1 VFR flights shall not be flown over the congested areas of cities at a height less than

- **A** the highest obstacle.
- **B** 500 ft above the highest obstacle.
- **C** 2000 ft above the highest obstacle within a radius of 600 ft from the aircraft.
- **D** 1000 ft above the highest obstacle within a radius of 600 m from the aircraft.

2 (For this question use annex A)

The planned flight is over a distance of 440 NM
Based on the wind charts at altitude the following components are found:
FL50: -30kt; FL100: -50kt; FL180: -70kt
The Operations Manual in appendix details the aircraft's performances.

Which of the following flight levels (FL) gives the best range performance:

- **A** FL 050
- **B** Either FL 050 or FL 100
- **C** FL 180
- **D** FL 100

3 Given: True course (TC) 017°, W/V 340°/30 kt, True air speed (TAS) 420 kt
Find: Wind correction angle (WCA) and ground speed (GS)

- **A** WCA -2°, GS 426 kt
- **B** WCA +2°, GS 416 kt
- **C** WCA -2°, GS 396 kt
- **D** WCA +2°, GS 396 kt

4 The fuel burn off is 200 kg/h with a relative fuel density of 0,8. If the relative density is 0,75, the fuel burn will be:

- **A** 200 kg/h
- **B** 213 kg/h
- **C** 188 kg/h
- **D** 267 kg/h

5 (For this question use annex B or Flight Planning Manual MRJT 1 Figure 4.3.1C)
For a flight of 2000 ground nautical miles, cruising at 30000 ft, within the limits of the data given, a headwind component of 25 kt will affect the trip time by approximately:

- **A** +5.3%
- **B** +7.6%
- **C** -3.6%
- **D** +2.3%

6 At a navigational checkpoint the remaining usable fuel in tanks is 60 US gallons. The alternate fuel is 12 US gallons. According to the flight plan the remaining flight time is 1h35min.
Calculate the highest rate of consumption possible for the rest of the trip.

- **A** 33.0 US gallons/hour
- **B** 30.3 US gallons/hour
- **C** 21.3 US gallons/hour
- **D** 37.9 US gallons/hour

7 In the ATC flight plan Item 15 (Cruising speed), when not expressed as a Mach number, cruising speed is expressed as:

A Groundspeed
B CAS
C IAS
D TAS

8 A "current flight plan" is a:

A flight plan with the correct time of departure.
B flight plan in the course of which radio communication should be practised between aeroplane and ATC.
C filed flight plan with amendments and clearance included.
D filed flight plan.

9 If your destination airport has no ICAO indicator, in the appropriate box of your ATC flight plan, you write:

A XXXX
B ////
C ZZZZ
D AAAA

10 The maximum permissible take-off mass of an aircraft for the L wake turbulence category on an ATC flight plan is:

A 10 000 kg
B 5 700 kg
C 2 700 kg
D 7 000 kg

11 During an IFR flight TAS and time appear to deviate from the data in the ATC flight plan. The minimum deviations, that should be reported to ATC in order to conform to PANS-RAC, are:

A TAS 5% and time 3 minutes.
B TAS 3% and time 3 minutes.
C TAS 5 kt and time 5 minutes.
D TAS 10 kt and time 2 minutes.

12 An executive pilot is to carry out a flight to a French aerodrome, spend the night there and return the next day. Where will he find the information concerning parking and landing fees ?

A in the AGA chapter of the French Aeronautical Information Publication (AIP)
B in the FAL section of the French Aeronautical Information Publication (AIP)
C by telephoning the aerodrome's local chamber of commerce, this type of information not being published
D in the GEN chapter of the French Aeronautical Information Publication (AIP)

13 The still air distance in the climb is 189 Nautical Air Miles (NAM) and time 30 minutes. What ground distance would be covered in a 30 kt head wind?

A 174 NM
B 203 NM
C 188 NM
D 193 NM

14 (For this question use annex C)
Which best describes be maximum intensity of icing, if any, at FL150 in the vicinity of BUCHAREST (45°N 026°E) ?

A Severe
B Nil
C Moderate
D Light

15 (For this question use annex D)
Which of the following flight levels, if any, is forecast to be clear of significant cloud, icing and CAT along the marked route from SHANNON (53°N 10°W) to BERLIN (53°N 13°E) ?

A FL250
B FL 210
C FL290
D None

16 A METAR reads: SA1430 35002KY 7000 SKC 21/03 QI024 =
Which of the following information is contained in this METAR ?

A temperature/dewpoint
B runway in use
C day/month
D period of validity

17 (For this question use annex E)
What lowest cloud conditions (oktas/ft) are forecast for JOHANNESBURG/JAN SMUTS at 0300 UTC?

A 3 to 4 at 400
B 5 to 7 at 800
C 3 to 4 at 800
D 5 to 7 at 400

18 (For this question use annex F or SID chart Paris Charles de Gaulle 20-3)
Planning an IFR-flight from Paris Charles de Gaulle to London. SID is ABB 8A.
Assume Variation 3° W, TAS 430kts, W/V 280/40 and distance to top of climb 50NM
Determine the magnetic course, ground speed and wind correction angle from top of climb to ABB 116.6.

A MC 169°, GS 450 kt, WCA +4°
B MC 349°, GS 414 kt, WCA +5°
C MC 169°, GS 414 kt, WCA +5°
D MC 349°, GS 414 kt, WCA -5°

19 An airway is marked 5000 2900a. The notation 5000 is the:

A base of the airway (AGL)
B minimum holding altitude (MHA)
C maximum authorised altitude (MAA)
D minimum enroute altitude (MEA)

20 An airway is marked 3500T 2100 a. This indicates that:

A the minimum obstruction clearance altitude (MOCA) is 3500 ft
B the minimum enroute altitude (MEA) is 3500 ft
C the airway base is 3500 ft MSL
D the airway is a low level link route 2100 ft - 3500 ft MSL

21 From which of the following would you expect to find information regarding known short unserviceability of VOR, TACAN, and NDB ?

A SIGMET
B ATCC broadcasts
C NOTAM
D AIP

22 You must fly IFR on an airway orientated 135° magnetic with a MSA at 7 800 ft. Knowing the QNH is 1 025 hPa and the temperature is ISA + 10°, the minimum flight level you must fly at is:

A 70
B 75
C 80
D 90

23 The purpose of the decision point procedure is:

A to reduce the landing weight and thus reduce the structural stress on the aircraft.
B to reduce the minimum required fuel and therefore be able to increase the traffic load.
C to increase the amount of extra fuel.
D to increase the safety of the flight.

24 Given:

Distance from departure to destination	500 NM
True track	090
W/V	090/20
TAS	150 kt

What is the distance and time of the PET from the departure point?

A Distance: 382 NM Time: 176min
B Distance: 250 NM Time: 88 min
C Distance: 217 NM Time: 100 min
D Distance: 283 NM Time: 131 min

25 (For this question use annex G or Flight Planning Manual MRJT 1 Figure 4.3.6)
Given: twin jet aeroplane, Dry operating mass 35500 kg, Traffic load 14500 kg, Final reserve fuel 1200 kg, Distance to alternate 95 NM, Tailwind component 10 kt
Find: Fuel required and trip time to alternate with simplified flight planning (ALTERNATE PLANNING)

A 800 kg, 24 min
B 800 kg, 0.4 hr
C 1000 kg, 24 min
D 1000 kg, 40 min

26 "Integrated range" curves or tables are presented in the Aeroplane Operations Manuals. Their purpose is

A to determine the still air distance for a wind components varying with altitude.
B to determine the optimum speed considering the fuel cost as well as the time related cost of the aeroplane.
C to determine the fuel consumption for a certain still air distance considering the decreasing fuel flow with decreasing mass.
D to determine the flight time for a certain leg under consideration of temperature deviations.

27 (For this question use annex H)
Finish the ENDURANCE/FUEL CALCULATION and determine ATC ENDURANCE for a twin jet aeroplane, with the help of the table provided. Contingency is 5% of the planned trip fuel and fuel flow for extra fuel is 2400 kg/h.

A ATC ENDURANCE: 04:12
B ATC ENDURANCE: 03:37
C ATC ENDURANCE: 03:52
D ATC ENDURANCE: 04:07

ANNEX A

Flight Level	40	80	120	160	200
TAS (knots)	190	198	204	212	220
Hourly fuel flow (l/hr)	210	202	182	170	156

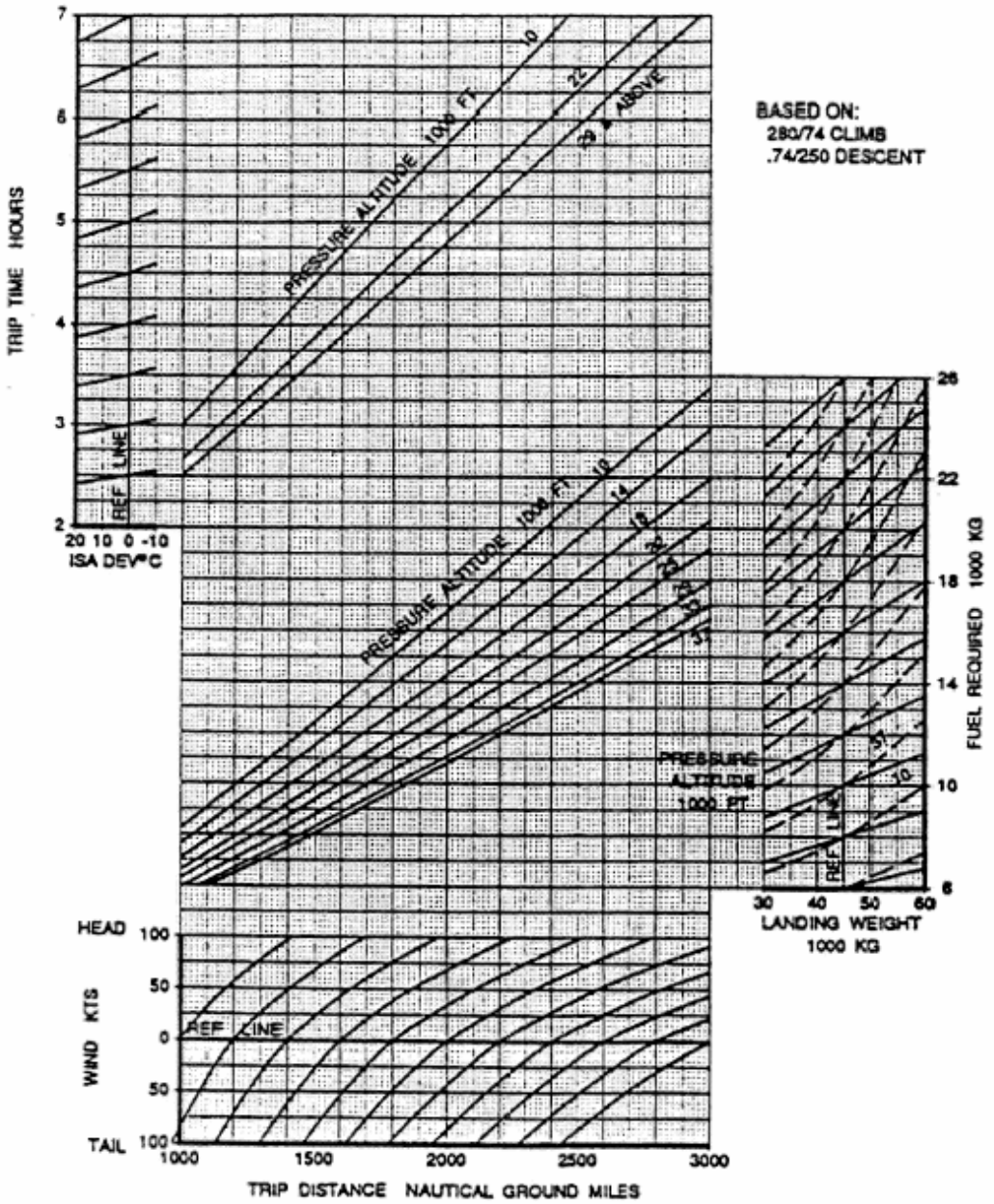
ANNEX B

CIVIL AVIATION AUTHORITY
FUEL PLANNING

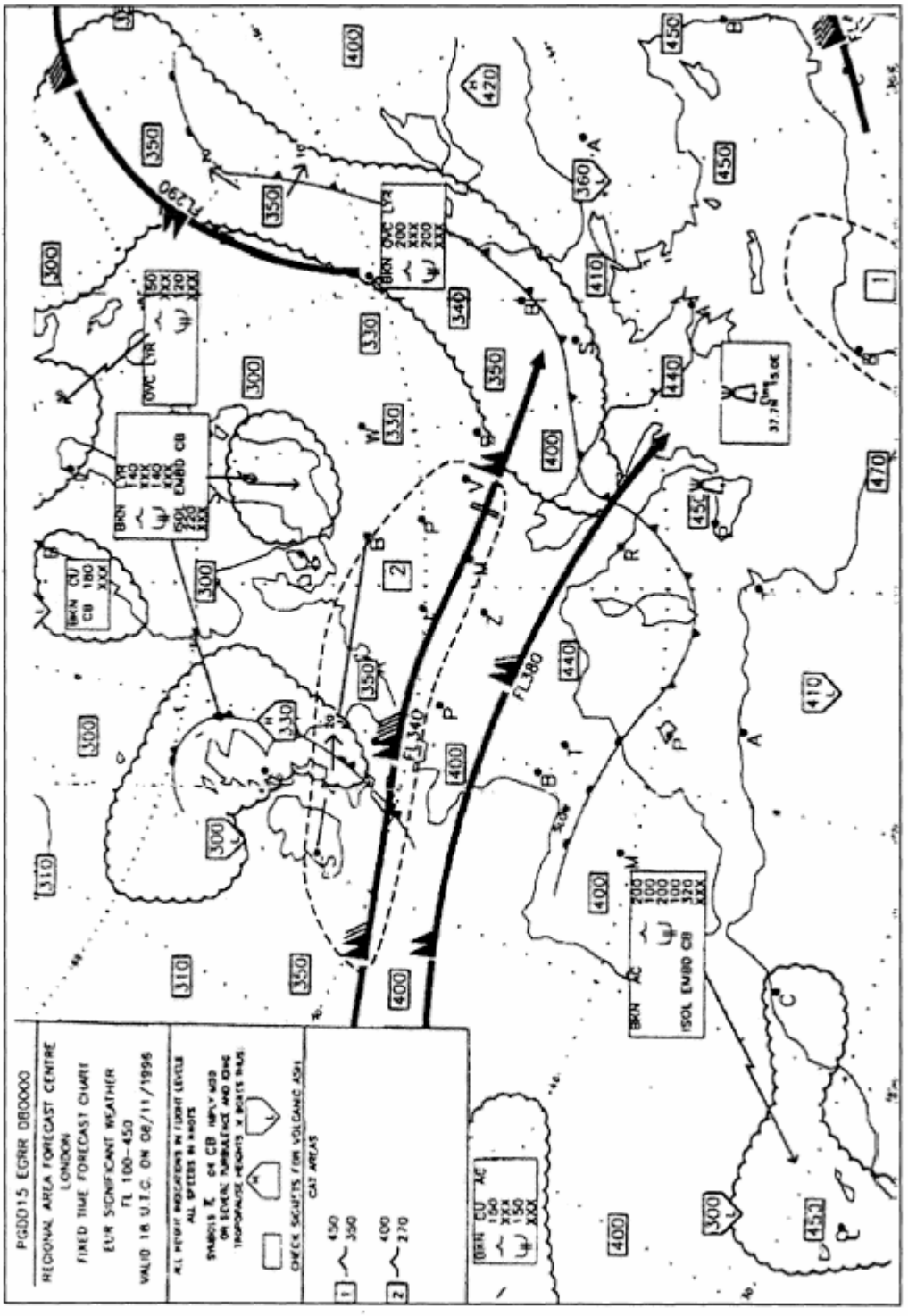
DATA SHEET
MRJT 1

Figure 4.3.1 C SIMPLIFIED FLIGHT PLANNING

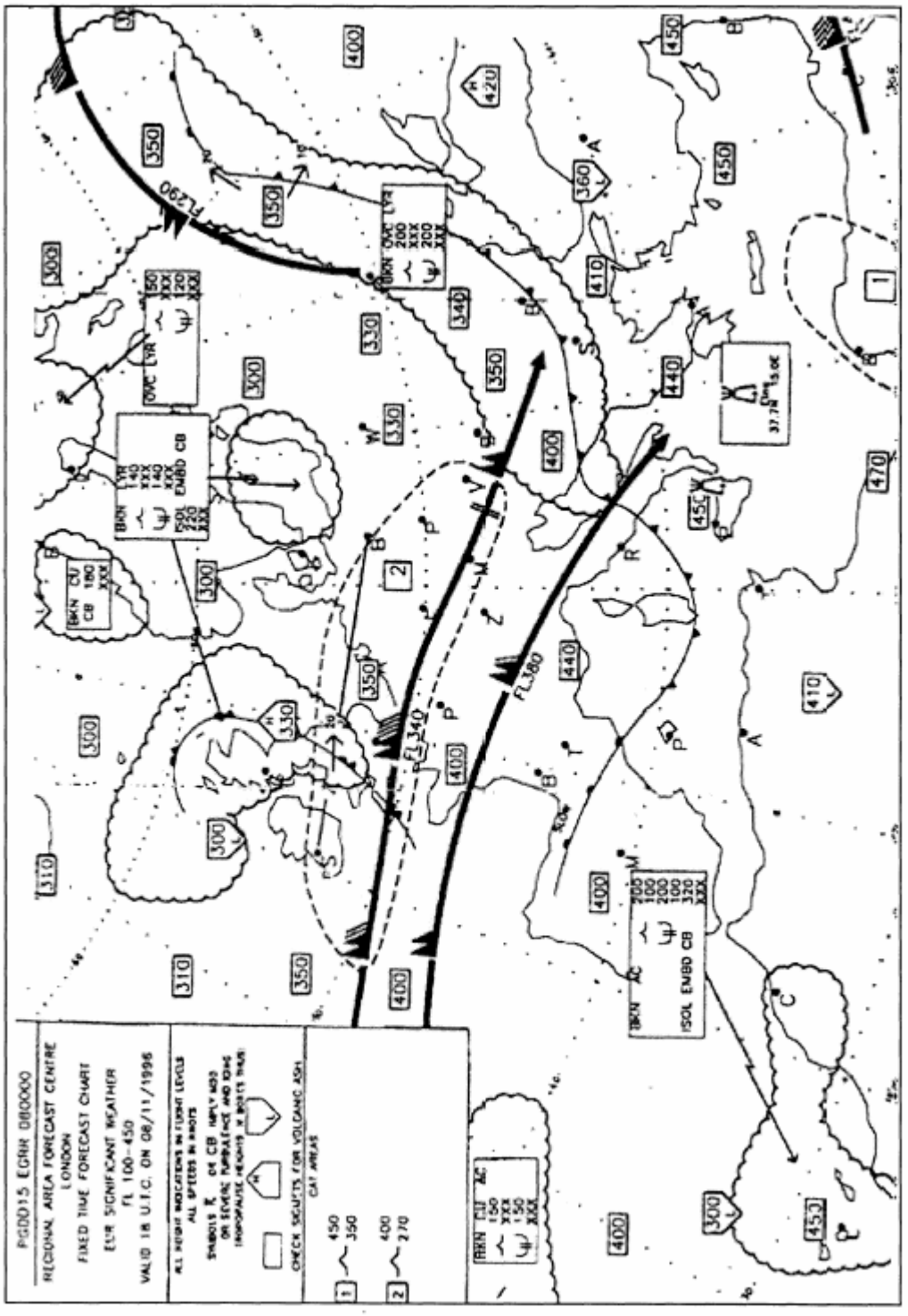
LONG RANGE CRUISE



ANNEX C


PGD015 EGRR 080000
REGIONAL AREA FORECAST CENTRE
LONDON
FIXED TIME FORECAST CHART
EUR SIGNIFICANT WEATHER
FL 100–450
VALID 18 U.T.C. ON 08/11/1996
FL290
FL380
FL340

ANNEX D

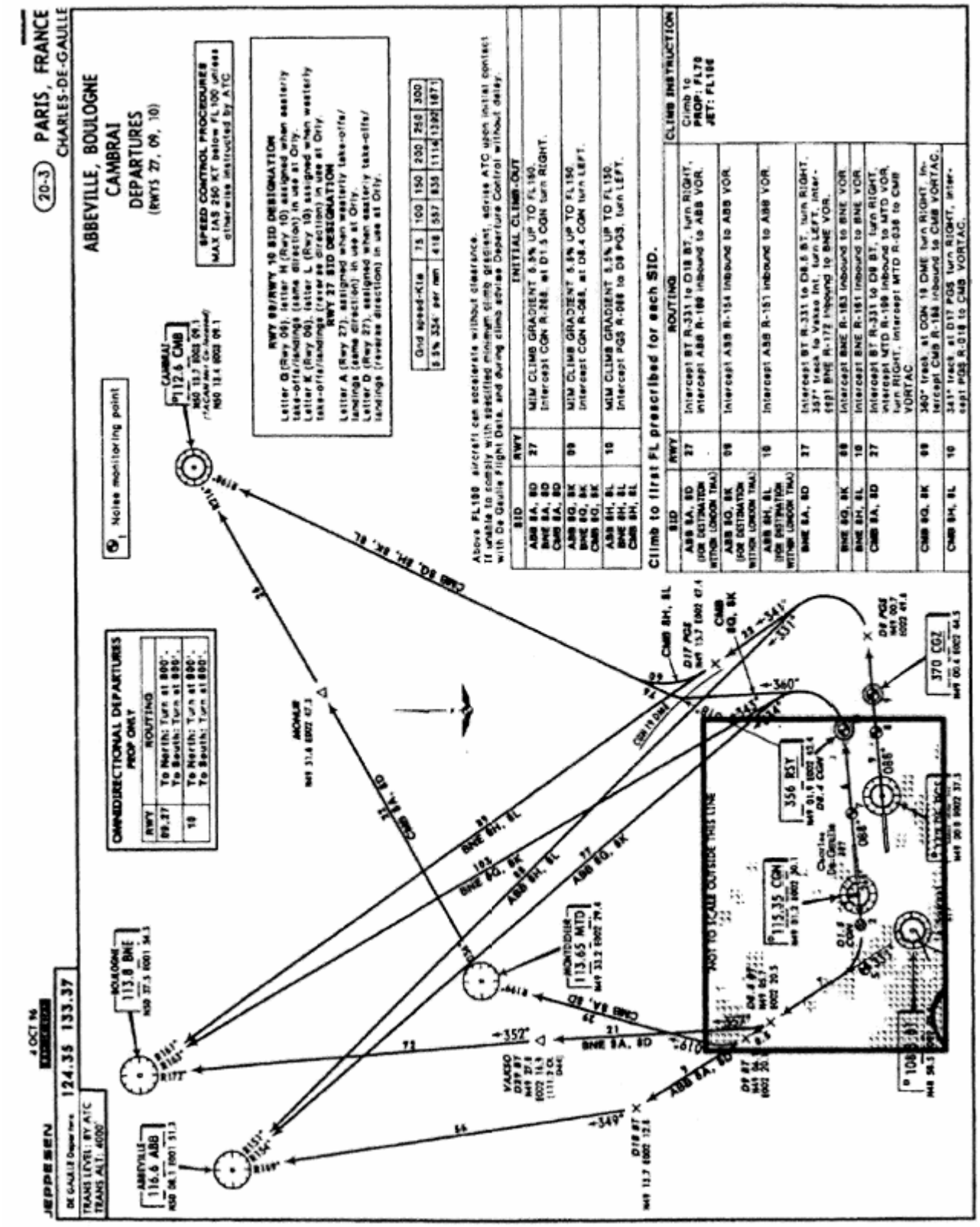

PGD015 EGRR 080000
REGIONAL AREA FORECAST CENTRE
LONDON
FIXED TIME FORECAST CHART
EUR SIGNIFICANT WEATHER
FL 100-450
VALID 18 U.T.C. ON 08/11/1996
CHECK SIGMETS FOR VOLCANIC ASH
CAT AREAS
FL290
FL340
FL380
ISOL EMBD CB

ANNEX E

METAR/TAF LIST

```
PARIS / CHARLES-DE-GAULLE
LFPG/CDG
       SA1330  121330Z 27004KT 9999 SCT011 BKN050 09/08 Q1001 NOSIG=

       FC1100r 120800Z 120918 30005KT 3500 BR BKN003 BECMG 0911 6000
               SCT011 SCT050 BECMG 1113 9999 SCT020 BECMG TEMPO 1317
               8000 -SHRA SCT025TCU BKN030 T08/12Z T09/15Z=

       FT1000  121000Z 121812 27008KT 9999 BKN025 BECMG 1821 20005KT SCT030
               BECMG 2124 6000 BECMG 0002 20008KT 2000 BR BKN005 TEMPO 0208
               20004KT 0500 BCFG OVC001 BECMG 0810 18012KT 9999 SCT012
               BCMG 1012 SCT020=

BORDEAUX / MERIGNAC
LFBD/BOD
       SA1330  121330Z 21005KT 9000 FEW030TCU FEW033CB SCT040 BKN100 09/08
               Q1005 TEMPO 25015G25KT 3000 TSRA SCT005 BKN015CB=

       FC1100r 121100Z 121221 28010KT 9999 -RA SCT020 FEW025CB SCT040
               TEMPO 1218 25015G25KT 6000 SHRA SCT008 SCT020CB BKN033 PROB30
               TEMPO 1218 28020G30KT 3000 TSRA SCT005 BKN015CB BKN030 BECMG
               1821 22004KT 8000 NSW FEW006 BKN030=

       FT1000  121000Z 121812 30010KT 9999 SCT020 FEW025CB BKN040
               BECMG 1822 22004KT 8000 FEW006 BKN030 BECMG 0306 24005KT 6000
               SCT007 SCT015 BKN090 BECMG 1012 -RA=

LYON / SATOLAS
LFLL/LYS
       SA1330  121330Z 14007KT 9000 -TSRA FEW020CB SCT033TCU BKN046 09/07
               Q1003 NOSIG=

       FC1100r 121100Z 121221 VRB03KT 9999 FEW010 SCT020 BKN040 BECMG 1821
               33006KT TEMPO 1221 VRB15G20KT 4000 SHRA SCT008 BKN015=

       FT1000  121000Z 121812 33004KT 9999 SCT025 BKN060 BECMG 2224 VRB02KT
               8000 SCT010 SCT020 BECMG 0204 1500 BR BKN003 TEMPO 0407 0800 FG
               OVC002 BECMG 0810 33006KT 9999 SCT015 BKN030=

BASEL / MULHOUSE
LFSB/BSL
       SA1330  121330Z 23008KT 9999 -RA FEW020 SCT030 BKN066 06/05 Q1001
               NOSIG=

       FC1100r 121100Z 121221 18005KT 9000 -RA FEW015 BKN030 BKN060
               TEMPO 1216 NSW BECMG 1517 9999 FEW030 BKN040 BKN080
               TEMPO 1621 -SHRA=

DUBAI
OMDB/DXB
       FT1000  121212 33015KT 9999 SCT030 BKN090 TEMPO 1209 5000 SHRA PROB40
               TEMPO 1224 VRB40KT 1000 TSSH SCT025CB BECMG 1618 05010KT
               BECMG 0608 33013G23KT=

JOHANNESBURG/JAN SMUTS
FAJS/JNB
       FT0900  120900Z 121212 36010KT 9999 FEW030CB FEW035 PROB40 TEMPO 1318
               VRB15KT 3000 TSRA SCT030CB BKN080 FM2000 03005KT CAVOK
               BECMG 0204 SCT008 SCT100 PROB30 0305 3000 BCFG BKN004
               FM0800 34012KT 9999 SCT025 T25/12Z T15/03Z T27/12Z=

TUNIS / CARTHAGE
DTTA/TUN
       SA1330  121330Z 24008KT 9999 FEW023 BKN200 24/08 Q1007=
```

ANNEX F


PARIS, FRANCE
CHARLES-DE-GAULLE
ABBEVILLE, BOULOGNE
CAMBRAI
DEPARTURES
(RWYS 27, 09, 10)
Noise monitoring point
SPEED CONTROL PROCEDURES
MAX IAS 250 KT below FL100 unless otherwise instructed by ATC
RWY 09/RWY 10 SID DESIGNATION
RWY 27 SID DESIGNATION
OMNIDIRECTIONAL DEPARTURES
PROP ONLY
ROUTING
Climb to first FL prescribed for each SID.
CLIMB INSTRUCTION
INITIAL CLIMB-OUT
JEPPESEN
4 OCT 96
124.35 133.37
TRANS LEVEL: BY ATC
TRANS ALT: 4000'
ABBEVILLE
116.6 ABB
BOULOGNE
113.8 BNE
CAMBRAI
112.5 CMB
MONTDIDIER
113.65 MTD
356 RSY
115.35 CDN
370 CDZ
NOT TO SCALE OUTSIDE THIS LINE

ANNEX G

CIVIL AVIATION AUTHORITY
FUEL PLANNING

DATA SHEET
MRJT 1

3.3 Altemate Planning (Fig. 4.3.6)

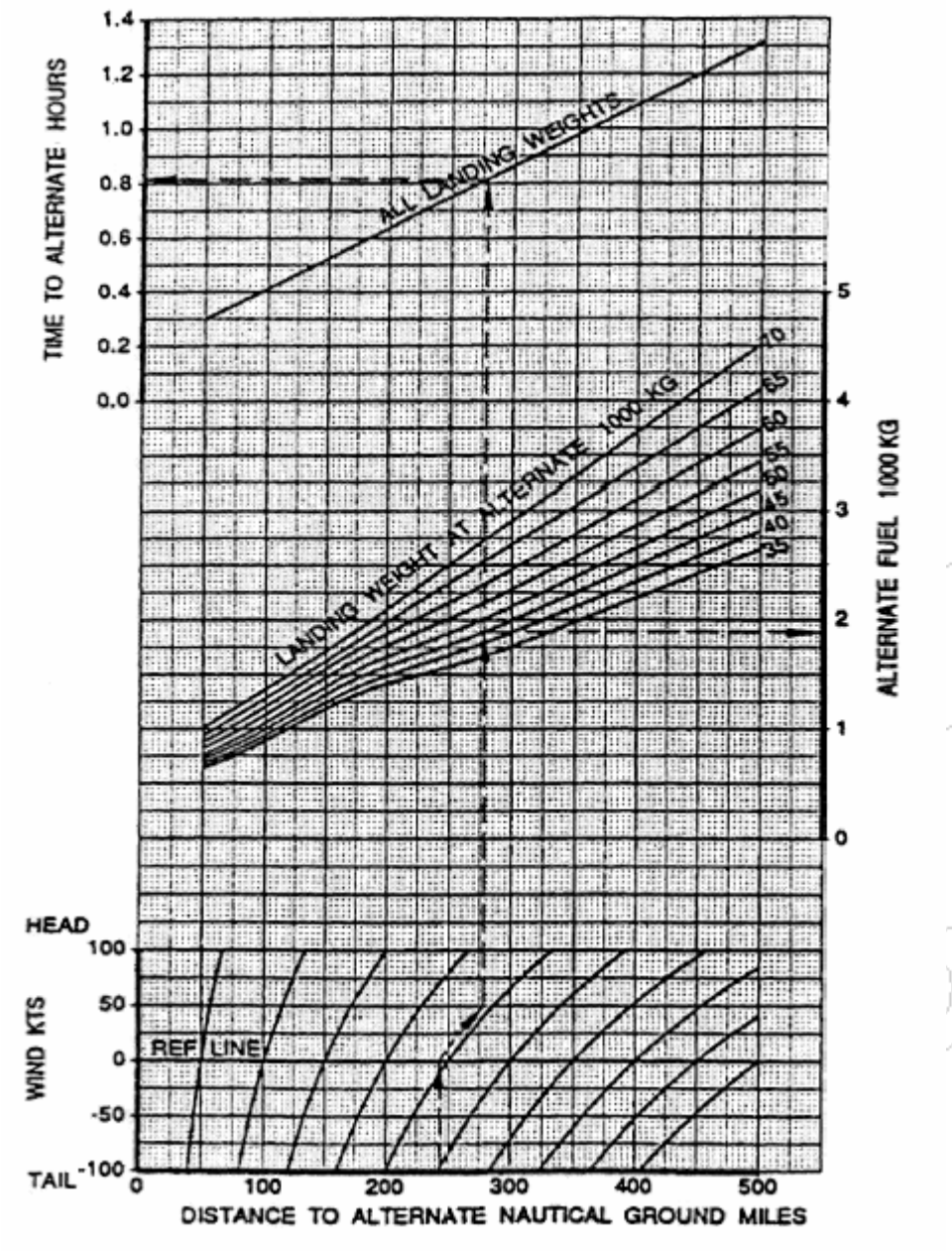
The fuel and time figures extracted from this chart include the following:

- Missed approach
- Climb to cruise altitude
- Cruise at LRC
- Descent and straight on approach.

Method of use is similar to previous graphs.
For distances greater than 500 NM use the LRC Simplffied Hight Planning Charts.

Figure 4.3.6 SIMPLIFIED FLICHT PLANNING

ALTERNATE PLANNING
LONG RANGE CRUISE


TIME TO ALTERNATE HOURS
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
ALL LANDING WEIGHTS
LANDING WEIGHT AT ALTERNATE 1000 KG
70
65
60
55
50
45
40
35
ALTERNATE FUEL 1000 KG
5
4
3
2
1
0
HEAD
WIND KTS
100
50
0
-50
TAIL -100
REF. LINE
0
100
200
300
400
500
DISTANCE TO ALTERNATE NAUTICAL GROUND MILES

ANNEX H

ENDURANCE/FUEL CALCULATION

	Fuel (kg)	Time (hh:mm)
Trip Fuel	5800	02:32
Contingency Fuel		
Alternate Fuel		
Final Reserve Fuel	1800	00:42
	1325	
Minimum T/O-Fuel		
Extra Fuel		
Actual T/O-Fuel		
Taxi FUEL	200	
Ramp Fuel	10000	

1. 1000ft – an ICAO regulation, see Air Law Answer (d)

2. There are 2 ways of doing this. Either calculate Specific Fuel Consumption (SFC), which is given by Fuel Flow/ground speed (SFC = Kgs of fuel used per ground nm; therefore, the lower the figure the better), or calculate the total fuel required for this 440nm navigation leg…I'll use SFC….

   Now, they have been awkward…..the question refers to FLs 50/100/180 and the cruise data is given at FLs 40/80/120/160/200. Also, the question gives fuel flow as Litres/hour rather than kg/hr but we can still use it to find a measure of efficiency – Litres of fuel used per ground nm.

   We need to interpolate and expand ANNEX A to find the data at Flight Levels 50/100/180 and then divide fuel flow by groundspeed to find the lowest SFC.

FL	40	**50**	80	**100**	120	160	**180**	200
TAS	190	**192**	198	**201**	204	212	**216**	220
Wind		**-30**		**-50**			**-70**	
GS		**162**		**151**			**146**	
L/hr	210	**208**	202	**192**	182	170	**163**	156
SFC		**1.283**		**1.271**			**1.116**	

   The best range performance is at FL180 where the SFC is 1.116 L/NGM

   Answer (c)

3. This is solved on the Nav Computer, WCA is another term for drift except that, while drift is usually expressed as port and starboard or left and right, the WCA uses + and -. The mnemonic for conversion is **P**ort **P**lus.

   On the CRP5 or similar use the wind face and the high speed scale. Rotate the inner scale to put 340º at the top and mark the wind cross 30kt down from the centre ring. Place the TAS, 420kt under the centre ring. Put the course (track) of 017º initially at the top, read an initial drift of 2.5º right. Rotate the inner scale 2.5º to the right to lay off the drift then, finally, read a heading of 015ºT, a drift of 2º right and a groundspeed of 396kt. The WCA is –2º,

   Answer (c)

4. Fuel burn of 200kg/hr remains 200kg/hr whatever the SG, that only affects the volume of fuel burnt per hour

   Answer (a)

5. Use either the Annex or CAP 697 page 30 which has a better print quality.

Enter at 2000 NGM……	ZERO wind trip time…..	4.830hrs
	25kt head wind trip time..	5.150hrs
	An increase of……	0.330hrs

   As a percentage of the still air time: $+ \frac{0.330}{4.830} \times 100 = + 6.85\ \%$

   Answer (b)

6. This question apparently ignores Final Reserve and Contingency and assumes all the usable fuel will be burnt in the rest of the trip. This is clearly a poor way to operate aircraft but, with no other information, we have to follow the assumption.

   Remaining Trip fuel = 60 – 12 = 48 US gals
   Remaining Trip time = 1.583 hrs

   Highest fuel consumption rate = $\frac{48.0}{1.583}$ = 30.3 US gals / hour

   Answer (b)

7. JEPP Manual Air Traffic Control Section page 438. TAS Answer (d)

8. PANS RAC 4444 states: The current flight plan is "The Flight Plan, including any changes, if any, brought about by subsequent clearances."

   Answer (c)

9. JEPP Manual Air Traffic Control Section page 438, ITEM 16. Answer (c)

10. JEPP Manual Air Traffic Control Section page 435, ITEM 9. Answer (d)

11. JEPP Manual Air Traffic Control Section page 438, ITEM 15 (3) Change of Speed or Level gives a clue – 5% TAS….3 minutes is also a requirement.

    Answer (a)

12. AGA Answer (a)

13. Climb distance 189 NAM – but you are in a headwind of 30kts for 30 minutes – you get blown back 15nms – ground distance covered 189 – 15 = 174 NGM

    Answer (a)

14. The quality of this Annex is very poor. It is sort of possible to make out the LAT and LONG, use London as a starter….. Bucharest is the **B** 5.5cm from the bottom, 4.5cm from the left edge! Icing over Bucharest at FL150: the detail is just above the **B**, remember the icing symbol has up to 3 verticals – light / moderate / severe. So, from CHART base (FL100) to FL200 there is MODERATE ICING forecast.

    Answer (c)

15. Annex D. Luckily the route SHANNON to BERLIN is drawn in. There are 2 areas of weather affecting this route – CAT AREA 2 – Moderate CAT FL270-FL400, and a Frontal System lying over England with MOD Icing and CAT FL100-FL140 ISOL EMBD CB FL100-FL220.

    There seems to be a clear area FL220-FL270. Answer (a)

16. ….SKC 21/03…Sky Clear Temperature 21°C Dew Point 3°C… Answer (a)

17. The question asks for the lowest cloud conditions forecast for 0300 UTC. Look at all the TEMPOs and PROBs…..third line….PROB30 0305 3000 **BKN004** FM0800….. The lowest cloud is 5 to 7 OKTAS at 400ft

Answer (d)

18. The Annex is offered, but if you have your JEPP Manual, use the PARIS CDG Chart 20-3 in that. To answer the question you need to know which segment of the departure you are in. Follow the ABB 8A departure track adding up the track miles as you go. TOC is at 50nm – this is after you get to N49 13.7 E002 12.8, the magnetic track (course) is 349° inbound to ABB VOR. So it must be either (B) or (D). The fact that the wind is coming from the left means you are being blown to the right, right drift, and have a negative WCA. It must be (D). You can also use the nav computer to find the exact values.

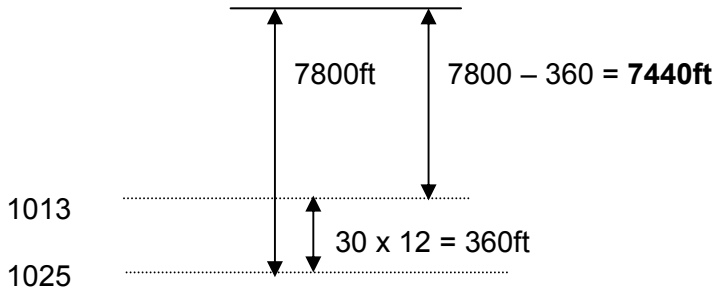
Answer (d)

19. JEPP Manual, Enroute chart legend page 57 – the blue pages Answer (d)

20. JEPP Manual, Enroute chart legend page 57 – the blue pages Answer (a)

21. Short term unserviceabilities – NOTAMs. Answer (c)

22.



The diagram shows the ISA Pressure Altitude of 7440ft corresponds to an altitude of 7800ft. There is also a temperature error to take account of, 4% of the difference between the height you are at and the datum for each 10º of ISA deviation, 4% x 7440 = 298ft, and this is subtracted from 7440ft to show an indicated 7142ft corresponds to an ISA pressure altitude of 7440ft, in high temperatures your altimeter under reads.

It might be worth noting that the temperature error correction is small, and is unlikely to affect the outcome of a calculation like this.

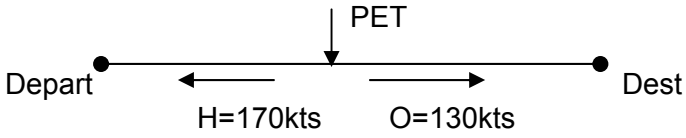
For an ICAO Semi-circular on 135°M, you need an ODD level, (levels shown on any en-route chart), FL70 would be too low, the next one up is FL90

Answer (d)

23. The Decision Point procedure allows a substantial reduction in contingency fuel, so you can load additional pax/bags/freight.

Answer (b)

24.



Distance to PET = $\frac{D\ H}{O+H} = \frac{500 \times 170}{130 + 170} =$ 283nm

Time to PET = $\frac{\text{Distance}}{\text{Speed}} = \frac{283}{130} = 2.179$ hrs = 131 minutes

Answer (d)

25. Use Annex G, or CAP 697 page 39.

First you need to calculate

LANDING WEIGHT = Dry Operating Mass + Traffic Load + Final Reserve
= 35500 + 14500 + 1200 = 51200 kg

Now to the chart and find 1000 kg, 0.4hr (24 minutes) Answer (c)

26. Integrated Range tables (CAP 697 pages 46…..) allow fuel consumption for a given nautical air mile distance; the tables consider decreasing aeroplane mass.

Answer (c)

27. We think the Annex to this question is flawed, it shows final reserve fuel of 1800kg and a time of 42 minutes with an apparently useless number 1325 floating below the bottom line.

We think the fuel figures in the Annex have slipped a line and it should actually look like this:

	Fuel (kg)	Time (hh:mm)
Trip Fuel	5800	2:32
Contingency Fuel		
Alternate Fuel	1800	0:42
Final Reserve Fuel	1325	
Minimum T/O Fuel		
Extra Fuel		
Actual T/O Fuel		
Taxi Fuel	200	
Ramp Fuel	10000	

The solution is now:

Complete the table:

Contingency fuel is 5% of TRIP = 290kg, no time is allocated.
Enter the time for Final Reserve fuel for a jet, 30 mins

Insert these figures in the table

	Fuel (kg)	Time (hh:mm)
Trip Fuel Contingency Fuel Alternate Fuel Final Reserve Fuel	5800 290 1800 1325	2:32 0:42 0:30
Minimum T/O Fuel Extra Fuel		
Actual T/O Fuel Taxi Fuel	 200	
Ramp Fuel	10000	

Add the top line to find the

Minimum T/O Fuel = 5800 + 290 + 1800 + 1325 = 9215 kgs

Contingency 290 kgs @ TRIP Fuel flow (2292 kgs / hr) = 7.6 mins
(5800 / 2.530 = 2292 kgs / hr)

Work the actual T/O fuel back from the ramp fuel

Actual T/O Fuel = Ramp Fuel – Taxy Fuel = 9800 kg

Therefore the “Extra Fuel” = 9800 - 9215 = 585 kgs

585 kgs @ the given 2400 kgs / hr = 0.244 hrs = 14.6 mins

	Fuel (kg)	Time (hh:mm)
Trip Fuel Contingency Fuel Alternate Fuel Final Reserve Fuel	5800 290 1800 1325	2:32 0:07.6 0:42 0:30
Minimum T/O Fuel Extra Fuel	9215 585	 0:14.6
Actual T/O Fuel Taxi Fuel	9800 200	
Ramp Fuel	10000	

So, TOTAL ENDURANCE = 2:32 + 0:07.6 + 0:42 + 0:30 + 0:14.6 = 4:06.2,
Answer (d)