

@ 1015 :- Steer to HK maintain
 stange. Tgt 'A', 'B' & 'C' clear
 ahead. Tgt 'D' maintains CPA
 but will now overtake in 6 mins
 allowing clear space to Sth'd,
 if required.
 CPA of collision risk 'E'
 is improved to 0.8. Tgt
 mentioned will finally
 part and clear.

'E'
 318°T @ 14.4K
 Collision @ 1104 Brg 182°R
 Asp 6.25°

'B'
 310°T
 @ 6K
 1.4 @ 1030 Brg 045°R
 Asp R 13.0°

'C'
 315°T @ 12K
 0.8 mins Brg 0522°T
 Asp R 81°

'D'
 313°T @ 15K
 0.3 @ 1041 Brg 042°R
 Asp R 15°

for
 11/15

Q3.

Time @ Ship Aug 4 d 12h 00m 63° 15' N 042° 50' W 133° T x 16K.
 L.I.T. 42° 50' W 2h 51m Assuming ship on LMT.

Start GMT 4d 14h 51m

1st App CT GMT 5d 00h 51m

1st App run 10h 00m @ 16K = 160'

Start 63° 15' N 042° 50' W

1st Dlat 1° 49.1 S Dlg. 4° 12.0 E

1st Approx 61° 25.9' N 038° 38' W

M. lat 62° 20' N. Dlg = Dep / cos M. lat = 117 / cos 62° 20' = 252' E

Start GMT 4d 14h 51m

2nd App GMT 5d 00h 11m

2nd App run 09h 20m @ 16K = 149.3

Start 63° 15' N 042° 50' W

Dlat 1° 41.8 S Dlg 3° 55.7 E

2nd DR. 61° 33.2' N 038° 54.3' W **

M. lat 62° 24'. D. lg = 109.2 / cos 62° 24' = 235.7 E

To re calculate C.T. again for new lat & Long would only change run by approx 1/2 mile which is a negligible adjustment. 3rd Approx not req'd.

DR @ Evening C.T. is 61° 33.2' N 038° 54.3' W **

(2.5 Marks)

Calculations:-

CT 2^d 64° N = 22 23 LMT.

62° N = 21 50

63° 15' N = $\frac{33 \times 75}{120} + 2150 = 2210$

5th 64 = 22 06

62 = 21 38

63° 15' N = $\frac{28 \times 75}{120} + 2138 = 2155$

4th CT = 2200 LMT.

1st LIT 2 51

1st Approx GMT 5d 00h 51m

Dlat = Dist x Cos Co.

= 160 Cos 133 = 109.1 S

Dep = Dist x Sin Co

= 160 Sin 133 = 117.0 E

CT 2nd 62° N = 21 50

60° N = 21 27

63° 25' = $\frac{23 \times 85}{120} + 2127 = 2143$

CT 5th 62° N = 21 38

60° N = 21 17

61° 25' = $\frac{21 \times 85}{120} + 2117 = 2132$

4th CT = 21 36

2nd LIT = 2 35

2nd Approx GMT = 5d 00h 11m

Dlat = 149.3 Cos 133 = 101.8 S

Dep = 149.3 Sin 133 = 109.2 E

CM - SQA - 15 March 2005

J. Mayer

Q1.

Dep. Brisbane: $26^{\circ} 49' S$ PA $63^{\circ} 18' 33''$ $153^{\circ} 10' E$

Lat. Papeete: $17^{\circ} 30' S$ PB $72^{\circ} 5'$ $149^{\circ} 36' W$

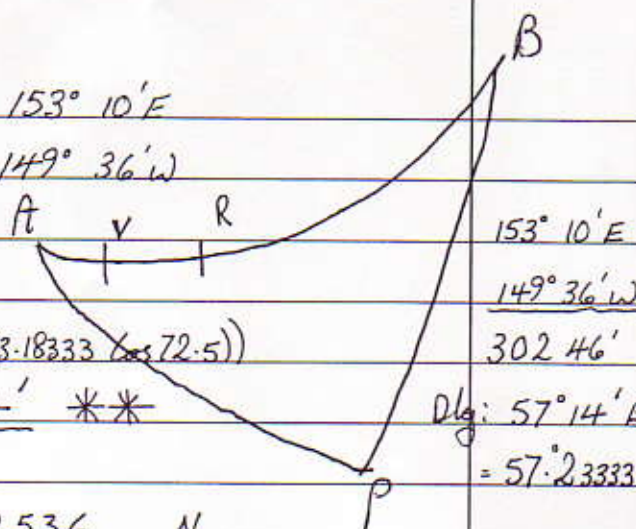
$$\cos AB = \cos Dlg \sin PA \sin PB + \cos PA \cos PB$$

$$AB = \cos^{-1} ((\cos 57.23333 \sin 63.18333 \sin 72.5) + (\cos 63.18333 \cos 72.5))$$

(15 marks)

$$= 53.39337 = 3203.6 = \underline{3204'} **$$

Dlg: $57^{\circ} 14' E$
 $= 57.23333 E$



$$A = \frac{\tan \text{Lat } A}{\tan Dlg} = \frac{\tan 26.81667}{\tan 57.23333} \therefore A = 0.32536 \quad N$$

$$B = \frac{\tan \text{Lat } B}{\sin Dlg} = \frac{\tan 17.5}{\sin 57.23333} \therefore B = 0.37496 \quad S$$

$$C = 0.04960 \quad S$$

$$\tan Dlg = \frac{1}{C \times \cos \text{Lat } A} \therefore \tan^{-1} \left(\frac{1}{0.04960 \cos 26.81667} \right) = Dlg = S 87.46518 E$$

(15 Marks)

$$\underline{\text{Initial } G = 092^{\circ} \frac{1}{2} T **}$$

For Vertex: $\sin PV = \sin A \sin PA = \sin 87.46518 \sin 63.18333$

$$\therefore PV = 63.07264 \therefore \underline{\text{Lat } V = 26^{\circ} 55.6' S **}$$



$$\tan P = \frac{1}{\cos PA} \tan A = \frac{1}{\cos 63.18333} \tan 87.46518$$

$$\therefore P = 5.60446 = \text{Dlg } 5^{\circ} 36.3' E$$

$$\text{'A' } 153^{\circ} 10.0' E$$

$$\underline{\text{Lg of } V = 158^{\circ} 46.3' E **}$$

(15 Marks)

Position of Vertex: Lat $26^{\circ} 55.6' S$ Long $158^{\circ} 46.3' E **$

$$P = \text{Lg } V \sim \text{Lg } R = 158^{\circ} 46.3' E \sim 159^{\circ} 47' W = 318.333 = 41^{\circ} 26.7' E$$

$$\tan PR = \tan PV / \cos P = \tan 63.07264 / \cos 41.445 \therefore PR = 69.15619$$

$$\therefore \text{Lat } R = 69^{\circ} 09.4' \sim 90^{\circ} = 20^{\circ} 50.6' S$$

$$\text{Lat Raratonga} = 21^{\circ} 10.0' S$$

(15 marks)

$$\underline{\text{Distance off} = 19.4' N \text{ of Raratonga. **}}$$

