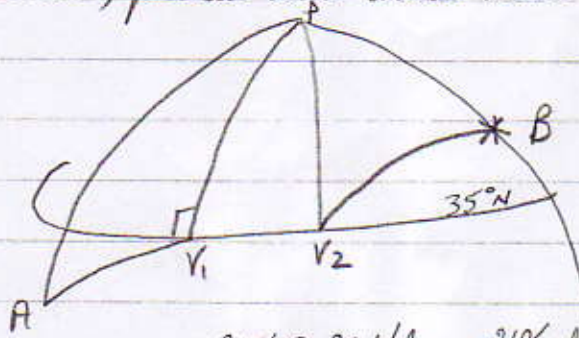


1999 Nov - 2/1 SQA - Q1 - CGC

\*\* a) GC to limit belt, parallel until water marks, GC to destination

A  $30^{\circ}55'N$   $130^{\circ}42'E$   
 PA  $59.083333$   
 PV  $55^{\circ}$



B  $46^{\circ}56'N$   $124^{\circ}10'W$   
 PB  $43.06667$   
 Speed  $14.7k$

$$210t @ 26t/day = \frac{210}{26} \text{ days} @ 14.7 \times 24/day = \frac{210 \times 14.7 \times 24}{26} = 2849.54$$



b) 1st GC by Napier's

$$PV_1: \cos PA = \cos PV_1 * \cos AV_1 \therefore \cos AV_1 = \cos PA / \cos PV_1 = \cos 59.083333 / \cos 55 \therefore AV_1 = 26.39287$$

$$AV_1 = 1583.57$$

$$\text{Dist } V_1V_2 = \frac{2849.54}{\cos 35} = 1265.97 = \text{Dep} @ 35^{\circ}N$$

$$\text{Dlong} = \frac{\text{Dep}}{\cos \text{Lat}} = \frac{1265.9}{\cos 35} = 1545.46 E = 25^{\circ}45.46 E$$

$$\hat{P}: \cos \hat{P} = \tan PV_1 / \tan PA = \tan 55 / \tan 59.08333 = 31.20784 = 31^{\circ}12.47 E$$

$$\cos V_2B = \cos \text{Dlong} \cos \text{Lat } V_2 \cos \text{Lat } B + \sin \text{Lat } V_2 \sin \text{Lat } B$$

$$= \cos 48.16783 \cos 35 \cos 46.93333 + \sin 35 \sin 46.93333$$

$$\therefore V_2B = 37^{\circ}37.09$$

$$= 2257.09$$

$$A \sim V_2 = 2849.54$$

\*\* Total = 5106.63 n.m

Initial Long	= $130^{\circ}42'00 E$
Long $V_1$	= $161^{\circ}54'47 E$
Dlong $V_1V_2$	= $25^{\circ}45'46 E$
Long $V_2$	= $187^{\circ}39'93 E$
	= $172^{\circ}20'07 W$
Long B	= $124^{\circ}10'00 W$
D. long	= $48^{\circ}10'07 = 48.16783$

⊆ Departure time December '76 18d 10h 00m S.T.

N.A. S.T. Allowance - 9h

$$5106.6 \div (14.7 \times 24)$$

$$= \text{Steaming time} =$$

Sail 18d 01h 00m GMT.

Steam Time: 14d 11h 23m

ETA Jan 01<sup>st</sup> 12h 23m GMT.

N.A. S.T. Allowance - 08h

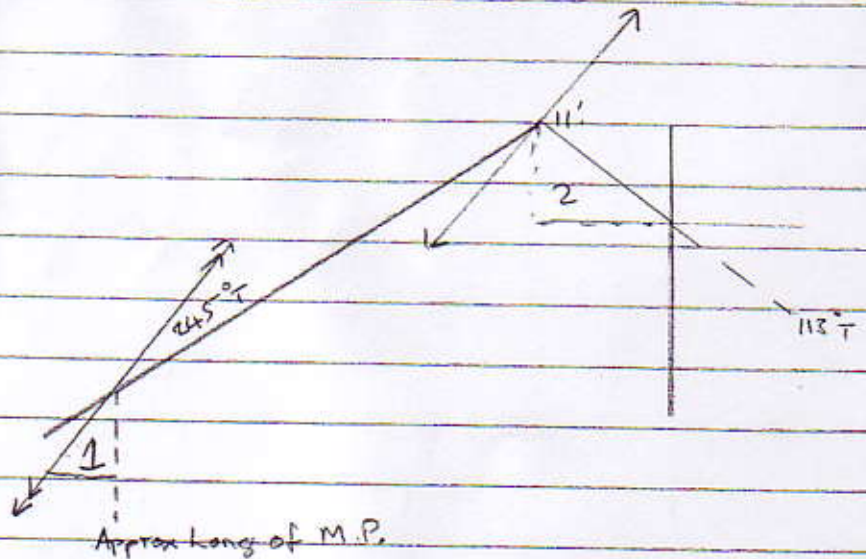
ETA. Jan 01<sup>st</sup> 04h 23m S.T.

\*\*

2

November 1999

At 17hr 42m 30s GMT DR  $42^{\circ}50' N$   $137^{\circ}48' W$   
 Course  $245^{\circ} T$  Speed 22 kts.



Start Time = April 1 day 17hr 42mins 30secs GMT

L.T.  $137^{\circ}48' W$  - 9hr 11mins

1<sup>st</sup> Approx LMT 8hr 31mins LMT.

Meridian by LMT - 12hr 04mins

Time Run 3hr 33mins  $\times$  22kts = 78.1

$$\begin{aligned} D. Lat &= Dist \times \cos(Co) \\ &= 78.1 \times \cos 65^{\circ} \\ &= 33.00 S \end{aligned}$$

$$\begin{aligned} DR \text{ lat was } &42^{\circ}50' N \quad 137^{\circ}48' W \\ D. Lat &= 0^{\circ}53' S \quad 1^{\circ}36' W \\ &42^{\circ}17' N \quad 139^{\circ}24' W \end{aligned}$$

$$D. Lat^2 = 60.11 \times \cos(29.5^{\circ}) = 43.0 \quad M. Lat \quad 42^{\circ}33.5'$$

$$\begin{aligned} Dep &= Dist \times \sin(Co) \\ &= 78.1 \times \sin 65^{\circ} \\ &= 70.78 W \end{aligned}$$

$$\begin{aligned} D. Long &= \frac{Dep \times 60}{\cos(M. Lat)} \\ &= \frac{70.78}{\cos(42.33.5)} = 96.09 \end{aligned}$$

$$\begin{aligned}
 2. \quad D. Lat &= Dist \cos(Co) & DR Lat & 42^{\circ} 50' N & Dep \\
 &= 78.1 \cos 245 & D. Lat & 33' 0 S & 70.78 W \\
 &= 0^{\circ} 33' S & D. Lat^2 & 4.3 N & 10.1 W \\
 & & Tot D. Lat & 28.7 S & 80.88 W
 \end{aligned}$$

$$\begin{aligned}
 Dep &= Dist \sin Co & Approx final Lat & 42^{\circ} 21.3' N \\
 &= 78.1 \times \sin 245 & M. Lat & 42^{\circ} 35.6' \\
 &= 70.78 W
 \end{aligned}$$

$$\begin{aligned}
 D. Lat^2 &= 11' \cos 293 & Long & 137^{\circ} 48' W \\
 &= 4.3 N & D. Long & 1^{\circ} 49.9 W
 \end{aligned}$$

$$\begin{aligned}
 \frac{Dep}{D. Lat} &= 11 \times \sin 293 & Final Long & 139^{\circ} 37.9 W \\
 &= 10.1 W
 \end{aligned}$$

$$\begin{aligned}
 D. Long &= \frac{Dep}{\cos M. Lat} \\
 &= \frac{80.88}{\cos 42^{\circ} 35.6'} \\
 &= 109.86 W
 \end{aligned}$$

Start 17 hr 42 mins

L.T.  $139^{\circ} 37.9'$  - 9 hr ~~18~~<sup>8</sup> mins W

2 hr 24 mins

M. Pass 12 hr 04 mins

New Run Time ~~3 hr 40 mins~~  $\times 22 \text{ kt} = 80.67 - 78.1 = 2.6 \text{ Nm}$   
 3 hr 40 mins difference.

It is unnecessary to calculate again due to fact position will not change significantly to warrant another approx.

∴ LMT M. Passage is 1 day 12 hr 04 min

L.I.T.  $139^{\circ} 37.9'$  + 9 hr ~~18~~<sup>9</sup> min

∴ GMT Mer Pass 1 day 21 hr ~~23~~<sup>2</sup> min