to be congratulated for his systematic and thoroughly seamanlike solution.

REFERENCE

¹ Método directo para o cálculo do ponto astronómico por observação de Estrelas ou Planetas. Mário Gama, Capitão da Marinha Mercante. (*Neptuno: Revista da Marinha Mercante Nacional*, No. 211, Jan./Mar. 1969, 42-54.)

Amendments to the Rules

A. N. Cockcroft

A GREAT deal has already been written about possible amendments to the Collision Regulations, but as there may be an international conference on the subject in 1972 the various schemes should be discussed as much as possible so that their advantages and disadvantages will be fully appreciated.

Criticism of the present Steering and Sailing Rules is mainly concerned with Rule 21. Disadvantages of this rule include the following:

- (1) If a giving-way vessel on a crossing course takes no action the privileged vessel must not act until collision cannot be avoided by the giving-way vessel alone. By such time collision is likely to be inevitable.
- (2) Small sailing vessels which may not easily be seen, especially at night, are required to maintain course and speed for large power-driven vessels.
- (3) High-speed vessels such as hovercraft are required to maintain course and speed for low powered ships crossing from the port side.
- (4) No provision is made for different types of hampered vessel approaching one another so as to involve risk of collision. If deep-draught vessels in certain areas are to be included in this category in the future the question of priorities may have to be considered.
- (5) An ordinary power-driven vessel is not permitted to give way to a tow on the port bow. In certain circumstances a tow is permitted to show the lights and shapes for a vessel not under command, though this is not generally appreciated.
- (6) A vessel being overtaken is apparently always required to keep her course and speed even though some hampered vessels carrying out special operations at high speeds may be unable to take action to keep clear.
- (7) Rule 21 can only apply to vessels in visual sight of one another. Any rules or guidance for vessels using radar in fog could not be consistent with the present Steering and Sailing Rules.

Rule 16 and the Annex are criticized mainly on the grounds that there is insufficient instruction or guidance for a vessel using radar in fog. Such a vessel