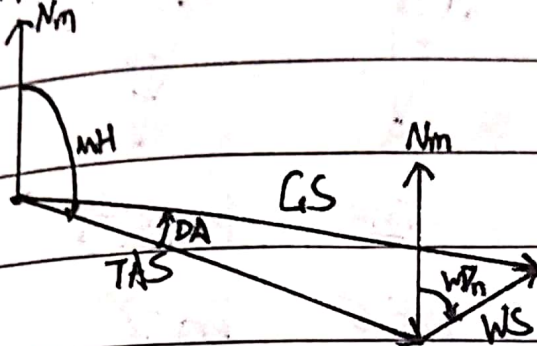


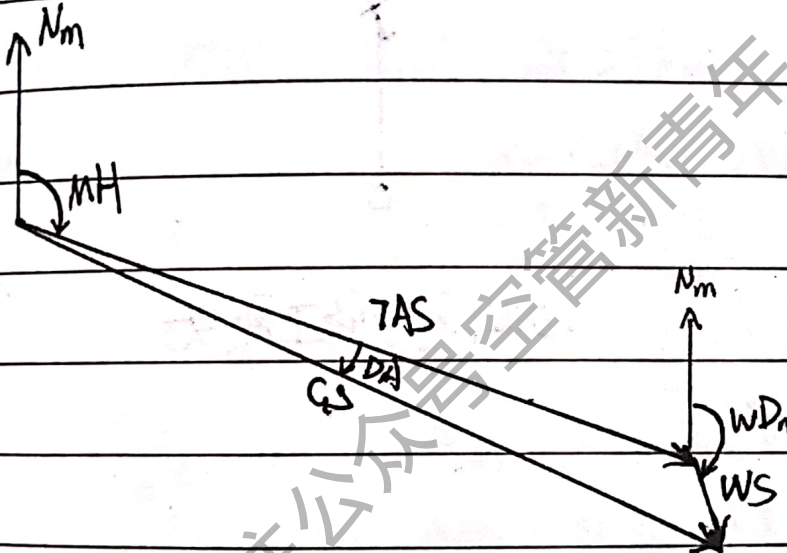
领航作业

P41 T13 画航行速度三角形

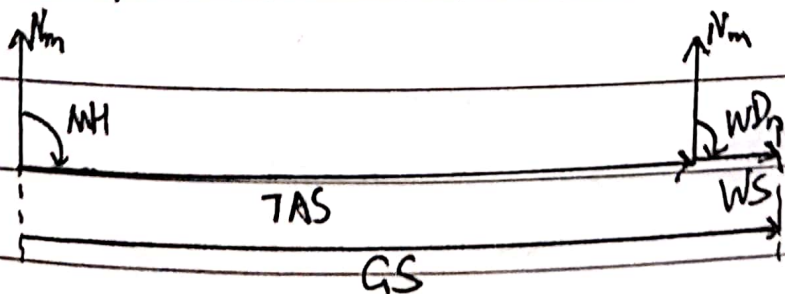
(3) MH 110° TAS 210 km/h $WD_n 60^\circ$ WS 30 km/h



(4) MH 110° , TAS 350 km/h $WD_n 160^\circ$ WS 35 km/h

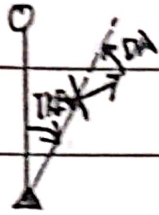


(6) MH 90° TAS 650 km/h $WD_n 90^\circ$ WS 80 km/h

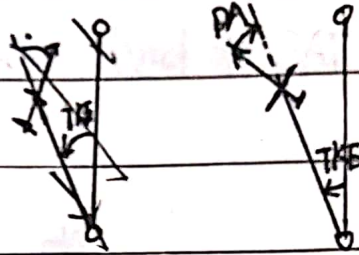


P123 T19 画出航线、航向线和航迹线关系图，分析偏航原因

① TKE $+5^\circ$, DA -3°



② TKE -3° , DA $+4^\circ$



右侧风, 修正过量

左侧风, 修正过量

③ TKE -3° DA -5°



④ TKE 0° DA -3°



右侧风, 修正不足

右侧风, 修正刚好

⑤ TKE $+3^\circ$ DA $+6^\circ$

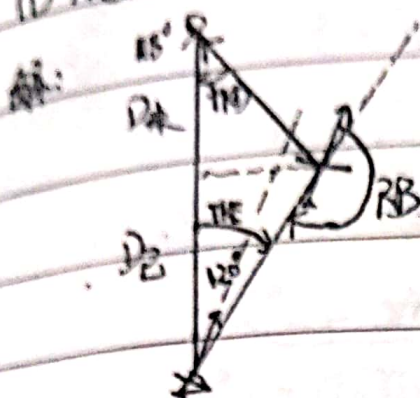


右侧风, 修正过量



例3 T₁₁ 判断飞机偏航并修正 (附飞行)

10 MC 115° MH 125° RB 132° D_E 80km D_A 76km



$$DA = RB - 132^\circ = 2^\circ \quad MTK = MH + DA = 122^\circ$$

$$\frac{\sin TKE}{D_A} = \frac{\sin TKD}{D_E}$$

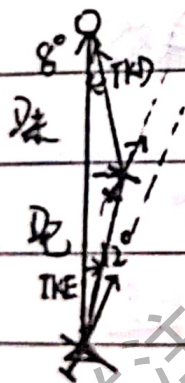
$$\Rightarrow TKD = 4^\circ$$

$$MC_{\text{新}} = MC - TKD = 114^\circ$$

$$MH_{\text{新}} = MC_{\text{新}} - DA = 112^\circ$$

(3) MC 8° MH 12° QDR 11° D_E 57km D_A 60km

解:



$$DA = QDR - MH = -1^\circ$$

$$\frac{\sin TKE}{D_A} = \frac{\sin TKD}{D_E} \Rightarrow TKD = 3^\circ$$

$$TKE = QDR - MC = 11^\circ - 8^\circ = 3^\circ$$

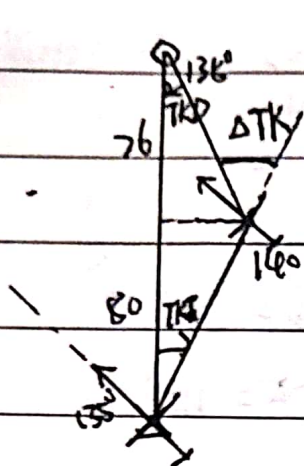
$$MC_{\text{新}} = MC - TKD = 8^\circ - 3^\circ = 5^\circ$$

$$MH_{\text{新}} = MC_{\text{新}} - DA = 5^\circ - (-1^\circ) = 6^\circ$$



Plb3 T₁₂ 按航修正角修正航迹 (背台)

(1) MC 138° MH 135° RB 185° D₂₈₀ 除 76



$$DA = RB - 180^\circ = 5^\circ$$

$$ACTK = MH + DA = 140^\circ$$

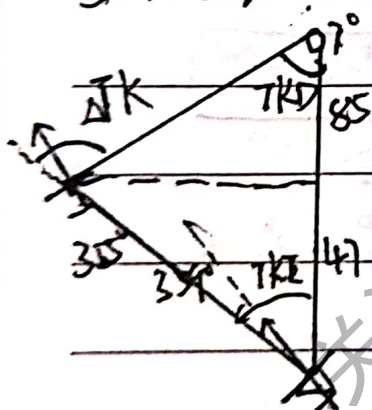
$$\frac{\sin TKE}{76} = \frac{\sin TKD}{76} \therefore TKD = 2^\circ$$

$$TKE = MTK - MC = 2^\circ$$

$$\Delta TK = TKE + TKD = 4^\circ$$

$$MH_{\text{真}} = MH - \Delta TK = 135^\circ - 4^\circ = 131^\circ$$

(2) MC 7° MH 359° RB 176° D₂₈₀ 除 85



$$PA = RB - 180^\circ = -4^\circ$$

$$MTK = MH + DA = 355^\circ$$

$$TKE = 7^\circ + 360^\circ - 355^\circ = 12^\circ$$

$$TKE = 355^\circ - (7 + 360)^\circ = -12^\circ$$

$$\frac{\sin TKE}{85} = \frac{\sin TKD}{85}$$

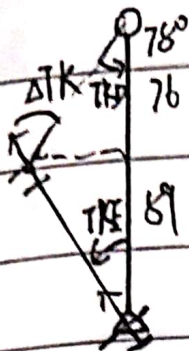
$$TKD = -7^\circ$$

$$\Delta TK = TKE + TKD = -19^\circ$$

$$MH_{\text{真}} = MH - \Delta TK = 359^\circ - (-19^\circ) = 378^\circ = 18^\circ$$



(3) $MC 78^\circ$ $MH 74^\circ$ $RB 180^\circ$ $DE 89$ $DA 76$



$$DA = RB - 180^\circ = 0^\circ$$

$$MTK = MH + DA = 74^\circ$$

$$TKE = MTK - MC = -4^\circ$$

$$\frac{\sin TKE}{76} = \frac{\sin TKD}{89} \therefore TKD = -5^\circ$$

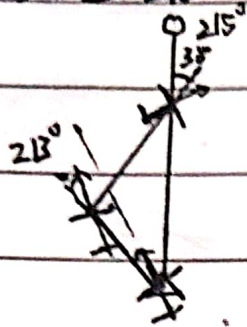
$$\Delta TK = TKD + TKE = -9^\circ$$

$$\therefore MH_{\text{true}} = MH - \Delta TK = 83^\circ$$



P163 7.13 进台背台切入航线计算

(1) MC 215° MH 213° RB 171° 切入角 30°



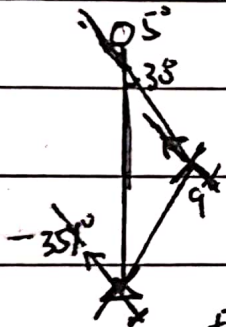
$$DA = RB - 180^\circ = -9^\circ$$

$$MTK = MH + DA = 212^\circ$$

$$MH_{切} = MC + 30^\circ = 245^\circ$$

$$切入后 MH_{返} = MC - DA = 216^\circ$$

(2) MC 5° MH 359° RB 190° 切入角 30°



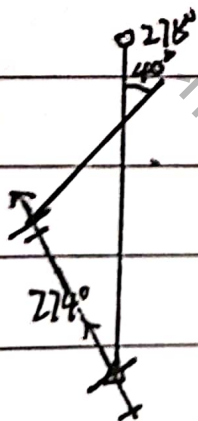
$$DA = RB - 180^\circ = 10^\circ$$

$$MTK = MH + DA = 369^\circ = 9^\circ$$

$$MH_{切} = MC + 30^\circ = 35^\circ$$

$$切入后 MH_{返} = MC - DA = -5^\circ = 355^\circ$$

(3) MC 218° MH 274° RB 180° 切入角 40°



$$DA = RB - 180^\circ = 0^\circ$$

$$MTK = MH + DA = 274^\circ$$

$$MH_{切} = MC + 40^\circ = 318^\circ$$

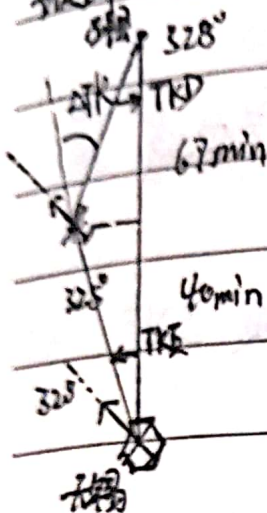
$$切入后 MH_{返} = MC - DA = 218^\circ$$



114 T14

无锡飞 328° MH 328° 背无锡 VOR 台 飞 40min.

预计还需 67min



$$QDR = 325^\circ$$

$$MTK = QDR = 325^\circ$$

$$DA = MTK - MH = 5^\circ$$

$$TKE = MTK - MC = -3^\circ$$

$$\frac{\sin TKE}{67} = \frac{\sin TKD}{40}$$

$$TKD = -2^\circ$$

$$MC_{\text{新}} = MC - TKD = 330^\circ$$

$$MH_{\text{后}} = MC_{\text{新}} - DA = 325^\circ$$

(2) 按照航迹修正角修正航迹

$$\Delta TK = TKE + TKD = -5^\circ$$

$$MH_{\text{后}} = MH - \Delta TK = 323^\circ$$

(3) 以 40° 切入背台切入航迹

$$MH_{\text{后}} = MC - 40^\circ = 288^\circ$$

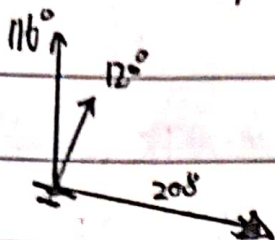
$$MH_{\text{后}} = MC + 40^\circ = 368^\circ = 8^\circ$$

$$\text{切入后 } MH_{\text{后}} = MC - DA = 323^\circ$$



P164 T17 判断飞机是否进入预定方位线

(1) MC 116° MH 12° RB 8° QDM指 2° QDM预 206°

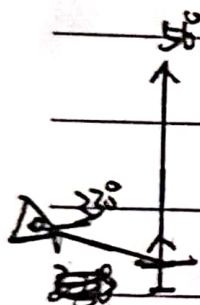


$$QDM_{\text{指}} = RB + MH = 200^\circ$$

$$QDM_{\text{指}} < QDM_{\text{预}}$$

还未进入预定方位线

(3) MC 56° MH 5° QDM指 33° QDM预 321°

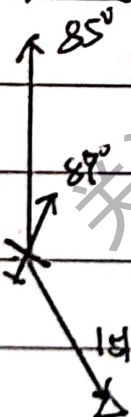


$$QDM_{\text{指}} > QDM_{\text{预}}$$

还未进入预定方位线

$$RB = QDM_{\text{指}} - MH = 33^\circ - 5^\circ = 274^\circ$$

(5) MC 85° MH 8° QDM指 23° QDM预 236°



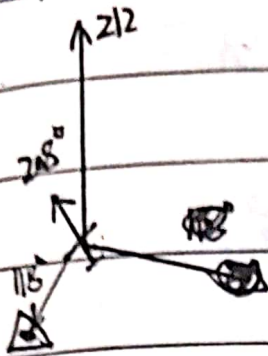
$$RB = QDM_{\text{指}} - MH = 147^\circ$$

$$QDM_{\text{指}} = QDM_{\text{预}}$$

在预定方位线上



(1) MC 212° MH 208° RB 27° QDM 预 122°

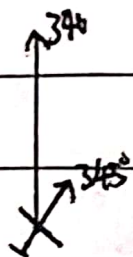


$$QDM_{指} = MH + RB = 478^\circ = 118^\circ$$

$$QDM_{指} < QDM_{预}$$

已进入预定方位线

(6) MC 340° - MH 345° RB 75° QDM 预 60°



$$QDM_{指} = MH + RB = 420^\circ = 60^\circ$$

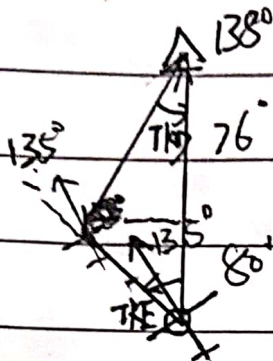
$$QDM_{指} = QDM_{预}$$

正好在预定方位线上



P164 T25 按新航线角修正航迹 (向鱼)

(1) MC 138° MH 135° RB 7° DZ 80 距 76



$$QDR = RB + MC =$$

$$QDM = RB + MH = 145^\circ$$

$$MC_{\text{新}} = QDM = 145^\circ$$

$$TKD = MC_{\text{新}} - MC =$$

$$TKD = MC - MC_{\text{新}} = -7^\circ$$

$$\frac{\sin TKD}{80} = \frac{\sin TKE}{76}$$

$$TKE = -7^\circ$$

$$MTK = MC + TKE = 131^\circ$$

$$DA = MTK - MH = -4^\circ$$

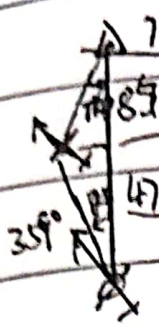
$$\Delta TK = TKD + TKE = -14^\circ$$

$$MH_{\text{应}} = MH + \Delta TK =$$

$$MH_{\text{应}} = MC_{\text{新}} - DA = 149^\circ$$



(12) MC 7° MH 359° RB 4° DE 47 DA 85

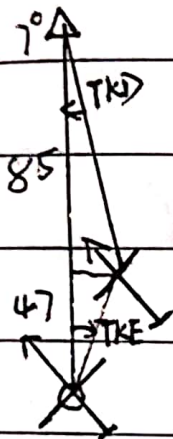


$$QDM = RB + MH = 363^\circ = 3^\circ$$

$$MC_{\text{新}} = QDM = 3^\circ$$

$$TKD = MC_{\text{新}} -$$

(13) MC 7° MH 359° RB 4° DE 47 DA 85



$$QDM = RB + MH = 363^\circ = 3^\circ$$

$$MC_{\text{新}} = QDM = 3^\circ$$

$$TKD = MC - MC_{\text{新}} = 4^\circ$$

$$\frac{\sin TKD}{85} = \frac{\sin TKE}{47} \Rightarrow$$

$$TKE = 7^\circ$$

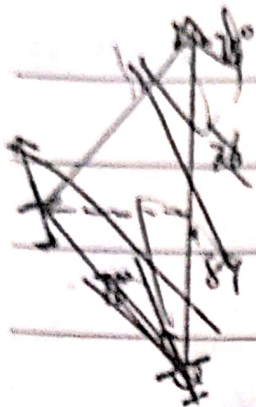
$$MTK = MC + TKE = 14^\circ$$

$$DA = MTK - MH = -345^\circ = 15^\circ$$

$$MH_{\text{总}} = MC_{\text{新}} - DA = 3^\circ - 15^\circ = -12^\circ = 348^\circ$$



① MC 78° MH 76° RB 358° D_B 89° D_A 76°



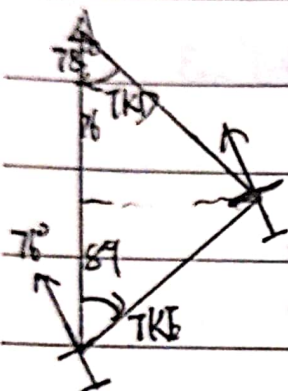
$$QDM = MH + RB = 434^\circ = 74^\circ$$

$$MC_{\text{新}} = QDM = 74^\circ$$

$$TKD = MC - MC_{\text{新}} = 4^\circ$$

$$\frac{\sin TKD}{89} = \frac{\sin TKE}{76}$$

$$TKE = 3^\circ$$



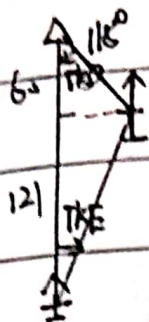
$$MTK = MC + TKE = 81^\circ$$

$$DA = MTK - MH = 5^\circ$$

$$MH_{\text{新}} = MC_{\text{新}} - DA = 69^\circ$$



(7) MC 118° MH 118° QDM 114° DZ 121 DA 60°



$$MC_{\text{新}} = QDM = 114^\circ$$

$$TKD = MC - MC_{\text{新}} = 4^\circ$$

$$\frac{\sin TKD}{121} = \frac{\sin TKE}{60}$$

$$TKE = 2^\circ$$

$$MTK = MC + TKE = 120^\circ$$

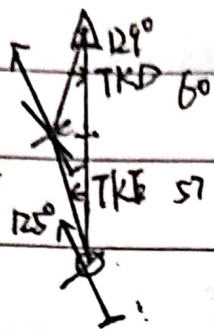
$$DA = MTK - MC = 2^\circ$$

$$MH_{\text{新}} = MC_{\text{新}} - DA = 112^\circ$$



P165 T26 按航迹修正角修正航迹

① MC 129° MH 125° RB 7° DE 57 DA 60



$$QDM = MH + RB = 132^\circ$$

$$MC_{\text{修正}} = QDM = 132^\circ$$

$$TKD = MC - MC_{\text{修正}} = -3^\circ$$

$$\frac{\sin TKD}{57} = \frac{\sin TKE}{60}$$

$$TKE = -3^\circ$$

$$\Delta TK = TKE + TKD = -6^\circ$$

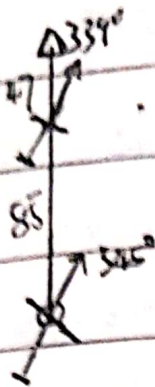
$$MH_{\text{修正}} = MH - \Delta TK = 131^\circ$$

$$MTK = MC + TKE = 126^\circ$$

$$DA = MTK - MH = 1^\circ$$



(5) MC 339° MH 345° RB 354° DL 85 DA 47



$$QDM = MH + RB = 699^\circ = 339^\circ$$

$$TKE = TKD = 0^\circ$$

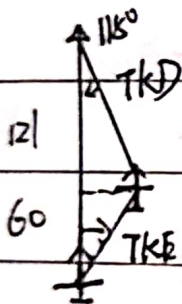
$$\Delta TK = TKE + TKD = 0^\circ$$

$$MH_{\text{改}} = MH - \Delta TK = 0^\circ$$

$$MC_{\text{新}} = QDM = 339^\circ$$

$$DA = MTK - MH = -6^\circ$$

(6) MC 115° MH 118° QDM 114° DL 60 DA 121



$$MC_{\text{新}} = QDM = 114^\circ$$

$$TKD = MC - MC_{\text{新}} = 4^\circ$$

$$\frac{\sin TKD}{60} = \frac{\sin TKE}{121}$$

$$TKE = 8^\circ$$

$$\Delta TK = TKE + TKD = 12^\circ$$

$$MH_{\text{改}} = MH + DA = 130^\circ$$

$$MH_{\text{改}} = MH - \Delta TK = 106^\circ$$

$$MTK = MC + TKE = 126^\circ$$

$$DA = MTK - MH = 8^\circ$$



P165 7.27 进行向台切/航线计算

1) MC 110° MH 108° RB 10° 切角 30° DA -5°



$$QDM = MH + RB = 118^\circ$$

$$MH_{\text{修正}} = MC + 30^\circ = 140^\circ$$

$$RB_{\text{修正}} = 360^\circ - 30^\circ = 330^\circ$$

$$TKD = MC - QDM = 110^\circ - 118^\circ = -8^\circ$$

$$\text{修正 } MH_{\text{修正}} = MC - DA = 115^\circ$$

2) MC 5° MH 359° RB 10° 切角 30° DA $+4^\circ$



$$QDM = RB + MH = 369^\circ = 9^\circ$$

$$MH_{\text{修正}} = MC + 30^\circ = 35^\circ$$

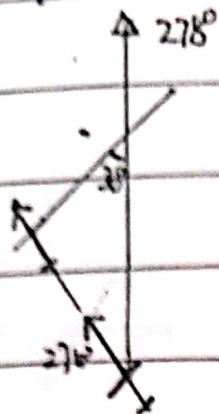
$$RB_{\text{修正}} = 360^\circ - 30^\circ = 330^\circ$$

$$TKD = MC - QDM = 5^\circ - 9^\circ = -4^\circ$$

$$\text{修正 } MH_{\text{修正}} = MC - DA = 1^\circ$$



(3) MC 278° MH 274° RB 10° 切入角 40° DA 0°



$$QDM = RB + MH = 284^\circ$$

$$MH_{\text{切}} = MC + 40^\circ = 318^\circ$$

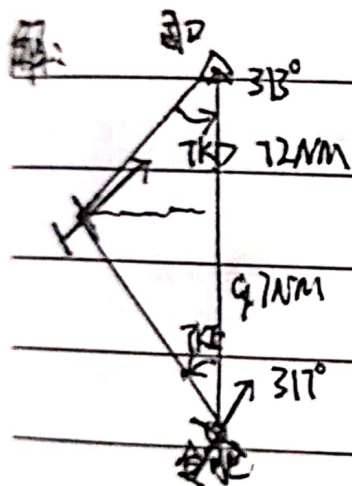
$$RB_{\text{切}} = 36^\circ - 40^\circ = 32^\circ$$

$$TKD = MC - QDM = -6^\circ$$

$$\text{切入后 } MH_{\text{切}} = MC - DA = 278^\circ$$

P165 T28 合肥 → 周口 MC 313°, 检查阜阳, 距 97 NM

DA 72 NM MH = 317° QDM 预 = 318°



1) 按新航线角修正航迹

$$\cancel{QDM} = \cancel{MH} \quad TKD = MC - QDM = -5^\circ$$

$$MC_{\text{新}} = QDM = 318^\circ$$

$$\frac{\sin TKD}{97} = \frac{\sin TKE}{72} \quad TKE = -4^\circ$$

$$MTK = MC + TKE = 309^\circ$$

$$DA = MTK - MH = -8^\circ$$

$$MH_{\text{切}} = MC_{\text{新}} - DA = 326^\circ$$

(2) 按航迹修正航迹

$$\Delta TK = TKE + TKD = -9^\circ$$

$$MH_{\text{切}} = MH - \Delta TK = 326^\circ$$

(3) 40° 切入角 切入航迹

$$MH_{\text{切}} = MC + 40^\circ = 353^\circ$$

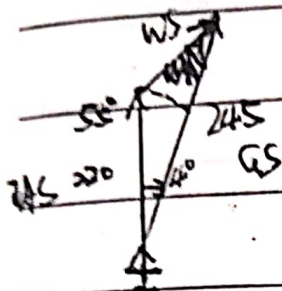
$$RB_{\text{切}} = 36^\circ - 40^\circ = 32^\circ$$

$$\text{切入后 } MH_{\text{切}} = MC - DA = 321^\circ$$



1166 733 按实测偏流, 地速计算风向, 风速

(1) MH 55° TAS 220 GS 245 DA $+4^\circ$



$$MTK = MH + DA = 59^\circ$$

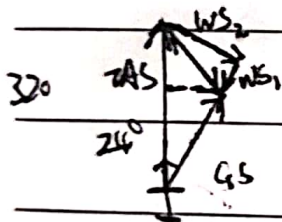
$$WA = \arctan\left(\frac{220 \sin 4^\circ}{245 - 220 \cos 4^\circ}\right) = 31^\circ$$

$$WD_n = MH + (DA + WA) = 99^\circ$$

$$WS = \sqrt{(220 \sin 4^\circ)^2 + (245 - 220 \cos 4^\circ)^2} \approx 30$$



(3) MH 24° TAS 320 GS 295 DA $+4^\circ$

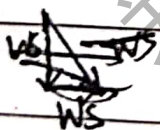


$$MTK = MH + DA = 28^\circ$$

$$WS_1 = 320 \cos 4^\circ = 295 \approx 295$$

$$WS_2 = 320 \sin 4^\circ \approx 22$$

$$WA = 22$$



$$\tan WA = \frac{TAS \times \sin DA}{GS - TAS \times \cos DA}$$

$$= \frac{320 \times \sin 4^\circ}{295 - 320 \times \cos 4^\circ}$$

$$WA = -43^\circ = 137^\circ$$

$$WD_n = MTK + WA = 165^\circ$$

$$WS = \sqrt{(TAS \times \sin DA)^2 + (GS - TAS \times \cos DA)^2}$$

$$= 33$$



$$\begin{cases} W = 6355 \frac{\tan \beta}{\pi \times TAS} & (km/h) \\ W = 3431 \frac{\tan \beta}{\pi \times TAS} & (kn) \end{cases}$$

$$T_1 = 180 \text{ 秒}$$

P214 7.16 计算转弯半径和转弯时的时间

1) TAS 160 kn $\beta 20^\circ$

$$R = \frac{TAS^2}{g \tan \beta} = \frac{(160 \times 1.852 / 3.6)^2}{9.8 \tan 20^\circ} \approx 1900 \text{ m}$$

$$W = \frac{360^\circ \times TAS}{2\pi R} = \frac{360^\circ \times 160}{2\pi \times 1900} \approx 1.7\%$$

$$W = 3431 \frac{\tan \beta}{\pi \times TAS} = 2.5\%$$

$$t_{180} = \frac{180^\circ}{2.5\%} = 72 \text{ s}$$

2) TAS 270 kn $\beta 25^\circ$

$$R = \frac{TAS^2}{g \tan \beta} = \frac{(270 \times 1.852 / 3.6)^2}{9.8 \times \tan 25^\circ} = 4222 \text{ m}$$

$$W = 3431 \frac{\tan \beta}{\pi \times TAS} = 3431 \times \frac{\tan 25^\circ}{\pi \times 270} = 1.9\%$$

$$t_{180} = \frac{180^\circ}{1.9\%} = 95 \text{ s}$$

3) TAS 350 km/h $W 2.8\%$

$$R = \frac{TAS}{W} = \frac{350 / 3.6}{2.8\%} = 35 \text{ km}$$

$$R = \frac{TAS}{W} = \frac{350 / 3.6}{2.8\%} = 1990 \text{ m}$$

$$t_{180} = \frac{\theta}{W} = \frac{180^\circ}{2.8\%} = 64 \text{ s}$$



(c) $TAS = 315 \text{ km/h}$ $\beta = 25^\circ$

$$R = \frac{TAS^2}{g \tan \beta} = \frac{(315/3.6)^2}{9.8 \tan 25^\circ} = 1675 \text{ m}$$

$$\omega = 6355 \times \frac{\tan 25^\circ}{\pi \times 315} = 3\%s$$

$$t_{180} = \frac{\theta}{\omega} = \frac{180^\circ}{3\%s} = 60 \text{ s}$$

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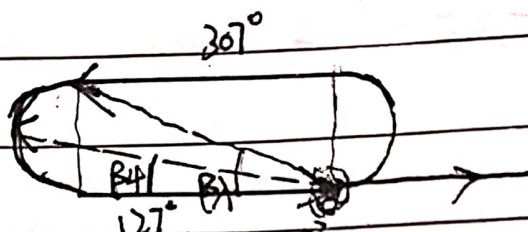


P220 719 如图 5.8 某机出航转弯速度 340 km/h,

出航 TAS 330 km/h, 出航飞行时间 1.5 min

入航转弯 TAS 320 km/h, 计算有角航线无风数据

解:



$$R_H = \frac{TAS^2}{g \tan \mu} = \frac{(340/3.6)^2}{9.8 \times \tan 25^\circ} = 1452 \text{ m}$$

$$R_A = \frac{TAS^2}{g \tan \mu} = \frac{(320/3.6)^2}{9.8 \tan 25^\circ} = 1729 \text{ m}$$

$$L_H = TAS \times t_H = (340/3.6) \times (1.5 \times 60) = 8500 \text{ m}$$

$$\text{航线长度} = L_H + R_A = 10229 \text{ m}$$

$$\text{航线宽度} = 2R_H = 3904 \text{ m}$$

$$QDM_{\text{turn}} = 307^\circ - 9^\circ = 217^\circ$$

$$RB_{\text{turn}} = QDM_{\text{turn}} - MH = 217^\circ - 307^\circ = 270^\circ$$

$$\Delta H = 1500 - 1000 = 500 \text{ m} \quad t_H = 1.5 \text{ min}$$

$$RD = \frac{\Delta H}{t_H} = \frac{500 \text{ m}}{90 \text{ s}} = 5.6 \text{ m/s}$$

$$\beta_A = \arctan \frac{2R}{L_H} = \frac{2 \times 1452}{8500} = 25^\circ$$

$$RB_A = 180^\circ + \beta_A = 205^\circ$$

$$QDM_A = MC_A + \beta_A = 332^\circ$$

$$\beta_4 = \arctan \frac{R_A}{L_H + R_A} = 10^\circ$$

$$RB_4 = 270^\circ + \beta_4 = 280^\circ$$

Maxleaf

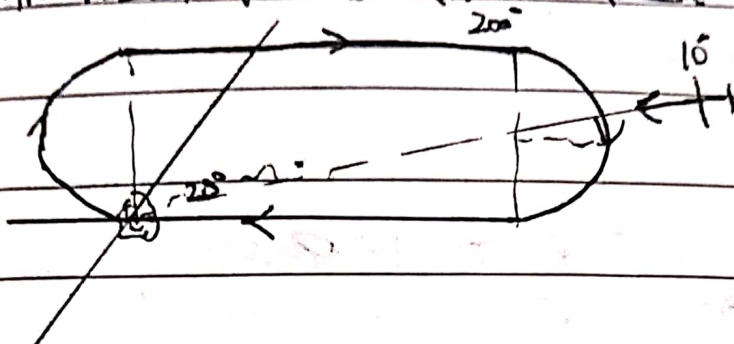
$$QDM_4 = MC_A + \beta_4 = 137^\circ$$



扫描全能王 创建

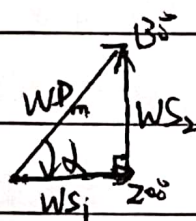
B20 T20 飞行执行MC出~~200~~200°左等待程序, 飞机保持MH18°
飞向等待点, 问如何加入等待程序? 若ATC通报WD_m为130°, WS为6m/s, 在出航边分解风并回答问题。

解:



(1) 直接进入

(2)



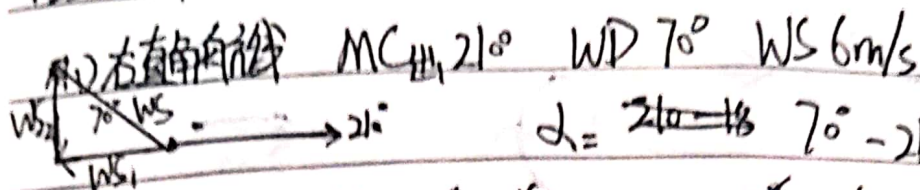
$$\alpha = 200^\circ - 130^\circ = 70^\circ$$

$$WS_2 = WD_m \cdot \sin \alpha = 122$$

$$WS_1 = WD_m \cdot \cos \alpha = 44$$



B20 72) 在出航边分解风并回答问题



$$\alpha = 21^\circ - 18^\circ + 70^\circ - 21^\circ + 18^\circ = 40^\circ$$

$$WS_1 = WS \cos 40^\circ = 5 \text{ m/s}$$

$$WS_2 = WS \sin 40^\circ = 4 \text{ m/s}$$

出航边修正飞行时间: $t_{\text{应}} = t_{\text{出}} + \Delta t$

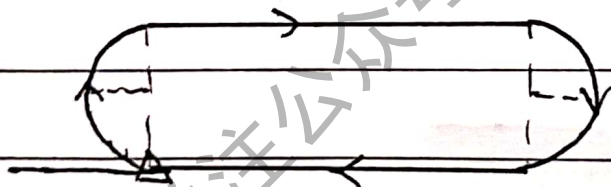
$$\Delta t = \frac{t_{\text{出}} WS_1}{TAS - WS_1}$$

用坡度修正入航转弯:

$$\text{① 入航边多飞一个 } \Delta t = \frac{t_{180} \cdot WS}{TAS - WS_1}$$

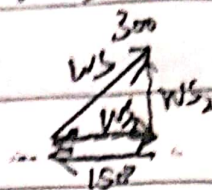
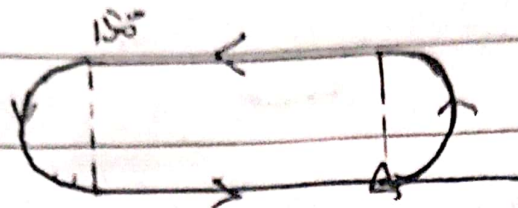
① 入航边无须修正

② 增加坡度



12) 左舷航线 MC 150° WD 300 WS 6 m/s

解



$$\alpha = 30^\circ \quad WS_1 = WS \times \cos \alpha = 5 \text{ m/s}$$

$$WS_2 = WS \times \sin \alpha = 3 \text{ m/s}$$

左舷修正出航时间:

$$t_{\text{正}} = t_{\text{出}} + \Delta t$$

$$\Delta t = \frac{t_{\text{出}} \cdot WS_1}{TAS - WS_1}$$

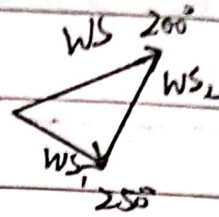
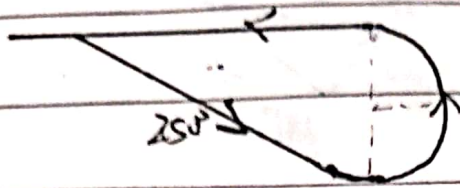
用坡度修正航转变

① 入航边不修正

② 入航转弯增大坡度



(3) 修正航线(左) $MC_{III} 250^\circ$ $WP_m 200^\circ$ $WS 8m/s$



$$\alpha = 250^\circ - 200^\circ = 50^\circ$$

$$WS_1 = WS \cos 50^\circ = 5 \text{ m/s}$$

$$WS_2 = WS \sin 50^\circ = 6 \text{ m/s}$$

修正飞行时间: $t_{\text{应}} = t_{\text{出}} - \Delta t$

$$\Delta t = \frac{t_{\text{出}} WS_1}{TAS + WS_1}$$

$$DA = \frac{57.3^\circ}{TAS} \cdot WS_2$$

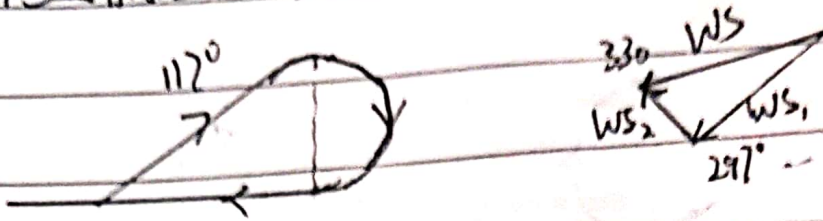
用坡度修正航转弯 -

$$\textcircled{1} t_{\text{应}} = t_{\text{出}} - \Delta t \quad \Delta t = \frac{(t_{\text{出}} + t_{180^\circ} + t_{\text{应}}) WS_1}{TAS + WS_1}$$

② 适当增加坡度



(4) 修正航线(右) 117° $MCA 117^\circ$ $WDm 330^\circ$ $WS 8m/s$



$$\alpha = 33^\circ$$

$$WS_1 = WS \cos \alpha = 8 m/s$$

$$WS_2 = WS \sin \alpha = 4 m/s$$

出航修正飞行时间

$$t_{\text{出}} = t_{\text{出}} + \Delta t$$

$$\Delta t = \frac{t_{\text{出}} WS_1}{TAS + WS_1}$$

用坡度修正入航转弯

$$\textcircled{1} t_{\text{入}} = t_{\text{入}} + \Delta t$$

$$\Delta t = \frac{(t_{\text{入}} + t_{\text{出}}) WS_1}{TAS - WS_1}$$

② 适当减小坡度



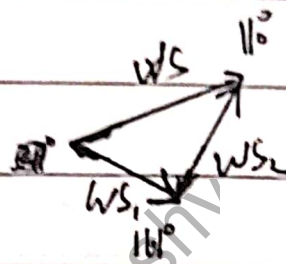
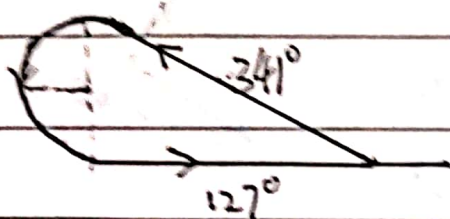
B20 722

飞机飞行如图 9.8 所示的航线, 航速 TAS 330 km/h,

飞行时间 1.5 min 风向 110° 风速 8 m/s

DA = 1.2 WS₂ Δt 顺 2 WS₁ 逆 3 WS₁,

计算 MH 及 $t_{\text{总}}$ RD



$$\alpha = 16^\circ - 11^\circ = 5^\circ$$

$$WS_1 = WS \cos \alpha = 8 \text{ m/s}$$

$$WS_2 = WS \sin \alpha = 0.7 \text{ m/s}$$

$$DA = 1.2 WS_2 = 0.84^\circ$$

$$MH_{\text{总}} = MC_{\text{总}} - DA = 334^\circ$$

$$t_{\text{总}} = t_{\text{H1}} + \Delta t$$

$$\Delta t = 3 WS_1 = 3 \times 0.7 \text{ m/s} = 2.1 \text{ s}$$

$$t_{\text{总}} = 9.0 \text{ s} + 2.1 \text{ s} = 11.1 \text{ s}$$

$$RD_{\text{总}} = \frac{1500 - 1000}{11.1} = \frac{500}{11.1} \text{ m/s} = 45 \text{ m/s}$$



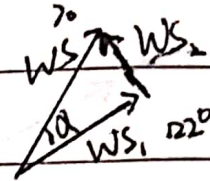
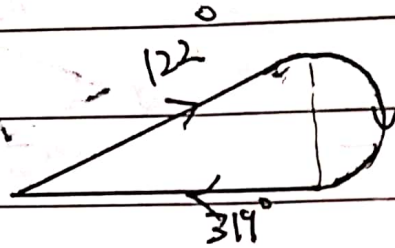
P220 T27

如图5.23所示的修正航线，出航 150 km

入航转弯 TAS 140 kn 风向 70° 风速 8 m/s

DA = 1.2 WS, 计算 MHE

在入航转弯中如何改变坡度修正风



$$\alpha = 122^\circ - 70^\circ = 52^\circ$$

$$WS_1 = WS \cos \alpha = 5 \text{ m/s}$$

$$WS_2 = WS \sin \alpha = 6 \text{ m/s}$$

$$DA = 1.2 WS_2 = 7.2^\circ$$

$$MHE = MC - DA = 115^\circ$$

入航转弯应当增大坡度

